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Addendum to Extend the Master Servicing Study (2018)

Barrhaven South Phase 3 (S1 Area)

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ENGINEERS · ARCHITECTS · PLANNERS

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Executive Summary

Minto Communities Inc. (Minto) retained a multi-disciplinary Consultant Team to prepare a suite of comprehensive technical studies in support of the Community Design Plan (CDP) for the Barrhaven South Phase 3 – S1 Area (the S1 Area). The CDP will be implemented through an amendment to the City of Ottawa Official Plan (OP).

J.L. Richards & Associates Limited (JLR) was retained to complete an Existing Conditions Study and subsequently undertake a Master Servicing Study (MSS). The MSS demonstrates that the subject lands can be adequately serviced with municipal water, sanitary sewer, storm sewer, and stormwater management infrastructure in accordance with City of Ottawa standards and applicable provincial requirements. The recommended servicing approach confirms that sufficient capacity exists, or can be provided through planned infrastructure upgrades, to support the proposed development without adverse impacts to existing municipal systems.

The S1 Area is located immediately adjacent to the existing Barrhaven South Urban Expansion Area (BSUEA) and the Ridge Subdivision. Owing to this proximity, the MSS for the S1 Area was undertaken as an extension to the 2018 BSUEA Master Servicing Study, which was completed under the Municipal Class Environmental Assessment (EA) process as a Master Plan. As part of this EA, a comprehensive range of servicing alternatives was developed and evaluated. Accordingly, the MSS for the S1 Area was completed as an addendum to the 2018 study and is hereafter referred to as the “MSS Addendum” or “Addendum.”

This Addendum documents the technical reviews, analyses, and findings that define the preferred infrastructure servicing strategies for the S1 Area Concept Plan. The objectives of the study, as outlined in the approved Terms of Reference (Appendix A), include:

- Reviewing and inventorying existing infrastructure in the vicinity of the proposed development.
- Assessing the residual capacity of the existing water, wastewater, and stormwater infrastructure. infrastructure.
- Identifying recommended stormwater, sanitary, and water servicing solutions for the proposed development, together with design criteria to guide future detailed design.

This Addendum to Extend the Master Servicing Study has been prepared to support the Concept Plan for the S1 Area and provides a functional design solution for on-site storm drainage, wastewater collection and water distribution servicing within the S1 Area. Future draft plan of subdivision and site plan applications submitted under the Planning Act will build upon and refine the conceptual servicing solutions presented herein.

The S1 Area encompasses approximately ≈71 hectares and is bounded to the east by the Quinn’s Pointe Subdivision, to the north by the Cavain’s Greenbank Development (Ridge Subdivision), to the south by Barnsdale Road, and to the west by Borrisokane Road and Highway 416. The lands are also located adjacent to the current City of Ottawa Urban Boundary.

The Study Area consists of undeveloped lands formerly used for agricultural purposes, together with two woodlots, with the southern one identified as ecologically significant by the project biologist. The site also includes a man-excavated pond at the intersection of Borrisokane Road and Barnsdale Road, as well as an existing spill-over dry pond located in the southeast portion of the Study Area.

As part of the original BSUEA Master Servicing Study, opportunities were identified and multiple servicing alternatives were developed and evaluated to extend municipal infrastructure into the expansion area while minimizing potential impacts to the social and natural environment. The servicing strategies established through the 2018 BSUEA MSS have been extended to the S1 Area through this Addendum. The recommended servicing approach includes the following key elements:

- A conceptual storm drainage system based on a dual-drainage design approach.
- Consistent with the 2018 BSUEA MSS, the incorporation of an Etobicoke Exfiltration System (EES) along local roads, to the maximum extent practicable, where adequate separation from seasonally high groundwater levels can be achieved, while recognizing site-specific constraints under the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA).
- Extension of rooftop stormwater infiltration via subsurface systems, which had previously been proposed for site plans within the BSUEA, to the industrial lands within the S1 Area.
- In areas where infiltration-based Low Impact Development (LID) measures are not feasible, implementation of a treatment train approach incorporating a filtration dry pond in Block 61 with appropriate pre-treatment measures.
- Proposed filtration dry pond adjacent to an existing spill over dry pond associated with the Quinn's Pointe Subdivision. The existing spill-over pond, originally intended to convey major overland drainage flows, will be expanded within Block 61 while maintaining the existing outlet sewer and respecting allowable flows within the downstream Quinn's Pointe storm sewer system.
- Provision of conventional storm sewers within public rights-of-way serving both residential and industrial lands. Storm sewers will be conceptually sized in accordance with the City of Ottawa Sewer Design Guidelines to convey the 1:2-year event on local roads and the 1:5-year event on collector roads.
- Assessment of residual capacity within surrounding wastewater infrastructure to identify suitable servicing outlets for sewage generated within the S1 Area. Wastewater servicing is proposed via extension of the existing sanitary sewer capped along Barnsdale Road near Bundoran Place.
- Provision of potable water servicing through watermain extensions from existing distribution systems within the Quinn's Pointe and Ridge Subdivisions.
- Confirmation that water servicing can be provided without additional interim or post-construction measures in advance of, or following, the planned municipal pressure zone reconfiguration.

This Addendum to extend the 2018 BSUEA MSS demonstrates that the development envisioned in the S1 Area Concept Plan can be serviced through strategic extensions of existing municipal water and wastewater infrastructure, together with the construction of an expanded stormwater management facility. These works will support the City of Ottawa in lifting the land-use overlay associated with the proposed Community Design Plan. The Addendum also establishes design

criteria to inform future draft plan of subdivision and site plan applications within the S1 Area. All proposed servicing works are consistent with current municipal and provincial design standards and satisfy the pre-established conditions of the CLI-ECA, thereby qualifying as pre-approved projects.

1.0 Introduction

1.1 Background

In 2016, Minto Communities Inc. (Minto) and Mattamy Homes (Mattamy) had retained a Consultant Team to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA) Community Design Plan (CDP), which was subsequently implemented as an Amendment to the City of Ottawa Official Plan (OP). As part of this undertaking, J.L. Richards & Associates Limited (JLR) had been retained to prepare a Master Servicing Study (MSS) which outlined water, wastewater, storm, and stormwater management servicing strategies for the BSUEA as well as an Existing Conditions Report that evaluated and documented existing water resources as well as the identification of servicing infrastructure in and around the BSUEA, and identified constraints and opportunities which provided the baseline conditions of an Environmental Management Plan (EMP).

The BSUEA MSS was subsequently approved by council, and a Notice of Completion of the Class Environmental Assessments (EA) was issued on August 31, 2018. Subsequently, the city was able to lift the overlay of the proposed Community Design Plan for the BSUEA. In parallel to the preparation of the 2018 MSS, parts of the BSUEA were disconnected from existing Municipal Drains, namely the Hawley and Thomas Baxter Municipal Drains, in accordance with the Ontario Drainage Act.

JLR was subsequently retained by Minto to proceed with detailed design of the various phases of the Quinn's Pointe Subdivision, which forms part of the BSUEA. To date, Stages 2 to 4 exist while the last stage of Quinn's Pointe Subdivision, namely Stage 5, is in the review process with the city's Development Review (DR).

In 2019, JLR was retained by Minto to prepare a Serviceability Study for the inclusion of several parcels located adjacent to the BSUEA. These parcels, previously referred to as the Barnsdale Expansion Lands, are located either adjacent to the current Official Plan Urban Area or in very close proximity to the Quinn's Pointe Subdivision (Stages 1-4). The 2019 Serviceability Study demonstrated that extensions from existing, and proposed infrastructure could support the urbanization of these parcels. Given their location next to the Quinn's Pointe Subdivisions (existing and future), their urbanization was deemed to be a logical urban expansion in the Barrhaven South - Barnsdale Expansion Lands.

The high-level servicing solutions presented in JLR's Serviceability Study (2019) for water, wastewater, storm and stormwater management were developed for the sole purpose of demonstrating the serviceability of each parcel. The Serviceability Study was prepared to support an application to amend the Official Plan (OP) during the City of Ottawa (City) 5-year review of the OP.

Following a review of the Serviceability Study (2019) by the City of Ottawa, two (2) of the four (4) expansion parcels that were analyzed by JLR were approved to be included in the Official Plan (OP) Urban Area; the parcels are those located north of Barnsdale Road, east and west of Greenbank Road. Specifically, this Master Servicing Study (MSS), herein as the Addendum was only prepared for one of the two (2) approved parcels, namely for the Barrhaven South Phase 3 – S1 Area.

1.2 Study and Public Participation

New urban areas added to the City's Official Plan require the preparation of Environmental Assessment (EA) Master Plans, integrated and approved under the Planning Act, to ensure coordinated land use and infrastructure planning. From a servicing perspective, the EA Master Plan should identify recommended water, sanitary, and stormwater management infrastructure, as well as transportation infrastructure (prepared by others), to support the new community.

The S1 Area is located immediately adjacent to existing Quinn's Pointe and the Ridge Subdivisions, which were part of the Barrhaven South Urban Expansion Area (BSUEA). Given this proximity, the MSS for the S1 Area was completed as an extension to the 2018 BSUEA Master Servicing Study, which was undertaken as a Municipal Class Environmental Assessment (EA) Master Plan that evaluated a range of servicing alternatives. Accordingly, this undertaking has been prepared as an Addendum to Extend the 2018 Master Servicing Study and is herein referred to as the "Addendum" or "MSS Addendum".

Under this framework, this Addendum fulfills Phase 1 (Problem and Opportunity) and Phase 2 (Alternative Solutions). Although Approach 2 typically includes a review of several servicing alternatives, these are limited, apart from those developed and evaluated under storm servicing, given that the Study Area is the last future community located in the southeast quadrant of the Barnsdale Road / Highway 416 / Borrisokane Road intersection.

As part of this Addendum, the following public consultation events have been completed to date:

- Notice of Commencement and Public Open House
- Public Open House 1 – Combined S1 & S2 (March 7, 2024)
- Public Open House 2 (May 20, 2025).

1.3 Addendum Objectives

Minto retained a Consultant Team to prepare a series of comprehensive documents that would support the Barrhaven South Phase 3 - S1 Area (herein referred to as the S1 Area). Once approved, this growth area will be implemented as an Amendment to the City of Ottawa (City) Official Plan (OP).

J.L. Richards & Associates Limited (JLR) was retained to undertake the MSS Addendum, which outlines water, wastewater, storm and stormwater management servicing strategies for the S1 Area. The Addendum demonstrates that the subject lands are serviceable with municipal water, sanitary sewer, and stormwater management infrastructure in accordance with City of Ottawa Sewer Design Guidelines and standards as well as applicable provincial requirements. The recommended servicing approach confirms that adequate capacity exists, or can be provided, to support the proposed development without adverse impacts to existing systems.

For reporting purposes, this Addendum which extends the servicing strategies identified in the 2018 BSUEA MSS will outline the preferred infrastructure servicing strategies for the S1 Area, including water, sanitary, storm sewer systems, and stormwater management.

The specific objectives of this Addendum are as follows:

- Review and prepare an inventory of the existing infrastructure surrounding the proposed development.
- Estimate residual capacity of the existing infrastructure.
- Develop conceptual site servicing for storm, stormwater management, sanitary and water services for the proposed development based on the approved Concept Plan.
- Evaluate the feasibility of conceptual servicing based on constraints and opportunities while recognizing that the proposed infrastructure will connect to existing infrastructure which had been identified as the preferred servicing solutions (per 2018 BSUEA MSS) as per the Class Environmental (Class EA) screening process.
- Select the optimal conceptual service solution for storm and stormwater management, as well as sanitary and water infrastructure.

1.4 General

Prior in preparing this Addendum that would support this new community, Terms of Reference (TOR) was prepared in accordance with the latest Ottawa Infrastructure Master Plan (IMP). The IMP provides guidance for preparing TORs for Master Servicing Studies (MSS), as outlined in "Appendix C: Guideline for Preparing Terms of Reference for a Master Servicing Study, June 2023."

JLR subsequently prepared a TOR for the S1 Area, which was accepted by the City of Ottawa. A copy of the TOR is included in Addendum for reference (Appendix A).

An Existing Conditions Report (ECR) was also prepared, with the latest version dated March 14, 2025 (sealed March 24, 2025), which is included in this Addendum (Appendix B). The ECR documented existing conditions and identified constraints and opportunities that serve as the baseline for an Environmental Impact Statement (EIS) prepared by Fotenn.

This Addendum has been prepared in support of the Concept Plan submission to confirm the servicing feasibility of the proposed development at a conceptual level. The study evaluates the proposed water, sanitary, and stormwater servicing approach associated with the Concept Plan and demonstrates that the development framework can be accommodated within the City of Ottawa's servicing standards and policies. The servicing concepts presented herein are intended to support the Concept Plan approval and to inform subsequent planning and detailed engineering design submissions, which will be subject to further review and approval by the City.

Since the proposed infrastructure within the S1 Area will connect to existing linear infrastructure in the adjacent subdivisions, as identified in the 2018 BSUEA MSS, a copy of that report is included in Appendix C for reference. This document as well as the ECR (2025) documents the servicing strategies investigated and the decision-making process that led to the selection of the recommended site servicing solutions.

Accordingly, this Addendum has been prepared in accordance with the City-approved Terms of Reference to support the Concept Plan approval process and to facilitate removal of the growth management overlay applicable to the subject lands.

1.5 Study Area

The Study Area of this Addendum encompasses ≈71 ha of an undeveloped mix of former agricultural fields and woodlots and a man-made excavated pond. The Study Area is adjacent to Barnsdale Road and Borrisokane Road to the south and west and by two (2) existing subdivisions to the east and north. It is adjacent to the Urban Boundary to the west and south (refer to Section 2.0 for more details).

1.6 Zoning and Proposed Land Use

The S1 Area is a logical development pattern, with improved phasing opportunities and more efficient connection to surrounding developments and infrastructure particularly to the Quinn's Pointe Subdivision. The S1 Area also supports the broader objectives of the city's Official Plan and will form part of the creation of a 15-minute neighbourhood with adjacent developments although not a specific requirement for this future growth area.

The Study Area includes the following three (3) types of zoning:

- Rural Countryside (RU) zone
- Agricultural Zone (AG) zone
- Mineral Aggregate Reserve (MR) zone

Based on the preferred Concept Plan (Appendix D), the proposed land usage consists of the following:

- Low density residential
- Medium density residential
- Industrial lands
- Retained woodlots[1]
- Park land
- Stormwater management block
- Servicing easements

Note [1]: The woodlot located within the Industrial and Logistics lands have been identified as a good candidate for conveyance as an urban natural feature through a future planning process. As such, this MSS has assumed the potential future conveyance of the woodlot throughout the report.

1.7 Supporting Studies

The preferred Concept Plan (Appendix D) was developed in consultation with various stakeholders and multiple city departments to support the various land uses listed in Section 1.6. The plan was prepared with consideration of constraints identified in the Environmental Impact Statement (EIS) and opportunities provided by adjacent subdivisions, as well as collector roads and the capacities of existing linear infrastructure documented in the Existing Conditions Report for the S1 Area (JLR, 2025).

Sections 3.0, 4.0, and 5.0 describe the sizing of proposed infrastructure required to support the S1 Area Concept Plan. This Addendum, completed as an extension to the 2018 Environmental

Assessment Master Plan (Master Servicing Study), was developed while considering the following supporting studies:

- Community Design Plan, Foten (2026)
- Natural Heritage Existing Conditions Report (2025), Arcadis Professional Services Canada
- Environmental Impact Statement (2026), Fotenn
- Geotechnical and Hydrogeological Existing Conditions Reports (2025), Paterson Group
- Community Energy Plan Report – Lifting of Future Neighborhood Overlay (2025), Fotenn
- Ontario Drainage Act – Revised Engineers Report (upcoming), Robinson Consultants Inc
- Sizing and Modelling of Linear Infrastructure (J.L. Richards & Associates Limited)

Regulatory approval requirements for this undertaking are listed in Section 8.0 of this Addendum.

2.0 Existing Conditions

The existing site conditions for the S1 Area were identified and outlined in JLR's 2025 Existing Conditions Report (ECR). This document included information pertaining to the site's climate, geology, physiography, drainage, surficial geology, bedrock, aquifer systems and groundwater levels, existing infrastructure at the subject site's boundary as well as additional physical attributes of the site. The latest version of the ECR is included in Appendix B of this document for reference.

2.1 Background Documents

A series of documents were reviewed as part of the 2018 BSUEA MSS, which were listed in a Synopsis of Background Documents (refer to Appendix C for the synopsis). To supplement these background documents, JLR's 2025 ECR (Appendix B) included more recent engineering documents that are applicable to Caivan's recent developments within the former aggregate extraction properties.

2.2 Surface Water Characteristics, Watercourses and Site Hydrology

The S1 Area, accounting for of ≈71 ha of land, is bounded by Quinn's Pointe Subdivision to the east, by Cavain's Greenbank Development (The Ridge Subdivision) to the north, by Barnsdale Road to the south and by Borrisokane Road to the west as shown on Figure 1 (Location Plan) is part of the Barrhaven South Area (BSC) within the former City of Nepean.

Based on the interpretation of both LiDAR data and topographical survey, the S1 Area is currently tributary to two (2) separate sub-watersheds as depicted on Figure 2 (Study Area and Drainage Divide). As shown on this figure, most of the S1 Area is tributary Mud Creek via the Thomas Baxter Municipal Drain while a small area located in the northeastern portion of the Study Area is tributary to the Jock River. Given that a significant portion of the S1 Area is tributary to a Municipal Drain, council appointed Robinson Consultants Inc. (RCI), as the Drainage Engineer, to prepare an update to the Engineer's Report to document the drainage modifications and potential disconnection from the Thomas Baxter Municipal Drain.

On-site investigations completed by the team's biologist did not identify any watercourse or formal conveyance channels within the S1 Area. The absence of channels or formal watercourses was confirmed by the review of LiDAR, which is generally indicative of areas exhibiting particularly low surface runoff potential.

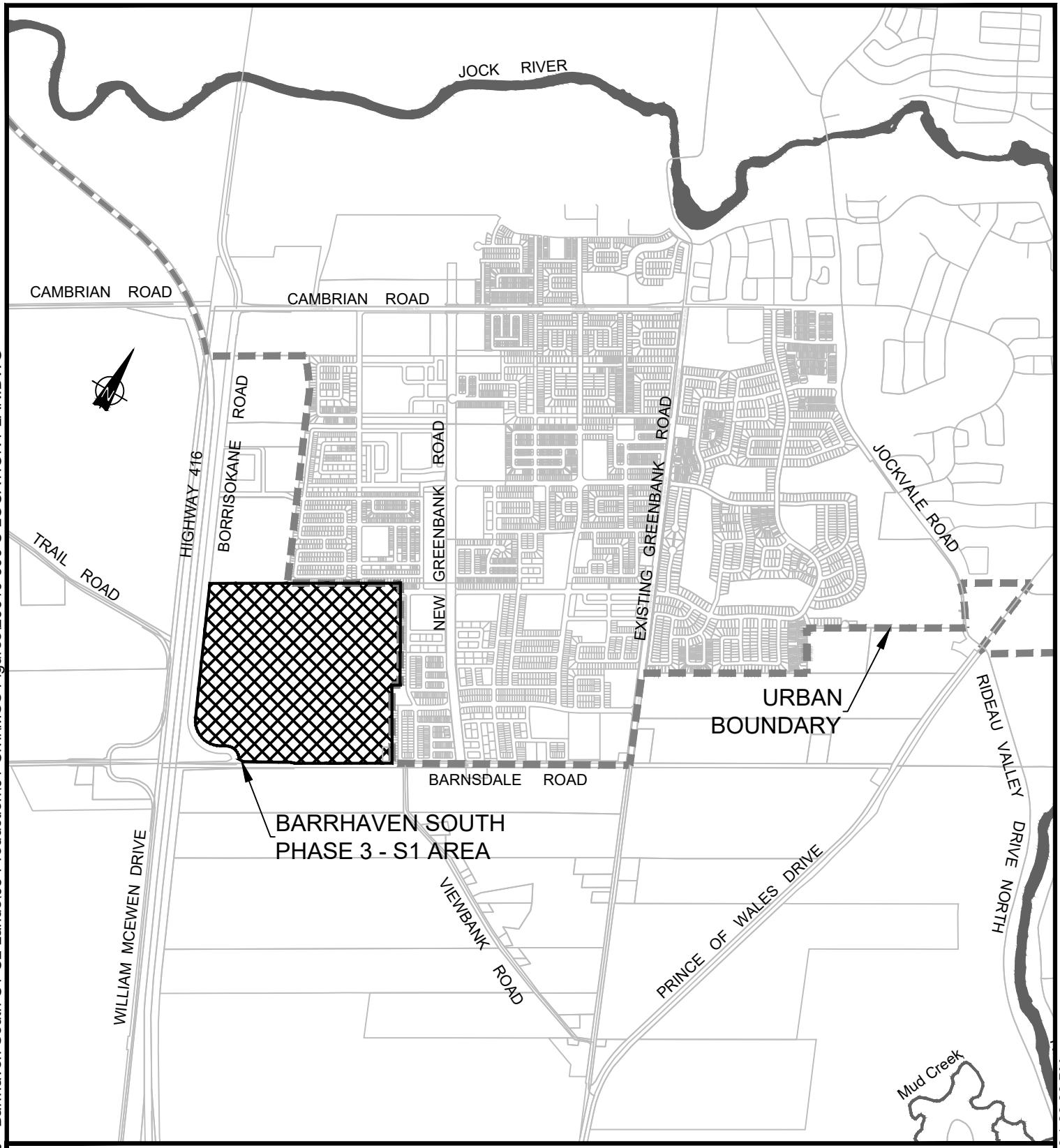
Catchment areas within the S1 Area have been delineated based on LiDAR as well as surface infrastructure such as roads (which tend to form a drainage path barrier) and culverts (where flow will concentrate into a point source). Information presented in the 2025 ECR (refer to Appendix B), namely Sections 5.2 and 5.3 as well as Figure 5-2, Figure 5-3 and Figure 5-4 show the drainage areas to boundary culverts, land cover and soil types for each of the sub-catchment's that is tributary to each of the boundary culverts located along the perimeter of the site.

Hydrological modelling to establish pre-development conditions was undertaken using the SWMHYMO platform for the BSUEA as part of the 2018 MSS. Given that the analysis was undertaken to assess flows at each boundary culvert bounding both the BSUEA And S1 Area,

flows reported in the initial version (R0) of this MSS (dated October 2025) were those extracted from the 2016 ECR (BSUEA) at each of the boundary culverts under infrequent storm events.

Due to additional requirements to refine the modelling undertaken along existing roadway culverts, as part of the 2016 ECR (BSUEA), the SWMHYMO pre-development model was replaced with a pre-development model using the PCSWMM platform. Having pre-development conditions modelled in PCSWMM is consistent with the post-development PCSWMM model. The pre-development simulation results with SWMHYMO are consistent with those generated with PCSWMM and provide an estimate of flood flows at the boundary control points of the site for storm events ranging from the 1:2-year to the 1:100-year recurrence as well as for the 4-hour 25 mm storm. Section 3.13.4 of this Addendum provides refined pre- and post-development modelling using PCSWMM. Both peak flows and runoff volumes were generated for several storm events at several locations along the open diches of Borrisokane Road and Barnsdale Road as well as the headwater of the Thomas Baxter Municipal Drain.

The PCSWMM simulation results under a frequent storm (4-hour 25 mm) show relatively low flow rates at each of the boundary culverts, due to the high infiltration capacity of the native soils in the area and the low imperviousness levels. In general, during larger and less frequent events, runoff will increase as the infiltration capacity decreases due to saturation of the native soils.



PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

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LOCATION PLAN

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FIGURE 1

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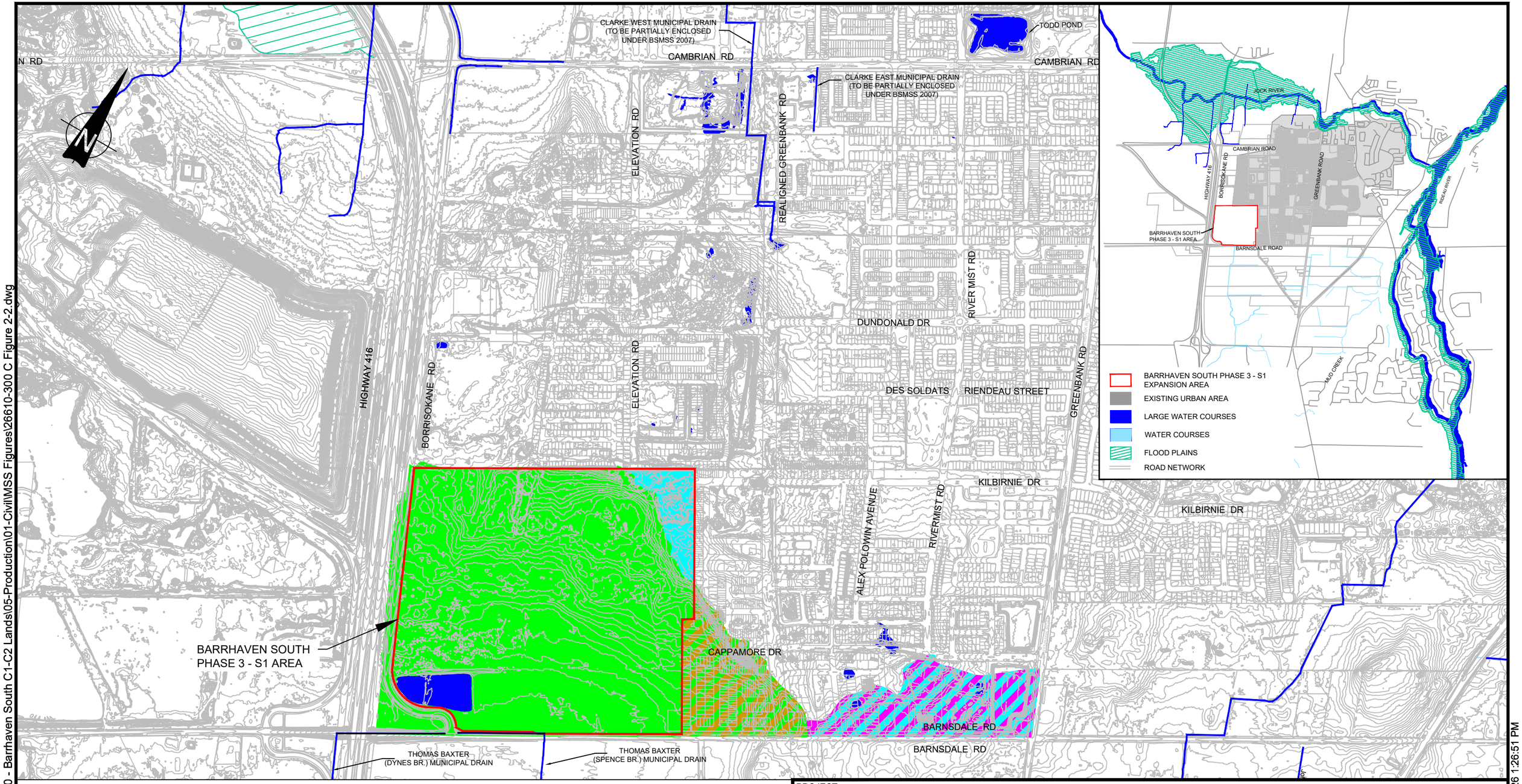

LEGEND

- S1 URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- WATERCOURSE/ MUNICIPAL DRAINS
- AGGREGATE EXTRACTION AREA
- TRIBUTARY AREA TO JOCK RIVER SUBWATERSHED
- TRIBUTARY AREA TO MUD CREEK SUBWATERSHED
- PRE-DEVELOPMENT EXTENTS TRIBUTARY TO RIDEAO RIVER REDIRECTED TO JOCK RIVER SUBWATERSHED WITH URBANIZATION
- CATCHMENT AREA TO HYDROLOGIC BOUNDARY CONTROL POINTS
- WATER BODIES
- FLOOD PLAIN
- PRE-DEVELOPMENT EXTENTS TRIBUTARY TO MUD CREEK REDIRECTED TO JOCK RIVER SUBWATERSHED WITH URBANIZATION

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

DRAWING:

STUDY AREA & DRAINAGE DIVIDE

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2.3 Site Features

The S1 Area (Figure 2) consists of an undeveloped mix of former agricultural land, two (2) woodlots, which have been identified of significance by the Team's biologist. As noted in Section 1.6 (above), the woodlot located within the Industrial and Logistics lands have been identified as a good candidate for conveyance as an urban natural feature through a future planning process. This MSS has, therefore, assumed the potential future conveyance of the woodlot throughout the report. The subject site also includes a man-excavated pond located at the intersection of Borrisokane Road and Barnsdale Road. The lands are sited adjacent to the current Urban Boundary.

The topography across the site has significant undulations. In general, the lands slope down from the northern to the southern boundary of the lands. Elevations of ±112 m at the highest point near the northern boundary while elevations drop to ±100 m at the lowest point near Barnsdale Road. At the intersection of Borrisokane Road and Barnsdale Road, in the southwest corner of the site, there is an existing man-made pond that was excavated in the 90's as displayed on the aerial on "geoOttawa".

2.4 Source Protection

The Mud Creek Subwatershed Study (2015) identified the S1 Area as being located within the Mississippi-Rideau Source Protection Region (MRSPR) as depicted in Figure 8 of the MRSPR. In addition, the entirety of the S1 Area is located within a Highly Vulnerable Aquifer based on the source protection mapping from the Ministry of the Environment, Conservation and Parks (MECP).

Conceptual storm servicing developed as part of this Addendum will incorporate infiltration measures to the maximum extent, while recognizing constraints listed in Table A2 of the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA), to minimize the impact on the shallow aquifer/esker.

Section 3.10 and Section 3.11of this Addendum present recommended servicing strategies that are consistent with site specific constraints and opportunities of the Study Area. Specifically, Section 3.10 describes infiltration strategies that are proposed to the maximum extent while accounting for the constraints documented in the CLI-ECA. It should be noted that the proposed servicing strategies for the S1 Area reflect those adopted as part of the 2018 BSUEA MSS. Similarly, Section 3.11 describes the filtration strategies reviewed to the maximum extent with the preferred strategy documented in a screening process.

2.5 Geotechnical and Hydrogeological Investigations

2.5.1 General

A Geotechnical Investigation as well as a Hydrogeological Investigation were carried out by Paterson Group Inc. (Paterson) to assess general subsoil and groundwater conditions within the boundaries of the S1 Area and to provide geotechnical recommendations for the design of municipal services associated as well as sub-surface information to assess infiltration measures with the proposed development.

The latest documents prepared by Paterson are as follows:

- Existing Conditions – Geotechnical Barrhaven South Phase 3 – S1 Area (June 27, 2025)
- Hydrogeological Existing Conditions Report – Barrhaven South Phase 3 S1 Area (March 25, 2025).

Both reports have been submitted to the City by Paterson under separate cover.

2.5.2 Geotechnical

Based on the Existing Conditions – Geotechnical Barrhaven South Phase 3 (S-1 Area) report prepared by Paterson, a total of 34 boreholes and 51 test pits were completed across the site and the immediate surrounding area with limited coverage in the northern wooded area and the southwest portion of the site near the existing stormwater pond. Borehole data indicate that the overburden thickness across the site is substantial, generally ranging from approximately 15 to 25 m, and bedrock was not encountered within the depths explored. The site is predominantly underlain by non-cohesive silty sand to sandy silt, which is considered suitable subgrade material for municipal servicing.

Localized silty clay deposits were encountered within the S-1 Lands, primarily in the northwest portion of the site and in isolated areas of the central-east. These clay deposits are not continuous and occur within an otherwise granular overburden profile dominated by silty sand and sandy silt. Where present, clay is typically encountered at shallow depths of approximately 0.5 to 3.5 m below ground surface, with thicknesses generally ranging from 0.5 to 3.0 m.

From a civil servicing and grading perspective, the presence of silty clay locally governs permissible grade raise, rather than limiting the feasibility of deep servicing. The report recommends a preliminary maximum grade raise of approximately 2.5 m in areas where silty clay remains beneath settlement-sensitive infrastructure, to control long-term total and differential settlement. These restrictions apply only within clay-affected zones and do not impact most of the site, which is underlain by granular soils suitable for conventional municipal servicing. In areas where higher grade raises are required, or where servicing alignments intersect clay-affected zones, supplemental investigation and mitigation measures may be required at later stages of design.

2.5.3 Hydrogeological and Assessment of Infiltration Rates

2.5.3.1 Infiltration Characteristics and Soil Permeability

Paterson's Hydrogeological Existing Conditions Report for the S1 Area (March 2025) states that the site is predominantly underlain by non-cohesive silty sand to sandy silt overburden associated with glaciofluvial and glaciomarine deposits. These materials form an unconfined overburden aquifer with generally favourable infiltration characteristics. Hydraulic conductivity testing of the saturated overburden yielded values ranging from 4.6×10^{-7} to 4.6×10^{-5} m/s, which are consistent with moderate to high permeability soils typically associated with groundwater recharge areas and was found to be consistent those measured as part of the BSUEA.

The in-situ infiltration testing results from the report show that typical infiltration rates generally range between 50 and 100 mm/hr, with higher infiltration rates exceeding 100 mm/hr primarily

observed in the northwestern portion of the site. These elevated rates are attributed to coarser granular soils associated with the Kars Esker system. From a stormwater management and Low Impact Development (LID) perspective, these results confirm that the site is generally suitable for infiltration-based solutions, provided that adequate vertical separation to the groundwater table can be maintained. Simulated unfactored infiltration rates, for the areas intended to be serviced by an EES, is discussed in greater details in Section 3.10.3 as part of the screening process.

2.5.3.2 Groundwater Levels

From the borehole and monitoring well data presented in the Hydrogeological Report for the S1 Area (March 2025), the overburden thickness across the site is substantial, generally ranging from 15 to 25 m. Bedrock was not encountered in boreholes advanced to depths of up to approximately 17 m below ground surface, indicating that bedrock depth does not present a constraint to deep servicing infrastructure. Instead, the depth to the groundwater table represents the primary hydrogeological constraint for servicing and infiltration design.

Groundwater elevations across the S-1 Lands are relatively consistent, generally ranging from approximately 98 m to 101 m in the northern portion of the site and approximately 96 m to 99 m in the southern portion. However, due to the natural site topography, which rises from approximately 99 m near Barnsdale Road to approximately 110 m toward Kilbirnie Drive, the depth to groundwater relative to surface elevation increases toward the northern portions of the site. In these areas, groundwater levels are locally observed at depths of approximately 6 m to 12 m below ground surface, providing sufficient vertical separation to support deeper sewer infrastructure and infiltration systems, including the proposed EES system.

Conversely, the southern portion of the site exhibits shallower groundwater levels due to the lower existing surface elevation and localized perched groundwater conditions, which may constrain the feasibility and extent of infiltration-based allowances in this area.

The Hydrogeological Report provided seasonal high groundwater levels for each borehole. This data was subsequently used by Paterson to generate seasonal high groundwater contours. The compiled information was subsequently adopted as the basis for design considerations presented in this Addendum. This information has been compiled on a Figure (Figure 9a) along with other information pertaining to the proposed configuration of the EES and included in Appendix G.

2.5.3.3 Groundwater Mounding Considerations

An Etobicoke Exfiltration System (EES) was the recommended servicing solution as part of the 2018 BSUEA MSS to achieve distributed infiltration and maintain the pre-development infiltration condition. The same screening process was carried out as part of this Addendum, which has been documented in Section 3.10.3 (below). Similarly to the BSUEA, an EES is being proposed within areas underlain by coarse native materials, such as sand or sandy gravel, as was the case in the BSUEA and some of the areas within the S1 Area. There is a potential risk of groundwater mounding although more probable when native material are mostly fine-grained soils, which is not representative of the areas in the S1 Area. Nonetheless, groundwater mounding remains an important design consideration and must be evaluated to confirm system

feasibility and long-term performance in accordance with the Sewer Design Guidelines (Appendix 10). It has been reviewed in greater detail, in Section 3.10.3.

3.0 Storm Drainage and Servicing

3.1 Background

A stormwater management strategy was developed for the S1 Area to ensure that prior to any off-site discharge, runoff would meet both municipal and provincial requirements. In addition, the stormwater management strategy also requires that the integrity of the downstream systems be maintained from both a minor and major systems perspective.

The stormwater management strategy should include measures to promote infiltration, to the maximum extent, while recognizing constraints, supplemented by filtration solutions to the maximum extent. In addition to the above strategies, SWM needs is to be identified, including the facility type, size and location, along with major overland flow paths and proposed storm sewer trunks.

From a surface water perspective, the S1 Area is tributary to the following two (2) sub-watersheds as depicted on Figure 2:

- **Jock River:** A small area located in the northeast portion of the Study Area.
- **Mud Creek:** The majority of the Study Area surrounding the northeast portion.

The S1 Area is bounded by two (2) existing subdivisions and by the current urban boundary along both southern and western limits. Hence, linear infrastructure exists at the northern boundary with Caivan's Greenbank Development (The Ridge) and eastern boundary with Quinn's Pointe Subdivision (existing Stages 3 and 4 and future Stage 5).

There is an existing spill-over pond located within the S1 Area (southeastern corner). This facility was designed as part of Quinn's Pointe Subdivision with the objective of intercepting major overland flow to prevent cascading onto the future Realigned Greenbank Road, an arterial.

There is no inlet sewer originating from Quinn's Pointe Subdivision to the spill-over pond as inflow to this feature is solely via cascading of major overland flow. The spill-over pond is currently connected to Quinn's Pointe Subdivision by means of an outlet structure complete with the 900 mm diameter outlet sewer which slowly releases the captured major overland flow. Figure 3 depicts existing surface drainage conditions, including existing ponds and culverts, in the vicinity of the S1 Area.

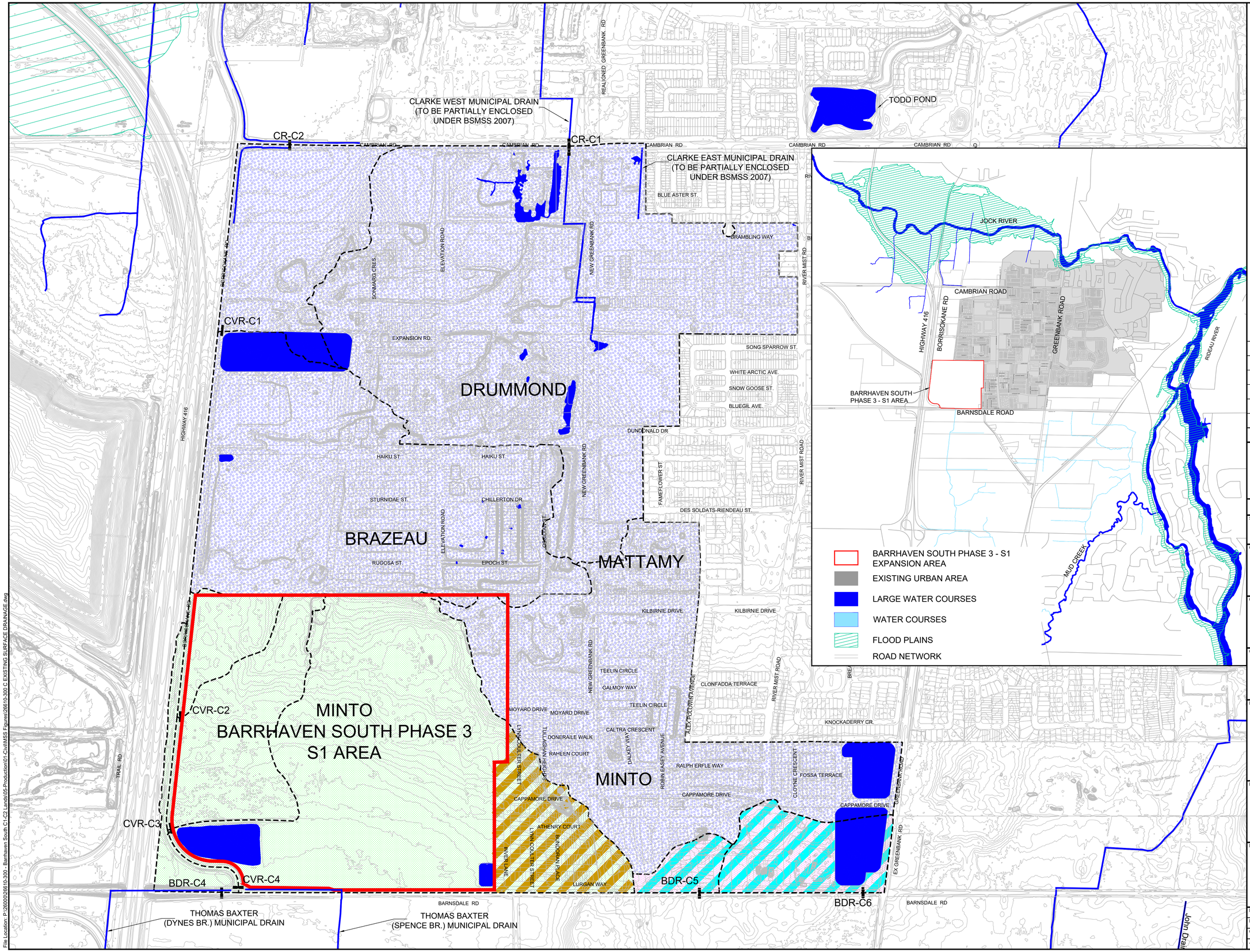
3.2 Storm Connections and Limitations

The S1 Area is not directly connected to any receiving water course. Consequently, runoff from the Study Area will be collected and conveyed to proposed and existing storm sewers, end-of-pipe facility and/or open ditches prior to being discharged off-site within the residual capacities in the downstream systems. Figure 3 shows the internal drainage limits within the S1 Area as well as culverts located along the perimeter of the lands.

Figure 4 below shows existing and planned storm sewer servicing infrastructure surrounding the S1 Area. As indicated in Section 7.4.3 of the ECR (Appendix B), several storm sewer systems were reviewed and assessed to determine their viability in providing an outlet to the S1 Area. Based on this review, it was determined that a storm connection to Elevation Road would not be a viable option as the system does not have residual capacities to accommodate part or full flows from the S1 Area.

In terms of a connection to the open ditch system along Borrisokane Road, the storm strategy was developed to minimize sheet flow drainage from the S1 Area to that drainage system by only allowing local drainage to reach the open ditch system since it is tributary to the Thomas Baxter Municipal Drain. Ultimately, modifications to the serviced area and/or hydrological regime of the Thomas Baxter Municipal Drain will require to be documented in an update to the Engineers Report for a subsequent disconnection (either full or partial) from the Thomas Baxter Municipal Drain.

Based on existing conditions servicing, flows captured and released from the spill-over pond (located in the southeast corner of the S1 Area) is being conveyed by the Quinn's Pointe storm sewer system, consisting of storm sewers ranging between 900 mm and 1650 mm in diameters. From the downstream end of this storm sewer system, flows are released to Dry Pond 2 before discharging into the Greenbank Road trunk storm sewer system. The storm strategy presented herein meets the flow allowance along the 900 mm diameter storm sewer with Quinn's Pointe.


CLARKE WEST MUNICIPAL DRAIN
(TO BE PARTIALLY ENCLOSED
UNDER BSMSS 2007)
CLARKE EAST MUNICIPAL DRAIN
(TO BE PARTIALLY ENCLOSED
UNDER BSMSS 2007)
TODD POND
CR-C1
CR-C2
CVR-C1
CVR-C2
CVR-C3
CVR-C4
BDR-C4
BDR-C5
BDR-C6
DRUMMOND
BRAZEAU
MATTAMY
MINTO
MINTO
BARRHAVEN SOUTH PHASE 3
S1 AREA
CAMBRIAN RD
REALIGNED GREENBANK RD
BLUE ASTER ST.
BRAMBLING WAY
EXPANSION RD.
SONMARG CRES.
ELEVATION ROAD
NEW GREENBANK RD
RIVER MIST RD
SONG SPARROW ST.
WHITE ARCTIC AVE.
SNOW GOOSE ST.
BLUEGIL AVE.
DUNDONALD DR
FAMELFLOWER ST
DES SOLDATS-RIENDEAU ST.
HAIKU ST.
STURNIDAE ST.
CHILLERTON DR.
RUGOSA ST.
EPOCH ST
KILBIRNIE DRIVE
TEELIN CIRCLE
GALMOY WAY
MOYARD DRIVE
CONNAUGHT PLACE
CONNAUGHT PLACE
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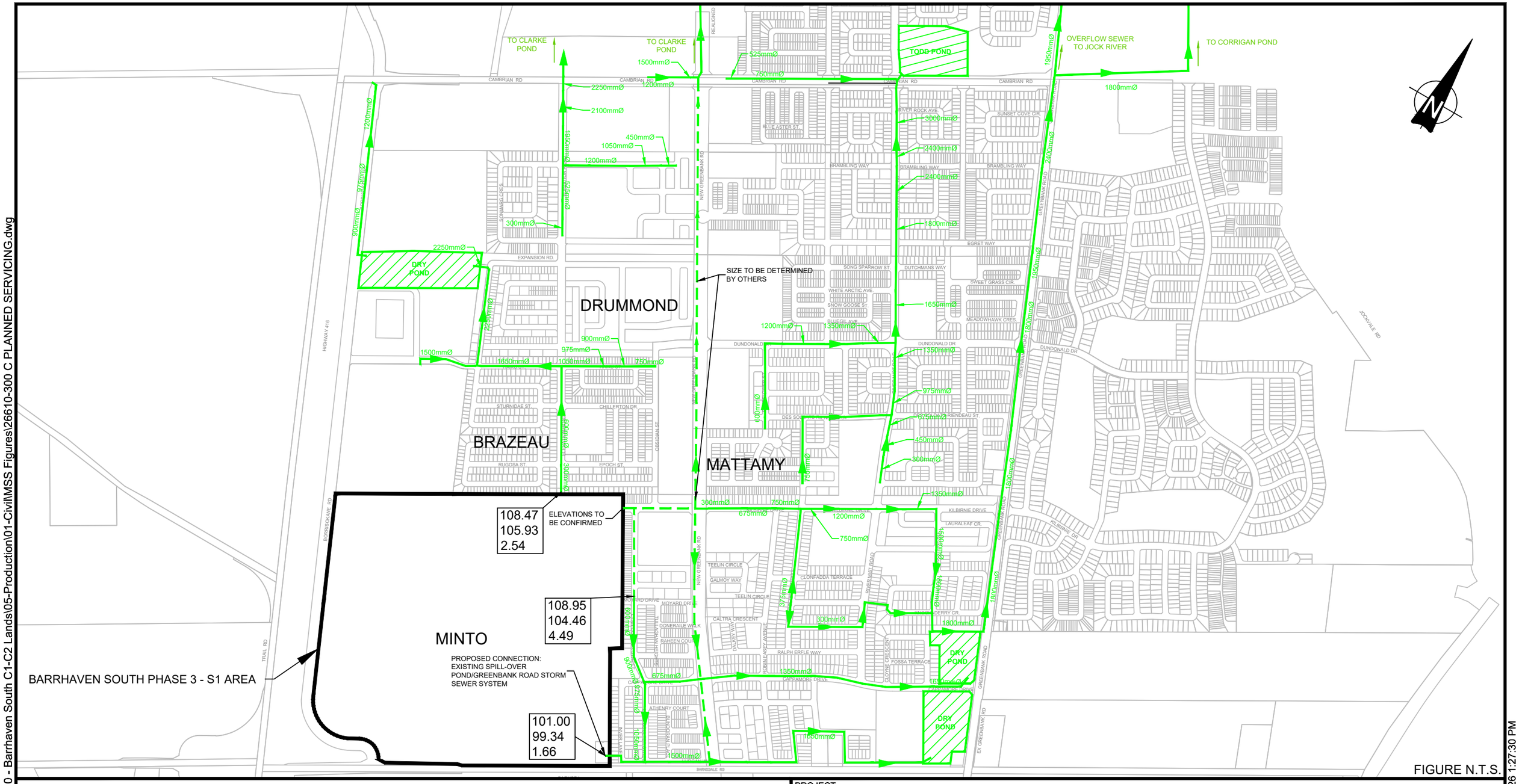

FIGURE N.T.S.

LEGEND

- EXISTING STORM SEWER
- PLANNED STORM SEWER

98.00
94.07
3.9

EXISTING GROUND ELEVATIONS (±)
STORM SEWER OBVERT
COVER DEPTH (m)

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

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EXISTING AND PLANNED STORM SERVICING INFRASTRUCTURE

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3.3 Roadway Projects

3.3.1 Barnsdale Road Widening

In 2025, the City of Ottawa initiated a Class Environmental Assessment for the Barnsdale Road widening project, from Prince of Wales Drive to Highway 416. It is important to note that there is a section of Barnsdale that bounds the S1 Area and that will be part of the future Highway 416 interchange, an initiative led by the Ministry of Transportation (MTO), as discussed in Section 3.3.2 (below).

The above-noted undertaking will be carried out under a Schedule C Class Environmental Assessment and will examine widening options of Barnsdale Road, from a two (2) to four (4) lanes. A Transportation Environmental Study Report (ESR) will ultimately be prepared that would document outlet locations for the various sections of the roadway, along with high-level water quality and quantity measures to meet regulatory requirements. It should be noted that detailed design of the Barnsdale Road widening will need to be developed in accordance with the requirements of the City of Ottawa CLI-ECA (No 008-S701).

The servicing strategy developed and presented herein did not account for the Barnsdale Road widening project in either the storm sewers or in the end-of-pipe facility within the S1 Area. It has been assumed that drainage for the widening project would be conveyed based on the pre-development flow pattern, which is from the roadway in a southerly direction, away from the S1 Area. It is expected the roadway project would culminate through the hierarchy of the CLI-ECA (i.e. Appendix A and Table A1 and Table A2 with constraints) and could possibly integrate its own surface filtration Low Impact Development (LID) measure or Manufactured Treatment Device (MTD).

From a quantity control perspective, simulation results summarized in Section 3.13.4 have shown a decrease in both peak flows and runoff volumes released to the headwater of the Thomas Baxter Municipal Drain. Hence, an opportunity may exist to outlet some of the runoff from the widening or interchange projects (refer to Section 3.3.2 below) to the Thomas Baxter Municipal Drain and take advantage of the partial disconnection of the majority of the S1 Area as shown in Section 3.13.5.

3.3.2 Highway 416 at Barnsdale Road Interchange

A Transportation Environmental Study Report (ESR) was completed in 2023 by Morrison Hershfield. A series of alternatives were reviewed against six (6) separate criteria with Alternative 5 (Parclo AB/South Side Loop) selected as the technically preferred Alternative for the interchange configuration.

Section 5.1.4 of the Transportation ESR reads as follows:

> "*The recommended option implements a Parclo AB interchange with four (4) free flow ramps servicing movements to and from the north and two (2) inner loop ramps."*

The proposed configuration of the interchange will require the closure of roadways, including the southern portion of Borrisokane Road. Active transportation facilities are located on the north side of Barnsdale Road, with two (2) high risk potential conflict areas.

The preferred Concept Plan (Appendix D) has considered land requirements for the Highway 416 / Borrisokane Road / Barnsdale Road interchange.

3.4 Master Grading Plan

Topography varies significantly throughout the Study Area, from elevation ±109 m at the highest point near the northern boundary and drops to ±99.5 m at the lowest point near Barnsdale Road. At the northern end of the Study Area, near the Ridge Subdivision, there is a vertical difference of 4 m within a horizontal length of 100 m. Overall, there is a grade differential of approximately 10 m from the northern to the southern portion of the Study Area.

A Conceptual Grading Plan (Drawing MG1 in Appendix K) was developed, at a macro-level, for the residential portion of the S1 Area. Centerline high points, with minimum 0.1% slopes from crests to crests, were established along ROWs and corridors, to identify locations and paths for major overland flow routes. Based on the high points and respective slopes between them, assumptions were made to assess where low points could be accommodated for future roadway sag storage. Overall, a target of 70 m³/ha of storage is anticipated to be achievable, which has been incorporated into the stormwater management strategy and dual drainage PCSWMM model as described in the following sections. It should be noted that the Conceptual Grading Plan was developed to target an overall balanced of cut and fill for the residential lands rather than on a phase-by-phase basis.

There are two (2) Blocks zoned as Industrial on western part of the Study Limits, bounding Borrisokane Road, as shown on the Concept Plan (Appendix D); the Northern Block (13.22 ha) and Southern Block (3.19 ha).

Given that a Site Plan or Concept Plan was not available for these Blocks, the Master Storm (Drawing MST in Appendix K) and Master Grading (Drawing MG1) were developed for the Industrial Lands to consider the following:

- **Northern Industrial Block:** Runoff from the entire northern Industrial Block is proposed to discharge into a storm sewer system along Moyard Drive, along the storm sewer reach from STMH631 to STMH630A to STMH630 (refer to Drawings KS1 and MST in Appendix K). This receiving storm sewer consists of a traditional storm sewer supplemented by an EES, as both contributions do not require any additional quality treatment. Stormwater from this Block combined to the areas with an EES will be conveyed easterly along Moyard Drive and then southerly along Elevation Road to the proposed stormwater management dry pond located within Block 61, at STMH600, thereby by-passing the filtration dry pond.

- **Southern Industrial Block:** Runoff from the entire southern Industrial Block is proposed to discharge into a storm sewer system flowing northerly along Moyard Drive, from reach from STMH680 to STMH651 to STMH650 (refer to Drawings KS1 and MST in Appendix K). The discharge of runoff from the southern block into this storm sewer system consists of a traditional system supplemented by an EES, as contributions do require any additional quality treatment. Runoff from these will be conveyed northerly and then easterly along Moyard Drive and eventually discharge in a dedicated storm sewer system from STMH 606 to STMH605 along Elevation Road, which flows southerly to the proposed

stormwater management dry pond within Block 61, at STMH600, thereby by-passing the filtration dry pond.

As a result of the above-noted sewer servicing strategies, the northern and southern Industrial Blocks will entirely be disconnected from the Thomas Baxter Municipal Drain. In support of the urbanization of the southern Industrial Block, Minto had retained Paterson to provide guidance with this future development. A bathymetric survey and Memorandum were prepared by Paterson with geotechnical recommendations to infill the existing man-excavated pond. Refer to Appendix E for the Memorandum and Bathymetric Survey, prepared by Paterson.

3.5 Stormwater Drainage Criteria

3.5.1 General

A thorough review of relevant background reports was completed as part of the 2016 ECR supporting the BSUEA MSS. A synopsis summarizing that review was included in the BSUEA MSS (2018).

The stormwater management design target developed as part of the BSUEA MSS considered all relevant reports to the Study Area, the Existing Conditions Reports prepared by Minto's Consultant Team as well as the Ottawa Sewer Design Guidelines and MECP's Stormwater Management and Planning Manual (2003). Similarly, the adjacent S1 Area is also bound by the recommendations of the Existing Conditions Reports prepared by all Minto's sub-consultants and the following background reports:

- The Jock River Reach 2 Subwatershed Study (2009)
- Corrigan Stormwater Management Facility and Design Brief (2010).
- The Lower Rideau River Subwatershed Report (2012)
- The Mud Creek Subwatershed Study (2015)
- The Barrhaven South Urban Expansion Area Master Servicing Study (BSUEA MSS) (2018).

Given that the BSUEA MSS (2018) was prepared while accounting for the recommendations from the other four (4) studies, the S1 Area should also meet the same stormwater management criteria and design objectives along with the requirements of the latest Sewer Design Guidelines (December 2025).

The following sub-sections summarizes the stormwater management targets as follows: Section 3.5.2.2 provides details on water balance, Section 3.5.2.3 on water quality, Section 3.5.2.4 on erosion while Section 3.5.2.5 on water quantity. Similarly, minor and major systems design criteria, is described in Section 3.5.3 and Section 3.5.4, respectively.

3.5.2 Stormwater Management Design Targets

3.5.2.1 General

The stormwater management design targets established as part of the 2018 BSUEA MSS were extended to the S1 Area in accordance with this Addendum Report. Those targets were

combined with those included in the SDG (December 2025) and the city's CLI-ECA (particularly those under Appendix), in establishing the overall design criteria for the S1 Area.

3.5.2.2 Water Balance

A water balance analysis was carried out as part of the BSUEA MSS (2018) which assessed the pre- and post-development infiltration regime while accounting for the proposed infiltration measures. As part of the 2018 BSUEA MSS, a statistical analysis was completed which demonstrated that infiltration measures along local roads, sized to capture and infiltrate the 22 mm event, was sufficient to maintain the pre-development infiltration condition when supplemented with rooftop infiltration within private blocks. This strategy was also found to meet the 80% TSS removal.

The Existing Conditions Report (March 2025) included the pre-development water balance for the S1 Area, which is summarized in Section 3.6 of this document. In light of Table A2 of the CLI-ECA, the following constraints will prevent the use of the EES:

- ✓ Areas of high groundwater levels - Constraint (b)
- ✓ High Risk Activities – Constraint (e)
- ✓ Source protection Restrictions – Constraint (f)

As a result, the implementation of the EES along local roads, to the maximum extent in areas not impacted by the above-noted constraints, is to be targeted to capture/infiltrate the 22 mm event which is to be supplemented by rooftop infiltration using sub-surface systems within both Industrial Blocks.

3.5.2.3 Water Quality

Constraints identified in Section 3.5.2.2 will prevent the use of infiltration measures throughout the S1 Area. In turn, areas impacted by these constraints, will require to be serviced by LID filtration measures, to the maximum extent.

The LID filtration solution should be sized to control the storm event identified as part of a water balance analysis carried as part of the 2018 BSUEA MSS and updated in this document. Accordingly, the design target of 22 mm was used as the design capture for both LID infiltration and filtration solutions.

The proposed LID filtration solution should also achieve an 80% TSS removal, consistent with the water quality objectives associated with the Jock River. The adherence to this water quality objective can be achieved by a single servicing solution or by a combination of measures designed as a treatment train approach. As per the CLI-ECA, an 80% TSS should be targeted for the proposed filtration solution.

3.5.2.4 Erosion Control

Off-site discharges should consider erosion potential for the given sub-watershed if the point of discharge is not a storm sewer system. For any areas serviced by an EES, erosion will not be of concern as the smaller and frequent events will be captured and infiltrated. In terms of erosion for the areas serviced by the preferred LID filtration solution, the peak flows will be captured,

detained and slowly released to the dry pond. Erosion targets have been developed based on the following discharge points:

- Off-site discharge to the existing Quinn's Pointe storm sewer system will not require any special provisions as it will be limited to the discharge rates identified as part of the overall Quinn's Pointe Subdivision design, to ensure that the integrity of the storm sewer system is maintained.

- Off-site discharges to existing open ditch systems should be reviewed for both Borrisokane Road and Barnsdale Road. If both peak flows and runoff volumes have been decreased under post-development conditions (i.e., 4-hour 25 mm storm and the 1:2-year storm), erosion potential should not be of concern (refer to Section 3.13.4).

3.5.2.5 Water Quantity

Both minor and major systems should be designed to meet the criteria discussed in the sections below, including Sections 3.5.3 and 3.5.4. Given that this Addendum is developed at the functional level, assumptions were made to evaluate both minor and major systems up to the 100-year and during the climate change event (100-year + 20%) as per the SDG.

In terms of flooding, water quantity control is to be provided to limit the post-development peak flows to either the peak flow limitations of the receiving infrastructure or those under pre-development conditions.

3.5.3 Minor System

Storm sewers servicing the S1 Area are to be designed in accordance with the SDG as summarized below:

Design Capture and Level of Service

- Minimum 1:2-year and 1:5-year capture for local and collector roads, respectively.
- 1:5-year for both Industrial blocks.
- 1:10-year capture for arterial roads, transitway or any depressed driveways, where applicable.

Design Flows

- Initial sizing of storm sewers via the Rational Method design sheets with final sizing to be confirmed via a hydraulic grade line (HGL) analysis.
- Rainfall intensity-duration-frequency (IDF) statistics as per SDG.
- Time of concentration (Tc) calculated based on an inlet time of 10 minutes and 15 minutes for the industrial lands.
- Runoff coefficients (Rc) to reflect proposed development. The Rc for the S1 Area was based on recently approved developments in Quinn's Pointe and consistent with the SDG.

Design Criteria

Design Criteria as per the SDG:

- Minimum velocity 0.80 m/s
- Maximum velocity 6.0 m/s
- Manning roughness coefficient 0.013
- Minimum allowable slopes See Table 6.1 of the OSDG
- Minimum depth of cover 2.0 m
- Minor losses at manholes set in accordance with Appendix 6B of the OSDG
- Inlet control rate to be achieved with inlet control devices (ICDs) with minimum capture of 1:2 year for locals, 1:5 year for collectors and 1:10 year for arterials.

3.5.4 Major System

Storm servicing was developed following the dual drainage concept with the minor system sized based on the criteria set out in Section 3.5.3, while the major system is configured based on the criteria outlined below and evaluated in accordance with the SDG.

Road Types and Allowable Flow Depths

- Local: 350 mm at edge of pavement
- Collector: 250 mm at edge of pavement
- Urban Arterial: No barrier curb overtopping; arterial should be designed to leave one lane free of water in each direction during the 1:100-year design storm.
- In the absence of barrier curbs, flow shall not encroach into adjacent private property.

Maximum Flow Velocity on Streets

The product of velocity (m/s) and depth (m) of overland flow on streets shall not exceed 0.6 during a 1:100-year peak flow.

Major System Flow Outlets

Major system flow should be directed towards either a watercourse/ditch or to a SWMF.

3.5.5 End-of-Pipe Facility

Any end-of-pipe control measures, either dry ponds, wet ponds, or filtration dry ponds recommended in this Addendum should be conceptually sized in accordance the SDG and MOE's publication entitled "SWM Planning and Design Manual, 2003" and other relevant source of dataa.

Given that the 2008 BSUEA MSS recommended two (2) dry ponds due to significant presence of EES which results in the capture and infiltration of frequent storm events, this service option will also be extended to the S1 Area with the addition of a filtration LID solution in accordance with the CLI-ECA.

3.6 Existing Conditions Water Budget

The water budget of a given area is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. This type of analysis establishes the baseline condition and would be used to assess any future changes in infiltration to subsurface water-bearing zones. It is also used to predict changes to the hydrological cycle that will result from urbanization with LID solutions.

A continuous hydrological model is often used to understand the water budget for a given area. As described in the ECR (refer to Appendix B), the PCSWMM software platform was also used to assess the water budget as part of the BSUEA ECR and MSS competed in 2017 and 2018, respectively by JLR. Since the approach and methodology was adopted by both the City and RVCA, the PCSWMM platform and modelling approach was once again utilized for this analysis.

The water balance assessment completed for the S1 Area was based on PCSWMM's simplified groundwater and snowmelt modules that allow continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall and snowmelt.

Section 6.2 of the 2025 ECR summarized the continuous simulation results of the water budget. Specifically, Table 6-4 of the ECR (Appendix B) shows each component of the water budget which accounts for the annual precipitation depth of 864 mm. The components of the water budget were reported as followed (refer to the 2025 ECR for PCSWMM water budget modelling files):

- Evapotranspiration accounts for approximately 59% (513 mm).
- Infiltration accounts for approximately 34% (297 mm).
- Surface runoff accounts for 7% (61 mm).

Figure 5 below summarizes graphically the various components of the existing condition water budget while a more detailed breakdown is provided below as reported in the 2025 ECR.

Figure 5: Existing Conditions Water Budget

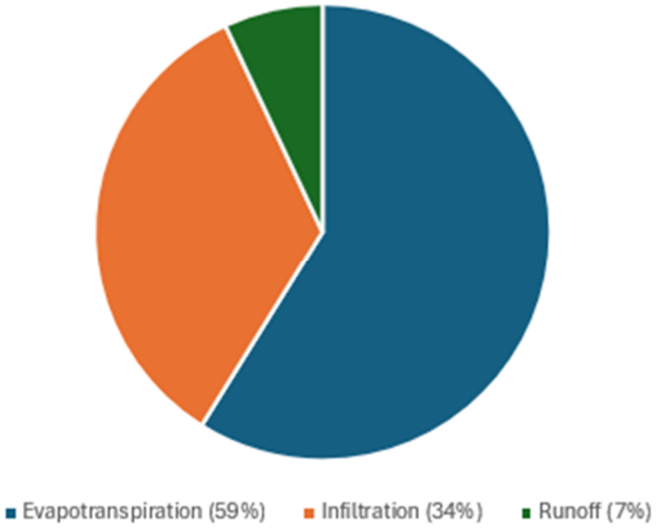


Table 1: Water Budget Continuous Simulation Results

Annual Water Budget Component	Annual Average Depth to Jock River (mm)	Annual Average Depth to Mud Creek (mm)	Annual Average Depth to Rideau River (mm)	Area Weighted Total (mm)	Budget %
Precipitation	864	864	864	864	100%
Evapotranspiration	509	531	509	513	59%
Infiltration	296	314	286	297	34%
Surface Runoff	83	60	0	61	7%

It should be noted that the Rideau River does not receive surface runoff directly from the S1 Area. However, infiltrated runoff does contribute to the groundwater catchment of the Rideau River. This is reflected in the results in the above Table.

Based on the above summary Table, infiltration under existing condition accounts for approximately 34% of the total annual precipitation of 864 mm when the three (3) receivers are combined, while surface runoff accounts for approximately 7% on a yearly average.

3.7 EES Monitoring (On-Going)

3.7.1 Monitored Rainfall Events

Monitoring of the EES was made a condition of approval within the Quinn's Pointe subdivision to gather data and confirm the suitability of the design parameters adopted during the preliminary design of the EES as part of the 2017 BSUEA. To facilitate monitoring, the city advised that it should be completed using the SmartLevel™ technology supported by Link Utility Technology as it has been tested and adopted by the City's Operation Group. In parallel, monitoring of

rainfall events was carried out using the SmartRain™ system to collect real-time precipitation data. The objective of the monitoring was as follows:

- Determine the spill occurrences and identify under which rainfall events results in spills into the conventional storm sewer system occur; and
- Determine the drawdown time and identify the time it takes for the drawdown of the EES following a rainfall event.

Three (3) monitoring locations have been set up within Quinn's Pointe Stages 2 and 3. The locations were established to cover various sizes of serviced areas; a small area at MHST82176 (2.6 ha), a mid-size area at MHST82182 (7.6 ha) and a larger serviced area at MHST83698 (20.5 ha).

Level monitoring was initiated once a minimum occupancy of 80% of the serviced area was achieved. Level monitoring was initiated in June 2022 for one of the stations while monitoring for the other two (2) stations was initiated in November 2022. Given the 22 mm capture, the review of the monitored data mainly focused on events of 22 mm or greater magnitude.

Of the 235 monitored events, twenty-seven (27) had total rainfall depths greater than 22 mm. The events greater than 22 mm depth are listed in the Table below in descending order of total rainfall depth.

Table 2: Recorded Rainfall Events (>22 mm and 0°C)

Date	Event Start	Event Duration (hrs)	Peak Intensity (mm/hr)	Total Event Rainfall Depth (mm)
August 7, 2022	2:00 PM	46	19.81	92.07
April 29, 2023	9:00 AM	122	5.33	76.83
June 6, 2024	3:00 AM	60	16.51	61.15
August 10, 2023	12:00 PM	11	28.96	58.2
August 7, 2023	8:00 AM	28	14.73	54.28
August 8, 2024	7:00 PM	22	7.62	48.63
October 30, 2025	10:00 AM	37	4.32	47.07
September 18, 2022	10:00 AM	50	12.95	38.65
August 17, 2024	1:00 AM	63	8.64	38.21
June 21, 2024	9:00 AM	74	9.91	37.88
July 9, 2024	7:00 PM	49	8.38	37.1
May 27, 2024	9:00 AM	33	12.19	33.43
April 11, 2024	8:00 AM	57	4.32	31.8
October 7, 2025	10:00 AM	16	9.4	30.9

Date	Event Start	Event Duration (hrs)	Peak Intensity (mm/hr)	Total Event Rainfall Depth (mm)
July 24, 2024	8:00 AM	13	9.4	30.2
October 6, 2023	10:00 AM	33	12.95	29.64
November 11, 2022	3:00 PM	14	5.84	29.12
July 15, 2023	9:00 PM	12	14.99	28.33
July 11, 2022	7:00 PM	24	17.78	28.27
August 28, 2025	3:00 AM	40	11.43	27.26
November 20, 2024	11:00 PM	47	2.54	27.14
July 21, 2023	12:00 AM	21	8.64	25.19
June 26, 2023	1:00 AM	22	15.24	24.98
July 18, 2022	7:00 AM	15	7.62	24.78
May 21, 2024	6:00 AM	15	14.73	24.33
July 24, 2022	12:00 PM	14	8.89	23.26
April 18, 2025	4:00 PM	18	9.65	22.26

Based on the above, the monitored events spanned, in general, between 22 mm to 92 mm with most of the events ranging between the 25 mm - 40 mm. The most significant event of 92 mm occurred over 46 hours and its 12-hour intensity was established to be comparable to a 1:10-year event when compared to the Ottawa IDF statistics.

3.7.2 EES Performance

Ten (10) out of the 27 events have resulted in flow conveyed by the traditional storm sewer, referred as a spill event. These events are considered to have occurred when the depth recorded in the manhole is above the invert elevation of the conventional sewer. Monitoring details along the three (3) monitoring stations follows (refer to Table 3 below):

- MH309: A single spill occurred on August 7, 2022, which was triggered by a 92.07 mm event.
- MH327; No spills were recorded.
- MH109: Nine (9) spill events were monitored – MH located at the intersection of Edenderry Way and Oranmore Lane.

Table 3: Spill Event Summary

Event	Location	Rainfall up to Spill Event (mm)	Duration of Spill Event (hrs)	Total Event Rainfall Depth (mm)	Drawdown Duration
August 7, 2022	MH309	22.48	5mins	92.07	2hrs 56mins
April 29, 2023	MH109	37.3	2hrs 50mins	76.83	47hrs 12mins
August 7, 2023	MH109	39.13	5hrs 41mins	54.28	56hrs 18mins
August 10, 2023	MH109	12.09	5hrs 5mins	58.2	45hrs 41mins
May 27, 2024	MH109	24.21	4hrs 16mins	33.43	231hrs 15mins
June 6, 2024	MH109	41.33	2hrs 45mins	61.15	16hrs 40mins
June 26, 2024	MH109	17.12	2hrs 25mins	17.12	55hrs
July 9, 2024	MH109	34.83	2hrs 25 mins	37.1	10hrs 10 mins
March 16, 2025	MH109	9.39	3hrs 23 mins	12.88	40hrs 50 mins
October 7, 2025	MH109	21.47	4hrs 46 mins	30.9	23hrs 47 mins

As shown above, the performance of the EES at both MH327 and MH309 by far exceed the design basis of the system, being the capture of a 22 mm rainfall event. The only recorded spill at MH309 was triggered by an event that exceeded 22 mm.

All the spills, apart from one event at MH309, occurred at MH109. The spills were triggered by storms exceeding 22 mm, except for three (3) events with rainfall of ±12 mm (August 10, 2023), ±17 mm (June 26, 2024) and ±9.4 mm (March 16, 2025). Details on these events follow:

- The August 10, 2023, event (58.2 mm) occurred less than 48 hours after the end of the August 7, 2023, rainfall event which had totaled 54.28 mm. On August 10, 2023, the slow drawdown continued, indicating elevated groundwater at that station.
- The spill events that occurred on June 26, 2024 (9:45 PM), was found to occur immediately after three (3) consecutive storms occurring between June 21st, 2024, to June 25th, 2024, totalling 55.24 mm.
- The March 16, 2025, event was during high groundwater reflecting typical spring freshet.

Based on the monitoring completed from 2022-2025, the performance of the EES in general exceeds the design capture of the system at 22 mm. However, one of the three (3) monitoring locations (MH109), has most of the spills shown in the above table. It should be noted that at that location, a separation less than 1 m (actual separation was 0.28 m) exists between the recorded seasonally high groundwater table and the bottom of the granular which explains why spills at that location are encountered more frequently.

3.7.3 Winter Performance

The annual EES monitoring Reports included graphical results showing monitoring results throughout the year including winter months, spanning from December until end of February. Although there are fewer precipitation events during this window, the data indicates that runoff from rain-on-snowmelt events, when applicable, is transmitted to the EES and infiltrated (refer to Annual EES Monitoring Reports), assuming that CB grates are fee of ice. The Table below summarizes a few winter events captured by the EES which were infiltrated.

Table 4: Winter Events Captured by EES

Date	Event Start	Event Duration (hrs)	Peak Intensity (mm/hr)	Total Event Rainfall Depth (mm)
January 9, 2024	5:00 AM	29	6.35	29.3
January 4, 2023	2:00 PM	9	4.32	13.51
December 16, 2024	8:50 PM	13	2.79	8.83

3.7.3.1 Drawdown Time During Winter Months

Based on the review of the monitoring data, it appears that drawdown of the EES (to the invert of the inlet of the EES) during winter months, continues to occur within the duration of the rainfall event or within a short period following the rainfall event based on Figures 6,7 and 8 below.

Rainfall events that occur during the winter are generally smaller in depth and have a smaller storm intensity as is expected during colder periods of the year. However, the below table and figures demonstrate that the EES continues to infiltrate during winter months event if the overall average rate of 18 mm/hr is slightly inferior to the design rates used in the MSS modelling. The design rates varied between 19.96 mm/hr to 20.63 mm/hr to 28.42 mm/hr depending on location. The rates used were as per the on-site testing results from the Geotechnical Engineers with a 2.5 factor of safety applied. Thus, the monitoring data shows a faster drawdown rate when compared to the simulated drawdown. A faster drawdown rate should allow a greater capture of the back-to-back events, which in turn, will generate greater infiltration.

Table 5: Winter Drawdown Rate Calculations (MH309)

Date	Rainfall Event depth up to Dry Period (mm)	Start Recorded Level (mm)	End Recorded Level (mm)	Dry Period Duration (hrs)	Total Event Rainfall Depth (mm/hr)
January 10, 2024, 11:00am	29.3	573	400	6.92	25
December 17, 2024, 10:10am	8.83	511	400	12.33	9
January 4, 2023, 11:00pm	13.51	585	400	9.3	20
Average Rate					18

Figure 6: Drawdown Rate Chart (January 2023 Event)

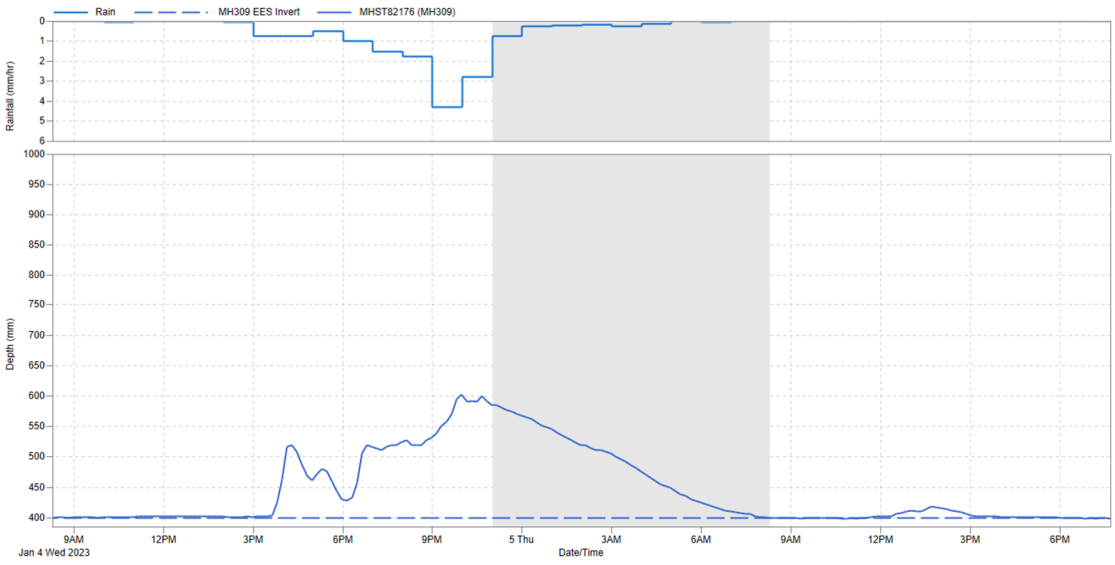


Figure 7: Drawdown Rate Chart (January 2024 Event)

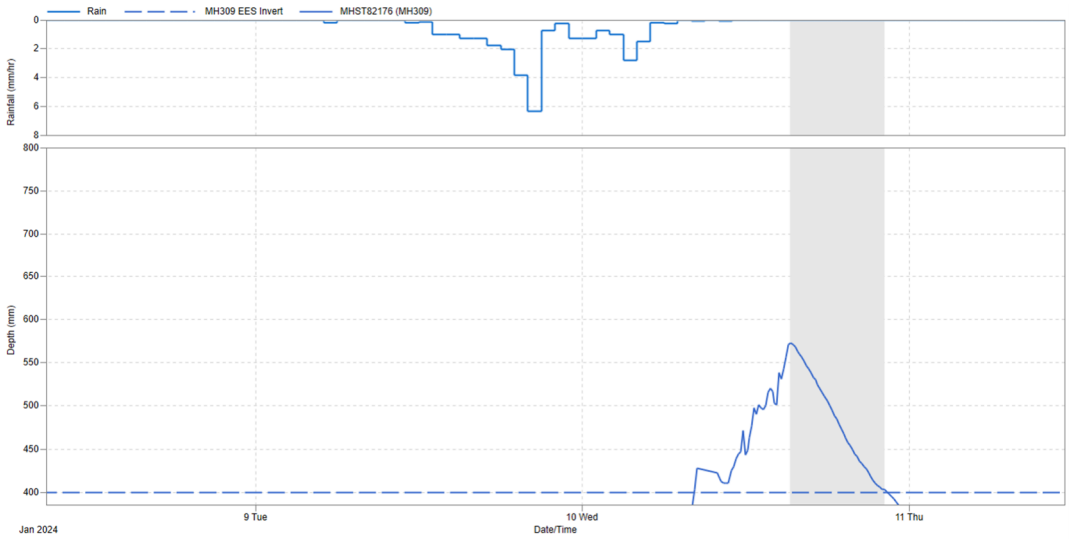
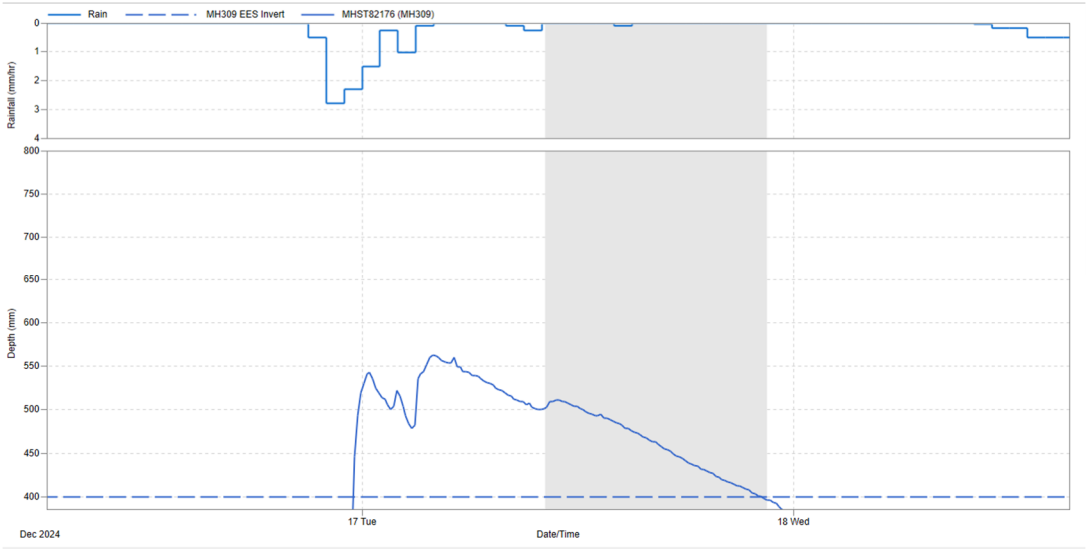


Figure 8: Drawdown Rate Chart (December 2024 Event)



3.7.4 Operation and Maintenance Activities - EES

Operation and Maintenance (O&M) activities are essential to ensure the long-term functionality and performance of a newly installed EES. As for the systems operational in Quinn's Pointe Subdivisions, the proposed EES will become part of the city's wastewater collection system.

A **Draft** Operation and Maintenance Manual (OMM) was prepared and included in Appendix L. The Manual is intended in assisting the city with typical procedures to reduce the risk of blockages and other events which could trigger costly emergency interventions and would extend the system's service life (refer to Appendix L). The **Draft** Manual will be submitted as

part of detailed design of Stage 5 and Stage 6. It is also the intent to include the **Manual** in an Appendix in the upcoming 2026 EES Monitoring Report and shared to the group which attended the June 17, 2025 meeting to discuss EES monitoring.

3.8 Consolidated Linear Infrastructure Environmental Compliance Approval

In 2022, the Ministry of the Environment, Conservation and Parks (MECP) launched a new approval process with the goal of modernizing the approach to authorize construction of linear infrastructure and stormwater management facilities. The intent of the framework was to reduce efforts on both the Ministry and with Municipalities by setting up a consistent set of conditions to improve environmental protection. By doing so, the old system which consisted of the issuance of individual Environmental Compliance Approval (ECA) would be replaced by a system that relies on pre-authorization of works with conditions. The new system adopted by MECP is referred to as the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA).

On December 10, 2025, and January 27, 2026, the City of Ottawa received their CLI-ECA for storm and sanitary, respectively. The transition period for the storm CLI-ECA is identified as December 26, 2026. However, the transition does not apply to the S1 Area as the infrastructure is proposed and will be constructed in 2027. The said infrastructure will need to be designed in accordance with MECP's document entitled "Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under an Environmental Compliance Approval (May 31, 2023)".

3.9 Evaluation of Servicing Strategies

3.9.1 General

A stormwater management strategy has been developed on a functional level basis based on the following constraints/targets:

- Residual capacities of existing storm outlet sewers (Section 3.2).
- Off-site post-development peak flow and runoff volume discharging to MTO's Borrisokane Road open ditch system will be limited to those of the pre-development condition.
- Off-site post-development peak flow and runoff volume discharging to the Barnsdale Road open ditch system will be limited to those of the pre-development condition.
- Off-site post-development peak flow and runoff volume discharging to the Thomas Baxter Municipal Drain, when the above contributions are accounted and will be limited to those of the pre-development condition.
- Runoff volume control target hierarchy, as presented in the screening process of the CLI-ECA, as follows:
    - Hierarchy Priority No. 1: LID Infiltration/retention
    - Hierarchy Priority No. 2: LID Filtration
    - Hierarchy Priority No. 3: Conventional treatment

Similar to the 2018 BSUEA MSS, the implementation of LID infiltration/retention alternatives to maintain pre-development water balance appears to be feasible based on actual measured data compiled by Paterson (Section 2.5.3). However, infiltration LIDs will only be possible in areas not impacted by constraints listed in Table A2.

Sections 3.10 and 3.11 summarize the screening process carried out that identified both preferred alternatives (infiltration-type and filtration LID), respectively within the S1 Area.

3.10 Screening Process - Infiltration-Type Servicing Strategies

3.10.1 General

In light of the runoff volume control hierarchy noted above, infiltration measures are to be maximized to the full extent while recognizing the constraints in Table A2 of the CLI-ECA before contemplating filtration servicing solutions. The following sub-sections summarize the screening process used to develop the preferred infiltration servicing strategies.

3.10.2 BSUEA MSS (2018)

Several infiltration-type measures were reviewed and evaluated in 2016 as part of a screening process undertaken as part of the 2018 BSUEA MSS. Infiltration measures reviewed included the following:

- Roof leader to soak away pits
- Perched rear yard CB with rear yard perforated system
- Previous catch basin with sand filter
- Etobicoke Exfiltration System (EES)
- Sub-surface infiltration trench.

From the screening of the above-noted practices, the 2018 BSUEA MSS determined that measures located within private properties were to be disregarded. It was concluded that the preferred infiltration LID solutions would consist of the following measures (refer to Appendix E of the 2018 BSUEA MSS, in Appendix C):

- **Etobicoke Exfiltration System (EES):** An EES along local roads, sized to capture the 22 mm event, based on measured groundwater levels would be sufficient to maintain the pre-development infiltration condition.
- **Other Infiltration Practice:** Infiltration of rooftop flows, as a source of clean water, should be adopted on all Site Plans, including school, library, Park & Ride, etc. Infiltration should be conducted using sub-surface LID measures such as infiltration galleries, cistern, etc. that would be sized to capture and infiltrate the 22 mm event.

Several Memoranda were prepared in support of the above-noted recommended infiltration strategy being the EES along local roads (refer to Appendix C for the 2018 BSUEA MSS, with Memoranda included in Appendix E of that MSS).

As part of the 2018 BSUEA MSS, it was concluded that the implementation of an EES sized for a 22 mm capture along local roads was equivalent, on average, to 150 m^3/ha which surpasses

the MECP's SWMPDM (20023). Additional details with respect to the achievement of the quality criterion, based on the 2023 SWMPDM, is provided in Section 3.11.6.2 and Section 3.11.6.3.

3.10.3 2026 Screening Process

The infiltration LID solutions recommended as part of the 2018 BSUEA MSS were extended to the S1 Area, when feasible, in areas not impacted by the constraints identified in Table A2.

Given the runoff volume target hierarchy, infiltration servicing solutions are set as highest priority and shall be developed to the maximum extent possible, as per the CLI-ECA. However, the use of infiltration LID solutions is to account for the constraints listed in Table A2, were deemed applicable. Constraints, which preclude the use of infiltration-type LID solutions, include the following:

- ✓ Areas of high groundwater levels - Constraint (b)
- ✓ High Risk Activities – Constraint (e)
- ✓ Source protection Restrictions – Constraint (f)

The above-noted constraints have been accounted for in the selection of areas where infiltration-type servicing solutions can be implemented.

3.10.3.1 Groundwater Mounding Risk

The new SDG (Appendix 10) requires that groundwater mounding calculations be supplied when the separation between the bottom of the EES and seasonal high groundwater is less than 1 m.

The routing of both storm sewer and EES was revisited from the initial version of the MSS (October 2025) with the minimum 1.0 m criterion set as a firm constraint. Based on the revised storm sewer and EES routing, all the proposed EES meet the minimum 1 m separation.

A Figure was prepared that displays the separation for all proposed EES reaches with the high seasonal groundwater level as measured by Paterson. This Figure, included in Appendix G, showed that the 1 m criterion is met.

3.10.3.2 Evaluation of Infiltration LID Servicing Alternatives

The feasibility of infiltration solutions was assessed using several criteria including high-risk activities, land use, areas of high groundwater. Based on this review, the S1 Area was broken down in several areas. For each of these areas, evaluation criteria table was developed based on a color-coding system where:

- Highly positive is shown in green
- Highly Negative is shown in red

Table 6 below provides a summary of the evaluation impact of infiltration LID alternatives being proposed with the design capture as they relate to individual growth areas located below (refer to Figure 9 for Location of Areas).

Table 6: Infiltration LID Evaluation Impact

Area No.	Area Type	Infiltration-Type LID	Impact Level	Relative Impact	Design Capture
1A & 1B	Local Roads > 1 m separation to groundwater	EES	Strong Positive Impact	Preferred	22 mm
1C	Local Roads < 1 m separation to groundwater	EES	Negative Impact	Least Preferred Constraint (b)	N/A
2	Collector Roads	EES	Negative Impact	Least Preferred Constraints (e) and (f)	N/A
3A & 3B	High Risk Areas Industrial Lands	Rooftop Infiltration (only)	Strong Positive Impact	Preferred	22 mm
3A & 3B	High Risk Areas Industrial Lands	EES along Roads or Parking	Negative Impact	Least Preferable Constraints (e) and (f)	N/A
4	Park Land[1]	Sub-surface Infiltration	Strong positive Impact	Preferred	22 mm
Area 5A & 5B	Woodlots[2]	N/A	N/A	N/A	N/A

Notes: [1] Servicing within the Park to be developed to maintain: i) pre-development infiltration levels by means of sub-surface methods and ii) pre-development peak flows and runoff volumes. Accordingly, water budget was simulated using the same parameters.
[2] Pre-development and post-development water budget was carried out using same parameters as the ecological function will remain.

Based on the above Infiltration LID evaluation impact table, the following conclusions are drawn:

- An EES system is to be implemented to capture and infiltrate the 22 mm event in Areas 1A & 1B when separation of 1 m exists between the bottom of granular and seasonal high groundwater table.
- Within the Industrial lands (Areas 3A and 3B), infiltration of rooftop flows is to be implemented using a sub-surface system to capture and infiltrate the 22 mm event.
- Filtration LID solutions to be developed to the maximum extent for Areas 1C & 2.
- Given that Areas 3A and 3B when developed, will include on-site stormwater management controls which will meet the applicable quality control criterion at the time of approval, filtration-type solution will not be accounted for these areas.

AREA 2

AREA 5B

BLOCK 63
RETAINED WOODLOT 2.39ha/5.91ac
OPEN SPACE 0.83ha/2.05ac
TOTAL AREA 3.22 ha/7.96 ac

AREA 3A

INDUSTRIAL LANDS
13.22 ha
32.67 ac

AREA 1B

AREA 1A

AREA 5A

FUTURE RETAINED WOODLOTS
6.14 ha
15.17 ac

AREA 4

PARK
BLOCK 62
1.92 ha
4.74 ac

AREA 2

AREA 1C

AREA 3B

INDUSTRIAL LANDS
3.19 ha
7.88 ac

BLOCK 61
SWM POND
3.66 ha
9.02 ac

KILBIRNIE DRIVE
CAPPAMORE DRIVE
MOYARD DRIVE
MOYARD DR
ELEVATION ROAD
PATHWAY BLOCK 70 0.02ha
BARNSDALE ROAD
LURGAN WAY
RAHEEN COURT
ATHENRY COURT
LYNN CORLETT STREET
DONEGAL WAY
TULLAMORE CRESCENT
STREET NO.1
STREET NO.2
STREET NO.3
STREET NO.4
STREET NO.5
STREET NO.6
STREET NO.7
STREET NO.8
STREET NO.9
STREET NO.10
STREET NO.11
STREET NO.12
STREET NO.13
STREET NO.14
STREET NO.15

6m SERVICING BLOCK 73 0.07ha
SERVICING ROAD (18m) 0.12ha
12m SERVICING BLOCK 64 0.35ha

BH 13-22 105.03 (98.45)
BH 15-22 106.79 (97.85)
BH 8-15 106.93 (98.96)
BH 14-22 104.43 [98.61] (102.26)
BH 10-22 104.84 {89.14} (99.68)
BH 14-15 103.47 (99.67)
BH 16-22 106.57 (96.79)
BH 11-22 103.15 (100.08)
BH 12-22 103.32 (99.63)
BH 13-15 [illegible] (99.47)
BH 5-22 99.31 (92.85)
BH 3-22 99.69 (98.80)
BH 4-22 [illegible] (99.47)
BH 1-22 100.08 (98.49)
BH 2-22 100.55 (98.43)
BH 33-16 [illegible] (98.04)
BH 7-22 103.28 (97.15)
BH 6-22 104.33 (99.94)
BH 10-22 110.15 (99.25)
BH 11-22 108.73 (98.85)
BH 12-22 100.84 (94.73) (100.54)

OVERFLOW
500A
POND
MTD
EX POND INLET
EX108A

LEGEND:

- LIMIT OF STUDY AREA
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- EXISTING STORM SEWER
- UNCONTROLLED AREAS

OPPORTUNITIES:

- LOCAL ROADS WITH EES
- RETAINED WOODLOTS WITH EXISTING CONDITIONS INFILTRATION WITHOUT EES
- INDUSTRIAL LANDS: ROOFTOP INFILTRATION WITHOUT EES PARK AND POND WITHOUT EES INFILTRATION TO BE DETERMINED BY PARKS GROUP

CONSTRAINTS:

- LOCAL ROADS WITHOUT EES
- COLLECTOR ROADS WITHOUT EES

BH 8-15 106.93 (98.96) — BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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DRAWING:
INFILTRATION CONSTRAINTS AND OPPORTUNITIES

DESIGN:	KF/GF
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PLOT DATE: Tuesday, May 26, 2026 1:27:58 PM

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\MSS Figures\26610-300 C FIGURE 6.dwg

3.11 Screening Process - Filtration-Type Servicing Alternatives

3.11.1 Design Constraints

Filtration LID solutions were developed to the maximum extent within the S1 Area, while recognizing that an EES is only being proposed in Area 1A and Area 1B as shown in Figure 9. As per the CLI-ECA, filtration LID solutions must also be reviewed the maximum extent.

Several filtration LID solutions were reviewed to the maximum extent within Area 1C and Area 2. In addition, the screening of filtration-type LID alternatives was completed while accounting with Constraint (n) - Economic Considerations. As a result, the selection of the filtration LID alternative also accounted for economic considerations when capital, lifecycle and/or operation and maintenance costs are taken into consideration.

3.11.2 Filtration-Type LID Solutions

Five (5) servicing alternatives were developed and screened using a set of criteria identified as having either major or minor influence on the evaluation. The filtration-type LID solutions consist of the following alternatives:

Alternative 1: Do Nothing
Alternative 2: Subdivision Level LIDs (Bio-Retention Bump-Outs and Porous Sidewalks)
Alternative 3: Stand Alone Manufactured Treatment Device (MTD)
Alternative 4: Pre-Treatment MTD + Underground Filtration Chambers
Alternative 5: Pre-Treatment MTD + Infiltration Dry Pond

A short description for each of the above alternatives is provided in the following sub-sections.

3.11.2.1 Alternative 1: Do Nothing

Alternative 1 is the standard “Do Nothing” option. Under this alternative, no servicing measure would be adopted. Accordingly, this alternative is considered as the baseline against the impacts of other alternatives when it is compared. This alternative does not address the identified issues and has only been carried forward as the baseline alternative for evaluation.

3.11.2.2 Alternative 2: Bump-Out Retention and Porous Sidewalks

This alternative consists of subdivision-level LID measures implemented along municipally owned ROWs with bump-out bioretention cells and porous sidewalks.

Bump-out bioretention cells: These are small, landscaped stormwater management features constructed along ROWs with engineered soil media, underdrains (where required), and vegetation tolerant of both dry and inundated conditions. Runoff enters the cell through curb cuts or inlets, allowing sediments and pollutants to settle and be filtered through the soil profile. Treated water would then be conveyed to the storm system via an underdrain. Bump-outs are typically integrated as a traffic calming measure along the ROW.

Given that they would be introduced in areas of high groundwater table (Area 1C) and/or along collector roads (Area 2), they would be designed to capture the 22 mm event and filer roadway and sidewalk runoff before being discharged as treated runoff back into the storm sewer system.

By intercepting runoff at the source, these systems improve water quality, reduce peak flows, and support LID filtration objectives.

In addition to stormwater benefits, roadway bump-out bioretention cells provide urban design and transportation advantages. They visually narrow the roadway, which can help calm traffic, shorten pedestrian crossing distances, and enhance streetscape aesthetics. When properly designed and maintained, these systems contribute to greener, safer, and more resilient urban environments while making efficient use of limited right-of-way.

Porous Sidewalks: would be implemented along the ROWs and allow runoff to flow along its surface where it would infiltrate through its surface and underlying soil or into a filter media. Given that porous sidewalks would be used in either the high groundwater area or along collector roads, this system would be underlain with a filter media. In addition to providing treatment via filtration, it would also provide the advantage of reducing peak flows discharging into the storm sewers.

3.11.2.3 Alternative 3: Stand Alone Manufactured Treatment Device

Another servicing alternative that would achieve the filtration requirements of the CLI-ECA would consist of implementing a single or multiple Manufactured Treatment Device(s) (MTD) at the downstream end of the storm sewer systems to meet the 80% TSS removal on its own. Given the size of the sewershed, multiple MTDs would be sized to meet the ISO 14034 Environmental Technology Verification (ETV) protocol as per Section 5.2.5 of the CLI-ECA.

To meet the ETV protocol, the treatment process of the MTD is based on filtration as opposed to dynamic settling of particulates. Commonly used MTD meeting the ETV protocol, include the Jellyfish® or Stormfilter®, distributed by Imbrium and Contech, respectively which could provide filtration of large sewersheds.

Filtration end-of-pipe MTDs are more onerous than regular oil grit separators (OGS), which no longer complies with the new MECP framework. The capital cost of a filtration type MTD is significantly more than a standard OGS as these are sized on fine particles as opposed to ETV particle size.

In addition to a higher capital cost, the operation and maintenance (O&M) costs for multiple end-of-pipe MTDs is more onerous and labor intensive when compared to the traditional OGS as individual filters would require to be rinsed and cleaned and be replaced on a bi-annual basis. These aggregate costs are in line with Constraint (n) of Table A2 (Economic Considerations).

3.11.2.4 Alternative 4: Pre-Treatment MTD combined with Filtration LID System

This storm servicing alternative would be implemented as a treatment train system, with pre-treatment provided by a manufactured treatment device (MTD) designed to capture the coarsest sediment fraction (TSS removal of ±35-40%). Effective pre-treatment is critical to protect the filtration chambers and underlying native soils from premature clogging and increased long-term maintenance requirements.

The MTD would be sized to achieve removal of coarse-to-medium sediment particles (±35-40% TSS). Following pre-treatment, runoff from the 22 mm event would be conveyed downstream

into a flow splitter manhole where flows up to ±1.0 m^3/s would be directed into the underground system consisting of a series of Stormtech chambers, or approved equivalent, while flows in excess would be directed towards the downstream dry pond.

Runoff conveyed to the underground chambers would be spread among the eight (8) isolator rows for TSS removal, where it would be directed downward by gravity through the ADS's proprietary underlying non-woven geotextile. The separation and filtration properties of the geotextile would provide the required 80% TSS removal of total suspended solids (TSS).

3.11.2.5 Alternative 5: Pre-Treatment MTD combined with Filtration Dry Pond

Similar to Alternative 4, this servicing alternative would be implemented as a treatment train system, with pre-treatment provided by a manufactured treatment device (MTD) designed to capture the coarsest sediment fraction (ETV particle size) followed by a filtration dry pond. Effective pre-treatment is critical to protect the downstream filtration dry pond from premature clogging and increased long-term maintenance requirements.

The proposed filtration dry pond would function as a passive stormwater quality control measure that relies on bioretention soil media as the primary treatment mechanism. Runoff entering the facility would be temporarily stored within the pond and treated through vertical filtration as it percolates through the engineered bioretention soil layer, which is designed to promote sedimentation, filtration, and adsorption of pollutants. Beneath the soil media, an underdrain system installed within a clear stone envelope would collect the filtered runoff and convey it to the sub-drain system. The clear stone layer provides structural support, maintains hydraulic conductivity, and facilitates uniform drainage, while the perforated subdrains ensure positive drainage under low-permeability soil conditions and limit prolonged ponding. Together, the pre-treatment MTD and bioretention media and underdrain system provide effective removal of TSS (80% removal) while maintaining reliable long-term performance and manageable maintenance requirements.

3.11.3 Evaluation of Filtration LID Servicing Alternatives

The five (5) filtration-type LID alternatives were evaluated using a similar screening process adopted in Section 3.10.3.1. The evaluation of the five (5) servicing solutions was based on a similar color-coding system which was applied to each criterion to represent its relative level of impact as follows:

- Green: Most Favorable and Least Disruptive Impact
- Yellow: Moderately Favorable and Moderately Disruptive Impact
- Orange: Least Favorable and Most Disruptive Impact

The relative impact of each criterion across the five (5) alternatives was assessed with a different weight placed on the following key considerations:

i. Fish Habitat Protection: 5 Points
ii. Achievement of the CLI-ECA: 5 Points
iii. Impact on Esker: 5 Points
iv. Aesthetics/Safety: 3 Points
v. Construction Considerations: 3 Points

vi.	Runoff Control Volume:	5 Points
vii.	Operational Requirements:	5 Points
viii.	Capital Cost Consideration:	5 Points
ix.	Lifecycle Consideration:	5 points
x.	O&M Cost Considerations:	5 Points

The alternative demonstrating the lowest overall negative impact and/or the strongest positive performance across these criteria was identified as the preferred solution.

3.11.4 Recommended Filtration-Type LID Solution

The screening of the above-noted five (5) alternatives has been summarized in an Evaluation Matrix in Table 7 (below). As previously noted, an emphasis was made on specific indicators by assigning a more important score of 5 and smaller emphasis on other criteria by assigning a score of 3.

The following conclusions are drawn from the screening process summarized in Table 7:

- **Alternative 1** (Do nothing) approach was deemed the most disruptive solution at a score of -50 and immediately dismissed.
- **Alternative 2** met the filtration objective; however, its score of -14 is indicative of being disruptive mainly due to the potential size of features, lifecycle and operation and maintenance costs (Constraint (n)) and disregarded from any further review/analysis.
- **Alternative 3** met the filtration objective; however, its low score of 1 is indicative of being moderately disruptive due to its substantial operation and maintenance costs (Constraint (n)) and also disregarded from any further review/analysis.
- **Alternative 4** met the filtration objective using the treatment train approach. The alternative shows a score of 21 which is indicative of a neutral rating. Its most adverse criteria lie with lifecycle costs which implicates the replacement of the geotextile fabric and replacement of all chambers. The timing of this costly replacement is unknown as this system appears to be relatively recent on municipally owned projects (less than 5 years old). The unknow lifecycle cost has reduced its rating when compared to other methods (Constraint (n)).
- **Alternative 5** also met the filtration objective using the treatment train approach. The alternative shows the highest score of all alternatives at 36 which is indicative of being the preferred solution. Similar systems have been implemented in Ottawa, and its long-term operation and maintenance requirements would appear to be less than Alternative 4.

Based on the above screening, Alternative 4 and Alternative 5 have scored the highest, with Alternative 5 shown as the preferred solution.

Table 7: Evaluation Matrix (Filtration Alternatives)

MAJOR CRITERIA	MINOR CRITERIA	ALTERNATIVE 1	ALTERNATIVE 2 SUBDIVISION LEVEL LIDS	ALTERNATIVE 3 STANDALONE MTD	ALTERNATIVE 4 MTD UNIT + UNDERGROUND FILTRATION SYSTEM	ALTERNATIVE 5 MTD UNIT + FILTRATION DRY POND
DESIGN COMPONENTS		**Do Nothing**	**ROW Bio-Retention Bump-Outs + Porous Sidewalks**	**Stand Alone MTD (ETV Sized)**	**MTD unit as Pre-Treatment Underground ADS Filtration Chambers**	**MTD unit as Pre-Treatment + Filtration Dry Pond including**: Filter Media + Perforated drain/clear stone + Filtration Berm
NATURAL ENVIRONMENT	**Fish Habitat (Jock River via Corrigan Pond)** **5 Points**	• Highly Disruptive **-5 Points**	• Improves water quality and enhances fish habitat protection **5 Points**	• Improves water quality and enhances fish habitat protection **5 Points**	• Improves water quality and enhances fish habitat protection **5 Points**	• Improves water quality and enhances fish habitat protection **5 Points**
TECHNICAL/ SOCIAL/ OPERATIONAL	**CLI-ECA Objectives: Effectiveness of Alternative** **5 Points**	• Not Achieved **-5 Points**	• Bio-retention bump-out sized to capture and provide filtration of 4hr 22 mm • Porous sidewalk to accommodate runoff from the boulevard for the 4hr 22mm Measures in tandem to be sized to meet the filtration requirement of the CLI-ECA **5 Points**	• MTD (single of multiple units) sized to achieve an 80% TSS removal (ETV particle) Servicing alternative would meet the filtration requirement of the CLI-ECA achieved **5 Points**	• MTD unit sized as pre-treatment only (35-40%) based on ETV particle size • Underground ADS filtration chambers sized to achieve an 80% TSS removal Measures in tandem sized to meet the filtration requirement of the CLI-ECA **5 Points**	• MTD Unit sized as pre-treatment (35-40%) based on ETV particle size • Infiltration Dry Pond to incorporate filtration components Measures in tandem sized to meet the filtration requirement of the CLI-ECA **5 Points**
	Impact on Esker **5 Points**	• Highly Disruptive **-5 Points**	• No Adverse impact – Filtration is used **5 Points**	• No Adverse impact – Filtration is used **5 Points**	• No Adverse impact – Filtration is used **5 Points**	• No Adverse impact – Filtration is used **5 Points**
	Aesthetics and/or Safety **3 Points**	• Highly Disruptive **-3 Points**	• Bio-retention bump-out can adversely impact the aesthetics, if vegetation is overgrown • Safety concerns can exist with overgrown vegetation **-3 Points**	• MTD is a sub-surface feature not impacting aesthetics nor safety **3 Points**	• MTD is a sub-surface feature not impacting aesthetics nor safety • ADS filtration system is a sub-surface system not impacting aesthetics nor safety **3 Points**	• MTD is a sub-surface feature not impacting aesthetics nor safety • Infiltration dry pond offering no safety concerns as fully contained within Block 61 **3 Points**
	Construction Considerations **3 Points**	• Highly Disruptive **-3 Points**	• Reduce on-street parking • Additional constraints with buried utilities • Limits future utility upgrades • Vegetation impacted by salts **-3 Points**	• MTD and Chambers buried along ROW and SWM Block • No impact on utilities **3 Points**	• MTD and Chambers buried along ROW and SWM Block • No impact on utilities **3 Points**	• MTD and Dry Pond located along ROW and SWM Block, respectively • No impact on utilities **3 Points**
	Runoff Control Volume (22 mm) **5 points**	• Highly Disruptive **-5 Points**	• Disruptive • Difficult to Achieve Solely at Roadway Sags **-3 Points**	• Can be achieved at a Higher Cost **0 Points**	• Can be achieved **5 Points**	• Can be achieved **5 Points**

MAJOR CRITERIA	MINOR CRITERIA	ALTERNATIVE 1	ALTERNATIVE 2 SUBDIVISION LEVEL LIDS	ALTERNATIVE 3 STANDALONE MTD	ALTERNATIVE 4 MTD UNIT + UNDERGROUND FILTRATION SYSTEM	ALTERNATIVE 5 MTD UNIT + FILTRATION DRY POND
	Operational Requirements **5 Points**	• Highly Disruptive **-5 Points**	• Routine inspections, debris and sediment removal, vegetation management, pruning & replanting • Mulch and bioretention soil media maintenance • Winter and roadway requirements (plowing) **-5 Points**	• Sediment depth monitoring (MTD) • Sediment flushing & removal (MTD) • Potential Cleaning of filters/blades **-5 Points**	• Sediment depth monitoring (MTD & chambers) • Sediment flushing & removal (MTD & Chambers) **0 Points**	• Sediment depth monitoring (MTD) • Sediment removal (MTD) • Sediment monitoring (infiltration dry pond) • Sediment removal (infiltration dry pond) • Bioretention soil media replacement **0 Points**
ECONOMIC CONSIDERATIONS	**Capital Cost** **5 Points**	• Not Applicable **-5 Points**	**High Capital Cost** **-5 Points**	**High Capital Cost** **-5 Points**	**Moderate Capital Cost** **0 Points**	**Least Capital Cost** **5 Points**
	Lifecycle Consideration **5 Points**	• Not Applicable **-5 Points**	• Replacement of vegetation (drought/salt) • Mulch and bioretention soil media replacement **-5 Points**	• Cartridges and/or blades to be replaced **-5 Points**	• Replacement of filtration fabric • Washing/replacement of clear stone **-5 Points**	• Replacement of soil amendment media • Washing/replacement of clear stone **0 Points**
	Operational & Maintenance Cost **5 Points**	• Not Achieved **-5 Points**	• Routine Inspections • Sediment and Debris Removal • Vegetation Management • Watering during plant establishment (first 1–2 growing seasons) • Pruning, replanting, and removal of invasive species • Replacement of dead or damaged plants • Mulch/Soil Media Aeration, Maintenance, and replacement • Winter and Roadway-Related Considerations – avoid stockpiling snow **-5 Points**	• Annual Inspection • Annual sediment and/or oil removal • Filters or blades rinsing every 1.5 year • Reinstallation of clean filters/blades every 1.5 year • Filter/blade replacement every 2-5 years • Other O&M procedures to be completed per manufacturer **-5 Points**	• Routine inspections • Annual sediment depth measurement in ports • Flushing and removal of sediments once 75 mm is exceeded • O&M procedures to be completed per manufacturer. **0 Points**	• Routine inspections • Annual sediment depth measurement in ports • Flushing and removal of sediments once 75 mm is exceeded • O&M procedures to be followed per manufacturer **5 Points**
OVERALL EVALUATION		**-50** **Highly Disruptive** **&** **Least Preferred**	**-14** **Disruptive** **&** **Less Preferred**	**1** **Moderately Disruptive** **&** **Less Preferred**	**21** **Neutral**	**36** **Preferred Solution**

3.11.5 Functional-Level Design Information

Conceptual level information is provided below for Alternative 4 while functional level information is presented for Alternative 5 (refer to Appendix F for details).

Alternative 4 - Pre-Treatment Manufactured Device with Filtration Chambers

High-level information is provided for Alternative 4, the option that scored the second highest at 21 as part of the screening process (Table 7) but not recommended for a more detailed review.

Alternative 4 was developed based on a treatment train servicing approach where an upstream Manufactured Treatment Device (MTD) has been conceptually sized for pre-treatment (35-40% TSS removal) followed by a commercially distributed sub-surface filtration system consisting of a series of underground chambers designed as isolator rows along with a bypass manhole. This system in tandem was sized to capture and provide filtration of the 22 mm design event.

High-level information was supplied at the onset by ADS; however, the information has not been revised to account for the latest changes in the hydraulic profiles which would result by using lower rise chambers and having a larger footprint which would provide increased filtration. Given that Alternative 4 is not the preferred option, the high-level information provided was deemed sufficient for the purpose of evaluating this servicing option. The information consists of the following:

- By-pass manhole (flow splitter) directing the 22 mm event to the filtration system while excess flows would by-pass the filtration system and be conveyed to the downstream dry pond.
- Pre-treatment MTD - Defender Model (FD-8HC) - ETV particle size.
- Stormtech Underground System consisting of:
  - Eight (8) Isolator rows (MC7200 chambers)
  - 88 MC7200 Chambers & 16 MC7200 End Caps
  - Sub-drain system including a by-pass manhole (flow splitter)
  - Clear stone above and between chambers
- The volume requirements of the system (±795 m^3) include the clear stone surrounding the chambers (void ratio of 0.40). Volumetric requirements based on the filtration capacity of the geotextile (4.1 gpm/ft^2) and the runoff hydrograph from the 22 mm storm.

High-level information from ADS is contained in Appendix F, including:

- Data on the proposed MTD (Defender FD-8HC)
- High-level concept of the Stormtech filtration chambers
- Manufacturer’s Inspection and Monitoring requirements (page 4/5) of the attachment

The performance of the above-noted system is as follows:

- 37% TSS removal is provided by the MTD (Defender FD-8HC)
- 80% TSS removal by 8 Isolator rows
- 87 TSS removal combined between the MTD & filtration system
- 98.8% of total volume treated

The above-noted performance data is also contained in Appendix F.

Alternative 5 - Pre-Treatment Manufactured Device with Filtration Dry Pond

As per the screening process and Evaluation Table (Table 7), Alternative 5 scored the highest at 36. Consequently, it is recommended as the preferred filtration LID Solution. Functional level information is provided below for Alternative 5 (refer to Appendix F and Appendix K for Drawings).

Alternative 5 was developed based on a treatment train approach where an upstream MTD has been conceptually sized for pre-treatment followed by a filtration dry pond. Both MTD and filtration dry pond was sized to capture, pre-treat and provide filtration of the 22 event prior in being released into the adjacent dry pond.

Alternative 5 consists of the following components:

- Defender Model FD-8HC (ETV particle size)
- Flow-splitter manhole forcing the 22 mm to the filtration dry pond while flows in excess, would by-pass the filtration dry pond and would be conveyed to the downstream dry pond.

The simulated filtration rate of the facility was assumed to be consistent with the measured unfactored infiltration rates reported by Paterson in their Existing Conditions Report at BH2-22, the closest borehole, as the amended soil's performance would be similar.

An average infiltration rate of 126 mm/hr was, therefore, calculated based on two (2) measurements of unfactored infiltration rates at BH2-22. A 2.5 safety factor was then applied to the average unfactored infiltration rate of 126 /mm/hr for an overall effective assumed filtration rate of 50.4 mm/hr. The assumed filtration rate of 50.4 mm/hr is consistent with the amended soil filtration rate of 50 mm/hr recommended by Sustainable Technology Evaluation Program (STEP).

Configuration of Filtration Dry Pond consisting of:

- Operating Levels: 100.10m – 100.80 m
- 3:1 side slope
- Filtration rate: 50.4 mm/hr
- Maximum Ponding Depth prior to Spill: 700 mm
- Spillway (15 m wide): 100.80 m
- Footprint at elevation 100.10 m: 1,822 m^2
- Surface Area at Spill of 100.80 m: 2,235 m^2
- Volume of Filtration Dry Pond: 1,418 m^3
- Hydro-seeded footprint & side slopes
- Amended soil (bio-retention soil media) 500-700 mm filter media
- Choker Layer 100 mm
- Clear stone 300-350 mm
- subdrains (spurs & header) 150 mm and 200 mm
- Inspection/clean-out ports

The proposed servicing within Block 61 along with pre-treatment is shown on Drawing MST (Appendix K) with information included in Appendix F. The above-noted configuration of the filtration pond as well as the filtration rate will be reviewed at detailed design.

3.11.6 Water Quality Control Assessment - Infiltration/Filtration Practices

3.11.6.1 General

An 80% TSS removal has been historically used for any development tributary to the Jock River, Rideau River and/or Thomas Baxter Municipal Drain (Mud Creek). Storage volume requirements for different types of SWM practices to achieve an 80% TSS removal are identified in Table 3.2 of MECP's publication entitled "Stormwater Management Planning and Design Manual, March 2003".

Quality control requirements for municipal works have since evolved with the implementation of MECP's framework which is based on pre-authorized works defined in the CLI-ECA, particularly those described in Appendix A.

Section 3.11.5 identified the preferred filtration alternative as Alternative 5. It consists of a pre-treatment MTD combined to a filtration dry pond. Given that this Addendum extended the analyses and conclusions from the 2018 BSUEA MSS, the design capture of the 22 mm event was maintained. Hence, the capture of the 22 mm event was extended to the sizing of the filtration solution given that it also relies on infiltration/filtration through a bio-retention media.

As a parallel verification, the proposed infiltration and filtration LIDs is being reviewed against Table 3.2 to ensure that it meets its recommendations. Sub-sections 3.11.6.2 and 3.11.6.3 summarize the verification against Table 3.2.

3.11.6.2 Infiltration Practices

An EES is proposed within two (2) residential blocks located north of Cappamore Drive, and east and west of Elevation Road. These Blocks have been identified as Area 1A and Area 1B on Figure 9.

Based on the average imperviousness of ±64% for each residential areas serviced by an EES, a water quality storage of ±33 m³/ha was calculated to be necessary to achieve 80% TSS removal based on interpolation between imperviousness of 55% (25 m^3/ha) and 70% (35 m^3/ha) for an infiltration SWM Practice. Based on an EES along local roads sized for the 22 mm event (per 2018 BSUEA MSS), the storage volume provided is equivalent, on average, to ±150 m³/ha. Therefore, the proposed EES along local roads (±150 m^3/ha) by far exceeds the infiltration requirements of 33 m^3/ha, the enhanced level of protection per Table 3.2 of the SWMPDM. Consequently, no further downstream water quality controls are necessary for Areas 1A and 1B apart from the EES as it meets Table 3.2 and the CLI-ECA.

3.11.6.3 Filtration-Type Practices

The screening process presented in Section 3.11.2 to 3.11.5 concluded that the preferred filtration LID solution consisted of Alternative 5. It includes a pre-treatment MTD combined to a filtration dry pond. As noted, the pre-treatment MTD under Alternative 4 will provide a 37% TSS removal based on ETV particle size.

The filtration dry pond was sized to capture and filtrate the 22 mm event using a bio-retention soil media with an underlain sub-drain system and clear stone envelope. Although the effluent is not infiltrated, the filtration mechanism proposed remains equivalent to infiltration; however, the filtered runoff will be conveyed in the dry pond portion of Block 61 for quantity control.

The filtration dry pond described in Section 3.11.5 would service Area 1C (high groundwater table) along with Area 2 consisting of the three (3) collector roads due to roadway salts. When both Area 1C and Area 2 are combined, an overall area of ±20.4 ha and average imperviousness of ±67% was calculated. Given that the proposed filtration dry pond operates as an infiltration SWM practice with an underlain sub-drain system, a storage volume of 34 m^3/ha was estimated by means of interpolation between imperviousness of 55% (25 m^3/ha) and 70% (35 m^3/ha) for this SWM practice. Based on an area of ±20.4 ha and the storage volume of 34 m^3/ha, the filtration dry pond should be sized with ±700 m^3. As shown in Section 3.11.5, the volume provided is 1,629 m^3 thereby exceeding the volume of Table 3.2. Consequently, the filtration dry pond is found to meet both Table 3.2 and CLI-ECA (Appendix A).

The proposed servicing of Block 61 along with pre-treatment is shown on Drawings K1 and MST is well as on Drawing POND and D2 in Appendix K.

3.12 Storm and Stormwater Servicing Assumptions and Methodology

The design and evaluation of the proposed storm servicing strategy was undertaken with the PCSWMM platform. Several design parameters and assumptions have been made to support both minor and major system designs as described in the sub-sections that follow.

3.12.1 Runoff Coefficient

Surface runoff is generated when precipitation exceeds the infiltration capacity of the landscaped surface and/or the initial abstraction of hard surfaces. To assess runoff rates from the various surfaces, hydrological parameters representing different drainage characteristics were calculated. The type of land cover and associated hydrological parameters are based on area weighting of each catchment's imperviousness using the various breakdown shown in Table 8.

Table 8: Land Cover Drainage Parameters

Land Cover	Impervious (%)	Runoff Coefficient	Draining to Pervious (%)
Collector Roads	71	0.70	0
Local Roads	64	0.65	0
Parks	36	0.45	100
Woodlots	0	0.20	100
Single Family Residential	64	0.65	70
Townhouse Residential	64	0.70	70
Back-to-Back Residential	71	0.70	70
Industrial Lands	86	0.8	0

Based on the guidance of the SDG, Runoff Coefficients (C-Factors) associated with the various types of residential usages were based on actual impervious areas for the adjoining Quinn's Pointe subdivision. Similar housing product will be proposed as part of the S1 Area.

3.12.2 Storm Sewer Sizing

Preliminary sizing of storm sewers was carried out based on the design criteria listed in Section 3.5.3 for the proposed road patterns shown on the Concept Plan (Appendix D). The storm servicing strategy was also developed while respecting the filtration and infiltration servicing solutions presented in Section 3.10 (infiltration) and filtration (Section 3.11.2). As such, the storm sewer strategy was developed with two (2) independent storm systems; one that collects and convey runoff from areas serviced by an EES and a second independent storm sewer system collecting runoff from collector roads and areas of high groundwater.

This functional level exercise is intended to demonstrate the feasibility of the overall storm servicing strategy. The preliminary storm sewer layout and associated drainage areas are shown in the following drawings (Appendix K):

- KS1: Key Servicing Plan
- MG1: Master Grading Plan
- MST: Master Storm

Based on the above Drawings, storm sewer design sheets have been prepared and included in Appendix G. The traditional storm sewers along the various road types have been sized in accordance with the level of service identified in Section 3.5.3, being 1:2 year and 1:5-year capture for local and collector roads, respectively.

3.12.3 Roadway Sag Storage

The Master Grading Plan (Drawing MG1 in Appendix K) was developed to provide a route to safely convey major overland flow while minimizing earth works. To fulfill these objectives, grading along the major overland system will be carried out following a saw-tooth profile with low points introduced along the major overland system. Since detailed design will dictate the location and extent of the roadway sag depths, modelling was carried out assuming an on-site storage of 70 m^3/ha which reflects the storage achieved in the Quinn's Pointe Subdivisions. Roadways with flatter slopes will generate greater storage capacity, while those that are steeper will have limited storage capacity.

The design of the major overland system will allow runoff to be stored in the roadway depressions prior to its capture by the catch basins and inlet control devices (ICD). During infrequent events, runoff exceeding the rate of capture of the minor system and roadway sag storage will cascade along the major overland system.

3.12.4 Dual Drainage Modelling – Assumption and Parameters

The PCSWMM software platform was used to simulate hydrology with the given land use and corresponding imperviousness shown in Table 8Table 8 as well as confirming the preliminary minor and major systems and the assessment of the post-development water budget by modelling the infiltration opportunities documented in Section 3.10.3.

The software used combines the EPA SWMM engine within a powerful GIS environment. The PCSWMM dual drainage model will provide preliminary confirmation of the overland flow depths along the local/collector roads, feasibility of the proposed sewer sizing in terms of hydraulic grade line (HGL) elevations, confirm block sizing of Block 61, the assessment of the proposed infiltration measures and the off-site peak flow discharges. Model inputs and results are contained in Appendix L.

The dual drainage analysis uses a dynamic simulation to calculate the hydrology and hydraulics of the major and minor systems. The model has been developed based on the following:

- The Chicago and SCS design storms derived from the Ottawa Intensity-Duration-Frequency (IDF) statistics which were applied across catchments with characteristics area weighted imperviousness.
- Sag storage of 70 m³/ha applied as a storage node for each residential sub-catchment.
- Both Industrial Blocks have been modelled assuming sufficient storage to self-contain their own runoff up to and including the 1:100-year storm in accordance with the SDG for the given land usage.
- A 1:2 year and 1:5-year design capture for the local and collector roads, respectively.
- Exit losses are applied at the downstream end of each section of sewer based on the SDG.
- Storm Sewers have a minimum cover of 1.3 meters below the proposed centre line grades shown on Drawing MG1. With this minimum freeboard to the HGL elevation, underside of footings (USFs) will meet the prescribed minimum freeboard of 300 mm.
- Several unfactored infiltration rates were used to represent the soil characteristics in areas where an EES is being contemplated. Paterson's unfactored infiltration rates were reduced by 2.5 to account for a safety factor. Simulated unfactored infiltration rates are presented in Section 3.13.1.1.
- The storage and filtration were simulated as a storage node along the minor system. This configuration within residential areas has proven to demonstrate the capture of the 22 mm storm and maintain pre-development infiltration conditions (refer to the BSUEA MSS, Appendix C).
- Roof areas in the Industrial Lands were assumed to reflect 30% of the overall area. The same assumption was used as part of the BSUEA MSS for any of the ICI Blocks. It was assumed that infiltration measures would be implemented to capture and infiltrate by means of sub-surface systems the 22 mm storm.

3.13 Simulation Results

Several types of simulations have been carried out to assess the performance of proposed servicing, including the water budget, sizing of linear infrastructure, major overland flow route, as well as confirming sizing of features in Block 61. Th following sub-sections provides these assessments.

3.13.1 Post-Development Water Budget

The existing condition water budget revealed that existing infiltration across the overall S1 Area accounted for 34% of the total annual precipitation based on long-term simulations (refer to Section 3.6 and ECR in Appendix B).

A similar analysis was carried out to assess the post-development water budget while accounting for constraints within the S1 Area as well as the opportunities within the S1 Area to incorporate an EES. As noted under Section 3.10.3, all EES being proposed provide the minimum 1 m separation between the seasonal high groundwater and the bottom of granular (refer to Appendix G for Figure displaying the separation between EES and groundwater). All EES lengths have been accounted for as part of the water budget and during detailed design best efforts will be made to utilize all EES lengths for the purpose of achieving the pre-development water budget. This is achieved by placing the plugs for the first reach at the downstream end. The sub-sections that follow provides the approach and assumptions made as part of the post-development water budget.

3.13.1.1 Simulated Infiltration Rates

The Existing Conditions Hydrogeological Report prepared by Paterson documented the hydrogeological condition within the S1 Area (refer to Section 2.5.3). As part of this undertaking, Table 3 documented the unfactored infiltration rates measured in the field.

The information summarized in Paterson's Table 3 along with other historical unfactored infiltration rate measurements were used to simulate the performance of the EES in various sub-areas (refer to Figure 9 for details). As shown in the table below, the largest area, namely Area 1A, was broken down into three (3) smaller areas; the northern part which consists of the area north of Moyard Drive, with two (2) smaller areas south of Moyard Drive consisting of an area to the west and one to the east.

It should be noted that the unfactored infiltration rates noted in Paterson's Table 3 were derived based on the Site Evaluation and Soil Testing Protocol (Appendix C) of the CVC/TRCA LID Manual. The simulated unfactored infiltration rates shown in Table 9 below, includes the 2.5 safety factor.

Table 9: Simulated Unfactored Infiltration Rates

Area No.	Borehole No	Average Unfactored Infiltration(mm/hr)	Effective[1] Unfactored Infiltration (mm/hr)
1A (northern) Aea north of Moyard	BH11-22 & BH16-22	109.5	43.8
1A (southwest) Area south of Moyard and west of Street 7	BH11-22 & BH18-15	88.5	35.4
1A (southeast) Area south of Moyard and east of Street 7	BH8-22 & BH9-22	72.5	28.9

Area No.	Borehole No	Average Unfactored Infiltration(mm/hr)	Effective[1] Unfactored Infiltration (mm/hr)
1B	BH17-22 & BH18-22	84.0	33.6

Note[1]: Simulated unfactored infiltration was calculated by applying a safety factor of 2.5 on the average unfactored infiltration rate.

3.13.1.2 Post-Development Water Budget Findings

The post-development water budget analysis was carried out while accounting for EES reaches being implemented in the following areas (refer to Figure 9):

- All of Area 1A.
- All of Area 1B.

In terms of simulation of the EES in the above-noted areas, the same configuration and approach used in all stages of the Quinn's Pointe Subdivisions has been extended for the S1 Area. The configuration is based on the following:

- 1000 mm thick clear stone envelope, surrounded by geotextile
- 2-300 mm diameter perforated pipes, surrounded by geotextile
- Width of clear stone envelope is based on the following:
  - ✓ Sewer diameter plus 450 mm clearance on either sides for 900 mm diameter sewer or smaller
  - ✓ Sewer diameter plus 500 mm clearance on either side for sewers over 900 mm diameter.

The analysis was completed using Paterson's unfactored infiltration rates (refer to Section 3.13.1.1). A comparison was made between the existing and post-development water budgets with the modelling approach and assumptions summarized above.

Table 10: Post-Development Water Budget

Annual Water Budget Component	Annual Average Depth to Jock River (mm)	Annual Average Depth to Mud Creek (mm)	Annual Average Depth to Rideau River (mm)	Area Weighted Total (mm)	Budget %
Precipitation	864 [864]	864 [864]	864 [864]	864 [864]	100% [100%]
Evapotranspiration	248 [509]	262 [531]	252 [509]	249 [513]	29% [59%]
Infiltration	301 [296]	214 [314]	274 [286]	297 [297]	34% [34%]
Surface Runoff	316 [83]	389 [60]	339 [0]	319 [61]	37% [7%]

*Values in brackets ([ ]) represent pre-development values for purpose of comparison with post-development water budget values.

The above simulation results show that the infiltration strategy, as depicted on both MST in Appendix K capable in maintaining the existing condition infiltration rate of 34%.

Given that the existing water budget is maintained under post-development conditions with the proposed infiltration measures, the infiltration requirements of the CLI-ECA (Appendix A) will be achieved.

3.13.2 Dual Drainage

3.13.2.1 Minor System

It was generally assumed that the USF elevations are approximately two (2) meters below the road centerline grades. However, in cases where the storm sewers are relatively shallow, such as to prevent the EES from being located within the groundwater, risers and appropriate grading will be required to ensure a minimum freeboard of 300 mm is maintained between the sewer HGL and the USF elevations of the units.

3.13.2.2 Major System

The dual-drainage analysis was reviewed in relation to the performance of the major overland system. Elevations above the major system nodes have been extracted and shown in Table 11. As shown below, there is no ponding in the 1:2-year event and there is no ponding in the 1:5-year in the industrial sites or along collector roads. Moreover, the depth of flow along the major system is below 350 mm during the 1:100-year event. Simulation results for other storm events, including climate change and historical storms, have been summarized in Appendix L.

Table 11: Major Overland Flow Results

Major System Node	1:2 yr - 3 hr Chi Ponding Depth (mm)	1:2 yr - 24 hr Ponding Depth (mm)	1:5 yr - 3 hr Chi Ponding Depth (mm)	1:5 yr - 24 hr Ponding Depth (mm)	1:100 yr 3 hr Chi Ponding Depth (mm)	1:100 yr - 24 hr SCS Ponding Depth (mm)
S_525-MTD	10	10	40	40	230	200
S_528-525	10	10	40	40	190	170
S_536-532	10	10	80	70	250	230
S_619-606	10	10	50	50	230	220
S_622-619_2	10	10	60	60	240	230
S_604-603	10	10	40	40	180	170
S_541-540	10	20	60	60	200	190
S_622-619	20	40	90	90	230	220
S_605-604	10	10	50	50	220	200
S_627-630	10	10	30	30	150	140
S_532-528	10	10	40	40	170	150
S_540-536	10	10	60	60	210	200
S_629-622	10	10	50	50	180	160

As part of the MSS level modelling, only the critical sewers and trunk sewers are modelled to ensure that the site is serviceable and to which further details are typically refined during conceptual/detailed designs. However, to ensure accuracy and conservativeness within such a model, the time of concentration calculated in the Storm Sewer Design Sheet for each downstream sewer reach within a tributary area was used to calculate the Rationale Method minor system inflow from major system node to the minor system. As a result, in some instances Table 11 above will show that there is ponding in some areas during the 1:2-year event and in the 1:5-year in the industrial sites or along collector roads. However, once the model is further refined during the detailed design stage, drainage areas will be further delineated and will be tributary to individual storm sewer reaches in which case the rational inflow for each area will be calculated based on a 10 minutes time of concentration and will in turn eliminate any ponding during the 1:2-year event and in the 1:5-year in the industrial sites or along collector roads. Moreover, the depth of flow along the major system is below 350 mm during the 1:100-year event. Simulation results for other storm events, including climate change and historical storms, have been summarized in Appendix L

3.13.3 Proposed Dry Pond Expansion

An existing spill-over area exists within the S1 Area, in the southeastern portion of Block 61. This facility was constructed as part of Quinn's Pointe Subdivision to capture major overland flow being directed westerly given that it could not cross future Greenbank Road. The existing spill-over area is serviced by an existing outlet sewer (900 mm diameter storm sewer) discharging to the Inver Lane 1500 mm diameter storm sewer system. The 900 mm diameter outlet sewer was sized to empty the spill-over pond during infrequent storm events.

Drawings KS1, MST, POND and D2 provide the configuration of the proposed end-of-pipe facility consisting of the following elements (refer to Section 3.11.5 for additional details and Appendix F for information):

- Pre-treatment device - Defender Model FD-8
- By-pass manhole (flow splitter) forcing the 22 mm to the filtration dry pond while excess flows to by-pass the filtration dry pond and would be conveyed to the downstream dry pond.

  Filtration Dry Pond:
  - Surface Area at Spill of 100.8m: 2,235 m^2
  - Volume of Infiltration Dry Pond: 1,418 m^3
  - 700 mm thick of amended soil (bio-retention soil media)
  - 350 mm thick clear stone
  - 150 mm diameter sub-brains
  - Geosynthetic membrane

  Dry pond:
  - Volume prior to spill: 28.790 m^3
  - Outlet elevation: 98.45 m
  - Internal sloping: 1.0-1.3%
  - 3 m wide perimeter access road
  - Major overland flow route: Barnsdale Road (events > 100-year)

Once storm flows have been filtered by the filtration dry pond, they will merge with the treated flows from the EES and Industrial Lands and will be controlled by the existing outlet consisting of the 900 mm diameter storm sewer system. Table 12 and Table 13 (below) summarize key parameters relating to the configuration of these facilities.

Table 12: Filtration Dry Pond Configuration and Results

Pond Configuration	Filtration Dry Pond
Pond Invert (m)	100.10
Footprint Area (m^2) @ 100.10 m	1,822
Top of Spillway Area (m^2) @ 100.80 m	2,235
Top of Bank (m) at Spill	100.80
Active Storage Depth (m)	0.70
Elevation of 3 m wide Spillway (m)	100.80
Outlet Diameter (m)	N/A
Drawdown Time (hrs) - 4-hour 22mm Design Storm	17
Overall effective filtration rate (mm/hr)	50.4

Table 13: Expanded Dry Pond Configuration and Results

Pond Configuration	Expanded Dry Pond
Pond Invert (m)	98.45
Modelled Release Rate (m^3/s) - 3-hour Chicago Storm	0.349
Pond Top of Bank (m)	100.8
Active Storage Depth (m)	2.35
Freeboard to adjacent building envelopes(m)	>0.3
Outlet Bottom Orifice Elevation (m)	98.45
Outlet Bottom Orifice Diameter (m)	0.335
Outlet Upper Orifice Elevation (m)	100.8
Outlet Upper Orifice Dimensions (m)	250 mm x 900 mm
Drawdown Time (hrs) - 4-hour 22mm Design Storm	18
Surface Area (ha)	3.66

The operation of the filtration pond is provided in Table 14 below for the 3-hour Chicago storm distribution and Table 15 for the 24-hour SCS storm Distribution.

Table 14: Filtration Pond Operation (3-hour Chicago Storm)

Event	Max HGL (m)	Max Depth (m)	Total Inflow (L/s)	Peak Filtration Rate (L/s)	Max Volume (m3)
4-hour, 22 mm	100.67	0.57	768	26	1,139
1:2 year	100.90	0.80	1,729	26	1,654
1:5 year	100.95	0.85	2,190	26	1,764

Event	Max HGL (m)	Max Depth (m)	Total Inflow (L/s)	Peak Filtration Rate (L/s)	Max Volume (m3)
1:100 year	101.06	0.96	5,807	26	2,009
1:100 year + 20%	101.10	1.00	8.047	26	2,122

Table 15: Filtration Pond Operation (24-hour SCS Type II Storm)

Event	Max HGL (m)	Max Depth (m)	Total Inflow (L/s)	Peak Filtration Rate (L/s)	Max Volume (m3)
1:2 year	100.92	0.82	1,926	26	1,698
1:5 year	100.95	0.85	2,210	26	1,768
1:100 year	101.04	0.94	4,964	26	1,959
1:100 year + 20%	101.08	0.98	6,837	26	2,066

The operation of the dry pond is provided in Table 16 below for the 3-hour Chicago storm distribution and Table 17 for the 24-hour SCS storm Distribution.

Table 16: Dry Pond Operation (3-hour Chicago Storm)

Event	Max HGL (m)	Max Depth (m)	Total Inflow (L/s)	Peak Minor System Release Rate (L/s)	Max Volume (m3)
4-hour, 22 mm	99.40	0.95	1,974	201	2,738
1:2 year	99.77	1.32	4,243	248	7,110
1:5 year	100.08	1.63	6,785	282	12,370
1:100 year	100.80	2.35	11,980	349	28,730
1:100 year + 20%	100.98	2.53	14,540	495	33,230

Table 17: Dry Pond Operation (24-hour SCS Type II Storm)

Event	Max HGL (m)	Max Depth (m)	Total Inflow (L/s)	Peak Minor System Release Rate (L/s)	Max Volume (m3)
1:2 year	99.785	1.34	4,499	249	7,319
1:5 year	100.056	1.61	7,000	279	11,870
1:100 year	100.687	2.24	10,780	340	26,020
1:100 year + 20%	100.915	2.47	12,990	426	31,630

The modelling results demonstrate that the pond contains flow in up to the 1:100-year event. The maximum water level in the pond is 100.8 m, which provides a minimum 300 mm freeboard to adjacent properties (Quinn's Pointe) and a controlled spill occurs in events greater than the 1:100-year storm event onto Barnsdale Road.

3.13.4 Off-Site Peak Flow Discharges

3.13.4.1 General

The proposed storm servicing strategy outlined herein was developed to ensure that there are no net increases in off-site peak flows at any of the discharge points. Due to the constraints of the Thomas Baxter Municipal Drain—the natural receiving outlet with limited conveyance capacity and shallow elevation—the storm servicing approach for most of the S1 Area involves capturing post-development drainage within a storm sewer system and redirecting it to a proposed on-site end-of-pipe facility in Block 61. Outflows from this facility would then discharge into the existing Quinn's Pointe storm sewer system at a rate equal to the flow rate identified for the Quinn's Pointe Subdivision under buildout conditions.

This storm servicing approach, referred to as a "disconnection," aligns with the secondary objective of facilitating approval timelines under the Ontario Drainage Act by minimizing the release of post-development drainage to the Thomas Baxter Municipal Drain. This approach also aligns with a previously completed disconnection of an area (refer to 2018 BSUEA MSS) of which was tributary to the Thomas Baxter Municipal Drain and later formalized by RCI in its report entitled "Engineer's Report for the Subsequent Disconnection Thomas R. Baxter Municipal Drain (October 2021)".

Section 3.13.5.3 (below) discusses in greater detail the area being contemplated for disconnection from the Thomas Baxter Municipal Drain. An area of 10.7 ha was initially disconnected as reported in the 2018 BSUEA MSS while the current proposal is to extend an additional disconnection of a 59.8 ha area. This value represents a reduction when compared to the previous MSS Addendum (October 2025) shown as 65.8 ha, as the flow pattern of the southern woodlot (identified as a good candidate for conveyance as natural feature) unchanged under post-development conditions as it will continue to sheet flow towards the Borrisokane Road open ditch system.

3.13.4.2 Hydrological Analysis and Simulation Results

In addition to the comparison of peak flows at the boundary of the Quinn's Pointe Subdivision, this hydrological analysis was refined to assess peak flows and runoff volumes at two (2) locations along the Borrisokane Road/Barnsdale Road open ditch systems, as well as at the boundary culvert leading to the headwater of the Thomas Baxter Municipal Drain.

The refined hydrological analysis considered a range of storm events, including the 4-hour Chicago 25 mm storm (the industry-standard water quality event) and typical events ranging from the 1:2-year to the 1:100-year return periods. The analysis also accounted for half of the Barnsdale Road ROW and the eastern half of the Borrisokane Road ROW, as detailed in Figure 5-2 of JLR's Existing Conditions Report (Appendix B).

Given that the SWMHYMO platform used in 2017 for the Existing Conditions for the BSUEA (as reported in JLR's ECR - S1 Area) is no longer compatible with current computer and operating systems, the pre-development analysis was revised using the PCSWMM platform, which aligns with the Addendum post-development condition hydrologic analysis.

The refined analysis was conducted under both pre-development and post-development conditions, with peak flows and runoff volumes extracted at several discharge points along the boundary. Figures entitled *Pre-Development Model Schematic* and *Post-Development Model Schematic* are included in Appendix H.

Peak flows and runoff volumes were generated at the following discharge points:

1. **Existing Quinn's Pointe 900 mm diameter storm sewer:** Peak flows are summarized in Table 18.
2. **Borrisokane open ditch/culvert system** – **Node "EXD_9"** (refer to Table 19 and Table 20)
3. **Borrisokane/Barnsdale Road open ditch/culvert system** and **Node "EXD_12"** (refer to Table 21 and Table 22)
4. **Thomas Baxter Municipal Drain** immediately downstream of the merging contributions between the Barnsdale Road and Borrisokane Road open ditch systems, at **Node "Municipal Drain"** (Table 23 and Table 24), refer to Appendix H for Schematics.

The P*re-Development Model Schematic* and *Post-Development Model* Schematic is contained in Appendix H.

Table 18: Off-Site Peak Flow - Quinn's Pointe 900 mm diameter Sewer

Development Condition	1:100-year Peak Flow (L/s) 3-hour Chicago	1:100-year +20% Peak Flow (L/s) 3-hour Chicago
Quinn's Pointe 900 mm diameter Sewer		
Existing Condition	349	499
Post-Development Condition	349	495

Peak flows and runoff volumes have been summarized under the 4-hour 25 mm storm as well as under the SCS Type II storm, during events ranging between 1:2-year to 1:100-year as follows:

- Table 19 and Table 20 at Node "EXD_9"
- Table 21 and Table 22 at Node "EXD_12"
- Table 23 and Table 24 at Node "Municipal Drain"

Refer to **Appendix H** for pre- and post-development PCSWMM Schematics.

Table 19: Peak Flow Comparison at Node EXD_9

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Peak Flow (m^3/s)	Off-Site Peak Flow (m^3/s)					
	Return Period	Return Period (years)					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	0.162	0.26	0.297	0.332	0.37	0.399	0.427
POST DEVELOPMENT	0.071 (56%)	0.127 (51%)	0.243 (18%)	0.268 (19%)	0.326 (12%)	0.366 (8%)	0.402 (6%)

Note: The values in parentheses are the reduction expressed in percentages

Table 20: Runoff Volume Comparison at Node EXD_9

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Runoff Volume (m^3)	Off-Site Runoff Volume (m^3)					
	Return Period	Return Period					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	518	742	1,148	1,523	2,059	2,544	3,082
POST DEVELOPMENT	354 (32%)	556 (25%)	873 (24%)	1,177 (23%)	1,637 (20%)	2,048 (19%)	2,490 (19%)

Note: The values in parentheses are the reduction expressed in percentages

Table 21: Peak Flow Comparison at Node EXD_12

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Peak Flow (m3/s)	Off-Site Peak Flow (m^3/s)					
	Return Period	Return Period (years)					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	0.41	0.636	0.894	1.057	1.255	1.408	1.560
POST DEVELOPMENT	0.173 (58%)	0.296 (53%)	0.461 (48%)	0.581 (45%)	0.698 (44%)	0.794 (44%)	0.891 (43%)

Note: The values in parentheses are the reduction expressed in percentages

Table 22: Runoff Volume Comparison at Node EXD_12

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Runoff Volume (m^3)	Off-Site Runoff Volume (m^3)					
	Return Period	Return Period					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	1310	1,886	2,766	3,516	4,570	5,508	6,550
POST DEVELOPMENT	977 (25%)	1,508 (20%)	2,189 (21%)	2,757 (22%)	3,539 (23%)	4,208 (24%)	4,916 (25%)

Note: The values in parentheses are the reduction expressed in percentages

Peak flows and runoff volumes have been summarized in Table 23 and Table 24 at the headwater of the Thomas Baxter Municipal Drain Node as reference by Node “Municipal Drain” on the pre- and post-development PCSWMM Schematics (Appendix H).

Table 23: Peak Flow Comparison at Node Municipal Drain

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Peak Flow (m3/s)	Off-Site Peak Flow (m^3/s)					
	Return Period	Return Period (years)					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	0.443	0.709	1.021	1.223	1.471	1.668	1.866
POST DEVELOPMENT	0.213 (52%)	0.374 (47%)	0.614 (40%)	0.774 (37%)	0.948 (36%)	1.076 (35%)	1.219 (35%)

Note: The values in parentheses are the reduction expressed in percentages

Table 24: Runoff Volume Comparison at Node Municipal Drain

	Design Storm						
	Water Quality Event	6 hr SCS Type II					
	Off-Site Runoff Volume (m^3)	Off-Site Runoff Volume (m^3)					
	Return Period	Return Period					
	4 hr 25 MM	1:2	1:5	1:10	1:25	1:50	1:100
EXISTING CONDITIONS	1628	2,334	3,481	4,468	5,849	7,062	8,394
POST DEVELOPMENT	1293 (21%)	1,995 (15%)	2,988 (14%)	3,840 (14%)	5,001 (14%)	5,985 (15%)	7,022 (16%)

Note: The values in parentheses are the reduction expressed in percentages

The following conclusions can be drawn from the review of the above summary Tables:

- The 1:100-year post-development peak flows released to the existing Quinn's Pointe storm sewer are maintained at levels identified for the Quinn's Pointe Subdivision at the build-out conditions (Table 18)
- The lower peak flows and runoff volumes at Node EXD_9 (Table 19 and Table 20) are attributable to a reduction in contributing drainage area from 22.0 ha under pre-development conditions to 9.0 ha under post-development conditions.
- The lower peak flows and runoff volumes at Node EXD_12 (Table 21 and Table 22) are attributed to a reduction in contributing drainage area from 73.2 ha under pre-development conditions to 13.4 ha under post-development conditions.
- As a result of the reductions in contributing drainage area noted above, post-development peak flows and runoff volumes discharging to the Borrisokane Road open ditch system and to the Borrisokane Road/Barnsdale Road at Nodes EXD_9 and EXD_12, respectively are lower than pre-development values for all storm events, as summarized in the above Tables.
- Peak flows and runoff volumes at the Municipal Drain (Table 23 and Table 24) reflect a reduction in the contributing drainage area from 80.3 ha under pre-development conditions to 20.5 ha under post-development conditions. Accordingly, Table 23 ands Table 24 indicate decreases in both peak flows and runoff volumes for all storm events.

3.13.5 Impact of Post-Development Drainage Modifications

3.13.5.1 General

The proposed drainage limit modifications will alter the hydrological regime as highlighted in Section 3.13.4.2. In all cases, the proposed disconnection reduces both peak flows and runoff volumes at the analyzed off-site discharge points.

The following sections provide an impact assessment of the modified hydrological regime at key locations:

- Borrisokane Road open ditch system
- Barnsdale Road open ditch system
- Thomas Baxter Municipal Drain
- Downstream Fisheries

3.13.5.2 Borrisokane Road Open Ditch System

The Borrisokane Road open ditch system is part of Highway 416's right-of-way (ROW), which is owned and operated by the Ministry of Transportation (MTO). Therefore, any modifications to the hydrological regime of the Borrisokane Road open ditch system should be reviewed by MTO.

As reported in Section 3.13.4.2, peak flows and runoff volumes were evaluated at the downstream end of the Borrisokane Road open ditch system at Node EXD_9 (Appendix H for Schematics). Simulation results indicated the following:

- Post-development peak flows are reduced by ±56% and 6% at Node EXD_9 during the 4-hour 25 mm storm and 1:100-year storm, respectively. Similarly, runoff volumes are reduced by ±32% and ±19% during the 4-hour 25 mm storm and 1:100-year event, respectively.

Based on the above simulation results, the proposed drainage modifications (i.e., disconnection) will provide relief to the Borrisokane Road open ditch system as both peak flows and runoff volumes will be reduced. Therefore, there are no anticipated adverse impacts along this drainage system owned and operated by MTO.

3.13.5.3 Barnsdale Road Open Ditch - Headwater Features

An Environmental Impact Statement (EIS) was prepared by Arcadis, with the latest version of the Report issued by Fotenn (March 3rd, 2026). As part of this EIS, a Headwater Drainage Feature (HDF) Assessment identified three (3) reaches along Barnsdale Road—BN-1-A, BN-1-1B, and BN-2-A—which received a management recommendation of mitigation requiring the following:

> *The reaches identified should have their functions replicated or enhanced through improved conveyance measures, with flows directed to the appropriate downstream receiver.*

A review of topography shows that the invert of the Barnsdale Road open ditch system varies from approximately 99.6 m at BN-1-A to 98.7 m at BN-2-A, matching the measured edge-of-water elevation of the adjacent man-made pond. Most reaches identified in the EIS would appear to be groundwater-fed rather than being fed by the northern areas, based on measured water elevations shown on the topographical map. Additionally, as a secondary source of inflow, the alignment of these HDFs coincide with the Barnsdale Road open ditch system, which receives runoff from half of the Barnsdale Road ROW, including about 4.5 m wide asphalt strip and a gravel shoulder at a typical 3:1 side slope. While part of the S1 Area is proposed to be

disconnected from BN-1-A, BN-1-1B, and BN-2-A, runoff from the Barnsdale ROW, including the shoulder and groundwater contribution will be maintained, allowing these reaches to function as they do under existing conditions.

Simulation of runoff volume at BN-2-A (EXD_12), as indicated in the above Table, shows a 25% reduction during the 4-hour 25 mm storm, which should not adversely impact the HDFs given the above-noted sources of inflow will be maintained. However, the EIS provided mitigation measures (Section 8.2.2) should any construction activities be planned to take place below the high-water mark of the HDFs. These are the following:

- Due to their classification as indirect fish habitat, any direct construction below the high-water mark in Features BN-1, BN-2, BN-3, and Feature 416 will require authorization from DFO through the submission of a Request for Review.
- Direct construction in BN-1, BN-2, BN-3, and Feature 416 and at elevations below the high-water mark should incorporate shallow groundwater measures as well as LID construction practices.
- No work within the high-water mark outside of the fish timing window.

No direct construction activities are envisioned to impact directly any of the above-noted HDFs. The following activities are however anticipated:

- Construction of the residential subdivision and infrastructure within the S1 Area, located outside of the HDFs.
- Construction of the Barnsdale Road 375 mm diameter sanitary sewer extension, planned from the existing stub (at Bundoran Place) to Street 17, and northerly. The alignment of this sanitary sewer extension is away from BN-1-A.

Upcoming Infrastructure Work

It is important to note that the MTO and the City of Ottawa plan to widen this section of Barnsdale Road in the future, as an ongoing Class Environmental Assessment was initiated in 2025 by the city. It is unknown at this time whether a rural or urban cross-section will be selected. However, widening will increase the paved surface and encroach on HDF reaches BN-1-A, BN-1-1B, and BN-2-A. Consequently, the function of these reaches will significantly be altered or completely removed as widening occurs over the next 5 to 10 years. Until such time, the function of these HDFs will remain due to groundwater inflow combined with surface runoff from Barnsdale Road.

3.13.5.4 Thomas Baxter Municipal Drain

The partial disconnection of approximately 59.8 ha results in reductions to both peak flows and runoff volumes at the headwaters of the Thomas Baxter Municipal Drain (Node “Municipal Drain”), as illustrated on the Pre-Development and Post-Development Model Schematics provided in Appendix H.

Peak flows and runoff volumes at the Municipal Drain (Table 23 and Table 24) similarly reflect a reduction in the contributing drainage area from 80.3 ha under pre-development conditions to 20.5 ha under post-development conditions. Accordingly, Table 23 and Table 24 indicate decreases in both peak flows and runoff volumes for all storm events. Accordingly, the partial

disconnection is not anticipated to adversely affect the Municipal Drain. Subject to approval, the proposed modifications to the hydrologic regime will be documented in an updated Engineer's Report prepared in accordance with the Drainage Act (Section 78, Chapter D.17, R.S.O. 1990).

As shown on Figure 7, the total study area of approximately 69.9 ha is comprised of two different watersheds: Mud Creek Subwatershed and the Jock River Subwatershed. Under existing condition, most of the study area is tributary to the Thomas Baxter Municipal Drain/Mud Creek Subwatershed and a small section in the Northeast corner is tributary to the Jock River. Under post-development condition a partial disconnection of approximately 59.8ha from the Mud Creek Subwatershed is captured tributary to the proposed dry pond which in turn tributary to the Jock River. A breakdown of the tributary areas under pre- and post-development conditions are summarized in the Table below:

Table 25: Study Area Breakdown by Watershed

Subwatershed	Pre-Development Area (ha)	Post-Development Area (ha)
Thomas Baxter Municipal Drain/Mud Creek	66.5	6.7
Jock River	3.4	63.2

3.13.5.5 Downstream Fisheries

Simulation results summarized in Section 3.14 demonstrate reductions in both peak flows and runoff volumes at the headwaters of the Thomas Baxter Municipal Drain, immediately downstream of the southern limit of the Barnsdale Road right-of-way. From a fisheries perspective, the 4-hour, 25-mm storm event is considered more influential than higher return period events, as it occurs approximately four to five times annually, compared to the less frequent 2-year and 100-year events.

Under post-development conditions, the runoff volume associated with the 4-hour, 25-mm rainfall event was estimated at approximately 1,293 m^3, representing a reduction of about 335 m^3 (approximately 21%) relative to pre-development conditions. As no fish habitat is present at the headwaters of the Thomas Baxter Municipal Drain near Barnsdale Road, this reduction in runoff volume is not expected to adversely affect downstream fish communities, which are primarily located near the confluence with Mud Creek.

LiDAR analysis indicates that the total drainage area of the Thomas Baxter Municipal Drain at its confluence with Mud Creek is approximately 883 ha, whereas the study area reflects a tributary area of approximately 80.3 ha—representing less than 10% of the total contributing area at Mud Creek. As additional runoff contributions occur along the reach between Barnsdale Road and Mud Creek, the relative influence of the reduced runoff volume diminishes as flow from the remaining ±803 ha of largely unchanged drainage area is incorporated. Consequently, hydrologic conditions in proximity to the Mud Creek fish communities are expected to remain effectively unchanged.

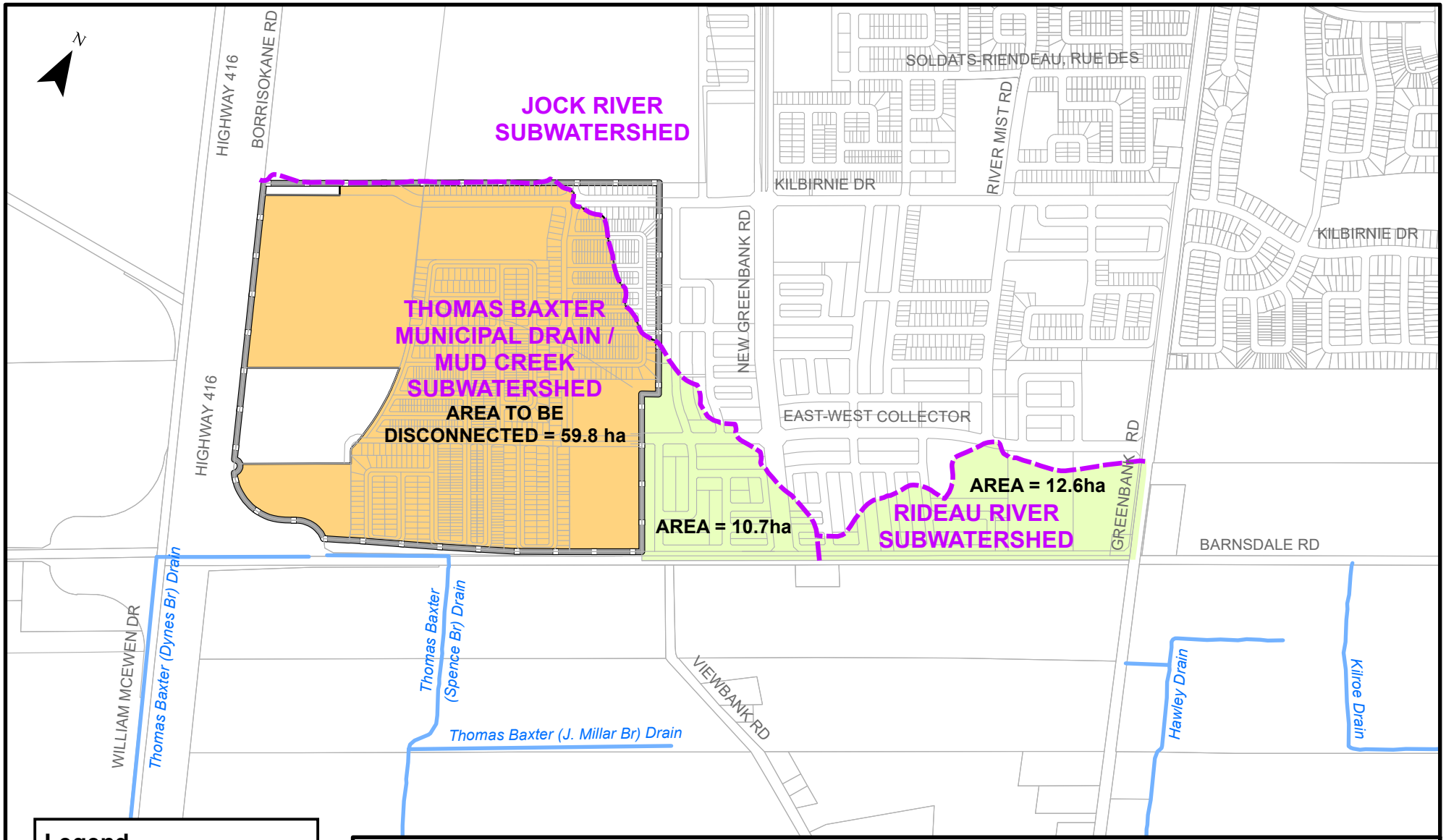
Consistent with this assessment, Section 8.2.2 of the EIS concludes that conditions near the Mud Creek fish communities are anticipated to remain virtually unchanged and align with the HDF Assessment mitigation objective to maintain or replicate existing conveyance functions

toward appropriate receivers. Accordingly, the proposed disconnection is not expected to result in adverse impacts to fish communities near Mud Creek.

3.13.6 Water Quality for the Constraint Areas

Calculations presented in Section 3.11.6 demonstrate that water quality control requirements are satisfied for all areas serviced by an EES, as this system exceeds the infiltration criteria outlined in Table 3.2 of the Stormwater Management Planning and Design Manual (SWMPDM). Furthermore, the infiltration strategy detailed in Section 3.13.1 is shown to be comparable to the existing condition water budget. Accordingly, the proposed stormwater servicing approach satisfies the requirements of the CLI-ECA.

Water quality treatment for areas identified as constraints on Figure 10 will be provided at both storm sewer inlets (STMH501 and STMH554) to the expanded dry pond (refer to Drawing MST in Appendix I). As infiltration measures have been implemented to the maximum practical extent and post-development water balance conditions are comparable to existing conditions, the requirements of the CLI-ECA are met. For the areas noted as constraints, water quality will be achieved via a treatment train approach; a pre-treatment MTD (ETV sized) and filtration dry pond sized to provide on its own an 80% TSS removal.



PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

DRAWING:

CHANGES TO MUNICIPAL DRAIN DRAINAGE AREAS

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FIGURE 10

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3.14 Stormwater Summary and Recommendations

This Addendum presented a storm servicing strategy, which was based on the extension of the approved solution described in the 2018 BSUEA MSS. This solution consisted of a traditional storm sewer system, sized based on the SDG, combined with infiltration measures that were developed to the maximum extent possible while recognizing a series of constraints described in Section 3.7.1 and depicted on Figure 9. To supplement this system, the areas referenced as constraints will be serviced by a treatment train approach combining a pre-treatment MTD with a filtration dry pond.

The conceptual servicing design was found to fulfill the following:

- Achieves the prescribed flow rate along the existing 900 mm diameter storm sewer within Quinn's Pointe.
- Achieves the minimum 300 mm freeboard across the S1 Area (residential).
- Achieves flow depths of 350 mm or less along the major overland system of the S1 Area. Achieves the infiltration requirements as specified in Appendix A of the CLI-ECA as the existing condition water budget will be maintained.
- Achieves the filtration requirements as specified in Appendix A of the CLI-ECA as the water quality control will be met.
- Achieves a comparable water budget to existing levels.
- Peak flow and runoff volume reductions to the Borrisokane Road open ditch system, to the Thomas Baxter Municipal Drain and Barnsdale Road open ditch system.

It is recommended that storm servicing in the S1 Area be carried out based on:

- ✓ Conventional storm sewers along with an EES on local roads, when permitting
- ✓ Lot-level sub-surface infiltration measures for each building within the Industrial lands.
- ✓ Areas defined as constraints to be serviced by a treatment train approach, combining a pre-treatment MTD with a filtration dry pond.

Simulation results indicate that the EES along local roads is sufficient to achieve an enhanced level of protection when sized to capture 22 mm of runoff. In contrast, roadway areas not serviced by an EES require a filtration alternative prior to discharging off-site. The recommended filtration solution as identified by the screening process is to provide a filtration dry pond supplemented by pre-treatment MTD.

Overall outflows from both trunk storm sewers are then controlled by the end-of-pipe facility dry pond discharging to the existing sewers in Quinn's Pointe.

Simulation results have revealed that the EES along local roads is sufficient when sized for 22 mm in meeting an enhanced protection level. Similarly, the filtration dry pond which uses the same infiltration principle is sufficient to meet the CLI-ECA.

4.0 Wastewater Servicing

4.1 Background

The wastewater collection system within the S1 Area has been conceptually sized to convey flows to existing gravity sanitary sewers within the Barrhaven South Community. These trunk sanitary sewers ultimately discharge the captured flows to the 900 mm diameter trunk sanitary sewer located along Greenbank Road. From that point, wastewater is then conveyed to the South Nepean Collector, followed by the West Rideau Collector, which ultimately outlets to the Robert O. Pickard Environmental Centre (ROPEC), where it is treated prior to being discharged into the Ottawa River.

In JLR's Serviceability Study (2019), it was demonstrated that the parcels adjacent to the BSUEA, which includes the S1 Area, could be serviced through extensions of the existing and proposed infrastructure in the area. From a wastewater servicing perspective, it was confirmed that the S1 Area could be serviced via a connection to the existing 375 mm diameter sanitary sewer located on Barnsdale Road, south of the existing Quinn's Pointe Stage 4 (refer to Figure 11 and Figure 12).

More recently, the 2025 ECR (Appendix B) identified several critical sewers where residual capacities of the existing trunk sanitary sewer network were to be reviewed to confirm that they could accommodate the increase in peak wastewater flows from the S1 Area. These critical pipe reaches are summarized in Table 26 below.

Table 26: Critical Residual Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Limiting Pipe Reach
Barnsdale Road	MH203 to MH202
Greenbank Road	MH200C to MH45
Greenbank Road	MH435A to MH501A

The wastewater servicing strategy for the S1 Area was developed in accordance with the design criteria outlined in the OSDG and subsequent technical bulletins, while also respecting the capacity limitations of the existing downstream infrastructure.

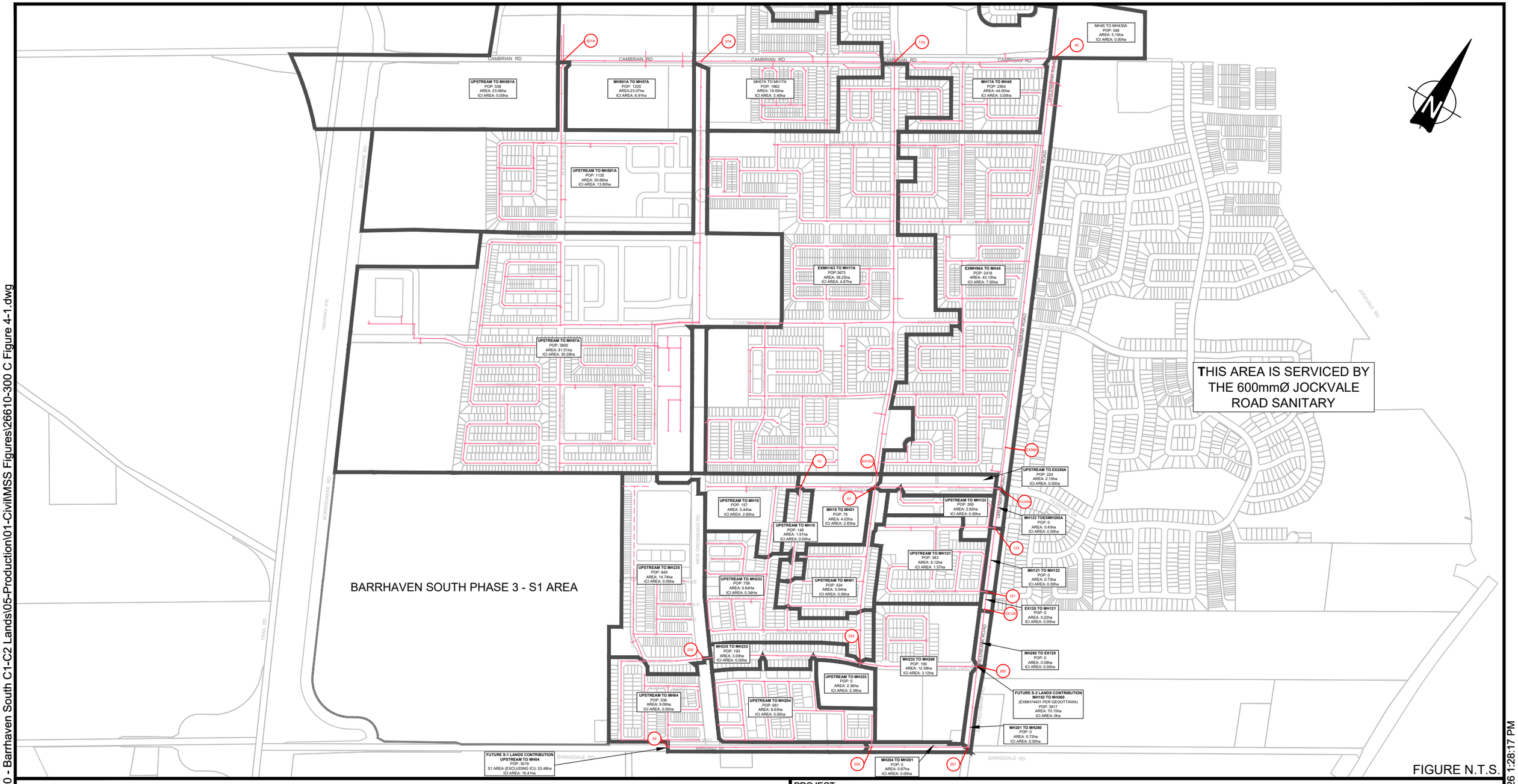

FIGURE N.T.S.

LEGEND

- S1 URBAN EXPANSION STUDY AREA
- EXISTING SANITARY DRAINAGE BOUNDARIES
- 100 — EXISTING SANITARY SEWER AND MANHOLE
- PLANNED SANITARY SEWER

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

DRAWING:

EXISTING OVERALL SANITARY DRAINAGE PLAN

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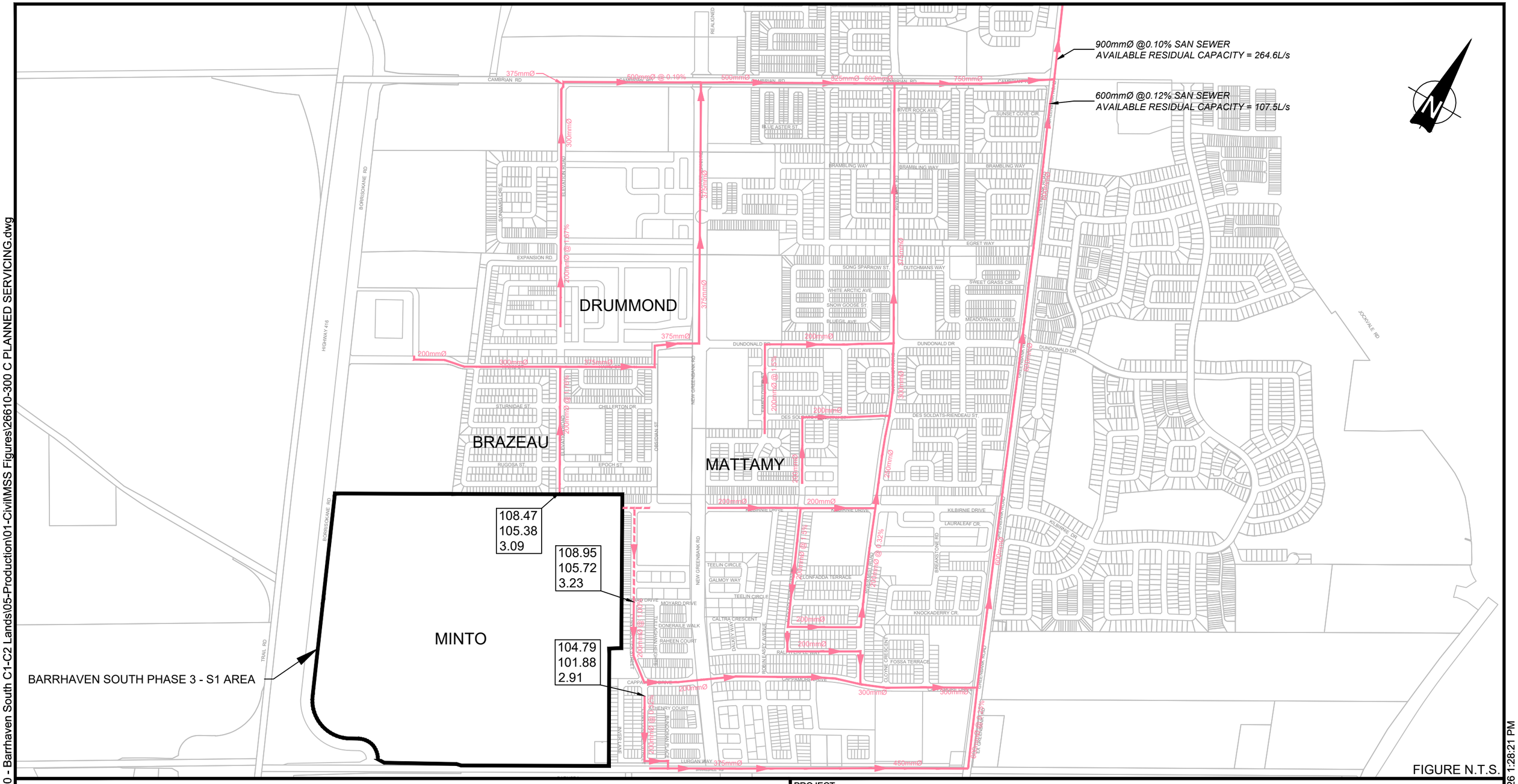
900mmØ @0.10% SAN SEWER
AVAILABLE RESIDUAL CAPACITY = 264.6L/s
600mmØ @0.12% SAN SEWER
AVAILABLE RESIDUAL CAPACITY = 107.5L/s
DRUMMOND
BRAZEAU
MATTAMY
MINTO
BARRHAVEN SOUTH PHASE 3 - S1 AREA
108.47
105.38
3.09
108.95
105.72
3.23
104.79
101.88
2.91
CAMBRIAN RD
BORRISOKANE RD
HIGHWAY 416
TRAIL RD
JOCKVALE RD
NEW GREENBANK RD
ELEVATION ROAD
DUNDONALD DR
DES SOLDATS-RIENDEAU ST.
BRAMBLING WAY
EGRET WAY
SONG SPARROW ST.
DUTCHMANS WAY
WHITE ARCTIC AVE.
SNOW GOOSE ST.
BLUEGILL AVE.
MEADOWHAWK CRES.
SWEET GRASS CIR
RIVER ROCK AVE.
SUNSET COVE CIR
BLUE ASTER ST.
EXPANSION RD.
STURNIDAE ST.
CHILLERTON DR
RUGOSA ST.
EPOCH ST.
OBSIDIAN ST.
KILBIRNIE DRIVE
LAURALEAF CR.
KILBIRNIE DR.
BREAKSTONE RD
TEELIN CIRCLE
GALMOY WAY
CLONFADDA TERRACE
KNOCKADERRY CR.
CALTRA CRESCENT
DALKEY WAY
DONERAILE WALK
RAHEEN COURT
DUBLINEASY AVENUE
CLONE CRESCENT
FOSSA TERRACE
CAPPAMORE DRIVE
ATHENRY COURT
INVERLANE
LURGAN WAY
MOYARD DRIVE
REALIGNED
375mmØ
500mmØ @ 0.19%
500mmØ
525mmØ
600mmØ
750mmØ
300mmØ
200mmØ @1.67%
200mmØ @1.15%
200mmØ @1.32%
200mmØ @1.11%
200mmØ @1.00%
200mmØ @1.18%
200mmØ @1.19%
200mmØ @1.00%
200mmØ @1.00%
200mmØ @1.00

4.2 Wastewater System Servicing

4.2.1 Design Criteria

Trunk sanitary sewers servicing the S1 Lands were designed in accordance with the following criteria from the ODSG and subsequent Technical Bulletins:

Table 27: Sanitary Design Criteria

Design Criteria	Design Value
Residential Average Flow	280 L/cap/day
Residential Peaking Factor	Harmon Formula x 0.8
Light Industrial Average Flow	28,000 L/gross ha/day
ICI Peaking Factor (1)	1.0/1.5
Total Infiltration	0.33 L/s/ha
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s
Manning Roughness Coefficient (for smooth wall pipes)	0.013
Minimum Allowable Slopes	Varies
Population Density	Single Family: 3.4 ppu Townhouse: 2.7 ppu

(1) 1.5 if ICI Contribution > 20%, 1.0 otherwise.

4.2.2 Residual Capacities in the Existing Sanitary Sewer Network

As part of the BSUEA MSS (2018), a Master Sanitary Design Sheet was developed to assess the available capacity of the existing sanitary sewer infrastructure within the BSUEA, and further downstream in the existing areas. This design sheet was subsequently refined during the 2019 Serviceability Study and further updated in the ECR (2025) to incorporate the most recent design flow data for Quinn's Pointe Stages 2 through 5, as well as the future S1 and S2 Areas. The S2 Area represents a planned expansion located east of Greenbank Road and north of Barnsdale Road which is also in the MSS preparation stage.

The Serviceability Study (2019) identified segments of the existing network with potential capacity limitations. This analysis was further refined in the ECR (2025), with a specific focus on the S1 Area. The sanitary trunk sewers evaluated for this area were located along Barnsdale Road and Greenbank Road. The limiting pipe reaches identified in this report are summarized in Table 26.

At the time of the preparation of the ECR (2025), the Concept Plan for the S1 Area was at a preliminary stage thus the available servicing capacities of the existing system have been re-evaluated in Section 4.4 to reflect the most recent iteration of the Concept Plan (Appendix D).

4.3 Wastewater Collection System Strategy

4.3.1 Phasing

As shown in the preferred Concept Plan (Appendix D), development of the S1 Area is proposed to proceed in three sequential residential phases: Phases 6, Phase 7, and Phase 8, including two industrial land parcels totaling 13.22 ha to the north and 3.19 ha to the south. The ultimate

sanitary outlet for the entire S1 Area is located within Phase 6 at Barnsdale Road at Street No. 15. Accordingly, the downstream sewer infrastructure as part of Phase 6 will be designed to accommodate ultimate buildout conditions, including all residential phases and both industrial lands. By sizing the initial phase infrastructure to meet full future capacity requirements, the system will inherently satisfy the servicing needs of all interim development phases.

4.3.2 Proposed Sewer System Layout and Sizing

As shown in the Concept Plan (Appendix D), the wastewater collection system for the S1 Area is intended to service single family units, townhouse blocks, the industrial lands and a park block.

The proposed sanitary sewers within the S1 Area have been conceptually sized based on the design criteria listed in Table 27 and the drainage areas depicted on Drawing MSAN in Appendix K. A trunk sanitary sewer system layout has been developed in accordance with the latest Concept Plan (Appendix D). Within the S1 Area, there are two (2) designated collector roads which are:

- Elevation Road: This roadway serves as the north-south collector from Kilbirnie Drive to Cappamore Drive; and
- Cappamore Drive: This roadway serves as the east-west collector from the woodlot, potentially conveyed as natural feature, which is adjacent to the Industrial Lands to the existing Quinn's Pointe Stage 4.

Since Elevation Road and Cappamore Drive are the designated collector roads within the S1 Area, the trunk sanitary sewers are proposed to follow their alignments within the Study Area.

The remainder of the sanitary sewer network is to follow the configuration of the local road system, with careful consideration given to maintaining minimum flow velocities, ensuring adequate cover, and avoiding infrastructure conflicts. The sanitary sewer layout is to be developed in coordination with the stormwater and watermain networks.

The Master Sanitary Sewer Design Sheet, prepared as part of the ECR, included the population and corresponding flows for the S1 Area (refer to Appendix I). It also shows trunk sanitary sewer sizing. Based on this assessment, wastewater from the S1 Area is expected to be conveyed primarily through an internal sanitary network consisting of sanitary sewers ranging from 200 mm to 375 mm in diameter. Final pipe sizing will be confirmed during detailed design.

4.3.3 Barnsdale Road Outlet

The 2019 Serviceability Study evaluated potential sanitary sewer connections for the S1 Area and concluded that servicing could be achieved via a connection to the existing 375 mm diameter sanitary sewer located on Barnsdale Road, south of the Quinn's Pointe Stage 4 development. This recommendation was based on the available residual capacity within the Barnsdale Road sewer infrastructure. Additionally, the Master Sanitary Sewer Design Sheet (refer to Appendix I) included in the report confirmed that the existing sanitary sewers on Cappamore Drive do not have sufficient capacity to accommodate additional flows.

4.4 Impact on Downstream System

The ECR (2025) included the refinement of the BSUEA Master Sanitary Design Sheet to assess the available capacity of the existing sanitary sewer infrastructure. This analysis incorporated the most up-to-date design flow data for Quinn's Pointe Stages 2 through 5, along with projected flows for the future S1 and S2 Areas.

This Master Sewer Design Sheet has been refined further as part of this assessment to include design flows from the most recent iteration of the Concept Plan (Appendix D). With the addition of the S1 and S2 Areas, the calculated theoretical peak wastewater flows were found to be within the available residual capacities of the existing downstream sanitary sewer (refer to Master Sanitary Design Sheet in Appendix I). Consequently, no further infrastructure improvements are required along the existing downstream system. Table 28 provides a summary of the impact of the S1 and S2 areas to the critical pipe reaches in Table 26.

Table 28: Residual Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Limiting Pipe Reach	Residual Capacity
Barnsdale Road	MH203 to MH202	118.4 L/s
Greenbank Road	MH200C to MH45	11.5 L/s
Greenbank Road	MH435A to MH501A	98.8 L/s

4.5 Wastewater Summary and Recommendations

The wastewater collection system illustrated in Drawing MSAN in Appendix K and the accompanying Master Sanitary Sewer Design sheet (Appendix I) has been conceptually sized based on the design criteria outlined in Table 27, while accounting for the residual capacities of the pipe segments identified in Table 28.

As noted in Section 4.3, the layout of the trunk sanitary sewer system has been developed in accordance with the most recent Concept Plan, with Elevation Road and Cappamore Drive designated as the primary north-south and east-west trunk sewers, respectively.

It is expected that wastewater generated by the S1 Area can be accommodated by a series of 200 mm diameter sanitary sewers as shown in the Master Sanitary Sewer Design Sheet (Appendix I). Furthermore, the calculated theoretical peak wastewater flows for the S1 Area were found to be within the available residual capacities of the existing downstream sanitary sewer while accounting for the projected flows from the S2 Area (refer to Appendix I). Consequently, no further infrastructure improvements are required along the existing downstream system.

5.0 Water Distribution

5.1 Background

The 2018 BSUEA MSS reviewed and evaluated servicing options with the identification of preferred trunk watermains, which were subsequently constructed. This Addendum, prepared as an extension to the 2018 BSUEA MSS, identifies feedermains to support the urbanization of the S1 Area.

In 2019, the Serviceability Study water supply assessment confirmed that extensions of existing watermains would provide potable water that met the design criteria and objectives listed in Section 4.2.2 of the Ottawa Design Guidelines for Water Distribution (December 2025).

The review of the existing and future planned watermains was carried out as part of the 2025 ECR (Appendix B). Figure 13 depicted the existing and planned watermains along the boundary of the S1 Area. This review has shown that the current urban development to the east of the Study Area (i.e., Quinn's Pointe Subdivision) and to the north of the Study Area (i.e., The Ridge Subdivision) are both serviced by the municipal distribution system, which draws its water from the Ottawa River at both the Britannia and Lemieux Water Purification Plants. From those purification plants, potable water is distributed via a series of feedermains and water booster stations. The City of Ottawa water distribution system is planned based on achieving the following design objectives:

- Quantity: sufficient water at sufficient pressure (Section 4.2.2 of the Ottawa Design Guidelines for Water Distribution)
- Quality: safe drinking water to the required standards (Section 4.1 of the Ottawa Design Guidelines for Water Distribution).
- Reliability: to ensure water supply under emergency conditions.
- Effectiveness and affordability: to reduce lifecycle costs being sustainable in the long term.

Three (3) feedermains service the Barrhaven South Community from the Barrhaven reservoir, which are as follows:

- a 406 mm main along Greenbank Road
- a 406 mm main along Cambrian Road; and
- a 305 mm feeder main along River Mist Road

Two (2) sections of the planned feedermains were also recently constructed as follows:

- 305 mm feedermain along New Greenbank Road, from Barnsdale Road to Kilbirnie Road.
- 406 mm feedermain on Cambrian Road, from Elevation Road to existing Greenbank Road.

Future planned feedermains are as follows:

- 305 mm feedermain on Kilbirnie Drive, from New Greenbank Road to the eastern perimeter of the S1 Area, including a connection to Obsidian Street.

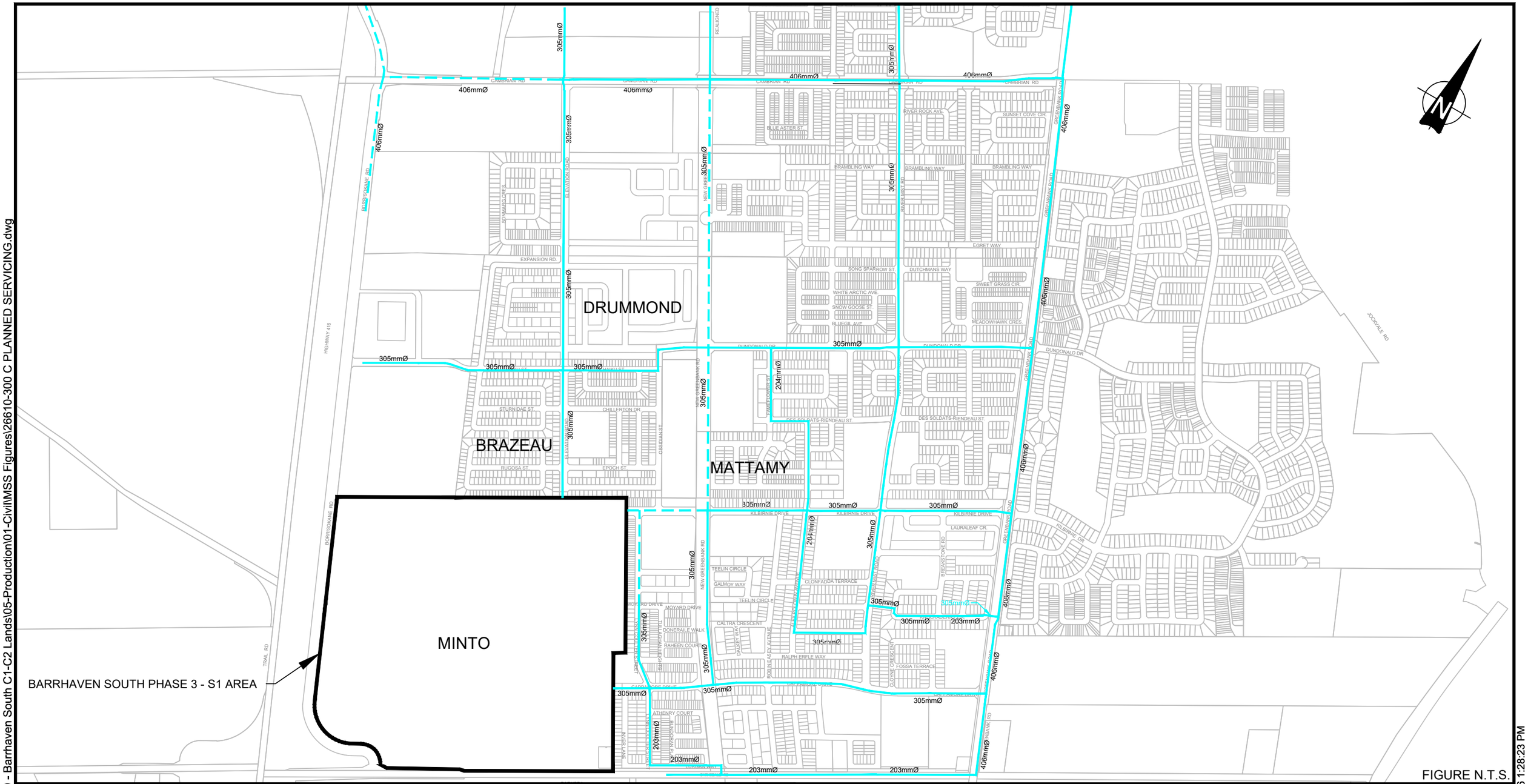

FIGURE N.T.S.

LEGEND

- EXISTING WATERMAIN
- PLANNED WATERMAIN

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

DRAWING:

EXISTING AND PLANNED WATER MAIN SERVICING INFRASTRUCTURE

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5.2 Water Servicing

5.2.1 Design Criteria

The Ottawa Design Guidelines for Water Distribution (December 2025) require that all new development additions to the public water distribution system be designed to conform to the following:

- In general conformance with the MOE Design Guidelines for Drinking-Water Systems the desired range of system pressures should be approximately 350 to 480 kPa (50 to 70 psi) and not less than 275 kPa (40 psi) during normal operating conditions.
- Where fire flow has been provided; during periods of maximum day and fire flow demand the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi).
- In accordance with the Ontario Code & Guide for Plumbing, the maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 552 kPa (80 psi.)
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi.)
- Feedermains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

In addition to the above targets, servicing should be carried out to minimize the use of dead-end watermains.

5.2.2 Phasing

As shown in the preferred Concept Plan (Appendix D), development of the S1 Area is proposed to proceed through three sequential residential phases: Phase 6 including an industrial land parcel of 13.22 ha to the north, Phase 7, and Phase 8 including an industrial land parcel of 3.19 ha to the south. All watermain connections from the S1 Area to the existing municipal network will be constructed as part of Phase 6, with the subsequent phases and future industrial lands extending from Phase 6.

Accordingly, the analysis and results in this Section are structured to reflect the cumulative staging of development:

- Phase 6 + Northern Industrial Parcel
- Phase 6 + Northern Industrial Parcel + Phase 7
- Phase 6 + Northern Industrial Parcel + Phase 7 + Phase 8 + Southern Industrial Parcel

The proposed connection at Kilbirnie Drive will extend from Quinn’s Pointe Stage 5, which has not yet been constructed but is planned to be completed prior to advancement of the S1 Area. Accordingly, the analysis and results incorporate the units from Quinn’s Pointe Stage 5 (herein referred to as “Stage 5”).

5.2.3 Domestic Water Demands

The water demands calculated for the S1 Area reflect the unit count and land-use areas shown on the Concept Plan (Appendix D).

System level parameters (Table 29) were provided by the City of Ottawa at the onset of this project given that the population of the S1 Area exceeds 3,000 (refer to Appendix J).

The maximum day demand shown in the table below is the sum of the average day demand, the water loss per connection and the outdoor water demand. The peak hour peaking factors shown below were provided by the City.

Table 29: Theoretical Water Consumption Rate

Land Use Type	Consumption Rate (L/cap/day)	Avg. Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Outdoor Water Demand (L/unit/day)	Max Day Demand (L/unit/day)	Peak Hour Demand
Single Family Homes @ 3.4 ppu	180	612	80	700	1,392	2.1 x Max
Executive and Avenue Towns @ 2.7 ppu	198	535	80	350	965	2.1 x Max
EMP (L/ha/day)	17,000	N/A	N/A	N/A	1.5 x Avg	1.8 x Max

When all the above parameters are applied to the S1 Area along with an assumed constant demand of 4 L/s for the park block, the following water demands were calculated as shown in the detailed water demand spreadsheet in Appendix J.

Table 30: S1 Area Water Demands

Phasing Scenario	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Phase 6	13.65	21.00	33.23
Phase 6, 7	15.46	24.00	39.27
Phase 6, 7, 8	18.11	28.53	48.24

*Note all scenarios include Stage 5.

5.2.4 Required Fire Flow

Based on the City's Design Guidelines, municipal watermains shall be designed to meet fire flow requirements estimated based on the Fire Underwriters Survey (FUS) method. To evaluate

the proposed water distribution system, a maximum fire flow of 13,000 L/min (217 L/s), based on the previous MSS Addendum, was targeted in the system for each phasing scenario shown in Table 30. A lesser fire flow of 10,000 L/min (167 L/s) was also assessed based on the City's capped fire flow requirement for single family homes and row townhouses that achieve adequate rear yard spacing.

5.2.5 Internal Water Servicing

Several 300 mm diameter feedermains are being proposed within the S1 Area. These trunk watermain locations have been determined based on the existing watermains surrounding the S1 Area as well as the Concept Plan and hydraulic requirements. The following trunk watermains are proposed, as illustrated on the Master Watermain Drawing (MWM in Appendix K):

- 300 mm diameter watermain westerly extension on Kilbirnie Drive.
- 300 mm diameter watermain westerly extension on Moyard Drive with 300 mm diameter watermain upgrade (±40m) on Moyard Drive west of Lynn Coulter Street.
- 300 mm diameter watermain westerly extension on Cappamore Drive.
- 300 mm diameter watermain southerly extension on Elevation Road.
- 300 mm diameter watermain westerly extension on Barnsdale Road.
- 200 mm or 300 mm diameter watermains at the west side of the S1 Area to provide looping between the extended watermains, including through the Industrial Lands, such to avoid the creation of dead-end feedermains.

5.2.6 Boundary Conditions

At the onset of this Study, boundary conditions were requested from the City for the existing pressure zone configuration and for the future South Urban Community (SUC) pressure zone reconfiguration. As the future SUC pressure zone reconfiguration is not expected to be completed until 2027, this Study analyzes results for both the existing and future pressure zones.

The boundary conditions received from the City (Appendix J) include connections to the existing watermains at Moyard Drive, Kilbirnie Drive, Obsidian Street, Elevation Road, Cappamore Drive, and Barnsdale Road. Boundary conditions were requested with and without a connection to Barnsdale Road as well as for the different phasing scenarios shown in Table 30. Although the boundary conditions indicate a marginal pressure increase with the Barnsdale Road connection, it is recommended that this looped connection be constructed for redundancy purposes given that the trunk sanitary sewer will also be extended westerly along this ROW. Thus, this Study only assesses the water servicing with the Barnsdale Road connection.

Boundary conditions received on November 24, 2025, were used for Phase 6 and Phase 6-7 scenarios and boundary conditions received on August 25, 2025, were used for the Phase 6-8 buildout scenario. It is noted that the current boundary conditions (received November 24, 2025) are generally reduced in pressure as compared to those presented in the previous studies carried out for these lands. This is attributed to the City's recent updates to their hydraulic water model which included updates to the pump controls at Barrhaven Pumping Station and updates to all water demands throughout the model, especially in neighbouring areas.

5.3 Water Servicing Analysis

The Hydraulic Network Analysis (HNA) was conducted using a model in WaterCAD® with a series of trunk watermains with a nominal diameter of 300 mm (modelled with an internal diameter of 297 mm) and 200 mm (modelled with an internal diameter of 204 mm). The 300 mm and 200 mm diameter watermains use a Hazen-Williams roughness coefficient (C-factor) of 120 and 110, respectively, per City Design Guidelines. A model schematic is presented in Appendix J that shows the proposed street centreline elevations and watermain sizing and layout within the S1 Area. The modelled watermain configuration follows the Master Watermain Drawing (MWM in Appendix K). The HNA encompassed system performance under three key scenarios: maximum hydraulic grade line (HGL) conditions, peak hour demand conditions, and maximum day demand plus fire flow conditions. These scenarios were assessed under both existing and future conditions (i.e., without and with the pressure zone reconfiguration). The model result schematics are presented in Appendix J.

The model results are presented for the phasing as follows:

- **Phase 6** = Phase 6 + Northern Industrial Parcel
- **Phase 7** = Phase 6 + Northern Industrial Parcel + Phase 7
- **Phase 8** = Phase 6 + Northern Industrial Parcel + Phase 7 + Phase 8 + Southern Industrial Parcel

5.3.1 Maximum HGL

The maximum HGL simulation was assessed to confirm that system pressures are expected to adhere to the maximum pressure constraint of 552 kPa (80 psi). This simulation was carried out assuming no demands, which is a conservative approach.

5.3.1.1 Existing Conditions

Table 31 below shows the pressure ranges for each phase scenario.

Table 31: Model Results – Maximum HGL Existing Conditions

Phase	Minimum Pressure	Maximum Pressure
Phase 6	443 kPa (59.9 psi)	533 kPa (77.3 psi)
Phase 7	436 kPa (61.5 psi)	527 kPa (76.4 psi)
Phase 8	424 kPa (59.8 psi)	515 kPa (74.7 psi)

Simulations for Phases 6, 7 and 8 result in pressures that are below the maximum allowable system pressure of 552 kPa (80 psi). Accordingly, each phase scenario satisfies the applicable pressure requirements.

5.3.1.2 Future Conditions

Table 32 below shows the pressure ranges for each phase scenario.

Table 32: Model Results – Maximum HGL Future Conditions

Phase	Minimum Pressure	Maximum Pressure
Phase 6	366 kPa (53.1 psi)	456 kPa (66.1psi)
Phase 7	366 kPa (53.1 psi)	456 kPa (66.1 psi)
Phase 8	362 kPa (52.5 psi)	452 kPa (65.6 psi)

Simulations for Phases 6, 7 and 8 result in pressures that are below the maximum allowable system pressure of 552 kPa (80 psi). Accordingly, each phase scenario satisfies the applicable pressure requirements.

5.3.2 Peak Hour

The peak hour simulation was assessed to confirm that system pressures generally comply with the normal operating conditions' minimum pressure constraint of 275 kPa (40 psi). This simulation was carried out by applying the peak hour demands in the model as summarized in Appendix J.

5.3.2.1 Existing Conditions

Table 33 below shows the pressure ranges for each phase scenario.

Table 33: Model Results – Peak Hour Existing Conditions

Phase	Minimum Pressure	Maximum Pressure (kPa)
Phase 6	289 kPa (41.9 psi)	380 kPa (55.1 psi)
Phase 7	260 kPa (37.7 psi)	350 kPa (50.8 psi)
Phase 8	282 kPa (40.9 psi)	373 kPa (54.1 psi)

Under Phase 6 and Phase 8, the pressures under peak hour conditions exceed the minimum pressure requirements.

Under Phase 7, the lowest system pressures occur at the east end of the study area (Appendix J) and along Kilbirnie Drive. Although these pressures fall below the minimum recommended pressure of 275 kPa for normal operating conditions, they are primarily attributable to local topographic high points rather than excessive headlosses within the watermain network. Under the future pressure zone reconfiguration, pressures improve along both the east end of the study area and Kilbirnie Drive, as presented next in section 5.3.2.2. Furthermore, the pressure zone modification will quite possibly occur prior to the construction of Phase 7. While pressures along Kilbirnie Drive during Phase 7 are marginally below guideline values for normal operating conditions, the latest City of Ottawa Design Guidelines do not explicitly define minimum pressures under peak hour conditions. This assessment will be refined at the detailed design stage when more definitive centreline elevation data becomes available.

5.3.2.2 Future Conditions

Table 34 below shows the pressure ranges for each phase scenario.

Table 34: Model Results – Peak Hour Future Conditions

Phase	Minimum Pressure	Maximum Pressure
Phase 6	285 kPa (41.3psi)	376 kPa (54.5 psi)
Phase 7	282 kPa (40.9 psi)	373 kPa (54.1 psi)
Phase 8	274 kPa (39.7 psi)	365 kPa (52.9 psi)

All modeled phase scenarios result in pressures that exceed the maximum allowable system pressure of 275 kPa (40 psi). Accordingly, each phase scenario satisfies the applicable pressure requirements.

5.3.3 Maximum Day plus Fire Flow

To ensure adequate fire protection, a maximum day demand was simulated with a fire flow along the proposed watermains within the S1 Area. As per Section 5.2.4, a fire flow of 10,000 L/min (167 L/s) and 13,000 L/min (217 L/s) was used in this analysis and assessed under existing and future pressure zone configurations.

5.3.3.1 Existing Conditions Fire Flow (167 L/s)

Under existing pressure zone conditions, for Phases 6, 7 and 8, the proposed watermain network is expected to be capable of delivering fire flows of 167 L/s during a maximum day demand.

5.3.3.2 Future Conditions Fire Flow (167 L/s)

Under future pressure zone conditions, for Phases 6, 7 and 8, the proposed watermain network is expected to be capable of delivering fire flows of 167 L/s during a maximum day demand.

5.3.3.3 Existing Conditions Fire Flow (217 L/s)

Under existing pressure zone conditions, for the proposed watermain network for Phase 6, 7 and 8, the network is generally expected to be capable of delivering fire flows of 217 L/s during maximum day demand. Under existing conditions simulations, nodes J-90 and J-34 along the woodlot easement and node J-48 on Kilbirnie Drive are unable to provide 217 L/s.

The lower available fire flow at this node can be attributed to the higher topography in this localized area and the headlosses along the watermains. Currently, on Street 5 there are no residential units along this section of watermain which require 217 L/s. Along Kilbirnie Drive, specifically at J-48, there are no residential units along this section of watermain. This portion of the site will be dedicated to light industrial uses. The required fire flow for the industrial block will be assessed at the detailed design stage for its site plan. It is noted that the available fire flow at these nodes improve with the future pressure zone reconfiguration as discussed in the next section.

5.3.3.4 Future Conditions Fire Flow (217 L/s)

Under future pressure zone conditions, for the proposed watermain network for Phase 6, 7 and 8, the network is generally expected to be capable of delivering fire flows of 217 L/s during

maximum day demand. Under future pressure zone conditions simulations, nodes J-90 and J-34 along the woodlot easement are unable to provide 217 L/s.

Currently, there are no residential units requiring 217 L/s along these sections of watermain. It is noted that the available fire flow at this node does improve with the reconfiguration of the future pressure zone. The lower available fire flow at this node can be attributed to the higher topography in this localized area and the headlosses along the watermains.

5.4 Water Summary and Recommendations

The proposed watermain trunk servicing within the S1 Area is shown on the Master Watermain Drawing (MWM in Appendix K). Water demands were calculated for the S1 Area using system level parameters provided by the City of Ottawa. A maximum fire flow target of 10,000 L/min (167 L/s) and 13,000 L/min (217 L/s) was used in this Addendum. Based on the boundary conditions provided by the City and the HNA presented herein, the proposed trunk watermains are generally expected to provide adequate water supply to the S1 Area.

6.0 Impact and Mitigation

6.1 Design, Construction and Operation

The analyses summarized in Sections 3.0 to 5.0 confirm that the preferred servicing strategy for the S1 Area is the extension of existing municipal services from the Quinn's Pointe and Ridge Subdivisions. The recommended servicing framework is illustrated on Drawings KS1, MG1, MST, MSAN, MWM, POND, D1, and D2.

The evaluation process of servicing strategies followed as part of the BSUEA MSS was extended to the S1 Area which had included an assessment of several indicators related to design, construction and operation, social, natural, and economic factors. This Addendum also reviewed both infiltration and filtration-type LID solutions as part of a simplified screening process which identified the preferred LID solutions. The impacts of the preferred servicing strategy on the S1 Area and the mitigation required are outlined in this section.

6.1.1 Storm and Stormwater Management Servicing

The preferred storm sewer and stormwater management servicing strategy for the S1 Area is based on a two-part approach, consisting of both infiltration and filtration measures:

- The infiltration-based solution builds upon the preferred servicing strategy identified in the 2018 BSUEA Master Servicing Study and includes: (i) the implementation of an Etobicoke Exfiltration System (EES) to promote recharge of the overburden aquifer, and (ii) infiltration of rooftop runoff through subsurface infiltration systems located on private properties.
- The filtration-based solution adopts a treatment train approach comprising a filtration dry pond supplemented with a mechanically treated device (MTD) to provide pre-treatment. This solution is proposed to service areas characterized by high groundwater conditions and areas where runoff quality may be influenced by roadway de-icing salts, such as collector roads.

With respect to the EES, one of the earliest known applications in Ontario was implemented in the former City of Etobicoke in 1993 as part of a retrofit project. While EES installations require enhanced inspection relative to conventional storm sewers, over approximately three decades of operation they have demonstrated reliable performance and maintenance requirements comparable to traditional systems. As part of the 2018 BSUEA MSS, several technical deliverables were prepared to support the acceptance of the EES; these documents are included in in Appendix C of this Addendum.

Prior to completion of the 2018 BSUEA MSS, the City confirmed that multiple EES installations form part of its existing municipally owned infrastructure. Since that time, EES has also been implemented within Quinn's Pointe Stages 2 through 4. Monitoring of the existing system indicates that it is operating in accordance with its design intent; however, elevated groundwater levels have the potential to limit system performance, as discussed in Section 3.7.

The preferred filtration-based servicing strategy consists of a filtration dry pond supplemented by an MTD for pre-treatment. This approach has been implemented elsewhere in Ontario and has been accepted by the City as a future municipally owned stormwater management facility.

The storm sewer and stormwater management servicing strategy detailed in this Addendum provides the following benefits:

- Preservation of the overall pre-development infiltration regime (water budget).
- Preservation of the baseflow characteristics.
- Mitigate adverse impacts (water quality) on the esker by means of implementing an filtration LID solution for the high-risk areas and areas where runoff will be impacted by chlorides.
- Reduce post-development peak flows, which in turn, will prevent increases in flood potential downstream.
- Protect downstream water quality by infiltrating or filtrating the first flush (22 mm storm) of the frequent storms, for parts of the Study Area where proper separation exists between the invert of the EES and groundwater levels.
- The servicing strategies meet the requirements of the CLI-ECA where the proposed solutions were developed based on the hierarchy described in Appendix A as follows:

    - ✓ Prioritize infiltration servicing solutions to the maximum extent while accounting for constraints.
    - ✓ Prioritize filtration servicing solutions to the maximum extent.

Since both types of solutions have been maximized, traditional stormwater management works such as a wet pond are not required nor recommended in this Addendum.

6.1.2 Sanitary Servicing

Sanitary servicing of the S1 Area has been described in greater detail in Section 4.0. Wastewater servicing will be achieved via extensions of the existing wastewater collection system. Consequently, there is no need for additional infrastructure to increase downstream conveyance capacity or to implement pumping to achieve gravity connections. In terms of operation, the extension of the gravity systems within the S1 Area will require standard operation and maintenance as for similar systems within the City.

6.1.3 Water Servicing

Water servicing of the S1 Area has been described in greater detail in Section 5.0. Watermain servicing will be achieved via extensions of the existing and planned trunk watermains and supplemented by local watermains. Consequently, there is no need for additional infrastructure to increase capacity or to implement pumping systems for servicing higher elevations.

There is an imminent pressure zone reconfiguration that is envisioned about the same time as the initial stage of the S1 Area will be made operational. The pressure characteristics was simulated and discussed in greater details in Section 5.0. In terms of operation, the extension of trunk watermains within the S1 Area will require standard operation and maintenance as for similar systems within the City.

7.0 Trunk Storm and Sanitary Sewers and Watermains

Sections 3.0, 4.0 and 5.0 documented the technical analyses that were carried out in support of trunk infrastructure sizing within the S1 Area. None of the trunk infrastructure identified will be subject to any additional Class EA review nor Approval.

Given that the BSUEA MSS reviewed several servicing alternatives in accordance with the Class EA, these solutions were extended to this undertaking. Screening of infiltration and filtration servicing solutions were investigated and evaluated as part of a screening process, consistent with municipal Class EA. Linear infrastructure proposed as part of this Addendum is as follows:

7.1 Stormwater Management and Servicing Projects

Several trunk sewers of various diameters are proposed to service the S1 Area, as illustrated on (Drawing MST). The key stormwater management components include the following:

- Trunk storm sewers along future Cappamore Drive, extending from the western limit near the southern Industrial Lands at Manhole STMH556 to the storm inlet at the dry pond (Manhole STMH600).
- Trunk storm sewers along Elevation Road, extending from Kilbirnie Drive at Manhole STMH513 through the pre-treatment device located along Street No. 15 to a flow-splitting manhole (labelled “Overflow”) within Block 61, discharging to either Manhole STMH500A or STMH500.
- A pre-treatment mechanically treated device (MTD; Defender Model FD-8HC), located south of Manhole STMH502 near the western boundary of Block 61.
- A filtration dry pond with inlet at Manhole STMH500A, situated near the future intersection of Cappamore Drive and Elevation Road.
- A flow-splitter manhole, labelled “Overflow,” located east of the proposed MTD.
- An end-of-pipe dry pond encompassing the filtration dry pond, with dual inlets at Manholes STMH500 and STMH600.
- A network of local storm sewers of varying sizes servicing residential and industrial lands within the S1 Area.
- The existing 900 mm diameter storm sewer outlet and outlet control structure near the southeast corner of Block 61 will be retained. The structure will be retrofitted with low- and high-level orifices sized in accordance with the criteria summarized in Table 13 (above).
- On-site storage facilities within both Industrial Blocks, designed to detain the 100-year design storm onsite while releasing flows in accordance with the available minor system capacity.
- Stormwater quality control measures within both Industrial Blocks, to be designed at the Site Plan stage to meet applicable water quality control requirements in effect at the time of approval.
- Implementation of an Etobicoke Exfiltration System (EES) along local roads, with a minimum 1.0 m separation from seasonally high groundwater levels. The EES is proposed within Areas 1A and 1B, as shown on (Figure 9).

7.2 Sanitary Servicing Projects

Several trunk sanitary sewers are proposed to service the S1 Area, as illustrated on Drawing MSAN). The proposed trunk sanitary sewer alignments include the following:

- Along Street No. 15, extending from the future Cappamore Drive extension at Manhole SAMH703 to Barnsdale Road at Manhole SAMH701.
- Along the Barnsdale Road right-of-way, extending from Manhole SAMH701 to the existing stub connection along Barnsdale Road near Sanitary Sewer Access SAEX04 within the Quinn's Pointe Subdivision.

7.3 Water Servicing Projects

Several 305 mm diameter feedermain extensions are being proposed, along the following roadways:

- Future Kilbirnie Drive extension, from the eastern boundary of the existing CDP limit to Borrisokane Road.
- Future Cappamore Drive extension, from the eastern boundary of the existing CDP limit to a point westerly to service the southern portion of the Industrial Lands.
- Future Elevation Road extension, from the northern boundary of the existing CDP limit to future Cappamore Drive extension, and southerly along Street No. 15 to Barnsdale Road.
- Future Moyard Drive extension from the eastern limit of the CDP to Street No. 5, and southerly to the Cappamore Drive extension.
- Conceptual watermain loops; one within the northern and one within the southern portion in the Industrial Lands.

8.0 Regulatory Approval Requirements and Development Applications

City Of Ottawa

This Addendum was prepared as an extension to the 2018 BSUEA MSS which was prepared as an Environmental Assessment Master Plan (i.e., Master Servicing Study). As such, this Addendum will require a technical review by several groups at the city of Ottawa. Ultimately, this Environmental Assessment Master Plan will require approvals under the *Planning Act*.

Given that this Addendum was prepared as an extension to the BSUEA MSS (2018) where several servicing strategies were analyzed under the Municipal Class Environmental Assessment, the proposed servicing strategies presented herein were developed in accordance with the planning principles of the Class Environmental Assessment. As previously noted, a screening process was carried out to assess various LID solutions with the preferred strategy scored the highest.

With the S1 Area being the last growth area in this quadrant bound by Highway 416 and Barnsdale Road, the servicing strategies for both wastewater and water are limited, and consequently, servicing is based on the capacity of linear infrastructure bounding the Site.

Ministry of the Environment, Conservation and Parks

Servicing strategies evaluated herein and in the 2018 BSUEA MSS were analyzed under the Municipal Class Environmental Assessment and are in accordance with the planning principles of the Class Environmental Assessment. Given that pre-authorized conditions of the Municipal CLI-ECA have been issued under the Environmental Protection Act, infrastructure meeting these conditions will fulfill the approval requirements of section 53 of the Ontario Water Resources Act for sewage works (sanitary and stormwater).

Section 7.0 documented trunk infrastructure supporting the urbanization of the S1 Area Concept Plan. All infrastructure listed in Section 7.1, 0 and 7.3 has been found to meet MECP's pre-authorized criteria under the CLI-ECA framework. Therefore, no additional approval from MECP is required.

Ontario Drainage Act

Any modifications to the hydrological regime or alteration to the serviced area of a municipal drain within the Mud Creek subwatershed, will require that it be documented in an Engineers Report, which is to be prepared by the Engineer of Record in accordance with the Ontario Drainage Act (Section 78, Chapter D.17, R.S.O. 1990).

RCI, the appointed Drainage Engineers for this project, will be coordinating this effort upon the approval of this Addendum. Given that a partial disconnection is being proposed, the process will be on-going in parallel and will not interfere with the completion of this MSS Addendum nor with the approval of the initial phase of the S1 Area.

Ministry of Transportation of Ontario

Although no formal approval is required, acceptance by the Ministry of Transportation of Ontario (MTO) of the proposed drainage alteration will be sought. A meeting was held on January 26, 2026, with representatives from MTO, to discuss the project as Borrisokane Road is part of MTO's Highway 416 right-of-way, and future interchange.

As noted in Section 3.3.2, there is a planned interchange in the southwest quadrant of the Barnsdale Road and Highway 416/Borrisokane Road intersection. A partial disconnection is being proposed which will alter the hydrological regime of the Borrisokane Road open ditch system. As per Section 3.13.4, the net impact of the drainage modification results in a reduction in both peak flows and runoff volumes released to this open ditch system.

Since the last version of the MSS, comments were issued by MTO on May 15, 2026, and a response to those comments submitted on May, 22, 2026 for MTO's review.

Rideau Valley Conservation

There is no formal approval of this MSS by the RVCA. However, the RVCA may review future development applications within the S1 Area to ensure that it is consistent with the conservation, development and management of natural resources. As part of this process, the RVCA will ensure that property and public are protected from hazards such as flooding and erosion. However, given the storm servicing strategy presented herein, flooding and erosion are not of concern since off-site discharges are less than those under existing conditions. Similar to the Existing Conditions Report (JLR, 2025), the City of Ottawa, to their discretion, will circulate the final version of this MSS to the RVCA as information.

Future Development Applications

Once this Addendum to the Environmental Assessment Master Plan (Master Servicing Study) is approved, it will also require council approval with the goal of lifting of the neighborhood overlay.

The alignment and sizing of infrastructure, as shown herein, is subject to change as part of *Planning Act* approvals and would be treated as minor changes to this MSS as part of Draft Plan approvals.

Subsequent development applications will be made in accordance with the policies outlined in the city of Ottawa Official Plan. The specific studies required under the development approval process are determined at the commencement of the process and provided at the pre-application consultation meeting with City staff. Specific studies may include:

- Geotechnical studies
- Community transportation and traffic studies
- Noise studies
- Site Servicing Study, including stormwater management
- Environmental Impact Studies.

Several of the above-noted Studies have already been completed as part of the Concept Plan Approval process and are unlikely require an update. However, Studies will be confirmed as part of the City of Ottawa pre-consultation process. A planning rationale outlining how the development meets the intent of the overarching plans for the area will also be required.

9.0 Financial Plans

9.1 Local Infrastructure and Development Charges

Local servicing infrastructure is anticipated to be funded by the developer through subdivision or site plan agreements, consistent with standard City of Ottawa development practices.

Infrastructure components that provide benefit beyond the subject lands or are required to support ultimate system build-out may be eligible for reimbursement through front-ending agreements, Development Charges (DC), or future City capital funding, subject to City approval. Based on the current DC By-law, oversizing payment will occur under the following:

- Sanitary sewers are greater or equal to 375 mm in diameter (> 80 L/s)
- Watermains are greater or equal to 406 mm diameter
- Storm Sewers are greater than or equal to 1800 mm diameter.

Based on current servicing and projects depicted on Drawings KS1, MST, MSAN, MWM as well as Drawings POND, D1 and D2, the following largest trunks are being proposed:

- 1800 mm diameter trunk storm sewers leading to STMH600.
- 375 mm diameter trunk sanitary sewers (flows < 80 L/s).
- 305 mm diameter trunk watermains.

Based on the above listed infrastructure, none of the linear infrastructure meets the oversizing policy of the city's Development Charges Act.

9.2 Cost Sharing and Opinion of Probable Costs

Minto is the sole landowner of the S1 Area. Therefore, there is no cost sharing of linear infrastructure envisioned as there are no arterials. However, oversizing cost to support the development of the park may apply.

Opinion of Probable Costs (OPC) will be completed by populating the city's Schedule B items for each of the stages of the development.

10.0 Infrastructure Phasing and Implementation

10.1 Adaptability

Once this Addendum to the MSS is approved and overlay lifted, construction of linear infrastructure can proceed following the typical Draft Plan of Subdivision process. It is, however, acknowledged that there may be changes prior to the construction being initiated/completed which would be documented as part of the subdivision approval process.

The alignment and sizing of infrastructure, as depicted on Drawings KS1, MST, MSAN and MWM and SWM projects depicted on Drawings POND, D1 and D2, is subject to change as part of *Planning Act* approvals and would be treated as minor changes to this Addendum.

10.2 Detailed Design

The objective of the MSS is to provide a high-level servicing solution, which can demonstrate that development is serviceable/feasible in accordance with municipal and provincial standards. Street-by-street detailed design and grading would still be required; however, this process would occur at the Plan of Subdivision or Site Plan applications stage.

10.3 Staging of Infrastructure

The development of the S1 Area will proceed from the eastern boundary of the Study Area, adjacent to the Quinn's Pointe Subdivision where infrastructure currently exists. Given that the Quinn's Pointe Stage 5 has yet been constructed, it could potentially, to the discretion of Minto, be combined with the initial phase of development within the S1 Area, referred to as Stage 6.

The intended phasing limits for the S1 Area is shown on the Concept Plan (Appendix D). As illustrated, the implementation of the S1 Area will proceed into three (3) successive phases; the initial phase noted as Stage 6, with two (2) subsequent phases noted as Stages 7 and 8. At this time, Minto plans to proceed with the development of the Industrial lands once Stages 6-8 have been completed.

Stage 6 would include the construction of the following roadways:

- Kilbirnie Drive extension, from the eastern limit of the S1 Area to the western edge of Block 63 (woodlot) near the eastern boundary of the Industrial Block.
- Elevation Road extension from Kilbirnie Drive extension to Cappamore Drive extension.
- The eastern leg of Street No 15, from Cappamore Drive to the southern limit adjacent to Barnsdale Road.
- Cappamore Drive extension, from the eastern limit of the S1 Area to Elevation Road extension near the northwestern corner of Block 61.
- Moyard Drive extension from the Industrial Lands pass Elevation Road up to the eastern limit of the S1 Area.
- Street No 1, Street No. 2, Street No. 3, and Street No.4.
- Street No. 5, Street No. 6, Street No. 7 (northern portion).

10.4 Construction of Infrastructure

Infrastructure, including storm, water and wastewater for Stage 6 will consist of the following:

- **Etobicoke Exfiltration System**: Street No 1, Street No. 2, Street No. 3, and Street No.4 as well as along Moyard Drive and Street No. 5, Street No. 6, Street No. 7.
- **Local and Trunk Storm sewers:** All storm sewers will be constructed along all roadways identified in Section 10.3
- **Watermains:** All local and trunk watermains will be constructed along the roadways identified in Section 10.3.
- **Sanitary Sewers:** All local and trunk sanitary sewers will be constructed along the roadways identified in Section 10.3.
- **End-of-Pipe Facility:** All the drainage components and associated infrastructure identified within or in the vicinity of Block 61, including the pre-treatment MTD, filtration dry pond and underlain subdrain system, and the dry pond will be constructed as part of the Stage 6 infrastructure work while the existing outlet structure and storm sewer will be maintained.

10.5 Monitoring

As the implementation of infrastructure proceeds with each of the phases of development, it is recommended that the on-going EES monitoring being conducted in Quinn's Pointe Subdivision be extended into the S1 Area once it has been completed in Quinn's Pointe Subdivision. At such time, monitors would be relocated initially in Stage 6 to gather additional data.

10.6 Implementation and Capacity Analysis

The initial phases of development can represent the most vulnerable period from a servicing and operational perspective, as only a portion of the ultimate infrastructure network is in place. During these early stages, temporary conditions such as reduced system redundancy, interim drainage patterns, and incomplete downstream works may exist. Accordingly, the proposed implementation strategy is intended to ensure that each phase of development functions independently and safely, with adequate servicing capacity and controls always provided until the full build-out of the infrastructure is achieved.

10.6.1.1 Storm Sewers and End-of-Pipe Facility

Storm sewers and ultimate end-of-pipe facility, including the MTD, by-pass manhole, filtration dry pond and dry pond including its existing outlet, are proposed to be constructed as part of Stage 6. Given that all drainage works in Stages 6 is intended to serve additional land, to account for future Stage 7, Stage 8, and Industria Lands, there are no capacity limitations for any of the storm sewers within Stage 6.

In terms of interim drainage conditions, the S1 Area is bounded by two (2) existing subdivisions, and by Barnsdale Road and Borrisokane Road. Therefore, there is no interim drainage conditions apart from the installation of temporary ditch inlets at the western and southern boundaries of Stage 6. The interim drainage condition and temporary infrastructure, including ICDs, will be developed as part of detailed design of Stage 6.

10.6.1.2 Sanitary Sewers

Trunk sanitary sewers that are planned to be constructed as part of Stage 6, are intended to serve additional land, to account for future Stage 7, Stage 8 and Industrial Lands, when constructed. Hence, there are no capacity limitations for any of the sanitary sewers in Stage 6.

Under the interim condition, temporary ICDs will be installed along any sanitary sewer that will service additional lands to limit wastewater flows that could be intercepted. Temporary flow restriction and details will be reviewed as part of detailed design of Stage 6.

10.6.1.3 Water Distribution Analysis

Water distribution systems are often vulnerable during the initial phase of a given development. As a result, the performance of each additional interim phase was evaluated under maximum HGL, peak hour and maximum day plus fire flow. It should be noted that as part of Phase 6, all connection points to the existing municipal distribution system will be utilized via trunk watermain extensions.

The Water HNA and modelling assessment presented in Section 5.3 demonstrates the following:

- Under Maximum HGL existing conditions, each phase is expected to adhere to the maximum pressure constraint of 552 kPa (80 psi).
- Under Maximum HGL future conditions, each phase is expected to adhere to the maximum pressure constraint of 552 kPa (80 psi).
- Under Peak Hour existing conditions, Phase 6 and Phase 8 are expected to adhere to the minimum pressure constraint of 275 kPa (40 psi). Phase 7 expects a few localized low-pressure areas, but these results are anticipated to be temporary if not trivial based on the pressure zone modification.
- Under Peak Hour future conditions, each phase is generally expected to adhere to the minimum pressure constraint of 275 kPa (40 psi).
- Under Maximum Day plus Fire Flow existing and future conditions, each phase is expected to provide 167 L/s at all nodes, and 217 L/s at most nodes. All required fire flows can be met with the proposed trunk watermains for each phase.

11.0 Conclusions

This Addendum to Extend Class EA Master Plan (MSS) prepared in 2018 for the BSUEA. The 2018 BSUEA MSS had reviewed a series of servicing strategies in accordance with the Class Environment Assessment (Class EA) and was completed in accordance with the Integrated Planning Process.

A simplified screening process was undertaken as documented in this Addendum. Infiltration LID and filtration LID alternatives were reviewed and documented in Section 3.10 and Section 3.11. The infiltration solution adopted as part of the 2018 BSUEA MSS was extended to the S1 Area while the proposed filtration LID solution that scored the highest has been recommended.

This Addendum has identified a recommended high-level servicing strategy for storm, wastewater and water servicing to support the proposed Concept Plan (Appendix D). The high-level servicing strategy developed herein demonstrates the feasibility of servicing the proposed S1 Area. The design criteria utilized to develop the servicing strategies shall be used to develop detailed design. It is anticipated that the detailed design to be carried out in the Plan of Subdivision application phase will be consistent with the MSS but will adapt for any alterations to the road and layout configurations. The MSS has been developed with this flexibility in the design.

Principal findings of this Addendum are set out below:

Storm Drainage and Stormwater Management

- The design of the storm drainage system has been undertaken using the dual-drainage approach. This Addendum has set out the design criteria for future draft plan and/or site plan applications for the S1 Area. The design criteria are consistent with current design standards.
- A Master Grading Plan was developed based on existing and proposed grades and utilized to develop the Master Storm Drainage Plan.
- The storm servicing solution developed for the S1 Area is being shown on the Key Servicing Plan and reflects the adopted servicing strategy.
- The infiltration servicing strategy was developed to the maximum extent while recognizing opportunities and constraints listed in Table A2 of the CLI-ECA. The strategy incorporates the Etobicoke Exfiltration System (EES), the recommended solution identified as part of the 2018 BSUEA MSS and supplemented by rooftop infiltration using sub-surface infiltration measures within the Industrial Lands.
- Both infiltration measures are to be sized to capture and infiltrate the 22 mm design storm event.
- Five (5) filtration-type servicing solutions were developed for the areas impacted by the constraints identified in the CLI-ECA,
- The five (5) filtration-type solutions were evaluated as part of a screening process which scored each LID solution against several minor and major criteria.
- The recommended filtration solution that scored the highest, Alternative 5, is being proposed.
- This LID solution is based on a treatment train approach where pre-treatment is being proposed by means of a MTD that is supplemented by a filtration dry pond, with bio-

retention media equipped with an underlain subdrain system surrounded by clear stone envelope, geotextile. Due to roadway salts, the filtration dry pond will be lined with a choked later to minimize migration of roadway salts to the aquifer.

- Given the same principle as an EES, the filtration dry pond was also sized to capture and filtrate the 4-hour 22 mm storm.
- Both proposed infiltration and filtration solutions were found to exceed the requirements of Table 3.2 of MECP's SWMPDM for an 80% TSS removal.
- The post-development water budget with proposed infiltration measures showed comparable infiltration identified under the pre-development water budget.
- The downstream storm boundary conditions or targeted flow allowances developed in the Addendum and were based on the design constraints of existing systems.
- A pre- and post-development analysis was completed to assess peak flows and runoff volumes along both Borrisokane Road (system owned by MTO) and Barnsdale Road open ditch systems as well as at the upper reach of the Thomas Baxter Municipal Drain. The analysis showed a reduction in both peak flows and runoff volumes along the open ditches noted above for all storm events. Hence, no adverse impacts were found along both open ditch systems.
- Simulation results along both Barnsdale Road and Thomas Baxter Municipal Drain have been assessed to not cause adverse impacts by the Team's biologist as reported in the Environmental Impact Statement for the S1 Lands.
- The trunk sewer network was conceptually sized based on the approved Concept Plan and modelled to ensure that the hydraulic grade line (HGL) elevations along the system maintained a 300 mm freeboard, which corresponds to 2 meters below proposed centreline elevations.
- The major overland system was simulated to assess ponding depths (static and dynamic) against the requirements of the SDG (December 2025) being that it shall not exceed 350 mm depth.
- Allowable minor system release rates were set at the required storm event, and future design should maintain the same release rate criteria.
- The stormwater management solution contained in Block 61 or proximity includes a pre-treatment MTD, a filtration dry pond which will be supplemented by an expanded dry pond surrounding this facility, replacing the existing spill-over area constructed as part of the Quinn's Pointe Subdivision.
- Post-development peak flows discharged in the existing 900 mm diameter storm outlet are maintained below those reported in the Site Servicing Report of the Quinn's Pointe Subdivisions.
- A significant area of the S1 Area is proposed to be disconnected from the Thomas Baxter Municipal Drain, which will result in a reduction in both peak flows and runoff volumes for all storm events. Once this Addendum is approved, it will be circulated to the appointed Drainage Engineer and used as part of an upcoming update to the Engineers Report.

Wastewater Servicing

- The residual capacities in the surrounding wastewater services were assessed to determine viable servicing outlets to accommodate wastewater flows from the S1 Area.
- Out of the potential connections, the extension of the existing Barnsdale Road 375 mm sanitary sewer was the only viable outlet having sufficient residual capacity and grade to accommodate wastewater flows from the S1 Area.

- The existing constructed wastewater system network is capable to accommodate servicing for the S1 Area.
- The MSS Addendum contains design criteria which are to be used for the S1 Area in future draft plan and site plan applications. The design criteria are consistent with current design standards.
- The proposed wastewater system layout has been conceptually sized based on the proposed Concept Plan.

Water Distribution

- The S1 Area can be serviced under current conditions with watermain extensions from the existing surrounding watermains within both the Quinn's Pointe and the Ridge Subdivisions.
- The S1 Area can also be serviced from the reconfigured pressure zone anticipated for implementation in 2027.
- The analysis confirmed that there are no upgrades to the existing nor to the planned distribution network identified in the latest Infrastructure Master Plan.
- Demand allocation for water supply servicing has been derived based on the Concept Plan and associated densities. The allocations were based on system level water consumption rates, and peaking factors provided by the City as the population for the S1 Area exceeds 3,000.
- Trunk watermain sizing has been carried out based on the Concept Plan and reflects trunk watermain extensions at the boundary of the S1 Area.
- This MSS has set design criteria which is to be used for the future draft plan and site plan applications for lands included in the S1 Area. The design criteria are consistent with current design standards.
- Individual potable water assessments will be carried out as part of the detailed design of the various phases of the subdivision as well as the Site Plans for the Industrial Lands using parameters consistent with the Water Distribution Design Guidelines (December 2025).

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Appendix A

Study Terms of Reference

Appendix B

Existing Conditions Report (2025)

Appendix C

2018 BSUEA MSS

Appendix D

Concept Plan (V54)

Appendix E

Paterson Memorandum and

Bathymetric Survey

Appendix F

Alternatives 4 and 5 – Conceptual Information

Appendix G

Figure (EES separation) and
Storm Sewer Design Sheets

Appendix H

PCSWMM Model Inputs and Results and Schematics

Appendix I

Sanitary Sewer Design Sheets and Calculations

Appendix J

Water Distribution

Appendix K

Drawings

Appendix L

Operation and Maintenance Manual (EES)
and Modelling Files

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BLOCK 63
RETAINED WOODLOT 2.39ha/5.91ac
OPEN SPACE 0.83ha/2.05ac
TOTAL AREA 3.22 ha/7.96 ac

INDUSTRIAL LANDS
13.22 ha
32.67 ac

FUTURE RETAINED WOODLOTS
6.14 ha
15.17 ac

INDUSTRIAL LANDS
3.19 ha
7.88 ac

PARK
BLOCK 62
1.92 ha
4.74 ac

BLOCK 61
SWM POND
3.66 ha
9.02 ac

KILBIRNIE DRIVE
MOYARD DR
CAPPAMORE DR
ELEVATION RD
STREET NO.1
STREET NO.2
STREET NO.3
STREET NO.4
STREET NO.5
STREET NO.6
STREET NO.7
STREET NO.8
STREET NO.9
STREET NO.10
STREET NO.11
STREET NO.12
STREET NO.13
STREET NO.14
STREET NO.15
PATHWAY BLOCK 70 0.02ha
6m SERVICING BLOCK 73 0.07ha
SERVICING EASEMENT 0.12ha
12m SERVICING BLOCK 64 0.35ha
500A T/G=101.58 INV=100.10 (W)
OVERFLOW T/G=102.94 INV=100.18 (SW) INV=100.80 (SE) INV=100.18 (E)
600 T/G=102.70 INV=100.40 (NW)
EX POND INLET
EX108A
EX04
STUB
BARNSDALE ROAD

LEGEND:

- LIMIT OF STUDY AREA
- PHASING LIMITS
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- SANITARY SEWER
- WATERMAIN
- INDUSTRIAL LANDS WATERMAIN SERVICE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
KEY SERVICING PLAN

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300
DRAWING #:	KS1

File Location: P:\26600\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C SERVICING.dwg

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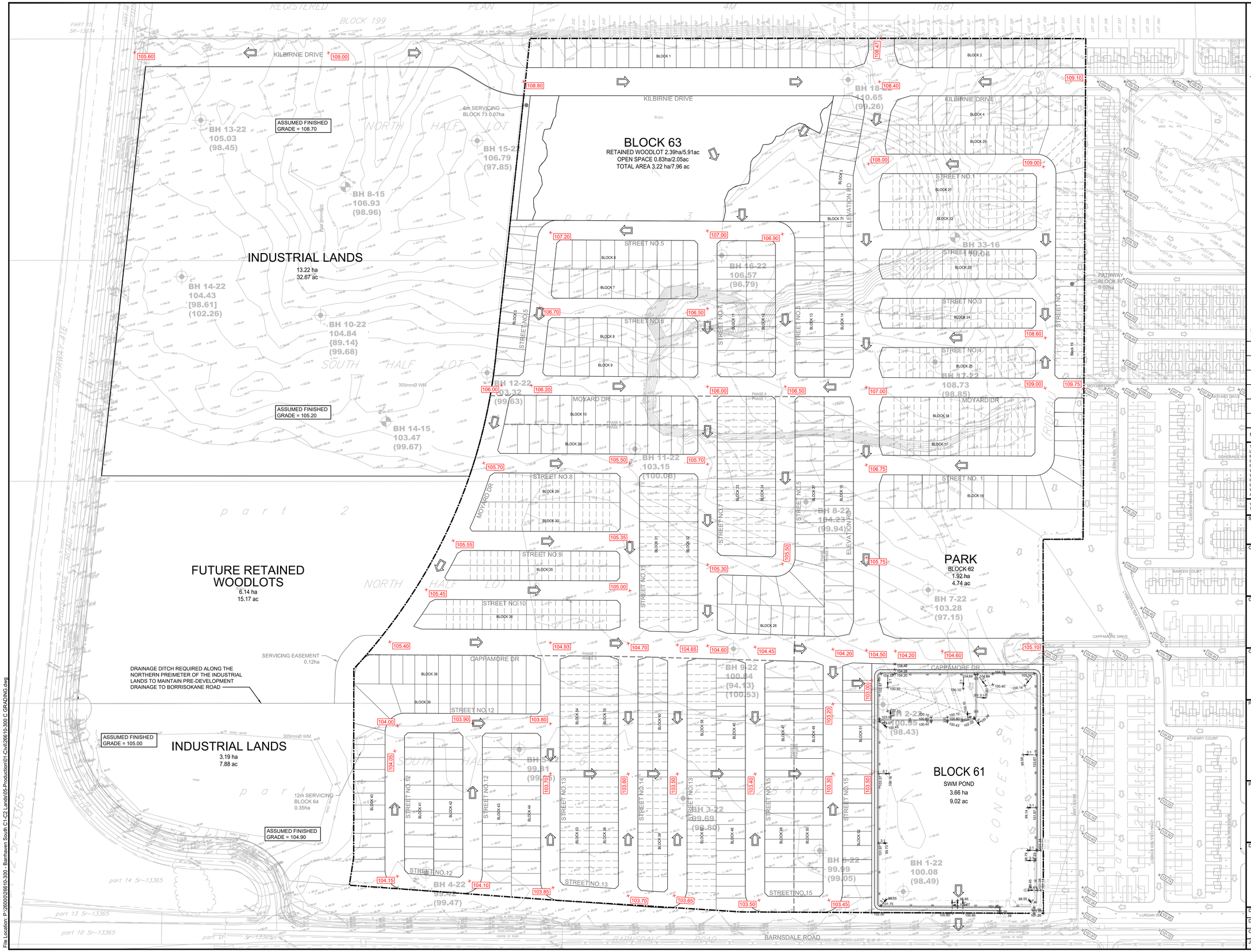

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- LIMIT OF STUDY AREA
- 108.40 PROPOSED CENTRELINE DESIGN GRADES
- 108.40 PROPOSED DESIGN GRADES
- ×109.30 EXISTING/PROPOSED CENTRELINE DESIGN GRADES
- BH 8-15 106.93 (98.96) BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025

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PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
MASTER GRADING PLAN

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MG1

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C GRADING.dwg

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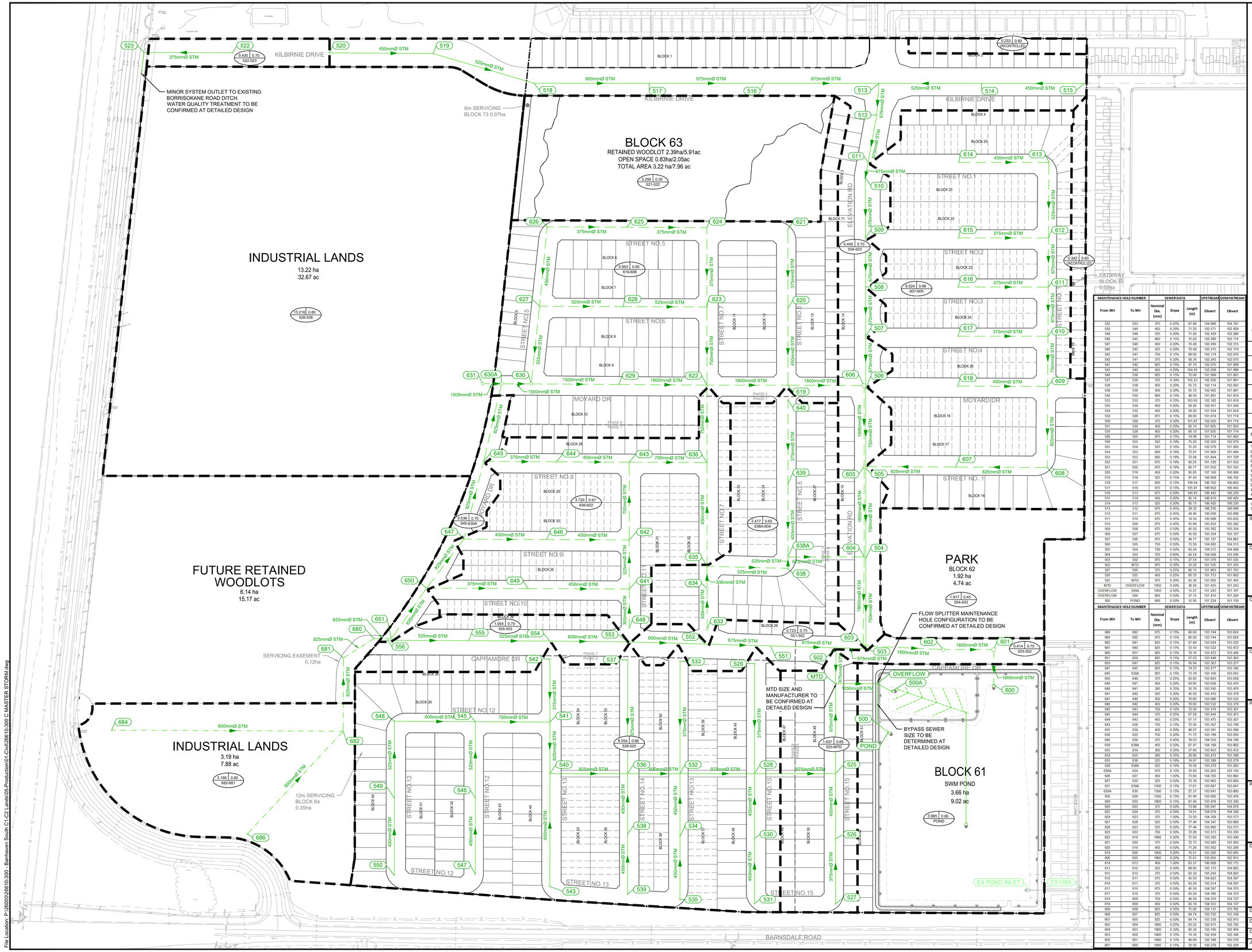

LEGEND:

- LIMIT OF STUDY AREA
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- PERFORATED PIPE
- EXISTING STORM SEWER
- STORM DRAINAGE BOUNDARY
- AREA IN HECTARES
- RUNOFF COEFFICIENT
- 0.10 | 0.70 / 505-504 — PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
522	523	375	0.25%	81.88	104.986	104.781
550	549	450	0.20%	71.20	102.571	102.429
549	548	525	0.20%	71.20	102.429	102.286
548	545	600	0.15%	75.02	102.286	102.174
547	546	450	0.20%	70.49	102.456	102.315
546	545	525	0.20%	70.49	102.315	102.174
545	541	750	0.15%	69.00	102.174	102.070
542	541	375	0.30%	58.34	102.245	102.070
541	540	825	0.15%	47.74	102.070	101.999
543	540	450	0.20%	104.45	102.208	101.999
540	536	825	0.15%	72.00	101.999	101.891
537	536	375	0.30%	105.23	102.206	101.891
539	538	450	0.20%	55.72	102.114	102.002
538	536	450	0.20%	55.72	102.002	101.891
536	532	900	0.15%	48.50	101.891	101.818
533	532	375	0.35%	103.93	102.182	101.818
535	534	450	0.20%	58.20	102.051	101.934
534	532	450	0.20%	58.20	101.934	101.818
532	528	975	0.15%	69.00	101.818	101.714
529	528	375	0.30%	101.87	102.020	101.714
531	530	450	0.20%	60.10	101.955	101.835
530	528	450	0.20%	60.10	101.835	101.714
528	525	975	0.15%	74.99	101.714	101.602
556	555	525	0.16%	75.20	102.200	102.079
555	554	525	0.16%	75.20	102.079	101.959
554	553	600	0.16%	72.01	101.959	101.844
553	552	600	0.16%	72.08	101.844	101.729
552	551	675	0.16%	60.25	101.729	101.632
551	502	675	0.16%	60.77	101.632	101.535
520	519	450	0.20%	95.85	107.100	106.908
519	518	525	0.15%	97.45	106.908	106.762
518	517	600	0.15%	106.64	106.762	106.602
517	516	675	0.15%	105.97	106.602	106.443
516	513	675	0.20%	106.63	106.443	106.230
515	514	450	0.20%	95.14	106.610	106.420
514	513	525	0.20%	95.15	106.420	106.230
513	512	675	0.45%	29.32	106.230	106.098
512	511	675	0.45%	44.46	106.098	105.898
511	510	675	0.45%	14.54	105.898	105.832
510	509	675	0.45%	55.69	105.832	105.582
509	508	675	0.50%	45.50	105.582	105.354
508	507	675	0.50%	45.50	105.354	105.127
507	506	675	0.50%	48.77	105.127	104.883
506	505	750	0.50%	73.50	104.883	104.515
505	504	750	0.50%	83.54	104.515	104.098
504	503	750	0.60%	83.54	104.098	103.596
503	502	975	0.15%	27.54	101.576	101.535
502	MTD	975	0.30%	33.22	101.535	101.435
527	526	375	0.25%	60.15	101.903	101.753
526	525	450	0.25%	60.33	101.753	101.602
525	MTD	975	0.20%	83.30	101.602	101.435
MTD	OVERFLOW	1050	0.50%	38.50	101.435	101.243
OVERFLOW	500A	1050	0.50%	15.21	101.243	101.167
OVERFLOW	500	600	0.50%	37.15	101.410	101.224
500	POND	600	0.50%	12.95	101.224	101.159

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
686	682	675	0.15%	80.00	103.744	103.624
684	682	675	0.15%	80.00	103.744	103.624
682	681	825	0.15%	67.89	103.624	103.522
681	680	825	0.15%	33.43	103.522	103.472
680	651	825	0.15%	16.16	103.472	103.448
651	650	825	0.15%	57.03	103.448	103.363
650	647	825	0.15%	56.94	103.363	103.277
647	645	825	0.15%	74.23	103.277	103.166
645	630A	825	0.15%	73.79	103.166	103.055
650	649	375	0.25%	93.85	103.893	103.658
649	641	450	0.20%	93.85	103.658	103.470
648	641	300	0.35%	35.70	103.595	103.470
641	642	525	0.20%	45.50	103.470	103.379
647	646	450	0.20%	76.60	103.686	103.532
646	642	450	0.20%	76.60	103.532	103.379
642	643	750	0.15%	72.00	103.379	103.307
645	644	375	0.25%	67.58	103.644	103.475
644	643	450	0.25%	67.17	103.475	103.307
643	636	750	0.15%	72.00	103.307	103.199
635	636	450	0.20%	96.07	103.591	103.399
636	622	750	0.20%	71.72	103.199	103.056
640	639	375	0.45%	78.03	104.550	104.199
639	638A	450	0.50%	67.47	104.199	103.862
633	634	300	0.35%	37.40	103.603	103.472
634	635	300	0.35%	20.90	103.472	103.399
635	638	525	0.16%	74.97	103.399	103.279
638	638A	525	0.15%	70.56	103.279	103.262
638A	604	675	0.15%	70.56	103.262	103.156
626	627	450	1.00%	73.80	104.700	103.962
627	630	525	0.50%	72.39	103.962	103.600
631	630A	1500	0.15%	17.61	103.667	103.641
630A	630	1500	0.15%	27.37	103.641	103.600
630	629	1500	0.15%	81.40	103.600	103.478
629	622	1800	0.15%	81.40	103.478	103.356
626	625	375	0.50%	73.88	105.047	104.678
625	624	375	0.50%	74.01	104.678	104.308
624	623	375	1.00%	73.50	104.308	103.573
627	628	525	0.50%	77.46	104.347	103.960
628	623	525	0.50%	77.46	103.960	103.573
623	622	750	0.50%	72.28	103.573	103.356
622	619	1800	0.20%	75.00	103.356	103.206
621	620	375	0.50%	72.75	103.926	103.562
620	619	450	0.50%	71.26	103.562	103.206
619	606	1800	0.20%	70.51	103.206	103.065
606	605	1800	0.20%	75.01	103.065	102.915
614	613	450	1.00%	83.37	106.008	105.175
613	612	525	0.50%	69.95	105.175	104.825
615	612	375	0.50%	83.32	105.242	104.825
612	611	675	0.50%	45.50	104.825	104.597
616	611	375	0.50%	83.29	105.014	104.597
611	610	675	0.50%	45.50	104.597	104.370
617	610	375	0.50%	83.24	104.786	104.370
610	609	750	0.50%	46.56	104.370	104.137
618	609	450	0.50%	83.19	104.553	104.137
609	608	825	0.50%	75.00	104.137	103.762
608	607	825	0.50%	84.74	103.762	103.338
607	605	825	0.50%	84.74	103.338	102.915
605	604	1800	0.25%	83.52	102.915	102.706
604	603	1800	0.30%	82.30	102.706	102.459
603	602	1800	0.15%	74.34	102.459	102.348
602	601	1800	0.15%	46.69	102.348	102.278
601	600	1800	0.15%	32.50	102.278	102.229

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 — 25mm

SCALE: 1:1500

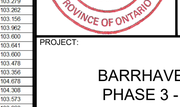
CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP



PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

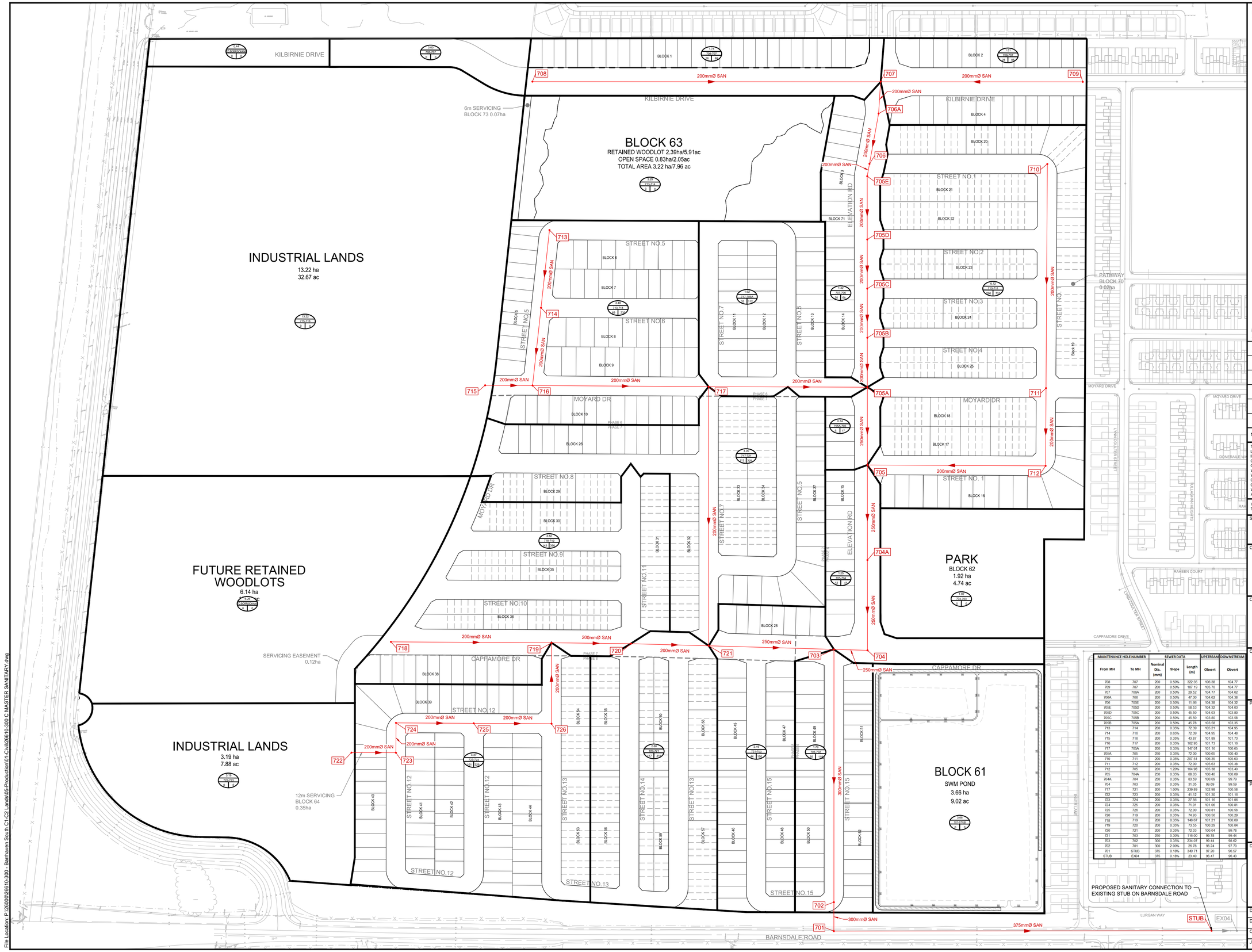
MASTER STORM

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MST

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C-MASTER STORM.dwg

PLOT DATE: Wednesday, May 27, 2026 3:33:50 PM



LEGEND:

- LIMIT OF STUDY AREA
- SANITARY SEWER
- EXISTING SANITARY SEWER
- SANITARY DRAINAGE BOUNDARY
- AREA IN HECTARES
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE
- POPULATION
- NUMBER OF UNITS

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
708	707	200	0.50%	322.35	106.38	104.77
709	707	200	0.50%	187.19	105.70	104.77
707	706A	200	0.50%	29.52	104.77	104.62
706A	706	200	0.50%	47.30	104.62	104.38
706	705E	200	0.50%	11.66	104.38	104.32
705E	705D	200	0.50%	58.53	104.32	104.03
705D	705C	200	0.50%	45.50	104.03	103.80
705C	705B	200	0.50%	45.50	103.80	103.58
705B	705A	200	0.50%	45.78	103.58	103.35
713	714	200	0.35%	72.39	105.21	104.95
714	716	200	0.65%	72.39	104.95	104.48
715	716	200	0.35%	43.87	101.89	101.73
716	717	200	0.35%	162.95	101.73	101.16
717	705A	200	0.35%	147.01	101.16	100.65
705A	705	250	0.35%	72.00	100.65	100.40
710	711	200	0.35%	207.51	106.35	105.63
711	712	200	0.35%	72.00	105.63	105.38
712	705	200	1.20%	104.98	105.38	103.40
705	704A	250	0.35%	88.03	100.40	100.09
704A	704	250	0.35%	83.59	100.09	99.79
704	703	250	0.35%	31.05	99.69	99.59
717	721	200	1.00%	239.89	102.98	100.58
722	723	200	0.35%	41.12	101.30	101.16
723	724	200	0.35%	27.56	101.16	101.06
724	725	200	0.35%	71.91	101.06	100.81
725	726	200	0.35%	72.00	100.81	100.56
726	719	200	0.35%	74.93	100.56	100.29
718	719	200	0.35%	148.67	101.21	100.69
719	720	200	0.35%	73.55	100.29	100.04
720	721	200	0.35%	72.03	100.04	99.78
721	703	250	0.30%	116.00	99.78	99.44
703	702	300	0.35%	234.07	99.44	98.62
702	701	300	2.00%	26.78	98.24	97.70
701	STUB	375	0.18%	349.71	97.20	96.57
STUB	EX04	375	0.18%	23.40	96.47	96.43

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER · K.R. FERREY MORENO · 100122432 · 2026-05-28 · PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

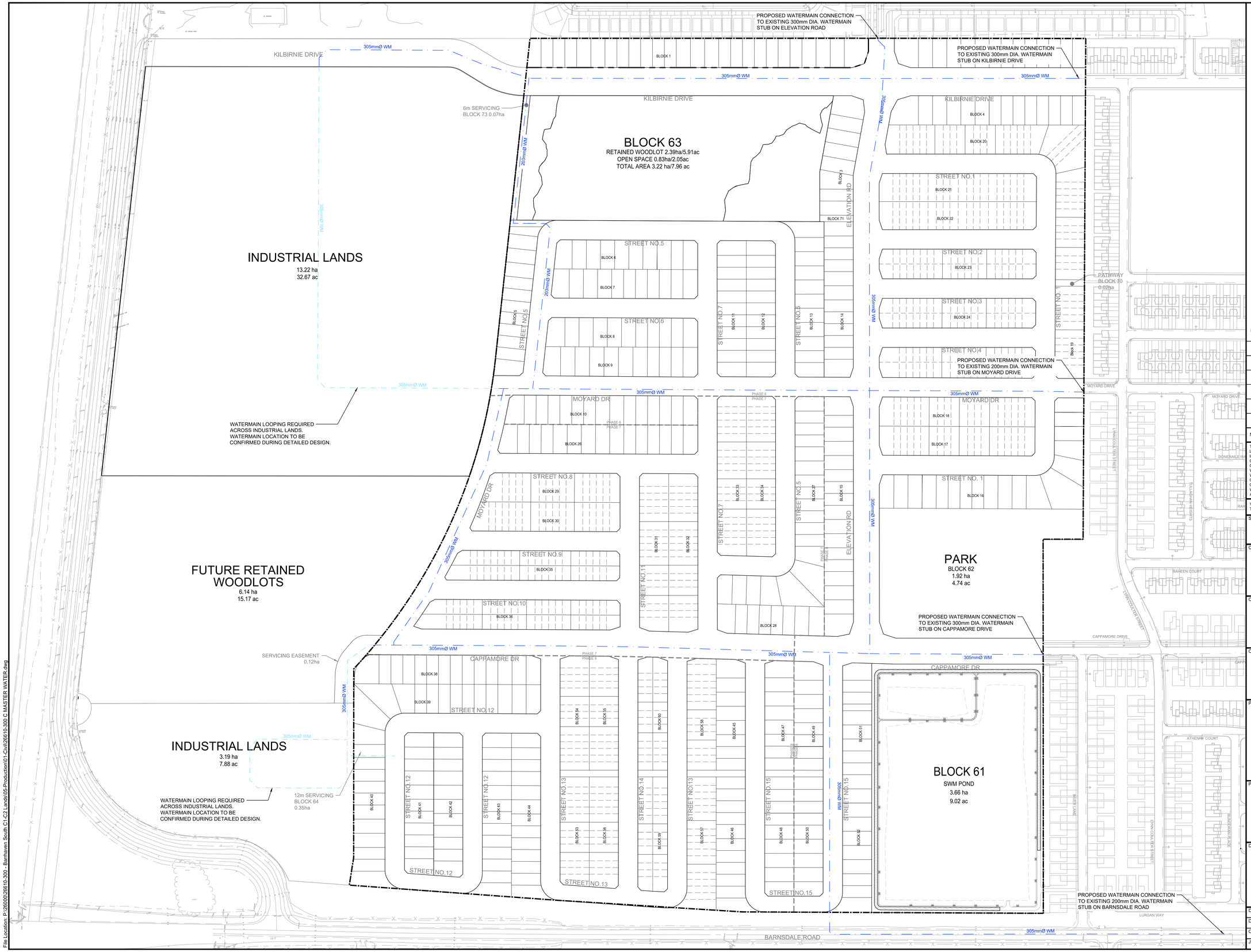
DRAWING:
MASTER SANITARY

DESIGN: KF/GF
DRAWN: KC
CHECKED: KF/GF
JLR #: 26610-300

DRAWING #: MSAN

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C MASTER SANITARY.dwg

PLOT DATE: Wednesday, May 27, 2026 3:34:16 PM



LEGEND:

- LIMIT OF STUDY AREA
- WATERMAIN
- INDUSTRIAL LANDS WATERMAIN LOOPING
- EXISTING WATERMAIN

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
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SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

MASTER WATERMAIN

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MWM

File Location: P:\26\00\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C MASTER WATER.dwg

PLOT DATE: Wednesday, May 27, 2026 8:18:54 PM

BLOCK 61

SWM POND

3.66 ha

9.02 ac

CAPPAMORE DR

CAPPAMORE DRIVE

BARNSDALE ROAD

STREET NO.15

BLOCK 45

BLOCK 46

BLOCK 47

BLOCK 48

BLOCK 49

BLOCK 50

BLOCK 51

BLOCK 52

PHASE 8

PHASE 6

BH 9-22
100.84
(94.13)
(100.53)

BH 2-22
100.95
(98.43)

BH 6-22
99.99
(99.05)

BH 1-22
100.08
(98.49)

OUTLET STRUCTURE COMPLETE WITH RIP RAP AND PLUNGE POOL. DIMENSIONS TO BE FINALIZED AT DETAILED DESIGN.

OUTLET STRUCTURE COMPLETE WITH RIP RAP AND PLUNGE POOL. DIMENSIONS TO BE FINALIZED AT DETAILED DESIGN.

150mmØ PERFORATED PIPE. LAYOUT TO BE FINALIZED AT DETAILED DESIGN.

200mmØ PVC DR-35

3.0m ACCESS/MAINTENANCE ROAD

OUTLET STRUCTURE TO BE SIZED AT DETAILED DESIGN COMPLETE WITH
335mm ORIFICE AT 98.45m
250mm X 900mm RECTANGULAR
ORIFICE AT 100.80m

EX POND INLET

EX108A

INVER LANE

TOP/BANK

DITCH

EDGE/GRAVEL

EDGE/ASPHALT

CENTRE OF ROAD

BARRIER CURB

TALBOT A

LEGEND:

- LIMIT OF STUDY AREA
- 108.40 PROPOSED CENTRELINE DESIGN GRADES
- 108.40 PROPOSED DESIGN GRADES
- 109.30 EXISTING/PROPOSED CENTRELINE DESIGN GRADES
- BH 8-15 106.93 (98.96) BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- PERFORATED PIPE
- EXISTING STORM SEWER
- 3m ACCESS/MAINTENANCE ROAD

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

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SCALE: 1:500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca — J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER — K.R. FERREY MORENO — 100122432 — 2026-05-28 — PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

FILTRATION AND DRY POND

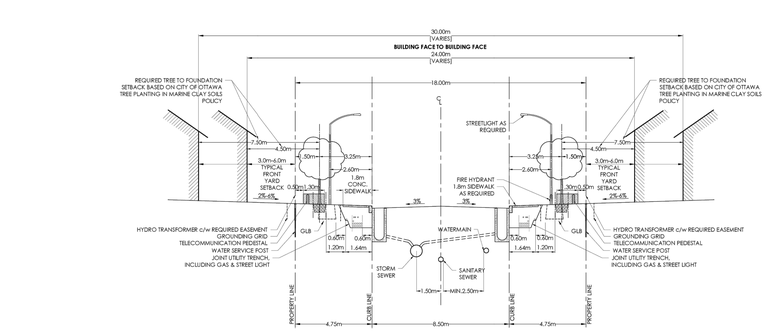
DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: POND

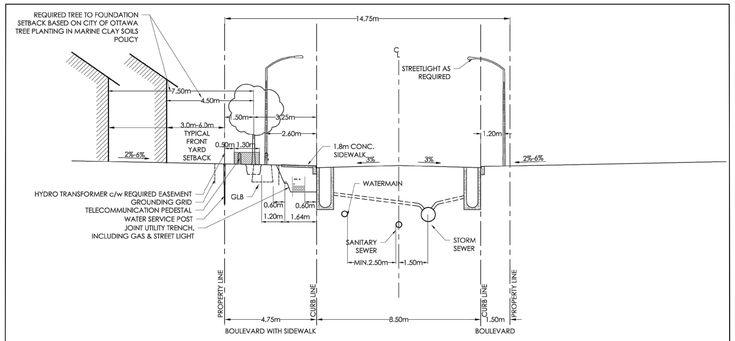
File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C POND.dwg

PLOT DATE: Tuesday, May 26, 2026 2:45:30 PM

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. 18M RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE.
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
4. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
5. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6M CLEARANCE FROM STRUCTURES (E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
8. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049, HELD BY HYDRO OTTAWA.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038
13. CLEARANCES SHOWN ARE MINIMUMS.



Ottawa	18.0m ROW CROSS SECTION
REV.DATE:	AUG. 2022
DWG. No.	ROW-18.0



NOTES:

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS
2. 14.75m RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS
4. TYPICAL FRONT YARD SETBACKS ARE TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS
5. FIRE HYDRANTS SHALL BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. STREETLIGHTS MAY BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
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9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049. HELD BY HYDRO OTTAWA
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038
13. BOULEVARD MAXIMUM SLOPE 1:3
14. NO RETAINING WALLS WITHIN 2.0m OF THE CURB LINE
15. CLEARANCES SHOWN ARE MINIMUMS

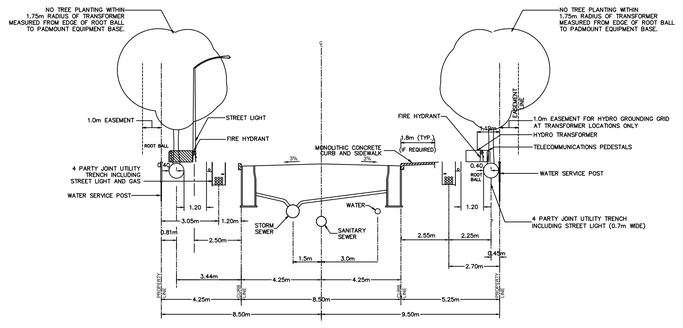
Ottawa	TITLE: 14.75m ROW CROSS SECTION
DATE:	AUG 2022
REV:	JULY 2024
DWG No:	ROW-14.75

NOTES:

1. THE STANDARD ROW CROSS SECTIONS INDICATE MINIMUM DIMENSIONS THAT ARE TO BE INCORPORATED INTO THE DESIGN OF ANY NEW DEVELOPMENTS INVOLVING NEW AND EXISTING STREETS. ANY VARIATIONS TO THE STANDARD ROW CROSS SECTIONS ARE SUBJECT TO THE INFRASTRUCTURE SERVICES DEVIATION PROCESS. CONTACT THE STANDARDS UNIT AT STANDARDSSECTION@OTTAWA.CA FOR MORE INFORMATION.
2. ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH APPLICABLE CITY STANDARDS, GUIDELINES, AND POLICES, INCLUDING COORDINATED UTILITY PLANS, GRADING PLANS AND LOCAL AREA PLANS. REFER ALSO TO UTILITY PARTNER STANDARD PLANT LOCATIONS.
3. ALL CROSS SECTIONS MAY BE SUBJECT TO SUBSEQUENT TRAFFIC CALMING MEASURES, TO BE DETERMINED THROUGH PLAN OF SUBDIVISION OR SEPARATE TRANSPORTATION STUDIES.
4. TYPICAL CROSS SECTION BOULEVARD WIDTH SHALL BE MAINTAINED WHEN CONSTRUCTING CUL-DE-SACS AND CORNER LOTS, REGARDLESS OF ROADWAY GEOMETRY.
5. WATERMAINS, WATER SERVICES, AND ASSOCIATED APPURTENANCES SHALL BE CONSTRUCTED PER THE WATER DESIGN GUIDELINES.
6. WATERMAIN AND HYDRANTS TO BE INSTALLED ON SOUTH AND EAST SIDE OF ROW, WHERE POSSIBLE.
7. SEWERS AND SEWER SERVICES SHALL BE CONSTRUCTED PER THE SEWER DESIGN GUIDELINES.
8. IN-ROAD CATCH BASINS SHALL ONLY BE USED ON RESIDENTIAL ROADS WITHOUT BUS TRAFFIC OR AS OTHERWISE DIRECTED BY THE SEWER DESIGN GUIDELINES.
9. BARRIER CURB SHALL BE USED ON ALL RESIDENTIAL ROADS WITH SINGLE FAMILY DWELLINGS. MOUNTABLE CURB MAY ONLY BE USED FOR AREAS WITH FREQUENT CURB-CUTS, SUCH AS TOWNHOME DEVELOPMENTS, WITH APPROVAL FROM THE CITY.
10. WATER AND SEWER SERVICES SHALL BE LAID AS PER CITY STANDARD DETAIL DRAWINGS, THE COORDINATED UTILITY PLAN, AND IN COORDINATION WITH ALL OTHER ELEMENTS IN THE ROW.
11. WHERE LOCATING WATER AND SEWER SERVICES UNDERNEATH LANDSCAPED AREAS WOULD PREVENT THE PLANTING OF A TREE, THEY MAY BE RUN UNDERNEATH THE DRIVEWAY OR OTHER HARDSCAPED AREAS.
12. MINIMUM 1.5 M CLEARANCE, AT-GRADE, TO BE MAINTAINED AROUND WATER SERVICE POST FROM TREE, TRANSFORMER, UTILITY PEDESTAL, TRAFFIC POLE, AND STREETLIGHT.
13. UTILITY PEDESTALS ARE TO BE GROUPED TOGETHER WITH THE HYDROELECTRIC TRANSFORMER, OR ON THE HOUSE SIDE OF THE UTILITY TRENCH.
14. STREETLIGHT CABLE SHALL BE LOCATED IN JOINT USE TRENCH (JUT). WHERE NO JUT EXISTS, ENSURE CLEARANCES TO TREE, HYDRANTS, AND WATER SERVICE POST.
15. TRAFFIC SIGNAL CABLE SHALL BE LOCATED IN THE JUT OR AT THE SAME OFFSET AS STREETLIGHT POLES IN A SEPARATE TRENCH.
16. TRAFFIC COMMUNICATIONS CABLE SHALL BE LOCATED IN THE JUT OR IN A TRENCH LOCATED AT THE SAME OFFSET AS THE STREETLIGHT POLES.
17. THE PREFERRED LOCATION FOR TRAFFIC HANDHOLES IS IN HARD SURFACES. WHEN HANDHOLES ARE PLACED IN THE BOULEVARD, A CONCRETE COLLAR SHALL BE PROVIDED.
18. THE DEVELOPER SHALL SUPPLY AND INSTALL DUCTS FOR UTILITY CROSSINGS AT INTERSECTIONS.
19. TREE PLACEMENT, NUMBER, AND SPECIES SHALL BE PER CITY POLICY, THE LANDSCAPE PLAN, COORDINATED-UTILITY-PLAN, AND THE DEVELOPMENT AGREEMENTS.
20. THE HYDRO TRANSFORMER BASE SHALL BE LOCATED A MINIMUM OF 2.0 M FROM THE DRIVEWAY EDGE.

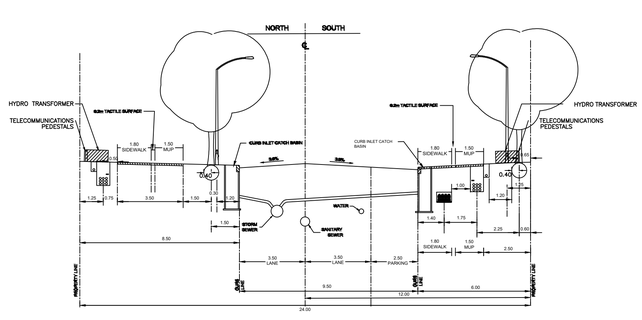
Ottawa	TITLE: STANDARD NOTES ROAD ALLOWANCE
DATE:	MAR 2009
REV:	SEPT 2022
DWG No:	ROW-NOTES

18.0m ROW WITH SIDEWALK

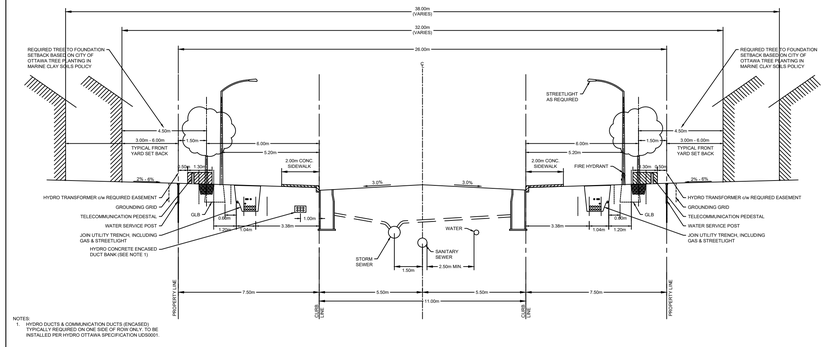


NOTES:
1. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6 m CLEARANCE FROM STRUCTURES.

24.0m ROW WITH PARKING LANE

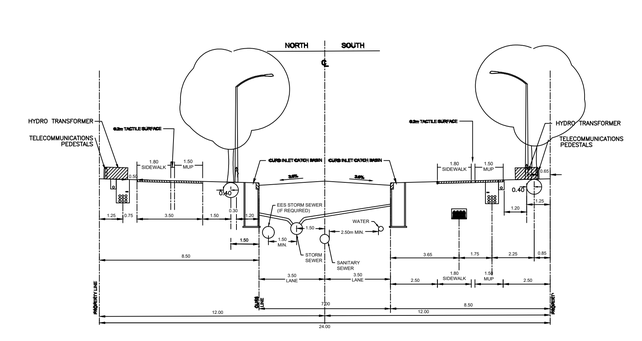


26.0m ROW



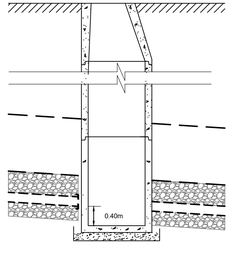
NOTES:
1. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED): TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. TO BE INSTALLED PER HYDRO OTTAWA SPECIFICATION UDS0001.

24.0m ROW TYPICAL

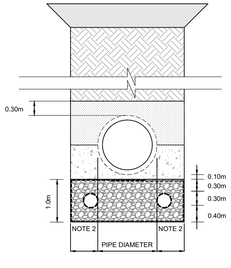


EES INSTALLATION DETAIL

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)



STORM MAINTENANCE HOLE DETAIL
N.T.S.



TRENCH FOR STORM SEWER
N.T.S.

NOTES
1. THE CONTRACTOR SHALL INSTALL EES PLUGS AT ALL EES PIPE MAINTENANCE HOLE CONNECTIONS. TEMPORARY PLUGS, WHICH ARE NOT SHOWN ON PROFILE DRAWINGS, SHALL BE REMOVED AT THE COMPLETION OF CONSTRUCTION. EES PLUGS SHOWN ON PROFILE DRAWINGS SHALL BE PERMANENT.
2. - 450mm CLEARANCE FOR PIPES 900mmØ OR LESS
   - 500mm CLEARANCE FOR PIPES OVER 900mmØ
3. PERFORATED PIPE TO BE HDPE N-12Ø WT IB AS PER MANUFACTURER WITH LONGITUDINAL SPACING OF 100mm AND ORIENTED AT 0, 2, 4, 6, 8 AND 10 O'CLOCK
4. INITIAL BACKFILL MATERIAL:
   4.1. CONCRETE PIPE - GRANULAR 'A' OR GRANULAR 'B' MATERIAL WITH 100% PASSING THE 37.5mm SIEVE
   4.2 PVC PIPE - GRANULAR 'A'
5. STORM SEWER MAINTENANCE HOLES SERVICING LOCAL SEWERS WHERE THE EES IS PRESENT SHALL BE CONSTRUCTED WITH A MINIMUM OF 400mm SUMP FOR SEDIMENT CAPTURE BELOW THE INVERT OF THE EES PERFORATED PIPES, REGARDLESS OF THE LOCAL SEWER PIPE SIZE.

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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CONSULTANT: www.jlrichards.ca
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CONSULTANT:

PROFESSIONAL STAMP
LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

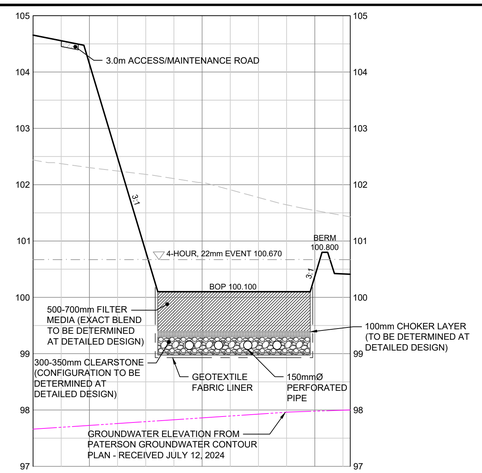
PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
DETAILS

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300
DRAWING #:	D1

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C DETAILS.dwg

PLOT DATE: Tuesday, May 26, 2026 2:45:37 PM



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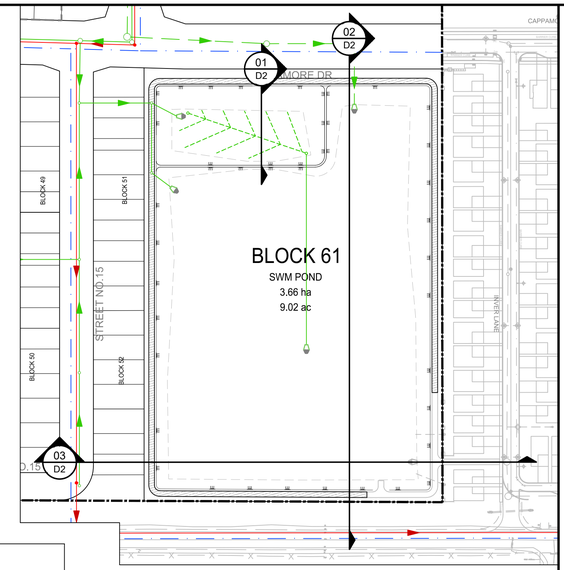

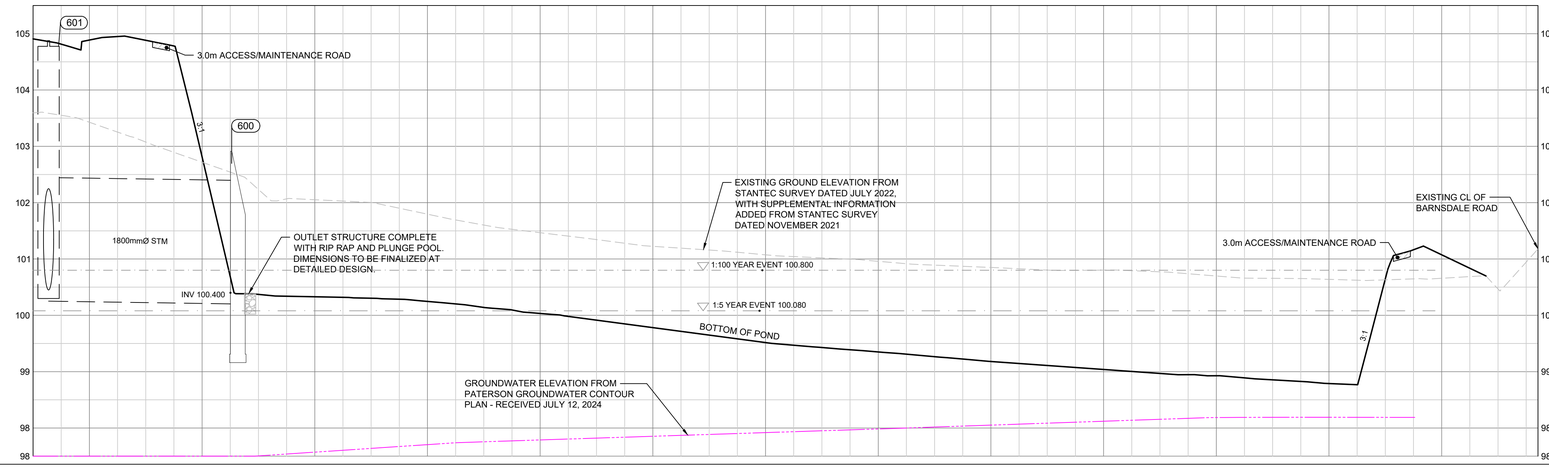

02 D2 DRY POND EES INLET

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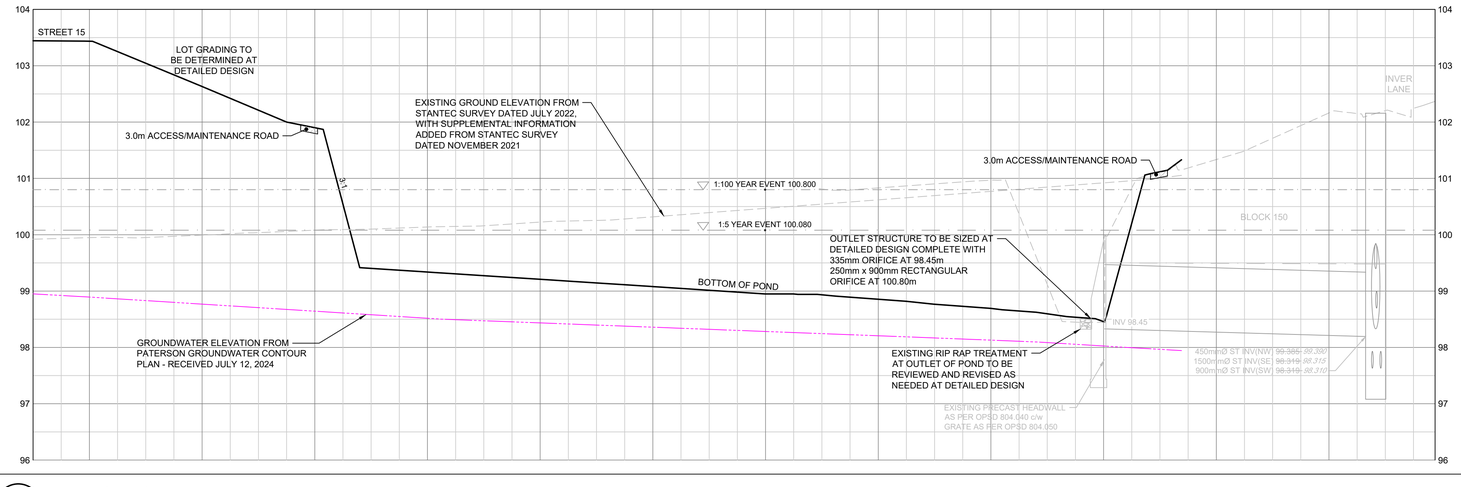

03 D2 DRY POND OUTLET

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CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

POND SECTIONS

DESIGN: KF/GF	
DRAWN: KC	DRAWING #: D2
CHECKED: KF/GF	
JLR #: 26610-300	

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Appendix A

Terms of Reference

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

MEMO

Date: May 31, 2024

To: Robin van de Lande, City of Ottawa

From: Guy Forget P.Eng.

CC: John Bougadis M.A.Sc., P.Eng. (City of Ottawa), Curtiss Scarlett P.Eng. (Minto Communities – Canada)

Subject: S1 Urban Expansion Area– Terms of Reference

JLR No.: 26610-300

The S1 Urban Expansion Area (S1 UEA) will encompass ≈68 ha of proposed development located west of the established Quinn's Pointe Subdivision, south of the established Ridge Subdivision, north of Barnsdale Road and east of Borrisokane Road, within the Barrhaven South Area. Based on the latest Concept Plan (version 37), the eastern portion of the S1 UEA will consist of proposed residential development (formerly referred as the C1 Lands) owned by Minto Communities while the western portion will consist of proposed commercial development (formerly referred to the C2 Lands) owned Minto Greenfield (Barrhaven South). Minto Communities Inc. – Canada is overseeing the progress of the Approval process on behalf of both Minto Communities and Minto Greenfield (Barrhaven South).

The approval of the S1 UEA will follow the Concept Plan Approval (CPA) process given that the parcel is relatively small, and that ownership is virtually by one single Owner being Minto. Several deliverables will be prepared on behalf of Minto in support of the CPA process.

Master Servicing Process

The MSS for the S1 UEA will be completed in accordance with Appendix C of the Infrastructure Master Plan "Guideline for Preparing Terms of Reference for Master Servicing Study (June 2023)", which sets out the deliverables required.

Task 1: Terms of Reference

This Term of Reference (TOR) for the S1 UEA was prepared in response to the City request that a Master Servicing Study (MSS) Terms of Reference (TOR) be prepared for the S1 UEA in accordance with the "Appendix C: Guideline for Preparing Terms of Reference for a Master Servicing Study, June 2023" included in the Draft Infrastructure Master Plan.

Task 2: Existing Conditions Report (ECR)

The ECR will consist of the following:

- Review and Consolidation of background reports and information.
- Inventory of Water Crossings and Watershed Delineation
- Hydrological Modelling and Capacity Analysis of Conveyance Systems
- Water Budget Modelling
- Floodplain Mapping and Geomorphological Assessment
- Review Existing Conditions: Wastewater, Water and Storm Servicing
- Identify Constraints/Opportunities and Recharge/Discharge Areas
- Evaluation and Assessment of Storm Design Criteria and Objectives

- Assist Drainage Engineer with Hydrological Calculations for the Thomas Baxter Municipal Drain
- Prepare Existing Conditions Report

Several background reports will be reviewed including:

- Barrhaven South Urban Expansion Area MSS (JLR, 2018)
- MSS Addendum for the Barrhaven South Urban Expansion Area (January 5, 2021)
- Technical Memo – The Ridge & Drummond lands (DSEL, April 7, 2020)
- SWM Report, The Ridge (Brazeau lands), (JFSA, June 2020)
- Design Brief – The Ridge (Brazeau lands) (DSEL July 27th, 2020)
- Design Drawings – The Ridge (Brazeau Lands) (DSEL, 2020-09-25)
- Design Brief – The Ridge SWM Pond (DSEL/JFA, June 2020)
- Site Servicing Plan – 3713 Borrisokane Road (ABIC) (DSEL, December 2019)
- Technical Memo – 3713 Borrisokane (ABIC) (Dillon, November 4, 2020)

In addition to the above, this task will include the review of other information provided by Minto, the City of Ottawa and/or the Rideau Valley Conservation Authority (RVCA), including:

- Land Ownership with boundary information.
- Recent air photography.
- Topographical maps.
- LiDAR as provided by the City of Ottawa.
- Surficial geology from the province.
- Land use and vegetation.
- Topographical surveys (from Minto).
- Floodplain mapping at the boundary of the S1 UEA, if applicable.
- Other information compiled by the Team's Geotechnical/Hydrogeological Engineer, Biologist and Transportation Engineer.

Task 3: Future Development Condition

The approved ECR will identify constraints and opportunities which will encompass physical, environmental, as well as servicing constraints that will be determined from the inventory of existing linear infrastructure and potential outlets. At such time, a further review of topographical maps and surveys will be completed as well as the drainage patterns identified under existing conditions.

Given that this project will follow the Concept Plan Approval (CPA) process and that the latest Minto Concept Plan (version 37) has been reviewed and revised based on the city and Fotenn's input, a single Concept Plan will be analyzed once it has been updated/revised to reflect the ECR's findings.

Task 4: Servicing Design Constraints and Develop Design Criteria

Servicing constraints will be identified for the existing systems at or near the boundary of the S1 UEA.

- Review Servicing Constraints defined in BSUEA MSS and other Reports
- Coordinate and Liaise with Geotechnical Engineer and Hydrogeological Engineer
- Coordinate and Liaise with Biologist

Task 5: Servicing Alternatives for Wastewater, Water and Stormwater Management, Including Preparation of Master Grading

JLR will develop potential servicing alternatives, when applicable, for wastewater, water, storm and stormwater management recognizing constraints identified through the Existing Conditions Report and Concept Plan.

Task 6: Evaluation of Servicing Alternatives, when applicable, and Identification of Recommended Wastewater, Water and Stormwater Management Solution

High-level servicing alternatives developed as part of Task 5, will be evaluated to confirm their adequacy and to identify the recommended servicing alternative for wastewater, water and storm/stormwater.

Task 7: Review/Develop Implementation and Phasing Plans and Prepare Cost Estimate

Task 8: Approvals

Approvals by various groups at the city of Ottawa will be sought as part of this MSS as well as other stakeholders. Based on the previous BSUEA MSS, coordination with Minto's subconsultants was carried out throughout the ECR and MSS. As part of the BSUEA MSS, the following groups were consulted:

- CPT Members (as needed)
- City of Ottawa Economic Development Services
- City of Ottawa Transportation Planning
- City of Ottawa Parks Forestry & Stormwater Services
- City of Ottawa Transit Customer Services and Planning
- City of Ottawa Parks and Facilities Planning Services
- City of Ottawa Infrastructure Services
- City of Ottawa Planning Services
- City of Ottawa Right of Way Heritage & Urban Design Services
- Ottawa Public Health
- Rideau Valley Conservation
- Ministry of the Environment, Conservation and Parks
- Ottawa Carleton District School Board (OCDSB)
- Conseil des écoles publiques de l'Est de l'Ontario (CEPEO)

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Guy Forget, P.Eng.
Senior Water Resources Engineer

Reviewed by:

Karla Ferrey, P.Eng.
Senior Associate; Manager, Ottawa Civil Development

Appendix B

Existing Conditions Report (2025)

JLR No.: 26610-300
Revision: 1

March 14, 2025

Prepared for:

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Existing Conditions Report

Barrhaven South Phase 3 – S1 Area

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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Executive Summary

Minto Communities Canada Inc. has retained several consultants to prepare a series of comprehensive documents to support the future development of the lands referred to as the Barrhaven South Phase 3 – S1 Area. The subject lands are herein referred to as the S1 Area. This Existing Conditions Report is submitted to the city in support of a Concept Design Plan, which will be implemented as an Amendment to the City of Ottawa Official Plan (OP).

J.L. Richards & Associates Limited (JLR) has been retained to prepare the Master Servicing Study (MSS) as part of the submission to outline water, wastewater, storm, and stormwater management servicing strategies for the S1 Area. In advance of preparing the MSS, an Existing Conditions Report is required to evaluate and assess existing water resources and servicing infrastructure within and around the S1 Area, and to identify constraints and opportunities.

The S1 Area is bounded by the existing Quinn's Pointe Subdivision to the east, by Barnsdale Road to the south, by the existing The Ridge Subdivision to the north, and by Borrisokane Road to the west. As such, the S1 Area is located immediately west and south of the current City of Ottawa Urban Boundary. The overall area is ≈71 ha which includes a retained woodlot and an artificial pond located at the Barnsdale Road and Borriokane Road intersection.

The subject site is an undeveloped mix of former agricultural land and forested areas spread generally across the site. Woodlots and pasture areas are present in the project site. The topography across the site has significant undulations, and, in general the lands slope down from the northern boundary to the southern boundary of the lands. Elevations of ≈112 m at the highest point near the northern boundary (adjacent to the Ridge Subdivision) and drops to ≈100 m at the lowest point, near Barnsdale Road. At the intersection of Borrisokane Road and Barnsdale Road, in the southwest corner of the site, there is an existing man-made pond that was excavated in the 1990's as displayed on the aerial on "geoOttawa".

For the purposes of defining the hydrology under the existing conditions of the S1 Area, the condition observed as part of the 2017 Existing Conditions Report for the BSUEA is consistent with the existing conditions noted as part of this undertaking. For the area encompassing the S1 Area assessed as part of the 2017 Existing Conditions Report, surface runoff is conveyed to the Mud Creek watershed, via the Thomas Baxter Municipal Drain and the Jock River watershed via a spill-over pond and rear yard catch basins and storm sewer system located within the Quinn's Pointe Subdivision and Greenbank Road.

It is our understanding that the investigations completed by Arcadis did not identify any formal conveyance channels within the S1 Area. The absence of channels or formal watercourses was confirmed by the LiDAR data. The absence of such waterways is generally indicative of areas exhibiting particularly low surface runoff potential. As a result, runoff generated from the site is carried as overland sheet flow to the natural low points at the culvert outlet locations.

Catchment areas within the S1 Area have been delineated based on LiDAR data compiled on behalf of the City of Ottawa, as well as any surface infrastructure such as roads, which tend to form a drainage path barrier, and culverts, where flow will concentrate into a point source. An understanding of the existing conditions in terms of capacity of the culverts and expected flow rates can be achieved from an accurate existing conditions hydrological model.

The SWMHYMO hydrological model, developed as part of the BSUEA, was maintained for the S1 Area. The model is a single event model for the purpose of estimating flood flows at the boundary control points of the site for storm events ranging from the 1:2-year and 1:100-year recurrence. The model was developed based on generally accepted standard hydrological parameters that fairly represent the land use, soil characteristics, types of flow paths, and topography. The simulated area included the S1 Area, as well as the lands up to the external boundary points: Cambrian Road, Borrisokane Road, and Barnsdale Road.

The SWMHYMO model results show relatively low flow rates at each of the culverts due to the high infiltration capability of the soils in the area and the low impervious ratio. In general, during larger and infrequent events, runoff will increase as the infiltration capability decreases due to saturation of the soils.

The water budget is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces, or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. The analysis of the water budget is often carried out to establish the baseline condition and assess any future changes in infiltration to subsurface water-bearing zones and, consequently, to surface runoff resulting from a significant land cover modification such as urbanization. It is also used to predict changes to the hydrological cycle that will result from urbanization of lands.

An understanding of the water budget within a given study area can be gained through the use of a continuous hydrological model. The PCSWMM software platform was used for this study, which included simplified groundwater and snowmelt modules that allowed the continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall, and snowmelt.

A long-term simulation was carried out for the site and was based on 20 years of hourly precipitation and temperature. Based on the long-term simulation results, infiltration accounts for approximately 34% of the total annual precipitation of 864 mm, while surface runoff accounts for approximately 7% on a yearly average.

A review of the existing and planned infrastructure (sanitary sewers, watermains, storm sewers, and stormwater management facilities) in the vicinity of the S1 Area was undertaken to assess available servicing opportunities and constraints within the subject lands.

The existing Greenbank Road trunk sanitary sewer was identified as the wastewater outlet for the existing Barrhaven South Community sanitary sewer system, which includes the Cambrian Road, River Mist Road, Barnsdale Road trunk sanitary sewers. Based on the theoretical peak flow calculations, the existing Barnsdale Road and Greenbank Road trunk sanitary sewers have sufficient capacity to accommodate the anticipated peak flows generated within the S1 Area.

Potable water will be provided to the S1 Area predominantly via potentially 300 mm diameter extensions from existing and planned feedermains located along the boundary with the Quinn's Pointe Subdivision and connections to the existing watermains within the Ridge Subdivision. There is a planned pressure zone reconfiguration that will occur in 2027 resulting in an expanded Zone 3C within areas previously identified as Pressure Zone BARR, including the Barrhaven

South Community, BSUEA and the future S1 Area. This future pressure zone is now being referred as Pressure Zone SUC.

Certain areas within the S1 Area might experience low pressures due to the high topography for a localized area near the Ridge Subdivision. However, this localized area has lower grades than the existing grades in the southern portion of the Ridge Subdivision. Hydraulic simulations will be required to be carried out as part of the upcoming MSS to determine if the localized area within the S1 Area will have pressures above the design criterion of 275 kPa (40 psi). Water servicing, watermain looping and sizing of the feedermains within the S1 Area will be determined during the MSS stage via a hydraulic network analysis (HNA).

The S1 Area is located on the edge of the current urban boundary and has existing or planned development on its eastern and northern boundary. The urban areas adjoining the S1 Area are currently serviced, or planned to be serviced, by SWMFs which were identified as part of the stormwater management strategy to service the Quinn's Pointe Subdivision to the east and the Ridge Subdivision to the north as identified in the BSUEA MSS (JLR, 2018), and in the BSUEA MSS Addendum (JLR, 2021) as summarized in this Report. There is an existing spill-over pond located within the S1 Area as it was identified to be required to support the Quinn's Pointe Stages 4 and 5 to prevent major overland flow from reaching New Realigned Greenbank Road. Given that no future additional flow allowance was to be incorporated in the Quinn's Pointe storm sewer system and spill-over dry pond, the existing residual capacities could be used as the dedicated capacity to accommodate the S1 Area.

The Hydrogeological Study undertaken by Paterson confirms that, in general, soils within the S1 Area have a moderate to high hydraulic conductivity with the highest hydraulic conductivity soils observed in the northwestern portion of the study area. Moderate hydraulic conductivity soil and shallow groundwater is encountered in the southern portion. Soils having the highest hydraulic conductivity are considered to act as a recharge zone for underlying aquifers and generally suitable for providing groundwater recharge and appropriate practices must be implemented to maximize the rate of infiltration. Based on fulfilling the objective of maintaining pre-development infiltration levels, storm servicing solutions incorporating infiltration measures will be reviewed and developed, when feasible, at the MSS level in order to achieve water balance.

1.0 Background

In 2016, Minto Communities Canada Inc. (Minto) and Mattamy Homes (Mattamy) retained a team of consultants to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA) Community Design Plan (CDP), which was subsequently implemented as an Amendment to the City of Ottawa Official Plan (OP). As part of this undertaking, J.L. Richards & Associates Limited (JLR) was retained to prepare a Master Servicing Study (MSS) to outline water, wastewater, storm, and stormwater management servicing strategies for the BSUEA. In advance of preparing the MSS, an Existing Conditions Report was prepared by JLR which evaluated and documented the existing water resources and servicing infrastructure in and around the BSUEA, and to identify constraints and opportunities which provided the baseline conditions of an Environmental Management Plan (EMP).

In 2018, following the approval of the BSUEA MSS, JLR was retained by Minto to proceed with detailed design of the three (3) of four (4) phases (Stages 2-4) of the BSUEA which are referred to Quinn's Pointe Stages 2-4 while Stage 5 is the last phase of development within the BSUEA.

In 2021, JLR was retained by Caivan Communities Inc. to prepare an MSS Addendum to "refresh" the 2018 MSS based on new preliminary engineering and detailed design engineering completed after 2018 to facilitate development of the former Aggregate Extraction Areas in the north part of the BSUEA.

In 2019, JLR was retained by Minto to prepare a Serviceability Study for the inclusion of several parcels located adjacent to the BSUEA. These parcels, previously referred to as the Barnsdale Expansion Lands, were mostly owned by Minto, and located either adjacent to the current Official Plan Urban Area, or in very close proximity of the Quinn's Pointe Subdivision (Stages 1-4). The 2019 Serviceability Study demonstrated that extensions to existing and proposed infrastructure could support the urbanization of these parcels. Given their location next to the Quinn's Pointe Subdivisions (existing and future), their urbanization was deemed a logical urban expansion in the Barrhaven South - Barnsdale Expansion Lands.

The high-level servicing solutions presented in the 2019 Serviceability Study for water, wastewater, storm and stormwater management were developed for the sole purpose of demonstrating the serviceability of the parcels. This Study was prepared to support an application to amend the Official Plan (OP) during the City of Ottawa (City) 5-year review of the OP.

Following a review of the 2019 Serviceability Study by the City, two (2) of the four (4) expansion parcels analyzed were approved to be included in the OP Urban Area. The approved expansion parcels consisted of the S1 Area, located west of the Quinn's Pointe Subdivision and north of Barnsdale Road, and the S2 Urban Expansion Area, located east of Greenbank Road and north of Barnsdale Road. These lands, now referred to as the Barrhaven South Phase 3 – S1 Area, are herein referred throughout this Existing Conditions Report as the S1 Area.

After several meeting between Minto and the City of Ottawa, it was understood that the S1 Area would not follow a full Community Design Plan process given that their urbanization was deemed a logical urban expansion of the current OP urban boundary.

Given that the S1 Area is a new urban area to be included in the OP urban boundary, the Concept Design Plan Amendment process will require that specific documents be prepared in accordance

with “Appendix C: Guideline for Preparing Terms of Reference for a Master Servicing Study, June 2023” which was included in the Draft Infrastructure Master Plan.

Based on this Guideline, a Table of Content and Terms of Reference was submitted to the City for their review. These documents will provide a road map for the preparation of an Existing Conditions Report and MSS. As such, the purpose of this Existing Conditions Report and subsequent MSS is aimed to support the Concept Plan and upcoming Draft Plan of Subdivision for S1 Area, which will be implemented as an Amendment to the City OP. The Terms of Reference is included in Appendix B1.

In advance of preparing the MSS, this Existing Conditions Report will evaluate and assess existing water resources and servicing infrastructure in and around the S1 Area, and to identify constraints and opportunities that will provide the baseline conditions of an Environmental Management Plan (EMP).

2.0 Study Area

2.1 Location

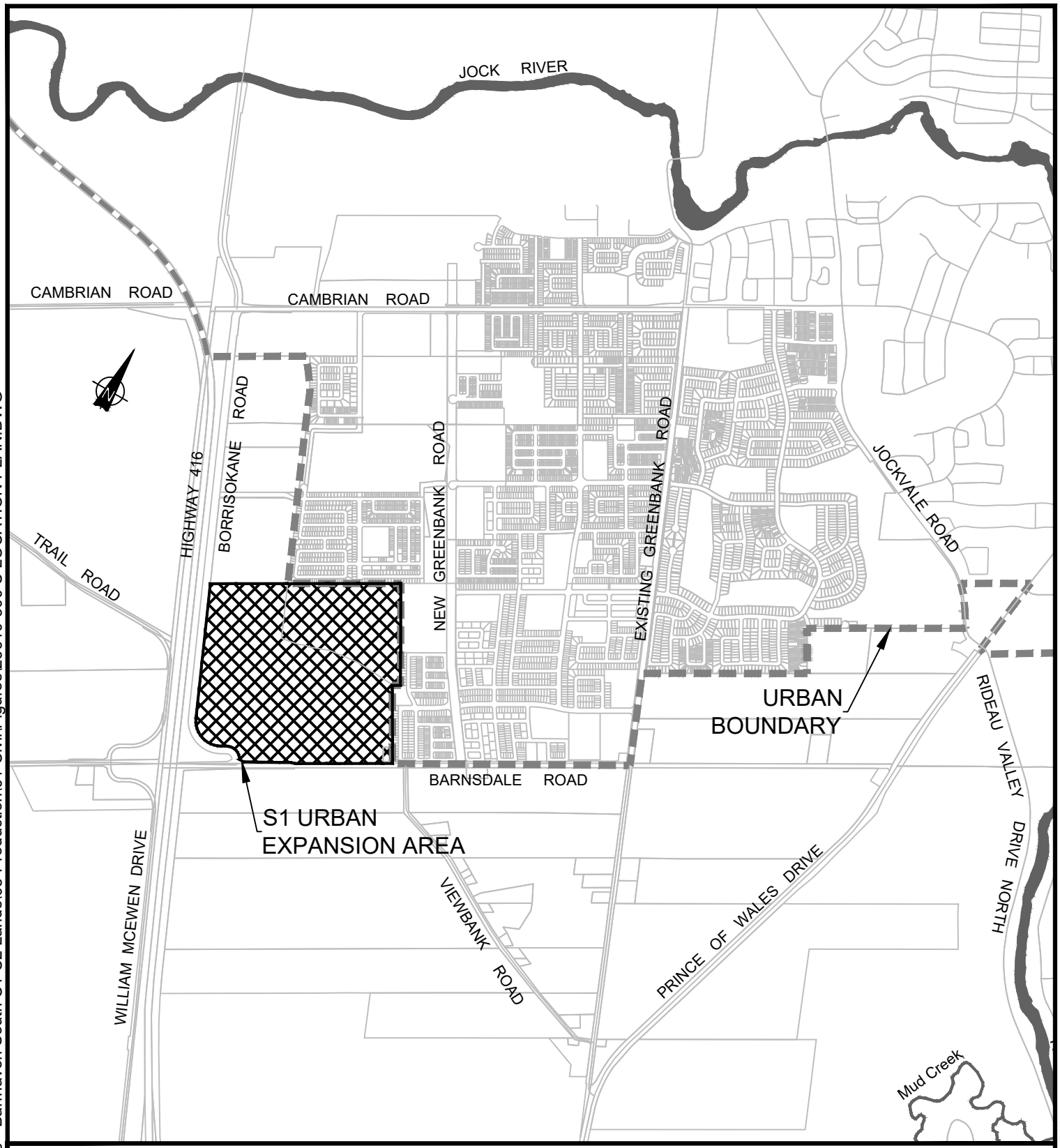
The S1 Area encompasses ≈71 ha of an undeveloped mix of former agricultural field and woodlots and a man-made excavated pond. It is bounded by Barnsdale Road to the south, by the existing and future Quinn’s Pointe Stage 4 and Stage 5 to the east, by Borrisokane Road to the west and by the former Brazeau Aggregate Extractions Area to the north, now a Caivan Greenbank Development. The S1 Area is located immediately west and south of the current City of Ottawa Urban Boundary as shown in Figure 2-1. The S1 Area is a logical development pattern, with improved phasing opportunities and more efficient connection to surrounding development and infrastructure.

2.2 Characteristics

As previously noted, the subject site is an undeveloped mix of former agricultural land and two (2) woodlots, one of which has been identified as being of significance.

The topography across the site has significant undulations, and, in general the lands slope down from the northern boundary to the southern boundary of the lands. Elevations of ≈112 m at the highest point near the northern boundary and drops to ≈100 m at the lowest point, near Barnsdale Road.

At the intersection of Borrisokane Road and Barnsdale Road, in the southwest corner of the site, there is an existing man-made pond that was excavated in the 1990’s as displayed on the aerial on “geoOttawa”.



PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

LOCATION PLAN

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FIGURE 2-1

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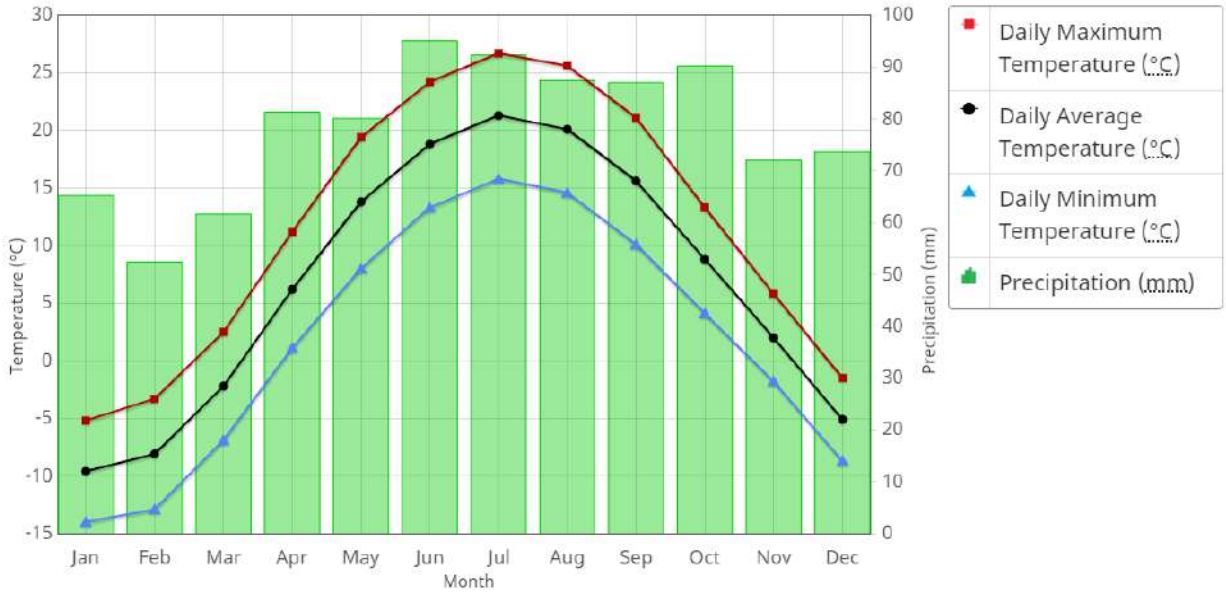
2.3 Climate

Environment Canada collects meteorological data at two (2) weather stations within the vicinity of the study area: the Ottawa CDA at the Experimental Farm (16 km to the northeast) and the Ottawa MacDonald Cartier International Airport (10 km to the northeast). The averages of the data collected at these two (2) stations provide some information on the climate expected in the study area (Figure 2-2).

The average temperature for the S1 Area varies between about -10°C in the winter and over 20°C in the summer. The daily maximum and minimum averages vary between 3.7 and 5.5 degrees from the average, with the greatest difference observed in the summer months. Evaporation is high in the summer, and negligible in the winter. Snowfall is highest during the December/January period. Generally, precipitation volumes are higher in the summer months, although the season variation is not as pronounced compared to temperature: the seasonal differences are usually no more than 40 mm and for three quarters (75%) of the year the variation in precipitation is no more than 20 mm.

Figure 2-2: Environment Canada, Ottawa Climate Normals (Ottawa City)



3.0 Background Documents

An exhaustive review of background documents and reports was completed as part of the BSUEA Existing Condition Report (JLR, 2017). At the time, the documents reviewed and summarized included subwatershed studies of the Jock River (covering the areas north of the site) and Mud Creek (covering the south of the site), and servicing strategies for the surrounding urban development lands northeast of the site. This review was summarized in four (4) categories and was included in the 2017 Existing Conditions Report (refer to Appendix B1 of 2017 Report).

The 2021 MSS Addendum reviewed and summarized new background information prepared for Caivan's "The Ridge Subdivision" (formerly Brazeau), the ABIC Lands and the future "Drummond Subdivision".

In August 2024, Design Reports were received from the city for the most recent developments in the Barrhaven South Area. These following documents have been gathered and reviewed as part of this Existing Conditions Report, including:

- The Ridge Phases 1 & 2 (Caivan Communities - formerly Brazeau)
- The Ridge Phases 3 & 4 (Caivan Communities – formerly Drummond)
- Half Moon Bay South Phase 1 to 5 and Phase 8 (Mattamy)
- The ABIC Commercial Lands
- Quinn's Pointe Stages 1 to 5 (Minto Communities)
- The Meadows Phase 1A, 1B and 2A (Tamarack Homes)
- The Meadows Phase 7 and 8 (Tamarack Homes)
- Half Moon Bay West Subdivision (Mattamy Homes)
- Barrhaven South Master Servicing Study (Stantec, October 12, 2017)
- Barrhaven South Master Servicing Study Appendices Volume 1 and 2 (Stantec, June 2007)
- Master Servicing Study Addendum Barrhaven South Urban Expansion Area (JLR, January 5, 2021).

Thus, the Master Sanitary Design Sheet included in Appendix B4 was updated based on the previous design sheet and integrated the above information.

4.0 Geology and Physiology

4.1 Surficial Geology

A Geotechnical Investigation was carried out by Paterson Group Inc. (Paterson) to assess general subsoil and groundwater conditions within the boundaries of the S1 Area and to provide geotechnical recommendations for the design of municipal services associated with the proposed development. The Report is entitled "Geotechnical Investigation Proposed Residential Development - Barrhaven South Expansion, Paterson Group Inc., March 25, 2024".

Based on Paterson's data gathering, the subsurface profile encountered for most of the test holes consisted of topsoil underlain by compact to very dense silty sand becoming silty sand to sandy silt with depth (Section 4.3 of Paterson's Report). The Report noted that the silty sand/sandy silt contained gravel, cobbles, and boulders at several test hole locations. A layer of stiff to very stiff brown silty clay with sand was encountered within the silty sand/sandy silt deposit at some test hole locations, predominately observed to be present within the northwest corner and central east portion of the site and at depths ranging between 0.3 m to 3.3 m with an approximate thickness of 0.4 to 3 m.

A field program, consisting of 9 boreholes and 18 monitoring wells, was carried out in the spring between April 11 and 18, 2022 and later in the fall between October 6 and 8, 2022. The data collected supplements the boreholes and monitoring wells established as part of the 2015 Existing Conditions Geotechnical Work which was also completed by Paterson.

The boreholes/monitoring well were advanced to depths ranging from 2.5 m to 12 m below existing ground surface. The test hole locations for the current investigation were distributed in a manner to provide general coverage of the S1 Area. It should also be noted that prior to 2015 investigations were also carried out in 2003 and 2011, which consisted of 27 test pits that were advanced to depths ranging from 2.7 m to 7.0 m.

4.2 Bedrock

Based on the available geological mapping, Paterson noted in their Report that the bedrock throughout the subject site consists of dolomite of the Oxford Formation with an overburden drift thickness of 15 m to 25 m.

4.3 Aquifer Systems and Groundwater

The Mud Creek Subwatershed Study (2015) has identified the area within the S1 Area as being part of the Mississippi-Rideau Source Protection Region (MRSPR) Significant Groundwater Recharge Area as depicted in Figure 8 of the 2015 Report. Based on the source protection atlas from the Ministry of the Environment, Conservation and Parks (MECP), all the S1 Area cover Highly Vulnerable Aquifers. Thus, site servicing developed as part of the upcoming Master Servicing Study will need to incorporate mitigation measures into the storm servicing strategy accounting for the delineated significant groundwater recharge area and account for any source water protection requirements of the Highly Vulnerable Aquifers.

5.0 Site Hydrology and Hydraulics

5.1 General

The 2017 Existing Conditions Report reviewed in detail the various sub-watersheds impacted by the BSUEA. At the time, it was determined via the review of the LiDAR and topographical survey along the boundary roadways that runoff from the BSUEA under pre-development conditions was tributary to three (3) sub-watersheds: the Jock River, Mud Creek via the Thomas Baxter Municipal Drain, and the Rideau River via the Hawkins Municipal Drain.

For the purposes of defining the hydrology under the existing conditions of the S1 Area, the condition observed as part of the 2017 Existing Conditions Report is considered consistent with the existing conditions noted at this time. It is anticipated that stormwater runoff from the S1 lands will be discharged via a new facility at the location of the existing overflow dry pond on the site, developed as part of the original BSUEA works. Since the design will not be dependent on the surrounding hydrologic existing conditions, and there have not been any changes to drainage connections for the S1 lands since 2017, the presentation of the 2017 existing conditions of the hydrology and hydraulics, other than the water balance and servicing connections, is considered sufficient.

For the area encompassing the S1 Area assessed under the 2017 existing conditions there are two (2) distinct sub-watersheds contributing to downstream receivers: the western part of the S1 Area is tributary to Mud Creek via one of the branches of the Thomas Baxter Municipal Drain; the remaining eastern part of the S1 Area, is tributary to the Jock River via the storm sewer system within the Quinn's Pointe Subdivision and Greenbank Road.

The area tributary to the above-noted sub-watersheds has been depicted in Figure 5-1. Based on the study area limits, approximately 2.7 ha is tributary to the Jock River (via Quinn's Pointe while an area of approximately 68 ha is tributary to Mud Creek. It is noted that although the Spence Branch of the Thomas Baxter Municipal Drain (shown at the bottom of Figure 5-2) is mapped by the City of Ottawa as Municipal Drain, it was not found during site observations. All flows appear to go to the Dynes Branch west of Borrisokane Road.

The investigations completed by Arcadis, the Team's biologist, did not identify any formal conveyance channels within the S1 Area. The absence of channels or formal watercourses was confirmed by the LiDAR data. The absence of such waterways is generally indicative of areas exhibiting particularly low surface runoff potential. As a result, runoff generated from the site is carried as overland sheet flow to the natural low points at the culvert outlet locations.

5.2 Water Crossings

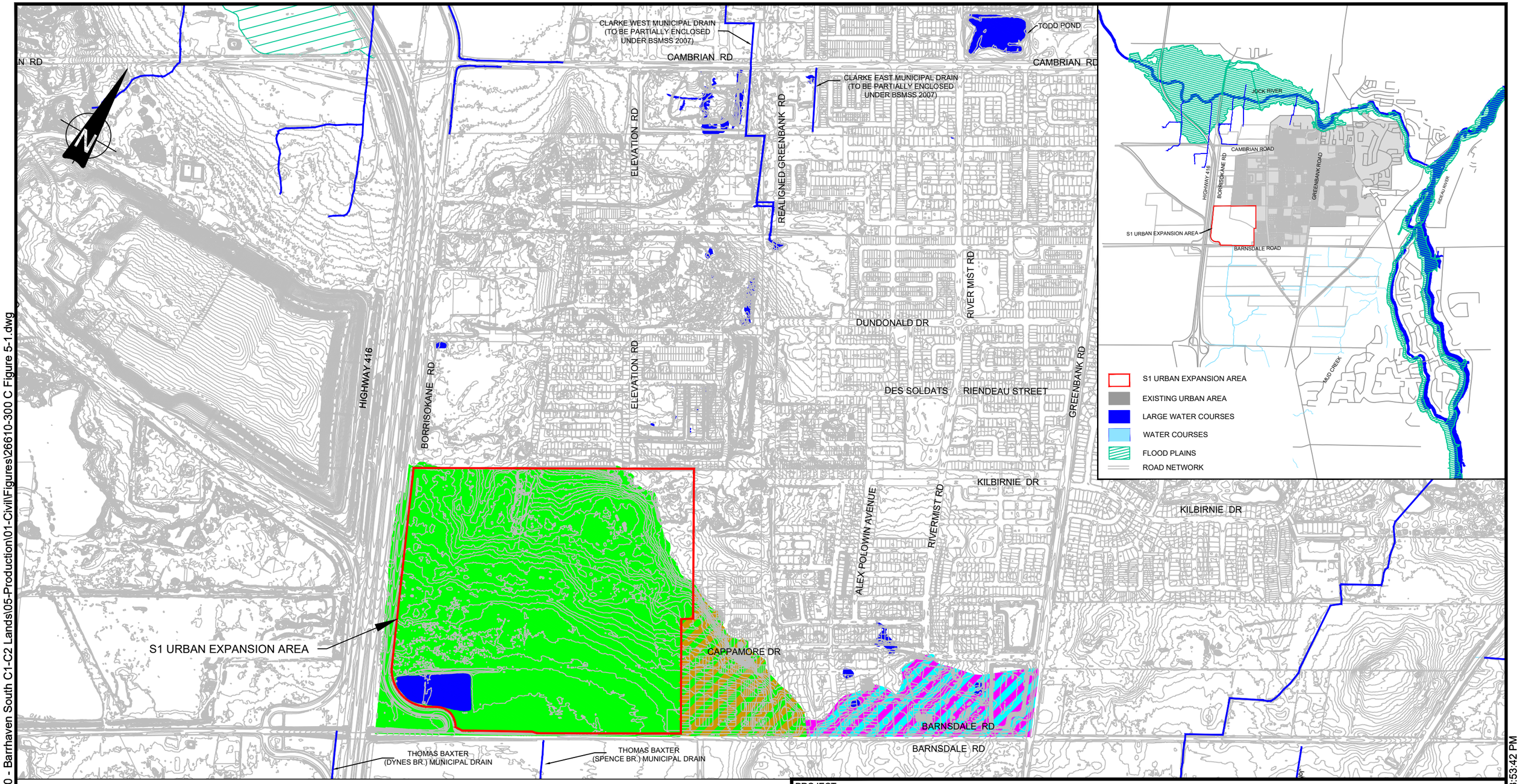
A total of thirteen culvert crossings were inventoried as part of the 2017 Exiting Conditions for the BSUEA. Among these culverts, seven (7) culverts were inventoried at the boundary of the S1 Area, which can be grouped into the following two (2) categories:

- Boundary: There are four (4) culvert crossings along the Barnsdale Road boundary of the area being modelled, culvert Ids BDR. Of the four culverts, one (1), BDR-C4, forms the downstream boundary of the modeled area, where overland sheet flow forms a concentrated point flow external to the site.
- Internal to the model: There are three (3) culvert crossings that are internal to the area being modelled. These crossings currently provide conveyance across access routes to property and farmland along Borrisokane Road and have culvert Ids referenced as "CVR".

The inventoried crossings have been summarized in Table 5-1, below, while Figure 5-2 depicts the location of the culvert crossings along with the general site hydrology. It should be noted that none of the inventoried water crossings are within the S1 Area limits, except for CVR-C2 and CVR-C3, that are located along Borrisokane Road and adjacent to the man-made impoundment pond. Additionally, no documented culvert change was received nor did the "geoOttawa" platform indicate a new crossing. Therefore, all the culverts listed are unchanged since the assessment of existing conditions in 2017.

Table 5-1: Inventory of Model Boundary Water Crossings

Culvert ID	Location	Type	Size (mm)
CVR-C2	East of Borrisokane Road at Field Entrance	Circular CSP	450
CVR-C3	East of Borrisokane Road at Field Entrance	Circular CSP	400
CVR-C4	Borrisokane Road Crossing north of Barnsdale Road	Circular CSP	1200
BDR-C1	Viewbank Road Crossing	Circular CSP	400
BDR-C2	Field Entrance Crossing South of Barnsdale Road	Circular CSP	400
BDR-C3	Field Entrance Crossing South of Barnsdale Road	Circular CSP	500
BDR-C4	On Barnsdale Road, 50 m west of Borrisokane Road	Circular CSP	1200



LEGEND

- S1 URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- WATERCOURSE/ MUNICIPAL DRAINS
- AGGREGATE EXTRACTION AREA
- TRIBUTARY AREA TO JOCK RIVER SUBWATERSHED
- TRIBUTARY AREA TO MUD CREEK SUBWATERSHED
- PRE-DEVELOPMENT EXTENTS TRIBUTARY TO RIDEAO RIVER REDIRECTED TO JOCK RIVER SUBWATERSHED WITH URBANIZATION
- CATCHMENT AREA TO HYDROLOGIC BOUNDARY CONTROL POINTS
- WATER BODIES
- FLOOD PLAIN
- PRE-DEVELOPMENT EXTENTS TRIBUTARY TO MUD CREEK REDIRECTED TO JOCK RIVER SUBWATERSHED WITH URBANIZATION

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

STUDY AREA & DRAINAGE DIVIDE

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FIGURE 5-1

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PLOT DATE: September 12, 2024 3:53:42 PM

N RD

CAMBRIAN RD

CR–C2

CR–C1

CLARKE WEST MUNICIPAL DRAIN

CLARKE EAST MUNICIPAL DRAIN

CAMBRIAN RD

ELEVATION RD

REALIGNED GREENBANK RD

A1
18.6 ha

A2
35.4 ha

A3
12.7 ha

A4
13.9 ha

CVR–C1

A5
12.7 ha

A6
11.7 ha

A7
15.5 ha

DUNDONALD DR

RIVER MIST RD

JOCKVALE RD

DUNDONALD DR

HIGHWAY 416

BORRISOKANE RD

A8
42.2 ha

DES SOLDATS

RIENDEAU STREET

GREENBANK RD

A9
5.1 ha

KILBIRNIE DR

KILBIRNIE DR

A10
5.5 ha

A13
24.6 ha

ALEX ROLOWIN AVENUE

RIVERMIST RD

CVR–C2

A11
15.2 ha

A12
60.0 ha

CAPPAMORE DR

A14
22.4 ha

CVR–C3

A15
3.5 ha

CVR–C4

A18
0.5 ha

A16
2.9 ha

A17
9.8 ha

BDR–C6

BDR–C4

BDR–C3

BDR–C2

A19
1.01 ha

BDR–C1

A20
4.8 ha

A21
1.5 ha

BDR–C5

BARNSDALE RD

BDR–C7

THOMAS BAXTER MUNICIPAL DRAIN (DYNES BRANCH)

THOMAS BAXTER MUNICIPAL DRAIN (SPENCE BRANCH)

LEGEND

- S1 URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- SURFACE FLOW DIRECTION
- WATERCOURSE
- FORMER AGGREGATE EXTRACTION AREA
- CDR CEDARVIEW ROAD CULVERTS
- CR CAMBRIAN ROAD CULVERTS
- BDR BARNSDALE ROAD CULVERTS

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

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SWMHYMO SITE DRAINAGE PLAN

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FIGURE 5-2

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Table 5-1, above, summarizes the various culvert crossings within the S1 Area. As shown above, all the culverts are 500 mm in diameter or less except for CVR-C4 and BDR-C4, which are 1200 mm in diameter.

5.3 Watershed Delineation

Catchment areas within the S1 Area have been delineated based on LiDAR data compiled on behalf of the City of Ottawa, as well as any surface infrastructure such as roads, which tend to form a drainage path barrier, and culverts, where flow will concentrate into a point source. The delineated catchment areas are split by the two (2) watershed areas noted above: Jock River to the east via the Quinn's Pointe Subdivision systems, Mud Creek to the south via the Thomas Baxter Municipal Drain. The catchment areas are summarized in Table 5-2 and are shown in Figure 5-2. The delineation of the watersheds in 2017 was undertaken with the 2015 LiDAR provided at the time of the report.

Table 5-2: Subcatchment Summary

Watershed	Downstream Culvert	Catchment ID	Area (ha)
Jock River	Overland Flow	A13	24.6
	Subwatershed Total		**24.6**
Mud Creek	CVR-C2	A10	5.5
	CVR-C3	A11	15.2
	CVR-C4	A12	60.0
	BDR-C4	A15	3.5
	Subwatershed Total		**84.2**
Total			**108.8**

5.4 Hydrological Modelling

5.4.1 Model Parameters

An understanding of the existing conditions, in terms of expected flow rates and capacity of the culverts, is normally assessed with an existing conditions hydrological model. To simulate the hydrological response of a given area, a hydrologic model should, ideally be calibrated, to actual monitored flows to ensure a true representation of the physical characteristics of the catchment area during the recorded storm events. To determine flows to the culvert BDR-C4 on Barnsdale Road at the downstream end of the S1 Area draining to Mud Creek, via the Municipal Drain, the approved model developed as part of the 2017 BSUEA Existing Conditions Report was utilized as reflecting the existing conditions for the S1 Area.

The existing conditions model in 2017 was developed based on generally accepted standard hydrological parameters (per the OSDG, MTO Drainage Manual and SWMM5 Guide) that fairly represent the land use, soil characteristics, types of flow paths, and topography.

CAMBRIAN RD

CAMBRIAN RD

HIGHWAY 416

ELEVATION RD

REALIGNED GREENBANK RD

BORRISOKANE RD

ELEVATION RD

A1

A2

A3

A4

A5

A6

A7

A8

A9

A10

A11

A12

A13

A14

A15

A16

A17

A18

A19

A20

A21

DUNDONALD DR

RIVER MIST RD

DES SOLDATS

RIENDEAU STREET

GREENBANK RD

JOCKVALE RD

DUNDONALD DR

KILBIRNIE DR

KILBIRNIE DR

ALEX POLOWIN AVENUE

RIVERMIST RD

CAPPAMORE DR

BARNSDALE RD

BARNSDALE RD

S1 URBAN EXPANSION AREA

URBAN BOUNDARY

LEGEND

- S1 URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- PARCEL
- AGRICULTURAL LANDS
- BUILDING
- GRASS
- GRAVEL
- PASTURE
- PAVEMENT
- POND
- UNIMPROVED LAND
- WOODLAND

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

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SWMHYMO LAND COVER

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5.4.2 Storm Distribution

The hydrological response of the S1 Area and abutting lands was simulated under a 6-hour, 12-hour, and 24-hour SCS Type II storm distribution. The SCS Type II storm distribution was developed by the American Soil Conservation Service and is generally used for estimating flows in rural areas. The critical storm event under pre-development conditions, with the highest peak runoff, was found to occur under the 12-hour SCS Type II storm distribution.

5.5 Modelling Results

The subject site was modeled using the SCS Curve Number (CN) methodology to simulate runoff. The CN number is selected based on the soil types in the area and the land cover, which in this case is predominately rural in nature with either agricultural or woodlot classifications. The site consists of 'unimproved lands', which consist of lands that are undeveloped open space with no current use. This classification was also used for the quarry areas. Land uses for the model area are shown in Figure 5-3, while a summary of the hydrological parameters is shown in Table 5-3.

Table 5-3 - Model Parameter Summary

Drainage Area ID	Area (ha)	CN*	Initial Abstraction (mm)	Time to Peak (hrs)
A10	5.5	55	14.4	0.27
A11	15.2	55	14.4	1.27
A12	60.0	51	16.9	0.95
A13	24.6	52	16.2	0.5

The soil types in the area are predominately soils with high infiltration and low runoff potential, even when saturated. Soil types by geotechnical description are depicted in Figure 5-4.

The model schematic is contained in Appendix B2 which also includes a detailed description of all the model parameters, including Time to Peak, Initial Abstraction, etc. (refer to Appendix B2).

The pre-development simulation results from the 2017 modelling, predicting flows at each of the culverts for the critical storm event, are shown in Table 5-4, below. The estimated capacity and level of service of each culvert is also provided.

Table 5-4: Hydrological Simulation Results at Culvert Locations (12-hour SCS Type II storm)

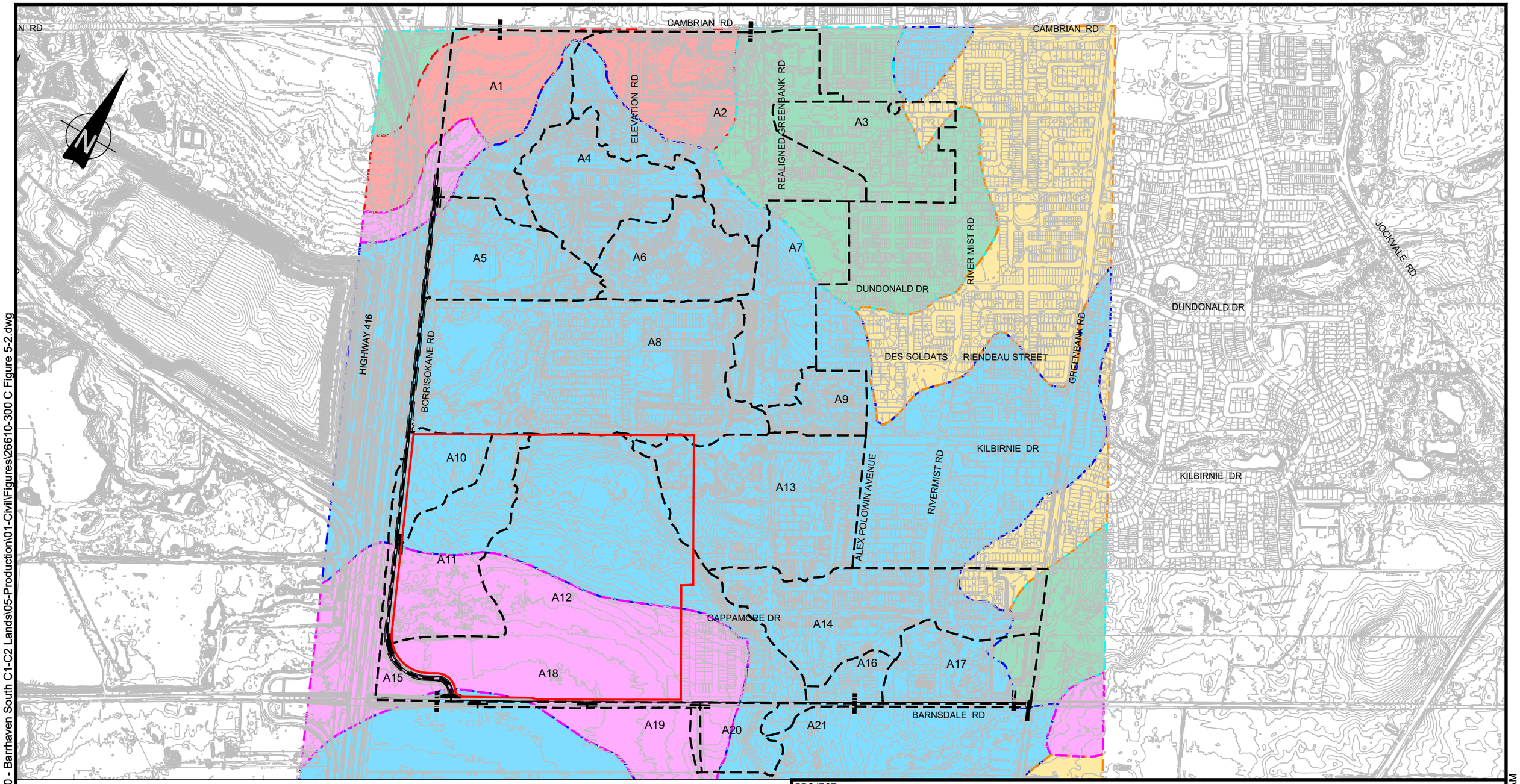
Culvert ID	Flow (m^3/s) at culvert location for 1:25 yr	Flow (m^3/s) at culvert location for 1:50 yr	Flow (m^3/s) at culvert location for 1:100 yr	Estimated Culvert Capacity (m^3/s)	Estimated Level of Service (years)
CVR-C2	0.2	0.2	0.3	0.2	1:25
CVR-C3	0.2	0.3	0.4	0.3	1:50
CVR-C4	0.9	1.1	1.4	2.6	1:100
BDR-C1	0.1	0.1	0.2	0.2	1:100
BDR-C2	0.1	0.2	0.2	0.2	1:50
BDR-C3	0.2	0.2	0.3	0.5	1:100
BDR-C4	0.9	1.2	1.5	2.6	1:100
Total to Municipal Drain	1.1	1.3	1.6	N/A	N/A

The model results noted above show relatively low flow rates at each of the culverts, due to the high infiltration capability of the native soils in the area and the low impervious ratio. In general, during larger and infrequent events, runoff will increase as the infiltration capability decreases due to saturation of the soils.

Culvert BDR-C4 crosses the main boundary road of the S1 Area and was found to have a high estimated level of service (more than 1:100 years). Since Barnsdale Road is classified as an arterial or collector road, the culvert would be expected to have a higher level of service compared to the internal culverts to the site or under access roads south of Barnsdale Road.

5.6 Hydraulics and Floodplain Mapping

Similar to the findings included in the BSUEA Existing Conditions Report (JLR, 2017), there are no well-defined watercourses on-site as shown on the LiDAR which are significant enough to warrant a hydraulic analysis or to prepare floodplain mapping. Flow conveyance for most of the subject site occurs by means of overland sheet flow, and flow in small, intermittent swales/channels. The floodplain of the Jock River subwatershed extends close to the site but remains within the northwestern quadrant of the Cambrian Road / Borrisokane Road intersection (Figure 5-1). The floodplain of Mud Creek does not extend close to S1 Area.



LEGEND

- S1 URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- SURFACE FLOW DIRECTION
- HSG A
- HSG AB
- HSG B
- HSG BC
- HSG C

HSG = HYDROLOGIC SOIL SETUP

NOTE: SOIL GROUPS DEFINED FROM A VARIETY OF GEOLOGICAL SOIL MAPPING SOURCES

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

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SOILS IN SWMHYMO MODEL

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6.0 Water Budget

The water budget of a given area is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces, or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. The analysis of the water budget is often carried out to establish the baseline condition and assess any future changes in infiltration to subsurface water-bearing zones and, consequently, to surface runoff resulting from a significant land cover modification such as urbanization. The analysis It is also used to predict changes to the hydrological cycle that will result from urbanization of lands. In simple terms, the general water budget assesses the change in water storage resulting from the difference in water inputs and outputs for a given area or watershed. To estimate the water budget, the following simplified equation is used:

$$P = ET + SW + GW + \Delta S$$

Where:

- P is precipitation;
- ET is evapotranspiration;
- SW is surface runoff;
- GW is groundwater; and
- ΔS is the difference in water storage.

As a fundamental requirement, the water budget developed for the existing conditions will be used as the baseline condition when assessing the effectiveness of any stormwater management (SWM) servicing strategies under the post-development condition Future SWM strategies should adhere to the recent provincial guidance from the MECP (MOECC) in their publication entitled “Expectation interpretation bulletin, February 2015”, as well as relevant provincial policy statement. In addition, the servicing of the site will require to adhere to the criteria for pre-authorized alteration to the City of Ottawa’s CLI-ECA (issued December 19, 2024), which has water recharge requirements. The 2024 Infrastructure Master Plan (IMP) and Official Plan has policies which require water balance assessments and runoff volume control targets to be assessed. One of the objectives of the upcoming Master Servicing Study for the S1 Area will be to develop a storm servicing strategy that will incorporate mitigation measures to minimize the water deficit to offset the potential impact of urbanization.

6.1 Continuous Modelling

An understanding of the water budget within a given study area can be gained using a continuous hydrological model. The Toronto and Region Conservation Authority (TRCA), in their publication entitled “Stormwater Management Criteria, August 2012”, recommend the use of a continuous model such as QUALHYMO or PCSWMM. A continuous simulation model is being implemented at this stage to facilitate assessment of implementation of infiltration processes integrated into the site development.

The PCSWMM model to be used for this study includes simplified groundwater and snowmelt modules that allow the continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall, and snowmelt. Due to its capabilities and versatility, the PCSWMM modeling tool will also be used to assess the

impact of development and effectiveness of the proposed Low Impact Development (LID) measures.

6.1.1 Infiltration Parameters

Saturated field hydraulic conductivity of the surficial soils for the S1 Area was measured in the field by Paterson during their site visits between May and October 2022. Field measurements of infiltration were by means of permeameter testing at depths between 0.5 m and 0.7 m below ground surface. Paterson have delineated six (6) zones of infiltration across the site varying in three (3) infiltration rate ranges. The infiltration rate ranges are from 30 to 50 mm/hour, 50 to 100 mm/hour and greater than 100 mm/hour, without application of any safety factor.

The median of each range has been applied as the representative infiltration rate and applied to the Horton Maximum Infiltration Rate in the model on a spatially weighted basis across the delineated subcatchments. Table 6-1, below, summarizes the various ranges of saturated field hydraulic conductivities and their corresponding range of maximum infiltration rates as well as the selected final infiltration coefficient used in the water budget model. In the previous BSUEA analysis, it was carried out using the minimum, median, and maximum values and the results indicated that there was negligible difference in the results within the range of infiltration values. The BSUEA simulation showed that only during the infrequent large peak rainfall events will infiltration be affected by the change in the parameter values. Therefore, the selection of the median value for the parameters for this analysis is suitable.

A decay constant, k, of 4.14 hr^{-1}, was used in the SWMM model to mimic the decreasing infiltration capacity of the soil over time during wet weather events.

It should be noted that since the water balance modelling was completed in 2017 for the BSUEA, the EPA SWMM 5.2 simulation engine was updated to allow seasonal adjustments to the infiltration capacity of soils over long term simulations. The adjustment to prevent infiltration during the winter period is consistent with the approach in the Thornthwaite Mather calculation method and is representative of frozen ground conditions present during the winter months. The extent of infiltration in a month has been prorated with the Environment Canada climate normals based on number of days with a minimum temperature below freezing as a general indication of likely infiltration. The infiltration monthly multipliers and days below freezing are provided in Table 6-2.

Table 6-1: Horton Coefficients for Water Budget Model

Range of Unfactored Infiltration Rates	Horton Maximum Infiltration Rate (mm/hr)	Estimated Soil Groupings (based on infiltration values)[1]	Horton Minimum Infiltration Rate (mm/hr)[1]	Selected Final Infiltration Coefficient (mm/hr)
30 - 50	40	Moist Loam Soils	3.8 - 7.6	3.8
50 - 100	75	Moist Loam soils	3.8 - 7.6	7.6
>100	100	Moist to Dry Sandy Soils	7.6 – 11.4	11.4

[1] Akan, A. O., *Urban Stormwater Hydrology: A Guide to Engineering Calculations.* Lancaster: Technomic Publishing Co., Inc., 1993 (extract contained in Appendix B2).

Table 6-2: Seasonal Infiltration Pattern

Month	Days with Minimum Temperature Below 0°C	SWMM Infiltration Pattern Multiplier
January	29.8	0.0
February	27.1	0.1
March	26.2	0.2
April	11.9	0.6
May	0.43	1.0
June	0	1.0
July	0	1.0
August	0	1.0
September	0.18	1.0
October	5.6	0.8
November	18.1	0.4
December	27.8	0.1

6.1.2 Precipitation and Evaporation

The water budget model was simulated under continuous mode using precipitation data from the Environment Canada weather stations at the Experimental Farm in Ottawa (approximately 15 km from the S1 Area). Twenty (20) years of hourly data, between April 19, 2004, and April 10, 2024, was used to undertake the water budget analysis. The average annual rainfall during this period was 864 mm, while maximum and minimum daily temperatures from the same weather stations and time period were also used.

The model undertakes evaporation calculations based on average monthly rates of evaporation (as reported by Environment Canada, refer to Section B2.3) and from the available standing water that is “trapped” in natural depressions within the subcatchment surfaces as a result of the initial abstraction depth.

6.1.3 Groundwater

The PCSWMM software platform analyzes groundwater flow for each of the simulated subcatchments independently. The model represents the subsurface region below a subcatchment as an unsaturated upper zone that lies above a lower saturated zone. The elevation of the lower saturated zone, the water table, varies in time depending on the rates of flow into and out of the lower saturated zone. The flow to the lower saturated zone is controlled by percolation, which is dictated by the soil characteristics, which is often represented by measured data. The upper unsaturated zone receives water via infiltration from surface runoff. Evapotranspiration occurs from the upper unsaturated zone; it can also occur from the lower saturated zone, depending on root depth. If the water table, or elevation of the lower saturated zone, reaches the surface level then all the soil becomes saturated, and infiltration will no longer occur.

For the purposes of modelling the project's water budget under existing condition, subcatchments were delineated by each hydrologic soils group (HSG) reflecting Paterson's characterization of the S1 Area as described in their Geotechnical/Hydrogeological Investigation. The soil parameters associated with each HSG are detailed in Appendix B3. It should be noted that these parameters are those that have been reviewed and approved by both the RVCA and City of Ottawa as part of the 2017 Existing Conditions Report.

6.1.4 Snowmelt

Snowmelt is an additional mechanism by which runoff may be generated in a continuous simulation model depending on the temperature. The current PCSWMM software platform utilizes the Canadian SWMM snowmelt routines with extensions for long term continuous modelling.

Snowfall rates are determined directly from hourly precipitation data by using a pre-set temperature: snowfall will occur when the temperature is below the pre-set point and rainfall will be triggered when above it. Snowmelt is handled differently by PCSWMM, depending on the occurrence of rainfall. During rain on snowmelt events, the model accounts the rainfall intensity and the air temperature as well as the saturation vapor pressure. When snowmelt occurs without any rainfall, the snowmelt is linearly proportional to the air temperature, which varies with the user supplied melt coefficients. The parameters used in the snowmelt module are detailed in Appendix B3. It should be noted that these parameters are those that have been reviewed/approved by both the RVCA and City of Ottawa as part of the 2017 Existing Condition reviewed and approved by both the RVCA and City of Ottawa as part of the 2017 Existing Conditions Report.

For the existing conditions model, it has been assumed that all snow occurs on pervious land cover given that it does not include any impervious surface which means that there is no snow removal.

6.1.5 Southwest Pond

The continuous simulation model extent includes the existing man-made pond in the south-west corner of the site. The pond forms a low point on the site which means that all flow contributing to the pond is infiltrated or evaporated until it reaches a spill elevation, estimated to be around 300mm above the natural water level. The pond has been included in the model using the LID components in the SWM Engine as this allows the infiltration from the pond to be included in the hydrology rather than a hydraulics component. Note that the seasonal infiltration pattern does not apply to LID components and therefore the infiltration is conservative for the existing condition as infiltration will occur in the pond in the model during the winter months.

Table 6-3: LID Parameter Summary

LID Parameter	Value	Notes
Berm Height (mm)	300 mm	Consistent with total ponding depth in pond
Vegetation Volume (fraction)	0	Ignored for the pond
Surface Roughness (Manning's n)	0	Not used for the pond

LID Parameter	Value	Notes
Surface Slope (%)	0	Not used for the pond
Storage Height (mm)	1	Necessary to incorporate a storage layer
Void Ratio	0.99	Maximum allowable but minimum impact on results
Seepage Rate (mm/hr)	42.265	Consistent with infiltration rates provided by Paterson and spatially weighted across the pond catchment.
Clogging Factor	0	No clogging assumed
Underdrain Drain Coefficient	0	No underdrain applied

6.2 Continuous Simulation Results

A long-term simulation was carried out for the median of each of the infiltration ranges of each block defined by Paterson in their Geotechnical/Hydrogeological Investigation. The continuous simulation results have been summarized for each of the three (3) subwatersheds as shown in Table 6-4, below. Note that the Rideau River does not receive any runoff from the S1 Area, but infiltrated rainfall does contribute to the groundwater catchment for the receiver. This is reflected in the results in the table.

Table 6-4: Water Budget Continuous Simulation Results

Annual Water Budget Component	Annual Average Depth to Jock River (mm)	Annual Average Depth to Mud Creek (mm)	Annual Average Depth to Rideau River (mm)	Area Weighted Total (mm)	Budget %
Precipitation	864	864	864	864	100%
Evapotranspiration	509	531	509	513	59%
Infiltration	296	314	286	297	34%
Surface Runoff	83	60	0	61	7%

Based on the above long-term simulation results, infiltration accounts for approximately 34% of the total annual precipitation of 864 mm, while surface runoff accounts for approximately 7% on a yearly average.

The 2017 BSUEA found that infiltration accounted for 40% of the water budget, however this did not include the seasonal infiltration pattern nor the existing pond. With these changes the value of 34% appears to be consistent with the previous results.

7.0 Existing Infrastructure and Servicing Summary

7.1 General

A detailed review of existing and planned infrastructure in the vicinity of the BSUEA was carried out as part of the Existing Conditions Report (JLR, 2017). A subsequent review was conducted as part of JLR's 2021 MSS Addendum which included more recent information associated with the former aggregate extraction parcels (Brazeau and Drummond properties).

As part of this Existing Conditions Report, the review of the most up to date information for recent developments was undertaking (refer to Section 3.0 for details).

In light of the above, Section 7.2 to 7.4 is an updated review of linear infrastructure in the vicinity of the S1 Area and BSUEA.

7.2 Trunk Wastewater Servicing

The existing and planned sanitary sewer systems located easterly and northerly from the proposed S1 Area were reviewed to identify potential connections points, if any, with available residual capacity, gravity connection, and opportunities and constraints for sewer extensions.

As previously noted, the sanitary design sheet, initially developed as part of the BSUEA MSS, and further revised as part of the design for the Quinn's Pointe Stages 2-4 and the 2019 Serviceability Study was used to assess residual capacity along the downstream sanitary sewer system.

This assessment was updated to reflect the latest design information supplied by the city for the development within the Brazeau, Drummond, ABIC lands, Meadows and Mattamy subdivisions. Additionally, the Master Design Sheet was revised to account for the latest peak wastewater flows from the S1 Lands (prepared by JLR) and S2 Lands (obtained from Arcadis), which located in the northeast quadrant of the Greenbank Road/Barnsdale Road intersection. The above information was reviewed to update the populations and was used to calculate sanitary peak flows and identify residual capacities along the downstream system. The Master Sanitary Design Sheet (refer to Appendix B4) and Master Sanitary Drainage Plan (Figure 7-1) was used to assess available residual capacities. The wastewater servicing trunk network along the northern and eastern perimeter of the S1 Area is as shown on Figure 7-2.

Servicing for the Brazeau and ABIC Lands consists of local 200 mm diameter sanitary sewers which eventually discharge into 300 mm and 375 mm diameter sanitary sewers on Haiku Steet and Dundonald Drive respectively. The 375 mm sanitary sewer on Dundonald Drive outlets into the 375 mm diameter trunk sanitary sewer along the Realigned Greenbank Road corridor, which in turn outlets into the Cambrian Road trunk sanitary sewers (500 mm and 750 mm in diameter). These sanitary sewers are currently existing as displayed on "geoOttawa" and have been depicted on Figure 7-2.

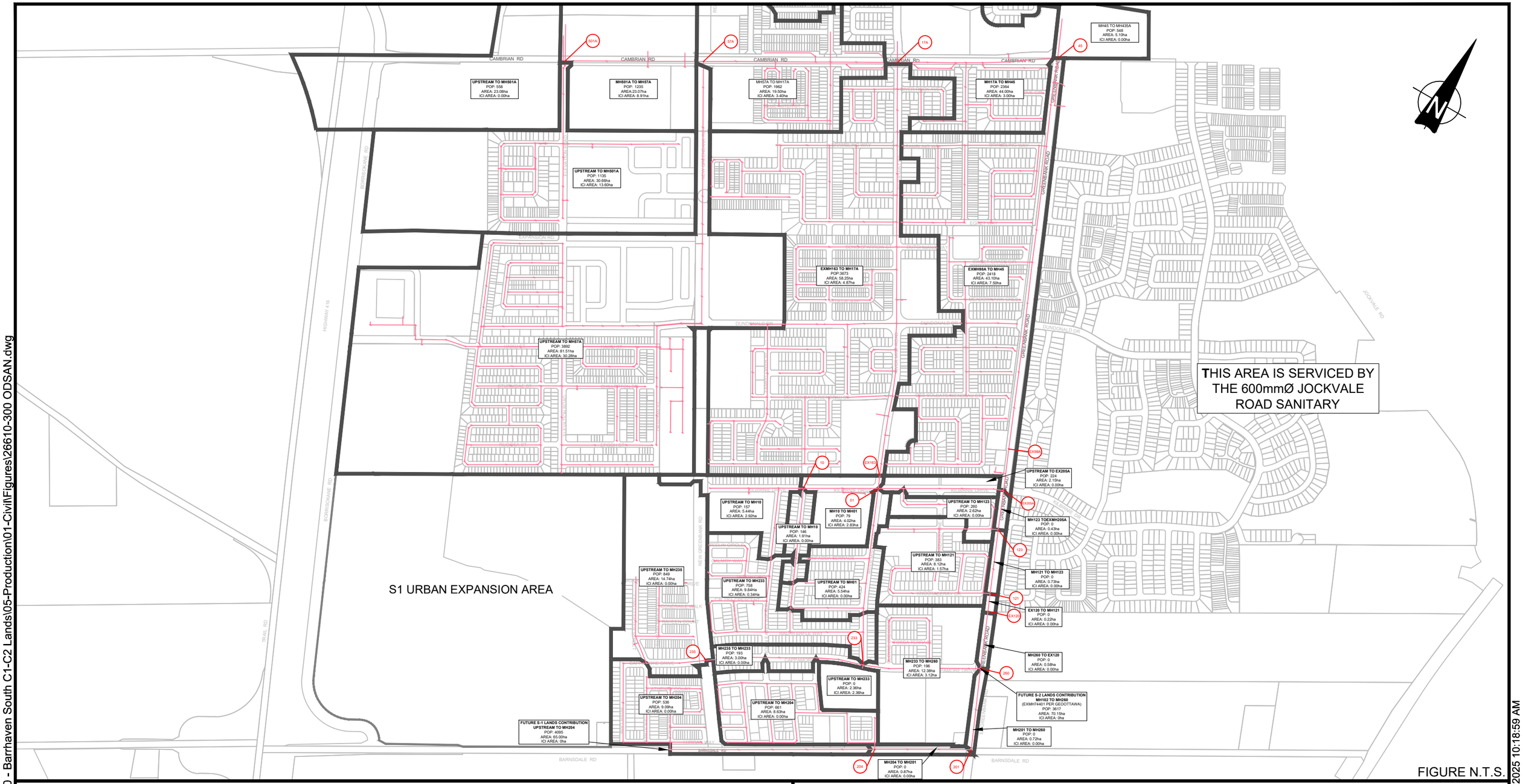
Servicing for the Drummond Lands consists of a local 200 mm diameter sanitary sewer system flowing northerly along Elevation Road where it merges into a shared sanitary sewer system within the Tamarack subdivision and eventually discharges into the Cambrian Road 500 mm diameter trunk sanitary sewer. The eastern portion of the Lands is serviced by a local sanitary

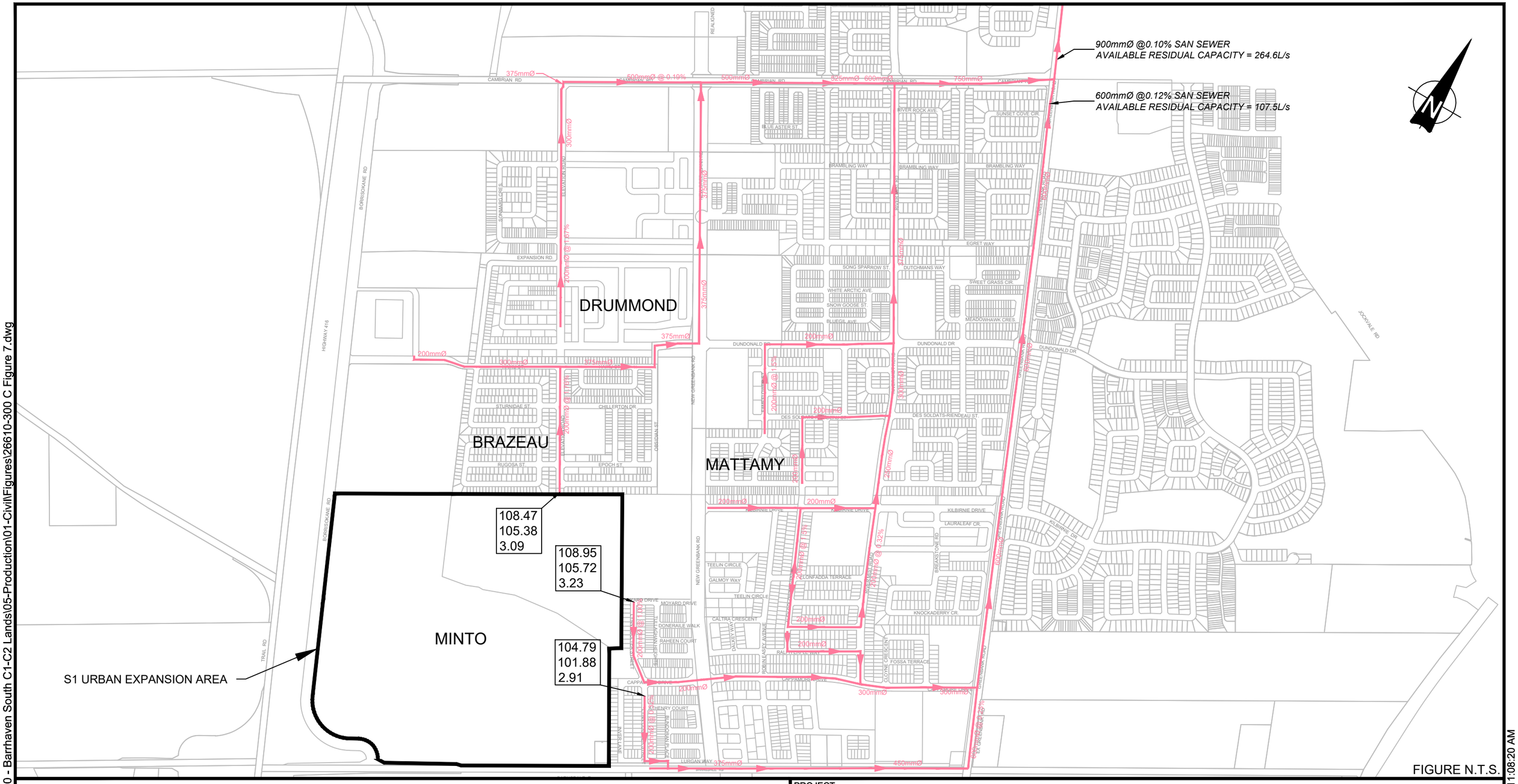
sewer that discharges into a 375 mm diameter trunk sanitary sewer along the Realigned Greenbank Road corridor, which flows northerly until discharging to the Cambrian Road 500 mm diameter sanitary sewer system. From this confluence, wastewater flows are conveyed easterly by the Cambrian Road 500 mm/600 mm/750 mm diameter trunk sanitary sewers until discharging into the Greenbank Road 900 mm diameter trunk sanitary sewer. These sanitary sewers are all existing as displayed on “geoOttawa” and have been depicted on Figure 7-2.

Based on the review of the residual capacity and elevation of the above-noted outlets, none of the sanitary sewers can provide a gravity connection with sufficient residual capacity to accommodate wastewater flows from the future S1 Area.

The latest wastewater servicing strategies developed for the Quinn’s Pointe Subdivision (Stages 2-5) were also reviewed. These strategies consisted of the following four (4) sanitary sewer outlets connecting to the existing Greenbank Road trunk sanitary sewers:

1. A connection to the most southern section of the Greenbank Road 600 mm diameter trunk sewer via the Barnsdale Road 375/450 mm trunk sanitary sewer.
2. A connection to the Greenbank Road 600 mm diameter trunk sanitary sewer via the Cappamore Drive 200/300 mm diameter trunk sanitary sewer.
3. A connection to the Greenbank Road 900 mm diameter trunk sanitary sewer via the River Mist trunk sanitary sewer (200 mm to 375 mm diameter) and Cambrian Road trunk 750 mm diameter sanitary sewer.
4. A connection to the Greenbank Road 600 mm diameter trunk sanitary sewer via the Kilbirnie Road 200 mm diameter sanitary sewer.


UPSTREAM TO MH501A
POP: 558
AREA: 23.08ha
ICI AREA: 0.00ha
MH501A TO MH57A
POP: 1235
AREA:23.07ha
ICI AREA: 8.91ha
MH57A TO MH17A
POP: 1962
AREA: 19.50ha
ICI AREA: 3.40ha
MH17A TO MH45
POP: 2364
AREA: 44.00ha
ICI AREA: 3.00ha
MH45 TO MH435A
POP: 548
AREA: 5.10ha
ICI AREA: 0.00ha
UPSTREAM TO MH501A
POP: 1135
AREA: 30.66ha
ICI AREA: 13.60ha
EXMH163 TO MH17A
POP:3673
AREA: 58.20ha
ICI AREA: 4.87ha
EXMH95A TO MH45
POP: 2418
AREA: 43.10ha
ICI AREA: 7.50ha
UPSTREAM TO MH57A
POP: 3892
AREA: 81.51ha
ICI AREA: 30.28ha
THIS AREA IS SERVICED BY THE 600mmØ JOCKVALE ROAD SANITARY
UPSTREAM TO EX205A
POP: 224
AREA: 2.19ha
ICI AREA: 0.00ha
UPSTREAM TO MH10
POP: 157
AREA: 5.44ha
ICI AREA: 2.92ha
MH10 TO MH01
POP: 79
AREA: 4.02ha
ICI AREA: 2.83ha
UPSTREAM TO MH123
POP: 260
AREA: 2.62ha
ICI AREA: 0.00ha
MH123 TOEXMH205A
POP: 0
AREA: 0.43ha
ICI AREA: 0.00ha
UPSTREAM TO MH10
POP: 146
AREA: 1.91ha
ICI AREA: 0.00ha
UPSTREAM TO MH121
POP: 283
AREA: 8.12ha
ICI AREA: 1.57ha
UPSTREAM TO MH235
POP: 840
AREA: 14.74ha
ICI AREA: 0.00ha
UPSTREAM TO MH233
POP: 758
AREA: 9.84ha
ICI AREA: 0.34ha
UPSTREAM TO MH01
POP: 424
AREA: 5.54ha
ICI AREA: 0.00ha
MH121 TO MH123
POP: 0
AREA: 0.73ha
ICI AREA: 0.00ha
EX120 TO MH121
POP: 0
AREA: 0.22ha
ICI AREA: 0.00ha
MH235 TO MH233
POP: 193
AREA: 3.00ha
ICI AREA: 0.00ha
MH233 TO MH260
POP: 196
AREA: 12.38ha
ICI AREA: 3.12ha
MH260 TO EX120
POP: 0
AREA: 0.58ha
ICI AREA: 0.00ha
UPSTREAM TO MH233
POP: 0
AREA: 2.36ha
ICI AREA: 2.36ha
UPSTREAM TO MH204
POP: 536
AREA: 9.09ha
ICI AREA: 0.00ha
UPSTREAM TO MH204
POP: 661
AREA: 8.63ha
ICI AREA: 0.00ha
FUTURE S-2 LANDS CONTRIBUTION MH102 TO MH260
(EXMH74401 PER GEOOTTAWA)
POP: 3617
AREA: 70.19ha
ICI AREA: 0ha
FUTURE S-1 LANDS CONTRIBUTION UPSTREAM TO MH204
POP: 4095
AREA: 65.00ha
ICI AREA: 0ha
MH201 TO MH260
POP: 0
AREA: 0.72ha
ICI AREA: 0.00ha
MH204 TO MH201
POP: 0
AREA: 0.87ha
ICI AREA: 0.00ha
S1 URBAN EXPANSION AREA
CAMBRIAN RD
GREENBANK ROAD
BORRISOKANE RD
HIGHWAY # 416
JOCKVALE RD
DUNDONALD DR
NEW GREENBANK RD
BARNSDALE RD
TRAIL RD
EXPANSION RD
KILBRENNIE DRIVE
KILBRENNIE CRES
KILBRENNIE HOLLOW
KILBRENNIE WAY
KILBRENNIE PLACE
KILBRENNIE GROVE
KILBRENNIE CIRCLE
KILBRENNIE WALK
KILBRENNIE COURT
KILBRENNIE GATE
KILBRENNIE PARK
KILBRENNIE MEWS
KILBRENNIE CRT
KILBRENNIE TERRACE
KILBRENNIE GLEN
KILBRENNIE LANE
KILBRENNIE PATH
KILBRENNIE RIDGE
KILBRENNIE VIEW
KILBRENNIE CRESCENT
KILBRENNIE GREEN
KILBRENNIE HEIGHTS



LEGEND

- EXISTING SANITARY SEWER
- PLANNED SANITARY SEWER

98.45
91.77
6.7
EXISTING GROUND (±)
SANITARY SEWER OBVERT
COVER DEPTH (m)

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

EXISTING AND PLANNED SANITARY SERVICING INFRASTRUCTURE

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CHECKED:	GF
JLR #:	26610-300

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FIGURE 7-2

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PLOT DATE: September 19, 2024 11:08:20 AM

Based on the above-noted servicing strategies, servicing outlets described under Item no. 2 to Item no. 4 do not have residual capacity to accommodate any of the S1 Area. Thus, wastewater flows from the S1 Area would need to be accommodated by the servicing connection to the Greenbank Road 600 mm diameter trunk sewer via the 375/400 mm trunk sanitary sewer on Barnsdale Road.

The above-noted sanitary sewers and connections are displayed on Figure 7-2.

7.2.1 Sanitary Sewer Outlet

The potential outlets noted in Section 7.1 revealed that the infrastructure within the existing Quinn's Pointe Subdivision (Servicing Strategy No. 1) could potentially serve as an outlet and accommodate the wastewater flows from the S1 Area. Thus, only the Barnsdale Road 375 mm diameter trunk sanitary sewer has residual capacity to accommodate part or all the S1 Area at Stub 2 (west of MHSAN77189 per geoOttawa).

7.2.1.1 Planned Trunk Sanitary Sewer

To provide an outlet connection from the S1 Area to an existing trunk sanitary sewer, a westerly extension of the Barnsdale Road 375 mm diameter sanitary sewer could provide the necessary capacity, from Stub 2 (west of MHSAN77189 per geoOttawa) to the southeast limit of the S1 Area. This extension, not shown on Figure 7-2, will be reviewed as part of the upcoming Master Servicing Study.

7.2.1.2 Available Capacities

The available capacity along the existing Barnsdale Road 375 mm diameter trunk sanitary sewer was reviewed to assess whether the system could service additional lands outside of the Quinn's Pointe Subdivision. To complete this task, the design sheets prepared to support the detailed design of the Quinn's Pointe Stages 2-4 and future Stage 5 were reviewed to identify the limiting pipe reach in terms of available residual capacity. This review showed that the limiting residual capacity along the Barnsdale Road trunk sanitary sewer was pipe reach MH 203 to MH 202 as shown in Table 7-1, below.

In parallel to the above, a similar task was completed to assess the limiting sewer reaches further downstream. To complete this review, the Master Sanitary Design Sheet prepared as part of the BSUEA MSS and further refined as noted in Section 7.2 (above), which was also revised to reflect the latest design flows for Stages 2-4 and both future S1 and S2 Lands. This review showed that the limiting residual capacity was along pipe reach MH200C to MH45 and pipe reach MH435A to MH501A along the trunk sanitary sewer along Greenbank Road. Details regarding this limiting pipe reach is also included in Table 7-1, below.

Table 7-1: Available Residual Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Limiting Pipe Reach	Residual Capacity (L/s)
Barnsdale Road	MH 203 to MH 202	117.1

Trunk Sanitary Sewer	Limiting Pipe Reach	Residual Capacity (L/s)
Greenbank Road	MH200C to MH45	8.7
Greenbank Road	MH435A to MH501A	95.6

As part of the upcoming MSS, peak sanitary loadings will be calculated for the approved Concept Plan to determine whether the above-noted limiting sewer reaches can accommodate the S1 Area.

7.3 Water Servicing

7.3.1 Existing Federmains

Currently, potable water is supplied to the southerly portion of the existing Barrhaven South Community by several feedermains located to the north and east of the S1 as depicted on Figure 7-3. A brief description of these feedermains follows.

- Greenbank Road 406 mm Diameter Feedermain
  This feedermain extends southerly from the Jock River to the southerly limit of the current Urban Boundary at Barnsdale Road.

- Cambrian Road 406 mm Diameter Feedermain
  This feedermain extends westerly from Greenbank Road to Elevation Road where it is currently capped.

- River Mist Road 305/203 mm Diameter Feedermain
  This feedermain extends the entire length of River Mist Road from River Run Avenue up to the Russett Terrace as a 305 mm diameter and then southerly to Cappamore Drive as a 203 mm diameter watermain.

- Elevation Road 305 mm diameter Feedermain
  This feedermain extends southerly, from Cambrian Road to the southerly limit of the current Urban Boundary within the Ridge Subdivision.

- Obsidian Street 305 mm diameter Feedermain
  This feedermain extends southerly, from Dundonald Drive to the southerly limit of the current Urban Boundary within the Ridge Subdivision.

- Cappamore Drive 305 mm diameter Feedermain
  This feedermain extends westerly within the Quinn's Pointe Subdivision, from Greenbank Road to westerly limit of the current Urban Boundary.

- Barnsdale Road 203 mm diameter feedermain
  Although this 203 mm diameter watermain is a local watermain, it could also act as a feedermain to the southern portion of the S1 Area. Currently, it spans from Greenbank Road westerly to a point east of Inver Lane.

7.3.2 Future Feedermains

As part of the long-term infrastructure needs, future feedermains have been planned but some have not yet been constructed within the current Urban Boundary. These future planned watermains, which have been identified as dashed lines on Figure 7-3.

- Realigned Greenbank Road 305 mm diameter feedermain
  This feedermain is planned to be extended northerly by others, from Kilbirnie Drive to Cambrian Road.

- Cambrian Road 406 mm diameter feedermain
  This feedermain, which is identified in the 2024 Infrastructure Master Plan, is planned to be extended westerly by others, from Elevation Road to Borrisokane Road and then span southerly to connect with the future logistics and commercial lands fronting Borrisokane Road.

Based on the recently issued IMP (June 2024), other watermains have been planned in the South Barrhaven Community that will improve the supply characteristics to the S1 and S2 Lands and increase resiliency. Two (2) watermain projects have been scheduled for implementation between 2029-2034, as follows:

- The Greenbank 610 mm diameter trunk watermain
- The 406 mm diameter trunk watermain along Cambrian Road/Borrisokane Road.

7.3.3 Water Supply and Current Operating Pressures

The Barrhaven South Community is currently being serviced from Pressure Zone BARR which receives its supply from Pressure Zone 2W via the two (2) source transmission mains: The Woodroffe Avenue 1200 mm diameter watermain, from Baseline Road to Fallowfield Road; and the Fallowfield Road 762 mm diameter watermain.

The Barrhaven Reservoir, located adjacent to Fallowfield Road, acts as balancing storage for Zone 2W and feeds the Barrhaven Pumping Station (BPS), which boosts water to the Pressure Zone BARR.

Based on a recent boundary condition request, the current hydraulic grade line (HGL) elevations and corresponding operating pressures under peak hour demand at the connection points with the S1 Area are expected to be around 140 m which would yield pressures between 43 psi to 50 psi. Similarly, under a fire flow condition, the HGL and corresponding pressures would fluctuate between 26 psi to 36 psi depending on the location and the extent of the fire flow requirements.

7.3.4 Zone Reconfiguration and Operating Pressures

Findings presented in the City of Ottawa Water Supply Optimization Study Report (Delcan, 2008) and the Draft 2014 BSMSSA showed that a reconfiguration of pressure zones within the South Urban Community, which includes the S1 and S2 Lands, would eliminate the need for a new booster pumping station, minimize system fragmentation (dead-ends), and generally improve system reliability and operation.

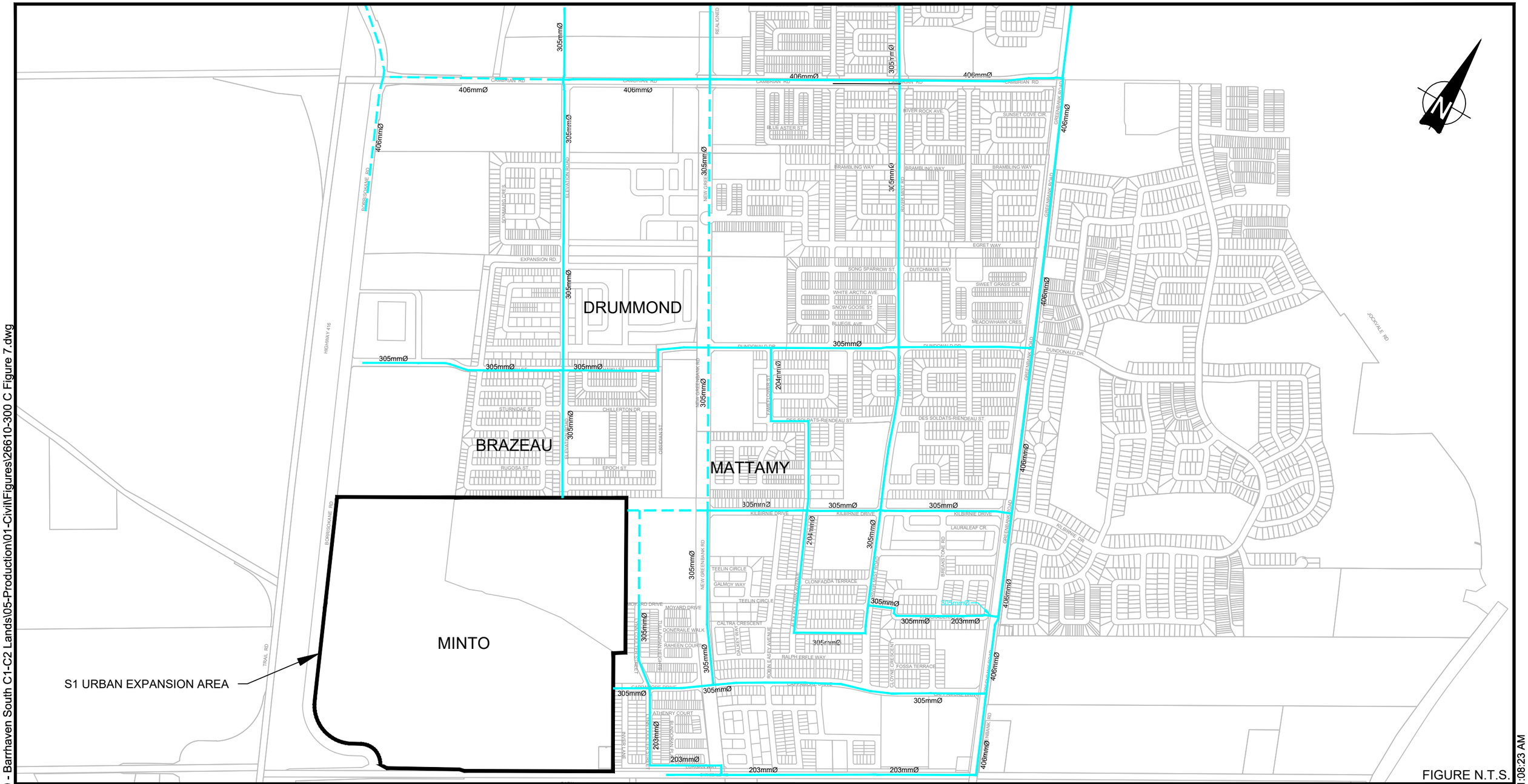

FIGURE N.T.S.

LEGEND

- EXISTING WATERMAIN
- PLANNED WATERMAIN

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

EXISTING AND PLANNED WATER MAIN SERVICING INFRASTRUCTURE

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JLR #:	26610-300

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FIGURE 7-3

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PLOT DATE: September 19, 2024 11:08:23 AM

This recommended zone reconfiguration would consist of an expanded Zone 3C, now being referred as Pressure Zone SUC. Pressure Zone SUC would include the South Barrhaven Community (including the future S1 and S2 Lands) and Gloucester South Community as well as the Airport Lands.

In addition to the implementation of several significant water projects over the next five (5) years, the two (2) watermain projects listed in Section 7.3.2 are scheduled for implementation in 2029-2034 as noted in the 2024 IMP. As such, the Riverside South Elevated Tank and Ottawa South Storage upgrade are scheduled for implementation between 2025-2029.

Based on the city's current project implementation schedule, the pressure zone reconfiguration to the common Pressure Zone SUC is scheduled to be in effect in 2027. Once the reconfiguration is completed, the supply characteristics of the reconfigured Pressure Zone SUC will enable to meet future growth, and reliability needs within both South Barrahven Community (including S1 and S2 Lands) and South Urban Community.

Based on a recent boundary condition request, the HGL elevations and corresponding operating pressures following the SUC pressure reconfiguration are expected to slightly increase above the current condition to around 141 m which would yield pressures between 45 psi to 53 psi under peak hour demands. Similarly, the corresponding operating pressures during a fire flow condition are expected to slightly decrease between 23 psi to 33 psi depending on the location and the extent of the fire flow requirements.

7.4 Stormwater Servicing and Stormwater Management

7.4.1 Barrhaven South Stormwater Management Servicing

The Barrhaven South Community is serviced by five (5) main stormwater management facilities which were identified as part of the Jock River Reach One Subwatershed Study (2007). These facilities were to provide quality control and meet an enhanced protection level. These five (5) facilities, located south of the Jock River, are referred to as the Corrigan, Todd, Clarke, Borrisokane and Greenbank facilities. A summary for each of these five (5) facilities can be found in JLR's 2017 Existing Conditions Report.

The review carried out as part of the 2017 Existing Conditions Report had shown that none of the five (5) facilities noted above were designed with any quality control volume dedicated to the urbanized BSUEA nor S1 Area.

The MSS review identified that the Corrigan Pond was intended to serve as the dedicated outlet for a small portion of the BSUEA (Quinn's Pointe Subdivision) under the pre-development drainage condition. Consequently, the two (2) existing dry ponds within the existing Quinn's Pointe Subdivision were designed to capture and limit the peak flows to the prescribed flow allowance to the Greenbank Road trunk storm sewer system, set at the pre-development contribution.

Given that major overland flow from the Quinn's Pointe Subdivision (Stages 4 and 5) could not sheet flow towards Greenbank Road, the servicing solution recommended that the dry ponds be sized to limit the post-development flows to pre-development levels and to contain on-site the major overland flow.

Since the Corrigan Pond did not have sufficient capacity for water quality control of the runoff from the BSUEA, servicing of the Quinn's Pointe developments had to integrate water quality features in addition to the water quantity controls prior to discharge to the Greenbank Road trunk storm sewer.

Servicing within the BSUEA incorporated a third pipe infiltration system, also known as an Etobicoke Exfiltration System (EES) to enhance groundwater recharge and to provide water quality treatment. The EES was restricted to local roads to limit chlorides from road salt entering the groundwater system. An Oil Grit Separator (OGS) unit was included on the downstream end of the collector storm sewer network to augment the water quality control for the collector roads within the BSUEA.

Due to topography of the BSUEA, a major system spill-over dry pond was implemented as part of the servicing, located outside of the BSUEA in the southeast corner of the now S1 Area. The pond collects major system overland flow from the western part of the BSUEA (between future realigned Greenbank Road and western OP limit) and discharges it at a controlled rate of 330 L/s into the storm sewer system on Inver Lane.

7.4.2 EES Monitoring

Monitoring of the EES was made a condition of approval by the city to gather data and confirm the suitability of the design parameters adopted during the preliminary design of the EES as part of the 2017 BSUEA. To facilitate monitoring, the city advised that it should be completed using the SmartLevel™ technology supported by Link Utility Technology as it has been tested and adopted by the City's Operation Group. In parallel, monitoring of rainfall events was carried out using the SmartRain™ system to collect real-time precipitation data. The objective of the monitoring was as follows:

- Determine the spill occurrences and identify under which rainfall events results in spills into the conventional storm sewer system occur; and
- Determine the drawdown time and identify the time it takes for the drawdown of the EES following a rainfall event.

Three (3) monitoring locations have been set up within Quinn's Pointe Stages 2 and 3. The locations were established to cover various sizes of serviced areas; a small area at MHST82176 (2.6 ha), a mid-size area at MHST82182 (7.6 ha) and a larger serviced area at MHST83698 (20.5 ha).

Level monitoring was initiated once a minimum occupancy of 80% of the serviced area was achieved. Level monitoring was initiated in June 2022 for one of the stations while monitoring for the other two (2) stations was initiated in November 2022. Given that the EES was sized to capture a 22 mm precipitation event, the review of the monitored data mainly focused on events of 22 mm or greater magnitude. During the period spanning from July 1, 2022, to February 29, 2024, a total of 108 rainfall events were recorded, from which a total of fourteen (14) events exceeded 22 mm when the minimum daily temperature was above 0°C.

The fourteen (14) recorded precipitation events spanned between ≈25 mm to 92 mm with most of the events between 25-40mm. The most significant event of 92 mm occurred over 46 hours

and its 12-hour intensity was established to be comparable to a 1:10-year event when compared to the Ottawa IDF statistics.

Based on the review of the recorded data, the following was observed:

A single spill was observed at MHST82716 (Robin Easey Avenue and Teelin Circle intersection) which was triggered after the first 22.5 mm of the 92 mm precipitation event. Hence, this spill is consistent with the design basis of the system.

Three (3) spill events were recorded at MHST83698 (Edenderry Way and Oranmore Lane intersection) which was triggered after 22 mm (i.e., 37 mm and 39 mm) of events greater than 54 mm except of one event that a spill was observed after 12 mm of the 58 mm event. Based on the review of the data, this rainfall event occurred during a period of high groundwater levels with slower drawdown periods and higher base depths. In addition, this precipitation event of August 10, 2023 (58 mm), started 48 hours after the end of the August 7, 2023, event which was 54 mm in total, while drawdown of that event was still occurring.

The drawdown rates were also assessed based on the review of the level recordings. This review showed that the overall average drawdown rate is much higher than the design rates used in the modelling undertaken as part of the BSUEA MSS given that a safety factor of 2.5 was applied to the hydraulic conductivities measured by Paterson. The increased drawdown rate should allow for a greater capture of back-to-back events provided that groundwater levels do not impede the actual drawdown time.

Based on the guidance from the Hydrogeological Report for the S1 lands, high groundwater levels in the southern portion of the site have the potential to restrict and limit the effectiveness of a sub-surface infiltration system given that it will be submerged. The most southern monitoring location, MHST83698, recorded elevated baseline levels in the spring of 2023 to the late summer 2023 and in the summer of 2024. The nature of these elevated levels indicates that groundwater is entering the manhole via the EES and, although the monitoring report to date indicates that the 22mm event storms are still being infiltrated it may impact the operation and maintenance over the lifespan of the system.

7.4.3 Storm Servicing Connection Points

There are four (4) storm sewer connections located on the boundary of the S1 Area, which are shown on Figure 7-4. The connections are:

- Northern Connection – Elevation Road
  There is a potential connection on the northern boundary of S1 Area at Elevation Road. At that location (≈10 m off the S1 Area limit), there is a 300 mm diameter storm sewer system flowing in a northerly direction to the Haiku Street 1650 mm diameter storm sewer system which eventually merges with the 2250 mm diameter storm sewer along Expansion Road. Upon further review of the design documents, there was no flow allowance made for the S1 Area in the Elevation Road 300 mm diameter storm sewer.

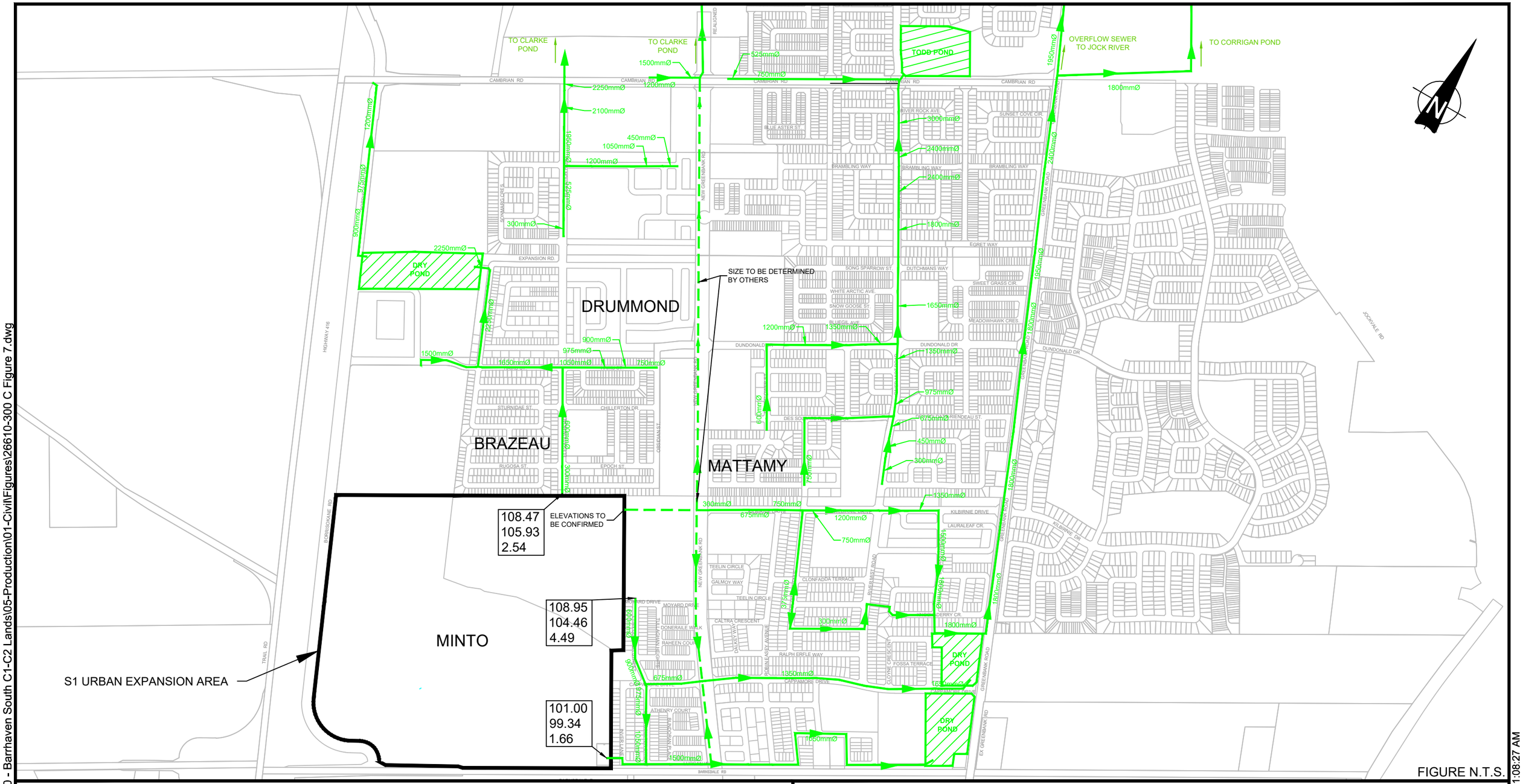

FIGURE N.T.S.

LEGEND

- EXISTING STORM SEWER
- PLANNED STORM SEWER

98.00
94.07
3.9

- EXISTING GROUND ELEVATIONS (±)
- STORM SEWER OBVERT
- COVER DEPTH (m)

PROJECT:

S1 URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

EXISTING AND PLANNED STORM SERVICING INFRASTRUCTURE

www.jlrichards.ca

J.L.Richards
ENGINEERS-ARCHITECTS-PLANNERS

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DESIGN:	GF
DRAWN:	KC
CHECKED:	GF
JLR #:	26610-300

DRAWING #:

FIGURE 7-4

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\Figures\26610-300 C Figure 7.dwg

PLOT DATE: September 19, 2024 11:08:27 AM

- Northeastern Connection - Planned Kilbirnie Drive/Realigned Greenbank Road
  There is a potential connection on the northeastern boundary of the S1 Area along Kilbirnie Road. The planned Kilbirnie Road storm sewer will flow easterly to the planned Realigned Greenbank Road trunk sewer system, which is currently under design by Stantec.

- Southeastern - Dry Pond
  There is a potential connection on the southeastern boundary of the S1 Area to the existing spill-over dry pond that is currently located within the S1 Area. This facility is serviced by a single outlet sewer, being a 900 mm diameter storm sewer, located east of the dry pond within a servicing easement. The 900 mm diameter storm sewer outlets into the 1500 mm diameter storm sewer along Inver Lane.

- Other Storm Connection
  In addition to the above-noted storm sewer outlets, there is a watercourse connection located at the southwestern boundary of the S1 Area which currently serves as the natural outlet for the properties. The connection point is to the Thomas Baxter Municipal Drain.

8.0 Opportunities and Constraints

8.1 Drainage Network

The review of LiDAR data and findings of the Environmental Inventories completed by Arcadis showed that there are no waterways or watercourses within the limits of the S1 Area. The lack of waterways is generally indicative of the low frequency in the flow generation potential for a given area. This has been corroborated by the measured saturated hydraulic conductivities carried out by Paterson.

As part of the upcoming storm servicing, some constraints such as modification to drainage may be reviewed and/or permitted as part of the MSS. These modifications will need to follow the appropriate levels of approvals. Any modification to the hydrological regime of the Thomas Baxter Municipal Drain will need to be completed in accordance with the Ontario Drainage Act.

The Thomas Baxter Municipal Drain is immediately south of the Study Area at Barnsdale Road and carries flow from the S1 Area and Barnsdale Road to Mud Creek. Based on topography, approximately 68 ha of the S1 Area (refer to drainage limits depicted on Figure 5-1) is tributary to Mud Creek via the Thomas Baxter Municipal Drain.

8.2 Aquatic Habitat and Natural Heritage

A Natural Heritage Existing Conditions Report was initially issued by Arcadis in October 2024. A revised Natural Heritage Existing Conditions Report was subsequently issued in February 2025 to address comments.

Field surveys completed by Arcadis showed that the headwater drainage feature in the southern extents of the S1 Lands has ephemeral flow, limited riparian function, contributing function to fish habitat, and limited function for terrestrial habitat. As such, the management recommendation is “mitigation”, and this feature will be realigned and maintain the conveyance of flows and the

contributing functions of the feature. Coordination during the upcoming MSS will be carried out with Arcadis' biologist.

The completion of the field surveys indicated that the S1 Lands does contain significant wildlife habitat (Candidate Bat Maternity Colony and Confirmed Woodland Raptor Nesting). Birds showing breeding indicators within the S1 Lands were limited to common species for the area.

The field surveys did not find any breeding habitat for Species at Risk, although two Species of Conservation Concern (monarch and eastern wood-pewee) were observed.
There are no wetlands present within the S1 Lands; however, it does contain two woodlands identified as "Significant" (Woodland A and Woodland B).

The development of the S1 Lands will lead to the loss of general flora and fauna habitat, and some mature trees within Woodland B. This loss can be compensated for through plantings of native trees and shrubs as included in future landscape plans.

Due to the disturbed nature of the S1 Lands, and low ecological value, from an environmental perspective the S1 Lands are an excellent candidate for the proposed development.

8.3 Floodplains

The S1 Lands are not restricted by any regulation floodplains within or adjacent to its boundary.

8.4 Water Quantity Control

Water quantity criteria will be affected by site constraints and municipal and provincial requirements. Water quantity control for lands that drain to the Jock River will be governed by available capacity in existing minor and major systems in the existing Quinn's Pointe Subdivision. Since the existing and planned infrastructure in Quinn's Pointe was designed to service lands up to the current Urban Boundary, there is limited capacity in existing minor and major systems in the Quinn's pointe Subdivision.

For lands that drain to Mud Creek, flows will need to be limited to the capacity of the Thomas Baxter Drain. Any additional flow discharge to the Thomas Baxter Drain should not aggravate the risk of flooding. Any modifications to this Drain or to its flow regime will need to be assessed and approved in accordance with the Drainage Act, Chapter D.17, R.S.O., 1990.

A meeting was held on August 9, 2024, to discuss the potential impact of the future urbanization of the S1 Area regarding the Ontario Drainage Act. The meeting was attended by both City's Drainage Superintendents, staff from city and Minto as well as JLR. During this meeting, JLR noted to the Drainage Superintendents that a further disconnection of the majority of the S1 Area would likely be confirmed as part of the upcoming MSS. Based on preliminary grades developed by JLR within the S1 Area , it would appear that a small post-development drainage area (≈2 ha) would remain connected to the Thomas Baxter Municipal Drain while the majority of the S1 Area (> 60 ha) would be disconnected from the Municipal Drain.

A subsequent E-Mail, prepared by the Drainage Superintendent, confirmed that the disconnection would follow a Section 65(4) of the Drainage Act and given the size of the area remaining within the serviced area of the Thomas Baxter Municipal Drain it would not warrant a request under

Section 65(1) nor a Section 78, pending the interpretation of a licensed Drainage Engineer which will be appointed by council.

8.5 Water Quality Control

Water quality treatment will need to be provided in accordance with the relevant subwatershed studies. The Jock River Reach One Subwatershed Study states that, for areas tributary to the Jock River, an enhanced level of water quality treatment protection, in accordance with the MOE 2003 SWMPDM, is required. Similarly, an enhanced level is to be targeted for the Thomas Baxter Municipal Drain / Mud Creek. Water quality will also need to account for the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA), which was issued in December 2024.

8.6 Infiltration

The Hydrogeological Study undertaken by Paterson confirms that, in general, soils within the S1 Area have a moderate to high hydraulic conductivity (refer to Figures included in Paterson's Appendix 2).

Based on Paterson's In-Situ Infiltration Testing completed using the Pask Permeameter (refer to Section 4.3.6 of their Report), field saturated hydraulic conductivity (K_{fs}) values of the unsaturated overburden material ranged from 1.1×10^{-7} m/s to 8.5×10^{-5} m/s with estimated unfactored infiltration rates of 30 mm/hr to 152 mm/hr. However, the Report notes that the majority of the infiltration test completed estimated infiltration rates between approximately 50 mm/hr to 100 mm/hr which is similar to the testing completed for the BSUEA.

Paterson's latest infiltration testing is included in their Appendix 3, and findings summarized on their Figure entitled "Preliminary Soil Infiltration Rates – Drawing PG6197-4 (refer to Paterson's Appendix 2 for Drawing). This data shows shallow groundwater encountered in the southern portion of the S1 Area. The moderate hydraulic conductivity soil is observed in the southern portion while the highest hydraulic conductivity soils are observed in the northwestern portion of the study area. Soils having the highest hydraulic conductivity are considered to act as a recharge zone for underlying aquifers and generally suitable for providing groundwater recharge and appropriate practices must be implemented to maximize the rate of infiltration. However, the shallow groundwater in the southern portion of the Study Area will prevent the use of infiltration practices.

Non-structural Best Management Practices such as discharging impervious runoff, including roof runoff, to lawns are required regardless of soil capacity, in accordance with the Jock River Reach One Subwatershed Study. In addition, the study should consider the potential to incorporate Low Impact Development (LID) measures in areas that are conducive to infiltration, to reduce the anticipated infiltration deficit and maintain pre-development infiltration levels to the esker.

Based on fulfilling the objective of maintaining pre-development infiltration levels, storm servicing solutions incorporating infiltration measures will be reviewed and developed, when feasible, at the MSS level to achieve water balance. These infiltration measures will be incorporated within all areas of the S1 Area where groundwater levels will allow the construction of this measure, striving to maintain pre-development infiltration levels in the areas with low groundwater elevations.

As part of storm servicing, some constraints such as modification to drainage may be reviewed and/or permitted as part of the MSS. However, these modifications will need to follow the appropriate levels of approvals.

The Mud Creek Subwatershed Study identified that there are significant groundwater recharge areas including the Kars Esker, a Mississippi-Rideau Source Water Protection Region Significant Groundwater Recharge Area, across the majority of the western portion of the S1 Area. These pre-development recharge conditions must be maintained. A water balance will be required to demonstrate adherence to this requirement. The Mud Creek Subwatershed Study also recommends avoiding infiltration of poor-quality runoff from paved surfaces without pre-treatment, and to consider the use of LID and Best Management Practices for stormwater management quality and quantity control.

8.7 Existing Servicing Infrastructure

The following opportunities and constraints have been identified for the existing and planned servicing infrastructure in Barrhaven South. These will be reviewed and evaluated in greater detail as part of the MSS

8.7.1 Wastewater Servicing

Wastewater servicing for the S1 is ultimately governed by the available residual capacities in the existing downstream trunk sanitary sewers in the Quinn's Pointe Subdivision as none of the sewers within the Ridge Subdivision included capacity for the lands. The previous Sanitary Master Design Sheet developed as part of the 2019 Serviceability Study was revised based on information supplied by the city as described in Section 3.0. This Design Sheet is included in Appendix B4.

Based on a gross area of 65 ha and a population density of 63 persons/ha, the equivalent residential development population for S1 Area would be approximately 4095 persons. Using this population and an average flow rate of 280 L/cap/day, the theoretical residual capacity for the limiting pipe reaches in Table 8-1 was evaluated. The peaking factors for each limiting pipe reach is based on the cumulative population which includes the contribution from the S1 Area. The projected peak flow based on the above assumptions were subtracted from the residual capacity of the pipe reaches which has been summarized in Table 8-1 below.

Table 8-1: Available Tributary Area Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Limiting Pipe Reach	Net Anticipated Residual Capacity (L/s)
Barnsdale Road	MH203 to MH202	117.1
Greenbank Road	MH200C to MH45	8.7
Greenbank Road	MH435A to MH501A	95.6

As indicated in Section 7.2 of this Report, the existing Barnsdale Road trunk sanitary sewer could serve as the main outlet for S1 Area.

Based on the theoretical peak flow calculations summarized in Table 8-1 above, the existing Greenbank Road trunk sanitary sewer has sufficient capacity to accommodate the peak flows generated within the S1 Area.

Based on the wastewater modelling supporting the 2024 IMP, no constraints with the existing Greenbank Road trunk sanitary sewer (downstream of at MH 522A – south of Jock River), was identified. This is based on actual real time monitoring data carried out by the city of Ottawa.

8.7.2 Water Servicing

Low pressures (i.e., less than 40 psi) could be encountered during peak hour demand conditions in the S1 Area, in localized areas, where the existing ground elevation is relatively high such as the knoll in the northern area that spans into the Ridge Subdivision at Appalachian Circle. Further opportunities and constraints will be identified upon completion of a detailed Hydraulic Network Analysis (HNA) as part of the S1 Area MSS.

8.7.3 Stormwater Servicing and Stormwater Management

As noted in Section 7.4, residual capacity only exists in the 900 mm diameter trunk storm sewer in the Quinn's Pointe Subdivision which services the spill-over dry pond, already located within the S1 Area. The residual capacity was estimated at 330 L/s as noted in Section 7.4.

9.0 Summary and Recommendations

The following provides a series of recommendations to be considered when preparing the S1 Area MSS, in the context of the opportunities and constraints discussed above.

9.1 Wastewater Servicing

Overall servicing for the S1 Area will convey wastewater flows towards the Barnsdale Road sanitary sewer extension as the elevation of the system can provide a gravity connection. The captured flow will then be conveyed to the existing Greenbank Road trunk sanitary sewer flowing northerly.

To minimize infiltration into the proposed local sanitary sewers in the southern portion of the S1 Area where it is anticipated to be below the groundwater table, the latest MECP guidance entitled "Design Criteria Final, May 31, 2023" should be followed.

Sections 2.9 and 2.10 of the above publication provides requirements for sanitary sewers and maintenance holes installed below the high seasonal groundwater table to include a series of measures where pipe joints and connections are to be designed to: to withstand pressures of 1.25 times the pressure exerted, be externally wrapped by waterproofing membranes, etc.

9.2 Water Servicing

Water servicing for the S1 Area will be developed to fulfill regulatory requirements under both domestic and fire flow conditions. It is anticipated that there will be an area that may not fulfill the minimum pressure requirements during domestic demand conditions, due to topography. As a result, this localized area may require oversized service laterals to minimize headlosses. This condition, as well as water servicing specifics such as watermain looping and sizing of the feedermains for the S1 Area, will be addressed at the MSS stage by a hydraulic network analysis (HNA). The HNA will be carried out in accordance with the most recent Design Guidelines and Technical Bulletins.

9.3 Stormwater Servicing and Stormwater Management

Section 7.4 identified the 900 mm diameter trunk storm sewer in Quinn's Pointe Subdivision as the gravity outlet for the S1 Area. Given its limited capacity (estimated at 330 L/s), a proposed end-of-pipe facility will be required at the current location of the spill-over pond. This future facility will be sized to accommodate minor and major system flows from the S1 Area as well as the major overland flow for an area in the existing Quinn's Pointe Subdivision west of Realigned Greenbank Road. This facility will need to be sized to maintain the integrity of the existing Quinn's Pointe storm sewer system as well as the Greenbank Road storm sewer system. Major system flows would also be conveyed overland to this future pond.

LID measures to promote infiltration are to be incorporated as part of the overall servicing of the S1 Area to achieve the targeted water balance to preserve the Kars Esker. In areas where LIDs cannot be implemented due to high groundwater table, other quality control measures will be reviewed.

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Appendix B1

Terms of Reference

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

MEMO

Date: May 31, 2024

To: Robin van de Lande, City of Ottawa

From: Guy Forget P.Eng.

CC: John Bougadis M.A.Sc., P.Eng. (City of Ottawa), Curtiss Scarlett P.Eng. (Minto Communities – Canada)

Subject: S1 Urban Expansion Area– Terms of Reference

JLR No.: 26610-300

The S1 Urban Expansion Area (S1 UEA) will encompass ≈68 ha of proposed development located west of the established Quinn's Pointe Subdivision, south of the established Ridge Subdivision, north of Barnsdale Road and east of Borrisokane Road, within the Barrhaven South Area. Based on the latest Concept Plan (version 37), the eastern portion of the S1 UEA will consist of proposed residential development (formerly referred as the C1 Lands) owned by Minto Communities while the western portion will consist of proposed commercial development (formerly referred to the C2 Lands) owned Minto Greenfield (Barrhaven South). Minto Communities Inc. – Canada is overseeing the progress of the Approval process on behalf of both Minto Communities and Minto Greenfield (Barrhaven South).

The approval of the S1 UEA will follow the Concept Plan Approval (CPA) process given that the parcel is relatively small, and that ownership is virtually by one single Owner being Minto. Several deliverables will be prepared on behalf of Minto in support of the CPA process.

Master Servicing Process

The MSS for the S1 UEA will be completed in accordance with Appendix C of the Infrastructure Master Plan "Guideline for Preparing Terms of Reference for Master Servicing Study (June 2023)", which sets out the deliverables required.

Task 1: Terms of Reference

This Term of Reference (TOR) for the S1 UEA was prepared in response to the City request that a Master Servicing Study (MSS) Terms of Reference (TOR) be prepared for the S1 UEA in accordance with the "Appendix C: Guideline for Preparing Terms of Reference for a Master Servicing Study, June 2023" included in the Draft Infrastructure Master Plan.

Task 2: Existing Conditions Report (ECR)

The ECR will consist of the following:

- Review and Consolidation of background reports and information.
- Inventory of Water Crossings and Watershed Delineation
- Hydrological Modelling and Capacity Analysis of Conveyance Systems
- Water Budget Modelling
- Floodplain Mapping and Geomorphological Assessment
- Review Existing Conditions: Wastewater, Water and Storm Servicing
- Identify Constraints/Opportunities and Recharge/Discharge Areas
- Evaluation and Assessment of Storm Design Criteria and Objectives

- Assist Drainage Engineer with Hydrological Calculations for the Thomas Baxter Municipal Drain
- Prepare Existing Conditions Report

Several background reports will be reviewed including:

- Barrhaven South Urban Expansion Area MSS (JLR, 2018)
- MSS Addendum for the Barrhaven South Urban Expansion Area (January 5, 2021)
- Technical Memo – The Ridge & Drummond lands (DSEL, April 7, 2020)
- SWM Report, The Ridge (Brazeau lands), (JFSA, June 2020)
- Design Brief – The Ridge (Brazeau lands) (DSEL July 27th, 2020)
- Design Drawings – The Ridge (Brazeau Lands) (DSEL, 2020-09-25)
- Design Brief – The Ridge SWM Pond (DSEL/JFA, June 2020)
- Site Servicing Plan – 3713 Borrisokane Road (ABIC) (DSEL, December 2019)
- Technical Memo – 3713 Borrisokane (ABIC) (Dillon, November 4, 2020)

In addition to the above, this task will include the review of other information provided by Minto, the City of Ottawa and/or the Rideau Valley Conservation Authority (RVCA), including:

- Land Ownership with boundary information.
- Recent air photography.
- Topographical maps.
- LiDAR as provided by the City of Ottawa.
- Surficial geology from the province.
- Land use and vegetation.
- Topographical surveys (from Minto).
- Floodplain mapping at the boundary of the S1 UEA, if applicable.
- Other information compiled by the Team's Geotechnical/Hydrogeological Engineer, Biologist and Transportation Engineer.

Task 3: Future Development Condition

The approved ECR will identify constraints and opportunities which will encompass physical, environmental, as well as servicing constraints that will be determined from the inventory of existing linear infrastructure and potential outlets. At such time, a further review of topographical maps and surveys will be completed as well as the drainage patterns identified under existing conditions.

Given that this project will follow the Concept Plan Approval (CPA) process and that the latest Minto Concept Plan (version 37) has been reviewed and revised based on the city and Fotenn's input, a single Concept Plan will be analyzed once it has been updated/revised to reflect the ECR's findings.

Task 4: Servicing Design Constraints and Develop Design Criteria

Servicing constraints will be identified for the existing systems at or near the boundary of the S1 UEA.

- Review Servicing Constraints defined in BSUEA MSS and other Reports
- Coordinate and Liaise with Geotechnical Engineer and Hydrogeological Engineer
- Coordinate and Liaise with Biologist

Task 5: Servicing Alternatives for Wastewater, Water and Stormwater Management, Including Preparation of Master Grading

JLR will develop potential servicing alternatives, when applicable, for wastewater, water, storm and stormwater management recognizing constraints identified through the Existing Conditions Report and Concept Plan.

Task 6: Evaluation of Servicing Alternatives, when applicable, and Identification of Recommended Wastewater, Water and Stormwater Management Solution

High-level servicing alternatives developed as part of Task 5, will be evaluated to confirm their adequacy and to identify the recommended servicing alternative for wastewater, water and storm/stormwater.

Task 7: Review/Develop Implementation and Phasing Plans and Prepare Cost Estimate

Task 8: Approvals

Approvals by various groups at the city of Ottawa will be sought as part of this MSS as well as other stakeholders. Based on the previous BSUEA MSS, coordination with Minto's subconsultants was carried out throughout the ECR and MSS. As part of the BSUEA MSS, the following groups were consulted:

- CPT Members (as needed)
- City of Ottawa Economic Development Services
- City of Ottawa Transportation Planning
- City of Ottawa Parks Forestry & Stormwater Services
- City of Ottawa Transit Customer Services and Planning
- City of Ottawa Parks and Facilities Planning Services
- City of Ottawa Infrastructure Services
- City of Ottawa Planning Services
- City of Ottawa Right of Way Heritage & Urban Design Services
- Ottawa Public Health
- Rideau Valley Conservation
- Ministry of the Environment, Conservation and Parks
- Ottawa Carleton District School Board (OCDSB)
- Conseil des écoles publiques de l'Est de l'Ontario (CEPEO)

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Appendix B2

Hydrological Modelling
Parameters

BARRHAVEN SOUTH EXPANSION AREA

EXISTING CONDITION - SWMHYMO INPUT PARAMETERS

September 2017

Drainage Area ID	Total Area (ha)	Land Use	Hydrologic Soil Group (HSG)	Area (ha)	CN	A x CN	Weighted CN	S	I_A (mm)	CN*	Tp (hrs)
A1	18.64	Asphalt	N.A	0.38	98	37	45	310	23.3	42	0.41
		Gravel	AB	0.16	81	13					
			BC	0.03	87	3					
			B	0.09	85	8					
		Woodlot	A	5.13	30	154					
			B	1.85	58	107					
			AB	8.76	44	385					
			C	0.03	71	2					
		Pasture	AB	0.76	50	38					
			B	0.19	61	11					
			C	0.11	74	8					
		Unimproved Lands	A	1.15	55	63					
A2	35.36	Asphalt	N.A	0.26	98	26	51	244	18.3	49	0.59
		Gravel	AB	0.06	81	4					
			BC	0.03	87	2					
		Woodlot	A	8.61	30	258					
			AB	5.53	44	243					
			BC	3.44	65	223					
		Pasture	AB	6.74	50	337					
			BC	8.18	68	557					
		Agricultural Lands	BC	2.51	68	170					
A3	12.71	Pasture	BC	11.32	68	770	69	114	8.6	67	0.43
			C	1.39	74	103					
A4	13.95	Woodlot	A	7.83	30	235	41	366	27.4	37	0.33
		Unimproved Lands	A	6.13	55	337					
A5	12.65	Asphalt	N.A	0.11	98	11	52	234	17.6	50	0.39
		Gravel	A	0.11	76	8					
			B	0.02	85	2					
		Woodlot	A	0.86	30	26					
			B	0.01	58	0					
		Pasture	A	1.27	39	49					
			B	0.14	61	9					
		Unimproved Lands	A	10.14	55	558					
A6	11.73	Unimproved Lands	A	11.73	55	645	55	208	15.6	53	0.27
A7	15.53	Woodlot	A	1.97	30	59	53	225	16.9	51	0.72
			BC	2.50	65	163					
		Pasture	A	1.46	39	57					
			BC	1.70	68	115					
		Unimproved Lands	A	7.90	55	435					
A8	42.25	Asphalt	N.A	0.15	98	15	55	208	15.6	53	0.74
		Gravel	A	0.19	76	15					
		Pasture	A	1.60	39	63					
		Unimproved Lands	A	40.31	55	2217					
A9	5.08	Pasture	A	1.10	39	43	52	234	17.6	50	0.25
		Unimproved Lands	A	3.98	55	219					
A10	5.53	Asphalt	N.A	0.13	98	12	57	192	14.4	55	0.27
		Gravel	A	0.14	76	10					
		Unimproved Lands	A	5.27	55	290					
A11	15.20	Asphalt	N.A	0.11	98	11	57	192	14.4	55	1.27
		Gravel	A	0.00	76	0					
			B	0.12	85	10					
		Woodlot	B	7.71	58	447					
		Unimproved Lands	A	6.98	55	384					
			B	0.27	65	17					
A12	60.01	Asphalt	N.A	0.600	98	59	53	225	16.9	51	0.95
		Gravel	A	0.046	76	4					
			B	0.152	85	13					
		Woodlot	A	7.37	30	221					
			B	3.25	58	188					
		Unimproved Lands	A	14.39	55	791					
			B	0.42	65	27					
		Agricultural Lands	A	7.42	39	289					
			B	23.15	61	1412					
		Pond/Lake	N.A	2.93	50	147					
A13	24.60	Woodlot	A	1.27	30	38	54	216	16.2	52	0.50
		Unimproved Lands	A	23.33	55	1283					
A14	22.41	Woodlot	A	2.36	30	71	43	337	25.3	40	1.50
		Agricultural Lands	A	16.3	39	635					
			BC	1.54	68	104					
			C	2.23	74	165					

Drainage Area ID	Total Area (ha)	Land Use	Hydrologic Soil Group (HSG)	Area (ha)	CN	A x CN	Weighted CN	S	I_A (mm)	CN*	Tp (hrs)
A15	3.47	Asphalt	N.A	0.42	98	41	63	149	11.2	61	0.39
		Gravel	A	0.11	76	8					
			B	0.21	85	18					
		Pasture	A	0.65	39	25					
			B	2.08	61	127					
A16	2.87	Asphalt	N.A	0.10	98	10	41	366	27.4	37	0.24
		Gravel	A	0.02	76	2					
		Agricultural Lands	A	2.57	39	100					
		Grass	A	0.17	39	7					
A17	9.75	Asphalt	N.A	0.40	98	39	47	286	21.5	44	0.42
		Gravel	A	0.08	76	6					
			BC	0.05	87	4					
		Agricultural Lands	A	6.59	39	257					
			BC	1.88	68	127					
		Grass	A	0.75	39	29					
A18	0.50	Asphalt	N.A	0.13	98	13	67	125	9.4	66	N.A
		Gravel	A	0.04	76	3					
			B	0.04	85	3					
		Grass	A	0.15	39	6					
			B	0.14	61	8					
A19	1.01	Asphalt	N.A	0.20	98	20	71	104	10.4	72	N.A
		Gravel	B	0.13	85	11					
		Grass	B	0.68	61	42					
A20	4.78	Asphalt	N.A	0.23	98	22	51	244	18.3	49	0.32
		Gravel	A	0.02	76	2					
			B	0.07	85	6					
		Grass	A	0.38	39	15					
		Agricultural Lands	A	2.35	39	91					
			B	1.74	61	106					
A21	1.50	Asphalt	N.A	0.40	98	40	59	177	13.2	57	N.A
		Gravel	A	0.13	76	10					
			BC	0.01	87	1					
		Grass	A	0.94	39	37					
			BC	0.02	83	1.5					

EXISTING CONDITION REPORT – APPENDIX B
SWMHYMO MODEL DESCRIPTION

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

1.0 NASHYD

In catchment areas with an area of impervious less than 20% the NASHYD command was used.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description</th></tr>
<tr><td>Catchment Area</td><td>ha</td><td>The catchment area was delineated using the supplied contours and took account of quarries. In the Pre-development model no changes are made to the catchment areas but the pits are assumed to be filled to the surrounding ground level.</td></tr>
<tr><td>CN</td><td></td><td>The modified CN* value is used in the model. The CN values are based on hydrological soil types from OMAFRA mapping and MTO Design Chart 1.08 and land cover as per the aerial photography. The MTO drainage manual Design Chart 1.09 was used to assign CN values. The following CN values have been used:
<table>
<tr><th rowspan="2">Land Cover</th><th colspan="4">CN for Hydrologic Soil Group</th></tr>
<tr><th>A</th><th>AB</th><th>B</th><th>BC</th></tr>
<tr><td>Asphalt</td><td colspan="4">98</td></tr>
<tr><td>Agricultural</td><td>39</td><td></td><td>61</td><td>68</td></tr>
<tr><td>Grass</td><td>39</td><td></td><td>61</td><td></td></tr>
<tr><td>Gravel</td><td>76</td><td>81</td><td></td><td></td></tr>
<tr><td>Pasture</td><td>39</td><td>50</td><td></td><td>68</td></tr>
<tr><td>Pond/Lake</td><td colspan="4">50</td></tr>
<tr><td>Unimproved Lands</td><td>49</td><td></td><td></td><td></td></tr>
<tr><td>Woodlot</td><td>30</td><td></td><td>58</td><td></td></tr>
</table>
The CN values were area weighted for each catchment area.</td></tr>
<tr><td>Initial Abstraction</td><td>mm</td><td>Initial Abstraction values are 0.075S for areas with CN value less than 70 and 0.1S for areas with CN values greater than 70. (Visual Otthymo Manual)</td></tr>
<tr><td>Time to Peak</td><td>hrs</td><td>The time to peak is 0.6 of the Time of Concentration which was calculated using Uplands Method.</td></tr>
</table>

2.0 STANDHYD

In catchment areas with impervious greater than 20% of the area, the STANDHYD command was used.

Parameter	Units	Description
Catchment Area	ha	The catchment area was delineated using the supplied contours and took account of quarries. In the Pre-development model no changes are made to the catchment areas but the pits are assumed to be filled to the surrounding ground level.
Imperviousness		The total imperviousness (TIMP) was calculated from land cover based on the aerial photography. Lands that are sealed such as parking lots or roads are included as impervious. The directly connected imperviousness (XIMP) (the percentage of impervious surface not routed through a pervious surface) is negligible as there is no storm sewer network to collect the flow from these areas.
Horton Coefficients		Horton methods are used to calculate the infiltration. The Horton coefficients entered are from the City of Ottawa manual and are typical for the Ottawa area. The values are f_c = 13.2 mm/hr, f_o = 76.2 mm/hr, k = 0.0015 s^{-1}.
Initial Abstraction	mm	Initial abstraction values are as per the City of Ottawa drainage manual: 4.67 mm for pervious areas and 1.57 mm for impervious areas.
Slope	%	Slope was read from the contour data and averaged across the catchment area for the pervious slope parameter. The impervious slope parameter is based on the cross grade on a typical road section.
Flow Length	m	The pervious flow length is based on the longest flow path from contour data, the impervious flow length is half a typical road width.
Manning's n		The pervious Manning's n value is 0.25 to be representative of sheet flow through grassland or pasture. Impervious Manning's n value is 0.013 to be representative of an asphalt surfacing.

BARRHAVEN SOUTH EXPANSION AREA
EXISTING CONDITIONS - HYDROLOGIC MODEL RESULTS AT CULVERT LOCATIONS
September 2017

Table 2: SWMHYMO Summary Results - Culvert Flows

Return Period	6 hr SCS Type II											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.218	0.103	0.027	0.036	0.121	0.009	0.032	0.046	0.13	0.001	0.009	0.047
1:5	0.574	0.288	0.069	0.087	0.322	0.03	0.045	0.062	0.344	0.006	0.037	0.072
1:10	0.905	0.462	0.108	0.136	0.51	0.051	0.078	0.102	0.542	0.013	0.065	0.125
1:25	1.389	0.717	0.164	0.206	0.782	0.084	0.127	0.162	0.83	0.024	0.110	0.205
1:50	1.825	0.947	0.214	0.269	1.027	0.114	0.174	0.218	1.088	0.036	0.151	0.281
1:100	2.307	1.203	0.269	0.338	1.299	0.147	0.226	0.279	1.374	0.05	0.198	0.365
Return Period	**12 hr SCS Type II**											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.287	0.139	0.036	0.045	0.158	0.012	0.039	0.055	0.169	0.001	0.014	0.057
1:5	0.689	0.349	0.086	0.106	0.385	0.038	0.051	0.065	0.411	0.008	0.046	0.080
1:10	1.044	0.536	0.129	0.159	0.585	0.062	0.084	0.105	0.623	0.016	0.078	0.133
1:25	1.574	0.817	0.191	0.236	0.884	0.099	0.134	0.163	0.939	0.03	0.128	0.217
1:50	1.996	1.04	0.24	0.298	1.122	0.129	0.176	0.212	1.189	0.042	0.17	0.285
1:100	2.456	1.284	0.293	0.365	1.381	0.162	0.223	0.267	1.463	0.057	0.216	0.363
Return Period	**24 hr SCS Type II**											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.309	0.154	0.04	0.049	0.176	0.014	0.019	0.026	0.189	0.002	0.016	0.03
1:5	0.678	0.352	0.084	0.106	0.391	0.038	0.05	0.059	0.416	0.009	0.047	0.076
1:10	0.993	0.52	0.12	0.154	0.574	0.06	0.077	0.09	0.61	0.016	0.076	0.12
1:25	1.453	0.767	0.171	0.223	0.842	0.091	0.118	0.137	0.892	0.029	0.12	0.188
1:50	1.869	0.989	0.216	0.285	1.083	0.12	0.156	0.181	1.147	0.041	0.161	0.253
1:100	2.323	1.232	0.266	0.352	1.346	0.152	0.198	0.229	1.425	0.055	0.207	0.326

Table 3: SWMHYMO Summary Results - Potential Culvert at Cambrian Road CR-C2

Return Period	Design Storm		
	6 hr SCS Type II	12 hr SCS Type II	24 hr SCS Type II
	Flow at Culvert Location (m^3/s)	Flow at Culvert Location (m^3/s)	Flow at Culvert Location (m^3/s)
	CR-C2	CR-C2	CR-C2
1:2	0.115	0.157	0.176
1:5	0.34	0.415	0.419
1:10	0.557	0.651	0.632
1:25	0.882	1.01	0.947
1:50	1.179	1.3	1.236
1:100	1.511	1.619	1.552

Table 4: Estimated Culvert Level of Service

Culvert ID	Location	Design Storm																		Estimated Culvert Capacity		Culvert Level of Service (Year)	
		6 hr SCS Type II						12 hr SCS Type II						24 hr SCS Type II						Flow for the Head at Edge of Pavement Elevation	Flow for the Head at Edge of Gravel Elevation	At Edge of Pavement Elevation	At Edge of Gravel Elevation
		Flow at Culvert Locations (m^3/s)						Flow at Culvert Locations (m^3/s)						Flow at Culvert Locations (m^3/s)									
		Return Period						Return Period						Return Period						Q_{EP} (m^3/s)	Q_{EG} (m^3/s)		
		1:2	1:5	1:10	1:25	1:50	1:100	1:2	1:5	1:10	1:25	1:50	1:100	1:2	1:5	1:10	1:25	1:50	1:100				
CR-C1	Cambrian Road	0.218	0.574	0.905	1.389	1.825	2.307	0.287	0.689	1.044	1.574	1.996	2.456	0.309	0.678	0.993	1.453	1.869	2.323	5.490	N/A	1:100	N/A
CR-C2	Cambrian Road	0.115	0.34	0.557	0.882	1.179	1.511	0.157	0.415	0.651	1.010	1.300	1.619	0.176	0.419	0.632	0.947	1.236	1.552	N/A	N/A	N/A	N/A
CVR-C1	Cedarview Road	0.103	0.288	0.462	0.717	0.947	1.203	0.139	0.349	0.536	0.817	1.040	1.284	0.154	0.352	0.52	0.767	0.989	1.232	0.500	0.4	1:5	1:5
CVR-C2	Cedarview Road	0.027	0.069	0.108	0.164	0.214	0.269	0.036	0.086	0.129	0.191	0.240	0.293	0.04	0.084	0.12	0.171	0.216	0.266	N/A	0.2	N/A	1:25
CVR-C3	Cedarview Road	0.036	0.087	0.136	0.206	0.269	0.338	0.045	0.106	0.159	0.236	0.298	0.365	0.049	0.106	0.154	0.223	0.285	0.352	N/A	0.3	N/A	1:50
CVR-C4	Cedarview Road	0.121	0.322	0.51	0.782	1.027	1.299	0.158	0.385	0.585	0.884	1.122	1.381	0.176	0.391	0.574	0.842	1.083	1.346	2.900	2.6	1:100	1:100
BDR-C1	Barnsdale Road	0.009	0.03	0.051	0.084	0.114	0.147	0.012	0.038	0.062	0.099	0.129	0.162	0.014	0.038	0.06	0.091	0.12	0.152	0.240	0.2	1:100	1:100
BDR-C2	Barnsdale Road	0.032	0.045	0.078	0.127	0.174	0.226	0.039	0.051	0.084	0.134	0.176	0.223	0.019	0.05	0.077	0.118	0.156	0.198	N/A	0.2	N/A	1:50
BDR-C3	Barnsdale Road	0.046	0.062	0.102	0.162	0.218	0.279	0.055	0.065	0.105	0.163	0.212	0.267	0.026	0.059	0.09	0.137	0.181	0.229	N/A	0.5	N/A	1:100
BDR-C4	Barnsdale Road	0.13	0.344	0.542	0.83	1.088	1.374	0.169	0.411	0.623	0.939	1.189	1.463	0.189	0.416	0.61	0.892	1.147	1.425	2.800	2.6	1:100	1:100
BDR-C5	Barnsdale Road	0.001	0.006	0.013	0.024	0.036	0.05	0.001	0.008	0.016	0.030	0.042	0.057	0.002	0.009	0.016	0.029	0.041	0.055	0.330	0.3	1:100	1:100
BDR-C6	Barnsdale Road	0.009	0.037	0.065	0.110	0.151	0.198	0.014	0.046	0.078	0.128	0.170	0.216	0.016	0.047	0.076	0.120	0.161	0.207	0.240	0.2	1:100	1:50
BDR-C7	Barnsdale Road	0.047	0.072	0.125	0.205	0.281	0.365	0.057	0.080	0.133	0.217	0.285	0.363	0.03	0.076	0.12	0.188	0.253	0.326	0.350	0.3	1:50	1:50
Total to Thomas Baxter Municipal Drain		0.159	0.403	0.629	0.952	1.24	1.556	0.207	0.475	0.716	1.069	1.347	1.647	0.215	0.473	0.69	1.004	1.286	1.592				

```
2     Metric units
*****************************************************************************
*#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
*#  Date        : February 2, 2016
*#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
*#  Company     : J. L. Richards & Associates Limited
*#  License #   :  4418403
*#****************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    ["2ySCS6.stm"]
*
READ STORM          STORM_FILENAME=["STORM.001"]
*%------------------|-------------------------------------------------------|
*
*#############################################################################
*#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                   #
*#############################################################################
*
*************************************************************
*NORTH PORTION OF THE SITE - Culvert at Cambrian Rd - CR-C1  *
*************************************************************
*
*******************************
*SUB-CATCHMENT A6             *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A6"], DT=[1]min, AREA=[11.73](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[16](mm),
                    N=[3], TP=[0.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[3], MajNHYD=["MAJA6"],
*                    MINID=[2], MinNHYD=["INFA6"],
*                    TMJSTO=[32146](cu-m)
*%------------------|-------------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA6"]
*                    HYD_COMMENT=["Infiltration at A6 area"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A4             *
*******************************
*
CALIB NASHYD        ID=[4], NHYD=["A4"], DT=[1]min, AREA=[13.95](ha),
                    DWF=[0](cms),  CN/C=[37], IA=[27](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[4], MajNHYD=["MAJA4"],
*                    MINID=[2], MinNHYD=["INFA4"],
*                    TMJSTO=[27238](cu-m)
*%------------------|-------------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA4"]
*                    HYD_COMMENT=["Infiltration at A4 area"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A3             *
*******************************
*
CALIB NASHYD        ID=[5], NHYD=["A3"], DT=[1]min, AREA=[12.71](ha),
                    DWF=[0](cms),  CN/C=[67], IA=[9](mm),
                    N=[3], TP=[0.43]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[5], MajNHYD=["MAJA3"],
*                    MINID=[2], MinNHYD=["INFA3"],
*                    TMJSTO=[21119](cu-m)
*%------------------|-------------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA3"]
*                    HYD_COMMENT=["Infiltration at A3 area"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A2             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A2"], DT=[1]min, AREA=[35.36](ha),
                    DWF=[0](cms),  CN/C=[49], IA=[18](mm),
                    N=[3], TP=[0.59]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A7             *
*******************************
*
CALIB NASHYD        ID=[2], NHYD=["A7"], DT=[1]min, AREA=[15.53](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[17](mm),
                    N=[3], TP=[0.72]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT CAMBRIAN ROAD 1600mm CSP Culvert - CR-C1
*****************************************************************************
*
ADD HYD             IDsum=[7], NHYD=["CR-C1"], IDs to add=[1+2+3+4+5]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[7],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CR-C1"]
                    HYD_COMMENT=["Flow at Cambrian Road Culvert-1600mm CSP"]
*%------------------|-------------------------------------------------------|
*
*************************************************************
*CENTRAL AREA OF THE SITE - Culvert at Cambrian Rd - CR-C2  *
*************************************************************
*
*******************************
*SUB-CATCHMENT A8             *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A8"], DT=[1]min, AREA=[42.25](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[16](mm),
                    N=[3], TP=[0.74]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[3], MajNHYD=["MAJA8"],
*                    MINID=[2], MinNHYD=["INFA8"],
*                    TMJSTO=[551827](cu-m)
*%------------------|-------------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA8"]
*                    HYD_COMMENT=["Infiltration at A8 area"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A5             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A5"], DT=[1]min, AREA=[12.65](ha),
                    DWF=[0](cms),  CN/C=[50], IA=[18](mm),
                    N=[3], TP=[0.39]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 500mm CSP Culvert - CVR-C1
*****************************************************************************
*
ADD HYD             IDsum=[4], NHYD=["CVR-C1"], IDs to add=[1+3]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C1"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-500mm CSP"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A1             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A1"], DT=[1]min, AREA=[18.64](ha),
                    DWF=[0](cms),  CN/C=[42], IA=[23](mm),
                    N=[3], TP=[0.41]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT CAMBRIAN ROAD CULVERT - CR-C2
*****************************************************************************
*
ADD HYD             IDsum=[5], NHYD=["CR-C2"], IDs to add=[1+4]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CR-C2"]
                    HYD_COMMENT=["Flow at Cambrain Road Culvert - CR-C2"]
*%------------------|-------------------------------------------------------|
*
*************************************************************
*SOUTH AREA OF THE SITE                                     *
*************************************************************
*
*******************************
*SUB-CATCHMENT A10            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A10"], DT=[1]min, AREA=[5.53](ha),
                    DWF=[0](cms),  CN/C=[55], IA=[14](mm),
                    N=[3], TP=[0.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C2"]
                    HYD_COMMENT=["Flow at Cedarview Road 450mm CSP Culvert"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A11            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A11"], DT=[1]min, AREA=[15.20](ha),
                    DWF=[0](cms),  CN/C=[55], IA=[14](mm),
                    N=[3], TP=[1.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 400mm CSP Culvert - CVR-C3
*****************************************************************************
*
READ HYD            ID=[2],  NHYD=["CVR-C2"],
                    HYD_FILENAME=["CVR-C2"]
*%------------------|-------------------------------------------------------|
*
ADD HYD             IDsum=[3], NHYD=["CVR-C3"], IDs to add=[1+2]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C3"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A12            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A12"], DT=[1]min, AREA=[60.00](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[17](mm),
                    N=[3], TP=[0.95]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 1200mm CSP Culvert - CVR-C4
*****************************************************************************
*
ADD HYD             IDsum=[8], NHYD=["CVR-C4"], IDs to add=[1+3]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[8],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C4"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-1200mm CSP"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A15            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A15"], DT=[1]min, AREA=[3.47](ha),
                    DWF=[0](cms),  CN/C=[61], IA=[11](mm),
                    N=[3], TP=[0.39]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 1200mm CSP Culvert - BDR-C4
*****************************************************************************
*
ADD HYD             IDsum=[9], NHYD=["BDR-C4"], IDs to add=[1+8]
*%------------------|-------------------------------------------------------|
*
SAVE HYD            ID=[9],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C4"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-1200mm CSP"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A20            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A20"], DT=[1]min, AREA=[4.78](ha),
                    DWF=[0](cms),  CN/C=[49], IA=[19](mm),
                    N=[3], TP=[0.32]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------|
*
*****************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C1
*****************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C1"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A19            *
*******************************
*
```

```
CALIB STANDHYD      ID=[1], NHYD=["A19"], DT=[1](min), AREA=[1.01](ha),
                    XIMP=[0.001], TIMP=[0.385], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[0.55](%),
                                         LGP=[450](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C2
*******************************************************************************
*
READ HYD            ID=[2],  NHYD=["BDR-C1"],
                    HYD_FILENAME=["BDR-C1"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[10], NHYD=["BDR-C2"], IDs to add=[1+2]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[10],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C2"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A18            *
*******************************
*
CALIB STANDHYD      ID=[1], NHYD=["A18"], DT=[1](min), AREA=[0.50](ha),
                    XIMP=[0.001], TIMP=[0.455], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[0.30](%),
                                         LGP=[330](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert - BDR-C3
*******************************************************************************
*
ADD HYD             IDsum=[2], NHYD=["BDR-C3"], IDs to add=[1+10]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C3"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-500mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW DOWNSTREAM OF BARNSDALE ROAD 1200mm CSP Culvert - BDR-C4
*******************************************************************************
*
READ HYD            ID=[9],  NHYD=["BDR-C4"],
                    HYD_FILENAME=["BDR-C4"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[1], NHYD=["FTBD"], IDs to add=[2+9]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["FTBD"]
                    HYD_COMMENT=["Flow to Thomas Bakster Drain"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A16            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A16"], DT=[1]min, AREA=[2.87](ha),
                    DWF=[0](cms),  CN/C=[37], IA=[27](mm),
                    N=[3], TP=[0.24]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert - BDR-C5
*******************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C5"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-500mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A17            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A17"], DT=[1]min, AREA=[9.75](ha),
                    DWF=[0](cms),  CN/C=[44], IA=[21](mm),
                    N=[3], TP=[0.42]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C6
*******************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C6"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A21            *
*******************************
*
CALIB STANDHYD      ID=[1], NHYD=["A21"], DT=[1](min), AREA=[1.50](ha),
                    XIMP=[0.001], TIMP=[0.427], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[1.2](%),
                                         LGP=[750](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert located west of GBR (BDR-C7)
*******************************************************************************
*
READ HYD            ID=[2],  NHYD=["BDR-C5"],
                    HYD_FILENAME=["BDR-C5"]
*%------------------|-------------------------------------------------------------|
*
READ HYD            ID=[3],  NHYD=["BDR-C6"],
                    HYD_FILENAME=["BDR-C6"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[4], NHYD=["BDR-C7"], IDs to add=[1+2+3]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C7"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*                SELF CONTAINED AREAS (A9, A13 and A14)
*******************************************************************************
*
*******************************
*SUB-CATCHMENT A9             *
*******************************
*
CALIB NASHYD        ID=[2], NHYD=["A9"], DT=[1]min, AREA=[5.08](ha),
                    DWF=[0](cms),  CN/C=[50], IA=[18](mm),
                    N=[3], TP=[0.25]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A13            *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A13"], DT=[1]min, AREA=[24.60](ha),
                    DWF=[0](cms),  CN/C=[52], IA=[16](mm),
                    N=[3], TP=[0.46]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A14            *
*******************************
*
CALIB NASHYD        ID=[4], NHYD=["A14"], DT=[1]min, AREA=[22.41](ha),
                    DWF=[0](cms),  CN/C=[40], IA=[25](mm),
                    N=[3], TP=[1.5]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*6 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    ["5ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    ["10ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    ["25ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    ["50ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    ["100SCS6.stm"]
*
*12 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[202]
                    ["2ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[205]
                    ["5ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[210]
                    ["10ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[225]
                    ["25ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[250]
                    ["50ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[300]
                    ["100SCS12.stm"]
*
*24 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[302]
                    ["2ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[305]
                    ["5ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[310]
                    ["10ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[325]
                    ["25ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[350]
                    ["50ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[400]
                    ["100SCS24.stm"]
*
*%------------------|-------------------------------------------------------------|
FINISH
```

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO         999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O       9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##   9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O        9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
                                                         9   9  9   9   # 4418403
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa, Ontario: (613) 836-3884            *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.com                   *********
 ********************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: J. L. Richards & Associates Limited         +++++++++
 +++++++++                                SERIAL#:4418403            +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
 *********           Maximum value for ID numbers  :    10             *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).    *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.             *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).       *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).       *****
 *****    *:   see WARNING or NOTE message printed at end of run.         *****
 *****   **:   see  ERROR  message printed at end of run.                 *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 ********************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2017-09-05     TIME: 14:00:30     RUN COUNTER: 000120          *
 ********************************************************************************
 * Input   filename: C:\RUNS\PRE-DE~1\26610EXB.dat                              *
 * Output  filename: C:\RUNS\PRE-DE~1\26610EXB.out                              *
 * Summary filename: C:\RUNS\PRE-DE~1\26610EXB.sum                              *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************


#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
  ** END OF RUN :   1

********************************************************************************




 RUN:COMMAND#
 002:0001----------------------------------------------------------------------------
-----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   2 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
 002:0002----------------------------------------------------------------------------
-----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=   6.00:PTOT=  37.20]
################################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
################################################################################
 002:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .041 No_date    3:25    1.82
.049
       [CN= 53.0: N= 3.00]
       [Tp=  .27:DT= 1.00]
 002:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .003 No_date    4:33     .24
.006
       [CN= 37.0: N= 3.00]
       [Tp=  .33:DT= 1.00]
 002:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .118 No_date    3:32    5.19
.139
       [CN= 67.0: N= 3.00]
       [Tp=  .43:DT= 1.00]
 002:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .054 No_date    3:58    1.30
.035
       [CN= 49.0: N= 3.00]
       [Tp=  .59:DT= 1.00]
 002:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .026 No_date    4:08    1.54
.042
       [CN= 51.0: N= 3.00]
       [Tp=  .72:DT= 1.00]
 002:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .054 No_date    3:58    1.30
n/a
                     +  02:A7            15.53     .026 No_date    4:08    1.54
n/a
                     +  03:A6            11.73     .041 No_date    3:25    1.82
n/a
                     +  04:A4            13.95     .003 No_date    4:33     .24
n/a
                     +  05:A3            12.71     .118 No_date    3:32    5.19
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28     .218 No_date    3:37    1.80
n/a
 002:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28     .218 No_date    3:37    1.80
n/a
       fname :C:\RUNS\PRE-DE~1\CR-C1.002
       remark:Flow at Cambrian Road Culvert-1600mm CSP
 002:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .083 No_date    4:08    1.82
.049
       [CN= 53.0: N= 3.00]
       [Tp=  .74:DT= 1.00]
 002:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .025 No_date    3:39    1.35
.036
       [CN= 50.0: N= 3.00]
       [Tp=  .39:DT= 1.00]
 002:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .025 No_date    3:39    1.35
n/a
                     +  03:A8            42.25     .083 No_date    4:08    1.82
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
 002:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C1.002
       remark:Flow at Cedarview Road Culvert-500mm CSP
 002:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .012 No_date    3:55     .55
.015
       [CN= 42.0: N= 3.00]
       [Tp=  .41:DT= 1.00]
 002:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .012 No_date    3:55     .55
n/a
                     +  04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .115 No_date    4:00    1.42
n/a
 002:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54     .115 No_date    4:00    1.42
n/a
       fname :C:\RUNS\PRE-DE~1\CR-C2.002
       remark:Flow at Cambrain Road Culvert - CR-C2
 002:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .027 No_date    3:23    2.33
.063
       [CN= 55.0: N= 3.00]
       [Tp=  .27:DT= 1.00]
 002:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .027 No_date    3:23    2.33
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C2.002
       remark:Flow at Cedarview Road 450mm CSP Culvert
 002:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .029 No_date    4:53    2.33
.063
       [CN= 55.0: N= 3.00]
       [Tp= 1.27:DT= 1.00]
 002:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .027 No_date    3:23    2.33
n/a
       Filename = C:\RUNS\PRE-DE~1\CVR-C2.002
       Comment  = Flow at Cedarview Road 450mm CSP Culvert
 002:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .029 No_date    4:53    2.33
n/a
                     +  02:CVR-C2         5.53     .027 No_date    3:23    2.33
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
 002:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C3.002
       remark:Flow at Cedarview Road Culvert-400mm CSP
 002:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .085 No_date    4:32    1.54
.042
       [CN= 51.0: N= 3.00]
       [Tp=  .95:DT= 1.00]
 002:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .085 No_date    4:32    1.54
n/a
                     +  03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
 002:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C4.002
       remark:Flow at Cedarview Road Culvert-1200mm CSP
 002:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .023 No_date    3:30    3.64
.098
       [CN= 61.0: N= 3.00]
       [Tp=  .39:DT= 1.00]
 002:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .023 No_date    3:30    3.64
n/a
                     +  08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
 002:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
       fname :C:\RUNS\PRE-DE~1\BDR-C4.002
       remark:Flow at Barnsdale Road Culvert-1200mm CSP
 002:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .009 No_date    3:34    1.17
.032
       [CN= 49.0: N= 3.00]
       [Tp=  .32:DT= 1.00]
 002:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .009 No_date    3:34    1.17
n/a
       fname :C:\RUNS\PRE-DE~1\BDR-C1.002
       remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .024 No_date    3:45   12.18
.327
       [XIMP=.00:TIMP=.38]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
```

```
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C1         4.78     .009 No_date    3:34    1.17
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.002
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 002:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A19            1.01     .024 No_date    3:45   12.18
n/a
                        +  02:BDR-C1         4.78     .009 No_date    3:34    1.17
n/a
      [DT= 1.00]  SUM=  10:BDR-C2          5.79     .032 No_date    3:43    3.09
n/a
 002:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            10:BDR-C2         5.79     .032 No_date    3:43    3.09
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A18             .50     .014 No_date    3:41   13.27
.357
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A18             .50     .014 No_date    3:41   13.27
n/a
                        +  10:BDR-C2         5.79     .032 No_date    3:43    3.09
n/a
      [DT= 1.00]  SUM=  02:BDR-C3          6.29     .046 No_date    3:42    3.90
n/a
 002:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            02:BDR-C3         6.29     .046 No_date    3:42    3.90
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.002
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 002:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.002
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 002:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             02:BDR-C3         6.29     .046 No_date    3:42    3.90
n/a
                        +  09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
      [DT= 1.00]  SUM=  01:FTBD           90.49     .159 No_date    3:56    1.97
n/a
 002:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:FTBD          90.49     .159 No_date    3:56    1.97
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.002
      remark:Flow to Thomas Bakster Drain
 002:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A16            2.87     .001 No_date    4:20     .23
.006
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 002:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A16            2.87     .001 No_date    4:20     .23
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.002
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 002:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A17            9.75     .009 No_date    3:49     .77
.021
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 002:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A17            9.75     .009 No_date    3:49     .77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A21            1.50     .037 No_date    3:47   12.84
.345
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C5         2.87     .001 No_date    4:20     .23
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.002
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 002:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            03:BDR-C6         9.75     .009 No_date    3:49     .77
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.002
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 002:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A21            1.50     .037 No_date    3:47   12.84
n/a
                        +  02:BDR-C5         2.87     .001 No_date    4:20     .23
n/a
                        +  03:BDR-C6         9.75     .009 No_date    3:49     .77
n/a
      [DT= 1.00]  SUM=  04:BDR-C7         14.12     .047 No_date    3:47    1.95
n/a
 002:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:BDR-C7        14.12     .047 No_date    3:47    1.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A9             5.08     .012 No_date    3:25    1.35
.036
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 002:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A13           24.60     .062 No_date    3:42    1.76
.047
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 002:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A14           22.41     .006 No_date    6:17     .38
.010
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :   4

************************************************************************************
```

```
 RUN:COMMAND#
 005:0001---------------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   5 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*************************************************************************
 005:0002---------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=   6.00:PTOT=  50.40]
###########################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS           #
###########################################################################
 005:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A6            11.73     .119 No_date    3:21    4.56
.090
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 005:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A4            13.95     .024 No_date    3:37    1.20
.024
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 005:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        05:A3            12.71     .247 No_date    3:29   10.29
.204
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 005:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A2            35.36     .166 No_date    3:49    3.54
.070
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 005:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A7            15.53     .074 No_date    3:59    4.02
.080
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 005:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A2            35.36     .166 No_date    3:49    3.54
n/a
                        +  02:A7            15.53     .074 No_date    3:59    4.02
n/a
                        +  03:A6            11.73     .119 No_date    3:21    4.56
n/a
                        +  04:A4            13.95     .024 No_date    3:37    1.20
n/a
                        +  05:A3            12.71     .247 No_date    3:29   10.29
n/a
      [DT= 1.00]  SUM=  07:CR-C1           89.28     .574 No_date    3:34    4.35
n/a
 005:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            07:CR-C1         89.28     .574 No_date    3:34    4.35
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.005
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 005:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A8            42.25     .227 No_date    4:00    4.56
.090
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 005:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A5            12.65     .079 No_date    3:32    3.67
.073
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 005:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A5            12.65     .079 No_date    3:32    3.67
n/a
                        +  03:A8            42.25     .227 No_date    4:00    4.56
n/a
      [DT= 1.00]  SUM=  04:CVR-C1          54.90     .288 No_date    3:51    4.35
n/a
 005:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:CVR-C1        54.90     .288 No_date    3:51    4.35
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.005
      remark:Flow at Cedarview Road Culvert-500mm CSP
 005:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A1            18.64     .055 No_date    3:39    1.99
.039
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 005:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A1            18.64     .055 No_date    3:39    1.99
n/a
                        +  04:CVR-C1        54.90     .288 No_date    3:51    4.35
n/a
      [DT= 1.00]  SUM=  05:CR-C2           73.54     .340 No_date    3:49    3.75
n/a
 005:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            05:CR-C2         73.54     .340 No_date    3:49    3.75
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.005
      remark:Flow at Cambrain Road Culvert - CR-C2
 005:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A10            5.53     .069 No_date    3:20    5.43
.108
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 005:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A10            5.53     .069 No_date    3:20    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.005
      remark:Flow at Cedarview Road 450mm CSP Culvert
 005:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A11           15.20     .069 No_date    4:43    5.43
.108
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 005:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:CVR-C2         5.53     .069 No_date    3:20    5.43
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.005
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 005:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A11           15.20     .069 No_date    4:43    5.43
n/a
```

```
                    +  02:CVR-C2         5.53     .069 No_date    3:20    5.43
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
 005:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.005
      remark:Flow at Cedarview Road Culvert-400mm CSP
 005:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .238 No_date    4:20    4.02
.080
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 005:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .238 No_date    4:20    4.02
n/a
                    +  03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
 005:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.005
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 005:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15           3.47     .052 No_date    3:27    7.69
.153
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 005:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15           3.47     .052 No_date    3:27    7.69
n/a
                    +  08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
 005:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.005
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 005:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20           4.78     .030 No_date    3:27    3.33
.066
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 005:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20           4.78     .030 No_date    3:27    3.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19           1.01     .029 No_date    4:09   21.01
.417
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1        4.78     .030 No_date    3:27    3.33
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.005
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 005:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19           1.01     .029 No_date    4:09   21.01
n/a
                    +  02:BDR-C1        4.78     .030 No_date    3:27    3.33
n/a
      [DT= 1.00]  SUM=  10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
 005:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18            .50     .018 No_date    3:59   22.70
.450
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18            .50     .018 No_date    3:59   22.70
n/a
                    +  10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
      [DT= 1.00]  SUM=  02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
 005:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.005
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 005:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.005
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 005:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
                    +  09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .403 No_date    4:08    4.74
n/a
 005:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .403 No_date    4:08    4.74
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.005
      remark:Flow to Thomas Bakster Drain
 005:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16           2.87     .006 No_date    3:28    1.20
.024
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 005:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16           2.87     .006 No_date    3:28    1.20
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.005
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 005:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17           9.75     .037 No_date    3:38    2.45
.049
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 005:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17           9.75     .037 No_date    3:38    2.45
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21           1.50     .043 No_date    4:13   21.89
.434
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5        2.87     .006 No_date    3:28    1.20
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.005
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 005:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6        9.75     .037 No_date    3:38    2.45
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.005
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 005:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21           1.50     .043 No_date    4:13   21.89
n/a
                    +  02:BDR-C5        2.87     .006 No_date    3:28    1.20
n/a
                    +  03:BDR-C6        9.75     .037 No_date    3:38    2.45
n/a
      [DT= 1.00]  SUM=  04:BDR-C7       14.12     .072 No_date    4:06    4.26
n/a
 005:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7       14.12     .072 No_date    4:06    4.26
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9            5.08     .041 No_date    3:20    3.67
.073
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 005:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13          24.60     .174 No_date    3:37    4.40
.087
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 005:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14          22.41     .025 No_date    5:32    1.59
.031
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :   9

************************************************************************



 RUN:COMMAND#
 010:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  10 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*********************************************************************
 010:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  59.40]
##############################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
##############################################################################
 010:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .192 No_date    3:20    7.01
.118
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 010:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .052 No_date    3:32    2.26
.038
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 010:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .355 No_date    3:29   14.47
.244
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 010:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .274 No_date    3:47    5.61
.094
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 010:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .119 No_date    3:56    6.28
.106
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 010:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .274 No_date    3:47    5.61
n/a
                    +  02:A7            15.53     .119 No_date    3:56    6.28
n/a
                    +  03:A6            11.73     .192 No_date    3:20    7.01
n/a
                    +  04:A4            13.95     .052 No_date    3:32    2.26
n/a
                    +  05:A3            12.71     .355 No_date    3:29   14.47
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28     .905 No_date    3:33    6.65
n/a
 010:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .905 No_date    3:33    6.65
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.010
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 010:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .360 No_date    3:57    7.01
.118
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
```

```
 010:0011----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .133 No_date    3:30    5.80
.098
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 010:0012----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .133 No_date    3:30    5.80
n/a
                    +  03:A8            42.25     .360 No_date    3:57    7.01
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
 010:0013----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.010
      remark:Flow at Cedarview Road Culvert-500mm CSP
 010:0014----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .103 No_date    3:35    3.42
.058
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 010:0015----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .103 No_date    3:35    3.42
n/a
                    +  04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .557 No_date    3:45    5.89
n/a
 010:0016----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .557 No_date    3:45    5.89
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.010
      remark:Flow at Cambrain Road Culvert - CR-C2
 010:0017----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .108 No_date    3:19    8.14
.137
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 010:0018----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .108 No_date    3:19    8.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.010
      remark:Flow at Cedarview Road 450mm CSP Culvert
 010:0019----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .105 No_date    4:40    8.14
.137
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 010:0020----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .108 No_date    3:19    8.14
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.010
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 010:0021----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .105 No_date    4:40    8.14
n/a
                    +  02:CVR-C2         5.53     .108 No_date    3:19    8.14
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
 010:0022----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.010
      remark:Flow at Cedarview Road Culvert-400mm CSP
 010:0023----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .382 No_date    4:16    6.28
.106
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 010:0024----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .382 No_date    4:16    6.28
n/a
                    +  03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
     [DT= 1.00]  SUM=  08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
 010:0025----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.010
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 010:0026----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .077 No_date    3:27   11.11
.187
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 010:0027----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .077 No_date    3:27   11.11
n/a
                    +  08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
     [DT= 1.00]  SUM=  09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
 010:0028----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.010
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 010:0029----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .051 No_date    3:25    5.36
.090
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 010:0030----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .051 No_date    3:25    5.36
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0031----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .044 No_date    3:57   27.41
.461
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0032----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .051 No_date    3:25    5.36
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.010
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 010:0033----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .044 No_date    3:57   27.41
n/a
                    +  02:BDR-C1         4.78     .051 No_date    3:25    5.36
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
 010:0034----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0035----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .025 No_date    3:50   28.91
.487
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0036----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .025 No_date    3:50   28.91
n/a
                    +  10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
 010:0037----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.010
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 010:0038----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.010
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 010:0039----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
                    +  09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .629 No_date    4:01    7.20
n/a
 010:0040----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .629 No_date    4:01    7.20
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.010
      remark:Flow to Thomas Bakster Drain
 010:0041----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .013 No_date    3:23    2.26
.038
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 010:0042----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .013 No_date    3:23    2.26
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.010
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 010:0043----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .065 No_date    3:35    4.08
.069
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 010:0044----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .065 No_date    3:35    4.08
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0045----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .065 No_date    4:00   28.32
.477
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0046----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .013 No_date    3:23    2.26
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.010
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 010:0047----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .065 No_date    3:35    4.08
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.010
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 010:0048----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .065 No_date    4:00   28.32
n/a
                    +  02:BDR-C5         2.87     .013 No_date    3:23    2.26
n/a
                    +  03:BDR-C6         9.75     .065 No_date    3:35    4.08
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .125 No_date    3:52    6.28
n/a
 010:0049----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .125 No_date    3:52    6.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0050----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .069 No_date    3:19    5.80
.098
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 010:0051----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .280 No_date    3:35    6.78
.114
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 010:0052----------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .046 No_date    5:19    2.85
.048
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  24

********************************************************************************



 RUN:COMMAND#
 025:0001----------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  25 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
```

```
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*****************************************************************************
 025:0002----------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  70.20]
##############################################################################
#             BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                 #
##############################################################################
 025:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .299 No_date    3:19   10.51
.150
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 025:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .100 No_date    3:28    3.92
.056
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 025:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .501 No_date    3:28   20.10
.286
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 025:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .436 No_date    3:45    8.61
.123
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 025:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .187 No_date    3:54    9.52
.136
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 025:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .436 No_date    3:45    8.61
n/a
                    +  02:A7            15.53     .187 No_date    3:54    9.52
n/a
                    +  03:A6            11.73     .299 No_date    3:19   10.51
n/a
                    +  04:A4            13.95     .100 No_date    3:28    3.92
n/a
                    +  05:A3            12.71     .501 No_date    3:28   20.10
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28    1.389 No_date    3:32    9.92
n/a
 025:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    1.389 No_date    3:32    9.92
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.025
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 025:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .555 No_date    3:55   10.51
.150
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 025:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .213 No_date    3:29    8.90
.127
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 025:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .213 No_date    3:29    8.90
n/a
                    +  03:A8            42.25     .555 No_date    3:55   10.51
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
 025:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.025
      remark:Flow at Cedarview Road Culvert-500mm CSP
 025:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .178 No_date    3:33    5.60
.080
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 025:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .178 No_date    3:33    5.60
n/a
                    +  04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .882 No_date    3:43    8.99
n/a
 025:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .882 No_date    3:43    8.99
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.025
      remark:Flow at Cambrain Road Culvert - CR-C2
 025:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .164 No_date    3:18   11.96
.170
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 025:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .164 No_date    3:18   11.96
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.025
      remark:Flow at Cedarview Road 450mm CSP Culvert
 025:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .157 No_date    4:37   11.96
.170
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 025:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .164 No_date    3:18   11.96
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.025
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 025:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .157 No_date    4:37   11.96
n/a
                    +  02:CVR-C2         5.53     .164 No_date    3:18   11.96
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
 025:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.025
      remark:Flow at Cedarview Road Culvert-400mm CSP
 025:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .593 No_date    4:13    9.52
.136
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 025:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .593 No_date    4:13    9.52
n/a
                    +  03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
 025:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.025
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 025:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .112 No_date    3:26   15.82
.225
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 025:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .112 No_date    3:26   15.82
n/a
                    +  08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
 025:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.025
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 025:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .084 No_date    3:23    8.31
.118
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 025:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .084 No_date    3:23    8.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .064 No_date    3:48   34.86
.497
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .084 No_date    3:23    8.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.025
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 025:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .064 No_date    3:48   34.86
n/a
                    +  02:BDR-C1         4.78     .084 No_date    3:23    8.31
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
 025:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .036 No_date    3:42   37.07
.528
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .036 No_date    3:42   37.07
n/a
                    +  10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
 025:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.025
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 025:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.025
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 025:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
                    +  09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .952 No_date    3:57   10.69
n/a
 025:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .952 No_date    3:57   10.69
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.025
      remark:Flow to Thomas Bakster Drain
 025:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .024 No_date    3:21    3.92
.056
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 025:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .024 No_date    3:21    3.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.025
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 025:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .110 No_date    3:33    6.50
.093
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 025:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .110 No_date    3:33    6.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .093 No_date    3:51   36.09
.514
      [XIMP=.00:TIMP=.43]
```

```
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .024 No_date    3:21    3.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.025
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 025:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .110 No_date    3:33    6.50
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.025
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 025:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .093 No_date    3:51   36.09
n/a
                     +  02:BDR-C5         2.87     .024 No_date    3:21    3.92
n/a
                     +  03:BDR-C6         9.75     .110 No_date    3:33    6.50
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .205 No_date    3:43    9.12
n/a
 025:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .205 No_date    3:43    9.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .111 No_date    3:18    8.90
.127
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 025:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .435 No_date    3:33   10.18
.145
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 025:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A14           22.41     .079 No_date    5:11    4.79
.068
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  49

************************************************************************************



 RUN:COMMAND#
 050:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  50 ]
#************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#************************************************************************
 050:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  78.60]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 050:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A6            11.73     .396 No_date    3:18   13.61
.173
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 050:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A4            13.95     .147 No_date    3:27    5.50
.070
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 050:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        05:A3            12.71     .626 No_date    3:27   24.88
.317
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 050:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A2            35.36     .585 No_date    3:44   11.30
.144
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 050:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A7            15.53     .247 No_date    3:53   12.42
.158
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 050:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .585 No_date    3:44   11.30
n/a
                     +  02:A7            15.53     .247 No_date    3:53   12.42
n/a
                     +  03:A6            11.73     .396 No_date    3:18   13.61
n/a
                     +  04:A4            13.95     .147 No_date    3:27    5.50
n/a
                     +  05:A3            12.71     .626 No_date    3:27   24.88
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.825 No_date    3:31   12.83
n/a
 050:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    1.825 No_date    3:31   12.83
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.050
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 050:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .730 No_date    3:54   13.61
.173
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 050:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .286 No_date    3:28   11.67
.149
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 050:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .286 No_date    3:28   11.67
n/a
                     +  03:A8            42.25     .730 No_date    3:54   13.61
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
 050:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.050
      remark:Flow at Cedarview Road Culvert-500mm CSP
 050:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .251 No_date    3:32    7.61
.097
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 050:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .251 No_date    3:32    7.61
n/a
                     +  04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.179 No_date    3:41   11.76
n/a
 050:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.179 No_date    3:41   11.76
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.050
      remark:Flow at Cambrain Road Culvert - CR-C2
 050:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A10            5.53     .214 No_date    3:17   15.32
.195
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 050:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A10            5.53     .214 No_date    3:17   15.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.050
      remark:Flow at Cedarview Road 450mm CSP Culvert
 050:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A11           15.20     .202 No_date    4:36   15.32
.195
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 050:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:CVR-C2         5.53     .214 No_date    3:17   15.32
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.050
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 050:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A11           15.20     .202 No_date    4:36   15.32
n/a
                     +  02:CVR-C2         5.53     .214 No_date    3:17   15.32
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
 050:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.050
      remark:Flow at Cedarview Road Culvert-400mm CSP
 050:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A12           60.00     .784 No_date    4:12   12.42
.158
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 050:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A12           60.00     .784 No_date    4:12   12.42
n/a
                     +  03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
 050:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.050
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 050:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A15            3.47     .143 No_date    3:25   19.87
.253
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 050:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A15            3.47     .143 No_date    3:25   19.87
n/a
                     +  08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.088 No_date    4:07   13.44
n/a
 050:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            09:BDR-C4        84.20    1.088 No_date    4:07   13.44
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.050
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 050:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A20            4.78     .114 No_date    3:23   10.96
.139
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 050:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A20            4.78     .114 No_date    3:23   10.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A19            1.01     .081 No_date    3:43   41.36
.526
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C1         4.78     .114 No_date    3:23   10.96
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.050
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 050:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A19            1.01     .081 No_date    3:43   41.36
n/a
                     +  02:BDR-C1         4.78     .114 No_date    3:23   10.96
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
 050:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB STANDHYD     01:A18             .50     .045 No_date    3:38   43.46
.553
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .045 No_date    3:38   43.46
n/a
                     +  10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .218 No_date    3:35   18.43
n/a
 050:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3          6.29     .218 No_date    3:35   18.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.050
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 050:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4         84.20    1.088 No_date    4:07   13.44
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.050
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 050:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3          6.29     .218 No_date    3:35   18.43
n/a
                     +  09:BDR-C4         84.20    1.088 No_date    4:07   13.44
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.240 No_date    3:55   13.78
n/a
 050:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.240 No_date    3:55   13.78
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.050
      remark:Flow to Thomas Bakster Drain
 050:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16             2.87     .036 No_date    3:19    5.50
.070
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 050:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16             2.87     .036 No_date    3:19    5.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.050
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 050:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17             9.75     .151 No_date    3:32    8.71
.111
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 050:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17             9.75     .151 No_date    3:32    8.71
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21             1.50     .118 No_date    3:46   42.72
.544
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5          2.87     .036 No_date    3:19    5.50
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.050
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 050:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6          9.75     .151 No_date    3:32    8.71
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.050
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 050:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21             1.50     .118 No_date    3:46   42.72
n/a
                     +  02:BDR-C5         2.87     .036 No_date    3:19    5.50
n/a
                     +  03:BDR-C6         9.75     .151 No_date    3:32    8.71
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .281 No_date    3:38   11.67
n/a
 050:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .281 No_date    3:38   11.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9              5.08     .150 No_date    3:17   11.67
.149
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 050:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13            24.60     .574 No_date    3:33   13.19
.168
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 050:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14            22.41     .109 No_date    5:07    6.61
.084
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  99

**********************************************************************************




 RUN:COMMAND#
 100:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 100 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************************
 100:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  87.00]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 100:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6             11.73     .503 No_date    3:17   17.02
.196
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 100:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4             13.95     .202 No_date    3:25    7.31
.084
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 100:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3             12.71     .760 No_date    3:27   29.95
.344
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 100:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2             35.36     .751 No_date    3:43   14.28
.164
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 100:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7             15.53     .315 No_date    3:52   15.60
.179
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 100:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2             35.36     .751 No_date    3:43   14.28
n/a
                     +  02:A7             15.53     .315 No_date    3:52   15.60
n/a
                     +  03:A6             11.73     .503 No_date    3:17   17.02
n/a
                     +  04:A4             13.95     .202 No_date    3:25    7.31
n/a
                     +  05:A3             12.71     .760 No_date    3:27   29.95
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    2.307 No_date    3:30   16.01
n/a
 100:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1          89.28    2.307 No_date    3:30   16.01
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.100
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 100:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8             42.25     .924 No_date    3:53   17.02
.196
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 100:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5             12.65     .368 No_date    3:27   14.74
.169
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 100:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5             12.65     .368 No_date    3:27   14.74
n/a
                     +  03:A8             42.25     .924 No_date    3:53   17.02
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.203 No_date    3:44   16.49
n/a
 100:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1         54.90    1.203 No_date    3:44   16.49
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.100
      remark:Flow at Cedarview Road Culvert-500mm CSP
 100:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1             18.64     .334 No_date    3:31    9.88
.114
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 100:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1             18.64     .334 No_date    3:31    9.88
n/a
                     +  04:CVR-C1         54.90    1.203 No_date    3:44   16.49
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.511 No_date    3:40   14.81
n/a
 100:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2          73.54    1.511 No_date    3:40   14.81
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.100
      remark:Flow at Cambrain Road Culvert - CR-C2
 100:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10             5.53     .269 No_date    3:17   18.98
.218
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 100:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10             5.53     .269 No_date    3:17   18.98
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.100
      remark:Flow at Cedarview Road 450mm CSP Culvert
 100:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11            15.20     .252 No_date    4:34   18.98
.218
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 100:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2          5.53     .269 No_date    3:17   18.98
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.100
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 100:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11            15.20     .252 No_date    4:34   18.98
n/a
                     +  02:CVR-C2          5.53     .269 No_date    3:17   18.98
n/a
      [DT= 1.00]  SUM=  03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
 100:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.100
      remark:Flow at Cedarview Road Culvert-400mm CSP
 100:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12            60.00     .996 No_date    4:11   15.60
.179
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 100:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12            60.00     .996 No_date    4:11   15.60
n/a
                     +  03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
      [DT= 1.00]  SUM=  08:CVR-C4         80.73    1.299 No_date    4:11   16.47
n/a
```

```
 100:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73    1.299 No_date    4:11   16.47
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.100
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 100:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .176 No_date    3:25   24.23
.278
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 100:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .176 No_date    3:25   24.23
n/a
                     +  08:CVR-C4        80.73    1.299 No_date    4:11   16.47
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.374 No_date    4:06   16.79
n/a
 100:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20    1.374 No_date    4:06   16.79
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.100
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 100:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .147 No_date    3:22   13.91
.160
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 100:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .147 No_date    3:22   13.91
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .099 No_date    3:39   47.80
.549
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C1         4.78     .147 No_date    3:22   13.91
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.100
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 100:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A19            1.01     .099 No_date    3:39   47.80
n/a
                     +  02:BDR-C1         4.78     .147 No_date    3:22   13.91
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
 100:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A18             .50     .054 No_date    3:35   49.96
.574
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A18             .50     .054 No_date    3:35   49.96
n/a
                     +  10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
 100:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.100
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 100:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           09:BDR-C4        84.20    1.374 No_date    4:06   16.79
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.100
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 100:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
                     +  09:BDR-C4        84.20    1.374 No_date    4:06   16.79
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.556 No_date    3:54   17.17
n/a
 100:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:FTBD          90.49    1.556 No_date    3:54   17.17
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.100
      remark:Flow to Thomas Bakster Drain
 100:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A16            2.87     .050 No_date    3:19    7.31
.084
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 100:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A16            2.87     .050 No_date    3:19    7.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.100
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 100:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A17            9.75     .198 No_date    3:31   11.19
.129
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 100:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A17            9.75     .198 No_date    3:31   11.19
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A21            1.50     .142 No_date    3:42   48.99
.563
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C5         2.87     .050 No_date    3:19    7.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.100
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 100:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           03:BDR-C6         9.75     .198 No_date    3:31   11.19
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.100
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 100:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A21            1.50     .142 No_date    3:42   48.99
n/a
                     +  02:BDR-C5         2.87     .050 No_date    3:19    7.31
n/a
                     +  03:BDR-C6         9.75     .198 No_date    3:31   11.19
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .365 No_date    3:35   14.42
n/a
 100:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:BDR-C7        14.12     .365 No_date    3:35   14.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A9             5.08     .193 No_date    3:17   14.74
.169
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 100:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A13           24.60     .729 No_date    3:32   16.50
.190
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 100:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A14           22.41     .145 No_date    5:04    8.68
.100
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 201

************************************************************************




 RUN:COMMAND#
 202:0001---------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 202 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 202:0002---------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  43.20]
#####################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS           #
#####################################################################
 202:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .057 No_date    6:19    2.93
.068
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 202:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .006 No_date    6:53     .58
.014
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 202:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .147 No_date    6:27    7.34
.170
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 202:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .075 No_date    6:51    2.19
.051
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 202:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .035 No_date    7:01    2.54
.059
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 202:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .075 No_date    6:51    2.19
n/a
                     +  02:A7            15.53     .035 No_date    7:01    2.54
n/a
                     +  03:A6            11.73     .057 No_date    6:19    2.93
n/a
                     +  04:A4            13.95     .006 No_date    6:53     .58
n/a
                     +  05:A3            12.71     .147 No_date    6:27    7.34
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28     .287 No_date    6:33    2.83
n/a
 202:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28     .287 No_date    6:33    2.83
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.202
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 202:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .111 No_date    7:01    2.93
.068
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 202:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .035 No_date    6:33    2.27
.053
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 202:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .035 No_date    6:33    2.27
n/a
                     +  03:A8            42.25     .111 No_date    7:01    2.93
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .139 No_date    6:54    2.78
n/a
 202:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .139 No_date    6:54    2.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.202
      remark:Flow at Cedarview Road Culvert-500mm CSP
 202:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

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     CALIB NASHYD       01:A1            18.64     .019 No_date    6:46    1.10
.025
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 202:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .019 No_date    6:46    1.10
n/a
                      +  04:CVR-C1        54.90     .139 No_date    6:54    2.78
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .157 No_date    6:53    2.35
n/a
 202:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .157 No_date    6:53    2.35
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.202
      remark:Flow at Cambrain Road Culvert - CR-C2
 202:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .036 No_date    6:18    3.60
.083
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 202:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .036 No_date    6:18    3.60
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.202
      remark:Flow at Cedarview Road 450mm CSP Culvert
 202:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .036 No_date    7:42    3.60
.083
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 202:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .036 No_date    6:18    3.60
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.202
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 202:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .036 No_date    7:42    3.60
n/a
                      +  02:CVR-C2         5.53     .036 No_date    6:18    3.60
n/a
      [DT= 1.00]  SUM=  03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
 202:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.202
      remark:Flow at Cedarview Road Culvert-400mm CSP
 202:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .113 No_date    7:21    2.54
.059
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 202:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .113 No_date    7:21    2.54
n/a
                      +  03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
      [DT= 1.00]  SUM=  08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
 202:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.202
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 202:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .029 No_date    6:25    5.33
.123
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 202:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .029 No_date    6:25    5.33
n/a
                      +  08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
      [DT= 1.00]  SUM=  09:BDR-C4         84.20     .169 No_date    7:15    2.92
n/a
 202:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4         84.20     .169 No_date    7:15    2.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.202
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 202:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .012 No_date    6:27    2.03
.047
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 202:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .012 No_date    6:27    2.03
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .027 No_date    6:42   12.96
.300
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .012 No_date    6:27    2.03
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.202
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 202:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .027 No_date    6:42   12.96
n/a
                      +  02:BDR-C1         4.78     .012 No_date    6:27    2.03
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
 202:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .016 No_date    6:38   14.41
.334
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .016 No_date    6:38   14.41
n/a
                      +  10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
 202:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.202
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 202:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .169 No_date    7:15    2.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.202
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 202:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
                      +  09:BDR-C4        84.20     .169 No_date    7:15    2.92
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .207 No_date    6:50    3.04
n/a
 202:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .207 No_date    6:50    3.04
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.202
      remark:Flow to Thomas Bakster Drain
 202:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .001 No_date    6:41     .58
.014
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 202:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .001 No_date    6:41     .58
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.202
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 202:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .014 No_date    6:41    1.43
.033
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 202:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .014 No_date    6:41    1.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .042 No_date    6:43   13.83
.320
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .001 No_date    6:41     .58
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.202
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 202:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .014 No_date    6:41    1.43
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.202
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 202:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .042 No_date    6:43   13.83
n/a
                      +  02:BDR-C5         2.87     .001 No_date    6:41     .58
n/a
                      +  03:BDR-C6         9.75     .014 No_date    6:41    1.43
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .057 No_date    6:43    2.57
n/a
 202:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .057 No_date    6:43    2.57
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .018 No_date    6:19    2.27
.053
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 202:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .084 No_date    6:36    2.83
.065
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 202:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .009 No_date    9:02     .83
.019
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 204

************************************************************************




 RUN:COMMAND#
 205:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 205 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 205:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  57.60]
#######################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS             #
#######################################################################
 205:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .149 No_date    6:16    6.48
.113
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 205:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

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     CALIB NASHYD       04:A4            13.95     .033 No_date    6:31    2.02
.035
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 205:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .286 No_date    6:26   13.60
.236
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 205:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .204 No_date    6:45    5.16
.090
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 205:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .090 No_date    6:55    5.79
.101
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 205:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .204 No_date    6:45    5.16
n/a
                    +  02:A7            15.53     .090 No_date    6:55    5.79
n/a
                    +  03:A6            11.73     .149 No_date    6:16    6.48
n/a
                    +  04:A4            13.95     .033 No_date    6:31    2.02
n/a
                    +  05:A3            12.71     .286 No_date    6:26   13.60
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28     .689 No_date    6:30    6.15
n/a
 205:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .689 No_date    6:30    6.15
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.205
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 205:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .274 No_date    6:55    6.48
.113
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 205:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .099 No_date    6:27    5.34
.093
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 205:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .099 No_date    6:27    5.34
n/a
                    +  03:A8            42.25     .274 No_date    6:55    6.48
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
 205:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.205
      remark:Flow at Cedarview Road Culvert-500mm CSP
 205:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .071 No_date    6:34    3.11
.054
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 205:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .071 No_date    6:34    3.11
n/a
                    +  04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .415 No_date    6:44    5.43
n/a
 205:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .415 No_date    6:44    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.205
      remark:Flow at Cambrain Road Culvert - CR-C2
 205:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .086 No_date    6:16    7.56
.131
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 205:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .086 No_date    6:16    7.56
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.205
      remark:Flow at Cedarview Road 450mm CSP Culvert
 205:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .081 No_date    7:36    7.56
.131
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 205:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .086 No_date    6:16    7.56
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.205
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 205:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .081 No_date    7:36    7.56
n/a
                    +  02:CVR-C2         5.53     .086 No_date    6:16    7.56
n/a
     [DT= 1.00]  SUM=  03:CVR-C3         20.73     .106 No_date    6:21    7.56
n/a
 205:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .106 No_date    6:21    7.56
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.205
      remark:Flow at Cedarview Road Culvert-400mm CSP
 205:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .287 No_date    7:14    5.79
.101
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 205:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .287 No_date    7:14    5.79
n/a
                    +  03:CVR-C3        20.73     .106 No_date    6:21    7.56
n/a
     [DT= 1.00]  SUM=  08:CVR-C4         80.73     .385 No_date    7:14    6.25
n/a
 205:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .385 No_date    7:14    6.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.205
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 205:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .062 No_date    6:24   10.39
.180
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 205:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .062 No_date    6:24   10.39
n/a
                    +  08:CVR-C4         80.73     .385 No_date    7:14    6.25
n/a
     [DT= 1.00]  SUM=  09:BDR-C4         84.20     .411 No_date    7:08    6.42
n/a
 205:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.205
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 205:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .038 No_date    6:22    4.92
.085
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 205:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .038 No_date    6:22    4.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .030 No_date    7:08   21.15
.367
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .038 No_date    6:22    4.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.205
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 205:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .030 No_date    7:08   21.15
n/a
                    +  02:BDR-C1         4.78     .038 No_date    6:22    4.92
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
 205:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .018 No_date    6:58   22.96
.399
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .018 No_date    6:58   22.96
n/a
                    +  10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
 205:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.205
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 205:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.205
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 205:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
                    +  09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .475 No_date    7:04    6.59
n/a
 205:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .475 No_date    7:04    6.59
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.205
      remark:Flow to Thomas Bakster Drain
 205:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .008 No_date    6:21    2.02
.035
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 205:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .008 No_date    6:21    2.02
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.205
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 205:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .046 No_date    6:33    3.72
.065
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 205:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .046 No_date    6:33    3.72
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .044 No_date    7:11   22.10
.384
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .008 No_date    6:21    2.02
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.205
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 205:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .046 No_date    6:33    3.72
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.205
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 205:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .044 No_date    7:11   22.10
n/a
```

```
                    +  02:BDR-C5         2.87     .008 No_date    6:21    2.02
n/a
                    +  03:BDR-C6         9.75     .046 No_date    6:33    3.72
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .080 No_date    6:48    5.33
n/a
 205:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          04:BDR-C7        14.12     .080 No_date    6:48    5.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      02:A9             5.08     .053 No_date    6:16    5.34
.093
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 205:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      03:A13           24.60     .212 No_date    6:32    6.27
.109
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 205:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      04:A14           22.41     .031 No_date    8:18    2.57
.045
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 209

************************************************************************************




 RUN:COMMAND#
 210:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 210 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************************
 210:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  67.20]
###################################################################################
#                  BARRHAVEN EXPANSION - EXISTING CONDITION FLOWS                 #
###################################################################################
 210:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      03:A6            11.73     .230 No_date    6:15    9.48
.141
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 210:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      04:A4            13.95     .065 No_date    6:26    3.42
.051
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 210:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      05:A3            12.71     .396 No_date    6:25   18.48
.275
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 210:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A2            35.36     .322 No_date    6:43    7.72
.115
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 210:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      02:A7            15.53     .139 No_date    6:53    8.56
.127
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 210:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A2            35.36     .322 No_date    6:43    7.72
n/a
                    +  02:A7            15.53     .139 No_date    6:53    8.56
n/a
                    +  03:A6            11.73     .230 No_date    6:15    9.48
n/a
                    +  04:A4            13.95     .065 No_date    6:26    3.42
n/a
                    +  05:A3            12.71     .396 No_date    6:25   18.48
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28    1.044 No_date    6:29    8.96
n/a
 210:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          07:CR-C1         89.28    1.044 No_date    6:29    8.96
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.210
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 210:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      03:A8            42.25     .417 No_date    6:53    9.48
.141
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 210:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A5            12.65     .158 No_date    6:26    7.98
.119
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 210:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A5            12.65     .158 No_date    6:26    7.98
n/a
                    +  03:A8            42.25     .417 No_date    6:53    9.48
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
 210:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.210
      remark:Flow at Cedarview Road Culvert-500mm CSP
 210:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A1            18.64     .124 No_date    6:31    4.95
.074
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 210:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A1            18.64     .124 No_date    6:31    4.95
n/a
                    +  04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .651 No_date    6:41    8.08
n/a
 210:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          05:CR-C2         73.54     .651 No_date    6:41    8.08
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.210
      remark:Flow at Cambrain Road Culvert - CR-C2
 210:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A10            5.53     .129 No_date    6:15   10.84
.161
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 210:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:A10            5.53     .129 No_date    6:15   10.84
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.210
      remark:Flow at Cedarview Road 450mm CSP Culvert
 210:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A11           15.20     .119 No_date    7:33   10.84
.161
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 210:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          02:CVR-C2         5.53     .129 No_date    6:15   10.84
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.210
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 210:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A11           15.20     .119 No_date    7:33   10.84
n/a
                    +  02:CVR-C2         5.53     .129 No_date    6:15   10.84
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
 210:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.210
      remark:Flow at Cedarview Road Culvert-400mm CSP
 210:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A12           60.00     .442 No_date    7:11    8.56
.127
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 210:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A12           60.00     .442 No_date    7:11    8.56
n/a
                    +  03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
     [DT= 1.00]  SUM=  08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
 210:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.210
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 210:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A15            3.47     .088 No_date    6:23   14.45
.215
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 210:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A15            3.47     .088 No_date    6:23   14.45
n/a
                    +  08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
     [DT= 1.00]  SUM=  09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
 210:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.210
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 210:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A20            4.78     .062 No_date    6:21    7.43
.111
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 210:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:A20            4.78     .062 No_date    6:21    7.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD    01:A19            1.01     .044 No_date    6:56   27.14
.404
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          02:BDR-C1         4.78     .062 No_date    6:21    7.43
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.210
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 210:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A19            1.01     .044 No_date    6:56   27.14
n/a
                    +  02:BDR-C1         4.78     .062 No_date    6:21    7.43
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .084 No_date    6:27   10.87
n/a
 210:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          10:BDR-C2         5.79     .084 No_date    6:27   10.87
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD    01:A18             .50     .025 No_date    6:49   28.65
.426
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A18             .50     .025 No_date    6:49   28.65
n/a
                    +  10:BDR-C2         5.79     .084 No_date    6:27   10.87
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .105 No_date    6:45   12.28
n/a
 210:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          02:BDR-C3         6.29     .105 No_date    6:45   12.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.210
```

```
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 210:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.210
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 210:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             02:BDR-C3         6.29     .105 No_date    6:45   12.28
n/a
                       + 09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .716 No_date    6:58    9.57
n/a
 210:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:FTBD          90.49     .716 No_date    6:58    9.57
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.210
      remark:Flow to Thomas Bakster Drain
 210:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A16            2.87     .016 No_date    6:18    3.42
.051
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 210:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A16            2.87     .016 No_date    6:18    3.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.210
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 210:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A17            9.75     .078 No_date    6:30    5.78
.086
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 210:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A17            9.75     .078 No_date    6:30    5.78
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A21            1.50     .064 No_date    7:00   28.09
.418
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .016 No_date    6:18    3.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.210
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 210:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .078 No_date    6:30    5.78
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.210
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 210:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .064 No_date    7:00   28.09
n/a
                       + 02:BDR-C5         2.87     .016 No_date    6:18    3.42
n/a
                       + 03:BDR-C6         9.75     .078 No_date    6:30    5.78
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .133 No_date    6:40    7.67
n/a
 210:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .133 No_date    6:40    7.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .085 No_date    6:14    7.98
.119
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 210:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .327 No_date    6:31    9.18
.137
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 210:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A14           22.41     .053 No_date    8:08    4.21
.063
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 224

*******************************************************************************




 RUN:COMMAND#
 225:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 225 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
 225:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  79.20]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 225:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A6            11.73     .352 No_date    6:15   13.85
.175
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 225:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A4            13.95     .121 No_date    6:23    5.62
.071
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 225:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        05:A3            12.71     .549 No_date    6:25   25.23
.319
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 225:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A2            35.36     .502 No_date    6:41   11.50
.145
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 225:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A7            15.53     .213 No_date    6:51   12.63
.160
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 225:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .502 No_date    6:41   11.50
n/a
                       + 02:A7            15.53     .213 No_date    6:51   12.63
n/a
                       + 03:A6            11.73     .352 No_date    6:15   13.85
n/a
                       + 04:A4            13.95     .121 No_date    6:23    5.62
n/a
                       + 05:A3            12.71     .549 No_date    6:25   25.23
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.574 No_date    6:28   13.04
n/a
 225:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    1.574 No_date    6:28   13.04
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.225
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 225:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .631 No_date    6:52   13.85
.175
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 225:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .247 No_date    6:25   11.88
.150
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 225:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .247 No_date    6:25   11.88
n/a
                       + 03:A8            42.25     .631 No_date    6:52   13.85
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
 225:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.225
      remark:Flow at Cedarview Road Culvert-500mm CSP
 225:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .211 No_date    6:28    7.76
.098
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 225:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .211 No_date    6:28    7.76
n/a
                       + 04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.010 No_date    6:39   11.97
n/a
 225:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.010 No_date    6:39   11.97
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.225
      remark:Flow at Cambrain Road Culvert - CR-C2
 225:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A10            5.53     .191 No_date    6:14   15.57
.197
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 225:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A10            5.53     .191 No_date    6:14   15.57
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.225
      remark:Flow at Cedarview Road 450mm CSP Culvert
 225:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A11           15.20     .175 No_date    7:31   15.57
.197
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 225:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:CVR-C2         5.53     .191 No_date    6:14   15.57
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.225
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 225:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A11           15.20     .175 No_date    7:31   15.57
n/a
                       + 02:CVR-C2         5.53     .191 No_date    6:14   15.57
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
 225:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.225
      remark:Flow at Cedarview Road Culvert-400mm CSP
 225:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A12           60.00     .674 No_date    7:09   12.63
.160
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 225:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A12           60.00     .674 No_date    7:09   12.63
n/a
                       + 03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
 225:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.225
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 225:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A15            3.47     .125 No_date    6:22   20.17
.255
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 225:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A15            3.47     .125 No_date    6:22   20.17
n/a
                       + 08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
```

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      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
 225:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.225
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 225:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A20            4.78     .099 No_date    6:19   11.17
.141
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 225:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A20            4.78     .099 No_date    6:19   11.17
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A19            1.01     .062 No_date    6:48   34.32
.433
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C1         4.78     .099 No_date    6:19   11.17
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.225
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 225:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A19            1.01     .062 No_date    6:48   34.32
n/a
                     +  02:BDR-C1         4.78     .099 No_date    6:19   11.17
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
 225:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A18             .50     .035 No_date    6:43   36.51
.461
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A18             .50     .035 No_date    6:43   36.51
n/a
                     +  10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
 225:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.225
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 225:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.225
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 225:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
                     +  09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.069 No_date    6:54   13.89
n/a
 225:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:FTBD          90.49    1.069 No_date    6:54   13.89
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.225
      remark:Flow to Thomas Bakster Drain
 225:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A16            2.87     .030 No_date    6:16    5.62
.071
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 225:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A16            2.87     .030 No_date    6:16    5.62
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.225
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 225:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A17            9.75     .128 No_date    6:28    8.88
.112
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 225:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A17            9.75     .128 No_date    6:28    8.88
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A21            1.50     .091 No_date    6:51   35.74
.451
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .030 No_date    6:16    5.62
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.225
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 225:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .128 No_date    6:28    8.88
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.225
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 225:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .091 No_date    6:51   35.74
n/a
                     +  02:BDR-C5         2.87     .030 No_date    6:16    5.62
n/a
                     +  03:BDR-C6         9.75     .128 No_date    6:28    8.88
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .217 No_date    6:36   11.07
n/a
 225:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .217 No_date    6:36   11.07
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .133 No_date    6:13   11.88
.150
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 225:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .497 No_date    6:30   13.42
.169
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 225:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A14           22.41     .089 No_date    8:01    6.75
.085
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 249

************************************************************************




 RUN:COMMAND#
 250:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 250 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 250:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  87.60]
#############################################################################
#             BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
#############################################################################
 250:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A6            11.73     .448 No_date    6:14   17.27
.197
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 250:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A4            13.95     .169 No_date    6:22    7.45
.085
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 250:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        05:A3            12.71     .666 No_date    6:24   30.33
.346
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 250:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A2            35.36     .647 No_date    6:40   14.50
.166
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 250:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A7            15.53     .272 No_date    6:50   15.84
.181
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 250:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .647 No_date    6:40   14.50
n/a
                     +  02:A7            15.53     .272 No_date    6:50   15.84
n/a
                     +  03:A6            11.73     .448 No_date    6:14   17.27
n/a
                     +  04:A4            13.95     .169 No_date    6:22    7.45
n/a
                     +  05:A3            12.71     .666 No_date    6:24   30.33
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.996 No_date    6:27   16.25
n/a
 250:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    1.996 No_date    6:27   16.25
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.250
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 250:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .800 No_date    6:51   17.27
.197
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 250:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .319 No_date    6:24   14.97
.171
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 250:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .319 No_date    6:24   14.97
n/a
                     +  03:A8            42.25     .800 No_date    6:51   17.27
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
 250:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.250
      remark:Flow at Cedarview Road Culvert-500mm CSP
 250:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .284 No_date    6:27   10.05
.115
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 250:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .284 No_date    6:27   10.05
n/a
                     +  04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.300 No_date    6:37   15.04
n/a
 250:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.300 No_date    6:37   15.04
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.250
      remark:Flow at Cambrain Road Culvert - CR-C2
 250:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       01:A10            5.53     .240 No_date    6:14   19.25
.220
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 250:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .240 No_date    6:14   19.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.250
      remark:Flow at Cedarview Road 450mm CSP Culvert
 250:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .218 No_date    7:30   19.25
.220
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 250:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .240 No_date    6:14   19.25
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.250
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 250:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .218 No_date    7:30   19.25
n/a
                    +  02:CVR-C2         5.53     .240 No_date    6:14   19.25
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
 250:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.250
      remark:Flow at Cedarview Road Culvert-400mm CSP
 250:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .860 No_date    7:08   15.84
.181
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 250:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .860 No_date    7:08   15.84
n/a
                    +  03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
 250:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.250
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 250:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .154 No_date    6:22   24.55
.280
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 250:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .154 No_date    6:22   24.55
n/a
                    +  08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
 250:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.250
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 250:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .129 No_date    6:19   14.13
.161
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 250:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .129 No_date    6:19   14.13
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .076 No_date    6:44   40.10
.458
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .129 No_date    6:19   14.13
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.250
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 250:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .076 No_date    6:44   40.10
n/a
                    +  02:BDR-C1         4.78     .129 No_date    6:19   14.13
n/a
      [DT= 1.00]  SUM=  10:BDR-C2        5.79     .176 No_date    6:25   18.66
n/a
 250:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .176 No_date    6:25   18.66
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .042 No_date    6:40   41.79
.477
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .042 No_date    6:40   41.79
n/a
                    +  10:BDR-C2         5.79     .176 No_date    6:25   18.66
n/a
      [DT= 1.00]  SUM=  02:BDR-C3        6.29     .212 No_date    6:32   20.50
n/a
 250:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .212 No_date    6:32   20.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.250
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 250:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.250
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 250:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .212 No_date    6:32   20.50
n/a
                    +  09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.347 No_date    6:52   17.28
n/a
 250:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.347 No_date    6:52   17.28
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.250
      remark:Flow to Thomas Bakster Drain
 250:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .042 No_date    6:15    7.45
.085
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 250:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .042 No_date    6:15    7.45
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.250
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 250:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .170 No_date    6:28   11.38
.130
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 250:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .170 No_date    6:28   11.38
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .110 No_date    6:47   41.08
.469
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .042 No_date    6:15    7.45
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.250
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 250:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .170 No_date    6:28   11.38
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.250
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 250:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .110 No_date    6:47   41.08
n/a
                    +  02:BDR-C5         2.87     .042 No_date    6:15    7.45
n/a
                    +  03:BDR-C6         9.75     .170 No_date    6:28   11.38
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .285 No_date    6:34   13.73
n/a
 250:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .285 No_date    6:34   13.73
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .173 No_date    6:13   14.97
.171
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 250:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .633 No_date    6:29   16.75
.191
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 250:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .120 No_date    7:58    8.83
.101
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
   ** END OF RUN : 299

************************************************************************




 RUN:COMMAND#
 300:0001---------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN   = 300 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 300:0002---------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  96.00]
#########################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS               #
#########################################################################
 300:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .553 No_date    6:14   20.97
.218
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 300:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .225 No_date    6:21    9.49
.099
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 300:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .789 No_date    6:24   35.69
.372
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 300:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .806 No_date    6:39   17.77
.185
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 300:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .337 No_date    6:49   19.32
.201
      [CN= 51.0: N= 3.00]
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      [Tp=  .72:DT= 1.00]
 300:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .806 No_date    6:39   17.77
n/a
                     +  02:A7            15.53     .337 No_date    6:49   19.32
n/a
                     +  03:A6            11.73     .553 No_date    6:14   20.97
n/a
                     +  04:A4            13.95     .225 No_date    6:21    9.49
n/a
                     +  05:A3            12.71     .789 No_date    6:24   35.69
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    2.456 No_date    6:27   19.72
n/a
 300:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    2.456 No_date    6:27   19.72
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.300
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 300:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .985 No_date    6:50   20.97
.218
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 300:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .398 No_date    6:24   18.33
.191
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 300:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .398 No_date    6:24   18.33
n/a
                     +  03:A8            42.25     .985 No_date    6:50   20.97
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
 300:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.300
      remark:Flow at Cedarview Road Culvert-500mm CSP
 300:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .365 No_date    6:27   12.58
.131
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 300:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .365 No_date    6:27   12.58
n/a
                     +  04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.619 No_date    6:37   18.39
n/a
 300:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.619 No_date    6:37   18.39
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.300
      remark:Flow at Cambrain Road Culvert - CR-C2
 300:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A10            5.53     .293 No_date    6:13   23.20
.242
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 300:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A10            5.53     .293 No_date    6:13   23.20
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.300
      remark:Flow at Cedarview Road 450mm CSP Culvert
 300:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A11           15.20     .266 No_date    7:29   23.20
.242
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 300:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:CVR-C2         5.53     .293 No_date    6:13   23.20
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.300
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 300:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A11           15.20     .266 No_date    7:29   23.20
n/a
                     +  02:CVR-C2         5.53     .293 No_date    6:13   23.20
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .365 No_date    6:19   23.20
n/a
 300:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            03:CVR-C3        20.73     .365 No_date    6:19   23.20
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.300
      remark:Flow at Cedarview Road Culvert-400mm CSP
 300:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A12           60.00    1.063 No_date    7:07   19.32
.201
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 300:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A12           60.00    1.063 No_date    7:07   19.32
n/a
                     +  03:CVR-C3        20.73     .365 No_date    6:19   23.20
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
 300:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.300
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 300:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A15            3.47     .185 No_date    6:22   29.20
.304
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 300:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A15            3.47     .185 No_date    6:22   29.20
n/a
                     +  08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
 300:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.300
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 300:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A20            4.78     .162 No_date    6:18   17.37
.181
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 300:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A20            4.78     .162 No_date    6:18   17.37
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A19            1.01     .091 No_date    6:41   45.32
.472
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C1         4.78     .162 No_date    6:18   17.37
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.300
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 300:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A19            1.01     .091 No_date    6:41   45.32
n/a
                     +  02:BDR-C1         4.78     .162 No_date    6:18   17.37
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
 300:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A18             .50     .050 No_date    6:37   47.23
.492
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A18             .50     .050 No_date    6:37   47.23
n/a
                     +  10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
 300:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.300
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 300:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.300
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 300:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
                     +  09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.647 No_date    6:51   20.93
n/a
 300:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:FTBD          90.49    1.647 No_date    6:51   20.93
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.300
      remark:Flow to Thomas Bakster Drain
 300:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A16            2.87     .057 No_date    6:14    9.49
.099
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 300:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A16            2.87     .057 No_date    6:14    9.49
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.300
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 300:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A17            9.75     .216 No_date    6:27   14.12
.147
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 300:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A17            9.75     .216 No_date    6:27   14.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A21            1.50     .130 No_date    6:44   46.43
.484
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .057 No_date    6:14    9.49
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.300
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 300:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .216 No_date    6:27   14.12
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.300
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 300:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .130 No_date    6:44   46.43
n/a
                     +  02:BDR-C5         2.87     .057 No_date    6:14    9.49
n/a
                     +  03:BDR-C6         9.75     .216 No_date    6:27   14.12
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .363 No_date    6:32   16.61
n/a
 300:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .363 No_date    6:32   16.61
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .215 No_date    6:12   18.33
.191
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 300:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .780 No_date    6:29   20.35
.212
      [CN= 52.0: N= 3.00]
```

```
      [Tp=  .46:DT= 1.00]
 300:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A14           22.41     .154 No_date    7:56   11.15
.116
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 301

************************************************************************************




 RUN:COMMAND#
 302:0001---------------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 302 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************************
 302:0002---------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=  24.00:PTOT=  48.00]
################################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                      #
################################################################################
 302:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .065 No_date   12:12    3.98
.083
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 302:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .008 No_date   12:42     .97
.020
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 302:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .151 No_date   12:20    9.27
.193
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 302:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .084 No_date   12:43    3.06
.064
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 302:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .039 No_date   12:53    3.49
.073
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 302:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .084 No_date   12:43    3.06
n/a
                     +  02:A7            15.53     .039 No_date   12:53    3.49
n/a
                     +  03:A6            11.73     .065 No_date   12:12    3.98
n/a
                     +  04:A4            13.95     .008 No_date   12:42     .97
n/a
                     +  05:A3            12.71     .151 No_date   12:20    9.27
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28     .309 No_date   12:25    3.81
n/a
 302:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28     .309 No_date   12:25    3.81
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.302
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 302:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .123 No_date   12:54    3.98
.083
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 302:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .040 No_date   12:24    3.17
.066
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 302:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .040 No_date   12:24    3.17
n/a
                     +  03:A8            42.25     .123 No_date   12:54    3.98
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
 302:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.302
      remark:Flow at Cedarview Road Culvert-500mm CSP
 302:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .022 No_date   12:37    1.66
.035
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 302:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .022 No_date   12:37    1.66
n/a
                     +  04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .176 No_date   12:44    3.25
n/a
 302:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54     .176 No_date   12:44    3.25
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.302
      remark:Flow at Cambrain Road Culvert - CR-C2
 302:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .040 No_date   12:11    4.78
.100
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 302:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .040 No_date   12:11    4.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.302
      remark:Flow at Cedarview Road 450mm CSP Culvert
 302:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .040 No_date   13:36    4.78
.100
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 302:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .040 No_date   12:11    4.78
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.302
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 302:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .040 No_date   13:36    4.78
n/a
                     +  02:CVR-C2         5.53     .040 No_date   12:11    4.78
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
 302:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.302
      remark:Flow at Cedarview Road Culvert-400mm CSP
 302:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .127 No_date   13:14    3.49
.073
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 302:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .127 No_date   13:14    3.49
n/a
                     +  03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
 302:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.302
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 302:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .031 No_date   12:18    6.87
.143
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 302:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .031 No_date   12:18    6.87
n/a
                     +  08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
 302:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.302
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 302:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .014 No_date   12:18    2.87
.060
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 302:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .014 No_date   12:18    2.87
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .013 No_date   13:31   12.76
.266
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C1         4.78     .014 No_date   12:18    2.87
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.302
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 302:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A19            1.01     .013 No_date   13:31   12.76
n/a
                     +  02:BDR-C1         4.78     .014 No_date   12:18    2.87
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
 302:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A18             .50     .008 No_date   13:17   13.82
.288
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A18             .50     .008 No_date   13:17   13.82
n/a
                     +  10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
 302:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.302
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 302:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.302
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 302:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
                     +  09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .215 No_date   13:10    4.05
n/a
 302:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:FTBD          90.49     .215 No_date   13:10    4.05
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.302
      remark:Flow to Thomas Bakster Drain
 302:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       01:A16            2.87     .002 No_date   12:35     .97
.020
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 302:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .002 No_date   12:35     .97
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.302
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 302:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .016 No_date   12:34    2.08
.043
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 302:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .016 No_date   12:34    2.08
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .019 No_date   13:35   13.47
.281
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .002 No_date   12:35     .97
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.302
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 302:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .016 No_date   12:34    2.08
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.302
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 302:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .019 No_date   13:35   13.47
n/a
                    +  02:BDR-C5         2.87     .002 No_date   12:35     .97
n/a
                    +  03:BDR-C6         9.75     .016 No_date   12:34    2.08
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .030 No_date   13:24    3.07
n/a
 302:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .030 No_date   13:24    3.07
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .021 No_date   12:11    3.17
.066
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 302:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .093 No_date   12:29    3.84
.080
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 302:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .010 No_date   14:38    1.31
.027
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 304

************************************************************************************




 RUN:COMMAND#
 305:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 305 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 441803
#*************************************************************************
 305:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  62.40]
##########################################################################
#              BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS            #
##########################################################################
 305:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .148 No_date   12:10    7.93
.127
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 305:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .034 No_date   12:21    2.68
.043
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 305:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .272 No_date   12:19   15.97
.256
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 305:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .205 No_date   12:38    6.38
.102
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 305:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .091 No_date   12:48    7.12
.114
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 305:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .205 No_date   12:38    6.38
n/a
                    +  02:A7            15.53     .091 No_date   12:48    7.12
n/a
                    +  03:A6            11.73     .148 No_date   12:10    7.93
n/a
                    +  04:A4            13.95     .034 No_date   12:21    2.68
n/a
                    +  05:A3            12.71     .272 No_date   12:19   15.97
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28     .678 No_date   12:22    7.50
n/a
 305:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .678 No_date   12:22    7.50
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.305
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 305:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .275 No_date   12:48    7.93
.127
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 305:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .099 No_date   12:20    6.61
.106
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 305:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .099 No_date   12:20    6.61
n/a
                    +  03:A8            42.25     .275 No_date   12:48    7.93
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
 305:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.305
      remark:Flow at Cedarview Road Culvert-500mm CSP
 305:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .072 No_date   12:26    3.98
.064
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 305:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .072 No_date   12:26    3.98
n/a
                    +  04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .419 No_date   12:37    6.70
n/a
 305:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .419 No_date   12:37    6.70
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.305
      remark:Flow at Cambrain Road Culvert - CR-C2
 305:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .084 No_date   12:09    9.14
.147
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 305:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .084 No_date   12:09    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.305
      remark:Flow at Cedarview Road 450mm CSP Culvert
 305:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .082 No_date   13:29    9.14
.147
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 305:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .084 No_date   12:09    9.14
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.305
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 305:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .082 No_date   13:29    9.14
n/a
                    +  02:CVR-C2         5.53     .084 No_date   12:09    9.14
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
 305:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.305
      remark:Flow at Cedarview Road Culvert-400mm CSP
 305:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .291 No_date   13:07    7.12
.114
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 305:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .291 No_date   13:07    7.12
n/a
                    +  03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
 305:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.305
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 305:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .059 No_date   12:17   12.36
.198
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 305:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .059 No_date   12:17   12.36
n/a
                    +  08:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
 305:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.305
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 305:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .038 No_date   12:15    6.12
.098
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 305:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .038 No_date   12:15    6.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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```
     CALIB STANDHYD     01:A19            1.01     .025 No_date   13:05   19.64
.315
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .038 No_date   12:15    6.12
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.305
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 305:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .025 No_date   13:05   19.64
n/a
                    +  02:BDR-C1         4.78     .038 No_date   12:15    6.12
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
 305:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .015 No_date   12:55   20.90
.335
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .015 No_date   12:55   20.90
n/a
                    +  10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
 305:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.305
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 305:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.305
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 305:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
                    +  09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .473 No_date   13:00    7.95
n/a
 305:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .473 No_date   13:00    7.95
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.305
      remark:Flow to Thomas Bakster Drain
 305:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .009 No_date   12:12    2.68
.043
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 305:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .009 No_date   12:12    2.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.305
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 305:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .047 No_date   12:25    4.70
.075
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 305:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .047 No_date   12:25    4.70
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .037 No_date   13:09   20.39
.327
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .009 No_date   12:12    2.68
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.305
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 305:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .047 No_date   12:25    4.70
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.305
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 305:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .037 No_date   13:09   20.39
n/a
                    +  02:BDR-C5         2.87     .009 No_date   12:12    2.68
n/a
                    +  03:BDR-C6         9.75     .047 No_date   12:25    4.70
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .076 No_date   12:36    5.96
n/a
 305:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .076 No_date   12:36    5.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .053 No_date   12:09    6.61
.106
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 305:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .211 No_date   12:25    7.67
.123
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 305:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .032 No_date   14:10    3.34
.054
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 309

************************************************************************************
```

```
 RUN:COMMAND#
 310:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 310 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*************************************************************************
 310:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  72.00]
##########################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
##########################################################################
 310:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .218 No_date   12:09   11.15
.155
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 310:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .065 No_date   12:18    4.24
.059
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 310:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .365 No_date   12:18   21.10
.293
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 310:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .312 No_date   12:36    9.16
.127
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 310:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .135 No_date   12:45   10.12
.140
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 310:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .312 No_date   12:36    9.16
n/a
                    +  02:A7            15.53     .135 No_date   12:45   10.12
n/a
                    +  03:A6            11.73     .218 No_date   12:09   11.15
n/a
                    +  04:A4            13.95     .065 No_date   12:18    4.24
n/a
                    +  05:A3            12.71     .365 No_date   12:18   21.10
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28     .993 No_date   12:21   10.52
n/a
 310:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .993 No_date   12:21   10.52
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.310
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 310:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .405 No_date   12:46   11.15
.155
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 310:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .151 No_date   12:19    9.47
.131
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 310:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .151 No_date   12:19    9.47
n/a
                    +  03:A8            42.25     .405 No_date   12:46   11.15
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
 310:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.310
      remark:Flow at Cedarview Road Culvert-500mm CSP
 310:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .121 No_date   12:23    6.01
.083
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 310:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .121 No_date   12:23    6.01
n/a
                    +  04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .632 No_date   12:35    9.56
n/a
 310:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .632 No_date   12:35    9.56
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.310
      remark:Flow at Cambrain Road Culvert - CR-C2
 310:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .120 No_date   12:09   12.66
.176
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 310:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .120 No_date   12:09   12.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.310
      remark:Flow at Cedarview Road 450mm CSP Culvert
 310:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .117 No_date   13:27   12.66
.176
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 310:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .120 No_date   12:09   12.66
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.310
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
```

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 310:0021----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A11          15.20     .117 No_date   13:27   12.66
n/a
                   +  02:CVR-C2        5.53     .120 No_date   12:09   12.66
n/a
     [DT= 1.00]  SUM=  03:CVR-C3       20.73     .154 No_date   12:14   12.66
n/a
 310:0022----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          03:CVR-C3       20.73     .154 No_date   12:14   12.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.310
      remark:Flow at Cedarview Road Culvert-400mm CSP
 310:0023----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A12          60.00     .432 No_date   13:05   10.12
.140
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 310:0024----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A12          60.00     .432 No_date   13:05   10.12
n/a
                   +  03:CVR-C3       20.73     .154 No_date   12:14   12.66
n/a
     [DT= 1.00]  SUM=  08:CVR-C4       80.73     .574 No_date   13:05   10.77
n/a
 310:0025----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          08:CVR-C4       80.73     .574 No_date   13:05   10.77
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.310
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 310:0026----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A15           3.47     .082 No_date   12:16   16.66
.231
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 310:0027----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A15           3.47     .082 No_date   12:16   16.66
n/a
                   +  08:CVR-C4       80.73     .574 No_date   13:05   10.77
n/a
     [DT= 1.00]  SUM=  09:BDR-C4       84.20     .610 No_date   13:00   11.01
n/a
 310:0028----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          09:BDR-C4       84.20     .610 No_date   13:00   11.01
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.310
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 310:0029----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A20           4.78     .060 No_date   12:14    8.85
.123
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 310:0030----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:A20           4.78     .060 No_date   12:14    8.85
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0031----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD    01:A19           1.01     .035 No_date   12:54   24.34
.338
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0032----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          02:BDR-C1        4.78     .060 No_date   12:14    8.85
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.310
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 310:0033----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A19           1.01     .035 No_date   12:54   24.34
n/a
                   +  02:BDR-C1        4.78     .060 No_date   12:14    8.85
n/a
     [DT= 1.00]  SUM=  10:BDR-C2        5.79     .077 No_date   12:18   11.55
n/a
 310:0034----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          10:BDR-C2        5.79     .077 No_date   12:18   11.55
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0035----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD    01:A18            .50     .020 No_date   12:48   25.33
.352
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0036----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A18            .50     .020 No_date   12:48   25.33
n/a
                   +  10:BDR-C2        5.79     .077 No_date   12:18   11.55
n/a
     [DT= 1.00]  SUM=  02:BDR-C3        6.29     .090 No_date   12:32   12.65
n/a
 310:0037----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          02:BDR-C3        6.29     .090 No_date   12:32   12.65
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.310
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 310:0038----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          09:BDR-C4       84.20     .610 No_date   13:00   11.01
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.310
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 310:0039----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           02:BDR-C3        6.29     .090 No_date   12:32   12.65
n/a
                   +  09:BDR-C4       84.20     .610 No_date   13:00   11.01
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .690 No_date   12:54   11.12
n/a
 310:0040----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:FTBD          90.49     .690 No_date   12:54   11.12
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.310
      remark:Flow to Thomas Bakster Drain
 310:0041----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A16           2.87     .016 No_date   12:10    4.24
.059
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 310:0042----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:A16           2.87     .016 No_date   12:10    4.24
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.310
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 310:0043----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A17           9.75     .076 No_date   12:23    6.95
.097
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 310:0044----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          01:A17           9.75     .076 No_date   12:23    6.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0045----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD    01:A21           1.50     .051 No_date   12:58   24.93
.346
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0046----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          02:BDR-C5        2.87     .016 No_date   12:10    4.24
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.310
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 310:0047----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD          03:BDR-C6        9.75     .076 No_date   12:23    6.95
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.310
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 310:0048----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A21           1.50     .051 No_date   12:58   24.93
n/a
                   +  02:BDR-C5        2.87     .016 No_date   12:10    4.24
n/a
                   +  03:BDR-C6        9.75     .076 No_date   12:23    6.95
n/a
     [DT= 1.00]  SUM=  04:BDR-C7       14.12     .120 No_date   12:32    8.31
n/a
 310:0049----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          04:BDR-C7       14.12     .120 No_date   12:32    8.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0050----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      02:A9            5.08     .081 No_date   12:09    9.47
.131
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 310:0051----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      03:A13          24.60     .312 No_date   12:23   10.80
.150
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 310:0052----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      04:A14          22.41     .053 No_date   14:01    5.16
.072
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 324

************************************************************************




 RUN:COMMAND#
 325:0001----------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN    = 325 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 325:0002----------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  84.00]
##########################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS          #
##########################################################################
 325:0003----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      03:A6           11.73     .318 No_date   12:09   15.77
.188
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 325:0004----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      04:A4           13.95     .114 No_date   12:16    6.64
.079
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 325:0005----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      05:A3           12.71     .493 No_date   12:18   28.11
.335
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 325:0006----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      01:A2           35.36     .469 No_date   12:34   13.19
.157
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 325:0007----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD      02:A7           15.53     .200 No_date   12:44   14.43
.172
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 325:0008----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD           01:A2           35.36     .469 No_date   12:34   13.19
n/a
                   +  02:A7           15.53     .200 No_date   12:44   14.43
n/a
                   +  03:A6           11.73     .318 No_date   12:09   15.77
n/a
                   +  04:A4           13.95     .114 No_date   12:16    6.64
n/a
                   +  05:A3           12.71     .493 No_date   12:18   28.11
n/a
     [DT= 1.00]  SUM=  07:CR-C1        89.28    1.453 No_date   12:20   14.84
n/a
 325:0009----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD          07:CR-C1        89.28    1.453 No_date   12:20   14.84
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.325
      remark:Flow at Cambrian Road Culvert-1600mm CSP
```

```
 325:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .593 No_date   12:45   15.77
.188
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 325:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .228 No_date   12:17   13.61
.162
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 325:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .228 No_date   12:17   13.61
n/a
                    +  03:A8            42.25     .593 No_date   12:45   15.77
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
 325:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.325
      remark:Flow at Cedarview Road Culvert-500mm CSP
 325:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .197 No_date   12:21    9.04
.108
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 325:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .197 No_date   12:21    9.04
n/a
                    +  04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .947 No_date   12:32   13.69
n/a
 325:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .947 No_date   12:32   13.69
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.325
      remark:Flow at Cambrain Road Culvert - CR-C2
 325:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .171 No_date   12:09   17.64
.210
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 325:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .171 No_date   12:09   17.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.325
      remark:Flow at Cedarview Road 450mm CSP Culvert
 325:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .166 No_date   13:25   17.64
.210
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 325:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .171 No_date   12:09   17.64
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.325
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 325:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .166 No_date   13:25   17.64
n/a
                    +  02:CVR-C2         5.53     .171 No_date   12:09   17.64
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
 325:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.325
      remark:Flow at Cedarview Road Culvert-400mm CSP
 325:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .639 No_date   13:02   14.43
.172
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 325:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .639 No_date   13:02   14.43
n/a
                    +  03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
 325:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.325
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 325:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .113 No_date   12:16   22.64
.270
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 325:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .113 No_date   12:16   22.64
n/a
                    +  08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
 325:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.325
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 325:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .091 No_date   12:13   12.83
.153
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 325:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .091 No_date   12:13   12.83
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .048 No_date   12:47   29.85
.355
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .091 No_date   12:13   12.83
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.325
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 325:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .048 No_date   12:47   29.85
n/a
                    +  02:BDR-C1         4.78     .091 No_date   12:13   12.83
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
 325:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .027 No_date   12:41   31.10
.370
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .027 No_date   12:41   31.10
n/a
                    +  10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
 325:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.325
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 325:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.325
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 325:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
                    +  09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.004 No_date   12:49   15.66
n/a
 325:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.004 No_date   12:49   15.66
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.325
      remark:Flow to Thomas Bakster Drain
 325:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .029 No_date   12:09    6.64
.079
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 325:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .029 No_date   12:09    6.64
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.325
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 325:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .120 No_date   12:21   10.28
.122
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 325:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .120 No_date   12:21   10.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .069 No_date   12:50   30.47
.363
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .029 No_date   12:09    6.64
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.325
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 325:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .120 No_date   12:21   10.28
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.325
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 325:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .069 No_date   12:50   30.47
n/a
                    +  02:BDR-C5         2.87     .029 No_date   12:09    6.64
n/a
                    +  03:BDR-C6         9.75     .120 No_date   12:21   10.28
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .188 No_date   12:26   11.68
n/a
 325:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .188 No_date   12:26   11.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .121 No_date   12:08   13.61
.162
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 325:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .458 No_date   12:22   15.29
.182
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 325:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .086 No_date   13:55    7.91
.094
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 349

************************************************************************



 RUN:COMMAND#
 350:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
```

```
      [NSTORM=   1 ]
      [NRUN  = 350 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
 350:0002-------------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  93.60]
###############################################################################
#                BARRHAVEN EXPANSION - EXISTING CONDITION FLOWS               #
###############################################################################
 350:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .408 No_date   12:09   19.88
.212
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 350:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .163 No_date   12:15    8.89
.095
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 350:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .604 No_date   12:18   34.13
.365
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 350:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .613 No_date   12:33   16.81
.180
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 350:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .260 No_date   12:43   18.30
.196
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 350:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .613 No_date   12:33   16.81
n/a
                     +  02:A7            15.53     .260 No_date   12:43   18.30
n/a
                     +  03:A6            11.73     .408 No_date   12:09   19.88
n/a
                     +  04:A4            13.95     .163 No_date   12:15    8.89
n/a
                     +  05:A3            12.71     .604 No_date   12:18   34.13
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.869 No_date   12:20   18.70
n/a
 350:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28    1.869 No_date   12:20   18.70
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.350
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 350:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .762 No_date   12:44   19.88
.212
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 350:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .298 No_date   12:17   17.34
.185
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 350:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .298 No_date   12:17   17.34
n/a
                     +  03:A8            42.25     .762 No_date   12:44   19.88
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
 350:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.350
      remark:Flow at Cedarview Road Culvert-500mm CSP
 350:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .270 No_date   12:20   11.83
.126
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 350:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .270 No_date   12:20   11.83
n/a
                     +  04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.236 No_date   12:31   17.40
n/a
 350:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54    1.236 No_date   12:31   17.40
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.350
      remark:Flow at Cambrain Road Culvert - CR-C2
 350:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .216 No_date   12:08   22.04
.236
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 350:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .216 No_date   12:08   22.04
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.350
      remark:Flow at Cedarview Road 450mm CSP Culvert
 350:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .211 No_date   13:23   22.04
.236
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 350:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .216 No_date   12:08   22.04
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.350
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 350:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .211 No_date   13:23   22.04
n/a
                     +  02:CVR-C2         5.53     .216 No_date   12:08   22.04
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
 350:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.350
      remark:Flow at Cedarview Road Culvert-400mm CSP
 350:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .827 No_date   13:01   18.30
.196
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 350:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .827 No_date   13:01   18.30
n/a
                     +  03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
 350:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.350
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 350:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .140 No_date   12:15   27.85
.298
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 350:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .140 No_date   12:15   27.85
n/a
                     +  08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
 350:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.350
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 350:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .120 No_date   12:12   16.42
.175
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 350:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .120 No_date   12:12   16.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .059 No_date   12:42   34.48
.368
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C1         4.78     .120 No_date   12:12   16.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.350
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 350:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A19            1.01     .059 No_date   12:42   34.48
n/a
                     +  02:BDR-C1         4.78     .120 No_date   12:12   16.42
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
 350:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A18             .50     .032 No_date   12:37   36.18
.387
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A18             .50     .032 No_date   12:37   36.18
n/a
                     +  10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
 350:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.350
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 350:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.350
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 350:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
                     +  09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.286 No_date   12:47   19.70
n/a
 350:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:FTBD          90.49    1.286 No_date   12:47   19.70
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.350
      remark:Flow to Thomas Bakster Drain
 350:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A16            2.87     .041 No_date   12:09    8.89
.095
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 350:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A16            2.87     .041 No_date   12:09    8.89
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.350
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 350:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A17            9.75     .161 No_date   12:20   13.31
.142
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 350:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A17            9.75     .161 No_date   12:20   13.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.350
```

```
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .085 No_date   12:45   35.43
.379
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .041 No_date   12:09    8.89
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.350
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 350:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .161 No_date   12:20   13.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.350
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 350:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .085 No_date   12:45   35.43
n/a                   +  02:BDR-C5         2.87     .041 No_date   12:09    8.89
n/a                   +  03:BDR-C6         9.75     .161 No_date   12:20   13.31
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .253 No_date   12:24   14.76
n/a
 350:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .253 No_date   12:24   14.76
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .158 No_date   12:08   17.34
.185
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 350:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .590 No_date   12:22   19.30
.206
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 350:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .118 No_date   13:52   10.47
.112
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 399

************************************************************************************




 RUN:COMMAND#
 400:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 400 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #    4418403
#*********************************************************************************
 400:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT= 103.20]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 400:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .506 No_date   12:08   24.34
.236
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 400:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .219 No_date   12:14   11.41
.111
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 400:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .721 No_date   12:17   40.46
.392
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 400:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .771 No_date   12:33   20.76
.201
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 400:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .324 No_date   12:42   22.50
.218
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 400:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .771 No_date   12:33   20.76
n/a                   +  02:A7            15.53     .324 No_date   12:42   22.50
n/a                   +  03:A6            11.73     .506 No_date   12:08   24.34
n/a                   +  04:A4            13.95     .219 No_date   12:14   11.41
n/a                   +  05:A3            12.71     .721 No_date   12:17   40.46
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28    2.323 No_date   12:19   22.88
n/a
 400:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    2.323 No_date   12:19   22.88
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.400
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 400:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .946 No_date   12:43   24.34
.236
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 400:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .375 No_date   12:17   21.40
.207
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 400:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .375 No_date   12:17   21.40
n/a                   +  03:A8            42.25     .946 No_date   12:43   24.34
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
 400:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.400
      remark:Flow at Cedarview Road Culvert-500mm CSP
 400:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .351 No_date   12:19   14.92
.145
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 400:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .351 No_date   12:19   14.92
n/a                   +  04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54    1.552 No_date   12:30   21.44
n/a
 400:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54    1.552 No_date   12:30   21.44
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.400
      remark:Flow at Cambrain Road Culvert - CR-C2
 400:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .266 No_date   12:08   26.79
.260
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 400:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .266 No_date   12:08   26.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.400
      remark:Flow at Cedarview Road 450mm CSP Culvert
 400:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .259 No_date   13:22   26.79
.260
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 400:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .266 No_date   12:08   26.79
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.400
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 400:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .259 No_date   13:22   26.79
n/a                   +  02:CVR-C2         5.53     .266 No_date   12:08   26.79
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
 400:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.400
      remark:Flow at Cedarview Road Culvert-400mm CSP
 400:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00    1.033 No_date   13:00   22.50
.218
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 400:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00    1.033 No_date   13:00   22.50
n/a                   +  03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
     [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.346 No_date   13:00   23.60
n/a
 400:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73    1.346 No_date   13:00   23.60
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.400
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 400:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .170 No_date   12:15   33.39
.324
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 400:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .170 No_date   12:15   33.39
n/a                   +  08:CVR-C4        80.73    1.346 No_date   13:00   23.60
n/a
     [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
 400:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.400
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 400:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .152 No_date   12:12   20.34
.197
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 400:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .152 No_date   12:12   20.34
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .071 No_date   12:38   39.51
.383
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 400:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .152 No_date   12:12   20.34
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.400
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 400:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .071 No_date   12:38   39.51
n/a                   +  02:BDR-C1         4.78     .152 No_date   12:12   20.34
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
 400:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     SAVE HYD           10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .038 No_date   12:34   41.38
.401
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 400:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .038 No_date   12:34   41.38
n/a
                    +  10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .229 No_date   12:20   25.09
n/a
 400:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .229 No_date   12:20   25.09
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.400
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 400:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.400
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 400:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .229 No_date   12:20   25.09
n/a
                    +  09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.592 No_date   12:45   24.08
n/a
 400:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.592 No_date   12:45   24.08
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.400
      remark:Flow to Thomas Bakster Drain
 400:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .055 No_date   12:08   11.41
.111
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 400:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .055 No_date   12:08   11.41
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.400
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 400:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .207 No_date   12:20   16.66
.161
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 400:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .207 No_date   12:20   16.66
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .102 No_date   12:41   40.63
.394
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 400:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .055 No_date   12:08   11.41
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.400
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 400:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .207 No_date   12:20   16.66
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.400
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 400:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .102 No_date   12:41   40.63
n/a
                    +  02:BDR-C5         2.87     .055 No_date   12:08   11.41
n/a
                    +  03:BDR-C6         9.75     .207 No_date   12:20   16.66
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .326 No_date   12:22   18.14
n/a
 400:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .326 No_date   12:22   18.14
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .198 No_date   12:07   21.40
.207
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 400:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .734 No_date   12:21   23.64
.229
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 400:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .153 No_date   13:49   13.32
.129
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
 400:0002--------------------------------------------------------------------------
----
     FINISH
-------------------------------------------------------------------------------
----
********************************************************************************
****
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2017-09-05     at 14:00:48
================================================================================
====
```

Appendix B3

Water Budget Analysis

EXISTING CONDITION REPORT – APPENDIX B3
PCSWMM WATER BUDGET MODEL DESCRIPTION

MINTO COMMUNITIES INC.
BARRHAVEN SOUTH PHASE 3 – S1 AREA

The tables below describe the parameters and values used for the water balance modeling in PCSWMM. In some cases values are required to be entered which, in this specific model scenario, are not used but must still be entered. Where a value does not affect the model or is not used the row is in grey.

1.0 CATCHMENTS

Parameter	Units	Description
Name	-	The name of the subcatchment. Format used is generally *EventModelID_Groundwater Outlet*.
Tag	-	The watercourse which the overland flow will discharge to.
Rain Gauge	-	The Storm used in the model simulation. In this case CDA_RCS_262_2014-2024 is the name for the continuous simulation time series used.
Outlet	-	The downstream major system node to which the subcatchment drains
Area	ha	The area is calculated internally by PCSWMM
Width / Flow Length	m	Flow path lengths for the subcatchments were identified based on the GIS flow path analysis and the longest length through the subcatchment selected as the flow path. The width is then internally calculated in PCSWMM from the flow path length and drainage area.
Slope	%	Averaged from the GIS analysis of the LiDAR surface data.
Imperv	%	Area weighted value from the SWMHYMO model parameters.
N Imperv	-	A constant of 0.013 is selected as the Manning's N for impervious surfaces such as roads.

Parameter	Units	Description
N Perv	-	A constant of 0.25 is selected as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
DStore Imperv	mm	A constant of 1.57 mm is used as the impervious depression storage as per the City of Ottawa Sewer Design Guidelines 2012 Section 5.4.5.4.
DStore Perv	mm	A constant of 4.67 mm is used as the impervious depression storage as per the City of Ottawa Sewer Design Guidelines 2012 Section 5.4.5.4.
Zero Imperv	%	Used to represent areas where there is no depression storage in impervious areas such as water bodies. Not used in this model.
Subarea Routing	-	All catchments are completely drained to the outlet. The parameter would be used if any impervious areas were being drained via a storm sewer system.
Percent Routed	%	Used to determine the percent of sub-area being routed as per the parameter above. In this case 100% is going to the outlet.
Maximum Infiltration Rate	mm/hr	The maximum rate on the Horton Infiltration Curve, areas weighted from the infiltration rates provided by Paterson.
Minimum Infiltration Rate	mm/hr	The minimum rate on the Horton Infiltration Curve. This rate is based on the soil type assumed from the Paterson field testing.
Decay Constant	hr^{-1}	City of Ottawa standard value of 4.14 used.
Drying Time	days	The time for a fully saturated soil to completely dry is set at 7 days.
Maximum Volume	mm	The maximum volume of runoff which can be infiltrated and no limit has been applied in this model.
Infiltration Pattern		An infiltration pattern which provides for full infiltration in April to October, part infiltration March and November and no infiltration December to February was used.

Curb length, LID Controls and Erosion parameters are not used in the model. Curb length relates to pollution control, there are no LID controls in the pre development scenario and there is no application of soil sediment loss in the model.

2.0 SNOWMELT

Parameter	Units	Description
Dividing Temperature	°C	The temperature below which precipitation will fall as snow. Generally accepted as being 0°C. **Value: 0**
Snow Capture Factor	Fraction	It is assumed that the data from Environment Canada has captured all snowfall in the gauges. This factor can be used to increase snowfall where the gauges may not be accurate. **Value: 1.0**
ATI Weight	Fraction	Applied over the entire subwatershed, the ATI weighting factor is an indication of the thickness of the surface layer of snow. A low value will indicate a thicker surface layer with weighting to temperatures over the previous week while a value closer to 0.5 will indicate a normal surface layer. The lower the ATI Weight the snow will cool and warm more slowly. A value of 0.5 has been found to give reasonable results in watersheds and has been used here. **Value: 0.5**
Negative Melt Ratio	Fraction	The effect of the heat transfer during non-melt periods and the standard value is used. **Value 0.6**
Elevation above MS	m	The elevation will affect atmospheric pressure for the melt calculations. **Value: 107**
Latitude	°	The latitude will dictate the sunrise and sunset times in temperature calculations. **Value: 45.0**
Longitude Correction	minutes	Used to correct for in separation of the position of site versus the meridian of the standard time zone. This will have negligible effects. **Value: 0**

Parameter	Units	Description
Melt Coefficients	mm/hr/°C	The Melt Coefficient has been taken from the AES snowmelt equations for southern Ontario (MNR Technical Guide Flooding Hazard Limit, 2002). The AES equations have a melt coefficient of 3.66 mm/day/°C for mean daily air temperatures. This equates to 0.1525 mm/hr/°C. **Value: 0.153**
Base Temperature	°C	The base temperature at which the snowpack will melt has been assumed as 0°C. A lower value could be used for rooftops where there will be heat transfer through the roof. **Value: 0**
Fraction Free Water Capacity	Fraction	Since snow is considered a porous medium some of the melt water may be contained within the snow pack. The fraction of the free water capacity is the fraction of the snow pack void space which will retain meltwater. This fraction is normally less than 0.1 and 0.05 has been used here to represent a deep snowpack. A value of 0.25 may represent a shallow slush layer. **Value: 0.05**
Initial Snow Depth	mm	The initial snow depth on the site is considered as zero. **Value: 0**
Initial Free Water	mm	Since there is no initial snow depth the initial free water has also been considered as zero. **Value: 0**
Depth at 100% Cover	mm	The snowmelt model assumes that there will always be a depth of snow above which there will be 100% coverage of the snow, even in areas which may be affected by shading, drifting of topography. Typical depths are 25 mm to 100 mm. Since the area is relatively open with limited shading then the lower end of the value range has been used. **Value: 25**
Areal Depletion	Fraction	The areal depletion curve represents the area of snow cover for depths of the snow less than the depth at 100% coverage. Natural areal depletion curves are suggested by the software and are used here.

No parameters were used related to mechanical snow removal as it is assumed that there are no snow removal operations on the S1 Area currently.

3.0 GROUNDWATER

3.1 Groundwater Parameters

<table>
<tr><th>Parameter</th><th>Units</th><th>Description</th></tr>
<tr><td>Aquifer Name</td><td>-</td><td>Name of the aquifer representing soil conditions. Four Aquifers were created based on different soil conditions from OSG mapping. Only two of the aquifers are used within the study area.
<table>
<tr><th>Aquifer</th><th>Description</th><th>Clay content (%)</th><th>Sand content (%)</th></tr>
<tr><td>A</td><td>Sand</td><td>5</td><td>92</td></tr>
<tr><td>B</td><td>Sandy Loam</td><td>10</td><td>65</td></tr>
<tr><td>C</td><td>Sandy Clay Loam</td><td>28</td><td>60</td></tr>
<tr><td>D (not used)</td><td>Clay Loam</td><td>34</td><td>33</td></tr>
</table></td></tr>
<tr><td>Receiving Node</td><td>-</td><td>Name of the receiving node for groundwater outflow to baseflow. This is based on the groundwater subwatershed delineation.</td></tr>
<tr><td>Surface Elevation</td><td>m</td><td>Elevation of the ground surface for the subcatchment was averaged from the LiDAR surface.</td></tr>
<tr><td>Coefficients</td><td></td><td>The coefficients were set for the saturated groundwater zone to represent a storage reservoir where outflow is linear proportional to the water table depth without surface water interaction. It was considered that the nearest open water channels were sufficiently far to have negligible impact on groundwater levels. The groundwater equation used is:

$f_G = A1\ (d_L - h_{sw})$

Where:
f_G = groundwater flow
d_L = depth of the lower saturated subsurface zone
h_{sw} = height of surface water above the bottom of the groundwater zone
A1 = Calibration factor (estimated at 0.05)

Value: 0.5 and 1</td></tr>
</table>

Parameter	Units	Description
Surface Water Depth	m	Set as 0.5 metres to allow flow from the water table to surrounding watercourses. **Value: 0.5**
Initial Elevation and Threshold Water Table Elevation	m	Set as per the median groundwater contour provided by the Hydrogeological report. **Value: varies**
		All other parameters used as per the receiving node or aquifer

3.2 Aquifer Parameters

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Porosity</td><td>Fraction</td><td>The following values were used for the volumetric water content of the soil at saturation (i.e. volume of water per total volume):
<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Porosity</td><td>0.436</td><td>0.450</td><td>0.432</td><td>0.472</td></tr>
</table>
(Source: SPAW Calculator)</td></tr>
<tr><td>Wilting Point</td><td>Fraction</td><td>This is soil moisture contact at which plants cannot obtain sufficient moisture from the soil to meet transpiration requirements and they will die. It is roughly equivalent to the moisture content of soil at 15 atmospheres. The following values were used:
<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Wilting Point</td><td>0.050</td><td>0.081</td><td>0.183</td><td>0.213</td></tr>
</table>
(Source: SPAW Calculator)</td></tr>
<tr><td>Field Capacity</td><td>Fraction</td><td>Considered to be the amount of water a well-drained soil holds after free water has drained off. The following values were used:
<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Field Capacity</td><td>0.094</td><td>0.179</td><td>0.283</td><td>0.350</td></tr>
</table>
(Source: SPAW Calculator)</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Conductivity</td><td>mm/hr</td><td>Within the Aquifer Parameters, the soil saturated conductivity is a governing parameter of the percolation rate between the upper unsaturated soil layer and the lower saturated soil layer. This is not the same as any hydraulic conductivity used for the surface infiltration. The values have been selected from the SPAW calculator and are:
<table><tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>Conductivity (mm/hr)</td><td>114</td><td>50.3</td><td>7.8</td><td>4.6</td></tr></table>(Source: SPAW Calculator)</td></tr>
<tr><td>Conductivity Slope</td><td>-</td><td>Conductivity slope measures the rate at which a soil's hydraulic conductivity decreases with decreasing moisture content. Regression analysis has shown it can be estimated with the following relationship:
Conductivity Slope = 0.48(% Sand) + 0.85(% Clay)
Based on this relationship the following values were used:
<table><tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>Conductivity Slope</td><td>48</td><td>40</td><td>53</td><td>45</td></tr></table></td></tr>
<tr><td>Tension Slope</td><td></td><td>Used for backward compatibility in the software and not used in this model</td></tr>
<tr><td>Upper Evaporation Factor</td><td>Fraction</td><td>This factor determines the fraction of available subsurface evaporation rate used in the upper subsurface zone (compared to the lower subsurface zone). A higher evaporation rate is associated with looser soils, lower water table elevations and shallow root zones. It was assumed that in all soils 80% of the available subsurface evaporation would be used in the upper zone due to the depth of the water table.
Value: 0.8</td></tr>
<tr><td>Lower Evaporative Depth</td><td>m</td><td>The depth of the lower subsurface zone which can be used for evapotranspiration should be approximate to the expected average depth of root penetration. The following values were used:
<table><tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>Evaporative Depth (m)</td><td>1.5</td><td>2.4</td><td>3.0</td><td>5.2</td></tr></table>(Source: Shah et al 2007 from EPA 2015)</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Lower Groundwater Loss Rate</td><td>mm/hr</td><td>This is the rate of percolation from the lower subsurface zone to a deep aquifer and is approximate to the rate at which the water table elevation will drop over a prolonged dry period. The saturated hydraulic conductivity of a compacted clay soil was used in all cases.
Value: 0.004</td></tr>
<tr><td>Bottom Elevation</td><td>m</td><td>The elevation of the bedrock as averaged from the Patterson 2016 report.
Value: 85</td></tr>
<tr><td>Unsaturated Zone Moisture</td><td></td><td>The moisture content of the unsaturated upper subsurface zone at the start of the simulation. Cannot be less than the wilting point and cannot be more that porosity. Assumed to be an approximate value between the wilting point and porosity fractions.
<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Evaporative Depth (m)</td><td>0.25</td><td>0.22</td><td>0.32</td><td>0.35</td></tr>
</table>
</td></tr>
</table>

Horton Equation

One of the oldest and most widely used infiltration equations was developed by Horton (1939). This equation was used in this study to compare the measured equation parameters with published literature values. The equation is as follows:

$$f = f_c + (f_o - f_c)e^{-kt} \quad (1\text{-}1)$$

where:
f= infiltration capacity (in/hr),
f_o = initial infiltration capacity (in/hr),
f_c = final infiltration capacity (in/hr),
k = empirical constant (hr^{-1})

This equation assumes that the rainfall intensity is greater than the infiltration capacity at all times and that the infiltration rate decreases with time (Bedient and Huber 1992). The capacity of the soil decreases as the time of the storm increases because the pores in the soil become saturated with water and do not allow water to continuously infiltrate through the surface (Bedient and Huber 1992). The Horton equation's major drawback is that it does not consider storage availability in the soil after varying amounts of infiltration have occurred, but only considers infiltration as a function of time (Akan 1993).

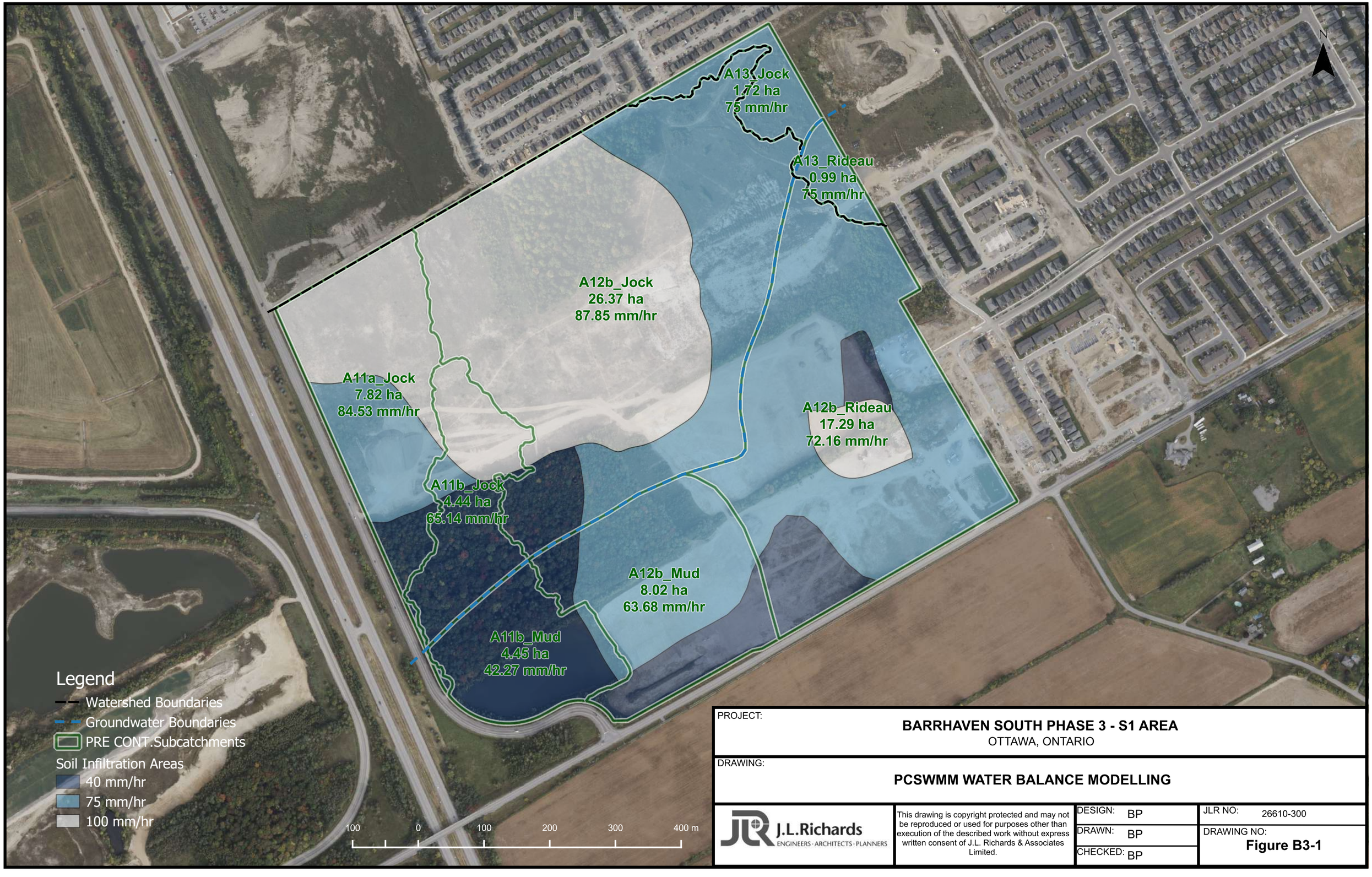
It is recommended that f_c, f_o, and k all be obtained through field data, but they are rarely measured locally. More commonly, they are determined through calibration of relatively complex stormwater drainage models, or by using values published in the literature. The use of published values in place of reliable field data is the cause of much concern by many (Akan 1993). The following lists include commonly used Horton infiltration parameter values:

Soil Type	f_o (in/hr)
Dry sandy soils with little to no vegetation	5
Dry loam soils with little to no vegetation	3
Dry clay soils with little to no vegetation	1
Dry sandy soils with dense vegetation	10
Dry loam soils with dense vegetation	6
Dry clay soils with dense vegetation	2
Moist sandy soils with little to no vegetation	1.7
Moist loam soils with little to no vegetation	1
Moist clay soils with little to no vegetation	0.3
Moist sandy soils with dense vegetation	3.3
Moist loam soils with dense vegetation	2
Moist clay soils with dense vegetation	0.7

Soil Type	f_c mm/hr	(in/hr)	k (1/min)
Clay loam, silty clay loams	0–1.3	(0–0.05)	0.069
Sandy clay loam	1.3–3.8	(0.05–0.15)	0.069
Silt loam, loam	3.8–7.6	(0.15–0.30)	0.069
Sand, loamy sand, sandy loams	7.6–11.4	(0.30–0.45)	0.069

Source: Akan 1993.

The above k values are not divided into categories, with only a single value used for all conditions (Akan 1993). The units of the k value are listed as 1/min instead of 1/hr because the time steps commonly used in urban hydrology are measured in minutes, while the infiltration rates are commonly measured in units of inches per hour. These values will be compared to the measured values obtained during this study by calibrating the Horton equation.



PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

OTTAWA, ONTARIO

DRAWING:

PCSWMM WATER BALANCE MODELLING

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN: BP

DRAWN: BP

CHECKED: BP

JLR NO: 26610-300

DRAWING NO: **Figure B3-1**

BARRHAVEN SOUTH PHASE 3 - S1 AREA
EXISTING CONDITION - PCSWMM WATER BALANCE MODEL
January 2025

	Name	A11a_Jock	A11b_Jock	A11b_Mud	A12b_Jock	A12b_Mud	A12b_Rideau	A13_Jock	A13_Rideau
INPUT PARAMETERS	Tag	Jock_River	Jock_River	Mud_Creek	Jock_River	Mud_Creek	Rideau_River	Jock_River	Rideau_River
	Rain Gage	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024	CDA_RCS_262_2014-2024
	Outlet	Mud_Creek	A11b_Mud	Mud_Creek	Mud_Creek	Mud_Creek	Mud_Creek	Jock_River	Jock_River
	Area (ha)	7.818	4.44	4.449	26.369	8.022	17.287	1.724	0.989
	Width (m)	158.63	108.472	108.693	524.956	253.523	840.86	186	417
	Flow Length (m)	492.845	409.322	409.318	502.309	316.421	205.587	92.688	23.717
	Slope (%)	3.2	3.952	2.79	3.578	1.789	2.348	4.578	4.045
	Imperv. (%)	0	0	0	0	0	0	0	0
	N Imperv	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	N Perv	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Dstore Imperv (mm)	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
	Dstore Perv (mm)	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
	Zero Imperv (%)	0	0	0	0	0	0	0	0
	Subarea Routing	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
	Percent Routed (%)	100	100	100	100	100	100	100	100
	Infil. Pattern	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
	Snow Pack	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace	Existing_OpenSpace
	LID Controls	0	0	1	0	0	0	0	0
	LID Names			Pond					
	Max. Infil. Rate (mm/hr)	84.531	65.142	42.265	87.853	63.68	72.16	75	75
	Min. Infil. Rate (mm/hr)	9.429	7.993	5.823	9.752	6.985	7.644	7.6	7.6
	Decay Constant (1/hr)	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	Drying Time (days)	7	7	7	7	7	7	7	7
	Groundwater	YES	YES	YES	YES	YES	YES	YES	YES
	Aquifer Name	B	B	C	A	B	B	B	B
	Receiving Node	Jock_River	Jock_River	Mud_Creek	Jock_River	Mud_Creek	Rideau_River	Jock_River	Rideau_River
	Surface Elevation (m)	104.538	102.623	99.792	105.808	99.916	102.284	111.128	110.078
	A1 Coefficient	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	B1 Exponent	1	1	1	1	1	1	1	1
	A2 Coefficient	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	B2 Exponent	1	1	1	1	1	1	1	1
	A3 Coefficient	0	0	0	0	0	0	0	0
	Surface Water Depth (m)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Threshold Water Table Elev. (m)	98.5	99	98.5	99	97.5	99	98.5	98.5
	Bottom Elevation (m)	95	95	95	95	95	95	95	95
	Initial Elevation (m)	98.5	99	98.5	99	97.5	99	98.5	98.5
	Initial Moisture (fraction)	-99	-99	-99	-99	-99	-99	-99	-99
RESULTS	Precipitation (mm)	17269.8	17269.8	17269.8	17269.8	17269.8	17269.8	17269.8	17269.8
	Runon (mm)	0	0	1349.06	0	0	0	0	0
	Evaporation (mm)	11.44	19.77	26.3	10.07	24.42	18.97	18.31	17.46
	Infiltration (mm)	16098.45	15946.75	18651.31	16115.65	15861.13	15874.22	15779.32	15702.48
	Imperv Runoff (mm)	0	0	0	0	0	0	0	0
	Perv Runoff (mm)	1187.21	1351.79	2225.44	1170.06	1431.35	1436.5	1598.5	1751.51
	Runoff Depth (mm)	1187.21	1351.79	0	1170.06	1431.35	1436.5	1598.5	1751.51
	Runoff Volume (ML)	92.82	60.02	0	308.54	114.82	248.33	27.56	17.32
	Peak Runoff (m^3/s)	0.29	0.21	0	0.97	0.39	0.93	0.14	0.09
	Runoff Coefficient	0.069	0.078	0	0.068	0.083	0.083	0.093	0.101
	GW Evaporation (mm)	10156.52	10154.49	11373.06	10157.12	10152.77	10154.59	10154.93	10155.07
	GW Seepage (mm)	257.04	367.55	494.1	259.24	356.14	384.64	152.01	162.6
	GW Outflow (mm)	5330.85	5210.49	6761.47	5520.5	5206.26	5140.52	4766.6	4738.17
	GW Max. Outflow (m^3/s)	0	0	0.03	0.01	0.01	0.02	0	0
	GW Avg. Moisture	0.26	0.26	0.31	0.26	0.25	0.25	0.26	0.26
	GW Avg. Table (m)	98.5	99	98.38	99	97.5	99	98.5	98.5
	GW Final Moisture	0.28	0.28	0.34	0.28	0.28	0.28	0.28	0.28
	GW Final Table (m)	98.5	99	98.5	99	97.5	99	98.5	98.5

Appendix B4

Master Sanitary Design Sheet

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

S1 URBAN EXPANSION AREA - BARRHAVEN SOUTH
SANITARY DESIGN SHEET - EXISTING CONDITIONS (REV. 1)
JLR NO: 26610-300

Prepared By: Mahad Musse

Design Parameters		
Singles	3.4	ppu
Towns	2.7	ppu
Apartments	1.8	ppu
Manning's Coefficient	0.013	
Residential Flow Rate	280	L/cap/day
Residential Peaking Factor	Harmon's Eqn	
Commercial/Institutional Flow Rate	28,000	L/ha/day
Commercial/Institutional Peaking Factor	1.0/1.5	
Infiltration Peaking Factor	0.33	

SOURCE	PIPE REACH			SANITARY PEAK FLOW ESTIMATION																						SEWER DATA (AS-BUILT)							
				RESIDENTIAL							COMMERCIAL				INSTITUTIONAL				PARKS/ROADS		INFILTRATION			PLUG FLOW	PEAK FLOW							
				UNITS					CUMULATIVE																								
	STREET NAME	FROM MH	TO MH	SINGLE	TOWNS	APART.	POP.	AREA (ha)	POP.	AREA (ha)	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	AREA (ha)	CUMUL. AREA	PEAK FLOW (L/s)	(L/s)	(L/s)	DIA. (mm)	ACT. DIA. (mm)	SLOPE (%)	LENGTH (m)	Q-FULL (L/s)	V-FULL (m/s)	RES. CAP. (L/s)	% FULL
Quinn's Pointe Stage 4 - As Builts (JLR, 2022)	**TO MH260 ON GREENBANK ROAD VIA BARNSDALE ROAD**																																
	TO MH204 ON BARNSDALE ROAD (VIA QUINN'S POINTE STAGE 4)																																
	Barnsdale Road	UPSTREAM	**MH204**	69	112	-	536	8.05	536	8.05	3.37	5.85		-	1.00	-	-	-	1.00	-	1.04	1.04	9.09	9.09	3.00	-	8.85	450	457	1.64%	97.8	380.94	2.32	372.1	2%
							536	8.05					-				-				1.04		9.09											
Quinn's Pointe Stage 3 - As Builts (JLR, 2020)	**TO MH204 ON BARNSDALE ROAD (VIA QUINN'S POINTE STAGE 3)**																																
	Finglas Court/ Barnsdale Road Connection	UPSTREAM	**MH204**	34	202	-	661	8.63	661	8.63	3.33	7.13	-	-	1.00	-	-	-	1.00	-	-	-	8.63	8.63	2.85	-	9.97	200	203	1.93%	19.7	47.49	1.46	37.5	21%
Future S1 Lands - (JLR, 2024)	**TO MH204 FROM PROPOSED S1 LANDS**																																
	Barnsdale Road	UPSTREAM	**MH204**	-	-	-	4,095	65.00	4,095	65.00	2.86	37.95	-	-	-	-	-	-	-	-	-	-	65.00	65.00	21.45	-	59.40	375	381	0.35%	100.00	108.21	0.95	48.82	55%
Quinn's Pointe Stage 3 / 4 - As Builts (JLR, 2020)	**TO MH260 ON GREENBANK ROAD VIA BARNSDALE ROAD**																																
	Barnsdale Road	**MH204**	MH203	-	-	-	-	0.29	5,292	81.97	2.78	47.64		-	1.00	-		-	1.00	-		1.04	0.29	83.01	27.39		75.03	525	533	0.20%	97.3	202.37	0.91	127.3	37%
	Barnsdale Road	MH203	MH202	-	-	-	-	0.22	5,292	82.19	2.78	47.64		-	1.00	-		-	1.00	-		1.04	0.22	83.23	27.47		75.10	525	533	0.18%	95.4	192.18	0.86	117.1	39%
	Barnsdale Road	MH202	MH201	-	-	-	-	0.36	5,292	82.55	2.78	47.64		-	1.00	-		-	1.00	`		1.04	0.36	83.59	27.58		75.22	525	533	0.24%	92.9	217.79	0.97	142.6	35%
							-	82.55					-				-				1.04		83.59											
	Greenbank Road	MH201	MH200	-	-	-	-	0.34	5,292	82.89	2.78	47.64		-	1.00	-		-	1.00	-		1.04	0.34	83.93	27.70		75.33	600	610	0.19%	124.5	281.83	0.97	206.5	27%
	Greenbank Road	MH200	MH260SE STUB	-	-	-	-	-	5,292	82.89	2.78	47.64		-	1.00	-		-	1.00	-		1.04	-	83.93	27.70		75.33	600	610	0.18%	110.9	274.12	0.94	198.8	27%
	Greenbank Road	MH260SE STUB	**MH260**	-	-	-	-	0.38	5,292	83.27	2.78	47.64		-	1.00	-		-	1.00	-		1.04	0.38	84.31	27.82		75.46	600	610	0.48%	12.2	444.73	1.52	369.3	17%
							5,292	83.27					-				-				1.04		84.31											
Quinn's Pointe Stage 4 - As Builts (JLR, 2022)	**TO MH260 ON GREENBANK ROAD VIA CAPPAMORE DRIVE**																																
	TO MH235 ON CAPPAMORE DRIVE (VIA QUINN'S POINTE STAGE 4)																																
	Cappamore Drive	UPSTREAM	**MH235**	59	240	-	849	9.17	849	9.17	3.28	9.01	-	-	1.00	-	-	-	1.00	-	5.57	5.57	14.74	14.74	4.86	3.00	16.88	200	203	0.35%	81.1	20.29	0.63	3.4	83%
							849	9.17					-				-				5.57		14.74											
Quinn's Pointe Stage 2 - As Builts (JLR, 2019)	**TO MH260 ON GREENBANK ROAD VIA CAPPAMORE DRIVE (QUINN'S POINTE STAGE 2)**																																
	River Mist Rd.	UPSTREAM	**MH233**	118	132	-	758	9.50	758	9.50	3.30	8.11	-	-	1.00	-	0	0.34	1.00	0.11	-	-	9.84	9.84	3.25		11.46	200	203	0.34%	98.6	19.95	0.62	8.5	57%
							758	9.50					-				0.34				-		9.84											
	School	Stub	**MH233**				-		-	-	3.80	-		-	1.50	-	2.36	2.36	1.50	1.15		-	2.36	2.36	0.78		1.93	200	203	0.35%	17.0	20.24	0.62	18.3	10%
							-	-					-				2.36				-		2.36											
	Cappamore Drive	**MH235**	MH237	13	-		44	0.65	893	9.82	3.26	9.45		-	1.00	-		-	1.00	-		5.57	0.65	15.39	5.08	3.00	17.53	200	203	0.35%	100.3	20.24	0.62	2.7	87%
	Cappamore Drive	MH237	MH239	18	-		61	0.91	954	10.73	3.25	10.05		-	1.00	-		-	1.00	-		5.57	0.91	16.30	5.38	3.00	18.43	200	203	0.35%	121.1	20.24	0.62	1.8	91%
	Cappamore Drive	MH239	MH241	18	-		61	0.82	1,015	11.55	3.24	10.65		-	1.00	-		-	1.00	-		5.57	0.82	17.12	5.65	3.00	19.30	200	203	0.78%	109.8	30.22	0.93	10.9	64%
	Cappamore Drive	MH241	MH243	6	-		20	0.36	1,035	11.91	3.23	10.84		-	1.00	-		-	1.00	-		5.57	0.36	17.48	5.77	3.00	19.61	200	203	0.35%	67.5	20.24	0.62	0.6	97%
	Cappamore Drive	MH243	**MH233**	2	-		7	0.26	1,042	12.17	3.23	10.91		-	1.00	-		-	1.00	-		5.57	0.26	17.74	5.85	3.00	19.76	200	203	0.35%	76.5	20.24	0.62	0.5	98%
							1,042	12.17					-				-				5.57		17.74											
	Cappamore Drive	**MH233**	**MH260**	58	-	-	196	9.26	1,996	30.93	3.07	19.85	-	-	1.00	-	3.12	5.82	1.00	1.89	-	5.57	12.38	42.32	13.97	7.00	42.71	250	254	0.89%	77.3	58.61	1.16	15.9	73%
							1,996	30.93					-				5.82				5.57		42.32											
Future S2 Lands - (Arcadis/IBI Group, 2024)	**TO MH260 (EXMH 74401 on GeoOttawa) FROM PROPOSED S2 LANDS BY ARCADIS/IBI GROUP**																																
	Cappamore Drive / Greenbank Road	MH 102A	**MH260**	544	560	142	3,617	70.15	3,617	70.15	2.90	33.97	-	-	-	-	-	-	-	-	-	-	70.15	70.15	23.15	-	57.12	375	381	0.38%	615.70	112.75	0.99	55.64	49%
Quinn's Pointe Stage 2 - As Builts (JLR, 2019)	**TO MH45 (SOUTH) ON GREENBANK ROAD**																																
	TO EX120 ON GREENBANK ROAD (QUINN'S POINTE STAGES 2, 3 AND 4 + GREENBANK ROAD)																																
	Greenbank Road	**MH260**	MH261	-	-	-	-	0.29	10,905	184.64	2.53	89.54		-	1.00	-		5.82	1.00	1.89		6.61	0.29	197.07	65.03	7.00	163.46	600	610	0.47%	86.4	439.15	1.50	275.7	37%
	Greenbank Road	MH261	**EX120**	-	-	-	-	0.29	10,905	184.93	2.53	89.54		-	1.00	-		5.82	1.00	1.89		6.61	0.29	197.36	65.13	7.00	163.56	600	610	0.38%	79.2	394.87	1.35	231.3	41%
							10,905	184.93					-				5.82				6.61		127.21											
Quinn's Pointe Stage 1 - As Builts (JLR, 2016)	**TO EX98A ON GREENBANK ROAD (QUINN'S POINTE STAGES 1, 2, 3 AND 4 + GREENBANK ROAD)**																																
	Greenbank Road	**EX120**	**121**	-	-	-	-	0.22	10,905	185.15	2.53	89.54		-	1.00	-		5.82	1.00	1.89		6.61	0.22	197.58	65.20	7.00	163.63	600	610	0.16%	58.1	256.22	0.88	92.6	64%
							10,905	185.15					-				5.82				6.61		127.43											
	Easement	UPSTREAM	**121**	84	36	-	383	6.55	383	6.55	3.42	4.25	-	-	1.00	-	1.57	1.57	1.00	0.51	-	-	8.12	8.12	2.68	5.00	12.44	300	305	0.20%	20.4	44.67	0.61	32.2	28%
							383	6.55					-				1.57				-		8.12											
	Greenbank Road	**121**	123	-	-	-	-	0.73	11,288	192.43	2.52	92.25	-	-	1.00	-	-	7.39	1.00	2.39	-	6.61	0.73	206.43	68.12	12.00	174.77	600	610	0.33%	75.3	367.97	1.26	193.2	47%
							11,288	192.43					-				7.39				6.61		136.28											
	Easement	UPSTREAM	**123**	-	96	-	260	2.62	260	2.62	3.48	2.94	-	-	1.00	-	-	-	1.00	-	-	-	2.62	2.62	0.86	-	3.80	300	305	0.35%	19.0	59.68	0.82	55.9	6%
							260	2.62					-				-				-		2.62											
	Greenbank Road	**123**	**EX. 205A**	-	-	-	-	0.43	11,548	195.48	2.51	94.08		-	1.00	-		7.39	1.00	2.39		6.61	0.43	209.48	69.13	12.00	177.60	600	610	0.25%	120.8	320.28	1.10	142.7	55%
							11,548	195.48					-				7.39				6.61		139.33											
	Kilbirnie Drive	UPSTREAM	**EX. 205A**	-	83	-	224	2.15	224	2.15	3.50	2.54	-	-	1.00	-	-	-	1.00	-	-	-	2.15	2.15	0.71	-	3.25	200	203	0.71%	28.7	28.83	0.89	25.6	11%
							224	2.15					-				-				-		2.15											
	Greenbank Road	**EX. 205A**	**EX. 98A**	-	-		-	-	11,772	197.63	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	-	211.63	69.84	12.00	179.88	600	610	0.25%	126.0	320.28	1.10	140.4	56%
							11,772	197.63					-				7.39				6.61		141.48											

Barrhaven South MSS Addendum (Stantec, 2017)

TO MH45 (SOUTH) ON GREENBANK ROAD

Greenbank Road	**EX. 98A**	MH99A				-	2.71	11,772	200.34	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	2.71	214.34	70.73	12.00	180.78	600	610	0.25%	320.28	320.28	1.10	139.5	56%
Greenbank Road	MH99A	MH100A				-	-	11,772	200.34	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	-	214.34	70.73	12.00	180.78	600	610	0.25%	320.28	320.28	1.10	139.5	56%
Greenbank Road	MH100A	MH204A				-	-	11,772	200.34	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	-	214.34	70.73	12.00	180.78	600	610	0.25%	320.28	320.28	1.10	139.5	56%
Greenbank Road	MH204A	MH206A				-	-	11,772	200.34	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	-	214.34	70.73	12.00	180.78	600	610	0.25%	320.28	320.28	1.10	139.5	56%
Greenbank Road	MH206A	MH97A				-	-	11,772	200.34	2.51	95.65		-	1.00	-		7.39	1.00	2.39		6.61	-	214.34	70.73	12.00	180.78	600	610	0.25%	320.28	320.28	1.10	139.5	56%
Greenbank Road	MH97A	MH96A				1,631	19.95	13,403	220.29	2.46	106.94		-	1.00	-		7.39	1.00	2.39	0.81	7.42	20.76	235.10	77.58	12.00	198.91	600	610	0.30%	350.85	350.85	1.20	151.9	57%
Greenbank Road	MH96A	MH95A				-	-	13,403	220.29	2.46	106.94		-	1.00	-		7.39	1.00	2.39		7.42	-	235.10	77.58	12.00	198.91	600	610	0.30%	350.85	350.85	1.20	151.9	57%
Greenbank Road	MH95A	MH201A				-	-	13,403	220.29	2.46	106.94		-	1.00	-		7.39	1.00	2.39		7.42	-	235.10	77.58	12.00	198.91	600	610	0.30%	350.85	350.85	1.20	151.9	57%
Greenbank Road	MH201A	MH201B				787	12.13	14,190	232.42	2.44	112.30		-	1.00	-		7.39	1.00	2.39		7.42	12.13	247.23	81.59	12.00	208.28	600	610	0.30%	350.85	350.85	1.20	142.6	59%
Greenbank Road	MH201B	MH200A				-	-	14,190	232.42	2.44	112.30		-	1.00	-		7.39	1.00	2.39		7.42	-	247.23	81.59	12.00	208.28	600	610	0.30%	350.85	350.85	1.20	142.6	59%
Greenbank Road	MH200A	MH200C				-	-	14,190	232.42	2.44	112.30		-	1.00	-		7.39	1.00	2.39		7.42	-	247.23	81.59	12.00	208.28	600	610	0.50%	452.94	452.94	1.55	244.7	46%
Greenbank Road	MH200C	**MH45**				-	-	14,190	232.42	2.44	112.30		-	1.00	-	7.50	14.89	1.00	4.83		7.42	7.50	254.73	84.06	12.00	213.19	600	610	0.12%	221.90	221.90	0.76	8.7	96%
						14,190	232.42					-				14.89				7.42		184.58											

Quinn's Pointe Stage 1 & 2 As Builts (JLR, 2016 & 2019)

TO MH17A ON CAMBRIAN ROAD VIA RIVER MIST ROAD

TO EXMH165 ON RIVER MIST ROAD (QUINN'S POINTE STAGES 1 AND 2)

Kilbernie Dr	UPSTREAM	**10**	46	-	-	157	2.52	157	2.52	3.55	1.81	0.49	0.49	1.50	0.24	2.43	2.43	1.50	1.18	-	-	5.44	5.44	1.80		5.02	200	203	2.96%	117.3	58.87	1.82	53.8	9%
						157	2.52					0.49				2.43				-		5.44											
Alex Polowin Ave.	UPSTREAM	**10**	43	-	-	146	1.91	146	1.91	3.56	1.68	-	-	1.00	-	-	-	1.00	-	-	-	1.91	1.91	0.63	-	2.31	200	203	1.65%	104.0	43.95	1.36	41.6	5%
						146	1.91					-				-				-		1.91											
River Mist Road	UPSTREAM	**1**	114	14	-	424	5.54	424	5.54	3.41	4.68	-	-	1.00	-	-	-	1.00	-	-	-	5.54	5.54	1.83	-	6.51	200	203	1.77%	112.1	45.46	1.40	38.9	14%
						424	5.54					-				-				-		5.54											
Kilbirnie Drive	**10**	1	-	29	-	79	1.19	382	5.62	3.43	4.24	-	0.49	1.50	0.24	2.83	5.26	1.50	2.56	-	-	4.02	11.37	3.75		10.79	200	203	0.32%	119.0	19.36	0.60	8.6	56%
						382	5.62					0.49				5.26				-		11.37											
River Mist Road	**1**	**EX. MH163**	-	-		-		806	11.16	3.29	8.59		0.49	1.50	0.24		5.26	1.50	2.56		-	-	16.91	5.58		16.96	200	203	0.32%	39.4	19.36	0.60	2.4	88%
						806	11.16					0.49				5.26				-		16.91											

Barrhaven South MSS Addendum (Stantec 2017)

TO MH17A ON CAMBRIAN ROAD VIA RIVER MIST ROAD

River Mist Road	**EX. MH163**	162	-	-		-	-	806	11.16	3.29	8.59		0.49	1.50	0.24	2.77	8.03	1.50	3.90	1.38	1.38	4.15	21.06	6.95		19.68	200	203	1.15%	36.3	36.69	1.13	17.0	54%
River Mist Road	162	161				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	250	254	1.15%	87.2	66.53	1.31	46.9	30%
River Mist Road	161	EX151				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	250	254	1.15%	75.6	66.53	1.31	46.9	30%
River Mist Road	EX151	MH142				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	300	305	1.40%	44.4	119.37	1.64	99.7	16%
River Mist Road	MH142	EX139				825	8.20	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	8.20	29.26	9.66		30.30	300	305	0.40%	74.8	63.80	0.87	33.5	47%
River Mist Road	EX139	EX136				-	-	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	29.26	9.66		30.30	300	305	0.40%	64.7	63.80	0.87	33.5	47%
River Mist Road	EX136	MH126				-	-	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	29.26	9.66		30.30	300	305	0.41%	78.9	64.60	0.89	34.3	47%
River Mist Road	MH126	EX123				954	16.50	2,585	35.86	3.00	25.11		0.49	1.50	0.24	2.1	10.13	1.50	4.92		1.38	18.60	47.86	15.79		46.06	375	381	0.45%	81.3	122.70	1.08	76.6	38%
River Mist Road	EX123	MH112				-	-	2,585	35.86	3.00	25.11		0.49	1.50	0.24		10.13	1.50	4.92		1.38	-	47.86	15.79		46.06	375	381	0.42%	90.3	118.54	1.04	72.5	39%
River Mist Road	MH112	EX102				689	8.30	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	8.30	56.16	18.53		53.04	375	381	0.31%	68.0	101.84	0.89	48.8	52%
River Mist Road	EX102	EX101				-	-	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	56.16	18.53		53.04	375	381	0.29%	34.0	98.50	0.86	45.5	54%
River Mist Road	EX101	MH43A				-	-	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	56.16	18.53		53.04	375	381	0.30%	38.0	100.18	0.88	47.1	53%
River Mist Road	MH43A	MH44A				352	6.60	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	6.60	62.76	20.71		58.19	375	381	0.30%	81.0	100.18	0.88	42.0	58%
River Mist Road	MH44A	MH45A				-	-	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	62.76	20.71		58.19	375	381	0.30%	64.0	100.18	0.88	42.0	58%
River Mist Road	MH45A	MH46A				-	-	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	62.76	20.71		58.19	375	381	0.30%	85.0	100.18	0.88	42.0	58%
River Mist Road	MH46A	MH47A				562	8.40	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	8.40	71.16	23.48		65.64	375	381	0.30%	41.0	100.18	0.88	34.5	66%
River Mist Road	MH47A	MH101A				-	-	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	71.16	23.48		65.64	375	381	0.30%	64.0	100.18	0.88	34.5	66%
River Mist Road	MH101A	MH102A				-	-	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	71.16	23.48		65.64	375	381	0.30%	64.0	100.18	0.88	34.5	66%
River Mist Road	MH102A	**MH17A**				291	4.00	4,479	63.16	2.83	41.09		0.49	1.00	0.16		10.13	1.00	3.28		1.38	4.00	75.16	24.80		69.34	375	381	0.30%	81.0	100.18	0.88	30.8	69%
						4,479	63.16					0.49				10.13				1.38		75.16											

The Ridge Phase 1 to 4 (DSEL, 2019 and 2022)

TO MH57A ON CAMBRIAN ROAD VIA NEW GREENBANK

TO MH57A ON CAMBRIAN ROAD VIA NEW GREENBANK (THE RIDGE PHASE 1 TO 4)

New Greenbank	UPSTREAM	**MH57A**		-	-	3,892	48.06	3,892	48.06	2.88	36.26	24.22	24.22	1.50	11.77	6.06	6.06	1.50	2.95	3.17	3.17	81.51	81.51	26.90		77.88	375	381	0.50%	15.0	129.34	1.13	51.5	60%
						3,892	48.06					24.22				6.06				3.17		81.51											

The Meadows Subdivision Phase 7/8 (DSEL, 2020)

TO MH501A ON CAMBRIAN ROAD VIA ELEVATION ROAD

TO MH501A ON CAMBRIAN ROAD VIA ELEVATION ROAD (THE MEADOWS SUBDIVISION PHASE 7/8)

Elevation Road	UPSTREAM	**MH501A**		-	-	1,135	15.87	1,135	15.87	3.21	11.81	10.80	10.80	1.50	5.25	2.80	2.80	1.50	1.36	1.19	1.19	30.66	30.66	10.12		28.73	375	381	0.20%	14.5	81.80	0.72	53.1	35%
						1,135	15.87					10.80				2.80				1.19		30.66											

The Meadows Subdivision Phase 7/8 (DSEL, 2020)

TO MH45 (EAST) ON GREENBANK ROAD VIA CAMBRIAN ROAD

TO MH45 (EAST) ON GREENBANK ROAD VIA CAMBRIAN ROAD

Cambrian (via Apolune St.)	UPSTREAM	**MH501A**				417	4.21	417	4.21			-	-	1.00	-		-	1.00	-	3.19	3.19	7.40	7.40										
Fut. Residential + Woodlot	UPSTREAM	**MH501A**				141	2.24	141	2.24	3.56	1.63	-	-	1.00	-		-	1.00	-	13.44	13.44	15.68	15.68	5.17									
Cambrian	**MH501A**	5010A				91	2.24	1,784	24.56	3.10	17.92		10.80	1.50	5.25		2.80	1.50	1.36		17.82	2.24	55.98	18.47		43.00	500	508	0.12%	124.0	136.46	0.67	93.5	32%
Cambrian	5010A	502A				-		1,784	24.56	3.10	17.92		10.80	1.50	5.25		2.80	1.50	1.36		17.82	-	55.98	18.47		43.00	500	508	0.12%	124.0	136.46	0.67	93.5	32%
Cambrian	502A	503A				1,144	11.48	2,928	36.04	2.96	28.10		10.80	1.50	5.25	6.05	8.85	1.50	4.30	0.24	18.06	17.77	73.75	24.34		61.99	500	508	0.15%	111.5	152.57	0.75	90.6	41%
Cambrian	503A	504A				-	0.20	2,928	36.24	2.96	28.10	2.86	13.66	1.50	6.64		8.85	1.50	4.30		18.06	3.06	76.81	25.35		64.39	500	508	0.15%	29.5	152.57	0.75	88.2	42%
Cambrian	504A	**MH57A**				-		2,928	36.24	2.96	28.10		13.66	1.50	6.64		8.85	1.50	4.30		18.06	-	76.81	25.35		64.39	500	508	0.61%	26.0	307.66	1.52	243.3	21%
						2,928	36.24					13.66				8.85				18.06		76.81											

Barrhaven South MSS Addendum (Stantec 2017)

Cambrian	**MH57A**	MH13A				458	4.30	7,278	88.60	2.67	63.03	3.40	41.28	1.50	20.07		14.91	1.50	7.25		21.23	7.70	166.02	54.79		145.13	500	508	0.25%	216.5	196.96	0.97	51.8	74%
Cambrian	MH13A	MH15A				634	6.20	7,912	94.80	2.64	67.79		41.28	1.50	20.07		14.91	1.50	7.25		21.23	6.20	172.22	56.83		151.94	500	508	0.20%	165.2	176.17	0.87	24.2	86%
Cambrian	MH15A	**MH17A**				870	5.60	8,782	100.40	2.61	74.24		41.28	1.50	20.07		14.91	1.50	7.25		21.23	5.60	177.82	58.68		160.23	600	610	0.13%	202.0	230.96	0.79	70.7	69%
						8,782	100.40					41.28				14.91				21.23		177.82											
Cambrian	**MH17A**	MH21A				1,956	26.00	15,217	189.56	2.42	119.22		41.77	1.50	20.30	3.00	28.04	1.50	13.63	5.1	27.71	34.10	287.08	94.74		247.89	750	762	0.13%	204.3	418.75	0.92	170.9	59%
Cambrian	MH21A	**MH45**				408	7.00	15,625	196.56	2.41	121.95		41.77	1.50	20.30		28.04	1.50	13.63	2.9	30.61	9.90	296.98	98.00		253.89	750	762	0.13%	277.8	418.75	0.92	164.9	61%
						15,625	196.56					41.77				28.04				30.61		296.98											

Barrhaven South MSS Addendum (Stantec 2017)

TO MH435A (NORTH OF MH45) ON GREENBANK ROAD

TO MH435A (NORTH OF MH45) ON GREENBANK ROAD

Greenbank	**MH45**	**MH435A**				548	5.10	30,363	434.08	2.18	214.28	-	41.77	1.00	13.54	-	42.93	1.00	13.91	-	38.03	5.10	486.66	160.60	12.00	414.33	900	914	0.10%	296.6	597.22	0.91	182.9	69%
						30,363	434.08					41.77				42.93				38.03		486.66											

Barrhaven South MSS Addendum (Stantec 2017)

TO MH501A (NORTH OF MH45) ON GREENBANK ROAD

TO MH501A (NORTH OF MH45) ON GREENBANK ROAD

Local (North of Cambrian Road)	**MA9**	**MA8**				2,378	22.23	2,378	22.23	3.02	23.28		-	1.00	-	2.45	2.45	1.00	0.79	9.54	9.54	34.22	34.22	11.29		35.37	450	457	0.11%	507.50	98.65	0.60	63.3	36%
Local (North of Cambrian Road)	**MA8**	**MA7**				308	2.88	2,686	25.11	2.99	25.99		-	1.00	-		2.45	1.00	0.79	0.78	10.32	3.66	37.88	12.50		39.29	450	457	0.11%	317.10	98.65	0.60	59.4	40%
Local (North of Cambrian Road)	**MA7**	**MA6**				1,979	18.50	4,665	43.61	2.82	42.61		-	1.00	-		2.45	1.00	0.79	-	10.32	18.50	56.38	18.61		62.01	450	457	0.11%	573.10	98.65	0.60	36.6	63%
Local (North of Cambrian Road)	**MA6**	**MA5**				2,320	21.68	6,985	65.29	2.69	60.80		-	1.00	-		2.45	1.00	0.79	-	10.32	21.68	78.06	25.76		87.36	525	533	0.10%	473.90	141.88	0.63	54.5	62%
Local (North of Cambrian Road)	**MA5**	**MA4**				1,020	9.53	8,005	74.82	2.64	68.49		-	1.00	-		2.45	1.00	0.79	-	10.32	9.53	87.59	28.90		98.19	525	533	0.10%	439.40	141.88	0.63	43.7	69%
Local (North of Cambrian Road)	**MA4**	**MH521A**				863	8.07	8,868	82.89	2.61	74.87		-	1.00	-		2.45	1.00	0.79	2.42	12.74	10.49	98.08	32.37		108.03	525	533	0.10%	530.70	141.88	0.63	33.9	76%
Local (North of Cambrian Road)	**MH521A**	**MH522A**				231	3.80	9,099	86.69	2.60	76.56		-	1.00	-		2.45	1.00	0.79	0.02	12.76	3.82	101.90	33.63		110.98	600	610	0.10%	49.90	202.56	0.69	91.6	55%
Local (North of Cambrian Road)	**MH522A**	**MH435A**				-	-	9,099	86.69	2.60	76.56		-	1.00	-		2.45	1.00	0.79	-	12.76	-	101.90	33.63		110.98	600	610	0.10%	11.10	202.56	0.69	91.6	55%
Greenbank	**MH435A**	**MH501A**				-	-	39,462	520.77	2.09	267.19		41.77	1.00	13.54		45.38	1.00	14.71	-	50.79	-	588.56	194.23	12.00	501.66	900	914	0.10%	13.30	597.22	0.91	95.6	84%
						39,462	520.77					41.77				45.38				50.79		588.56											

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Appendix C

2018 BSUEA MSS

JLR No.: 26610
Revision: 2

May 4, 2018

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Master Servicing Study

Barrhaven South Urban Expansion Area

Greenbank Road, Ottawa

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Executive Summary

Minto Communities Inc. (Minto) and Mattamy Homes Ltd. (Mattamy) herein referred to as the Sponsored Owner, have retained a Consultant Team to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA), which will be implemented as an Amendment to the City of Ottawa (City) Official Plan (OP). J.L. Richards & Associates Limited (JLR) has been retained to undertake the Master Servicing Study (MSS) Class Environmental Assessment (Class EA) that would outline water, wastewater, storm and stormwater management servicing strategies for the BSUEA. The following report documents the reviews, analyses and findings meant to outline the preferred infrastructure servicing strategies for the BSUEA Community Design Plan (CDP). The specific objectives of this report were set out in the Terms of Reference (Appendix A) and outlined as follows:

- Review and inventory the existing infrastructure surrounding the proposed development;
- Estimate residual capacity of the existing infrastructure;
- Develop a set of feasible alternatives for storm, sanitary and water services for the proposed development based on the preferred CDP;
- Evaluate the feasible service designs based on a set of criteria that incorporates environmental, social and fiscal considerations; and
- Select one, or set of, optimal service option(s) and provide criteria for a detailed design.

This MSS has been prepared to support the Community Design Plan (CDP) for the Barrhaven South Urban Expansion Area (BSUEA). It provides a functional design solution for on-site storm drainage, wastewater collection and water distribution servicing in the BSUEA. Future Plan of Subdivision development applications under the Planning Act will build upon and refine the solutions presented herein. The Master Servicing Study is an integral part of the CDP study process and is undertaken to confirm the feasibility of servicing a potential development site. This document has also been prepared to meet the requirements of the provincial planning and Class Environmental Act (Class EA) processes.

The BSUEA is 121 ha of land bounded by Cambrian Road to the north and Barnsdale Road to the south. The expansion area is adjacent to the current City of Ottawa Urban Boundary limits and approximately 360 m east of Borrisokane Road. The subject site is an undeveloped mix of former agricultural land and forested areas and contains two (2) ongoing aggregate extraction operations. The southern portion of the site generally consists of former agricultural land with some woodlot areas.

Opportunities were identified and a number of alternative servicing options were developed and evaluated using a set of criteria that accounted for environmental, social and economic impacts. High level servicing strategies for storm, sanitary and water infrastructure systems are outlined within the MSS document. These strategies have been developed to expand and upgrade the existing and planned municipal infrastructure to achieve the land use objectives, while minimizing impacts to the social and natural environments. The recommended strategies are summarized below:

- The design of the storm drainage system has been undertaken using the dual-drainage approach.

- Two (2) separate storm servicing solutions were developed; one conventional servicing strategy and one that incorporates the Etobicoke Exfiltration System (EES). Should the performance of Phase 1's EES be inconclusive, then the feasibility of an infiltration gallery servicing the Phase 2 lands was reviewed. The high level assessment found that an infiltration gallery incorporated within the proposed spill-over dry pond next to Barnsdale Road could provide sufficient storage for part of Minto's Phase 2 lands.
- The stormwater management solution incorporates potentially four (4) stormwater management ponds; two (2) adjacent to Greenbank Road, one spill-over dry pond west of the CDP boundary and a potential spill-over dry pond within the Mattamy West Lands. An additional two (2) potential stormwater management facilities have been identified in the stormwater management solution for the aggregate extraction areas.
- The residual capacities in the surrounding wastewater services were assessed to determine viable servicing outlets for wastewater generated within the BSUEA.
- The existing constructed and planned wastewater system network can provide servicing for the BSUEA.
- Upsizing of some planned (but currently unconstructed) wastewater infrastructure is recommended.
- The MSS servicing evaluation has identified that wastewater servicing for the BSUEA is feasible based on the downstream residual capacities and the proposed trunk sanitary sewer network.
- The BSUEA can be serviced from the BARR pressure zone with watermain extensions from the surrounding existing watermains.
- The analysis confirmed that there are no upgrades to the planned distribution network identified in the 2013 Infrastructure Master Plan.

The MSS sets out the design criteria for future draft plan and site plan applications within the BSUEA. The design criteria for storm, wastewater and water are consistent with current design standards. The MSS component of the BSUEA CDP has been developed to satisfy the requirements of Phases 1 and 2 of the Municipal Class EA process. Infrastructure projects that will be undertaken as part of the development of the BSUEA, along with their phasing and schedule classification, are contained within the report.

The MSS demonstrates that the development proposed by the CDP can be serviced by extending existing municipal water and wastewater infrastructure; upsizing planned future wastewater infrastructure, and constructing stormwater management facilities.

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MG1	Master Grading Plan 1
MG2	Master Grading Plan 2
SWM-CONV	SWMFs for Conventional Storm System
SWM-EES	SWMFs for EES Storm Sewer System
DT1	Detail Sheet
D-SAN	Master Sanitary Drainage Area
MWM	Master Watermain

1.0 Introduction

Minto Communities Inc. (Minto) and Mattamy Homes Ltd. (Mattamy) herein referred to as the Sponsored Owner, have retained a Consultant Team to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA), which will be implemented as an Amendment to the City of Ottawa (City) Official Plan (OP). J.L. Richards & Associates Limited (JLR) has been retained to undertake the Master Servicing Study (MSS) Class Environmental Assessment (Class EA) that would outline water, wastewater, storm and stormwater management servicing strategies for the BSUEA. The following report documents the reviews, analyses and findings meant to outline the preferred infrastructure servicing strategies for the BSUEA Community Design Plan (CDP). The specific objectives of this report were set out in the Terms of Reference (Appendix A) and e outlined as follows:

- Review and inventory the existing infrastructure surrounding the proposed development;
- Estimate residual capacity of the existing infrastructure;
- Develop a set of feasible alternatives for storm, sanitary and water services for the proposed development based on the preferred CDP;
- Evaluate the feasible service designs based on a set of criteria that incorporates environmental, social and fiscal considerations; and
- Select one, or set of, optimal service option(s) and provide criteria for a detailed design.

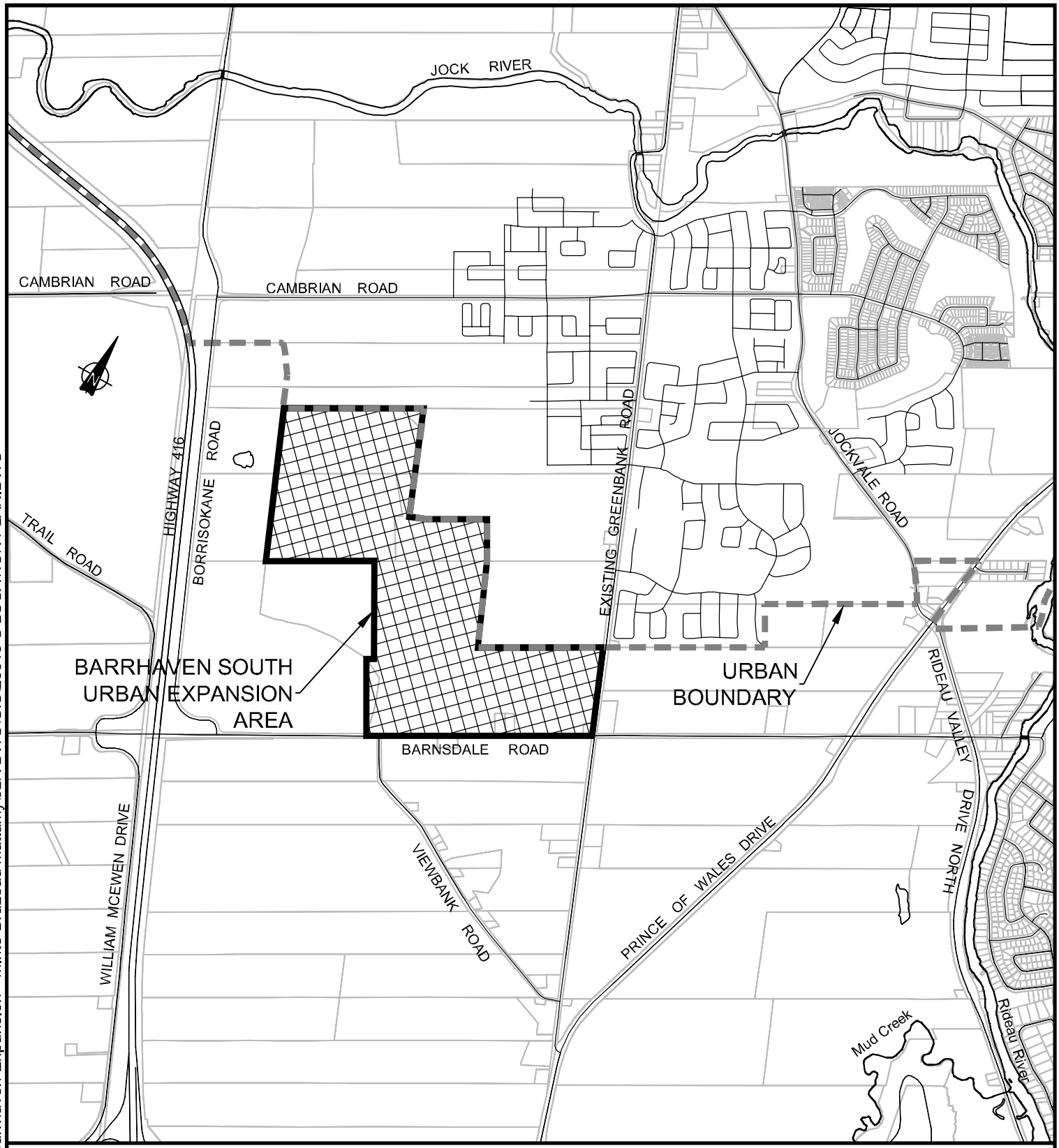
1.1 Barrhaven South Urban Expansion Area

The BSUEA is 121 ha of land bounded by Cambrian Road to the north and Barnsdale Road to the south. The expansion area, as shown on Figure 1-1, is adjacent to the current City of Ottawa Urban Boundary limits and approximately 360 m east of Borrisokane Road. The subject site is an undeveloped mix of former agricultural land and forested areas and contains two (2) ongoing aggregate extraction operations. The southern portion of the site generally consists of former agricultural land with some woodlot areas.

1.2 Class Environmental Assessment Process

The *Ontario Environmental Assessment Act* (EA Act), enacted in 1976, formally recognizes the Municipal Class EA process and outlines requirements for EA approval. The Class EA applies to municipal infrastructure projects including roads, water, wastewater and stormwater projects. To ensure that environmental impacts and effects are considered for each project as per the EA Act, proponents are required to generally follow the planning process set out in the Class EA Guidelines, prepared by the Municipal Engineers Association (MEA, 2011). The Class EA process includes the following stages:

- Phase 1: Problem or opportunity identification.
- Phase 2: Identification and evaluation of alternative solutions to determine a preferred solution to the problem or opportunity. This Phase also compiles an environmental 'inventory', identifies impacts, and outlines mitigation measures.



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

MASTER SERVICING STUDY

DRAWING:

BSUEA LOCATION PLAN

J.L.Richards
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DESIGN: HM	JLR NO: 26610
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- Phase 3: Identification and evaluation of design concepts for the preferred solution. A detailed evaluation of the environmental effects and mitigation measures will be addressed during this project Phase.
- Phase 4: Complete and place Environmental Study Report (ESR) on Public Record. The Report will document Phases 1 through 3 and summarize the consultation undertaken throughout the planning process and is considered valid for a 10 year period.
- Phase 5: Implementation and monitoring.

Since projects may vary with regards to their environmental impact, they are classified in terms of the following schedules:

- Schedule 'A' projects usually have minimal environmental effects and generally include normal or emergency operational and maintenance activities. These projects are pre-approved under the Class EA planning process. Projects within this category are subject to Phases 1 and 5.
- Schedule 'B' projects have potential for some adverse environmental impacts and, therefore, the proponent is required to proceed through a screening process, including consultation with affected parties. Generally, these projects include improvements and minor expansions to existing facilities. Projects within this category are subject to Phases 1, 2 and 5.
- Schedule 'C' projects have potential for greater environmental impacts and are subject to all five (5) Class EA Phases. Generally, these projects include the construction of new facilities and major expansions to existing facilities.

Based on the MEA Guidelines, this project has been undertaken as a Schedule 'B' Class EA, and thus Phases 1 to 2 of the Class EA process were completed and summarized herein.

1.3 Integrated Planning Process

In 2009, the City of Ottawa Council and the Municipal Board reviewed the City's OP and designated a number of expansion areas for future development, including the BSUEA. These urban expansion areas are intended to accommodate the projected population growth to 2031. In order to ensure the development of functional and livable neighborhoods, an integrated planning approach is utilized. The integrated approach consists of drawing information from a number of detailed studies (summarized below) in order to inform and guide the planning process for the development of these new communities.

- Community Design Plan (CDP): Transmits the guiding principles of the City's OP down to a community scale. The CDP outlines various infrastructure requirements such as roads, sanitary, storm and water services. The CDP also establishes the responsibilities between owners and the City with regards to new infrastructure projects.
- Transportation Master Plan (TMP): Inventories existing transportation facilities and outlines future transportation requirements.
- Master Servicing Study (MSS): Provides high level analysis of different service options for storm, sanitary and water distribution systems based on existing conditions and projected future demand. Provides design guidelines and criteria for further detailed design.

- Environmental Management Plan (EMP): Studies potential adverse effect of proposed land-use changes and develops a plan to minimize them.

The Integrated Approach combines the CDP with a Class EA. In doing so, the approval requirements for both the EA and the Planning Act are able to be coordinated.

1.4 Study Team and Agency Involvement

The organization of the CDP and preparation of the individual MSS documents is a collaborative effort between various stakeholders, the general public, and members of both the Core Project Team (CPT) and Technical Advisory Committee (TAC). These committees included several groups within the City of Ottawa organization, provincial government agencies, the Owner, and a consortium of consultants.

1.4.1 Core Project Team (CPT)

The CPT was established at the onset of the study, and was comprised of various groups at the City of Ottawa (including internal project management) and representatives from the Planning, Infrastructure & Economic Development Department portfolio, complemented by staff from other departments. Other members included the two (2) participating sponsoring Landowners (Minto and Mattamy), and the Consulting Team that consisted of the following firms:

- FOTENN Planning + Design - Land Use Planning and Urban Design;
- Morrison Hershfield - Integrated Environmental Assessment and Environmental Management Plan;
- J.L. Richards & Associates Limited - Master Servicing Study;
- Stantec Inc. - Transportation Master Study;
- Dillon Consulting Limited - Natural Heritage;
- Paterson Group - Geotechnical and Hydrogeology; and
- Golder Associates Ltd - Archaeology and Heritage.

1.4.2 Technical Advisory Committee (TAC)

The TAC was established to discuss the various CDP alternatives, provide guidance for the preparation of the EMP, and the Transportation and Master Servicing Plans. Representatives of the following organizations were invited to participate:

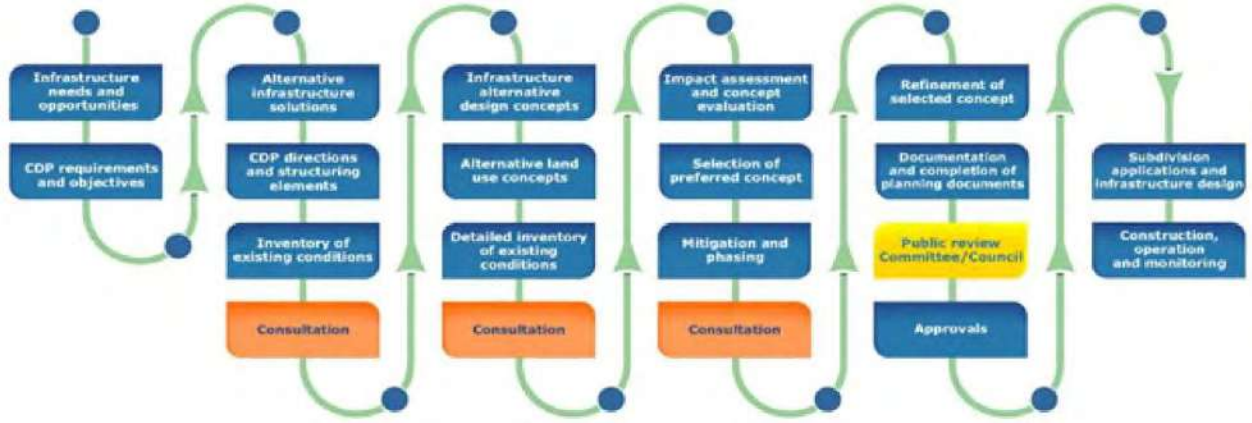
- CPT Members (as needed);
- City of Ottawa Economic Development Services;
- City of Ottawa Transportation Planning;
- City of Ottawa Parks Forestry & Stormwater Services;
- City of Ottawa Transit Customer Services and Planning;

- City of Ottawa Parks and Facilities Planning Services;
- City of Ottawa Infrastructure Services;
- City of Ottawa Planning Services;
- City of Ottawa Right of Way Heritage & Urban Design Services;
- Ottawa Public Health;
- Ottawa Carleton District School Board (OCDSB);
- Conseil des écoles publiques de l'Est de l'Ontario (CEPEO);
- Ottawa Catholic School Board (OCSB); and
- Hydro Ottawa.

2.0 Master Servicing Study Process

The Master Servicing study is an integral part of the CDP study process and is undertaken in order to confirm the feasibility of servicing a potential development site. It is integrated with the provincial planning and Class EA processes. Collaboration with stakeholders and the general public was an integral part of CDP study process, consequently, a series of Public Consultation events were held to fulfill the Class EA requirements. The flow chart presented in Figure 2-1, prepared by Morrison Hershfield, shows the integration of the Class EA, CDP and OP amendment processes.

Figure 2-1: Integration of the Class EA, CDP and Official Plan Amendment Processes[1]



Initially, a review of the existing services was carried out to establish residual capacity in in the infrastructure for the flows that will be generated by the BSUEA. The site's physical features - including soil properties, existing watercourse and aquatic features - were also inventoried through site investigations conducted as part of an EMP.

2.1 Public consultation

As shown in Figure 2-1, a minimum of three (3) planned consultation events are to be held as per the Integrated CDP and Class EA processes. The consultations undertaken for this study are summarized below:

2.1.1 Public Consultation Event No. 1 (March 10, 2016)

This Open House was the first of the scheduled public consultation meetings, held at the Pierre-Savard French Catholic High School. Here, residents in the vicinity of the Study Area were invited to attend and discuss the future CDP for the BSUEA. Prior to the identification of the infrastructure needs that would support this CDP, characterization of the Existing Conditions was completed by the consortium of consultants. Public Consultation Event No. 1 was intended to share the information that was gathered and compiled for landform, soil and geology, surface water, existing infrastructure in the vicinity of the Study Area limits, groundwater

[1] Courtesy of Morrison Hershfield

resources, aquatic and fish habitat, wetlands, terrestrial vegetation, potential Species at Risk, and wildlife.

2.1.2 Public Consultation Event No. 2 (November 5, 2016)

This second public consultation meeting was held as a workshop at the Pierre-Savard French Catholic High School. The attendees were assigned to four (4) facilitated groups and asked to develop their own version of the CDP while considering land use constraints and opportunities, which have been identified in the Existing Condition Reports. They were also asked to identify their preferred locations of residential and commercial areas, collector roads, schools, parks, library, Park and Ride, and stormwater management facilities (SWMFs). Four (4) CDPs were developed for further consideration and analysis by the consortium of Consultants and members of the TAC.

2.1.3 Public Consultation Event No. 3 (June 22, 2017)

This third public consultation meeting was scheduled to present the preferred land use concept plan, to collect feedback from the community, and to provide a summary of next steps. In addition, supporting studies and anticipated servicing and transportation projects were identified.

2.1.4 On-Site Meeting (Municipal Drains)

As part of the surface water component summarized in the Existing Condition Report (Appendix B), the BSUEA was found to span over three (3) separate watersheds / sub-watersheds: the Jock River, the Rideau River via the Hawley/Hawkins Municipal Drain, and Mud Creek via the Thomas Baxter Municipal Drain. As per the requirements of the Drainage Act (Section 78, Chapter D.17, R.S.O. 1990), any modifications to the hydrological regime must be documented in an Engineers Report for either of the above-noted Municipal Drains. Based on the requirements of the Drainage Act, the update to the Engineers Report is to be completed by an Engineer of Record. As a result, City council appointed on July 13, 2016, Andy Robinson P.Eng., of Robinson Consultants Inc., as the Engineer of Record to document and address modifications to the Engineers Report for the above-noted Municipal Drains.

As per the requirements of the Drainage Act, an on-site meeting was completed at the North Gower SCS (2155 Roger Stevens Drive) on February 15, 2017 for both the Thomas Baxter and Hawkins Municipal Drains. Pending the recommended storm servicing alternative for the BSUEA, additional public consultations may be held.

3.0 Existing Conditions

The existing site conditions were identified and outlined within the BSUEA by JLR as part of an Existing Conditions Report (Appendix B). The document includes information that pertains to the site's climate, geology, physiography, drainage, surficial geology, bedrock, aquifer systems and groundwater levels, existing/planned infrastructure at the subject site's boundary as well as additional physical attributes of the site. The latest version of this Report (September, 2017) is appended to this document in Appendix B.

3.1 Site Location

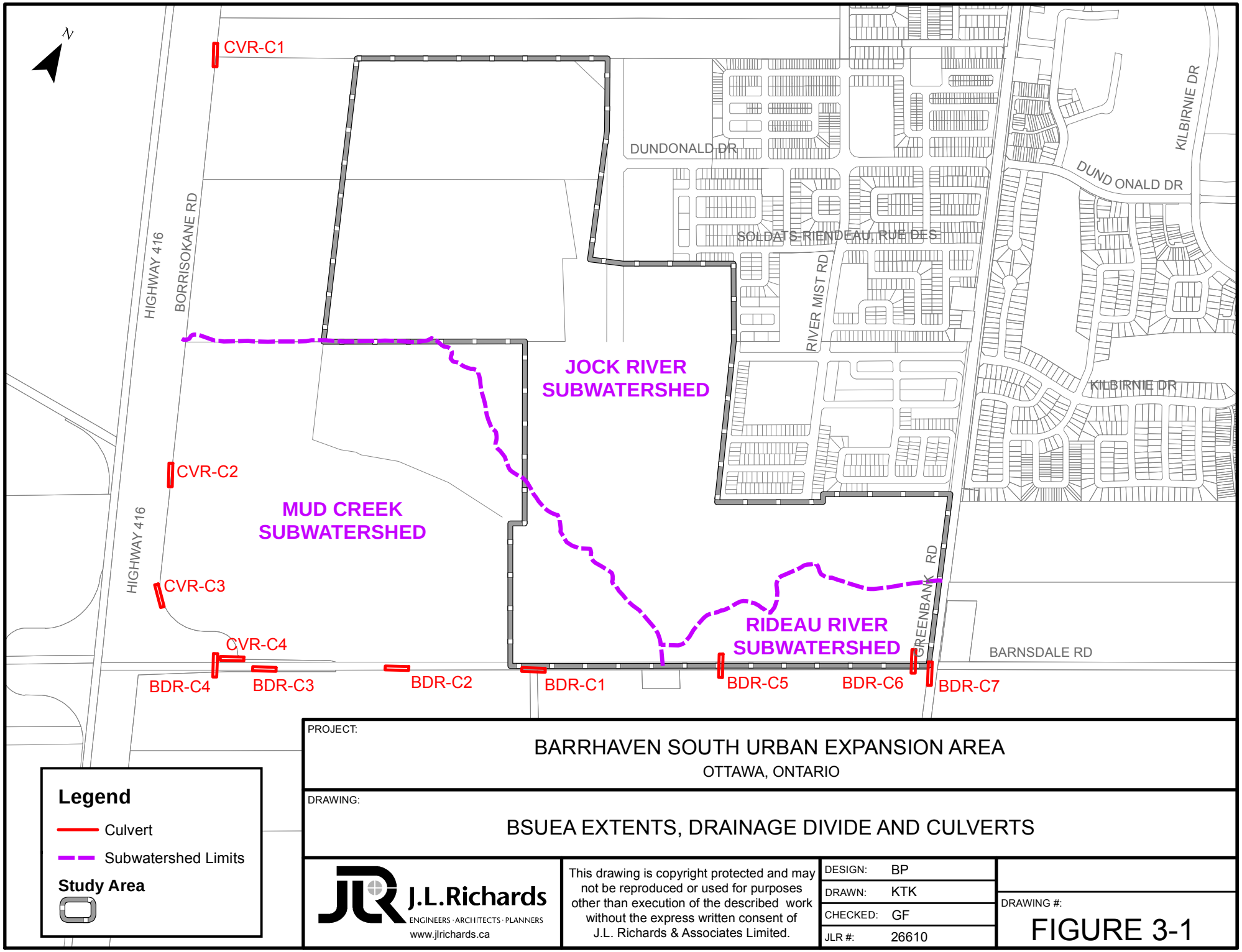
The BSUEA CDP consists of 121 ha of land bounded by Cambrian Road to the north and Barnsdale Road to the south. The BSUEA is located immediately west of the current City of Ottawa Urban Boundary and approximately 360 m east of Borrisokane Road as depicted in Figure 3-1.

The subject site is an undeveloped mix of former agricultural land and forested areas, spread generally across the southern portion of the site. Also within the site boundary are two (2) ongoing aggregate extraction operations. These pits are located in the northern area of the site, extending west to the Borrisokane Road / Highway 416 corridor. Woodlots and pasture areas are adjacent to the site to the north, and recent urban development abuts the eastern boundary. The topography across the site has significant undulations, and there is a knoll located approximately 1 km north of Barnsdale Road. At the intersection of Borrisokane Road and Barnsdale Road, southwest of the site, there is an existing waterbody that appears to be man-made.

3.2 Surface Water Characteristics and Receiving Watercourses

Based on LiDAR data and the topographical survey compiled by Stantec (Geomatics), the BSUEA is tributary to three (3) sub-watersheds, as depicted on Figure 3-1: the Jock River, the Rideau River via the Hawley/Hawkins Municipal Drain, and Mud Creek via the Thomas Baxter Municipal Drain. On-site investigations completed by the team's biologist did not identify any watercourse or formal conveyance channels within the BSUEA. The absence of channels or formal watercourses was confirmed by the LiDAR data, and is generally indicative of areas exhibiting particularly low surface runoff potential.

Catchment areas within the BSUEA have been delineated based on LiDAR data as well as surface infrastructure such as roads (which tend to form a drainage path barrier) and culverts (where flow will concentrate into a point source). Thirteen (13) culvert crossings were inventoried in close proximity to the subject area for which eleven (11) are shown on Figure 3-1 and two (2) are located across Cambrian Road to the north of the BSUEA. In Figure 3-1 three (3) culverts are along the south side of Barnsdale Road (south of BSUEA) and the remaining eight (8) culverts provide conveyance across access routes to property and farmland along Borrisokane Road and Barnsdale Road.



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

BSUEA EXTENTS, DRAINAGE DIVIDE AND CULVERTS

J.L.Richards

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FIGURE 3-1

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C BSUEA EXTENTS.mxd

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3.3 Geotechnical

The site consists primarily of glacio-fluvial deposits to the north and reworked glacio-fluvial sand deposits to the west and southwest. Overburden thickness was found to generally range between 10 m and 17 m. Geological mapping from Natural Resources Canada (NRCan) shows that the bedrock in the area consists of dolomite of the Oxford formation.

3.4 Site Hydrology and Hydraulics

A SWMHYMO hydrological model was developed for the BSUEA (refer to Appendix B) to estimate flood flows at the boundary control points of the site for storm events ranging from the 1:2 year to the 1:100 year recurrence. The model was developed based on the land use, soil characteristics, types of flow paths, and topography of the site. The simulated area included the BSUEA, as well as the lands up to the external boundary points: Cambrian Road, Borrisokane Road and Barnsdale Road.

The SWMHYMO model results show relatively low flow rates at each of the culverts, due to the high infiltration capacity of the soils in the area and the low imperviousness. In general, during larger and infrequent events, runoff will increase as the infiltration capacity decreases due to saturation of the soils. Section B5.6 of the Existing Condition Report (Appendix B) summarizes the simulation results at each of the culverts.

The water budget of a given area is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. The analysis of the water budget is often carried out to establish the baseline condition and to assess any future changes in infiltration to subsurface water-bearing zones and, consequently, to surface runoff resulting from a significant land cover modification such as urbanization. It is also used to predict changes to the hydrological cycle that will result from urbanization of lands.

An understanding of the water budget within a given study area can be gained through the use of a continuous hydrological model. The PCSWMM software platform was used for this study, which includes simplified groundwater and snowmelt modules that allow continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall and snowmelt.

A long-term simulation was carried out for the site based on 30 years of hourly precipitation and temperature. The long-term simulation results indicate that infiltration accounts for approximately 40% of the total average annual precipitation of 844 mm. On average, runoff accounts for only 1 mm out of the total annual precipitation of 844 mm per year, representing approximately 0.1%. Section B6.1.5 of the Existing Condition Report (Appendix B) summarizes the findings of the water budget analysis.

The Barrhaven South Community (BSC) bounded by the Jock River to the north, Borrisokane Road to the west and by existing Greenbank to the east is to be serviced by five (5) existing or planned stormwater management facilities (SWMFs). Two (2) SWMFs, known as the Corrigan Pond and the Todd Pond, are currently in operation. Three (3) additional SWMFs are planned to service the BSC in accordance with the Jock River Subwatershed Study, the Barrhaven South

Master Servicing Study and the Barrhaven South Master Servicing Study Addendum. These planned SWMFs are referred to as the Clarke Pond, the Greenbank Pond and the Borrisokane (formerly Cedarview) Pond. Although all five (5) existing/planned SWMFs in Barrhaven South have excess water quality volumes and have available residual capacity in their associated trunk infrastructure, all existing and planned storm sewer systems in Barrhaven South have relatively high hydraulic grade line (HGL) elevations. Areas tributary to the Corrigan and Todd ponds also have major system ponding depth that are generally at or exceeding the maximum allowable depth of 350 mm.

3.5 Aggregate Extraction Pits

As previously noted, the BSUEA includes two (2) aggregate extraction pits, which are contiguous properties. The southern property is the Brazeau Todd Pit (Brazeau), while the northern property is the Drummond Costello Pit (Drummond). Since both properties have a current Class 'A' license, their operation is in accordance with the Ontario Aggregate Resources Act and Regulations. Information regarding the limit of extraction, license boundary groundwater elevation and anticipated rehabilitation elevation dates to 1992 and has been included in Appendix C. Key information for both properties has been extracted (from the 1992 information) and is summarized in Table 3-1 below.

Table 3-1: Aggregate Extraction Pits Summary

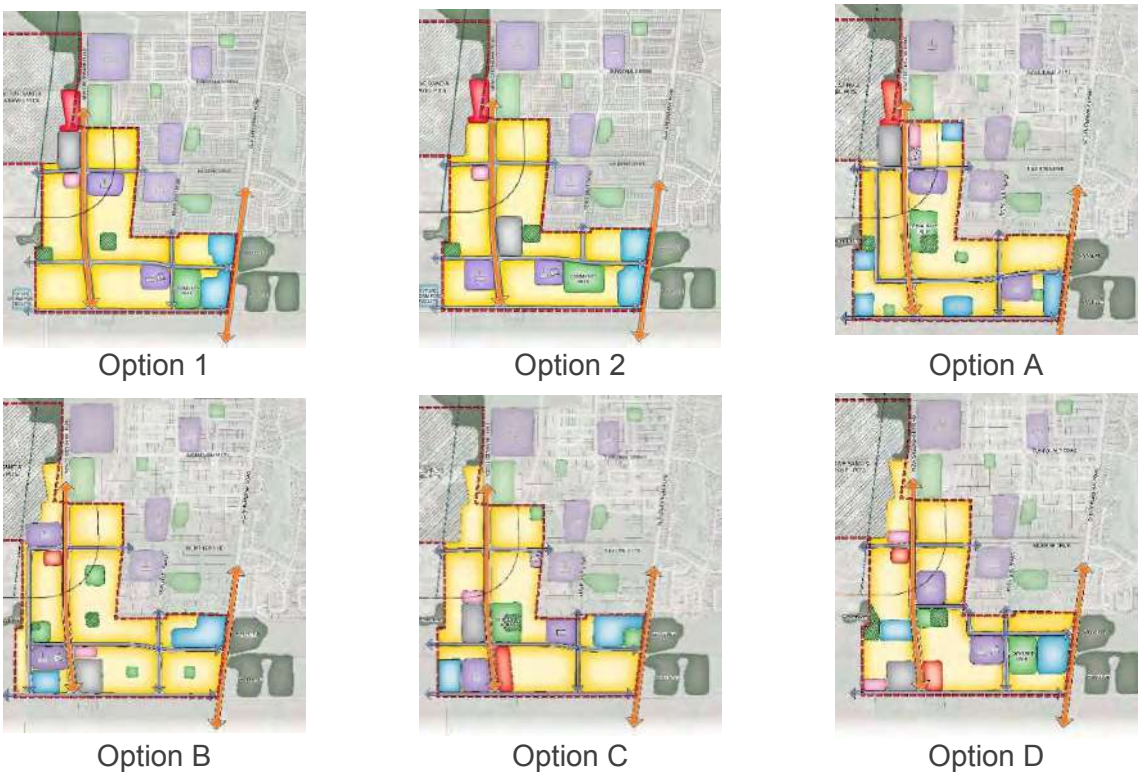
Design Information	Brazeau Pit	Drummond Pit
Licensed Area	40.2 ha	23.5 ha
Area of Operation	38.1 ha	22.3 ha
Existing Disturbed Area	40.2 ha	16.4 m
Minimum Rehabilitation Elevation	97.0 m	104.0 m

4.0 Evaluation of Servicing Alternatives

4.1 Alternative Demonstration Plans

A total of six (6) alternative CDPs were developed for the BSUEA: two (2) CDPs were developed by the sponsored Owner (Options 1 and 2), and four (4) CDPs were developed by the public as part of the second Public Open House held on November 5, 2016 (Section 2.1, Options A to D). The six (6) CDP alternatives are shown in Figure 4-1.

Figure 4-1: Alternative Demonstration Plans



The servicing of these six (6) alternative CDPs was addressed at a high level as part of the evaluation of these alternatives. The high level servicing concepts developed for each alternative demonstration plan had to meet City and Provincial Standards and Guidelines. In parallel, evaluation of the CDPs was undertaken in terms of the environment, social connections, transportation linkages, and economics.

The elements reviewed as part of the servicing evaluation criteria for the proposed CDPs included: opportunities for infiltration; compatibility with existing and future municipal infrastructure; maintenance and operations requirements associated with SWMFs; minimization of upgrades to the water system; and construction and operation requirements for the sanitary system.

The evaluation identified four (4) levels of impact for each of the criteria as summarized in Table 4-1. In the overall evaluation, Option 1 was identified as the most preferred option as it achieved

the highest scoring with Option A and Option 2 next to Option 1. This was consistent with the servicing evaluation results.

Table 4-1: Impact Description Table

Definition of Impact	Negative Impacts	Positive Impacts (Benefits)	
The impact exists, but is of a magnitude small enough that it has little effect, or is of limited benefit; or has the least impact compared to all the alternatives. Best compliance, contribution or benefit.	Negligible	Greatest	Most Preferred ■
The impact exists and is of relatively small physical magnitude or duration. Provides a moderate effect or contribution or benefit.	Minor	Good	◘
The impact exists and has an effect that is of a physically larger magnitude or prolonged duration. Provides a measurable contribution or benefit.	Some	Reasonable	▣
The impact exists and has an effect that is relatively large, permanent or has the most impact when compared to other alternatives. Little to no contribution or benefit	Major	Limited	Least Preferred □

4.2 Evaluation of Servicing Criteria / Objectives

4.2.1 Opportunities for Infiltration

Achieving distributed infiltration is driven by two (2) key factors; i) having soil that is conducive to infiltration, and ii) achieving infiltration when native soils have a separation with the groundwater table. With respect to key factor (i), measured saturated field hydraulic conductivities showed that infiltration rates across the BSUEA are conducive to achieving groundwater recharge (refer to Section B6.1.1 of the Existing Condition Report, Appendix B). With respect to key factor (ii), the distance between the top of the overburden to the measured groundwater level is generally greater than 5 m across the BSUEA, with the exception of the southeast portion of the site that abuts Greenbank Road. In that area, the distance between the top of the overburden to the groundwater level was measured to be as low as 3.5 m – 4.5 m. As a result, promoting distributed infiltration near Greenbank Road (from Barnsdale Road to Quinn's Pointe) would be difficult to achieve as the performance of the infiltration system would be impacted by the high groundwater levels. Based on this assessment, placing stormwater management facilities in the area in close proximity to Greenbank Road would score the highest, as there would not be any need to infiltrate in that area. Consequently, Options 1 and 2 scored the highest, while Options A to D scored the lowest.

4.2.2 Compatibility with Existing Infrastructure

In all of the alternatives, with the exception of Option D, there is a proposed East-West Collector Road that provides the greatest benefit for the alignment of trunk infrastructure. Option D would place a greater portion of the trunk network on local roads and limit direct connections between existing and proposed trunk infrastructure.

Options 1, 2 and A to C were rated as most preferred under this criteria while Option D was the least preferred.

4.2.3 Stormwater Management Construction and Maintenance Requirements

Currently, municipal and provincial standards require that the control of urban runoff is achieved in regional end-of-pipe facilities sized to provide the necessary quantity and quality control. Quantity control is necessary on this site due to the limited residual capacity in the existing storm sewer systems. Proposed end-of-pipe SWMFs can be located as efficiently as possible within the layouts proposed in the CDPs to reduce construction and maintenance costs. The facilities should be placed in areas of low topography to capture the largest drainage area as possible. Fewer, larger facilities are preferred over a larger number of smaller facilities. This will provide savings in both construction and maintenance costs in the future and provides for a more efficient use of land that must be dedicated to stormwater management.

There is currently a spill-over dry pond located on the western side of Greenbank Road. This facility provides major overland flow control from the existing Quinn's Pointe subdivision located to the north of the CDP area. The intent is to decommission and replace the spill-over dry pond with a SWMF at the same location to control major system flows. This proposed facility would also intercept the existing minor system flows from Quinn's Pointe. This strategy provides for greater residual capacity in the receiving trunk storm sewer along Greenbank Road.

Options 1 and 2 have similar stormwater management arrangements: two (2) end-of-pipe facilities on the eastern boundary with Greenbank Road, at the low point of the area, as well as a spill-over dry pond on the western boundary, outside of the CDP. The latter facility is of lesser complexity as it does not have any inlet sewers and simply provides for control of major system flows east of New Greenbank Road, as City standards prohibit major system flows being conveyed across urban arterials.

Option A has five (5) SWMFs that are not always located in areas of low topography. As a result, land utilization will not be maximized and the areas serviced by some of the facilities would be limited. In addition, Option A does not include a facility that would replace the current spill-over dry pond servicing the existing Quinn's Pointe subdivision.

Options B and C have two (2) SWMFs that are both in areas of low topography. One of the facilities will provide control for Quinn's Pointe, and the other is west of

New Greenbank Road. As a result, overland flows do not have to cross New Greenbank Road or existing Greenbank Road. The single eastern facility may be significantly larger than the facility required under Options 1 and 2, while the western pond block may be too large due to its small drainage area.

Option D has two (2) facilities. However, neither is located in areas of low topography, and nor do they provide control for the overland flow from Quinn's Pointe.

From a stormwater management perspective, Options B and C were identified as having the greatest positive impacts. Options 1 and 2 have good positive impacts, Option D has reasonable impacts, and Option A is the least preferred CDP option.

4.2.4 Water System Upgrade Requirements

The BSUEA has a number of areas with high topography (elevations greater than 110 m) south of the Brazeau aggregate extraction property. Pressures in the proposed distribution system in these areas will, therefore, be lower. Since standards required that a minimum pressure criterion be achieved, CDPs developed with non-residential land uses located in the areas of higher topography are preferred as this will reduce the potential for additional pumping to mitigate low distribution system pressures.

Option 1 and Option A include the Park and Ride, as well as commercial land uses, as part of the potential low pressure zones. Consequently, Option 1 and Option A have the greatest positive impacts, based on the location of the non-residential uses. The other alternatives have greater areas of residential uses in the potential low pressure zones and, therefore, have the potential to require additional water supply infrastructure to meet standard pressure criteria.

4.2.5 Sanitary Servicing Construction and Operation Requirements

Sanitary servicing of residential properties generally requires deeper sewers than for non-residential uses to service the basements. When approaching the Brazeau property, topography increases up to elevation 111.0. However, the Brazeau property has a rehabilitation elevation of 97.0 m (refer to Table 3-1), which is 4 m above. As a result, planning for residential usage with deep sanitary sewers next to the Brazeau property will be more challenging due to this grade differential and will require special attention by the designers. Consequently, having land uses – such as commercial blocks or Park and Ride blocks that do not require basement connections next to the Brazeau property—would be preferred.

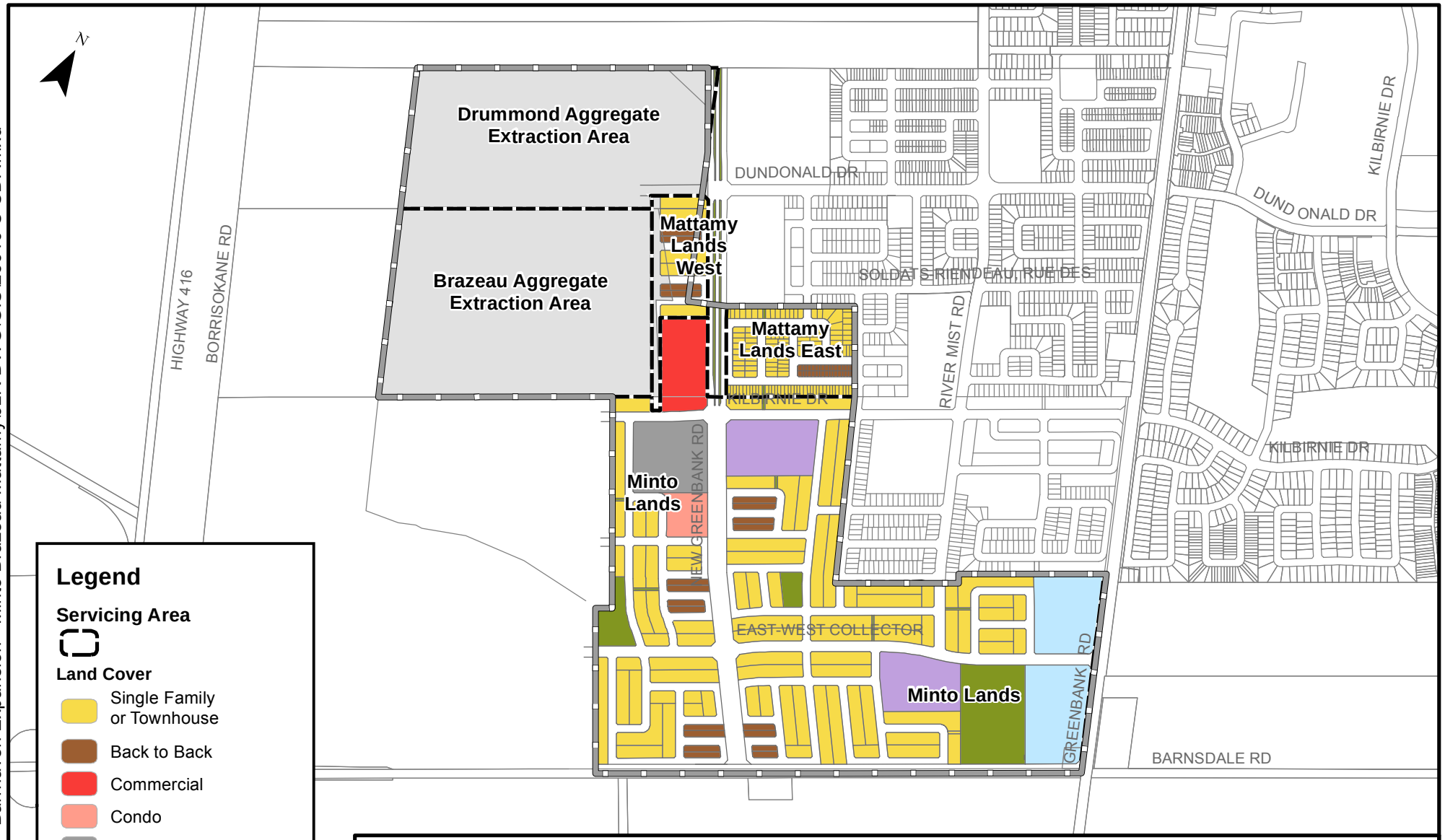
Options 1 and 2 and Option A have commercial and Park and Ride blocks next to the Brazeau property. Consequently, these options are the most preferred, while Options B to D are the least preferred due to difficulty with sanitary servicing of their residential land uses next to the Brazeau property.

4.3 Preferred Demonstration Plan and Servicing Blocks

Based on a rigorous evaluation of all contributing elements, including servicing, environmental and transportation, as well as the comments received from the Public Open House, Option 1 was selected as the preferred CDP. Feedback from the Open House resulted in minor amendments to Option 1, from which a demonstration plan was developed. The final demonstration plan used to develop this MSS is shown in Figure 4-2.

For discussion purposes, the demonstration plan has been broken down into the following five (5) areas (Figure 4-2) for the purpose of assessing the performance of the proposed servicing:

- **Minto Lands** – Extends from the eastern to the western boundaries of the BSUEA, from Barnsdale Road to the Kilbirnie Drive Extension, including the lots facing Kilbirnie Drive. For servicing purposes, this sector also includes the commercial block at the intersection of Kilbirnie Drive and New Greenbank Road, although the land owner is Mattamy for part of this future block.
- **Mattamy Lands East** – Within the BSUEA, from north of the Kilbirnie Drive extension, between New Greenbank Road and the current urban boundary limit, and part of the Mattamy Half Moon Bay South development. The servicing design for this development was carried out by others.
- **Mattamy Lands West** – Includes the proposed residential area immediately west of New Greenbank Road and north of the proposed commercial block.
- **Brazeau Aggregate Extraction Area** – Extends from the Kilbirnie Drive extension to the potential Dundonald Drive extension from the commercial block, and BSUEA Mattamy Lands West to the western boundary of the CDP.
- **Drummond Aggregate Extraction Area** – Extends from the Dundonald Drive extension to the northern limit of the CDP and from the western to the eastern limits of the CDP.



Legend

Servicing Area

Land Cover

- Single Family or Townhouse
- Back to Back
- Commercial
- Condo
- Industrial Office
- Active Sand and Gravel
- Park
- School
- SWM Buffer

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

CDP DEMONSTRATION PLAN AND SERVICING AREAS

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FIGURE 4-2

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5.0 Storm Drainage and Servicing

5.1 Background

A stormwater management strategy needs to be developed to ensure that runoff from the site meets the necessary provincial and municipal requirements. The adopted strategy must also respect the integrity of the downstream systems from both a minor and major system perspective. The stormwater management strategy should identify lot level measures, SWMFs in terms of size and location, major overland flow paths and storm sewer networks. As noted in Section 3.3, the study area is located across three (3) watershed catchments: the Jock River catchment to the north, Rideau River catchment to the east, and Mud Creek catchment to the south (Figure 3-1). However, surface flow from the BSUEA lands is not directly connected to any of these watercourses.

The study area is located on the edge of the current urban boundary and has existing or planned development on its eastern boundary. The urban areas adjoining the BSUEA are currently serviced, or planned to be serviced, by SWMFs which were identified as part of the stormwater management strategy to service the BSC, located to the north of the BSUEA. The Draft 2014 BSMSSA (Stantec) identified a preferred stormwater management strategy for the BSC, which was also in accordance with the Jock River Reach One Subwatershed Study (Stantec, 2007). The five (5) SWMFs servicing the South Barrhaven area are the Corrigan, Todd, Borrisokane (formerly Cedarview), Clarke, and Greenbank ponds.

5.2 Master Grading Plan

A Master Grading Plan was developed, at a macro-level, for the various parts of the BSUEA lands (refer to Drawings MG1 and MG2 in Appendix M). The design was carried out as follows:

- The proposed centerline road grades displayed within the Mattamy East Lands were derived from the review of the Todd Pond XPSWMM hydraulic model parameters and extracted from the appendix of the Todd Pond Model Keeper Analysis (Re-Assessment of Existing System Capacity) report prepared by J.F. Sabourin and Associates Inc., dated April 2015;

- The New Greenbank Road centerline grades were derived from the July 2014 Environmental Study Report for the Realigned Greenbank Road and Southwest Transitway Extension prepared for the City of Ottawa by the MMM Group;

- The macro-level grading developed for the Brazeau and Drummond Aggregate Extraction Areas was developed based on the greater fill requirement between:

    - the minimum rehabilitation elevation as per Table 3-1: 97.0 m for the Brazeau Aggregate Extraction Area and 104.0 m for the Drummond Aggregate Extraction Area;

    - the minimum 2 m cover requirement over the pits future storm sewer servicing system based on the City of Ottawa's Design Guidelines.

- The macro-level grading within the Minto Lands was developed to target an overall balanced cut/fill site for their overall holdings, rather than on a phase by phase basis. As

previously noted, the topography within the Minto Lands varies significantly throughout the site; several areas have a vertical difference of 5 m within a horizontal length of 80 m. Overall, there is a grade differential of approximately 13 m from west to east (i.e., from 112 m at the north-west boundary to 99 m near Greenbank Road).

Understanding that master grading plans are typically developed at macro-levels as part of MSS documents, the BSUEA Master Grading Plan was prepared with the same concept in mind. Centerline high points, with minimum 0.1% slopes from crests to crests, were established along ROWs and corridors, to identify locations and paths for major overland flow routes. Based on the high points and respective slopes between them, assumptions were made to assess where low points could be accommodated for future roadway sag storage. Overall, a target of 50 m³/ha of storage was anticipated to be achievable, which has been incorporated into the stormwater management strategy that is described in the following sections

5.3 Stormwater Drainage Connections

The storm servicing and stormwater management review undertaken as part of the Existing Condition Report (Section B7.3, Appendix B) found that the BSUEA is not directly connected to any open channel or receiving watercourse. Consequently, runoff from the subject site will have to be collected and conveyed to a downstream receiving watercourse via existing storm sewers, as shown on Figure 5-1, and be controlled at the boundary to meet the residual capacities in the downstream systems. These water quantity measures will ensure that the integrity of the existing storm sewer systems is maintained.

5.3.1 Minto Lands

The topography of the site will allow the Minto Lands (Figure 4-2) to connect into the existing trunk storm sewer system on Greenbank Road, which discharges into the Corrigan Pond. There are also potential connections into the existing Quinn's Pointe Subdivision to the north-east of the Minto Lands (Figure 5-1). These minor system connection points within Quinn's Pointe currently capture drainage from small areas to the west and south under pre-development conditions.

The capacity of the Greenbank Road trunk sewer system discharging to the Corrigan Pond is currently fully utilized as per the design intent of the Quinn's Pointe development, which is located immediately north-east of the BSUEA. The Quinn's Pointe subdivision was approved on the basis of:

i) a Servicing Brief (2014); and

ii) a subsequent Site Servicing Report (August, 2015) both prepared by JLR.

As part of those undertakings, IBI, the model keeper for the Corrigan SWMF and the designer of the Greenbank Road trunk sewer system, was tasked to assess the impact of runoff from the Quinn's Pointe development and southern rural lands both of which is intercepted and conveyed by the Greenbank Road trunk storm sewer to the Corrigan SWMF. IBI's Report entitled "Stormwater Management – Barrhaven South, October, 2014" was appended to JLR's 2014 Servicing Brief (refer to Appendix D for copy of IBI's Report).

The IBI document summarized the proposed stormwater management servicing strategy for the Quinn's Pointe subdivision which consisted on a fixed minor system unit capture rate of 85 L/s/ha combined to a stormwater management facility sited next to Greenbank Road that would intercept major overland flows prior to reaching Greenbank Road. In addition, major overland flow allowances of 0.9 m^3/s and 0.3 m^3/s were allocated to the Quinn's Pointe subdivision via Mattamy's existing subdivision to the north. As part of the model keeper's analyses (Appendix D), the following peak flows were extracted from their model at existing MH102 located at the Kilbirnie and Greenbank Road intersection:

- 1:100 year Qp (3 hour Chicago) = 3.515 m^3/s
- 1:100 year Qp (24 hour SCS) = 3.580 m^3

Detailed storm servicing and grading for Quinn's Pointe was subsequently developed by JLR so that all major overland flows from the subdivision would be conveyed in a southeasterly direction towards a proposed spill-over dry facility where it would be captured and eventually released back into the local storm sewer system, which in turn, discharge into the Greenbank Road trunk storm sewer system and ultimately to the Corrigan SWMF. Consequently, the major overland allowances noted above via the existing Mattamy lands would not be utilized. As part of the Site Servicing Report (JLR, August 2015), the simulated flows at MH102 (Kilbirnie and Greenbank Road intersection) were as follows:

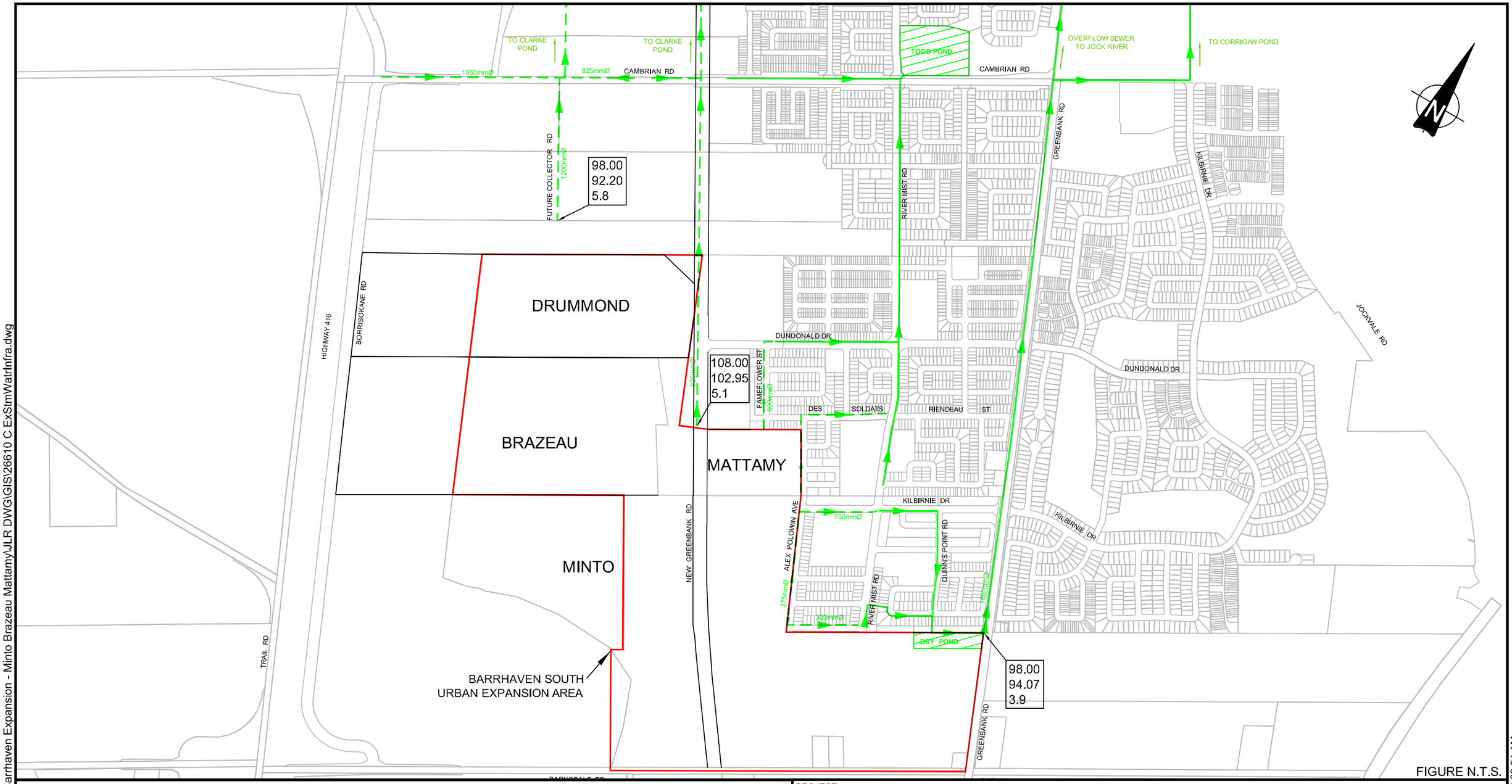
- 1:100 year Qp (3 hour Chicago) = 3.376 m^3/s
- 1:100 year Qp (24 hour SCS) = 3.180 m^3/s

The above flow rates were found to be below those reported by the model keeper, which are inclusive of the Greenbank Road ROW as well as the rural lands on either side of Greenbank Road.

Since a SWMF servicing the BSUEA is proposed west of Greenbank Road and immediately south of Quinn's Pointe, the intent, from a storm servicing perspective, and as shown on Figure 5-1, is as follows:

- Decommission and remove the existing spill-over dry pond that is currently located within the BSUEA lands. As a result, flows in excess of the capacity of the Quinn's Pointe storm sewer system would, therefore, cascade further downstream to the proposed SWMF (northern); and,
- Connect the outlet of the proposed northern SWMF to the Quinn's Pointe 1800 mm diameter trunk storm sewer and install an orifice plate or ICD on the downstream end of the trunk storm sewer upstream of the connection with the Greenbank Road trunk storm sewer in order to control flows.

The above-noted retrofit would allow the proposed SWMFs to fully utilize the dedicated capacity of the Greenbank Road trunk storm sewer. Based on IBI's design of the Greenbank Road trunk storm sewer and subsequent analysis following the 2014 Quinn's Pointe Servicing Brief, peak flows of 3,580 L/s during



LEGEND

- EXISTING STORM SEWER
- PLANNED STORM SEWER

98.00 / 94.07 / 3.9 — EXISTING GROUND / STORM SEWER OBVERT / COVER DEPTH (m)

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT: BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING: EXISTING AND FUTURE STORMWATER INFRASTRUCTURE

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the 1:100 year 24 hour SCS event are allocated to existing MH102, located at the Greenbank Road and Kilbirnie Drive intersection. The design flow in MH102 includes flows from the undeveloped area east of Greenbank Road, Greenbank Road runoff, Quinn's Pointe and any future runoff from the BSUEA.

It should be noted that the above retrofits were envisioned during the detailed design of the Quinn's Pointe Subdivision. As such, residential blocks in the BSUEA that face onto roads in the Quinn's Pointe development have already been accounted for in the Quinn's Pointe modelling. Consequently, no further allowance for these lots is required.

All major overland flow generated by the Minto Lands will have to be captured and detained on-site, as major overland flow cannot be conveyed across Greenbank Road, which is classified as an arterial road. Likewise, there is no allowance in the Quinn's Pointe subdivision for major overland flow from adjoining lands.

In regard to water quality control, the Corrigan Pond was designed as the dedicated end-of-pipe facilities for the Quinn's Pointe Development. As part of the Site Servicing Report (2015) completed by JLR for the Quinn's Pointe Subdivision, an assessment of the water quality volumes was carried out by IBI to confirm that the Corrigan SWMF had the ability to service the subject lands while meeting the enhanced protection level (refer to Appendix D for copy of the assessment). Based on Table 2 of the assessment by IBI, the overall water quality requirements at the Corrigan SWMF were increased to 14,307 m^3 and 5,900 m^3 for permanent pool and extended storage, respectively as a result of adding the Quinn's Pointe Subdivision. The IBI assessment reported that the Corrigan SWMF provided 16,000 m^3 and 6,000 m^3 of permanent pool and extended storage, respectively thereby satisfying the enhanced level of protection. Consequently, the Corrigan SWMF was found to be adequately sized for water quality control for the Quinn's Pointe subdivision.

As a result, no quality control is required for Quinn's Pointe. However, the Corrigan Pond was not sized to provide quality control for the BSUEA lands. Consequently, minor system flows from the Minto Lands will need to comply with the Jock River Reach One Subwatershed Study (Stantec, 2007), which identified a water quality control target of 80% TSS removal. As a result, runoff from the Minto Lands (excluding Quinn's Pointe) will need to meet an enhanced protection level prior to discharge into the Greenbank Road trunk storm sewer.

As depicted on Figure 3-1, part of the Minto Lands currently drains to the Mud Creek subwatershed and Rideau River subwatershed via the Thomas Baxter and Hawley/Hawkins Municipal Drains, respectively. Any additional runoff conveyed to these Municipal Drains would need to be documented in an Engineers Report in accordance to the Drainage Act.

5.3.2 Mattamy Lands East

The Mattamy Lands East are located next to the existing Mattamy Half Moon Bay South subdivision that is fully serviced by a storm sewer system (Figure 4-2), and is part of the Todd Pond serviced area. The system was sized for the Half Moon

Bay South subdivision, and includes capacity to convey rural drainage from the Mattamy Lands East within the BSUEA. The Mattamy Lands East can, therefore, utilize this dedicated capacity in the minor storm system of the adjoining Half Moon Bay South development. The stormwater management servicing of the Half Moon Bay South development has been approved by the City of Ottawa as per the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, August 2017). The modelling carried out for the Phase 4 Stormwater Management Report included the Mattamy Lands East as fully developed under their ultimate servicing solution scenario. Extracts of the Stantec report are contained in Appendix H of this Report.

5.3.3 Mattamy Lands West

The Mattamy Lands West lands are located south of the proposed Half Moon Bay West development and west of New Greenbank Road (Figure 4-2). The lands are tributary to the proposed Clarke Pond, as identified in the Draft 2014 BSMSSA (Stantec). The Mattamy Lands West area was accounted for in the following two (2) studies:

1. The hydrological analysis of the Draft 2014 BSMSSA showed these lands as an urbanized area where post-development flow was captured by the New Greenbank Road trunk sewer, and

2. The conceptual modeling of the Clarke Pond, undertaken by JFSA (Design Brief for the Clarke Stormwater Management Pond for the Half Moon Bay West Subdivision, August 2017), included an undeveloped portion of the Mattamy Lands West area and potential connections to the Clarke Pond from this area.

The Mattamy Lands West area is part of Catchment Area A227C of the Draft 2014 BSMSSA, which includes an area of 4.75 ha at a total imperviousness of 71.4 %. The Draft 2014 BSMSSA has identified and accounted for a 1:5 year capture for this catchment. However, the Study also states that the catchment will be required to incorporate on-site storage such that full retention of the 1:100 year major overland flow should be provided to prevent flows from spilling onto New Greenbank Road. On-site storage can be provided by a spill-over dry pond unless servicing of the Mattamy Lands West can incorporate sufficient on-site storage such as rooftop, road sag and/or underground storage.

The design sheets prepared as part of the Draft 2014 BSMSSA include a lumped area assigned to the node at the point of Mattamy Lands West. However, by extracting catchment A227C from the design sheet, the allowable release rate assigned to these lands and directed to the trunk storm sewer is 880 L/s. Based on the HGL analysis completed by Stantec as part of the Draft 2014 BSMSSA, it was reported that the sewer at this location does not operate under surcharged conditions during the 1:100 year event. On this basis, minor system capture from this site should be limited to 880 L/s and servicing should also incorporate measures to detain the major overland flow.

5.3.4 Brazeau and Drummond Aggregate Extraction Areas

A significant portion of the Brazeau and Drummond lands are currently operated as aggregate extraction areas. The active portion of those lands has lower elevations than the surrounding topography. The Existing Condition Report (Appendix B) identified that prior to operating as aggregate extraction areas, these lands naturally drained north, either via north-east or north-west overland flow paths. As a result, it is envisioned that any post development flow from these future rehabilitated areas would have to:

- Meet the existing flow in the downstream system;
- Meet the quality control target of 80% TSS removal as per the Jock River Reach One Subwatershed Study (Stantec, 2007); and,
- Preserve pre-infiltration condition levels

In order to provide positive drainage to a storm outlet, both properties will need to be rehabilitated to the minimum elevations (Table 3-1) specified by the Ontario Ministry of Natural Resources.

As identified in the Existing Conditions Report (Appendix B), the culvert downstream of the aggregate properties receives a pre-development flow of 1,300 L/s during the 1:100 year event. During detailed design, servicing of both properties should be developed such that the downstream pre-development flow is not exceeded. Any downstream system should have sufficient capacity for the pre-development flow.

5.4 Site Storm Drainage Criteria

The functional design of the storm sewer system was developed for the BSUEA in accordance with the OSDG and Technical Bulletin PIEDTB-2016 while the sizing of the SWMFs has been based on the Ontario Ministry of Environment (MOE) Stormwater Management Planning and Design Manual (SWMPDM) 2003. Specifics and design criteria for both minor and major systems is described below.

5.4.1 Minor System

The storm sewers servicing the BSUEA are to be designed in accordance with the OSDG and associated Technical Bulletins as summarized below:

<u>Design Capture and Level of Service</u>

- Minimum 1:2 year and 1:5 year capture for local and collector roads, respectively
- 1:10 year capture for arterial roads, Transitway or any depressed driveways

<u>Design Flows</u>

- Initial sizing of the storm sewer via the Rational Method design sheets with final sizing to be confirmed via an HGL analysis

- IDF Rainfall statistics as per OSDG
- Time of concentration (Tc) based on an inlet time of 10 minutes
- Runoff coefficients to be based on recently approved developments of similar nature as per Section 5.4.5.2.2 of the OSDG

Design Criteria

Design Criteria as per the OSDG

- Minimum velocity 0.80 m/s
- Maximum velocity 6.0 m/s
- Manning roughness coefficient 0.013
- Minimum allowable slopes See Table 6.1 of the OSDG
- Minimum depth of cover 2.0 m
- Minor losses at manholes set in accordance with Appendix 6B of the OSDG
- Inlet control rate to be achieved with inlet control devices (ICDs) with minimum capture of 1:2 year for locals, 1:5 year for collectors and 1:10 year for arterials

5.4.2 Major System

The storm servicing for the BSUEA was developed following the dual drainage concept: the minor system is sized based on the criteria set out in Section 5.4.1, while the major system is configured based on the criteria outlined below and evaluated in accordance with the OSDG and Technical Bulletins.

Maximum Flow Velocity on Streets

The product of velocity (m/s) and depth (m) of overland flow on streets shall not exceed 0.6 for a 1:100 year peak flow.

Major System Flow Outlets

Major system flow should outlet to either a watercourse or a SWMF.

Road types and Allowable Flow Depths

- Local: 350mm at edge of pavement
- Collector: 250mm at edge of pavement
- Urban Arterial: No barrier curb overtopping; arterial should be designed to leave one lane free of water in each direction during the 1:100 year design storm
- In the absence of barrier curbs, flow shall not encroach into adjacent private property

5.4.3 Stormwater Management Facilities (SWMFs)

The SWMFs, either wet ponds or dry ponds, should be designed in accordance with Section 8 of the OSDG and MOE's publication entitled "SWM Planning and Design Manual, 2003".

The normal water level in the wet ponds should be above the highest elevation of either: (i) the free flowing water level in the downstream storm sewer during the 1:2 year event; or (ii) the elevation of the underlying groundwater table.

For safety reasons, the live storage in dry ponds should be kept to 1.5 m (OSDG) to 2.0 m deep (MOE). A minimum 300 mm freeboard should be provided between the 1:100 year water surface elevation and the overflow elevation.

SWMFs should be integrated into the community through the use of pathways or other linkages.

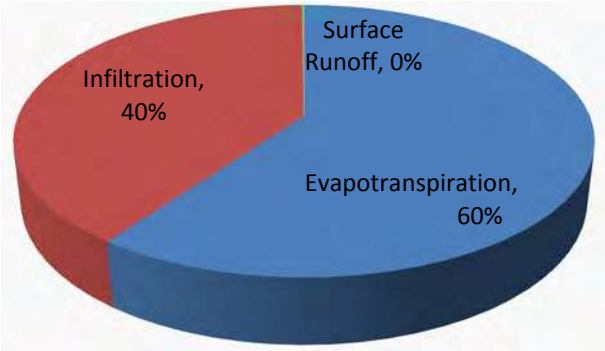
5.4.4 Water Balance

The Hydrogeological Existing Conditions Report (Paterson Group Inc., 2017) recommended that infiltration measures be incorporated into the BSUEA's storm servicing design, as the subject area contributes to groundwater recharge of the esker, which should be preserved. The Paterson Group Inc. (Paterson) Report recommended that:

- Distributed infiltration be achieved to promote recharge of overburden aquifer and preserve the pre-infiltration condition for the three (3) subwatersheds; and,
- Only captured runoff that is relatively free of roadway salts be infiltrated to minimize adverse impacts on the esker.

An analysis (using the PCSWMM software platform) was carried out and is summarized in the Existing Condition Report (Appendix B) to determine the various contributions of the water budget based on long-term simulations. To simulate the infiltration, the analysis utilized measured data compiled as part of Paterson's field program. Infiltration to groundwater recharge zones was simulated based on measured saturated field hydraulic conductivity, which was translated to infiltration rates (refer to Section B6.1.1 of Appendix B). The analysis revealed that overall pre-development infiltration from the subject site (excluding the aggregate extraction areas) accounted for 40% of the overall water budget (Figure 5-2). The City and RVCA have agreed with Paterson's recommendation that pre-development infiltration levels should be maintained and distributed infiltration be achieved across the site, and should not be concentrated at one or two location(s).

Figure 5-2: Existing Water Budget Breakdown



5.5 Storm Servicing Strategy

Based on the storm drainage connections and criteria set out in Sections 5.2 and 5.4 respectively, a stormwater management strategy has been developed. The strategy strives to preserve pre-development infiltration across the BSUEA, which in turn, impacts the individual stormwater management strategies developed for each of the servicing areas depicted in Figure 4-2. Sub-section 5.4 presents the rationale in developing storm servicing strategies, Sub-section 5.5.5 the storm drainage and design methodology, Sub-sections 5.7 5.8, and 5.9 present the analyses carried out for the conventional, EES and infiltration gallery servicing strategies, respectively while Sub-section 5.10.2 summarizes the impact of the strategies on the municipal drains.

5.5.1 EES Infiltration Strategy

5.5.1.1 Background

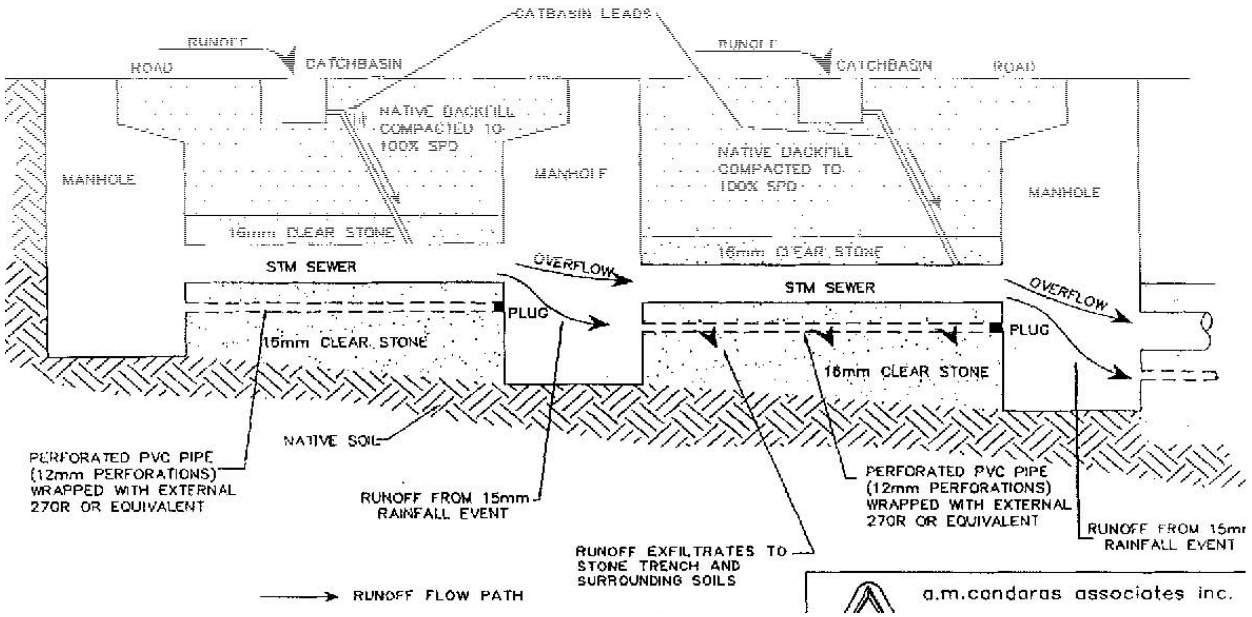
During the preparation of the Existing Condition Report, it became evident that storm servicing for the BSUEA would need to incorporate measures to recharge the overburden aquifer. As a result of extensive work and consultation with the both the City and RVCA over a nine (9) month period, the preferred infiltration servicing strategy has been identified as the Etobicoke Exfiltration System (EES). During this nine (9) month period, a number of Memoranda were prepared to support the selection process. All documents and work undertaken (Memoranda and Presentation) are described below (Sections 5.5.1.1 to 5.5.1.6) and included in Appendix E.

In September 2016, a Memorandum to the City outlined potential infiltration measures that could be considered for the BSUEA. The Memorandum outlined general considerations related to infiltration and nine (9) specific infiltration measures, which ranged from reduced lot grading to infiltration galleries and bio-retention cells. The advice from the City and RVCA following submission of the Memorandum is that infiltration measures should be spread across the site so as to mimic current infiltration patterns and should not rely on infrastructure on private properties. After further review and discussions, the EES was selected as the preferred measure to preserve the water budget and carried forward for further sizing and analysis.

The main benefit of implementation of the EES is that it is contained within the ROW and not subject to maintenance by individual property owners who are difficult to hold responsible and the nature of the distributed infiltration will preserve groundwater drainage boundaries.

The EES (Figure 5-3) was developed, designed and constructed in the former City of Etobicoke (now part of the City of Toronto) in 1993. Its main objective was to restore the natural hydrologic cycle in an existing developed area. The EES consists of two perforated pipe sub drains constructed below the conventional storm sewer that is surrounded by a clear stone media, which collects and detains surplus stormwater runoff before reaching the conventional storm sewer line. The downstream ends of the perforated pipes are capped. The EES is intended to capture frequent storm events and the initial "first flush" of large storm events by trapping flow in the perforated pipe sub drain and surrounding media. It is also intended to infiltrate runoff from frequent events into the surrounding soils, while runoff from larger events will overtop the capacity of the EES system and would then overflow to the conventional storm sewer system above.

Figure 5-3: Diagram of Typical EES Application



5.5.1.2 Sizing of EES

To investigate the sizing and performance of the EES, a test simulation was developed using the PCSWMM software platform. The test simulation consisted of an urbanized area of 2.7 ha that reflected the anticipated type of development within the BSUEA. The test simulation used infiltration parameters calculated from Patersons' measured saturated field hydraulic conductivities, which were reduced by a factor of safety of 2.5 as per the guidance from Credit Valley and Toronto and Region Conservation Authorities on Low Impact Development. It was determined that PCSWMM could be utilized to simulate the EES, and the results of the test simulation indicated that the system was sized in accordance with the document

entitled “Planning and Design Manual of the Etobicoke Exfiltration System” met and exceeded the pre-infiltration rates when applied across the overall BSUEA.

According to the “Planning and Design Manual of the Etobicoke Exfiltration System”, the EES should detain and infiltrate up to the 95th percentile rainfall event. An analysis of the 30 year long-term rainfall used for the continuous simulation shows that the 95th percentile is approximately 22 mm of rainfall; hence, a 22 mm capture was used as the sizing criteria.

5.5.1.3 EES versus Water Quality Control

Storage volume requirements to achieve an 80% TSS removal using infiltration measures are summarized in Table 3.2 of the MOE “Stormwater Management Planning and Design Manual, March 2003”. Based on the average imperviousness used in the test model, the required volume of water quality storage for the EES to achieve 80% TSS removal is 32 m³/ha. Based on an EES sized for the 95th percentile storm, the storage volume in the test model is on average 150 m³/ha. The proposed EES system, therefore, satisfies the requirements for water quality control in accordance with the MOE for any of the proposed land uses and means that further downstream water quality controls would not be required for areas serviced with the EES.

5.5.1.4 Presentation of Potential Infiltration Measures

On May 24, 2017, a presentation was made to the City focusing on two (2) potential infiltration measures that could be implemented in the BSUEA to maintain the pre-infiltration levels. The measures presented included the EES (discussed above) and an additional infiltration measure that was implemented in Vaughan: the Clean Water Collector (CWC). Subsequent to this presentation, the City advised that the EES was more suitable than the CWC since the infrastructure is solely located along municipal ROWs. A copy of this presentation is included as an appendix to the Memorandum discussed below in Section 5.5.1.6.

5.5.1.5 Impact of Salting Practice on the EES

Following presentations to City staff and a request from the City in June 2016, a further Memorandum was provided outlining the application of the EES across site, but only on local roads and their respective catchments. The intent is to prohibit any infiltration of roadway runoff to occur when originating from either collectors or arterials due to the salting practices adopted for those roadways. The spreadsheet calculations on applying the EES in limited areas found that infiltration rates pre- and post-development would remain similar. The implementation of an EES along roadways impacted by salt applications would capture runoff with chlorides, which could adversely impact the quality of the overburden aquifer during periods of melt.

5.5.1.6 Operation and Maintenance Memorandum

At the request of the City, a Memorandum was prepared outlining recommended operation and maintenance practices that would be anticipated should the City accept the EES infrastructure. This Memorandum issued on June 22, 2017

indicated that maintenance associated with an EES would marginally increase when compared to conventional systems as there would be a need to flush the two (2) perforated sub drains. Based on the information gathered by the TRCA in 2013, flushing of the EES in the former City of Etobicoke was completed approximately twenty (20) years following the last cleanout of the system. Once flushing was completed, it was determined via testing that the original infiltration capability of the system was reinstated. On that basis, assuming and adopting a twenty (20) year flushing frequency would be consistent with the current practice within the City for conventional storm sewer system.

5.5.1.7 Assessment of EES in the BSUEA

Given that the operation and maintenance requirements associated with the EES exceeds that of a conventional storm sewer system, there is an uncertainty whether the adopted storm servicing strategy will incorporate an EES. As a result, this MSS was prepared considering; i) a conventional storm sewer system incorporating an EES along local roads, and ii) the standard conventional system.

To allow flexibility, this MSS has reviewed the servicing needs of the BSUEA for the EES servicing solution as well as a conventional system. Based on this review, the Minto Lands are those with the greatest difference in servicing needs of the BSUEA. As an example, servicing of the Minto Lands with a conventional storm sewer system will result in the need for wet ponds to achieve the MOE protection level. Conversely, should an EES be incorporated within the servicing of the Minto Lands, the end-of-pipe facilities at Greenbank Road will consist of dry ponds due to the water quality treatment level inherent in the EES that exceeds, by far, the minimum MOE requirement. Other areas such as the Mattamy Lands East and Mattamy Land West would not be impacted by the alternative servicing options as they are both tributary to an existing storm sewer system that discharge to the Todd Pond and there would not be any subsequent changes in storm sewer sizing.

The stormwater management strategies developed for each of the areas depicted on Figure 4-2 is presented below for each strategy namely the conventional system or the EES. Consequently, Section 5.5.3 presents the conventional servicing strategy and associated results summarized in Section 5.7 while Section 5.5.4 and Section 5.8 provides an overview and simulation results respectively of the EES strategy as outlined in this section of the report.

5.5.1.8 Monitoring Requirements in the BSUEA

During the course of the Existing Condition Report, the City of Ottawa acknowledged that they own and operate a few systems within their jurisdiction that rely on exfiltration without detail knowledge on either their performance or maintenance requirements. Although the EES has been used in the City of Ottawa and elsewhere in Ontario, it is proposed that monitoring of the system be undertaken to assess and confirm that it operates as proposed. The details and extent of flow monitoring should be discussed and reviewed by the City as part of Draft Plan and confirmed at the detailed design stage of the initial phase of both builders (Minto and Mattamy). The intent of the EES monitoring is two-fold; to estimate the drawdown time of the EES (i.e., time for water levels in the system to

drop) and also to determine an average rate of capture before runoff is conveyed by the traditional sewer system.

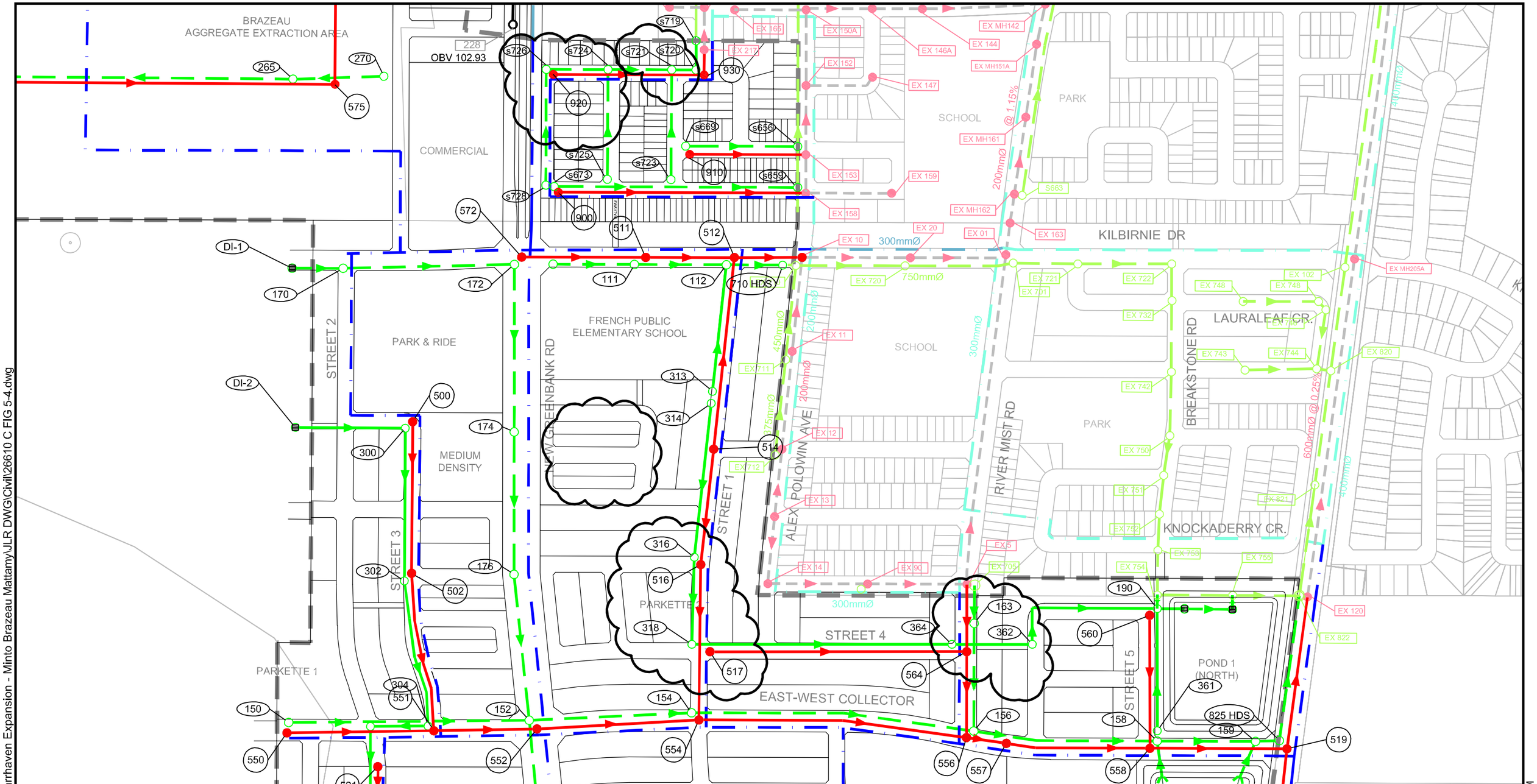
It is proposed that monitoring locations be set, in general, within the areas depicted on Figure 5-4. Based on discussions held with the City, the EES should be monitored at five (5) locations; three (3) locations within the Minto Lands (Phase 1) and two (2) within the Mattamy Lands (Phase 1). The exact location within each of the five (5) areas should be discussed with the City. Given that the existing Quinn's Pointe Subdivision does not include an EES, the most downstream flow monitoring location within the Minto Lands should be set upstream of Manhole No. 190, preferably near Manhole No. 362/364. Due to the variability of soils (hydraulic conductivities), it is proposed that the initial phase of both builders (Minto and Mattamy) include one location near the upper end of their EES and one near the downstream end of the system. In regard to Minto's third flow monitoring location, it is recommended that it be set mid-way of their Phase 1 lands. Flow monitoring should be set up to capture runoff from the spring freshet when the groundwater levels are likely to be near their maximum and span for a period of around 6 months. In order that an assessment of the EES can be made prior to development of subsequent phases of the CDP area, it is recommended that monitoring be initiated when 50% or more of the Phase 1 area serviced by the EES is developed and occupied.

Other monitoring requirements are further described in Paterson's latest Existing Conditions Report and Morrison Hershfield's Environmental Management Plan (EMP). The following monitoring is also to be completed:

- Baseline monitoring of existing drinking water wells in accordance with Paterson's recommendations described in Section 5 of their ECR; and
- Baseline monitoring of chloride and bromide under pre-development conditions to set the baseline condition as well as future monitoring which will necessitate the construction of monitoring wells in the overburden at strategic locations. Similar to the EES monitoring, five (5) monitoring wells should be constructed; three (3) within the Minto Lands and two (2) with the Mattamy Lands. The location of these monitoring wells are to be discussed at Draft Plan stage. Additional details have been provided in Section 4.3.6 of the EMP.

5.5.2 Infiltration Gallery Strategy

Section 5.5.1 provided a summary of the process followed throughout the course of the Existing Conditions Report and Master Servicing Study with respect to the selection of the EES servicing strategy as a means to promote infiltration. To support the EES, flow monitoring is proposed as part of initial phase of development (refer to recommendations made in Section 5.5.1.8). Should flow monitoring not show the effectiveness or maintenance of the EES proves to be more exhaustive than what was assumed then an infiltration gallery is an alternate servicing strategy which is investigated at a high level to replace the EES.



POTENTIAL LOCATION FOR EES MONITORING

NOTE:

- BASELINE MONITORING OF EXISTING DRINKING WELLS TO BE PERFORMED IN ACCORDANCE WITH PATERSON'S EXISTING CONDITIONS REPORT.
- BASELINE MONITORING OF CHLORIDE AND BROMIDE TO BE COMPLETED UNDER PRE-DEVELOPMENT AND POST-DEVELOPMENT CONDITIONS AT FIVE (5) LOCATIONS (MINTO (3) AND MATTAMY (2)) IN ACCORDANCE WITH THE ENVIRONMENTAL MANAGEMENT PLAN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

POTENTIAL LOCATIONS FOR EES FLOW MONITORING

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DESIGN:	GF
DRAWN:	CJM
CHECKED:	GF
JLR #:	26610

DRAWING #:

FIGURE 5-4

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The infiltration gallery investigated conceptually consists of an underground system made of proprietary manufactured modular structures surrounded by a clear stone envelope, which provides storage in its voids. The overall system creates temporary storage for runoff, which in turn, would exfiltrate/infiltrate into the underlying native soil in areas that are conducive to infiltration.

5.5.2.1 Sizing Basis

The infiltration gallery should, similarly to the EES, be sized to capture the 22mm rainfall event, which was found to approximately represent the 95th percentile rainfall. By adopting this sizing criterion, the aim is for the area serviced by this system to preserve pre-infiltration levels. The hydraulic conductivity of the soils underlying the gallery would be sourced, as per the EES design, from the Paterson's measured saturated field hydraulic conductivities, which would then be transformed into an infiltration rate as per the methodology described in the Ontario Ministry of Municipal Affairs and Housing (MMAH) Building Code Supplementary Standard SB-6 (2012).

Since the gallery would be sized to capture the 22 mm event, it is envisaged that the storage volume would be similar to the 150 m³/ha stored in the EES. Consequently, the storage capacity of 150 m³/ha provided by such facility would be greater than the 32 m³/ha required to achieve 80% TSS removal under the MOECC SWMPDM. As a result, no further water quality treatment storage would be required for the area serviced by an infiltration gallery. The 150 m³/ha estimate should, however, be confirmed during the design stage.

5.5.2.2 Location and Serviced Area

The infiltration gallery would be best suited where soils were reported as having high hydraulic conductivities. The higher the soil capacity for infiltration, the more efficient the size of the infiltration gallery will be. It is recommended that the gallery not be placed under private property or within ROW corridors. The infiltration gallery must also be in a location with easy access for operation and maintenance.

Similar to the EES, the area serviced by an infiltration gallery should be free of road salts in order to prevent adverse impact on the underlying groundwater. Consequently, the area serviced by an infiltration gallery should only consist of local roads and residential lots.

5.5.2.3 Operation and Maintenance

The performance of infiltration galleries is often found to be impacted by sediment deposition, which seals the bottom and hinders the ability of soils to allow infiltration. As a result, pre-treatment is often incorporated in the design of infiltration galleries to minimize accumulation of sediments. Should an infiltration gallery be proven to be required, it is recommended that it be combined with a HDS sized to provide pre-treatment similar to a sedimentation forebay in a wet pond. The HDS should be sized to achieve a minimum of 60% TSS removal.

The infiltration gallery and pre-treatment device will require regular maintenance which will include annual as well as long term activities. Maintenance would be twofold; maintenance of the pre-treatment device (i.e., HDS) and maintenance of the infiltration gallery. The former would be consistent with the manufacturer's recommendations which is typically every year while the latter would consists of more frequent tasks; cleaning out leaves, debris and accumulated sediment caught in inlets and outlets annually or as needed. Inspection via a monitoring well should be performed on an annual basis to ensure the facility drains within 72 hours following a major storm event (>25 mm). If the time required to fully drain exceeds 72 hours, then the gallery should be drained via pumping and cleaned out. If the slow drawdown time persists then the system may need removal and replacement of granular material and/or geotextile fabric.

5.5.2.4 Assessment of Infiltration Galleries in the BSUEA

There is some uncertainty at this time as to confirm whether storm servicing of the BSUEA will incorporate measures to promote infiltration such as an infiltration gallery or an EES. This uncertainty mainly lies with the increased maintenance requirements such a system would potentially impose on the City. The implementation of an infiltration gallery with pre-treatment will be assessed at a very high level in this MSS to determine the effectiveness of such a system.

5.5.3 Conventional System

5.5.3.1 Minto Lands

The only potential and feasible downstream minor system connection for the Minto Lands is the existing connection along the Greenbank Road trunk storm sewer system, which conveys captured flows to the Corrigan Pond. Due to falling topography from west to east, there are no major system outlets available to the Minto Lands as the Greenbank Road forms a barrier. In order to maximize the minor system connection at Greenbank Road, all major and minor system flows will have to be captured and controlled to the dedicated capacity in the Greenbank Road storm sewer. Flows from the adjoining Quinn's Pointe development will also have to be controlled by the stormwater management facilities to be located within the Minto Lands.

The preferred Demonstration Plan (Section 4.3 and Figure 4-2) identified three (3) stormwater management blocks for the purposes of providing quantity and quality runoff control for the Minto Lands. The facilities include two (2) stormwater management blocks on the eastern side of the BSUEA next to the connection to the Greenbank Road storm sewer and a single spill-over dry pond on the western edge of the BSUEA. The minor system for the Minto Lands will drain to the stormwater management blocks and the major overland flow will be divided between the end-of-pipe facilities to the east and the spill-over dry pond to the west.

The major system overland flow routes within the BSUEA are defined from the preliminary grading plan developed for the site. The Master Grading Plan has been developed to convey overland flow to the respective collection points as shown on

Drawing MG1. Overland flow is not permitted to cross arterial roads, such as New Greenbank Road, which runs through the site north to south. Overland flow is, therefore, directed away from the arterial ROW and towards the SWMFs.

Major overland flow from the areas west of New Greenbank Road will be conveyed towards the spill over dry pond located just outside of the western boundary of the CDP, along Barnsdale Road. Major overland flow from the areas east of New Greenbank Road and south of the new East-West Collector Road will be conveyed towards the SWMF located at the intersection of Barnsdale Road and Greenbank Road. The majority of the area east of New Greenbank Road and north of the East-West Collector Road will drain towards the SWMF at Greenbank Road. However, parts at the northern end will drain towards the adjoining Quinn's Pointe development. Capture rates in this area will have to be increased as there is insufficient street ponding storage to capture and detain runoff without cascading into Quinn's Pointe with just a 1:5 year capture rate. Based on past analyses, no flow can cascade into Quinn's Pointe as the area has no capacity in the major system.

Under the conventional storm system, there would be a requirement for wet ponds to provide water quality treatment and fulfil the enhanced protection level.

A conventional sewer system will result in a reduction of the infiltration levels due to the hard surfaces and the lack of measures to promote infiltration. Hence, the pre-development infiltration level would not be preserved. In terms of the operation and maintenance requirements, this servicing option would be the same to any other conventional systems with two wet ponds.

5.5.3.2 Mattamy Lands East

The Mattamy Lands East can connect to the existing minor system in the Half Moon Bay South development. The Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015) has assessed the impact of servicing the Mattamy Lands East through the Half Moon Bay South development and into Todd Pond. As stated in the 2015 Stantec report, the inclusion of the 5.6ha Mattamy Lands East lands to the Todd Pond drainage boundary via the Half Moon Bay South subdivision has been confirmed by the JFSA Todd Pond Model Keeper analysis and approved by City staff.

5.5.3.3 Mattamy Lands West

As identified in the Draft 2014 BSMSSA (Stantec), the dedicated storm outlet for the Mattamy Lands West is the proposed New Greenbank Road storm sewer system that would flow northerly and outlet to the Clarke Pond. A release rate of 880 L/s was accounted for in this storm sewer system as per the Barrhaven South MSS design sheet. Flows in excess of 880 L/s up to the 1:100 year event must be detained on-site by means of street sag storage or a dry pond, or a combination of both. In the case that detailed design shows that street sag storage is sufficient to detain the 1:100 year major overland flow then a dry pond may not be warranted.

5.5.3.4 Brazeau and Drummond Aggregate Extraction Areas

The redevelopment of the Drummond and Brazeau Aggregate Extraction Areas will occur in the future once the rehabilitation grades are achieved. In addition, the preparation of Existing Conditions Reports for both aggregate pit areas will need to be completed prior to their development. At such time, it is proposed that post-development surface flows follow pre-development flow path to the north-west of the site. In order to fulfil the criteria listed in Section 5.3.4, quantity and quality control will have to be provided prior to discharge, either via on-site controls or a SWMF depending on final land use configuration. It is envisioned that both aggregate extraction areas will need to preserve pre-infiltration levels. As a result, storm servicing for both areas will need to incorporate measures that would promote infiltration.

The potential storm servicing strategy for the aggregate extraction areas is based on the phasing of each aggregate extraction area. The land owners have indicated that development will not proceed in tandem and each property will require their own stormwater management solutions with two (2) separate SWMFs and two (2) separate outlets. The outlets will discharge to a trunk storm sewer along Borrisokane Road which will convey flows to the Jock River.

5.5.4 EES Infiltration Approach

5.5.4.1 Minto Lands

The implementation of infiltration type measures within the Minto Lands would involve the EES infrastructure (i.e., sewers and granular envelope), as described in Section 5.5.1, combined with conventional conveyance sewers located above. The overall stormwater strategy would remain as per the conventional system outlined in Section 5.5.3.1; there would be two (2) downstream end-of-pipe facilities in the south east of the BSUEA and a dry spill-over pond to the west. The underground storm infrastructure would incorporate the EES and the stormwater management facilities would not require any water quality component. As a result, the facilities would be dry ponds.

Due to the salting practice within the City, it is proposed to incorporate an EES within areas such as local roads and associated residential runoff so that the captured runoff is relatively free of roadway salts due to the implications outlined in Section 5.5.1.5. The current salting practice showed that salt is not applied on local roads on a regular basis. However, it is applied on the collector and arterial roads.

Where residential units are fronting collector roads, storm servicing would be carried out solely with a conventional storm sewer system. However, in order to maximize infiltration via an EES, all rear-yards should be directed to an EES network where possible. In addition, it is recommended that servicing of the park and ride block, commercial block and school blocks exclude an EES due to the potential salt application within these land usages. Given that significant portions of commercial and institutional blocks include rooftops of up to 30% coverage, the modelling was carried out assuming that rooftop flows should continue to be

captured and infiltrated up to the 95th percentile storm (a 22 mm event, Section 5.5.1.2). Runoff in excess of 22 mm would either be directed to a local road EES (if feasible and practical) or be discharged into the collector conventional system.

Since the EES sewers will provide water quality treatment to 80% TSS removal or enhanced protection (Section 5.5.1.2), no further downstream water quality treatment of EES sewers will be necessary. Consequently, runoff in excess of the capacity of the EES can be conveyed to the end-of-pipe facilities that would consist of dry ponds for water quantity control prior to release into the Greenbank Road trunk storm sewer.

Conversely, water quality control would still be required for the areas draining to the conventional sewer system, including the arterial and collector roads as well as the land use areas with salt applications. Due to the smaller extent of these areas and the lack of flow during frequent storm events, the proposed servicing strategy includes the provision of a Hydro Dynamic Separator (HDS) at the downstream end of the conventional system immediately near the dry ponds. The servicing strategy that includes an HDS was selected over having wet detentions ponds, as the latter could experience problems such as an algae bloom or West Nile Virus; in frequent events the majority of the runoff will be captured by the EES and there will be a lack of flow to any downstream treatment facility.

Overall, the size of the end-of-pipe facilities would be reduced as the exfiltration of the EES will reduce the overall volume of runoff conveyed to the ponds, which in turn, will result in lesser storage volume requirement.

Major overland flow from the areas west of New Greenbank Road will be conveyed towards the spill over dry pond located just outside of the western boundary of the CDP, along Barnsdale Road. Major overland flow from the areas east of New Greenbank Road and south of the new East-West Collector Road will be conveyed towards the SWMF located at the intersection of Barnsdale Road and Greenbank Road. The majority of the area east of New Greenbank Road and north of the East-West Collector Road will drain towards the SWMF at Greenbank Road. However, parts at the northern end will drain towards the adjoining Quinn's Pointe development. Capture rates in this area will have to be increased as there is insufficient street ponding storage to capture and detain runoff without cascading into Quinn's Pointe with just a 1:5 year capture rate. Based on past analyses, no major overland flow can cascade into Quinn's Pointe as the area has no capacity depth wise along the major system.

5.5.4.2 Mattamy Lands East and Mattamy Lands West

The stormwater management strategy for the lands part of the Mattamy Lands East and Mattamy Lands West would not vary from that described in Section 5.5.3.2 and Section 5.5.3.3 with the exception of the inclusion of the EES.

Mattamy Lands East, with the EES, can connect to the existing minor system in the Half Moon Bay South development. The Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015) has assessed the impact of connecting the Mattamy Lands East through the Half Moon Bay South

development and into Todd Pond from both a water quality and quantity perspective. This servicing strategy was deemed the preferred servicing solution for the Mattamy Lands East.

Mattamy Lands West, with the EES, would continue to connect to the trunk storm sewer on New Greenbank Road and the captured flows would need to be limited to the 880 l/s allocation as per the Barrhaven South MSS design sheet. As a result, flows in excess of 880 L/s up to the 1:100 year event must be detained on-site by means of street sag storage or a dry pond, or a combination of both. Should detailed design show that street sag storage is sufficient to detain the 1:100 year major overland flow then a dry pond may not be warranted.

5.5.4.3 Brazeau and Drummond Aggregate Extraction Areas

Existing Conditions Reports for both aggregate pit areas will need to be completed prior to their development. It is envisioned that both aggregate extraction areas will need to preserve pre-infiltration levels and which in turn will require that the proposed stormwater management servicing strategy incorporates measures to promote infiltration. The EES has been identified as a suitable strategy on urban development in the BSUEA to achieve distributed infiltration as required by the City. For private lots, infiltrating clean water roof runoff can achieve the required infiltration. At detailed design of these properties, the strategy to preserve pre-development infiltration rates will need to be reviewed with the Geotechnical Engineer once it is known what type of fill material was used to meet the minimum rehabilitation elevations.

5.5.5 Gallery Infiltration Approach

5.5.5.1 Minto Lands

Within the Minto Lands, an infiltration gallery could supplement the EES and/or replace part of the EES within Phase 2, on the western side of New Greenbank Road. It is envisioned that an infiltration gallery could be integrated to the footprint of the proposed spill-over dry pond located on the western side of the CDP boundary, adjacent to Barnsdale Road. This facility would service the local roads part of Minto's Phase 2 lands and would be bounded by New Greenbank Road to the east, the Park and Ride to the north, by Barnsdale Road to the south and by the western perimeter of the CDP. The total serviced area of the infiltration gallery would be around 12.5 ha.

Storm servicing of Phase 1 of the Minto Lands would be developed with the EES as described in Sections 5.5.4.1 and 5.8.2. Should monitoring of Phase 1's EES be inconclusive, then storm servicing of Phase 2 would be developed using an infiltration galley. The storm servicing approach with an infiltration gallery would need to incorporate a two pipe system; one system that would convey salt impacted runoff and the second conveying runoff free of chlorides. The latter system would drain to an infiltration gallery while the other system would service collector and arterial roads and would discharge to a downstream HDS for quality treatment. The proposed infiltration gallery would be located as part of the spill-over dry pond off Barnsdale Road and outside the CDP western boundary.

Potential infiltration volume would first be reviewed at the spill-over dry pond while considering design constraints such as infiltration rate of the native soils, available footprint of the spill-over dry pond, groundwater depth, hydraulics of the storm sewer system that would be connected to the infiltration gallery. Once the infiltration volume is assessed at the spill-over dry pond assuming a system comprised of manufactured module structures and surrounding granular material, an equivalent serviced area would be found based on 150 m^3/ha. From this assessment and the close review of the conceptual storm sewer system, a serviced area would be depicted.

It is envisioned that the EES would be approved as the measure that preserves infiltration for Minto's initial phase of development while carrying out flow monitoring concurrently to assess the performance of the EES.

5.5.5.2 Mattamy Lands East and Mattamy Lands West

The stormwater management strategy for the lands part of the Mattamy Lands East and Mattamy Lands West would not vary from that described in Section 5.5.3.2 and Section 5.5.3.3 with the exception of incorporating an infiltration gallery that would be sized to preserve infiltration levels.

Storm servicing for the Mattamy Lands East can be developed based on a connection to the existing minor system in the Half Moon Bay South development as assessed in the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015). This servicing strategy was deemed the preferred servicing solution for the Mattamy Lands East. The strategy and layout currently do not offer any lands dedicated to stormwater management in the subdivision to accommodate an infiltration gallery. Some of the proposed residential lots in the northern corner of the site near Manhole s720 would have to be dedicated as an infiltration facility should it be pursued at detailed design. In addition, smaller facilities would be required prior to connection to the external network at manholes s656 and s659 which would require further conversion of the residential lots into SWM blocks.

Storm servicing of the Mattamy Lands West with an infiltration gallery would maintain the same connection to the trunk storm sewer on New Greenbank Road and the captured flows would need to be limited to the 880 l/s allocation as per the Barrhaven South MSS design sheet. As a result, flows in excess of 880 L/s up to the 1:100 year event must be detained on-site by means of street sag storage or a dry pond, or a combination of both. The site of the dry pond could also accommodate an infiltration gallery. If the detailed design were to show that street sag storage is sufficient to detain the 1:100 year major overland flow then a dry pond may not be warranted, however land would still be required to host an infiltration gallery.

5.5.5.3 Brazeau and Drummond Aggregate Extraction Areas

It is envisioned that the proposed stormwater management servicing strategy will have to be developed to limit post-development flows to pre-development levels while preserving pre-infiltration rates. An infiltration gallery could be

accommodated into the land use development plan for the site to provide the required infiltration capacity. For private lots, infiltrating clean water roof runoff can achieve the required infiltration. At detailed design of these properties, the strategy to preserve pre-development infiltration rates will need to be reviewed with the Geotechnical Engineer once it is known what type of fill material was used to meet the minimum rehabilitation elevations.

5.6 Storm and Drainage Design Methodology

The design and evaluation of the proposed storm servicing solutions as outlined above were undertaken with the following design parameters for minor and major system analysis.

5.6.1 Runoff Coefficient

Surface runoff is triggered when precipitation exceeds the infiltration of landscaped surface and/or the initial abstraction of hard surfaces. To quantify the rate of runoff from the various surfaces, hydrological parameters representing different drainage characteristics must be calculated. The type of land cover and associated hydrological parameters are based on area weighting of the following:

Table 5-1: Land Cover Drainage Parameters

Land Cover	Impervious (%)	Runoff Coefficient	Draining to Pervious (%)
Commercial / Condo	93	0.85	0
Arterial / Collector Roads	86	0.80	0
Local Roads	71	0.70	0
Parks	29	0.40	100
Woodlots	0	0.20	100
Schools	79	0.75	0
Park and Ride	93	0.85	0
Single Family Residential	57	0.60	70
Townhouse Residential	64	0.65	70
Back to Back Residential	71	0.70	70
Blended Residential	66	0.66	70

Based on the above three (3) types of residential usages, a blended (average) Runoff Coefficient of 0.66 was used in the storm drainage analysis for the residential blocks.

Based on the recommendations noted in Section 5.4.5.2.2 of the OSDG, Runoff Coefficients or C-Factors associated with the various types of residential usages were based on actual impervious areas for the adjoining Quinn's Pointe subdivision

to the north-east of the site. Similar housing product is likely to be used on the study area development.

5.6.2 Trunk Sewer Sizing

Preliminary sizing of the storm sewer system is based on the road patterns shown on the demonstration plan (Figure 4-2) and intended to demonstrate the feasibility of the overall storm servicing strategy. The preliminary trunk storm sewer layout and associated drainage areas are shown on the following drawings:

- KS1: Servicing Key Plan - Conventional
- KS2: Servicing Key Plan - EES
- MST-1: Master Storm Drainage Plan - Conventional
- MST-2: Master Storm Drainage Plan - EES
- SWM-CONV: SWMFs - Conventional Storm System
- SWM-EES: SWMFs - EES Storm Sewer System
- MG1 and MG2: Master Grading Plans
- DT1: Detail Sheet

Based on the above information, storm sewer design sheets have been prepared and included in Appendix F. The proposed storm sewers along the various road types have been sized in accordance with the level of service identified in Section 5.6.1. The rate of capture along the arterial road was set to the prescribed 1:10 year design event in accordance with the OSDG while collector and local roads were set to a 1:5 year design event, which meets and exceeds the OSDG for both roadway types.

Where required, storm sewers were upsized to accommodate the freeboard to the HGL requirements as per the hydraulic modelling assessment. In addition, the HGL requirements meant that one storm sewer section will require to be constructed invert to invert rather than the conventional obvert to obvert connection. This deviation from normal standards is requested from the City.

The Storm Sewer Design Sheets included in Appendix F were developed to incorporate the BSUEA lands as well as the Quinn's Pointe system as the captured flow from the latter system impacts the performance of the storm sewer system connecting to the Greenbank Road trunk system. In addition, the storm sewer design sheets account for overland flow from external areas which will remain undeveloped and flow uncontrolled towards the BSUEA and be captured into the minor system via ditch inlets.

The Quinn's Pointe storm sewer system was originally designed in 2015 based on a storm capture of 1:5 year. Since then, the level of service for local streets has been reduced in the OSDG from the 1:5 year to a 1:2 year capture. Given that proposed servicing depicted on Drawings KS1 and MST-1 shows that the area from the BSUEA lands serviced by the existing Kilbirnie Road 750 mm diameter

storm sewer (i.e., pipe reach between MH710-MH720) has increased from 2.3 ha (per 2015 design) to 4.8 ha, the Storm Sewer Design Sheets for the Quinn's Pointe subdivision was revised based on a 1:2 year capture. With the 1:2 year capture criteria, the minimum freeboard of 300 mm during the 1:100 year storm (3 hour and 24 hour) is met everywhere in Quinn's Pointe and the BSUEA (Minto Lands) as per Table 5-5 and Table 5-11 below, and free flow occurs in the Quinn's Pointe minor system in the 1:2 year event. During a significant event, runoff exceeding the above-noted level of service would result in overland flow, which would be conveyed along the major overland system. As layout revisions are anticipated in the future as plans of subdivision are developed, refinements to the design of the systems are expected. The plans of subdivision should maintain consistency with the drainage boundaries as much as possible since this information has been used to size the SWMF blocks and EES.

5.6.3 Roadway Sag Storage

Due to falling topography when moving easterly, the Master Grading Plan (Drawing MG1) was developed to provide a route to safely convey major overland flow while minimizing earth works. In order to fulfill these objectives, grading of the major overland system is to be carried out following a saw-tooth profile with low points introduced along the major overland system when topography will allow. Since detailed design will dictate the location and extent of the roadway sag depths, modelling was carried out assuming an on-site storage of 50 m^3/ha which is deemed conservative based on the storage achieved in Quinn's Pointe having similar topography. Roadways with flatter slopes will generate greater storage capacity, while those that are steeper will have limited storage capacity.

The design of the major overland system will allow runoff to be stored in the roadway depressions prior to its capture by the catch basins and inlet control devices (ICD). During infrequent events, runoff in excess of the rate of capture of the minor system and roadway sag storage will cascade along the major overland system.

5.6.4 Storm Dual Drainage Analysis

5.6.4.1 Modelling Software

The dual drainage analyses presented herein were carried out using the PCSWMM software platform. This includes the hydrology of the study area as well as the preliminary minor and major system analyses and infiltration system hydraulics. PCSWMM is based on the EPA SWMM engine in a GIS environment.

The PCSWMM dual drainage model will provide preliminary confirmation of the overland flow depths along the collector and arterial roads, feasibility of the proposed sewer sizing in terms of HGL, block sizes for SWMFs, and capacity of the infiltration system. Model inputs and results are contained in Appendix G.

5.6.4.2 Model Assumptions and Methods

The dual drainage analysis uses a dynamic simulation to calculate the hydrology and hydraulics of the major and minor systems. The model has been developed using:

- City of Ottawa IDF data Chicago Storms applied across catchments with characteristics area weighted from Table 5-1;
- Sag storage for each subcatchment represented as storage nodes with a basic 50 m³/ha applied across all catchments with the exception of Commercial and ICI blocks where on-site storage was assumed to be sufficient to self-contain the 1:100 year flow;
- A 1:5 year and 1:10 year design capture for the local/collector roads and arterials, respectively;
- Exit losses are applied at the downstream end of each sewer section based on the OSDG; and,
- HGL should be kept at least 2.3 m below the proposed grades shown on the preliminary grading plan to accommodate an underside of footing which incorporates basements, approximately 2 metres, as well as prescribed minimum freeboard of 300 mm.

In addition, the following assumptions were used for the modelling of the EES along local roads:

- An average storage of 0.75 m³/m (950 mm deep envelope) was utilized and combined with an exfiltration rate based on the hydraulic conductivities found during geotechnical assessment with the required safety factor reduction, which was simulated as a storage node in the minor system. This configuration within residential areas has proven that the EES can capture the 95th percentile, equivalent to a 22 mm storm event. It was also assumed that ICI blocks would include an EES sized to solely capture rooftop flow up to a 22 mm storm.

5.6.4.3 Interaction with Other Models and External Areas

Due to existing servicing in Quinn's Pointe, there is an interaction between Quinn's Pointe and the BSUEA. As a result, the minor system model developed for Quinn's Pointe was integrated to the BSUEA model.

5.7 Analysis of Conventional System

5.7.1 BSUEA Site Wide Infiltration with Conventional System

A water budget analysis was carried out as part of the Existing Condition Report (Section B6, Appendix B). This analysis revealed that pre-development infiltration across the BSUEA accounted for 40% of the total precipitation based on long-term simulations. The simulated post-development water budget analysis described in Section 5.4.4 has been carried out to evaluate the post-development infiltration

should storm servicing rely solely on a conventional system. Table 5-2 summarizes the water budget simulation results under both pre- and post-development conditions. As shown below, servicing of the BSUEA lands with a conventional system will achieve an infiltration of 22% which is less than that under pre-development conditions. Consequently, the conventional system cannot preserve the pre-infiltration levels.

It should be noted that this analysis has excluded the Brazeau and Drummond aggregate areas, which have been assumed to integrate measures to promote infiltration and preserve pre-infiltration rates along both properties separately from the remaining BSUEA.

Table 5-2: BSUEA Conventional System Water Budget Results

Water Budget Component	Annual Average Depth (mm)	Budget (%)	Existing Condition Budget (%)
Precipitation	844	100%	100%
Evapotranspiration	231	27%	60%
Infiltration	189	22%	40%
Surface Runoff	413	49%	0%

5.7.2 Minto Lands

5.7.2.1 Major System Cascading and Ponding Levels

The elevations of the major system nodes are shown in Table 5-3 and Table 5-4. As shown in these tables, there is no ponding in the 1:5 year event or 1:10 year event for local/collector roads and arterial roads, respectively, while the depth of flow along the major system is maintained to or below 350 mm during the 1:100 year event.

Table 5-3: Minto Conventional Local and Collector Road Major Node Depths

Major System Node	1:5 yr - 3 hr Chi Ponding Depth (mm)	1:5 yr - 24 hr Ponding Depth (mm)	1:100 yr 3 hr Chi Ponding Depth (mm)	1:100 yr - 24 hr SCS Ponding Depth (mm)
S_101-102	10	10	330	270
S_102-151	10	10	320	260
S_110-111	10	10	350	210
S_111-112	10	10	250	30
S_113	10	10	30	20
S_113-112	10	10	330	120
S_114-116	10	10	320	280
S_116-154	10	10	210	150

Major System Node	1:5 yr - 3 hr Chi Ponding Depth (mm)	1:5 yr - 24 hr Ponding Depth (mm)	1:100 yr 3 hr Chi Ponding Depth (mm)	1:100 yr - 24 hr SCS Ponding Depth (mm)
S_121-122	10	10	40	20
S_120-124	10	10	270	230
S_123-124	10	10	340	290
S_132-134	10	10	350	300
S_134-136	10	10	340	270
S_136-SWP	10	10	320	260
S_150-151	10	10	190	140
S_152	0	0	40	10
S_152-154	10	10	80	70
S_154-156	10	10	190	160
S_156-158	10	10	170	140
S_158-NWP	0	0	280	200
S_160-158	10	10	350	310
S_164-156	10	10	350	310
S_170-172	0	0	10	10
S_178-132	10	10	350	320

Table 5-4: Minto Conventional Arterial Major System Flows

Major System Node	1:10 yr - 3 hr Chi Ponding Depth (mm)	1:10 yr - 24 hr SCS Ponding Depth (mm)	1:100 yr - 3 hr Chi Ponding Depth (mm)	1:100 yr - 24 hr SCS Ponding Depth (mm)
S_172	0	0	0	0
S_172-174	10	10	80	40
S_174-176	10	10	70	40
S_178	0	0	20	10
S_179-178	10	10	80	40

5.7.2.2 Minor System HGL

An HGL analysis was conducted along the minor system to demonstrate that the minimum prescribed freeboard of 300 mm is achieved. Simulation results have been summarized in Table 5-5 based on assumed USF elevations of 2 m below the surface. Table 5-5 shows that during the 1:100 year event the system provides the required 300 mm minimum freeboard along the trunk sewers. During the climate change event, the simulated HGLs remain below the USF.

Table 5-5: Minto Conventional Minor System Freeboards

Minor System Node	1:100 year 3-hr CHI Freeboard (mm)	1:100 year 24-hr SCS Freeboard (mm)	Climate Change Node (mm)
MH_101	2.12	2.06	1.82
MH_102	2.15	2.03	1.91
MH_110	2.35	2.35	2.35
MH_111	1.21	1.28	1.15
MH_112	1.26	1.32	1.21
MH_113	1.66	1.71	1.59
MH_114	0.34	0.23	0.22
MH_116	2.14	2.14	2.14
MH_120	1.27	1.33	0.99
MH_121	1.76	1.75	1.71
MH_122	0.68	0.68	0.64
MH_123	1.57	1.57	1.54
MH_124	2.01	2.07	1.73
MH_132	2.86	2.91	2.64
MH_134	2.53	2.57	2.37
MH_136	2.87	2.89	2.76
MH_150	2.04	2.04	2.04
MH_151	2.24	2.27	2.1
MH_152	2.89	2.89	2.89
MH_154	2.9	2.89	2.89
MH_156	4.22	4.22	4.22
MH_158	1.51	1.55	1.49
MH_160	0.35	0.42	0.38
MH_164	2.66	2.66	2.66
MH_170	2.13	2.12	1.6
MH_172	1.65	1.65	1.58
MH_174	2.72	2.72	2.64

Minor System Node	1:100 year 3-hr CHI Freeboard (mm)	1:100 year 24-hr SCS Freeboard (mm)	Climate Change Node (mm)
MH_176	1.92	1.92	1.86
MH_178	3.59	3.65	3.31
MH_179	2.73	2.75	2.64

5.7.2.3 Water Quality

Under the conventional storm system, water quality treatment for the Minto Lands will be provided through the use of two (2) wet ponds abutting Greenbank Road as depicted on Drawing SWM-CONV. These facilities are sized to provide water quality and quantity control prior to discharge into the 1800 mm outlet from Quinn's Pointe that discharge into the Greenbank Road trunk sewer system. Given that the capacity into the Greenbank Road trunk storm sewer system will be shared by Quinn's Pointe, Minto's BSUEA lands and the Greenbank Road ROW, a high level concept for the facilities is shown on Drawing SWM-CONV.

As previously noted, the Corrigan facility was sized to achieve an 80% TSS removal for the Quinn's Pointe subdivision.

As a result, Quinn's Pointe runoff does not require any quality control. Hence, the volume requirements identified in Table 5-6 for Wet Pond 1 is solely based on Minto's lands part of the BSUEA and excludes Quinn's Pointe while Wet Pond 2 is based on the remainder of Minto's lands and the southern section of Greenbank Road ROW. Calculations carried out for the sizing each of the pond's permanent pool volume is included in Appendix G.

Table 5-6: Minto Conventional System Water Quality Volumes

Parameter	Wet Pond 1	Wet Pond 2
Total Drainage Area (ha)	29	58
Average Imperviousness (%)	70%	64%
Water Quality Volume Required / ha (m^3/ha)	225	212
Minimum Extended Detention Storage (m^3)	1,160	2,330
Volume of Permanent Pool required (m^3)	5,360	9,990
Permanent Pool Volume Provided (m^3)	11,166	11,960

5.7.2.4 Pond Operation

The proposed end-of-pipe wet ponds abutting Greenbank Road, as depicted on Drawing SWM-CONV (Wet Pond 1 and Wet Pond 2), were sized at a high level to serve a dual purpose: i) meet an 80% TSS removal for all of the BSUEA lands (Minto Lands) as well as for an additional ROW section of Greenbank Road (up to Barnsdale Road), and ii) limit post-development flows from both the BSUEA lands

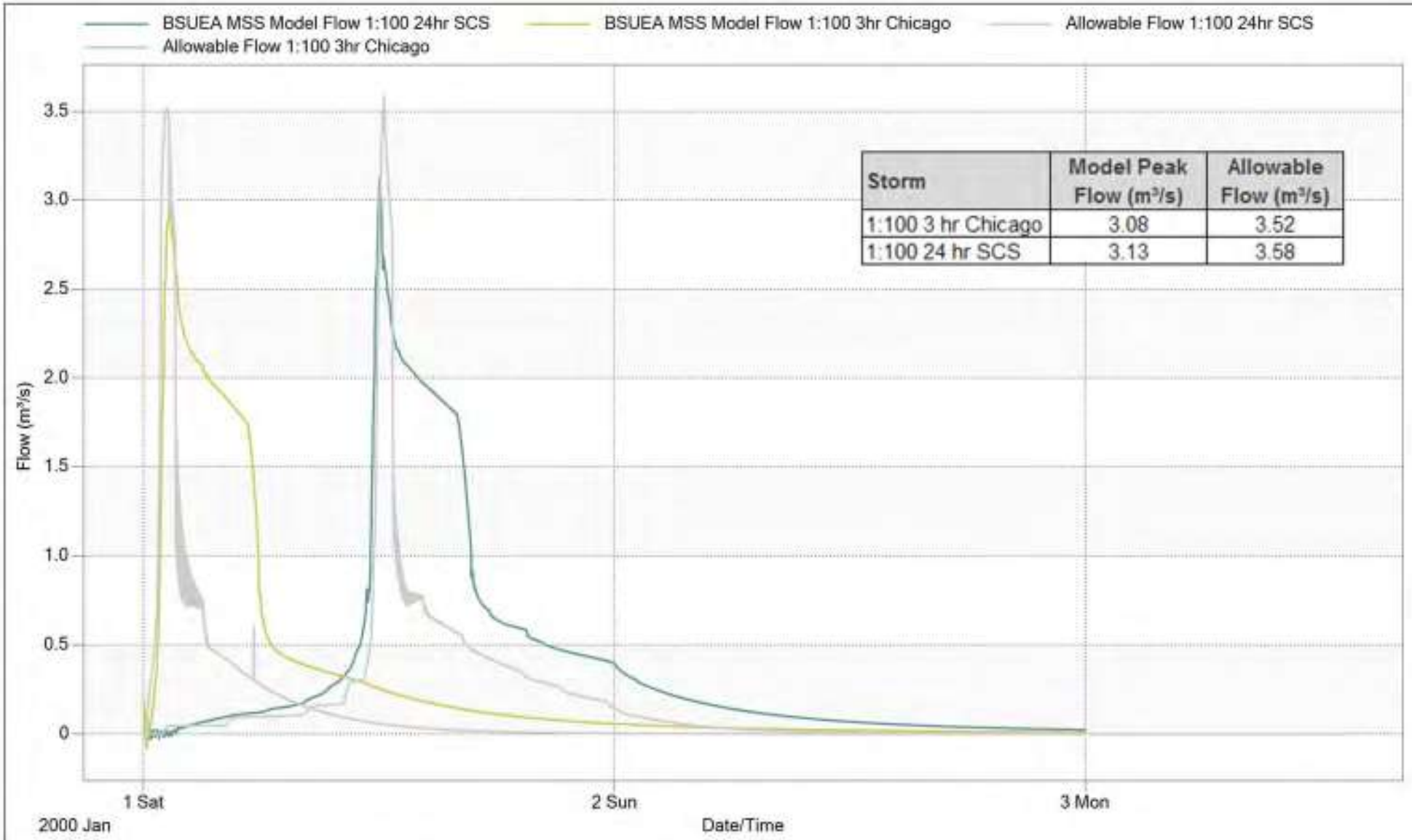
and Quinn's Pointe to ensure that the 1:100 year prescribed flow of 3,580 L/s allocated to the trunk storm sewer leading to the Corrigan Pond at Manhole MH102 at the intersection of Greenbank Road and Kilbirnie Drive.

In order to reduce headlosses, runoff from Wet Pond 1 discharges via two (2) double ditch inlets which connect into a new sewer loop constructed off the existing trunk storm sewer outlet for the Quinn's Pointe subdivision. The double ditch inlets allow both discharge of the pond and controlled surcharging of the Quinn's Pointe minor system into Wet Pond 1 when the conveyed flows exceed the capacity of the downstream orifice plate. To achieve the prescribed flow of 3,580 L/s, the combined outflow from Wet Pond 1 and Quinn's Pointe is controlled through a 675 mm diameter orifice plate on the downstream end of the Quinn's Pointe storm sewer, and upstream of the connection with the Greenbank Road trunk storm sewer. The flow allocation was identified in the IBI's analysis which was part of JLR's Servicing Brief (2014) as described in Section 5.3.1.

A comparison of the trunk sewer hydrographs was carried out between those at the downstream end of the combined model of the BSUEA and Quinn's Pointe with those in the same sewer section in the IBI analysis. The graphical comparison (Figure 5-5) shows that peak flow rates of the proposed servicing under the conventional system strategy is consistent with or below the peak flow rates in the IBI analysis. In addition, the analysis of the existing Greenbank Road trunk storm sewer contained in the model shows that during the 1:100 year storm event the Q/Qcap value in the storm sewer is just below 65% indicating that there is additional residual capacity available.

The required extended detention volume in Wet Pond 1 will need to be controlled without hindering the surcharge of flows from Quinn's Pointe through the two double ditch inlets. To achieve the required extended detention storage, a berm has been placed in the facility around the two double ditch inlets. This proposed configuration will create a two (2) cell pond with the larger of the cells on the upstream side of the berm being sized to provide containment and slow release of the extended detention storage. The additional cell on the downstream side, near the existing 1800 mm diameter storm sewer outlet will contain the double ditch inlets.

Frequent flows from BSUEA (Minto Lands) will first enter Wet Pond 1 and will be directed through the plunge pool/sedimentation forebay for pre-treatment. From that point, flows would then be conveyed along a flow path that has been extended by means of low flow berms. Frequent flows would fill-up the extended detention storage of the containment cell, set between elevations of 95.0 m and 95.5 m, and would be controlled by means of an orifice located within the berm of the containment cell set at the Normal Water Level elevation of 95.0 m. This restrictor, sized as part of the detailed design of the facility, would be responsible for providing the 24 hour drawdown of the extended detention storage of 780 m^3. By adopting this configuration, frequent flows from BSUEA (Minto lands) would receive treatment while allowing Quinn's Pointe runoff to be conveyed freely to the Greenbank Road trunk sewer system.



Storm	Model Peak Flow (m^3/s)	Allowable Flow (m^3/s)
1:100 3 hr Chicago	3.08	3.52
1:100 24 hr SCS	3.13	3.58

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
MASTER SERVICING STUDY

DRAWING:

Comparison of Flow Rates under Conventional System at Greenbank Road Receiving Sewer

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DRAWN:	BP
CHECKED:	BP
JLR NO.:	26610

DRAWING NO.:

FIGURE 5-5

During less frequent events where flows from Quinn's Pointe exceed the conveyance capability of the 675 mm diameter orifice, surcharge would be encountered in the system where flows from Quinn's Pointe would begin to back-up and fill Wet Pond 1 from the new sewer loop and have reverse flow through the double ditch inlets. Filling of the downstream cell would continue until the volume of the cell is exceeded. Once an elevation of 95.50 m is reached, the downstream cell would overtop the berm into the containment cell. When this situation occurs, flows beyond the water quality event would then be combined and the facility would perform as a 1 cell pond. Once capacity in the existing 1800 mm diameter storm outlet is available (controlled via the 675 mm diameter orifice plate), runoff would then flow through the double ditch inlets. Once the water level in Wet Pond 1 recedes below 95.50 m, runoff from the containment cell would be released slowly through the restrictor until reaching the Normal Water Level of 95.0 m.

Wet Pond 2 has been conceptually configured as a traditional wet pond that incorporates a plunge pool/sedimentation forebay, permanent pool, extended detention storage as well as quantity storage. The facility has been set with a normal level of 95.6 m with extended detention storage of 1.2 m (refer to Drawing SWM-CONV for details). A restrictor will be set at the Normal Water Level of 95.60 m and will be sized at detailed design to achieve the drawdown time of 24 hours. As previously noted, Wet Pond 2 was sized for Minto's lands and also for the southern extension of Greenbank Road ROW totalling 1.67 ha (up to Barnsdale Road). In terms of quantity control, Wet Pond 2 will be controlled by means of a 450 mm diameter restrictor.

The spill-over dry pond located outside the CDP was sized to capture the major overland flow while releasing flows to the available capacity in the downstream storm sewers. Table 5-7 summarizes the various parameters used in the sizing of the wet ponds and spill-over dry pond while Drawing SWM-CONV provides the arrangement of the facilities and connections to the proposed storm sewer system.

Table 5-7: Minto Conventional System Pond Parameters and Results

Pond Parameter	Wet Pond 1	Wet Pond 2	Western Spill-over Pond
Pond Invert (m)	93.5	94.1	100
Permanent Pool Elevation (m)	95	95.6	-
Modelled Release Rate (m^3/s)	1.65	0.2	0.08
Pond Top of Bank (m)	96.1	96.8	100.7
Active Storage Depth (m)	1.0	1.2	1.0
Freeboard (m)	>0.3	>0.3	>0.3
Outlet Elevation (m)	95	95.6	100

Pond Parameter	Wet Pond 1	Wet Pond 2	Western Spill-over Pond
Outlet Diameter (m)	0.675	0.3	0.2
Drawdown Time (hrs)	6	48	12
Surface Area	1.7	2.0	0.2
Sediment Drying Area Required (m^2)	960	1,500	n/a

5.7.3 Mattamy Lands East

As part of the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015), a major and minor system analysis was undertaken by Stantec using DDSWMM and XPSWMM, respectively for the Half Moon Bay South subdivision incorporating the Mattamy Lands East. These analyses were carried out under: i) interim conditions, - where undeveloped lands across the BSUEA are naturally draining overland, and ii) under ultimate conditions - with the Mattamy Lands East developed and draining to the Todd Pond.

The proposed servicing where the Mattamy Lands East would be connected to the adjacent services would only impact the Half Moon Bay South development. A summary of the analysis undertaken by Stantec is extracted and presented below. The full report is copied on the data disc included in Appendix N.

5.7.3.1 Major System Ponding Levels

The DDSWMM major overland analysis has shown 1:100 year ponding depths less than 350 mm deep, within both the Mattamy Lands East lands and the wider Half Moon Bay subdivision, thereby meeting the City requirements. The DDSWMM segments and associated ponding depths are shown in Appendix H, Table G-1.

5.7.3.2 Minor System HGL

An HGL analysis of the minor system was carried out as part of the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015). This analysis showed that the 1:100 year HGL achieves the 300 mm freeboard to the USF within both the Mattamy Lands East (Appendix H, Table G-2) and the wider Half Moon Bay Subdvision (Appendix H, Table G-3). Under the Climate Change stress test event, the HGL does not rise above the USF.

The results for the Mattamy Lands East lands minor system were not included in the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015) however the modelling undertaken for the report did include the Mattamy Lands East area as developed and the results for this area were extracted from the modelling.

5.7.3.3 Quality Control

The assessment of water quality control for the Half Moon Bay South subdivision, including the Mattamy Lands East portion, was included in the work undertaken by J.F. Sabourin & Associates in April 2015 as the Todd Pond Model Keeper.

According to the Todd Pond Model Keeper Analysis Re-Assessment of Existing System Capacity (JFSA, 2015), adding the Mattamy Lands East to the current serviced area of the pond would result in an area of 113 ha at a weighted average imperviousness of 54%. In order to achieve an enhanced protection (80% TSS removal) for the overall catchment, a permanent pool volume of 187 m³/ha is required or a total volume of 16,670 m³ (excluding the 40m³/ha of extended detention storage). The reported available permanent pool volume in the pond, at a water level of 89.650 m, is 23,716 m³. Therefore, there is sufficient capacity to provide water quality control for the Mattamy Lands East in the Todd Pond.

Based on the Todd Pond Model Keeper Analysis Re-Assessment of Existing System Capacity (JFSA, 2015), the required extended detention storage for the 113 ha is 4,520 m³ and the available extended detention storage in the pond is 21,015 m³. Therefore, there is sufficient extended detention storage in the facility for the Mattamy Lands East.

5.7.4 Mattamy Lands West

5.7.4.1 Quantity Control

The Mattamy Lands West area will need sufficient on-site storage to prevent the 1:100 year major overland flow from reaching New Greenbank Road. On-site storage will be a combination of street sag storage that will be complemented by a spill-over dry pond to accommodate the 1:100 year major overland flow. Based on the Demonstration Plan (Figure 4-2), the area for these lands is 3.6 ha and has a total imperviousness of 65.3 %. Based on an assumed street sag storage of 50 m³/ha, a major system depth limit of 350 mm and a 1:5 year capture rate of 780 L/s, the 1:100 year simulation results showed that to maximize the street sag storage and prevent cascading onto New Greenbank Road, there is a need for an additional 130 m³ spill-over dry pond as depicted on Drawings SWM-CONV and SWM-EES. Simulation undertaken assumed a dry pond release rate of 100 L/s which combined to the capture rate of 780 L/s met the prescribed flow from the site of 880 L/s (per the allowable release rate of the Draft BSMSSA, Stantec, 2014).

Should detailed design show that the street sag storage can be increased to 90 m³/ha, modelling has showed that there would not be a need for a spill-over dry pond. Detailed design including grading of the Mattamy Lands West will dictate whether a spill-over dry pond is required.

5.7.4.2 Quality Control

The permanent pool of the Clarke Pond was sized based on a drainage area of 119.9 ha at an average imperviousness of 68% (refer to the Clarke Pond Design Brief, JFSA, 2015). By altering the pond catchment characteristics for Mattamy

Lands West from 8 ha of undeveloped to the 3.6 ha of urban development as per the demonstration plan would yield a drainage area of 116 ha at an average imperviousness of 73%. In accordance with Table 3.2 of the MOE SWMPDG, a water quality volume of 229 m³/ha is required for 80% TSS removal, which equates to a permanent pool of ±22,000 m³, excluding the 40 m³/ha of extended detention storage. The Clarke Pond has been designed with a permanent pool of 22,868 m³, and therefore has sufficient capacity to provide water quality control for the Mattamy Lands West.

5.7.5 Brazeau and Drummond Aggregate Extraction Areas

Due to timing of this development, the Brazeau and Drummond aggregate extraction areas have been modelled as two (2) separate drainage areas. In order to restrict the post-development peak flows to the required constraint of 1,300 L/s (Section 5.3.4) at the downstream outlet, an average storage of 365 m³/ha is required across the site. The storage can be provided in a combination of rooftop, surface ponding, ponds or underground.

Assuming that the aggregate areas would be serviced via two (2) separate SWMFs (Section 5.5.3.4), the total on-site quantity storage requirement for the sites is 8,640 m³ on Brazeau lands and 7,300 m³ on Drummond lands.

The outlet trunk storm sewer for the two SWMFs servicing the Aggregate Extraction Areas has been sized based on the allowable release rates from the two sites as per Section 5.3.4. This outlet trunk storm sewer, proposed along Borrisokane Rd, was sized as the minimum diameter (825 mm diameter at 0.17% slope) required to intercept the flow from the two SWMFs to the edge of the 1:100 year floodplain of the Jock River, at which point it will be conveyed in a proposed open watercourse (i.e., Borrisokane roadside ditch) to the Jock River. In order to have sufficient cover, the pipe may have to be constructed under the Borrisokane Road shoulder rather than under the ditch centreline. Should additional lands be required to drain to this outlet trunk storm sewer, such as the ROW of Borrisokane Road and/or adjacent properties, then the 825 mm dia. outlet trunk will need to be resized accordingly at the detailed design stage.

In terms of the on-site storm sewer system required to service the Brazeau and Drummond Aggregate Extraction Areas, a high level gravity sewer system free of submergence was developed based on a normal water level (NWL) assigned to each of the SWMFs. The NWL for the Drummond SWMF and the Brazeau SWM facility were conceptually set at elevation 94.0 m and 94.5 m, respectively, based on the conceptual invert of the 825 mm dia. Borrisokane Rd outlet trunk pipe. For the Brazeau lands, the most upstream storm sewers would vary from 98.0m to 99.5m depending on crossings of the sanitary sewers. Based on a projected cover of 3.0m over the 99.5 m obvert, a grade rise up to 101.5m in the westerly half of the property would be required. For the Drummond lands, the most upstream storm sewer obvert was estimated at approximately 97.65 m, assuming the sanitary sewer would cross above the storm sewers. Based on a projected cover of 3.0m over the 97.65 m obvert, a grade rise up to 100.65 m in the easterly half of the property would be required. Refer to Section 6.3.1 for additional information on required reinstatement elevation for the Aggregate Extraction Areas.

5.8 Analysis of EES Results

5.8.1 BSUEA Site Wide Infiltration with EES

A water budget analysis was carried out as part of the Existing Condition Report (Section B6, Appendix B). This analysis revealed that pre-development infiltration across the BSUEA accounted for 40% of the total precipitation based on long-term simulations. Based on the post-development simulation results, the water budget for the overall BSUEA lands is shown in Table 5-8 below and compared in the table with the existing conditions water budget. The use of the EES along the local road network within the BSUEA lands achieves an infiltration of 44% which is greater than under existing conditions, which shows that infiltration within ±10% of existing is achievable. It should be noted that this analysis has excluded the Brazeau and Drummond properties which have been assumed to integrate measures to promote infiltration and preserve pre-infiltration rates along both properties separately from the remaining BSUEA. Further refinements to the high level infiltration concept, including sizing of the EES, can be investigated during detailed design.

Table 5-8: BSUEA EES Water Budget Results

Water Budget Component	Annual Average Depth (mm)	Budget (%)	Existing Condition Budget (%)
Precipitation	844	100%	100%
Evapotranspiration	231	27%	60%
Infiltration	377	44%	40%
Surface Runoff	225	27%	0%

5.8.2 Minto Lands

5.8.2.1 Major System Cascading and Ponding Levels

The simulated elevations along the major overland system nodes are shown in Table 5-9 and Table 5-10. There is no ponding during the 1:5 year event or 1:10 year event for local/collector roads and arterial roads, while the depth of flow along the major system is maintained to or below 350 mm during the 1:100 year event.

Table 5-9: Minto EES Local and Collector Road Major Node Depths

Major System Node	3 hr Chi 1:5 yr Ponding Depth (mm)	24 hr SCS 1:5 yr Ponding Depth (mm)	3 hr Chi 1:100 yr Ponding Depth (mm)	24 hr SCS 1:100 yr Ponding Depth (mm)
S_110-111	10	10	350	210
S_111-112	10	10	250	30
S_150-152	10	10	210	160
S_152-154	10	10	80	70

Major System Node	3 hr Chi 1:5 yr Ponding Depth (mm)	24 hr SCS 1:5 yr Ponding Depth (mm)	3 hr Chi 1:100 yr Ponding Depth (mm)	24 hr SCS 1:100 yr Ponding Depth (mm)
S_154-156	10	10	200	160
S_156-158	10	10	180	150
S_158-NWP	0	0	310	240
S_170-172	0	0	10	10
S_300-302	10	10	140	90
S_302-304	10	10	220	150
S_313-112	10	10	330	120
S_314-316	10	10	150	100
S_314-316_2	10	10	30	20
S_316-318	10	10	220	150
S_318-364	10	10	110	80
S_320-324	10	10	120	80
S_322-323	10	10	90	70
S_323-324	10	10	260	220
S_330-332	10	10	110	80
S_332-334	10	10	190	140
S_334-336	10	10	260	180
S_336-SWP	10	20	270	210
S_362-360	10	10	120	80

Table 5-10: Minto EES Arterial Major System Flows

Major System Node	3 hr Chi 1:10 yr Ponding Depth (mm)	24 hr SCS 1:10 yr Ponding Depth (mm)	3 hr Chi 1:100 yr Ponding Depth (mm)	24 hr SCS 1:100 yr Ponding Depth (mm)
S_172	0	0	0	0
S_172-174	10	10	80	40
S_174-176	10	10	80	40
S_177	0	0	20	10
S_177-152	10	10	80	40

5.8.2.2 Minor System HGL

The simulated HGL along the minor system is summarized in Table 5-11 below, along with estimated freeboard calculated based on assumed under side of footing (USF) elevation of 2 m below the surface. The calculated freeboards along the trunk storm system are greater than 300 mm as prescribed during the 1:100 year event. HGLs remain below the USF in the climate change event.

Table 5-11: Minto EES Minor System HGL and Freeboards

Minor System Node	1:100 year 3-hr CHI Freeboard (mm)	1:100 year 24-hr SCS Freeboard (mm)	Climate Change Node (mm)
MH_110	2.35	2.35	2.35
MH_111	1.36	1.37	1.26
MH_112	1.44	1.44	1.29
MH_150	1.95	1.95	1.95
MH_152	3.20	3.21	3.17
MH_154	3.19	3.20	3.16
MH_156	2.79	3.39	2.96
MH_158	0.25	0.92	0.40
MH_163	1.37	1.37	1.37
MH_170	2.13	2.12	1.60
MH_172	1.65	1.64	1.43
MH_174	2.33	2.33	2.09
MH_176	1.62	1.62	1.52
MH_177	1.53	1.53	1.53
MH_300	2.12	2.10	2.08
MH_302	3.45	3.06	2.89
MH_304	3.08	2.78	2.65
MH_313	1.78	1.78	1.70
MH_314	0.69	0.66	0.67
MH_316	2.04	2.02	2.03
MH_318	2.44	2.43	2.43
MH_320	0.88	0.69	0.46
MH_321	3.13	2.86	2.73
MH_322	2.03	1.77	1.65

Minor System Node	1:100 year 3-hr CHI Freeboard (mm)	1:100 year 24-hr SCS Freeboard (mm)	Climate Change Node (mm)
MH_323	2.95	2.71	2.61
MH_324	2.00	1.82	1.74
MH_330	3.83	3.71	3.65
MH_332	2.80	2.72	2.69
MH_334	2.33	2.27	2.24
MH_336	3.67	3.58	3.65
MH_360	0.45	0.50	0.18
MH_362	1.80	1.79	1.78
MH_364	2.82	2.80	2.81

5.8.2.3 Water Quality

Infiltration systems are known to be an effective measure to meet the fish habitat protection level as define in the MOE SWMPDG. Table 3.2 of the SWMPDG stipulates that infiltration systems can provide for water quality treatment and up to 80% TSS removal provided that the system is sized with sufficient storage. The requirements for infiltration storage to achieve 80% TSS removal are set out in Table 5-12 below. As can be seen from Table 5-12, the provision of EES within the Minto Lands achieves water quality protection for the lands serviced by the EES. As a result, no further water quality treatment is required.

Table 5-12: Minto EES Water Quality Volumes

Parameter	Value
Total EES Drainage Area (ha)	36.6 ha
Average Imperviousness (%)	66%
Water Quality Volume Required / ha (m^3/ha)	34 m^3/ha
Total Storage Volume in EES (m^3)	5,315 m^3
Total Storage Volume in EES / ha (m^3/ha)	145 m^3/ha

For the remaining of the Minto Lands not serviced by EES (i.e., collector and arterial) but draining to a conventional system, the water quality treatment will be provided by a HDS prior to discharge into the dry pond. The HDS unit is the preferred quality control measure to meet an 80% TSS removal; during frequent events, runoff from the conventional sewer system will be insufficient to maintain flow in a wet pond which could lead to algae bloom and mosquito breeding grounds. Based on the conceptual Storm Sewer Design Sheet under the EES servicing strategy (Appendix F), an AxC ratio of 16.13 is tributary to the HDS. It is

recommended that a commercially distributed unit be selected at detailed design and that design flows be provided to the manufacturer for sizing.

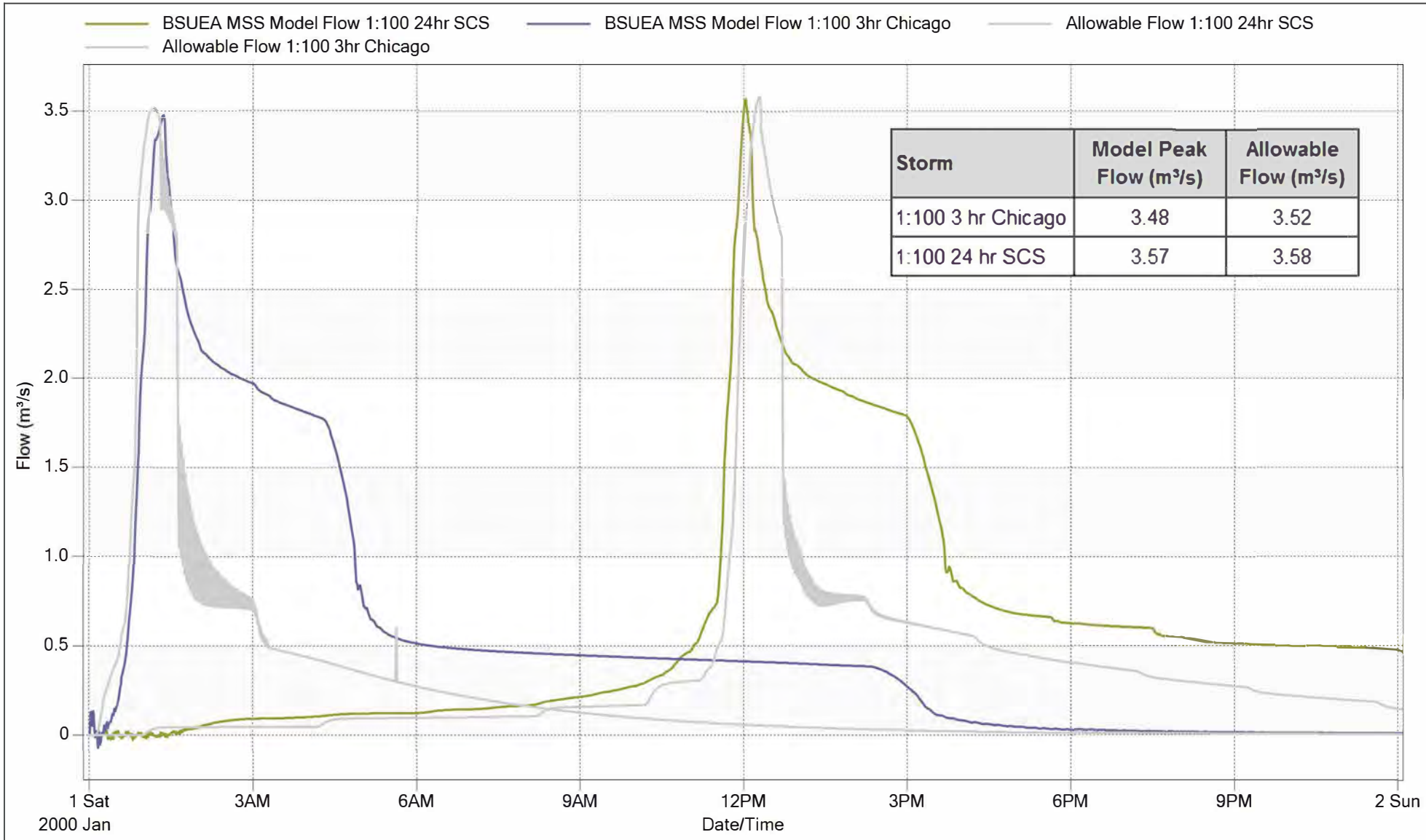
5.8.2.4 Pond Operation

The proposed two (2) dry ponds abutting Greenbank Road are referred to as Dry Pond 1 (northern Dry Pond) and Dry Pond 2 (southern dry pond) as depicted on Drawing SWM-EES. These facilities were sized to limit the post-development flows under the 24 hour - SCS 1:100 year design storm to the prescribed flow of 3,580 L/s allocated to the trunk storm sewer leading to the Corrigan Pond at Manhole MH102 at the intersection of Greenbank Road and Kilbirnie Drive. The above flow allocation also includes the Greenbank Road ROW (from the Barnsdale Road intersection to MH820), an existing undeveloped area of 3.6 ha located east of Greenbank Road, and portions of Quinn's Pointe that discharges at MH820 and MH102. The flow allocation was identified in the IBI servicing report as described in Section 5.3.1.

A comparison of the trunk sewer hydrographs was carried out between those at the downstream end of the combined model of BSUEA and Quinn's Pointe with those in the same sewer section in the IBI analysis. The graphical comparison (refer to Figure 5-6) shows that peak flow rates of the proposed servicing under the EES strategy is consistent with or below the peak flow rates in the IBI analysis. In addition, the analysis of the existing Greenbank Road trunk storm sewer contained in the model shows that during the 1:100 year storm event the Q/Qcap value in the storm sewer is just below 75% indicating that there is additional residual capacity available.

The dry pond discharges through two (2) double ditch inlets which connect into a new sewer loop constructed off the existing trunk storm sewer outlet for the Quinn's Pointe subdivision. The double ditch inlets serve as the pond's outlet and provide a connection that will result in the surcharging of the Quinn's Pointe minor system in a controlled manner vertically into the pond. The connection is proposed to ensure that the invert of Pond 1 is set above the groundwater level in that area. The discharge into the Greenbank Road trunk storm sewer is controlled through an orifice plate on the downstream end of the Quinn's Pointe storm sewer downstream of the pond connection and prior to the connection with the Greenbank Road trunk storm sewer.

In regard to the western spill-over dry pond, its release rate was set to maximize the residual capacity in the downstream storm sewers while meeting the minimum drawdown time of 24 hours as prescribed by the MOE in the SWMPDG. Should the restrictor be susceptible to clogging due to its size, it can be increased at detailed design which would reduce the drawdown time. A summary of key pond parameters are in Table 5-13 below while Drawing SWM-EES presents the Conceptual Pond design.



Storm	Model Peak Flow (m³/s)	Allowable Flow (m³/s)
1:100 3 hr Chicago	3.48	3.52
1:100 24 hr SCS	3.57	3.58

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
MASTER SERVICING STUDY

DRAWING:

Comparison of Flow Rates under EES at Greenbank Road Receiving Sewer

J.L.Richards
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CHECKED:	BP
JLR NO.:	26610

DRAWING NO.:

FIGURE 5-6

Table 5-13: Minto EES Pond Parameters and Results

Pond Parameter	Dry Pond 1	Dry Pond 2	Western Spill-over Pond
Water Quality	Not Required	Not Required	Not Required
Simulated Release Rate (m^3/s)	1.7	0.5	0.33
Pond Invert (m)	95	95.6	100
Pond Top of Bank (m)	95.75	96.8	100.7
Active Storage Depth (m)	0.75	1.2	1.1
Freeboard (m)	>0.3	>0.3	>0.3
Outlet Elevation (m)	95	95.6	100
Outlet Diameter (m)	0.675	0.375	0.4
Drawdown Time (hrs)	6	12	6
Surface Area (ha)	1.5	1.7	1.2

5.8.3 Mattamy Lands East and Mattamy Lands West

The Mattamy Lands East was modelled at the conceptual level as part of the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015) while the minor system of Mattamy Lands West was included in the Draft BSMSSA, Stantec, 2014. Neither of these Reports included an assessment of EES within the storm minor system.

Including the EES within these areas would not alter the stormwater management approach as neither of the Mattamy Lands requires additional water quality control and the MSS designs do not affect major system storage requirements. The use of EES in Mattamy Lands East, however, may improve the downstream HGLs in the Half Moon Bay South subdivision and areas draining to the Todd Pond as exfiltration of clean runoff into the underlying groundwater and esker would be promoted resulting in a reduction in the flow and increase in available capacity in the conventional sewers.

5.8.4 Brazeau and Drummond Aggregate Extraction Areas

The EES has been identified as a suitable strategy on urban development in the BSUEA to achieve distributed infiltration as per the recommendations of Paterson's Existing Conditions Report. Assuming that both aggregate extraction areas are developed as residential, infiltrating clean runoff from local roads can achieve the required infiltration. Alternatively, infiltration galleries could also supplement or replace part of an EES. At detailed design of these properties, the strategy to preserve pre-development infiltration rates will need to be reviewed in consultation with the Geotechnical Engineer once it is known what type of fill material was used to meet the minimum rehabilitation elevations.

5.9 Analysis of Gallery Results

5.9.1 BSUEA Site Wide Infiltration with Gallery

The infiltration gallery servicing Minto's Phase 2 Lands would need to be designed with an equivalent infiltration capacity of that of the EES in order to achieve a water balance similar to that shown in Section 5.8.1. The water balance under the EES would achieve within 10% of the pre-development infiltration under post development conditions. Under the EES strategy, it was considered that comparable infiltration would be achieved pre- to post-development conditions while excluding the aggregate extraction areas that would be assessed on their own.

5.9.2 Minto Lands

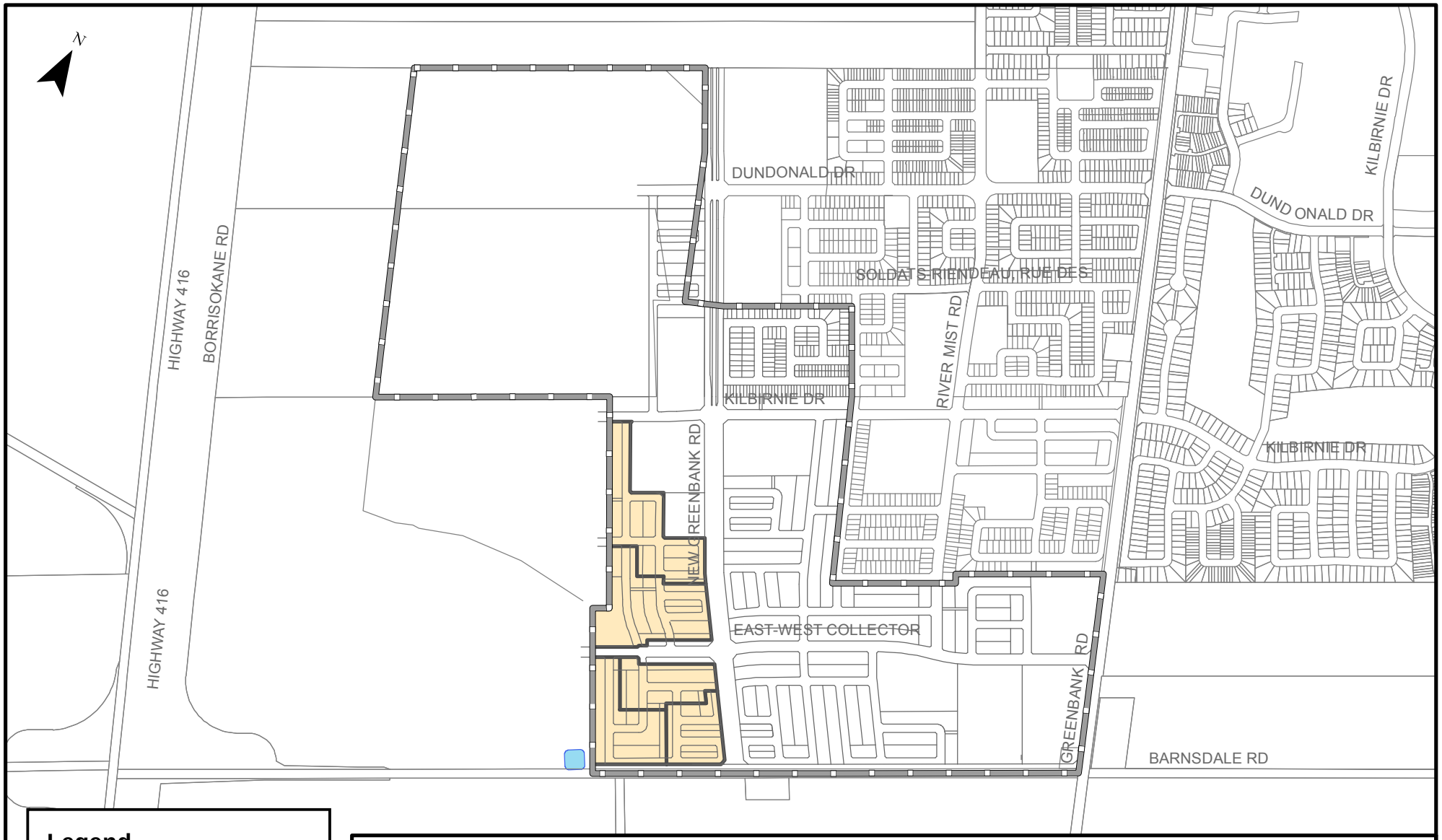
To maintain the same infiltration rate as achieved under the EES servicing approach, the same unit storage volume would have to be accommodated by the infiltration gallery proposed under this servicing alternative. Based on a serviced area of ±13.5 ha (Figure 5-7) and a required storage volume of 145 m^3/ha, the gallery would have to provide an infiltration volume of ±1,870 m^3. The proposed spill-over dry pond could incorporate an infiltration gallery as it is a shallow facility and located in a low-lying area. The spill-over dry pond depicted on Drawing KS2 has a footprint of ±1,200 m^2 and considering perimeter access roads, a block of ±1,350 m^2 would be required to capture major overland flow. The dry pond footprint is, therefore, consistent with the storage volume requirements of the infiltration gallery. This high-level assessment was completed based on the provision of the Storm Tech storage chambers as the infiltration gallery infrastructure. Other equivalent products would be reviewed at detailed design once the exact storage volume and block requirement is found.

Similar to the EES, storage of 145 m^3/ha in an infiltration system is greater than the 34 m^3/ha required under the MOE SWMPDG to achieve 80% TSS removal. Therefore, no further water quality treatment would be required under the infiltration gallery approach. However given that there is a potential for the infiltration gallery to deteriorate with a build-up of sediment, some level of pre-treatment would extent the lifespan of the facility.

5.9.3 Mattamy Lands East and Mattamy Lands West

The Mattamy Lands East was simulated at the conceptual level as part of the Half Moon Bay South – Phase 4 Stormwater Management Report (Stantec, 2015) while the minor system of Mattamy Lands West was included in the Draft BSMSSA, Stantec, 2014. Neither of these Reports included an infiltration gallery in the stormwater management strategy.

Incorporating an infiltration gallery within these areas would not impact the stormwater management servicing approach as neither of the Mattamy Lands requires additional water quality control. The use of an infiltration gallery in Mattamy Lands East, however, may improve the downstream HGLs in the Half



Legend

Service Areas

- Areas Draining Into Potential Infiltration Gallery
- Potential Infiltration Gallery Footprint

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

INFILTRATION GALLERY SERVICE AREA

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DESIGN:	BP
DRAWN:	KTK
CHECKED:	GF
JLR #:	26610

DRAWING #:

FIGURE 5-7

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C InfiltratServiceArea.mxd

Plot Date: February 26, 2018 9:13:29 AM

Moon Bay South subdivision as exfiltration of clean runoff into the underlying groundwater and esker would be promoted resulting in a reduction in the flow conveyed to the Todd Pond which in turn would increase the available capacity in the conventional sewers. However, a block for this purpose would need to be dedicated in the subdivisions to accommodate an infiltration gallery.

5.9.4 Brazeau and Drummond Aggregate Extraction Areas

The use of an infiltration gallery has not been assessed in these areas. The aggregate extraction areas will need to preserve pre-infiltration rates. The strategy to preserve pre-development infiltration rates will need to be reviewed in consultation with the Geotechnical Engineer once it is known what type of fill material was used to meet the minimum rehabilitation elevations.

5.10 Impact of Servicing

5.10.1 Groundwater

Groundwater levels were monitored as part of an extensive monitoring program developed by Paterson. The extent and results have been summarized in their Existing Conditions Report (July 5, 2017). This Report documents the monitoring that spanned between 2015 and 2016.

Data reported in the Existing Conditions Report showed a decrease in the groundwater levels when compared to information compiled in 2011 and 2014 as part of the Quinn's Pointe Subdivision. The higher groundwater levels recorded in 2011 and 2014 resulted from surface water ponding over a clay lens immediately south of Quinn's Pointe. Surface water ponding was created by fill material that was placed on the Quinn's Pointe property which caused a barrier to sheet flow and temporary ponding over the clay area. The boreholes were placed adjacent to the ponded zone that produced artificially high groundwater levels due to the temporary perched water. Once the fill material on the Quinn's Pointe development was removed, the perched water was able to dissipate. It is the opinion of the hydrogeologist that groundwater measurement differences are not attributed to the construction of servicing in the adjacent Quinn's Pointe development but more so as a result of site alteration.

During the preparation of the Existing Conditions Report, it was acknowledged that sewers installed below the groundwater levels (2015 and 2016) could be designed at detailed design with mitigating measures. However, the City also acknowledged that compacted granular 'A' along sewers installed within the groundwater would provide an impediment to groundwater flow provided that the native material exhibits a greater hydraulic conductivity. Should sewers be installed within areas of high groundwater table with lower hydraulic conductivities than compacted granular 'A', the following mitigation measures could be utilized;

- Concrete pressure pipe (CPP);
- Higher class PVC pipes;
- Higher percentage silica fume in maintenance hole structures; and

- Cretex seals in maintenance holes.

It should be noted that at some locations along the minor system in the EES servicing option, the groundwater table is estimated to approach the underside of the EES temporarily during periods of high groundwater. Guidance on the EES recommends that there is sufficient clearance from the underside of the EES to the groundwater table, which is achieved during normal operations. The EES has been designed to store runoff from up to the 22mm rainfall event. Storage of up to the 22 mm rainfall event would still be possible if there is a temporarily high groundwater table and infiltration would continue when groundwater levels lower.

5.10.2 Impact of Servicing on Municipal Drains

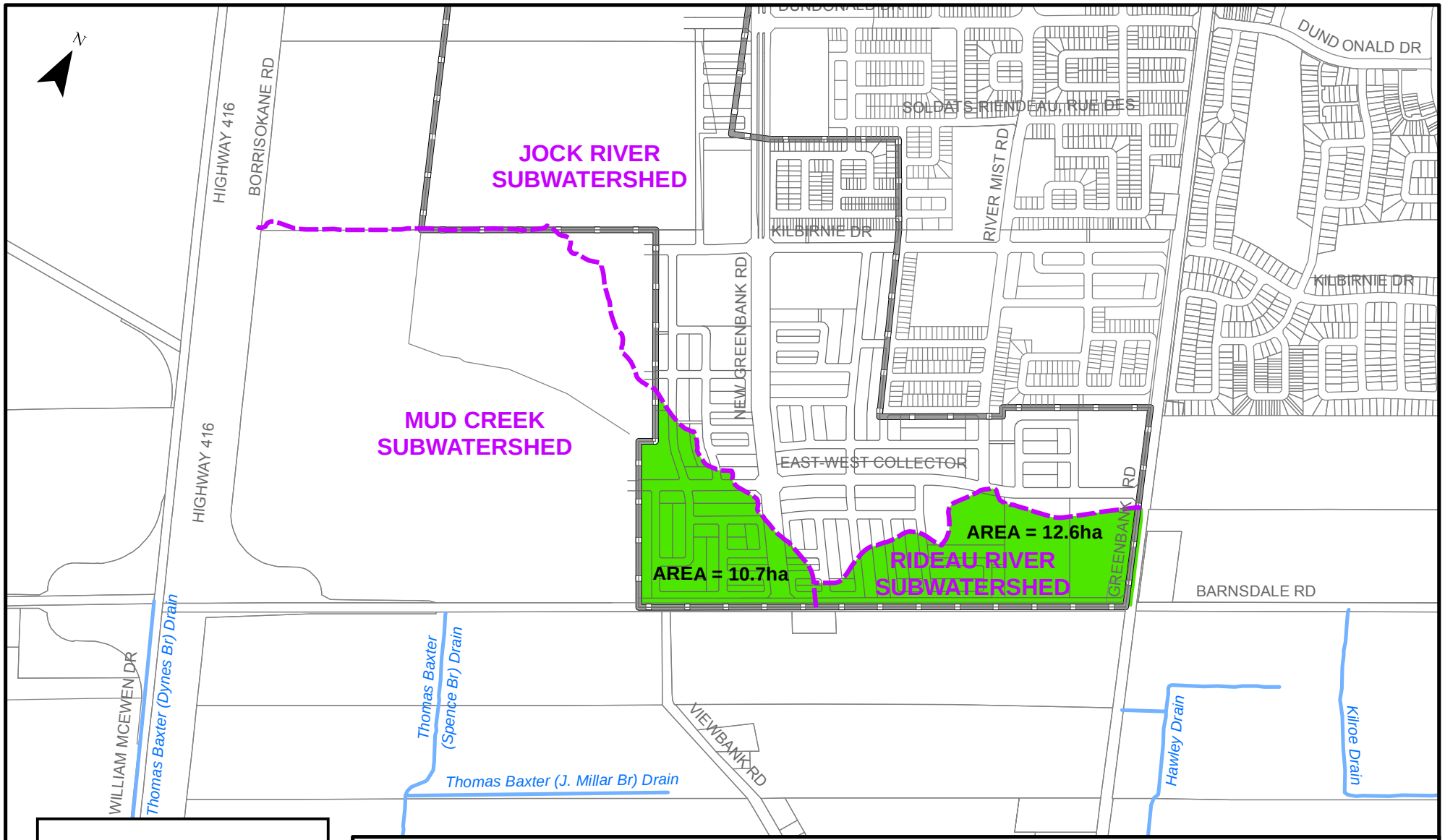
The review of topography had revealed that parts of the BSUEA lands are tributary to the Thomas Baxter (Dynes Branch) Municipal Drain and to the east, the Hawley Municipal Drain, which outlets to the Hawkins Municipal Drain. Tables 5-3 and 5-5 of the Existing Condition Report (Appendix B) summarized the tributary area and simulated flows to boundary culverts leading to both Municipal Drains. As reported in these tables, culverts BDR-C3 and BDR-C4 were found to convey flows for an area of 84.2 ha from which only 10.7 ha accounts for the BSUEA lands. Similarly, culvert BDR-C7 was found to convey flows for an area of 12.6 ha, which is predominately from the BSUEA lands excluding a small 1.5 ha catchment along Barnsdale Road.

Given the hydraulic conductivity of the native soils, the implementation of distributed infiltration for the first 22 mm of runoff would ensure that pre-development groundwater flows and drainage boundaries are preserved at each of the sub-catchments. Hence, incorporating an EES would allow for the hydrological regime to be maintained at each of the municipal drains for frequent events up to 22 mm. Under events in excess of 22 mm, the recommended servicing strategy presented herein will redirect flow from the municipal drains to the Jock River (via the Greenbank Road trunk storm sewer). Hence, the overall area to either Municipal Drain will be slightly reduced as depicted in Figure 5-8.

Table 5-14 summarizes the simulated flows under pre- and post-development conditions for flows to the Thomas Baxter Municipal Drain and boundary culvert BDR-C7.

Table 5-14: Hydrological Simulation Results at Culvert Locations (12 hour - SCS Type II Storm)

Culvert ID	Flow (m^3/s) at culvert location for return period (recurrence in years)					
	1:2	1:5	1:10	1:25	1:50	1:100
To Thomas Baxter (Pre)	0.2	0.5	0.7	1.1	1.3	1.6
To Thomas Baxter (Post)	0.2	0.4	0.6	1.0	1.2	1.5
BDR-C7 (Pre) to Hawley/Hawkins	0.1	0.1	0.1	0.2	0.3	0.4
BDR-C7 (Post) to Hawley/Hawkins	0.0	0.0	0.1	0.1	0.1	0.1



Legend

- Subwatershed Limits
- Municipal Drains
- Land removed from subwatershed limits for municipal drain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
OTTAWA, ONTARIO

DRAWING:

CHANGES TO MUNICIPAL DRAIN DRAINAGE AREAS

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JLR #:	26610

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FIGURE 5-8

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Plot Date: February 23, 2018 11:10:01 AM

The simulated flows to Mud Creek under pre and post conditions (Table 5-14) show that there is a reduction in flows to the Thomas Baxter drain of around 0.1 m³/s in larger events and negligible reductions in flow in the frequent events. There is a greater reduction in flows draining towards the Municipal Drain through culvert BDR-C7.

5.11 Storm Servicing Evaluation

As presented above in this section, high level storm and stormwater management servicing was developed such that:

- Sizing of the storm sewer system meets or exceeds the minimum level of service of the OSDG;
- A minimum 300 mm freeboard is provided along the minor system with the exception of a few locations within the Mattamy Lands East;
- A major overland flow route is provided throughout the BSUEA lands safely convey major overland flow to the end-of-pipe facilities;
- Major overland flow is not conveyed across New Greenbank Road; and
- Major overland flow depths less than 350 mm are provided within the BSUEA lands.

The minor and major systems presented herein have been evaluated based on a series of criteria and summarized in Table 5-15.

Table 5-15: Storm Servicing Evaluation

Issue	Aspects	Advantages
Geotechnical Issues and Construction Risks	Potential for poor soils/rock/elevated groundwater table etc.	There is potential for the storm sewers to be close to the water table in the south east corner of the study area
Infrastructure Requirements	Extent of works required	Works are contained to those within the BSUEA
Phasing and Scheduling	Integration with development phasing	SWMFs will be required to be installed first
Property Acquisition / Land Use	Ease of property acquisition / compatibility with demonstration plan	Servicing is contained within proposed corridors and servicing parcels
System Flexibility	Ability to adapt to changes in demonstration plan	Sewers can adapt to ROW corridor changes. SWMFs required at low points
Displacement of existing land uses	Effects in removal of existing communities	All work within BSUEA
Disruption to existing land uses	Extent of works affecting existing communities	All work within BSUEA

Issue	Aspects	Advantages
Consistency with City Infrastructure	Compatibility with the OSDG and IMP	Adheres to local and provincial design guidelines
Impact on Significant Natural Features	Loss of natural areas due to servicing	Adheres to land use and demonstration plans
Impact on Aquatic Systems	Potential impact of water quality in receiving watercourses	Achieves required water quality standards
Impact on Surface Water and Groundwater	Minimization of works in waterbodies or in the groundwater table	May extend into the groundwater table in the south east of the site
Impact on esker	Preservation of pre-infiltration levels and achievement of distributed infiltration	The EES is the preferred servicing alternative to minimize the impact on the esker
Effects on Urban Green Space, Open Space and Vegetation	Disruption or loss of green space or trees due to servicing	Adheres to land use and demonstration plans
Efficiency of Proposed Infrastructure	Use of existing or combined corridors	Services are contained within combined corridors
Efficiency with Existing Infrastructure	Use of existing infrastructure or capacity	Utilizes residual capacity in existing infrastructure
Issue	**Aspects**	**Disadvantages**
Operational Impacts	Extent of maintenance intensive infrastructure	The use of the EES will increase maintenance. However, this has been limited in the design
System Reliability	Level of redundancy within system	EES may become clogged if not maintained, no direct overflow watercourse
Capital Costs	Initial Construction Cost	Increased capital cost of using EES compared to conventional sewers
Operating Costs	Ongoing operation and maintenance requirements	Increased maintenance of using EES compared to conventional sewers

5.12 Storm Summary and Recommendations

This section of the MSS has presented two (2) storm servicing options, one including a conventional storm system while an alternate servicing solution was developed incorporating an EES. Both servicing options were reviewed and their performance analyzed against the OSDG and other provincial guidelines. The conceptual design outlined above was found to fulfill the following:

- Achieves the prescribed flow rate along the Greenbank Road trunk storm sewer tributary to the Corrigan Pond (refer to Figure 5-5 and Figure 5-6 for peak flow comparisons);
- Achieves 300 mm freeboard across the BSUEA;
- Achieves flow depths of 350 mm along the major system of the BSUEA; and,
- Achieves infiltration levels, under the EES, comparable to existing levels. It is recommended that the analysis be refined at detailed design. Under the conventional system, the target to achieve distributed infiltration and preserve pre-infiltration levels is met.

It is recommended that storm servicing in the BSUEA be carried out using the EES on local roads and conventional storm sewers equipped with downstream HDS along collector and arterial roads. This recommended servicing strategy would fulfill; i) the enhanced water quality protection level, ii) achieve distributed infiltration and preserve pre-infiltration levels, iii) meet the prescribed peak flow rates prior to discharge into the Greenbank Road trunk sewer system.

In addition, it is recommended that the EES be approved for the initial phase of the development for both Minto and Mattamy to assess operation of the system. Consequently, it is recommended that the performance of the EES be assessed via flow monitoring as part of the initial phase of both builders (Minto and Mattamy) (Section 5.5.1.8). The extent and details of flow monitoring should be discussed with the City as part of the design stage of the initial phase of both builders (Minto and Mattamy). Should the flow monitoring identify deficiencies with the EES then storm servicing with infiltration galleries can be further investigated for implementation in Phase 2.

5.12.1 Stormwater Management

The overall approach to stormwater management is to combine the EES with the conventional storm system to ensure that the pre-infiltration levels are preserved. Calculations have revealed that the EES along local roads are sufficient in meeting MOE's enhanced protection level; however, a HDS would be required along collectors and arterials to meet the 80% TSS removal. Since quality control with the EES is provided along the ROWs, the end-of-pipe facilities abutting Greenbank Road would be dry ponds.

5.12.2 Storm Sewer Design

The proposed storm sewers within the BSUEA are designed to accommodate the 1:5 year capture rate under free flow conditions. The existing Quinn's Pointe storm sewer system can accommodate the 1:2 year peak flows from the BSUEA (Minto Lands) without any surcharge.

6.0 Wastewater Servicing

6.1 Background

The wastewater collection system for the BSUEA has been designed to convey wastewater to existing or planned gravity sanitary sewers in the BSC, which all eventually outlet to the Greenbank Road 900 mm diameter trunk sanitary sewer. The Greenbank Road trunk sanitary sewer ultimately discharges to the South Nepean Collector (SNC) and to the West Rideau Collector (WRC) which, in turn, outlets to the Robert O. Pickard Environmental Centre (ROPEC) where wastewater is processed and treated prior to discharge into the Ottawa River.

The existing BSC is currently serviced by existing trunk sanitary sewers located along Greenbank Road, Cambrian Road and River Mist Road, as shown on Figure 6-1. There are also trunk sanitary sewers that have yet to be constructed in the BSC, in accordance with the Draft 2014 BSMSSA. These planned sewers are located along the future Cambrian Road extension, New Greenbank Road, and the Future Collector Road located west of New Greenbank Road, as shown on Figure 6-1.

The wastewater servicing strategy for the BSUEA was developed to respect the integrity of the existing downstream system in regard to the known minimum residual capacities in the downstream trunk sanitary sewers. These critical residual capacities are summarized in Table 6-1 in terms of the three main trunk sewers in the BSC.

Table 6-1: Critical Residual Capacity in Existing Trunk Sanitary Sewers

Existing Trunk Sanitary Sewer	Limiting Pipe Reach	Residual Capacity
Cambrian Road	MH 13A to MH15A	51.4 L/s
River Mist Road	MH 102A to MH 17A	14.4 L/s
Greenbank Road	MH 45 to MH 435A	295.4 L/s

Section B7.1.1 of the Existing Conditions Report (Appendix B) should be reviewed for additional information regarding the existing and planned trunk sanitary sewers in the BSC.

6.2 Wastewater System Servicing

6.2.1 Design Criteria

Trunk sanitary sewers servicing the BSUEA were designed in accordance with the following criteria:

- Residential average flow rate 280 L/capita/day
- Commercial/Institutional average flow rate 28,000 L/ha/day
- Residential peaking factor Harmon formula

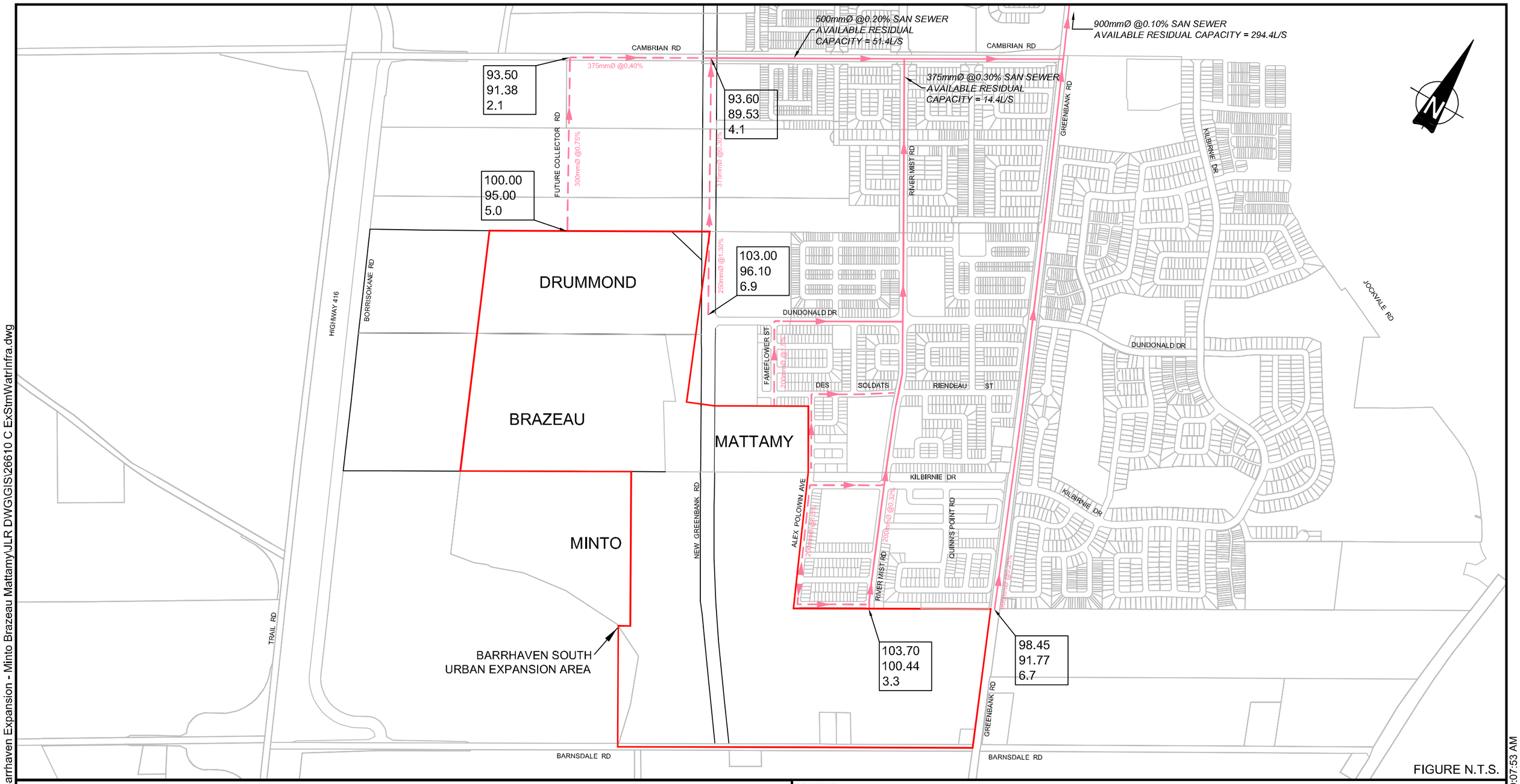

FIGURE N.T.S.

LEGEND

- EXISTING SANITARY SEWER
- PLANNED SANITARY SEWER

98.45
91.77
6.7

EXISTING GROUND
SANITARY SEWER OBVERT
COVER DEPTH (m)

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

EXISTING AND FUTURE SANITARY SEWER INFRASTRUCTURE

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DRAWING NO.:	FIGURE 6-1

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PLOT DATE: September 12, 2017 9:07:53 AM

- Commercial/Institutional peaking factor 1.5[2]
- Infiltration allowance 0.33 L/s/ha
- Manning roughness coefficient 0.013
- Minimum velocity 0.6 m/s
- Maximum velocity 3.0 m/s

It is understood that the majority of the aforementioned design criteria deviate from the City of Ottawa 2012 Design Guidelines. However, it was confirmed by the City via email on December 6, 2017 (copy attached in Appendix J) that these revised criteria shall be applied to the design of the BSUEA MSS wastewater sewer system and to the existing downstream systems. In recent discussions with City staff, the MSS design team was advised that the City intends issuing these revised criteria as part of a forthcoming Technical Bulletin expected for early 2018.

6.2.2 Wastewater Flows

Theoretical residential wastewater peak flows generated in the BSUEA were calculated based on population forecasts obtained using the projected number of residential units in the BSUEA and corresponding population densities prescribed in the 2012 Design Guidelines. Total residential units counts were adopted from the BSUEA CDP for the Minto and Mattamy lands. As the unit values reported in the CDP document were expressed in terms of net area (36 units per net ha), an equivalent density of 63.9 persons/gross ha was used in order to calculate wastewater flows and size the sanitary sewers.

Table 6-2: Residential Densities

Residential Type	Number of Units	Population per Unit[3]
Detached	660 units	3.4
Multiple-Attached	420 units	2.7
Apartments (or similar density)	120 units	1.8
	1200 units	

Based on the land uses presented on the Demonstration Plan (Figure 4-2), theoretical peak wastewater flows for the BSUEA were calculated and are summarized in Table 6-3 below. To estimate the total amount of housing and ICI lands for the Aggregate Extraction Areas, the same ratios of roads, ICI and residential housing land uses as those used for the Minto and Mattamy lands, and outlined in the CDP, were assumed (park and ride was excluded). The Minto area/unit ratios were then applied to the residential lands portion of the Aggregate Extraction Areas to estimate the total number of units. The Park and Ride block

[2] *ICI Peak Factor = 1.5 when ICI contributing area >20%, 1.0 if ICI in contributing area is <20%.
[3] Densities are in accordance with Section 4.3 of the 2012 Design Guidelines.

was assumed to have 4 washbasins that deliver 375 L/d and four (4) water closets that generate 150 L/hr for 10 hr/day resulting in a total flow of 7500 L/day.

Table 6-3: Land Use and Theoretical Wastewater Flows

Land Use	Flow Rate	Area (ha)	Units	Pop.	Average Flow (L/S)	Peak Factor	Infiltration	Total Flows (L/s)
Minto and Mattamy Lands								
Schools	28,000 L/ha/d	4.55			1.50	1.5	1.50	3.8
Park Block	4 L/s	4.39			4.0	1	1.45	5.5
Commercial	28,000 L/ha/d	2.13			0.70	1.5	0.70	1.8
Low-Medium density Residential	280 l/c/d	35.26	1080	3378	11.0	2.92	11.64	43.6
High Density Residential	280 l/c/d	0.90	120	216	0.7	3.51	0.30	2.8
Roads	-	27.00				1	8.91	8.9
Park and Ride		2.57			0.1	1	0.85	1.0
Total		**76.8**	**1200**	**3594**	**17.95**		**25.35**	**67.4**
Brazeau Aggregate Extraction Area								
Schools	28,000 L/ha/d	1.47			0.48	1.5	0.49	1.2
Commercial	28,000 L/ha/d	0.67			0.22	1.5	0.22	0.6
Low-Medium Density Residential	280 l/c/d	10.27	360	1126	3.65	3.21	3.39	15.1
High Density Residential	280 l/c/d	0.28	38	68	0.22	3.63	0.09	0.9
Roads	-	7.95				1	2.62	2.6
Park Block	-	1.48				1	0.49	0.5
Pond Blocks	-	1.78				1	0.59	0.6
Total		**23.9**		**1194**	**4.57**		**7.89**	**21.5**
Drummond Aggregate Extraction Area								
Schools	28,000 L/ha/d	1.25			0.41	1.5	0.41	1.0
Commercial	28,000 L/ha/d	0.57			0.18	1.5	0.19	0.5
Low-Medium Density Residential	280 l/c/d	8.72	288	900	2.92	3.26	2.88	12.4
High Density Residential	280 l/c/d	0.24	32	58	0.19	3.64	0.08	0.8
Roads	-	6.75				1	2.23	2.2

Land Use	Flow Rate	Area (ha)	Units	Pop.	Average Flow (L/S)	Peak Factor	Infiltration	Total Flows (L/s)
Park Blocks	-	1.26				1	0.42	0.4
Pond Blocks	-	1.51				1	0.50	0.5
Total		**20.3**		**958**	**3.70**		**6.71**	**17.8**
Barrhaven South Urban Expansion Area Totals								
Total		**121.0**		**5746**	**26.22**		**40.0**	**106.7**

Based on the land uses presented on the Demonstration Plan (Figure 4-2), the BSUEA would generate a peak wastewater flow of approximately 106.7 L/s.

6.3 Wastewater Collection System Strategy

6.3.1 Proposed Sewer System Layout and Sizing

A trunk sanitary sewer system layout was developed based on the ROW corridors identified on the BSUEA Demonstration Plan for the purposes of demonstrating the feasibility of providing wastewater servicing for the BSUEA lands, refer to the Key Servicing Plans. Proposed trunk sanitary sewers were sized based on the aforementioned design criteria and the drainage areas depicted on the Master Sanitary Drainage Area Drawing MSAN, refer to the BSUEA Sanitary Sewer Design Sheet (Appendix J) for detailed calculations. Final configuration and sizing of the wastewater collection system will be confirmed at detailed design of each subdivision stage. At such time, refinements may be implemented.

The proposed BSUEA trunk sanitary sewers will discharge to existing/planned sanitary sewers at the following six (6) locations, as shown on Figure 6-2:

1. The Future Collector Road
2. New Greenbank Road
3. Flameflower Street
4. Alex Polowin Avenue
5. Kilbirnie Drive
6. Greenbank Road

500mmØ @0.20% SAN SEWER
AVAILABLE RESIDUAL
CAPACITY = 51.4L/S
(PRIOR TO BSUEA)

900mmØ @0.10% SAN SEWER
AVAILABLE RESIDUAL CAPACITY = 294.4L/S
(PRIOR TO BSUEA)

375mmØ @0.30% SAN SEWER
AVAILABLE RESIDUAL
CAPACITY = 14.4L/S
(PRIOR TO BSUEA)

CAMBRIAN RD

FUTURE COLLECTOR RD

HIGHWAY 416

BORRISOKANE RD

GREENBANK RD

RIVER MIST RD

KILBIRNIE DR

JOCKVALE RD

DUNDONALD DR

PAMEFLOWER ST

DES SOLDATS

RIENDEAU ST

ALEX POLOWIN AVE

QUINN'S POINT RD

TRAIL RD

BARNSDALE RD

DRUMMOND

BRAZEAU

MATTAMY

MINTO

BARRHAVEN SOUTH
URBAN EXPANSION AREA

20 ha / 1

24 ha / 2

4 ha / 2

4 ha / 3

5 ha / 4

6 ha / 5

60 ha / 6

① ② ③ ④ ⑤ ⑥

FIGURE N.T.S.

LEGEND

- EXISTING SANITARY SEWER
- PLANNED SANITARY SEWER
- 60 ha / 6 — AREA (ha) / OUTLET NUMBER

PROJECT: BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING: OVERALL SANITARY DRAINAGE AREAS

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PLOT DATE: May 3, 2018 11:57:22 AM

6.3.1.1 Future Collector Road (west of new Greenbank Road) Outlet

The Drummond Aggregate Extraction Area will be serviced by a connection (at MA11) to the planned trunk sanitary sewer on the Future Collector Road. This planned trunk sanitary sewer will outlet to the planned Cambrian Road trunk sanitary sewer, located west of New Greenbank Road, as identified in the 2014 BSMSSA. The proposed BSUEA sanitary sewer system within the Drummond property was conceptually sized to be 200 mm in diameter with a slope of 0.35% assuming that the development of the Aggregate Extraction Area would generally consists of a residential land usage. Although a demonstration plan is not currently available for this area, a high level trunk sanitary sewer layout was developed for the property.

Per the Draft 2014 BSMSSA, the specified obvert elevation of 95.00 m at maintenance hole MA11, which is located at the northern limit of the BSUEA, is proposed to be respected. Based on this outlet obvert elevation and based on a high level sewer layout concept, which would cross above the future storm sewer system, an upstream obvert elevation of 99.20 m would result at MH 593 within the southeastern corner of the Drummond Aggregate Extraction Area. As discussed in Section 5.7.5, the existing Drummond Aggregate Extraction Area must be reinstated to a minimum elevation of 104.0 m. Allowing for a 3.0m cover over the sanitary sewer system, would require a reinstated elevation of approximately 102.2m, which would still be within the minimum required reinstatement elevation of 104.0 m.

6.3.1.2 New Greenbank Road Outlet

The Brazeau Aggregate Extraction Area will be serviced by a connection (at MA14) to the planned trunk sanitary sewer on the New Greenbank Road. This planned trunk sanitary sewer will outlet to the existing Cambrian Road trunk sanitary sewer, located east of New Greenbank Road, as identified in the 2014 BSMSSA.

The proposed BSUEA sanitary sewer system within the Brazeau property was conceptually sized to be 250 mm in diameter with a slope of 0.24% assuming that the development of the Aggregate Extraction Area would generally consists of a residential land usage. Although a demonstration plan is not currently available for this area, a high level sanitary sewer layout was developed for the property.

Per the Draft 2014 BSMSSA, the specified obvert elevation of 96.10 m at maintenance hole MA14, which is located at the northern limit of the BSUEA, is proposed to be respected. Based on this outlet obvert elevation and based on the high level sewer layout developed for the site, an upstream sanitary sewer obvert elevation of 98.55 m would result at MH 585 within the southwest corner of the Brazeau Aggregate Extraction Area.

As discussed in Section 5.7.5, the existing Brazeau Aggregate Extraction Area must be reinstated to a minimum elevation of 97.0 m. However, when accounting for a 3.0 m cover over the sanitary sewers in the westerly half of the property, a minimum reinstated elevation of approximately 101.55 m would be required. Similarly, when accounting for a 3.0 m cover over the storm sewer system (as

described in Section 5.7.5) in the easterly half of the site, a minimum reinstated elevation of approximately 102.5 m would be required. Per the available existing topography of the Brazeau lands, the lowest topography appears to be approximately 98.0 m. Consequently, to service the Brazeau Aggregate Extraction Area with gravity sewers, with an allowable 3.0 m cover, it is anticipated that some areas may require as much as 4.5 m of fill.

Wastewater generated by Mattamy Lands West, will outlet to the planned 250 mm diameter sanitary sewer on New Greenbank Road at MA14. The planned New Greenbank Road sanitary sewer will discharge to the Cambrian Road trunk sanitary sewer as per the Draft 2014 BSMSSA.

A southerly extension of the 250 mm diameter New Greenbank Road trunk sanitary sewer will be required to service the proposed BSUEA tributary area. A new trunk sanitary sewer segment is proposed from MH 900 to MA14, as shown on the Key Servicing Plan. This proposed sewer segment is much shallower than the planned portion of the trunk downstream of MA 14 where cover depth is in the range of 6.9 m. The proposed sewer segment will have a proposed cover depth of 7.43 m.

6.3.1.3 Flameflower Street Outlet

The 2 ha commercial block located west of New Greenbank Road as well as a 2 ha portion of Mattamy Lands East will be serviced by a connection to the existing 200 mm diameter sanitary sewer located on Fameflower Street at MH EX 217. The existing Fameflower street sewer conveys wastewater to the Dundonald Drive sanitary sewer which ultimately outlets to the existing River Mist Road trunk sanitary sewer.

A 200 mm diameter local sanitary sewer is proposed to service the residential and commercial development. A drop maintenance hole is expected at MH 920 due to the relatively high elevation of the commercial block and New Greenbank Road compared to the residential development, as shown on the Master Grading Plan, Drawing MG1.

6.3.1.4 Alex Polowin Avenue Outlet

Wastewater generated by 5 ha of Mattamy Lands East will be conveyed to the existing 200 mm diameter sanitary sewer on Alex Polowin via two (2) connection points: MH EX153 and MH EX158. The existing Alex Polowin sewer will convey wastewater northerly to the Des Soldats Reindeau Street sanitary sewer which ultimately outlets to the River Mist Road trunk sanitary sewer.

Two (2) parallel local 200 mm diameter sanitary sewers are proposed to convey wastewater generated in the BSUEA tributary area to the proposed outlet locations.

6.3.1.5 Kilbirnie Drive Outlet

Residential development and the school fronting the Kilbirnie Drive extension as well as the northern portions of Alex Polowin (south of Kilbirnie) and Street 1, in the Minto Lands, will be serviced by a connection at MH 10 to the existing 200 mm

diameter sanitary sewer along Kilbirnie Drive. The existing Kilbirnie Drive local sanitary sewer conveys wastewater easterly to the River Mist Road trunk sewer.

The Kilbirnie Drive outlet is proposed as a result of the naturally low-lying area at the intersection of Kilbirnie Drive and Street 1 relative to the rest of the Minto Lands. If this naturally low-lying area were to be serviced via a sanitary sewer network to the south, then the sanitary sewer would have to be excessively deep or extensive amounts of fill would be required.

6.3.1.6 Greenbank Road Outlet

Wastewater generated by the majority of the Minto Lands (i.e., 59.86 ha) will outlet to the existing 600 mm diameter Greenbank Road trunk sanitary sewer at existing MH 120. This includes some wastewater generated in the existing Quinn's Pointe development (1.14 ha) which will be redirected away from the River Mist Road trunk sanitary sewer to the Greenbank Road trunk sanitary sewer via the proposed BSUEA sanitary sewers. Wastewater conveyed by sewer reaches on Alex Polowin (MH EX13 - EX14) and Russet Terrace (MH EX14 - EX5) will be conveyed in a southerly direction along a new sanitary sewer on River Mist Road. The purpose of this diversion is to increase the available capacity in the River Mist Road trunk sanitary sewer in order to accommodate additional BSUEA peak flows.

Wastewater generated in the BSUEA will be conveyed to the Greenbank Road trunk via two main trunk sanitary sewers: i) along the East-west Collector, and ii) along the southern limit of the BSUEA and Barnsdale Road. As shown on the Master Sanitary Drainage Area Plan, generally most Minto Lands to the north of the East-west Collector will outlet to the East-west Collector trunk while Minto Lands to the south of the East-west Collector will outlet to the trunk sewer located along the southern limit of the BSUEA and Barnsdale Road. Both trunk sanitary sewers range in size between 200 mm and 450 mm in diameter.

An extension of the existing Greenbank Road trunk sanitary sewer is required to provide the necessary connections to the proposed BSUEA trunks. A 525 mm diameter trunk will convey wastewater along Greenbank Road from Barnsdale Road to the East-West Collector (MH 538-119) and a 600 mm diameter trunk sewer will convey wastewater from the East-West Collector to the existing sewer at MH EX120.

6.4 Impact of BSUEA Flows on Downstream System

Sanitary sewer design sheets were compiled for the BSC trunk wastewater collection system to verify the impact of the additional flow generated by the BSUEA on the existing downstream sewer system (refer to Appendix J). With the addition of the BSUEA lands, the calculated theoretical peak wastewater flows were found to be within the available residual capacities of the existing downstream sanitary sewers. Consequently, no further infrastructure improvements are required along the existing downstream system in the BSC. Table 6-4 provides a summary of the impact of the BSUEA on the available residual capacities in terms of the three main existing trunk sanitary sewers in the BSC.

It is noted that the residual capacity in the River Mist Road trunk sanitary sewer has in fact increased with the addition of the BSUEA peak flows. This is the result of adding a relatively small tributary area while reducing the average daily residential flow from 350 L/cap to 280 L/cap combined with diverting some existing drainage areas, located in Quinn's Pointe, away from the outlet.

Table 6-4: Residual Capacity Comparison in the BSC Trunk Sanitary Sewers

Existing Trunk Sanitary Sewer	Limiting Pipe reach	Current Minimum Residual Capacity	Proposed BSUEA Tributary Lands	Proposed BSUEA Tributary Area	Revised Minimum Residual Capacity with inclusion of BSUEA Peak Flow
Cambrian Road	MH 13A to MH15A	51.4 L/s	Drummond, Brazeau, Mattamy West (Residential only)	48 ha	52.9 L/s
River Mist Road	MH 102A to MH 17A	14.4 L/s	Mattamy East, Mattamy West (Commercial only), Northwest corner of Minto	12 ha	30.5 L/s
River Mist Road	MH 1 to MH 163	5.58 L/s	Minto	5 ha	4.63 L/s
Greenbank Road	MH 45 to MH 435A	295.4 L/s	Minto	60 ha	283.2 L/s

With the addition of the BSUEA lands, a total theoretical peak wastewater flow of 403.7 L/s was calculated at the most downstream maintenance hole in the BSC (MH 501A on Greenbank Road), as indicated in the Sanitary Sewer Design Sheet in Appendix J. This calculated theoretical peak flow is less than the 590 L/s allocated for all of the BSC in Stantec's City-wide 2013 Wastewater Collection System Assessment. In this assessment, Stantec created a hydrodynamic model of trunk sanitary sewers (450 mm in diameter and greater) which demonstrated that the existing downstream trunk system could accommodate the theoretical flow of 590 L/s generated by the BSC with no risk of surcharging or basement flooding. Consequently, Stantec concluded that system upgrades were not required to accommodate the anticipated growth in the BSC. Since the Stantec assessment considered a peak flow that was 186 L/s greater than that calculated for the BSC and the BSUEA combined, it is understood that the existing trunk sanitary sewers located downstream of the BSC can accommodate the additional flows generated by the BSUEA.

6.5 Detailed Wastewater Servicing Evaluation

The wastewater collection system presented on Drawing DSAN and associated design sheets has been conceptually sized to comply with the City's revised December 6, 2017 design criteria and to respect the integrity of the existing systems. The proposed wastewater collection system has been evaluated based on a series of criteria and summarized in Table 6-5.

Table 6-5: Wastewater Servicing Evaluation

Issue	Aspects	Advantages
Geotechnical Issues and Construction Risks	Potential for poor soils/rock/elevated groundwater table, etc.	There is potential for the wastewater system to be close to the water table in the south east corner of the study area
Infrastructure Requirements	Extent of works required	Works are required outside the BSUEA but are limited to upgrading of planned infrastructure
Operational Impacts	Extent of maintenance intensive infrastructure	Conventional wastewater system with no additional pumps or treatment facilities
Phasing and Scheduling	Integration with development phasing	Multiple points of connection allow flexibility with phasing.
Property Acquisition / Land Use	Ease of property acquisition / compatibility with demonstration plan	Servicing is contained within proposed ROW corridors and servicing parcels, except an easement parallel to Barnsdale Road.
System Reliability	Level of redundancy within system	Overflow is provided to a SWMF
System Flexibility	Ability to adapt to changes in demonstration plan	Wastewater collection system can adapt to ROW corridor changes. However, connection points with the existing infrastructure are fixed
Displacement of existing land uses	Effects in removal of existing communities	All work within BSUEA
Disruption to existing land uses	Extent of works affecting existing communities	All work within BSUEA
Consistency with City Infrastructure	Compatibility with the OSDG and IMP	Adheres to local and provincial design guidelines

Issue	Aspects	Advantages
Impact on Significant Natural Features	Loss of natural areas due to servicing	Adheres to land use and demonstration plans
Impact on Aquatic Systems	Potential impact of water quality in receiving watercourses	No receiving watercourses or watercourses affected during construction
Impact on Surface Water and Groundwater	Minimization of works in waterbodies or in the groundwater table	No watercourses affected during construction. Groundwater in south-east corner may be affected depending on depths
Effects on Urban Green Space, Open Space and Vegetation	Disruption or loss of green space or trees due to servicing	Adheres to land use and demonstration plans
Efficiency of Proposed Infrastructure	Use of existing or combined corridors	Services are contained within combined corridors
Efficiency with Existing Infrastructure	Use of existing infrastructure or capacity	Utilizes residual capacity in existing infrastructure
Capital Costs	Initial Construction Cost	Standard sewer design
Operating Costs	Ongoing operation and maintenance requirements	Gravity sewers only with no pumping or pressure lines

6.6 Wastewater Summary and Recommendations

Wastewater servicing for the BSEUA will be provided by a network of gravity trunk sanitary sewers ranging between 200 mm and 600 mm in diameter, as shown on Drawing MSAN. The trunk sanitary sewer network will outlet to existing and planned sanitary sewers at six (6) locations: i) the Future Collector Road, ii) New Greenbank Road, iii) Fameflower Street, iv) Alex Polowin Avenue, v) Kilbirnie Drive, and vi) Greenbank Road. Based on the land uses identified on the Demonstration Plan, the design criteria summarized in Section 6.2.1 and the drainage areas delineated on Drawing MSAN, the existing downstream sanitary sewers at those six (6) locations can accommodate the additional peak flow generated by the BSUEA, as demonstrated in the Sanitary Sewer Design Sheets presented in Appendix J. Final configuration and sizing of the sanitary sewer system may be refined at detailed design of each subdivision stage.

7.0 Water Distribution

7.1 Background

A water supply assessment was conducted for the BSUEA to investigate whether the extension of existing watermains would provide potable water that meets the hydraulic objectives described in Section 4.2 of the OSDG (water distribution).

A review of the existing and future planned watermains was carried out as part of the Existing Condition Report (JLR, 2017). Figure 7-1 depicts the existing and planned watermains along the boundary of the BSUEA lands. This review has shown that the current urban development to the east of the study area is served by the municipal distribution system, which draws its water from the Ottawa River at both the Britannia and Lemieux Water Purification Plants. From those plants, potable water is distributed via a series of water booster stations. The City water distribution system is planned based on achieving the following design objectives:

- Quantity: sufficient water at sufficient pressure (Section 4.2 of the Ottawa Design Guidelines for water distribution, July 2010);
- Quality: safe drinking water to the required standards (Section 4.1 of the Ottawa Design Guidelines for water distribution);
- Reliability: to ensure water supply under emergency conditions; and,
- Effectiveness and affordability: to reduce lifecycle costs being sustainable in the long term.

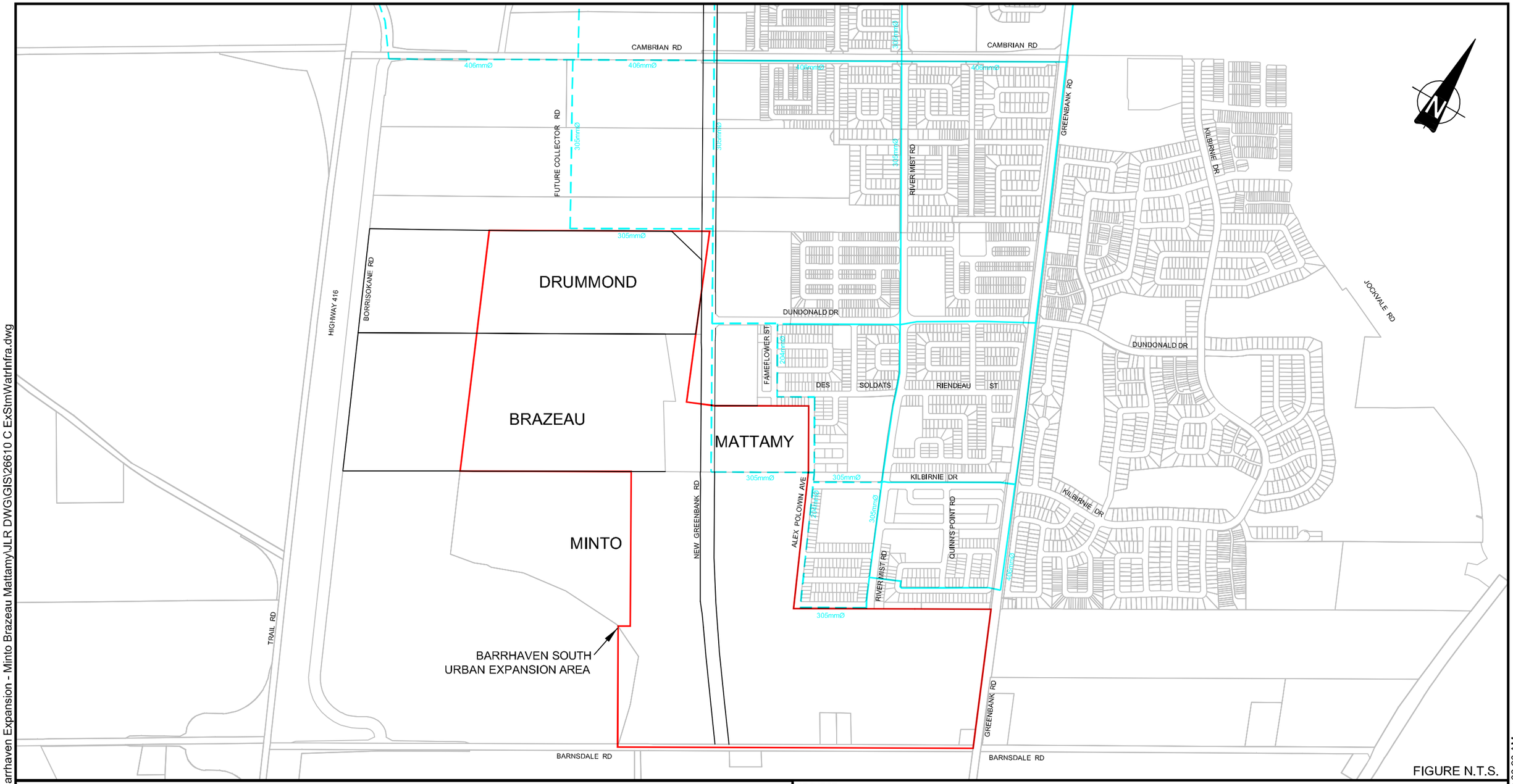
The existing BSC is part of the City's Pressure Zone BARR, which is fed from Pressure Zone 2W via the Woodroffe Avenue 1200 mm diameter transmission watermain and the Fallowfield Road 762 mm diameter transmission watermain. The Barrhaven Reservoir located off Fallowfield Road, acts as balancing storage for Zone 2W and feeds the Barrhaven Pumping Station (BPS), which boosts water to the Pressure Zone BARR.

Three (3) feedermains service the BSC from the Barrhaven reservoir, which are as follows:

- a 406 mm main along Greenbank Road;
- a 406 mm main along Cambrian Road; and,
- a 305 mm feeder main along River Mist Road.

Three (3) additional feedermains are planned as the BSC expands which in turn will trigger increases in water demand. These feedermains are as follows:

- a 305 mm main along New Greenbank Road;
- a 406 mm main on Cambrian Road; and,
- a 305 mm main on the future Collector Road between New Greenbank Road and Borrisokane Road.



LEGEND

EXISTING WATERMAIN

PLANNED WATERMAIN

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

EXISTING AND FUTURE WATERMAIN SERVICING INFRASTRUCTURE

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DRAWN: CJM
CHECKED: LD

JLR NO: 26610

DRAWING NO.:

FIGURE 7-1

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C ExStmWatrInfra.dwg

PLOT DATE: September 12, 2017 9:08:20 AM

In 2016, Stantec was tasked to carry out a potable water analysis to determine whether the supply characteristics of the existing and planned watermains in the BSC would be sufficient to accommodate the projected demands of the BSUEA under both existing and build-out conditions. The Technical Memorandum entitled "Barrhaven MSS Addendum – Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area, October 19, 2016" summarized the findings of the analysis which is included in Appendix I. Initially, the potable water analysis was carried out assuming that both the Brazeau and Drummond aggregate extraction areas would be developed as commercial/employment usages; however, it has since been considered as having residential usage. It should also be noted that ICI demands from the remaining parts of the BSUEA lands was not incorporated by Stantec in their potable water analysis. The modelling presented herein has incorporated ICI demands.

Water demands were calculated based on zone/system level criteria as the overall population in the BSUEA exceeded 3,000. The calculated water demand was distributed over four (4) nodes along the existing backbone of the system (i.e., along an existing 300 mm diameter watermain within Quinn's Pointe) as shown on Stantec's Figure 4 (Appendix I). The analysis first confirmed that the BSUEA does not require any off-site watermains to support its development. The analysis also showed that, during peak hour demand conditions, pressures are expected to meet the prescribed pressure of 40 psi (275 kPa) within the existing Quinn's Pointe. However, areas of higher topography along the existing backbone as depicted on Stantec's Figure 7 will have pressures of 40 psi (275 kPa) or less. The analysis concluded that the performance of the local watermains within the existing areas met the prescribed pressures and that the proposed watermains within the BSUEA be evaluated as part of the MSS.

7.2 Water Servicing Criteria

7.2.1 Design Criteria

The water supply servicing for the BSUEA complies with the Ottawa Design Guidelines for Water Distribution (July 2010), which require that the water supply system be designed to satisfy the greater of either of the following criteria:

- Maximum day demand plus fire flow; or,
- Maximum hourly demand (peak hour demand)

Section 4.2.2 of the Design Guidelines for Water Distribution requires that all new development additions to the public water distribution system be designed such that the minimum and maximum water pressures, as well as flow rates, conform to the following:

- Under maximum hourly demand conditions (peak hour), the pressures are not less than 276 kPa (40 psi);
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi);
- In accordance with the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi);
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and,

- Feedermains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

In addition to the above targets, servicing should be carried out to minimize dead-ends.

7.2.2 Domestic Water Demand

The water demands presented in this section are based on the same unit and population estimates as per the wastewater servicing flows described in Section 6.2.1, which reflects the CDP unit count. The zone/system level criteria for water demands are based on land use type and are in Table 7-1 below. The water demand criteria are consistent with those used in Stantec's Revised Potable Water Servicing Analysis (October 19, 2016). Calculations are summarized below.

Basic Day (BSDY) demands are calculated from the system level water demands for residential, commercial and institutional land uses. Maximum Day (MXDY) demands are calculated by adding an Outdoor Water Demand (OWD) also shown in Table 7-1 below. Peak hour demands result from applying the 72-hour diurnal patterns developed by the City to each type of MXDY demand. The 72-hour diurnal patterns are unique to each type of land use to reflect the different use patterns. The maximum hourly demand observed within the 72-hour patterns is the Peak Hour (PKHR) demand.

The review of the Demonstration Plan (Figure 4-2) has revealed that the number of units and associated densities will result in an overall population that will exceed 3,000. As a result, the water supply analysis presented herein is to be conducted using system level water demands as developed by the City. These system level demands are summarized in Table 7-2.

Table 7-1: Theoretical Water Consumption Rate

Land Use Type	Consumption Rate	Units
Single Family Residential	180	L/cap/day
Multi-unit Residential (Townhouse / Back to Back)	198	
Apartment Residential	219	
Commercial	50,000	L/ha/day
Institutional	50,000	
Outside Water Demand	1,049	L/SFH/day

The above system level demands were applied to each of the blocks depicted on the Demonstration Plan. As previously noted, the Brazeau and Drummond aggregate properties have now been accounted as residential usage. It was assumed that residential densities for both properties would be consistent with those for the BSUEA. Based on this exercise, overall water demands of 18.66 L/s and 31.48 L/s were calculated for the basic day (BSDY) and maximum day

(MXDY), respectively. It should be noted that MXDY of 31.48 L/s includes an outside water usage of 10.15 L/s.

Table 7-2: Estimated Water Demands

Land Use	Area (ha)	Units	Pop.	ADD SFH[4]	ADD MLT[5]	ADD APT[6]	ADD COM[7]	ADD INS[8]	Total BSDY	OWD[9]	Total MXDY
Minto and Mattamy Lands											
Schools	4.55							2.63	2.63		2.63
Commercial	2.13						1.23		1.23		1.23
Medium-Low Density Residential	32.90	1080	3378	4.68	2.60				7.27	8.01	15.29
High Density Residential	0.90	120	216			0.55			0.55		0.55
Total	**40.48**	**1200**	**3594**	**4.68**	**2.60**	**0.55**	**1.23**	**2.63**	**11.69**	**8.01**	**19.71**
Brazeau Aggregate Extraction Area											
Schools	1.47							0.85	0.85		0.85
Commercial	0.67						0.39		0.39		0.39
Medium-Low Density Residential	10.30	360	1126	1.56	0.87				2.42	2.67	5.10
High Density Residential	0.28	38	68			0.17			0.17		0.17
Total	**12.72**	**398**	**1194**	**1.56**	**0.87**	**0.17**	**0.39**	**0.85**	**3.84**		**6.51**
Drummond Aggregate Extraction Area											
Schools	1.25							0.72	0.72		0.72
Commercial	0.57						0.33		0.33		0.33

[4] Daily Demand, Single Family Homes, L/s
[5] Average Daily Demand, Multi-Units (Townhouses and Back to Back Unit) L/s
[6] Average Daily Demand, Apartment Units, L/s
[7] Average Daily Demand, Commercial, L/s
[8] Average Daily Demand, Institutional, L/s

Medium-Low Density Residential	8.72	288	900	1.25	0.69				1.94	2.14	4.07
High Density Residential	0.24	32	58			0.15			0.15		0.15
Total	**10.78**	**320**	**958**	**1.25**	**0.69**	**0.15**	**0.33**	**0.72**	**3.14**	**2.14**	**5.28**
Barrhaven South Urban Expansion Area Totals											
Total	**63.98**	**1918**	**5746**	**7.48**	**4.16**	**0.87**	**1.95**	**4.21**	**18.66**	**10.15**	**31.48**

7.2.3 Watermain Sizing and Roughness

The overall watermain layout for the BSUEA is shown on Drawing MWM. Watermain roughness coefficients were determined using the friction factors presented in Section 4.2.12 of the Design Guidelines and summarized in Table 7-3 below. The internal pipe diameters were modelled based on Section 4.3.5 of the Design Guidelines, as summarized in Table 7-4 below.

Table 7-3: Watermain Roughness Coefficients

Watermain Diameter	C-Factor
150 mm	100
200 to 250 mm	110
300 to 600 mm	120
Over 600 mm	130

Table 7-4: PVC Watermain Internal Diameters

Nominal Diameter	Inside Diameter
150 mm	155 mm
200 mm	204 mm
300 mm	297 mm
400 mm	393 mm

7.2.4 Fire Flow

The City standard in regard to fire protection is the Fire Underwriters Survey and Technical Bulletin ISDTB-2014-02. To evaluate the proposed water distribution system, a fire flow of 13,000 L/min (217 L/s) was used in this system level analysis in accordance with the recommendations of the 2013 Water Master Plan.

7.3 Water Servicing Design

7.3.1 Watermain Servicing and Alignments

7.3.1.1 Minto Lands

A single water main loop is proposed as the main backbone within the BSUEA. This backbone will span through the Minto Lands, along the New Greenbank Road and the East-West Collector. This feedermain would then connect to the existing 400 mm feedermain on Greenbank Road and to the planned feedermain for New Greenbank Road to the north. To supplement this backbone spine, it is also proposed to make connections to the above-noted backbone via the River Mist and Kilbirnie Drive 300 mm diameter watermains. Internal system looping via 200 mm diameter watermains will also be provided.

7.3.1.2 Mattamy Lands East

Mattamy Lands East will be serviced through the water feedermains in the Half Moon Bay South subdivision via Fameflower Street.

7.3.1.3 Mattamy Lands West

Mattamy Lands West will be serviced via watermain extensions from the Half Moon Bay West subdivision.

7.3.1.4 Aggregate Extraction Areas

Given the phasing for the Aggregate Extraction Areas, water servicing for both properties will be achieved via watermain extensions off of the eastern portion of the BSUEA. System looping will be required within both properties with feedermain connections to the; i) future 300 mm diameter feedermain along New Greenbank Road, ii) future 300 mm diameter feedermain along the future North Collector, and iii) connection to the Kilbirnie Drive extension.

7.3.2 Water Modelling and Boundary Conditions

At the onset of this Study, the City provided an extract of the City wide water model that covered part of the Pressure Zone 3C which includes the BSUEA study area. The model's extract - with boundary conditions at the three (3) 2031 connection points with the wider City system (Table 7-5) - can be used to assess the performance of the proposed water distribution under existing (2016) and build-out (2031) conditions of the BSUEA lands. The boundary locations are shown below in Figure 7-1.

The existing (2016) supply characteristics of the distribution system have been simulated via two (2) static reservoirs; one is located at the Longfields Drive/Jockvale Road intersection, while the second is located near the Jockvale Road/Greenbank Road intersection. Under the build-out condition (2031), a third reservoir is being used in the simulation to reflect the additional supply that will occur from the new connector link along Regional Road 19 (River Road) that will be constructed as per the Infrastructure Master Plan. This third connection will

improve system reliability and supply for both Manotick Village and the BSC. This additional boundary condition is included in the 2031 build out version of the model.

The model extract was revised to include the backbone watermains shown on Drawing MWM along with the calculated demands (Table 7-2) distributed along various nodes within the study area. The model is included in with the data files in Appendix N.

Table 7-5: Boundary Condition Head Elevations

Scenario	Node Location	Basic Day (m)	Peak Hour (m)	Max Day Plus Fire[10] (m)
2016	3236	146.8	143.0	145.0
2016	18595	146.7	141.0	143.0
2031	3236	146.7	141.8	144.2
2031	18595	146.6	140.0	143.0
2031	F_MWL3	146.1	135.4	140.3

7.3.1 Ground Elevations

Topography within the BSUEA falls when moving easterly towards Greenbank Road; elevations generally range between 112 m in the western portion to 99 m in the eastern portion of the study area. There are also a series of knolls south of the Brazeau property with elevations reaching 115 m. Figure 7-1 shows existing ground elevations as per the LiDAR data while Drawings MG1 and MG2 shows preliminary grades at key locations within the BSUEA.

7.3.2 Impact of Demonstration Plan versus Water Quality

The supply of safe drinking water to the end users is key for operators of water distribution systems. Section 4.1.2 of the City of Ottawa's Design Guidelines for water distribution system speaks about water stagnation due to poor configuration and dead ends as well as oversizing of watermains. The preferred Demonstration Plan was developed to minimize the occurrence of dead-ends. Furthermore, watermain servicing within multi-unit residential areas have been limited to 200 mm diameter in size as per the recommendations of Technical Bulletin ISDTB-2014-02. Trunk watermain layout, as described below in Section 7.3.1, was kept to extensions of existing watermains of nominal diameters of 300 mm and 400 mm to minimize water stagnation.

[10] Fire demand was applied at Node B_30318 within the BSUEA

Figure 7-2: Boundary Condition Locations

7.4 Water Servicing Analysis

7.4.1 Basic Day (BSDY) and Peak Hour (PKHR) Conditions

The proposed watermain servicing within the BSUEA lands is depicted on Drawing MWM. The backbone of the existing distribution system that consists of 300 mm and 400 mm diameter watermain has been extended in the BSUEA. As shown on Drawing MWM, a few local watermains (200 mm diameter) were added to the analysis in a critical area where centerline elevations exceed 106.0 m. The proposed backbone providing supply to the BSUEA includes the following watermains:

- 400 mm Greenbank Road Extension (from Existing at Knockaderry Crescent - Barnsdale Road);
- 300 mm East-West Collector (Greenbank Road - Western limit of CDP);
- 300 mm Kilbirnie Drive Extension (Alex Polowin Avenue - Park & Ride);
- 300 mm Future Collector Road Extension (Northern Limit of Drummond - Kilbirnie Drive Extension);
- 300 mm New Greenbank Road (Barnsdale Road - Northern limit of CDP); and
- 300 mm River Mist Road Extension (Northern CDP Limit - East-West Collector).

The water demands summarized in Table 7-2 were distributed in the model over nine (9) nodes of the BSUEA. A Model Schematic was prepared (Figure 7-4) that shows the centre line elevations and watermain sizing within the BSUEA.

7.4.1.1 Existing Condition (2016 Scenario)

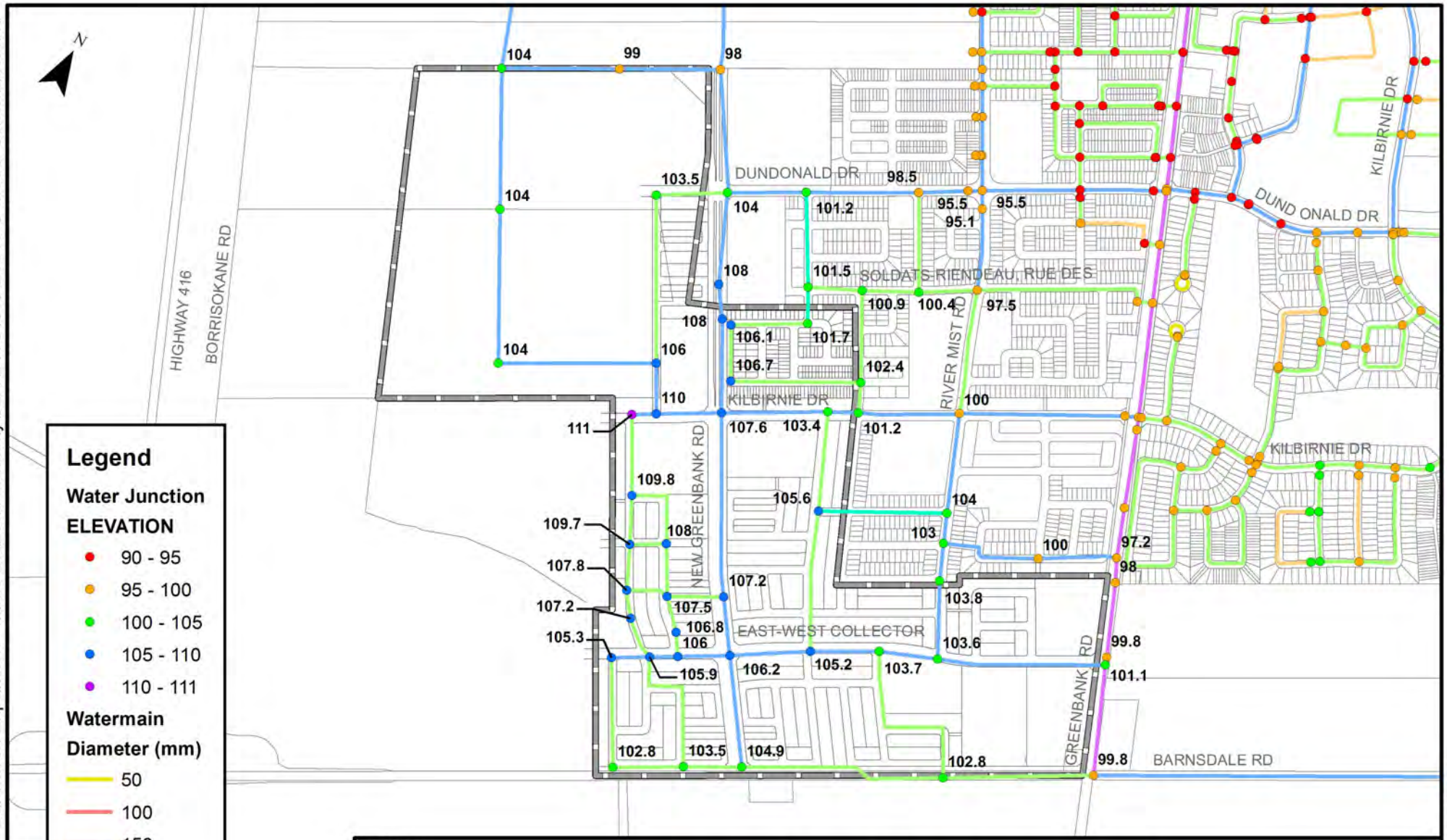
The 2016 existing condition model obtained from the City was revised as follows:

i) proposed watermains identified on Drawing MWM were incorporated,

ii) water demands described in Table 7-2 were added to the system. Water demands were revised from those reported in the September 2017 MSS and now reflects residential usage for both Brazeau and Drummond aggregate extraction properties, and

iii) the supply characteristics of the system were set to the static elevations identified in Table 7-5 under the 2016 scenario.

The performance of the proposed distribution system was evaluated under domestic demand conditions; Figure 7-5 depicts the basic day (BSDY) simulation while Figure 7-6 depicts the minimum pressure encountered during the 72-hour peak hour (PKHR) condition. An additional figure was prepared (Figure 7-7) showing the average pressure during the 72-hour PKHR condition.



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

MODEL SCHEMATIC

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JLR #:	26610

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FIGURE 7-4

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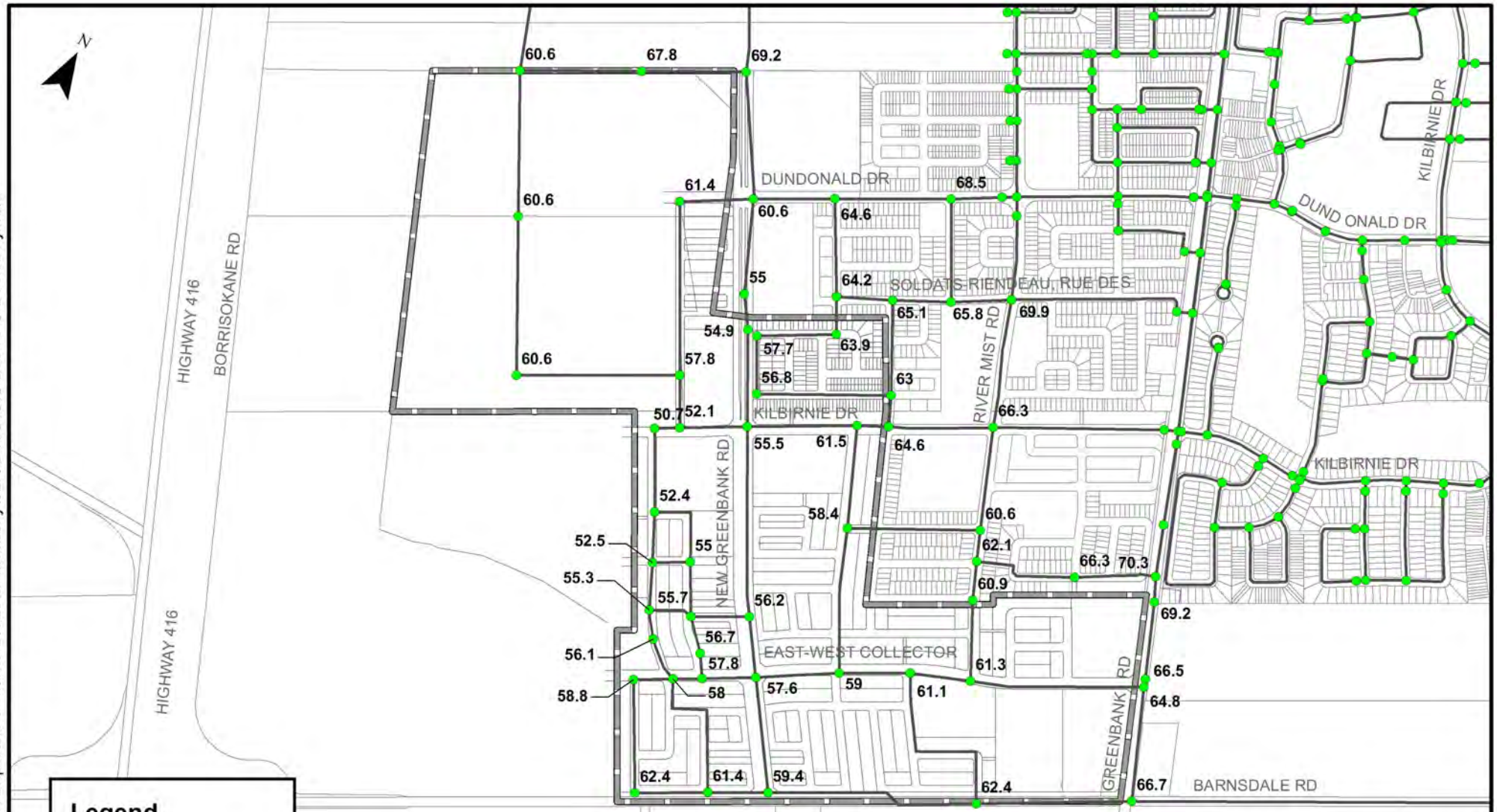
Plot Date: February 23, 2018 7:45:08 AM



Legend

Water Junction

Max pressure in system

- < 80 psi
- > 80 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

BASIC DAY (2016)

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FIGURE 7-5

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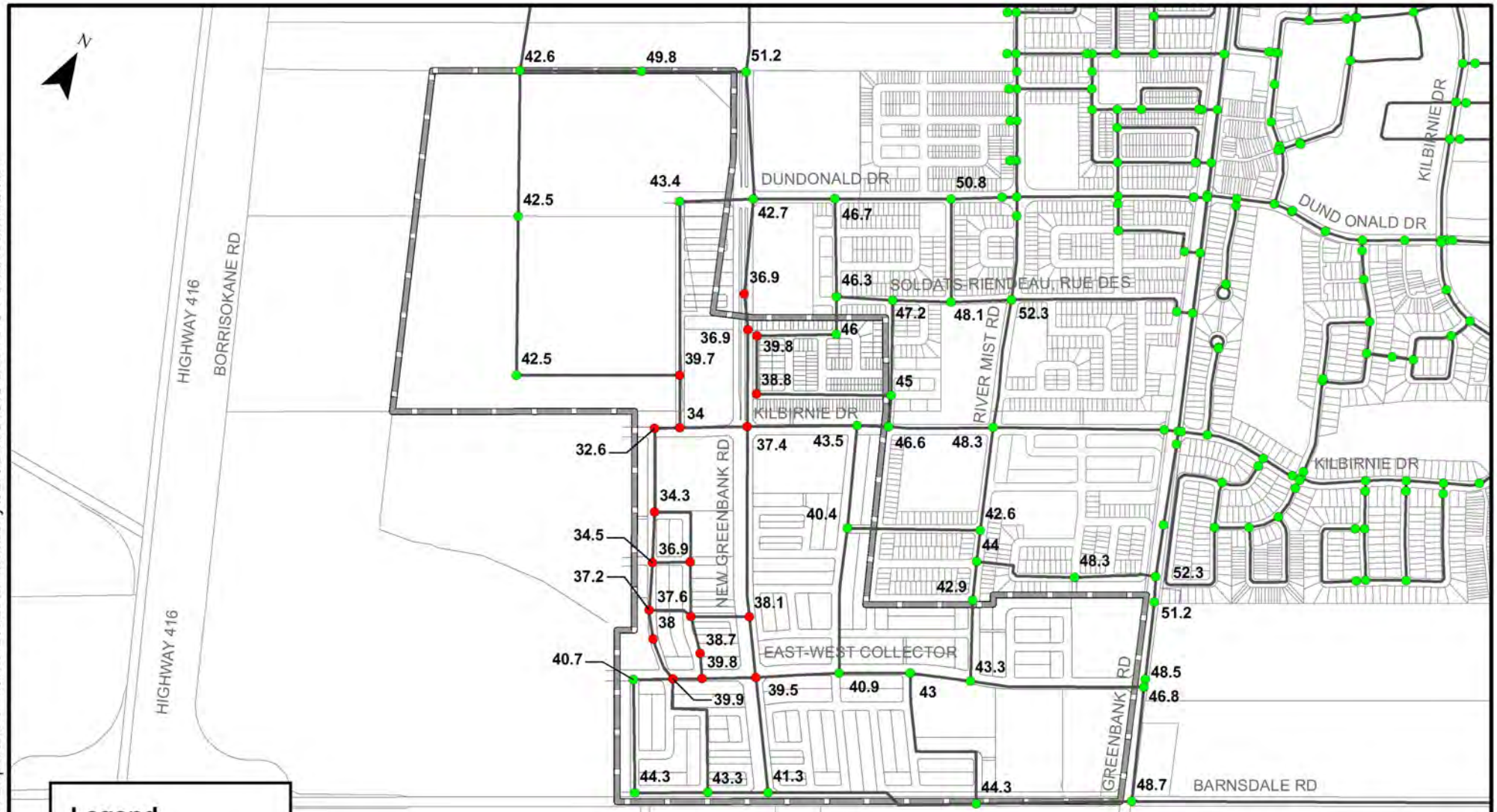

Legend

Water Junction

Min pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR MINIMUM (2016)

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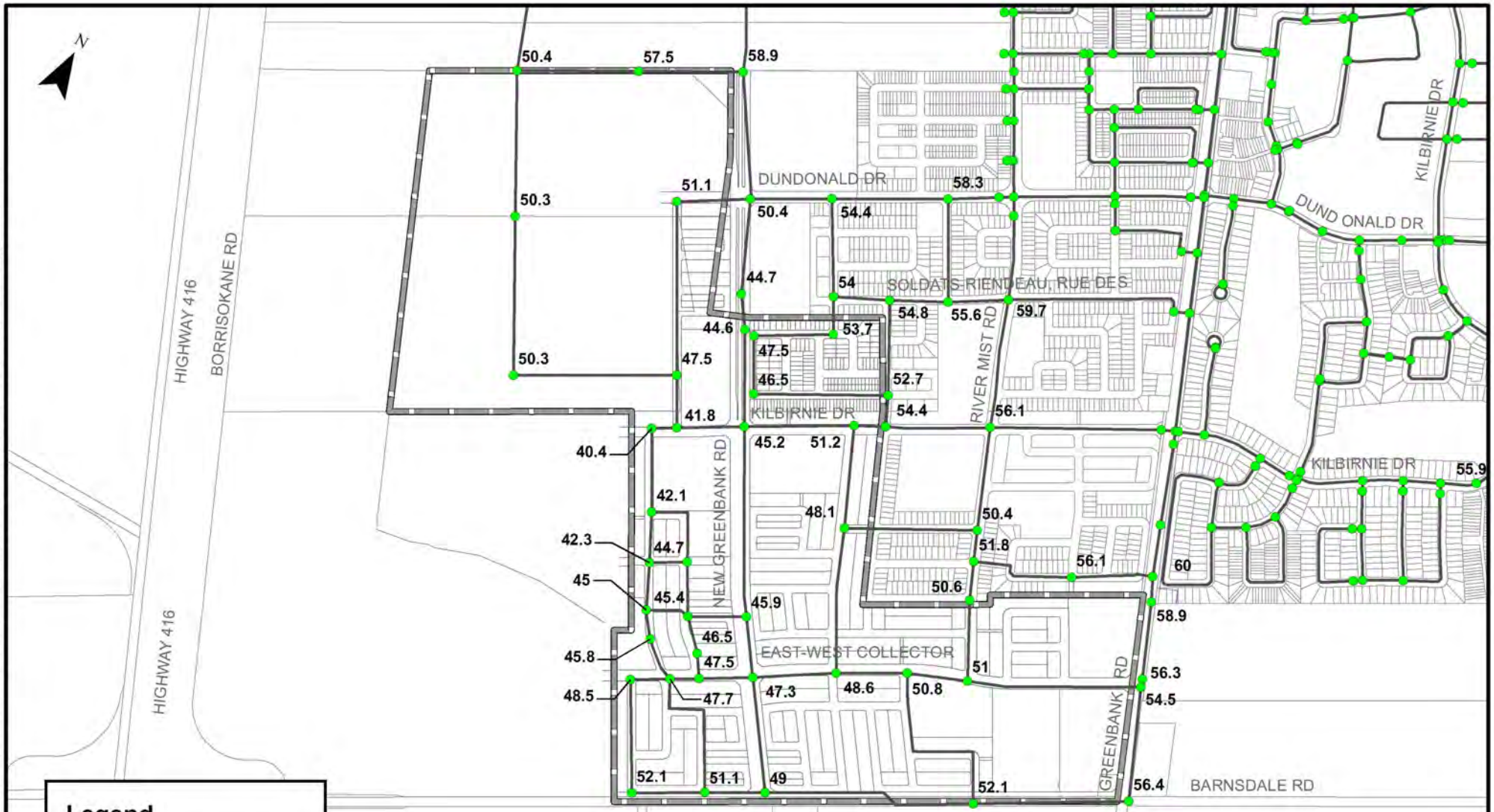
FIGURE 7-6

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C PeakHourMin.mxd

Plot Date: May 2, 2018 9:09:20 AM



Legend

Water Junction

Average pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR AVERAGE (2016)

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FIGURE 7-7

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C PeakHourAvg_2016.mxd

Plot Date: May 2, 2018 9:25:34 AM

The performance of the distribution system was evaluated under domestic demands for the existing condition (2016). Simulation results have shown the following:

- Under the BSDY simulation (Figure 7-5), pressures within the BSUEA will not exceed the maximum pressure criterion of 80 psi (552 kPa);
- Under the PKHR demand scenario, the minimum pressures during this 72-hour simulation (Figure 7-6) range between 32.6 psi (225 kPa) and 51.2 psi (353 kPa). In general, a number of nodes located west of New Greenbank Road will exhibit pressures below the minimum pressure criterion of 40 psi (276 kPa);
- Under the PKHR demand scenario, the average pressures during this 72-hour simulation (Figure 7-7) range between 40.4 psi (279 kPa) and 58.9 psi (406 kPa), thereby satisfying the minimum pressure constraint of 40 psi (276 kPa).

Although the minimum pressure constraint of 40 psi is not met during the minimum hour of the 72-hour PKHR simulation, it is met everywhere in the BSUEA during the average pressure of the 72-hour PKHR simulation. Hence, it is recommended that this deviation to the Guidelines be accepted.

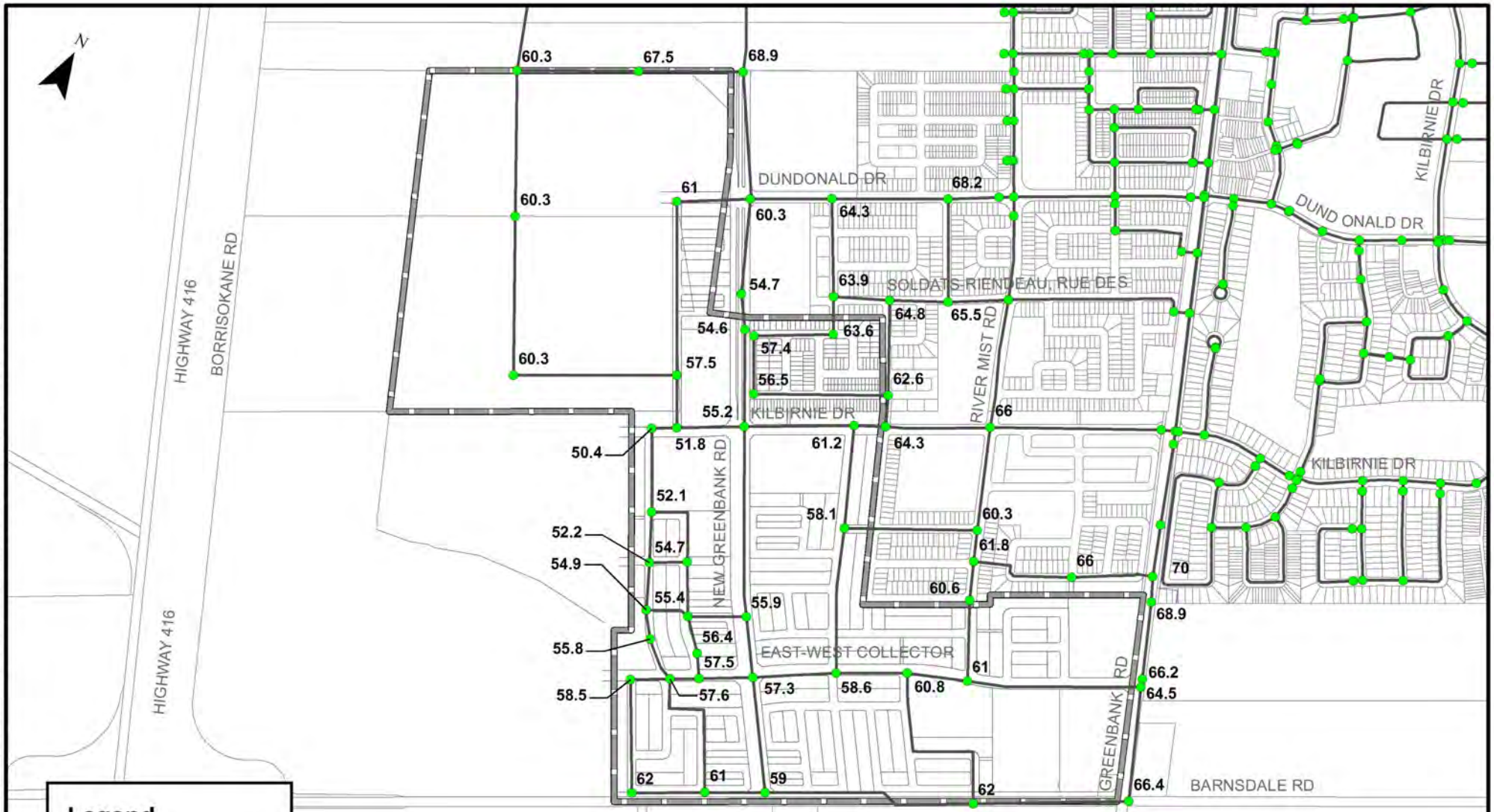
7.4.1.2 Build-out Condition (2031 Scenario)

The 2031 build-out condition model obtained from the City was revised as follows:

- proposed watermains identified on Drawing MWM were incorporated;
- water demands identified in Table 7-2 were added to the system; and
- the supply characteristics of the system were set to the static elevations identified in Table 7-5 under the 2031 scenario.

The performance of the proposed distribution system was evaluated under domestic demands for the build-out conditions (2031). Simulation results have shown the following:

- Under the BSDY simulation (Figure 7-8), pressures within the BSUEA will not exceed the maximum pressure constraint of 80 psi (552 kPa);
- Under the PKHR demand scenario, the minimum pressures during this 72-hour simulation (Figure 7-9) range between 32.2 psi (222 kPa) and 50.7 psi (350 kPa). In general, a number of nodes located west of New Greenbank Road will exhibit pressures below the minimum pressure criterion of 40 psi (276 kPa);
- Under the PKHR demand scenario, the average pressures during this 72-hour simulation (Figure 7-10) range between 37.7 psi (260 kPa) and 56.2 psi (387 kPa). Specifically, there are four (4) nodes that do not satisfy the minimum pressure constraint of 40 psi (276 kPa). These nodes are located in the southwest quadrant of the Kilbirnie Drive extension and New Greenbank Road intersection.



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

BASIC DAY (2031)

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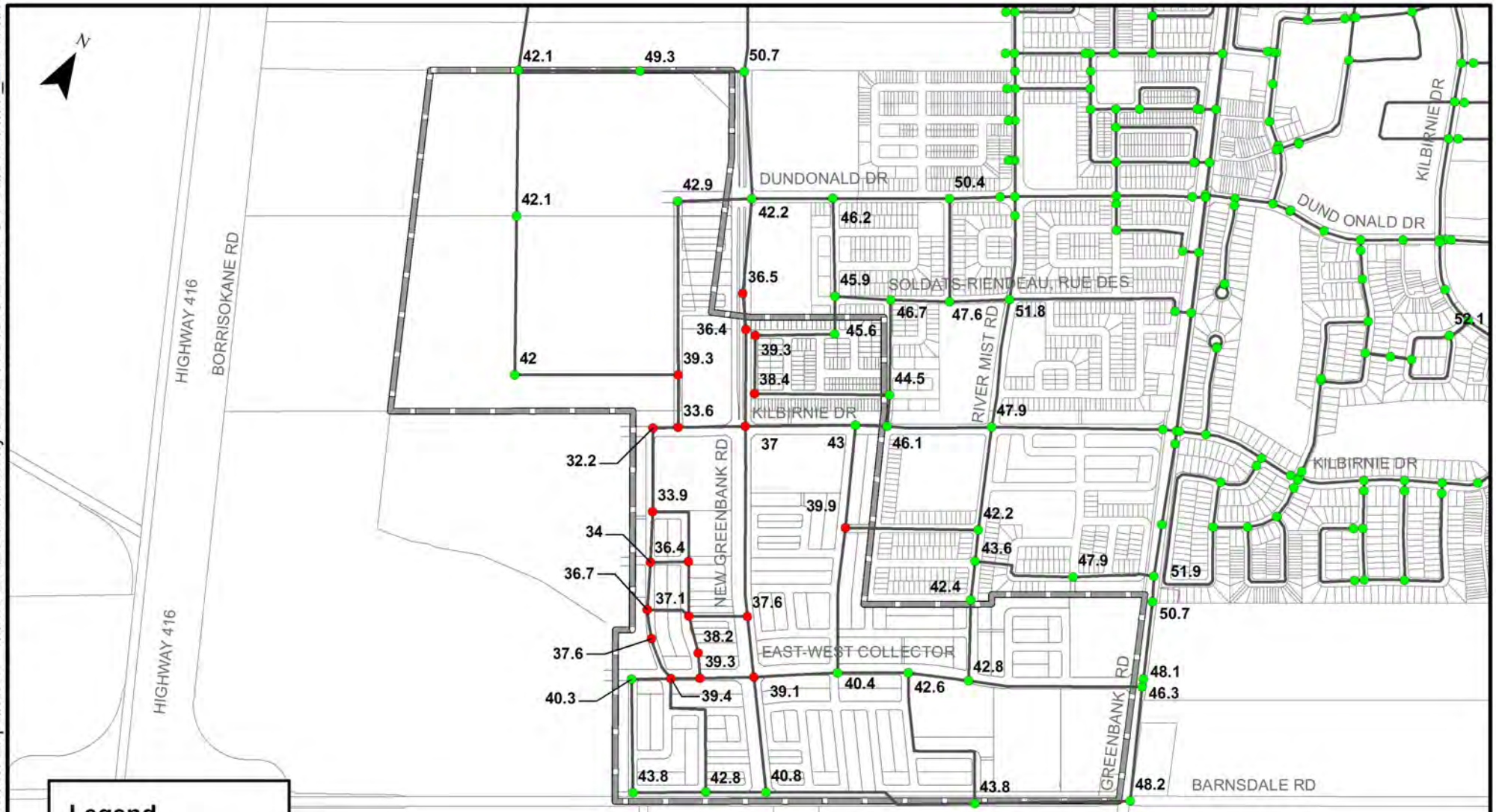
FIGURE 7-8

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C BasicDay_2031.mxd

Plot Date: May 2, 2018 9:42:54 AM



Legend

Water Junction

Min pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR MINIMUM (2031)

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FIGURE 7-9

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C PeakHourMin_2031.mxd

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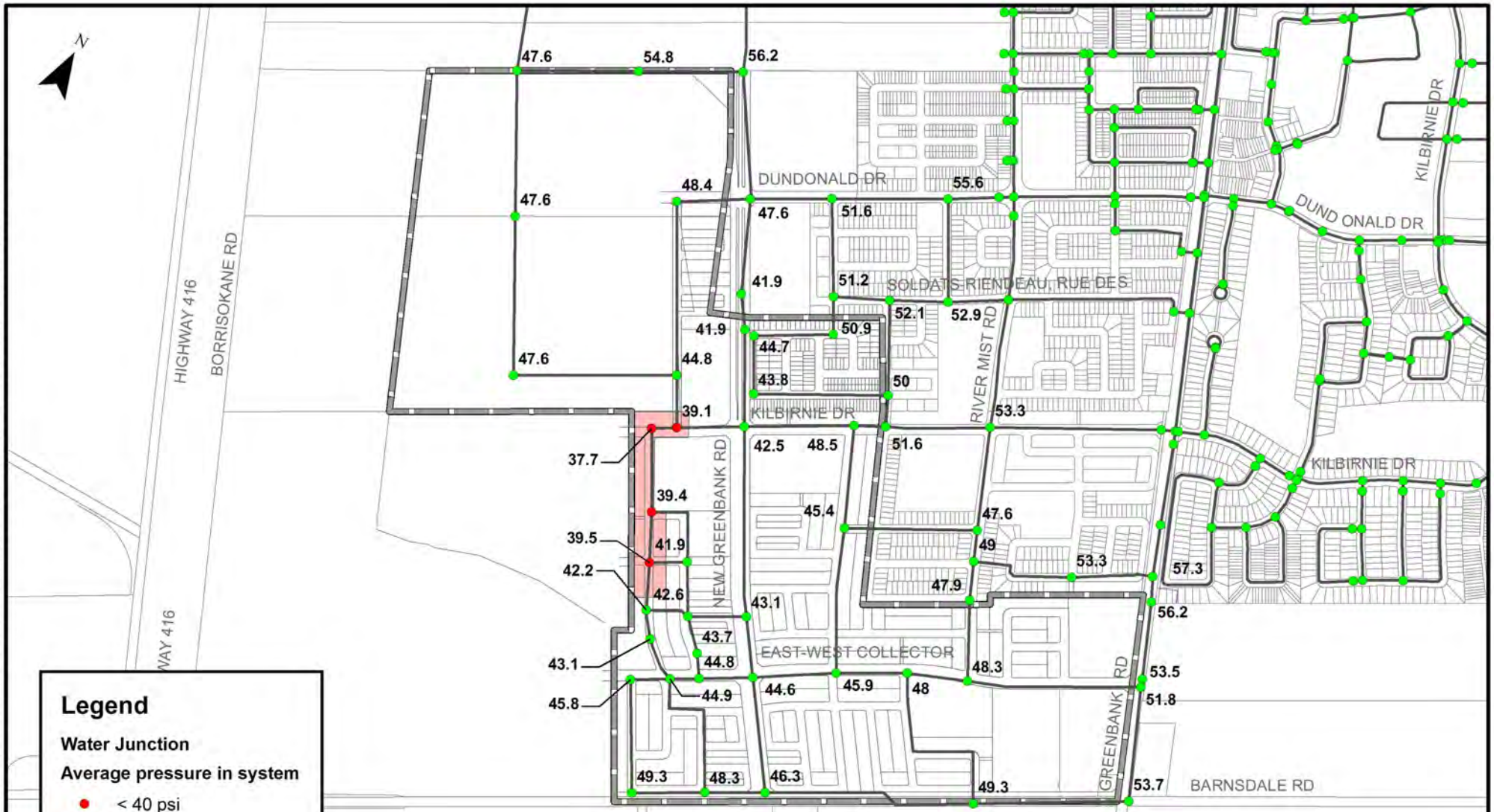
A further review of the PKHR simulation results was carried out for the southwestern quadrant noted above. The results for the 72-hour PKHR (average and minimum pressures) has showed that deficient nodes with pressures less than 40 psi (275 kPa) were solely due to topography and not related to excessive headlosses along the distribution system. Therefore, upsizing watermains in that quadrant to 300 mm was found not to increase the simulated pressure. The review of Drawings MG1 and MG2 has showed that proposed centerline elevations in that quadrant of the BSUEA range between 106.2 m to 111.0 m; pressures associated with low topography of 106.2 met the minimum pressure constraint under the PKHR (average) while topography of 111.0 m generated pressures below the minimum pressure constraint.

To minimize the inconvenience of low pressures during the occurrence of a peak hour demand (i.e., a few hours per year), mitigation measures such as oversized service laterals (25 mm) and oversize internal plumbing are recommended. To determine the extent of these mitigation measures, the simulated hydraulic grade line was used as well as the proposed centerline elevations to determine the varying pressure head in the southwest quadrant of New Greenbank Road/Street 2 intersection. Based on the simulated HGL of 137.5 m (average pressure during the 72-hour PKHR simulation), the pressure head was calculated for various centerline elevations. The findings of this analysis are summarized in Table 7-6.

Table 7-6: Pressure Head versus Centreline Elevation

Road Centreline Elevation (m)	Head Differential (m): based on HGL of 137.5 m	Pressure head (psi): based on HGL of 137.5 m
111.0	26.5	37.6
110.5	27.0	38.3
110.0	27.5	39.1
109.5	28.0	39.8
109.0	28.5	40.5
108.5	29.0	41.2
108.0	29.5	41.9
107.5	30.0	42.6
107.0	30.5	43.3
106.5	31.0	44.0

Based on the above calculated pressure heads during PKHR (i.e., 72-hour average pressure), servicing in areas with proposed centerline elevations greater to or equal to 109.0 m should incorporate mitigation measures (i.e., 25 mm service lateral and oversized internal plumbing) to reduce headlosses from the ROW watermain to each of the house fixtures. Figure 7-10 depicts an area that abuts the western perimeter of the Park and Ride facility where servicing of



Legend

Water Junction

Average pressure in system

- < 40 psi
- > 40 psi

Watermain

Residential Servicing

Residential servicing to Include 25mm service lateral & oversized plumbing

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR AVERAGE (2031)

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FIGURE 7-10

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Plot Date: May 3, 2018 7:35:21 AM

residential units be completed with mitigation measures. The extent of this area should, however, be finalized pending the final grading plan and a more detailed analysis at detailed design. Although the minimum pressure constraint will not be achieved, the recommended measures are appropriate to reduce the inconvenience of low pressures. Hence, it is recommended that this deviation to the Guidelines be accepted.

7.4.2 Maximum Day plus Fire Flow Conditions

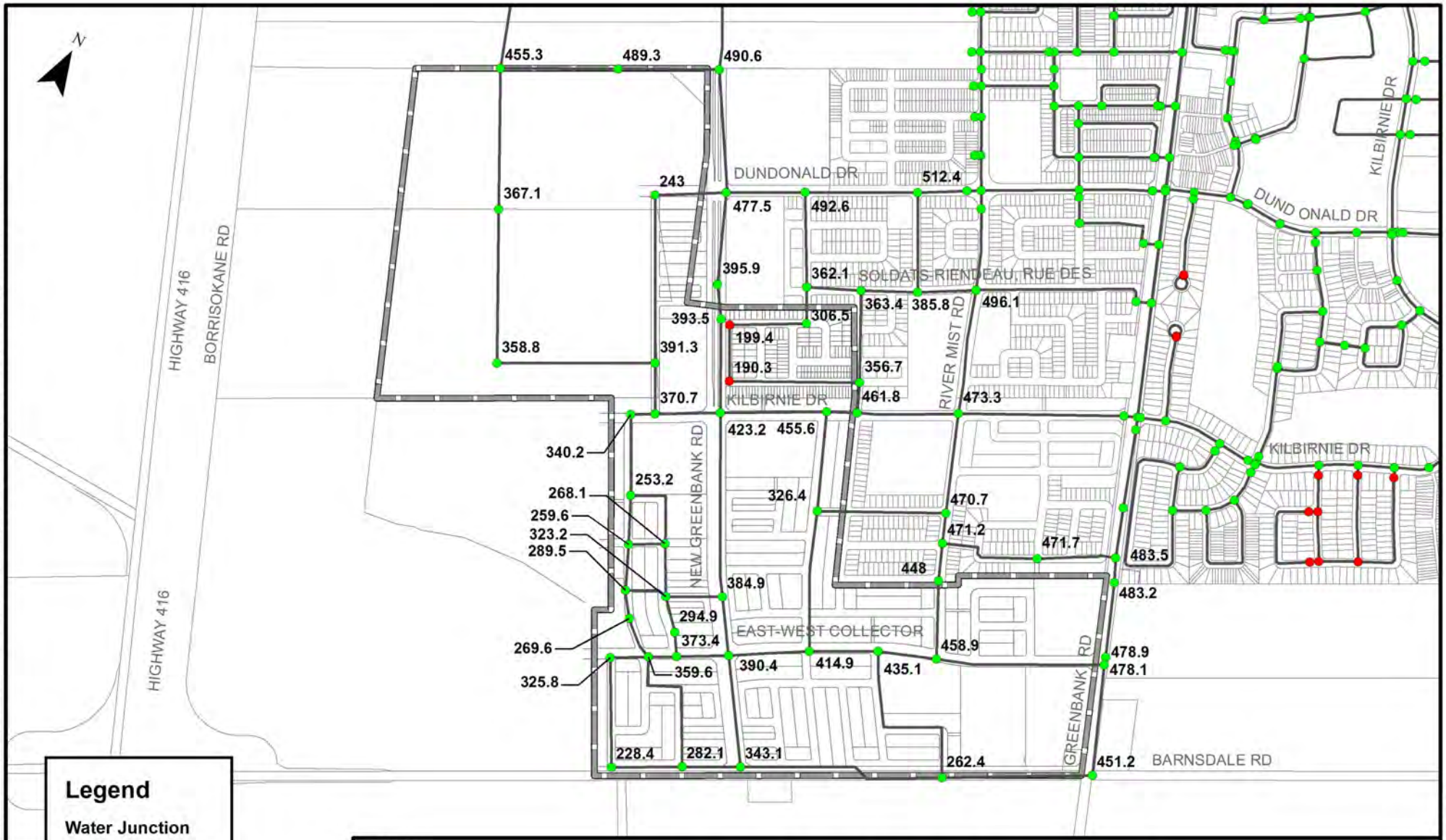
To ensure adequate fire protection, a maximum day demand was simultaneously simulated with a fire flow along the proposed watermains within the BSUEA. As per Section 7.2.4, a system level fire flow of 13,000 L/min (217 L/s) was used in this analysis with the static elevations reported in Table 7-5 under existing (2016) and build-out conditions (2031).

7.4.2.1 Existing Condition (2016 Scenario)

The watermain layout as depicted on Drawing MWM was found, in general, to be capable of delivering fire flows in excess of 13,000 L/min (217 L/s) within the BSUEA during a maximum day demand as shown on Figure 7-11. However, there are two (2) nodes located within the Mattamy Lands East that do not meet the system level fire flow of 13,000 L/min (217 L/s). Those nodes, located next to New Greenbank Road, have a fire flow availability that exceeds the cap fire flow of 10,000 L/min (167 L/s) as per Technical Bulletin ISDTB-2014-02; the two (2) nodes show fire flows of 190.3 L/s and 199.4 L/s. Given that fire flow at the boundary of the property of the Mattamy Lands East exceed 21,300 L/min (356 L/s), it is recommended that hydrant spacing within the Mattamy Lands East be developed by locating proposed hydrants closest to existing Half Moon Bay rather than New Greenbank Road. This servicing approach would increase fire flow availability within the Mattamy Lands East and potentially meet the system fire flow of 13,000 L/min (217 L/s). It is therefore recommended, that hydrant spacing be reviewed closely at detailed design of the Mattamy Lands East to maximize fire flow availability. It should also be noted that since the previous submission, the City has issued a Technical Bulletin (ISTB-2018-02) on water distribution, particularly in regard to hydrant capacity requirements and required fire flow (RFF). This Bulletin allows that the aggregate fire flow capacity of all contributing fire hydrants within 150 m of a building/structure be used against the RFF. Contributing hydrant flow should reflect those in Table 1 of Appendix I of the Technical Bulletin.

7.4.2.2 Build-out Condition (2031 Scenario)

The watermain layout as depicted on Drawing MWM was found, in general, to be capable of delivering fire flows in excess of 13,000 L/min (217 L/s) within the BSUEA during a maximum day demand as shown on Figure 7-12. However, there are two (2) nodes located within the Mattamy Lands East that do not meet the fire flow of 13,000 L/min (217 L/s). Those nodes, located next to New Greenbank Road, have a fire flow availability that exceeds the cap fire flow of 10,000 L/min (167 L/s) as per Technical Bulletin ISDTB-2014-02. Given that fire flow at the boundary of the property exceed 22,000 L/min (368 L/s), it is recommended that



Legend

Water Junction

Available fire flow

- < 217 L/s
- > 217 L/s

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

MAX DAY PLUS FIRE CONDITION (2016)

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FIGURE 7-11

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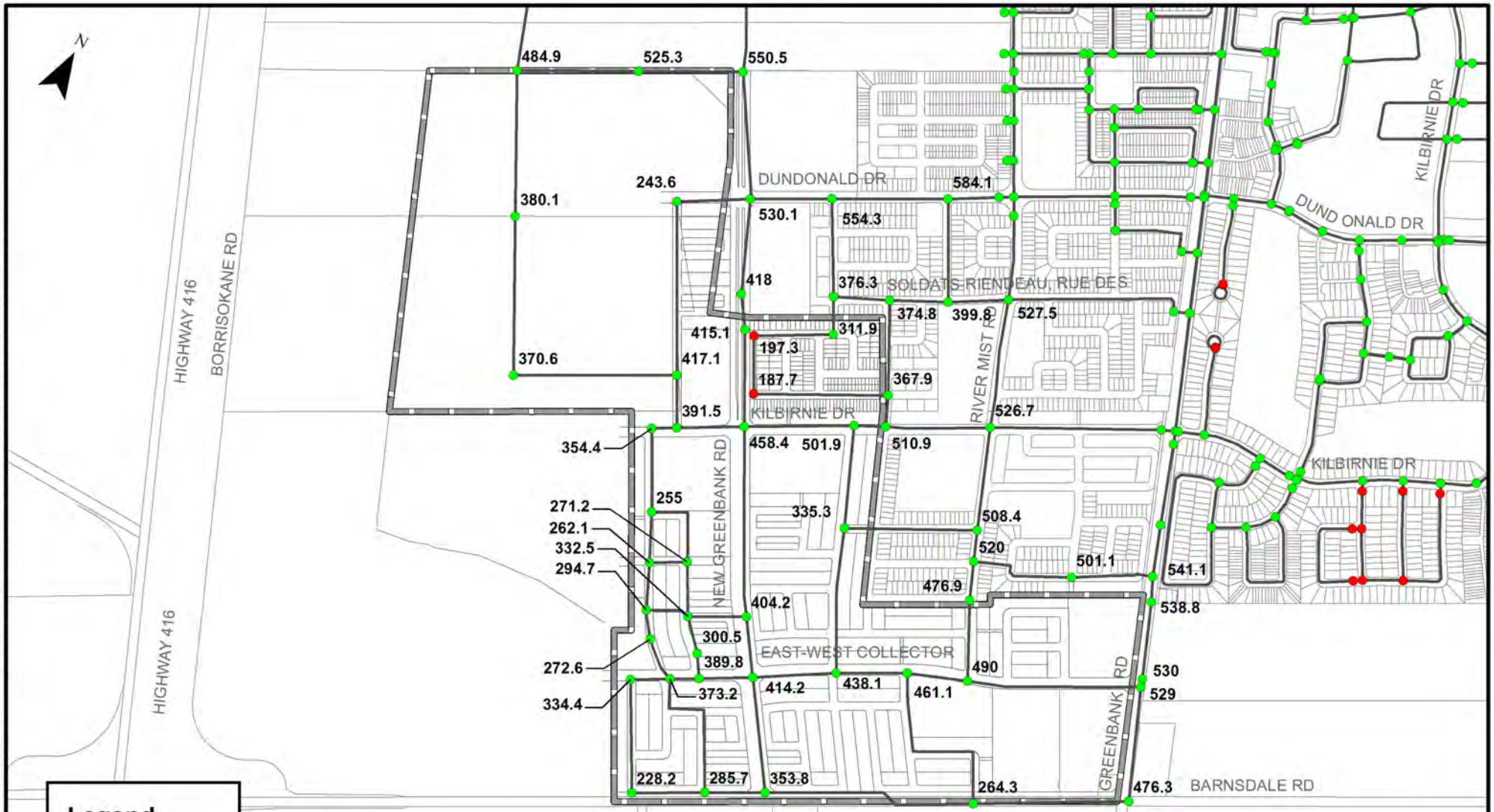

Legend

Water Junction

Available fire flow

- < 217 L/s
- > 217 L/s

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

MAX DAY PLUS FIRE CONDITION (2031)

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FIGURE 7-12

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C MaxDayFire_2031.mxd

Plot Date: May 2, 2018 10:54:12 AM

hydrant spacing be carried out to locate proposed hydrants closest to existing Half Moon Bay rather than New Greenbank Road. This servicing approach would increase fire flow availability within the Mattamy Lands East. It is therefore recommended that hydrant spacing be reviewed closely at detailed design to maximize fire flow availability and that the aggregate fire flow capacity be evaluated as per Technical Bulletin ISTB-2018-02.

7.5 Investigations of Additional Servicing Strategies (2031)

Two (2) additional servicing strategies were investigated under the 2031 development scenario. The first servicing alternative was evaluated to assess its effectiveness in improving the level of service in the BSUEA while the second scenario was investigated to assess the reduction in the level of service should the construction of one of the feedermains be delayed. These servicing strategies are as follows:

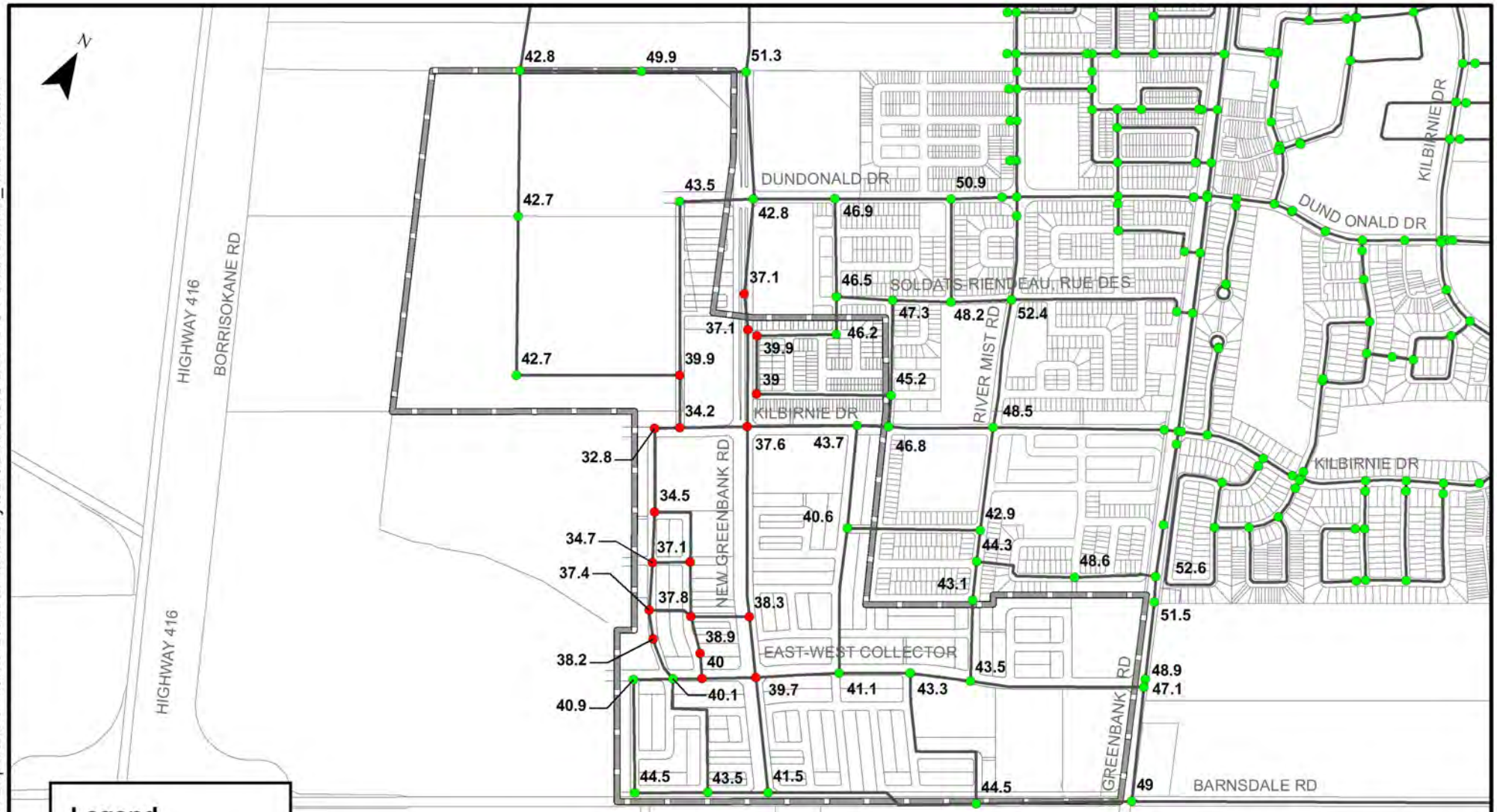
1) First, additional servicing strategy would consist of the construction of a dedicated 300 mm diameter feedermain to the BSUEA along Barnsdale Road. This feedermain would connect the Rideau Valley Drive 400 mm diameter feedermain to the proposed 200 mm diameter feedermain along Barnsdale Road (refer to Section 7.5.1). Given that a second feed to Manotick Village from the Riverside South Community is expected in the future, this servicing option could potentially provide an increase in the operating pressures; and
2) Second, additional servicing strategy would assess pressures under the 2031 development scenario without the 300 mm diameter feedermain along New Greenbank Road, which would be assumed to be delayed beyond 2031 (refer to Section 7.5.2).

7.5.1 Implementation of Barnsdale Road 300 mm diameter feedermain

This servicing alternative was developed and evaluated to determine whether an additional feedermain originating from Manotick Village could improve pressures in the BSUEA in an attempt to reduce and/or eliminate the area exhibiting sub-standard pressures during PKHR (refer to Figure 7-10 for area). This servicing alternative entails the construction of a 300 mm diameter feedermain connecting the local 200 mm diameter Barnsdale watermain to the existing 406 mm diameter feedermain along Rideau Valley Drive. This proposed 300 mm diameter feedermain would follow the Barnsdale Road ROW from existing Greenbank Road easterly to its connection with Rideau Valley Drive.

The performance of the proposed distribution system was evaluated under the 2031 development scenario under the: i) PKHR (minimum hour), and ii) PKHR (average) conditions. Simulation results under this servicing strategy have shown the following:

- Under the PKHR demand scenario, the minimum pressures during this 72-hour simulation (Figure 7-13) range between 32.8 psi (226 kPa) and 51.5 psi (355 kPa). Simulation results show a slight increase in the operating pressures of 0.6 psi (4 kPa) resulting from the construction of this new Barnsdale Road 300 mm diameter feedermain. In general, the same nodes as the main servicing scenario, located west of New Greenbank Road will still exhibit pressures below the minimum pressure criterion of 40 psi (276 kPa);



Legend

Water Junction

Min pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR MINIMUM (2031)
CONNECTION TO MANOTICK

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FIGURE 7-13

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Plot Date: May 3, 2018 8:46:44 AM

- Under the PKHR demand scenario, the average pressures during this 72-hour simulation (Figure 7-14) range between 37.0 psi (255 kPa) and 55.5 psi (383 kPa). Specifically, the same four (4) nodes that do not satisfy the minimum pressure constraint of 40 psi (276 kPa) under the main servicing scenario. These nodes are located in the southwest quadrant of the Kilbirnie Drive extension and New Greenbank Road intersection.

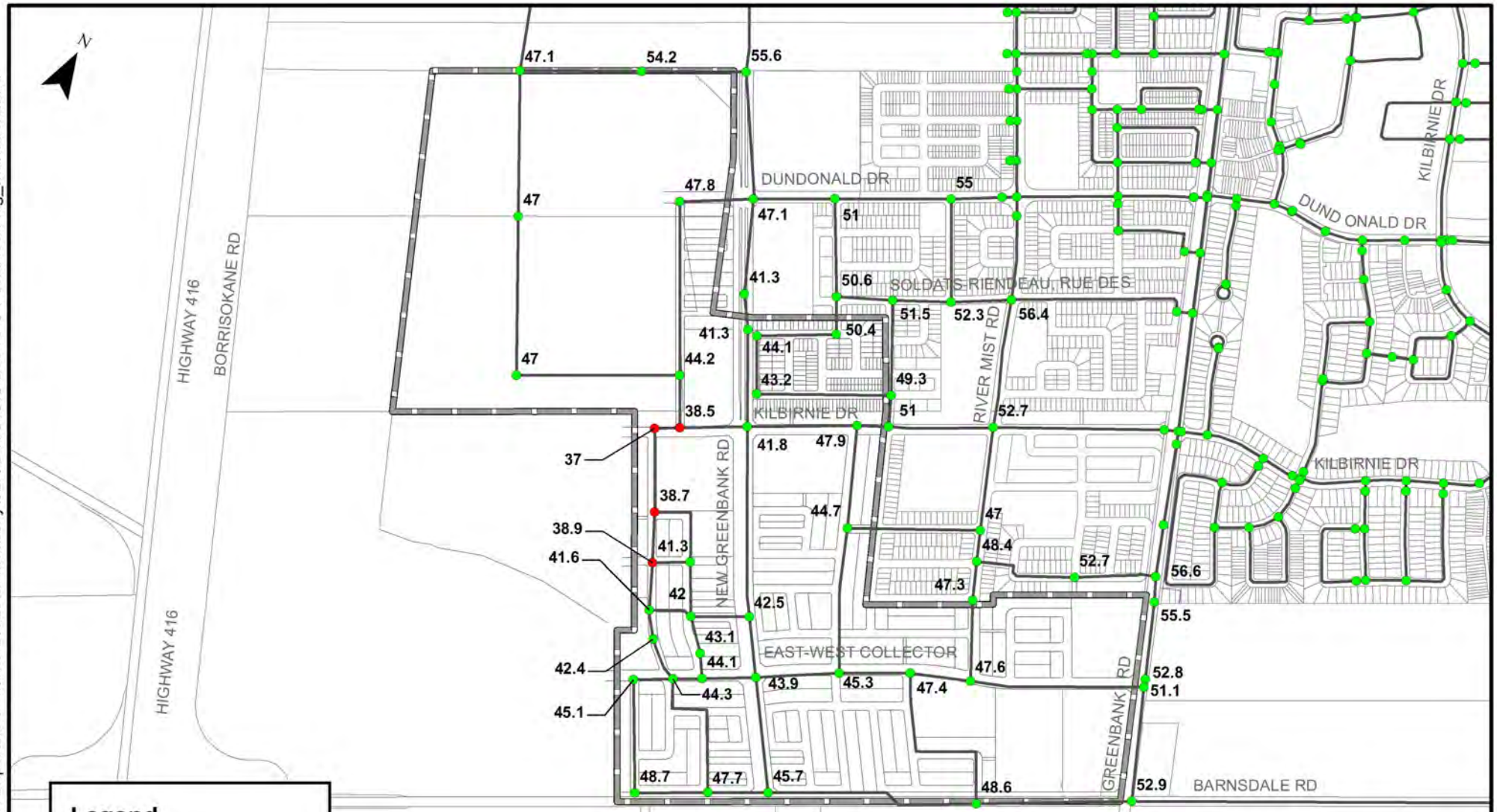
A further review of the above peak hour simulation results has revealed that the proposed Barnsdale Road 300 mm diameter feedermain would supply potable water easterly, from the BSUEA to Rideau Valley Drive. As a result, the supply to Manotick would benefit the most while the level of servicing of the BSUEA would virtually remain the same. Consequently, this servicing alternative was not further pursued.

7.5.2 Assessment of Level of Service without New Greenbank Road Feedermain

Simulation results under the 2031 development scenario have so far been completed assuming that the 400 mm diameter feedermain along New Greenbank Road would be in operation. Although funds appear to be available for this capital project, there is no certainty on timing. An alternate servicing alternative was, therefore, investigated assuming the New Greenbank Road 400 mm diameter feedermain would not be operational under the 2031 scenario.

The performance of the proposed distribution system was, therefore, evaluated under the 2031 development scenario for the: i) PKHR (minimum hour), and ii) PKHR (average) conditions. Simulation results under this servicing strategy have shown the following:

- Under the PKHR demand scenario, the minimum pressures during this 72-hour simulation Figure 7-15 range between 32.1 psi (221 kPa) and 50.7 psi (350 kPa). In general, all nodes west of and including New Greenbank Road will exhibit pressures below the minimum pressure criterion of 40 psi (276 kPa). Similarly, the western portion of the Mattamy Lands East will also exhibit pressures below the 40 psi (276 kPa) criterion;
- Under the PKHR demand scenario, the average pressures during this 72-hour simulation (Figure 7-16) range between 37.6 psi (259 kPa) and 56.1 psi (387 kPa). Specifically, there are four (4) nodes that do not satisfy the minimum pressure constraint of 40 psi (276 kPa). Similar to the 2031 scenario with New Greenbank Road, these nodes are located in the southwest quadrant of the Kilbirnie Drive extension and New Greenbank Road intersection.



Legend

Water Junction

Average pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR AVERAGE (2031)
CONNECTION TO MANOTICK

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FIGURE 7-14

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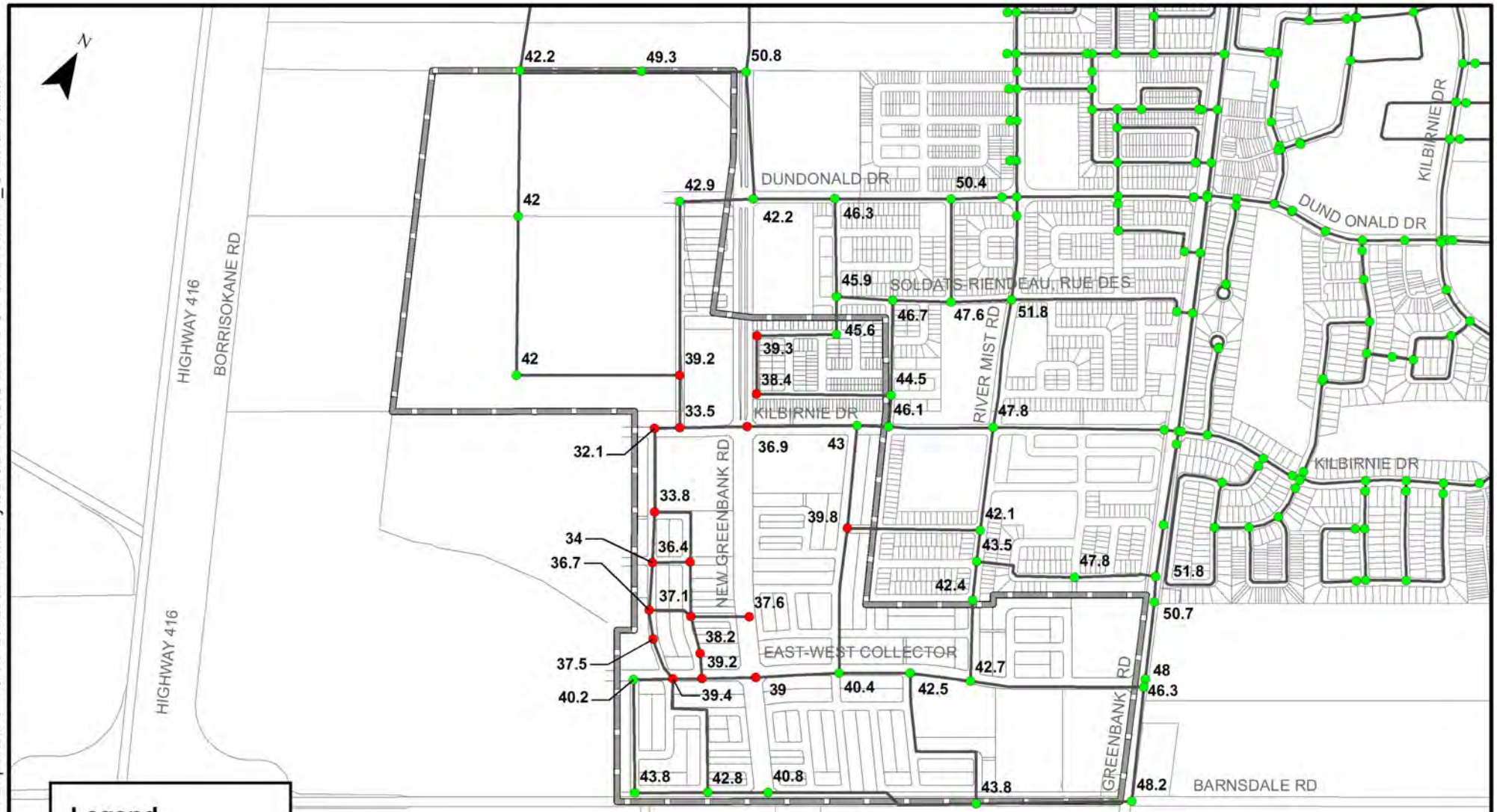

Legend

Water Junction

Min pressure in system

- < 40 psi
- > 40 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
OTTAWA, ONTARIO

DRAWING:

PEAK HOUR MINIMUM (2031)
WITHOUT NEW GREENBANK CONNECTION

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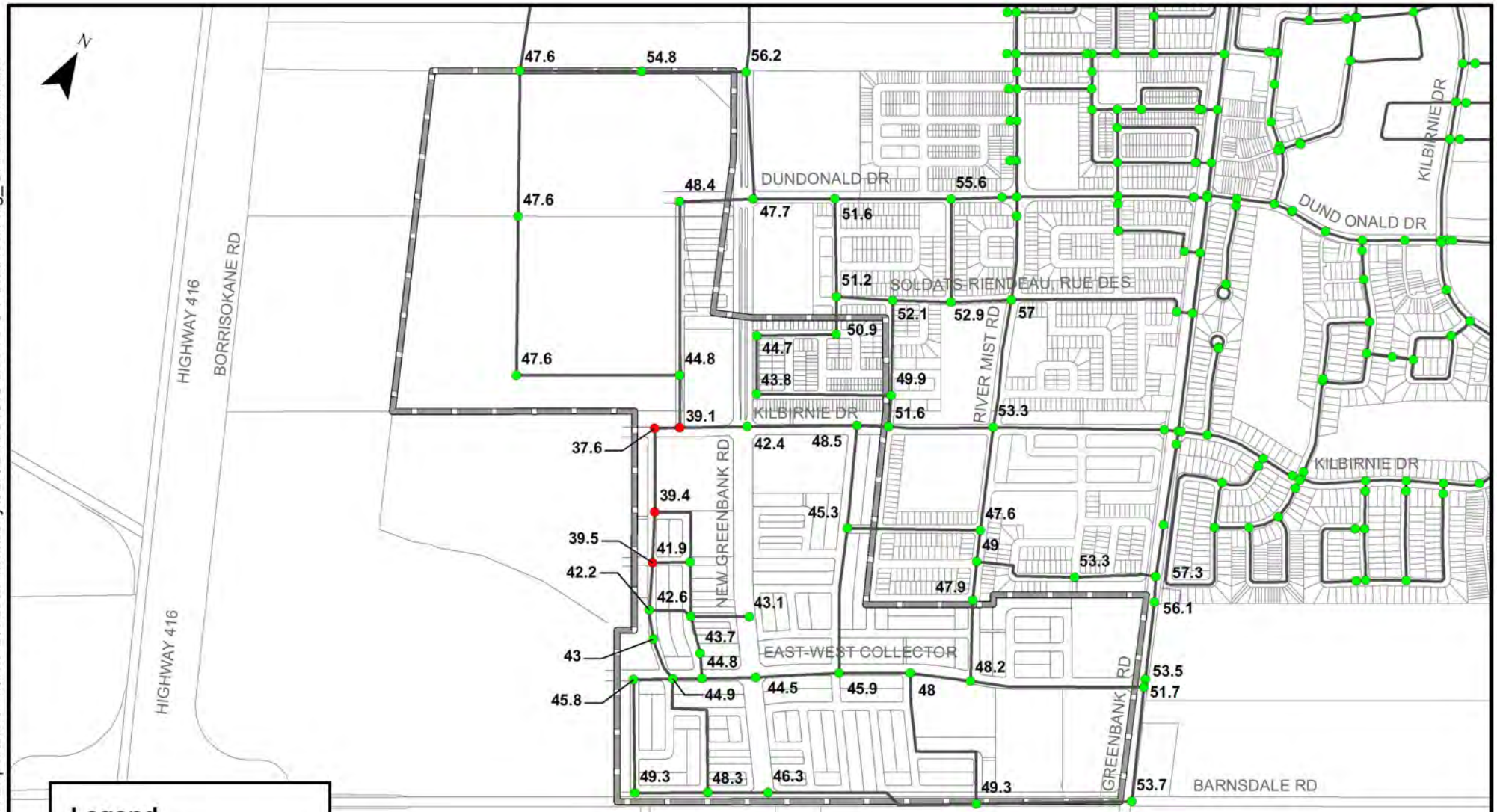
FIGURE 7-15

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C PeakHourMin_Greenbank.mxd

Plot Date: May 2, 2018 11:56:44 AM


N
HIGHWAY 416
BORRISOKANE RD
HIGHWAY 416
DUNDONALD DR
SOLDATS-RIENDEAU, RUE DES
RIVER MIST RD
KILBIRNIE DR
KILBIRNIE DR
DUND ONALD DR
NEW GREENBANK RD
EAST-WEST COLLECTOR
GREENBANK RD
BARNSDALE RD
47.6
54.8
56.2
48.4
47.7
51.6
55.6
47.6
51.2
52.1
52.9
57
50.9
44.7
47.6
44.8
43.8
49.9
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53.3
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53.5
45.8
44.9
44.5
45.9
48
51.7
49.3
48.3
46.3
49.3
53.7
Legend
Water Junction
Average pressure in system
< 40 psi
> 40 psi
Watermain
Study Area
PROJECT:
BARRHAVEN SOUTH URBAN EXPANSION AREA
OTTAWA, ONTARIO
DRAWING:
PEAK HOUR AVERAGE (2031)
WITHOUT NEW GREENBANK CONNECTION
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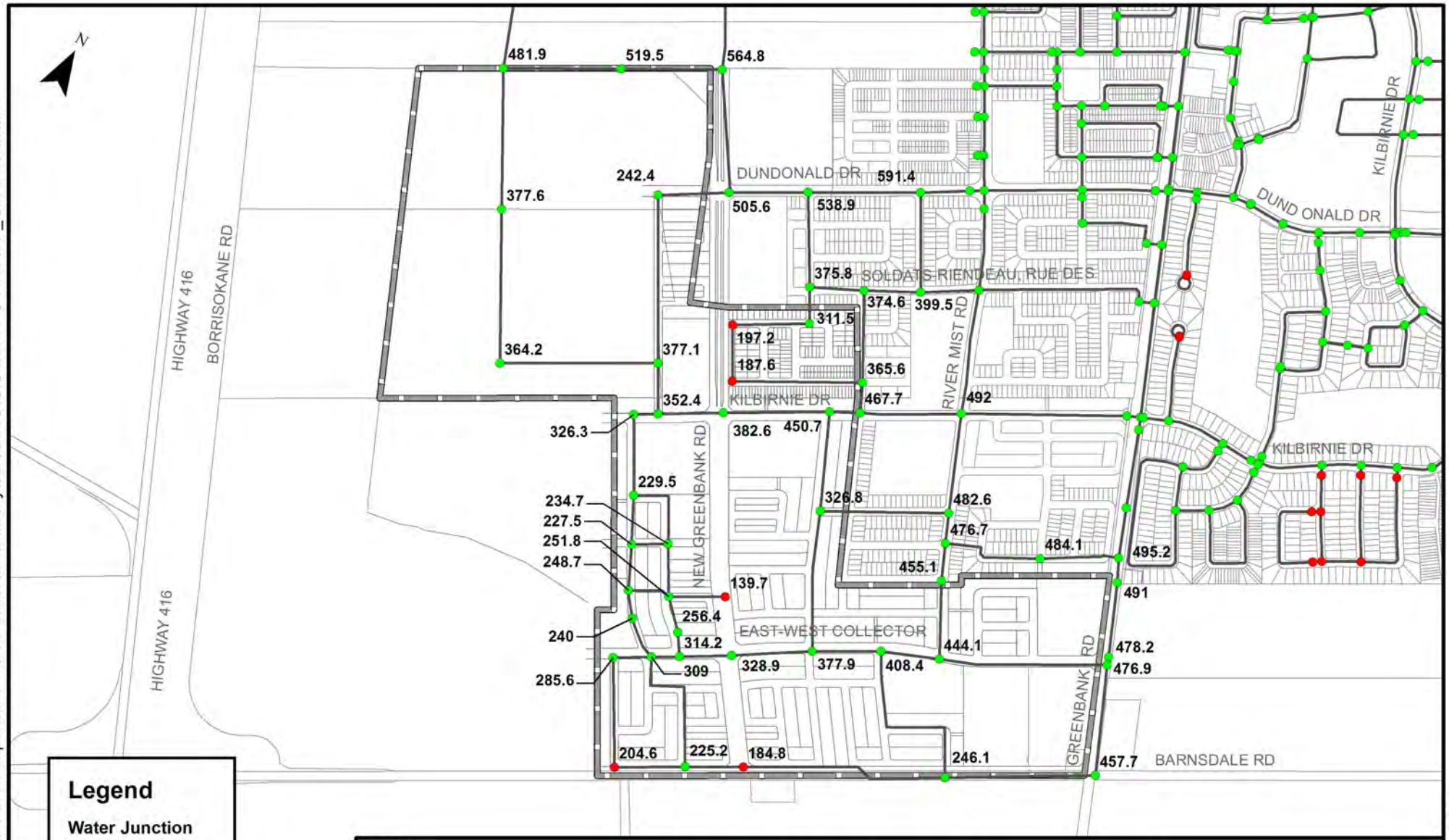
FIGURE 7-16
File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\GIS\26610 C PeakHourAvg_Greenbank.mxd
Plot Date: May 2, 2018 12:03:41 PM

- This servicing strategy (without Greenbank Road) was found, in general, to be capable of delivering fire flows in excess of 13,000 L/min (217 L/s) within the BSUEA during a maximum day demand as shown on Figure 7-17. The exception is two (2) nodes located within the Mattamy Lands East that do not meet the system level fire flow of 13,000 L/min (217 L/s); however, those nodes exceed the minimum cap of 10,000 L/min (167 L/s). Given that the nodes are located within the Mattamy Lands East, next to New Greenbank Road, and that fire flow at the boundary of the property exceed 21,900 L/min (365 L/s), it is recommended that hydrant spacing be carried out to locate proposed hydrants closest to existing Half Moon Bay rather than New Greenbank Road. This servicing approach would increase fire flow availability within the Mattamy Lands East. It is recommended that hydrant spacing be reviewed closely at detailed design to maximize fire flow availability and that the aggregate fire flow capacity be evaluated as per Technical Bulletin ISTB-2018-02. There is also an additional node along New Greenbank Road that does not meet either the cap fire flow or the system level fire flow. However, this node would not represent a hydrant as it is located on the opposite side of the arterial and would not be operational. As previously noted



Legend

Water Junction

Available fire flow

- < 217 psi
- > 217 psi

Watermain

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
OTTAWA, ONTARIO

DRAWING:

MAX DAY PLUS FIRE CONDITION (2031)
WITHOUT NEW GREENBANK CONNECTION

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FIGURE 7-17

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7.6 Water Servicing Evaluation

Table 7-7: Water Servicing Evaluation

Issue	Aspect	Advantages
Geotechnical Issues and Construction Risks	Potential for poor soils/rock/elevated groundwater table, etc.	Standard watermain depth will be above water table
Infrastructure Requirements	Extent of works required	Works are contained to those within the BSUEA
Operational Impacts	Extent of maintenance intensive infrastructure	Standard watermain design
Property Acquisition / Land Use	Ease of property acquisition / compatibility with demonstration plan	Servicing is contained within proposed corridors and servicing parcels
System Reliability	Level of redundancy within system	Watermain trunk loop has two connection points
System Flexibility	Ability to adapt to changes in demonstration plan	Watermain can adapt to ROW corridor changes but connection points are set
Displacement of existing land uses	Effects in removal of existing communities	All work is within the BSUEA
Disruption to existing land uses	Extent of works affecting existing communities	All work is within the BSUEA
Consistency with City Infrastructure	Compatibility with City Design Guidelines and IMP	Adheres to local and provincial design guidelines
Impact on Significant Natural Features	Loss of natural areas due to servicing	Adheres to land use and demonstration plans
Impact on Aquatic Systems	Potential impact of water quality in receiving watercourses	No watercourse crossings
Impact on Surface Water and Groundwater	Minimization of works in waterbodies or in the groundwater table	No watercourse crossings
Effects on Urban Green Space, Open Space and Vegetation	Disruption or loss of green space or trees due to servicing	Follows land use and demonstration plans
Efficiency of Proposed Infrastructure	Use of existing or combined corridors	Extension of existing system with no upgrades required
Efficiency with Existing Infrastructure	Use of existing infrastructure or capacity	Extension of existing system with no upgrades required
Capital Costs	Initial Construction Cost	Standard watermain at standard depths

Issue	Aspect	Advantages
Operating Costs	Ongoing operation and maintenance requirements	No projected additional booster pump or reservoir infrastructure
Issue	**Aspects**	**Disadvantages**
Operational Impacts	Extent of maintenance intensive infrastructure	Standard watermain design however with mitigation measures for low pressure areas
Phasing and Scheduling	Integration with development phasing	Watermain looping may be required to achieve pressures regardless of phasing.

7.7 Water Summary and Recommendations

The proposed watermain servicing within the BSUEA lands is shown on Drawing MWM. A number of trunk watermain extensions are recommended as backbone to service the BSUEA lands. These watermains include:

- 400 mm diameter Greenbank Road Extension (from Existing at Knockaderry Crescent - Barnsdale Road);
- 300 mm diameter East-West Collector (Greenbank Road - Western limit of CDP);
- 300 mm diameter Kilbirnie Drive Extension (Alex Polowin Avenue - Park & Ride);
- 300 mm diameter Future Collector Road Extension (Northern Limit of Drummond - Kilbirnie Drive Extension);
- 300 mm diameter New Greenbank Road (Barnsdale Road - Northern limit of CDP); and,
- 300 mm diameter River Mist Road Extension (Northern CDP Limit - East-West Collector).

Water demands were spread over nine (9) nodes within the BSUEA. Demand allocation should be revisited at detailed design once all local watermains are added to the water model. At such time, it is recommended that all nodes include local water usage.

Watermain sizing has considered basic day demands as well as peak hourly demands, fire flow requirements and system redundancy. The proposed distribution system was evaluated against the requirements described in the Ottawa Design Guidelines for water distribution. The analysis confirmed that servicing of the BSUEA lands does not require any off-site watermains to support its development. However, mitigation measures are proposed (i.e., 25 mm diameter service lateral and oversized plumbing) for a residential area abutting the western perimeter of the Park and Ride facility. Although the minimum pressure constraint will not be achieved, the above recommended measures are appropriate to mitigate low pressures. Hence, it is recommended that this deviation to the Guidelines be accepted.

8.0 Impacts and Mitigation

The analysis and evaluation process completed and summarized in Sections 5.0 to 7.0 above has identified the preferred servicing strategy for the BSUEA as depicted on Drawings DSAN, MWM, KS1, KS2 and MSWMF. The evaluation process included assessment of indicators related to design, construction and operation, social, natural, and economic factors as summarized in Table 5-15, Table 6-5 and Table 7-7. The impacts of the preferred servicing strategy on the study area and the mitigation required are outlined in this section.

8.1 Design, Construction and Operation

8.1.1 Storm and Stormwater Management Servicing

The preferred storm servicing and stormwater management servicing strategy involves the use of an infiltration measure that will promote recharge of the overburden aquifer. The preferred infiltration method identified is the EES (refer to Section 5.5.1), relies on the exfiltration of minor system capture. By promoting infiltration of captured runoff via the EES and by achieving distribution infiltration of clean runoff (i.e., from local streets, relatively free of roadway salts), the following benefits will be achieved:

- Preservation of the pre-development infiltration regime (water budget) for each of the three (3) subwatersheds;
- Preservation of the baseflow characteristics;
- Mitigate adverse impacts on the esker;
- Reduce post-development peak flows, which in turn, will prevent increases in flood potential;
- Protect downstream water quality by infiltrating the first flush of the frequent storms;
- Remove the need for a water quality pond and associated safety concerns; and,
- Maintain quality of downstream aquatic resources by infiltrating the first flush.

The EES was implemented in 1993 in the former City of Etobicoke as part of a project retrofit. Although these systems require additional inspection, it has proven for the past 25 years of operation that the system is reliable and its maintenance very similar to a conventional system. Annual inspections part of or combined with a post-large storm event monitoring program, are required.

Due to the additional maintenance associated with an EES, there is a possibility that the BSUEA lands be serviced solely by a conventional storm sewer system, which will require end-of-pipe wet ponds. Should the conventional system and wet ponds be pursued, their operation and maintenance would be the same for similar systems within the City.

8.1.2 Sanitary Servicing

Sanitary servicing of the BSUEA lands has been described in greater detail in Section 6.0. The BSUEA will be serviced via extensions of the existing and/or planned wastewater collection system. Hence, there are no infrastructure needs to either increase downstream capacity or to implement pumping in order to achieve gravity connections. In terms of operation, the extension of the gravity systems within the BSUEA lands will require standard operation and maintenance for similar systems within the City.

8.1.3 Water Servicing

Water servicing of the BSUEA lands has been described in greater detail in Section 7.0. The BSUEA will be serviced via extensions of the existing and/or planned watermains. Hence, there are no infrastructure needs to either increase downstream capacity of delivery or to implement pumping to service high areas. In terms of operation, the extension of the water distribution system within the BSUEA lands will require standard operation and maintenance for similar systems within the City.

9.0 Class EA Project Listing

9.1 Environmental Assessment Projects

The infrastructure conceptually sized as part of this MSS process satisfies the requirements of Phases 1 and 2 of the Class EA process as outlined in Sections 1.3 and 2.0. The infrastructure projects, which will be required to be undertaken, are listed in this section of the report.

All the projects listed in this section will fall under the Environmental Assessment Act and will require an Environmental Compliance Approval (ECA) from the Ministry of the Environment and Climate Change (MOECC). Since the BSUEA CDP process follows the Class EA process, review agencies and the public will have an opportunity to review the documentation being prepared and appeal to the Ontario Municipal Board (OMB). The opportunity to appeal to the OMB will occur following the Notice of Completion, which will also include the conditions of planning approvals as well as the Class EA documents. This can be explained by the fact that both the development and review process is being integrated with the Planning Act and development application process.

Appeals to the OMB can be made to any of the OP and zoning by-law amendments or to the approval of subdivisions, as stipulated in the Planning Act. A Part II Order (PIIO) request may also be made to the MOECC or a delegate. However, when reviewing a PIIO request, the purpose and intent of the integration provisions – to co-ordinate the requirements of the Planning Act within the Class EA – will be considered. If any projects are appealed to the OMB, then the OMB will have to render a decision, allowing the project to proceed before the requirements of both the development approval process and the Class EA process are deemed to have been satisfied.

Once the notice period is complete (or a decision to proceed has been made as a result of an appeal), the Class EA documents and the preferred projects listed below will not be subject to any additional EA approval requirements with following submissions, unless there are major changes (Section 11.1). At this stage, the projects will be able to proceed to construction without any additional Class EA requirement.

9.1.1 Stormwater Management and Servicing Projects

The Schedule ‘B’ projects include:

- Trunk storm sewers along New Greenbank Road, from future Kilbirnie Road extension (MH172) to future East-West Collector (MH152);
- Trunk storm sewers along New Greenbank Road, from future East-West Collector (MH152) to Barnsdale Road (MH176);
- Trunk storm sewers along future East-West Collector, from western CDP limit (MH150) to Wet Pond 1;
- Trunk storm sewers along future ROWs and easements north of Barnsdale Road, from western CDP limit (MH120) to Wet Pond 2;
- Trunk storm sewers along future Street 1, from local road (MH114) to future East-West Collector (MH154);

- Water Quality Treatment Unit at Kilbirnie Drive west of Polowin Avenue (MH710);
- Wet Pond 1 abutting Greenbank Road and Knockaderry Crescent;
- Wet Pond 2 abutting Greenbank Road and Barnsdale Road;
- Spill-over dry pond 1 abutting Barnsdale Road;
- Spill-over dry pond 2 within the Mattamy Lands West near the future Dundonald Drive extension;
- Quantity Storage and water quality treatment for Brazeau lands;
- Quantity Storage and water quality treatment for Drummond lands; and,
- Pilot project that includes an Etobicoke Exfiltration System (EES) along a local road. The exact location and length of the system to be determined at first phase of Draft Plan of Subdivision.

In the event that the EES be accepted by the City, the above-noted projects should be replaced by the following:

- Trunk storm sewers along New Greenbank Road, from i) future Kilbirnie Road extension (MH172) to future East-West Collector (MH152),and ii) Barnsdale Road (MH177) to future East-West Collector (MHMH152);
- Trunk storm sewers along future East-West Collector, from western limit of CDP (MH150) to Dry Pond 2;
- Trunk storm sewers along future ROWs and easements north of Barnsdale Road, from western CDP limit (MH320) to Wet Pond 2;
- Trunk storm sewers along future Street 1, from local road (MH314) to future East-West Collector (MH154);
- Water Quality Treatment Unit at Kilbirnie Drive west of Polowin Avenue (MH710);
- Dry Pond 1 abutting Greenbank Road and Knockaderry Crescent;
- Dry Pond 2 abutting Greenbank Road and Barnsdale Road.
- HDS at MH158 and downstream of MH336;
- Spill-over dry pond 1 abutting Barnsdale Road; and
- Spill-over dry pond 2 within the Mattamy Lands West near the future Dundonald Drive extension;
- Quantity Storage and water quality treatment for Brazeau lands;
- Quantity Storage and water quality treatment for Drummond lands; and,
- Local roads to be serviced with an EES.

9.1.2 Wastewater Servicing Projects

The Schedule 'B' projects include:

- Trunk wastewater sewers along future East-West Collector, from the western limit of the CDP (MH550) to Greenbank Road (MH119);
- Trunk wastewater sewers along the eastern perimeter of the French Catholic Elementary School, from Barnsdale Road (MH536) to future East-West Collector (MH557);
- Trunk wastewater sewers along future Street 1, from MH 514 to future East-West Collector (MH554);

9.1.3 Water Distribution Projects

The Schedule 'B' projects include:

- 300 mm trunk watermains along future Kilbirnie Drive extension, from Alex Polowin Avenue to the western limit of the CDP trunk watermain from future Kilbirnie Drive extension through a local road to the Brazeau Pit;
- 300 mm trunk watermains along the future East-West Collector, from Greenbank Road to the western limit of the CDP;
- 300 mm trunk watermains along the New Greenbank Road, from the northern limit of the CDP to Barnsdale Road;
- 300 mm trunk watermains along the River Mist Road extension, from future East-West Collector to the northern limit of the CDP; and
- 400 mm trunk watermains along Greenbank Road, from Knockaderry Crescent to Barnsdale Road

9.2 Development Applications and Approvals

The development application that is to be made to the City will be reviewed in accordance with the policies outlined in Section 4 of the OP. The specific studies required under the development approval process are determined at the commencement of the process at a pre-application consultation meeting with City staff. Studies required may include geotechnical studies, community transportation and traffic studies, noise studies, servicing and stormwater management studies, and environmental impact studies. A number of the studies that are likely to be required have already been completed as part of the CDP and it is generally accepted that these can be used as part of the development approvals process for a five (5) year period following completion of the respective study.

A planning rationale outlining how the development meets the intent of the overarching plans for the area, including the OP, this BSUEA CDP and City design guidelines, is usually required.

9.3 External Agency Approvals

9.3.1 Ministry of the Environment and Climate Change

An ECA from the MOECC is required under the Ontario Water Resources Act for all sanitary sewers, storm drainage located along ROWs as well as for any SWMFs.

9.3.2 Ontario Drainage Act

Any modifications to the hydrological regime or alteration to the municipal drains within the Mud Creek and Rideau River subwatersheds will need to be documented in an Engineers Report by the Engineer of Record as per the Drainage Act (Section 78, Chapter D.17, R.S.O. 1990).

9.3.3 Rideau Valley Conservation Authority (RVCA)

The RVCA will review the development applications to ensure that it is consistent with the conservation, development and management of natural resources within the Rideau River watershed. In addition, they will ensure that property and people are protected from hazards such as flooding and erosion.

9.3.4 Ministry of Tourism, Culture and Sport (MTCS)

Application for Archaeological Clearance for Stage 1 Archaeological Assessment and Stage 2 must be made to the MTCS.

9.3.5 Ministry of Natural Resources and Forestry (MNRF)

Registration of a project and/or a permit is required with the MNRF where there may be disruption to a Species at Risk as part of the Ministry's Endangered Species Act (S.O. 200, c.6).

9.4 Development Charge Projects

Development Charges (DCs) are a one-time fee imposed by municipalities under the Development Charges Act. They are reviewed and set every five (5) years as part of a DCs by-law by the City. The charges are imposed on new residential and non-residential properties to cost share a portion of the growth-related capital infrastructure requirements. Once adopted by the City, this CDP can be used to include items in the development charge due to the increased need for services contained in the CDP. The following is a list of projects within the BSUEA that are eligible to be included in a development charges study:

- New Greenbank Road;
- Oversizing of sanitary sewers if larger than 375 mm and conveying flows in excess of 80 L/s;
- Oversizing of watermains if larger than 405 mm diameter; and,
- Land acquisition for Park and Ride.

10.0 Opinion of Probable Cost

10.1 Cost Comparison Between Conventional and EES Storm Sewer Systems

An Opinion of Probable Cost (OPC) for the Conventional and the EES storm sewer systems was completed to compare the cost between the two (2) systems. Only items which differed between the two (2) systems were included in the cost comparison provided in Appendix K. Storm sewers were, excluded from the OPC since sewer sizes are considered to be the same between the two systems.

The main difference between the two systems is the inclusion of the perforated pipe, clear stone and geotextile below local storm sewers in the EES, as shown on the cross sections on the Detail Drawing DT1. The exfiltration system requires deeper trenches which have also been accounted for in the cost comparison. In addition to the exfiltration system, the comparison also includes water quality controls including the water quality units in the case of the EES and the excavation for the permanent pool in the case of the conventional system.

As shown in the detailed cost comparison spreadsheet presented in Appendix K, it is anticipated that an EES for the BSUEA will have a construction OPC of approximately $3.45M over than a conventional storm sewer system (including a 40% contingency), which is equivalent to $293 per linear meter of road based on 11.8 km of road.

10.2 Cost Sharing of trunk storm sewers

It is anticipated that trunk storm sewers servicing New Greenbank Road and the Park & Ride will be eligible for cost sharing between Minto and the City. A theoretical cost sharing amount was estimated for both the conventional sewer system and the EES option based on the extent of trunk storm sewers that were oversized to accommodate runoff generated by the New Greenbank Road ROW and the Park & Ride.

10.2.1 Conventional Storm Sewer System

In terms of the conventional storm sewer system, the Park & Ride and the New Greenbank Road ROW are tributary to trunk storm sewers along Kilbirnie Drive, New Greenbank Road and the southern limit of the BSUEA/Barnsdale Road. If the Park & Ride and New Greenbank Road drainage areas (totalling approximately 6 ha) are excluded from the system, then storm sewers can be reduced in size, as indicated Table 10-1 below.

Table 10-1: Sewer Size Comparison with and without Park & Ride and New Greenbank

Street/Location	Upstream MH	Downstream MH	Pipe Size (mm) INCLUDING P&R and New Greenbank	Pipe Size (mm) EXCLUDING P&R and New Greenbank
Kilbirnie Drive	170	172	900	900
New Greenbank Road	172	174	1350	975
New Greenbank Road	174	176	1350	975

New Greenbank Road	176	179	1350	975
New Greenbank Road	179	178	1800	1500
Southern Limit of BSUEA	178	132	1950	1650
Southern Limit of BSUEA	132	134	1950	1800
Barnsdale Road	134	136	1950	1800
Barnsdale Road	136	137	1950	1800
Southern Limit of BSUEA	137	P2-In	1950	1800

An OPC was prepared for the aforementioned trunk sewers and is presented in Appendix K. The OPC estimates are based on both sewer and maintenance hole sizes for a storm sewer system with and without the Park & Ride and New Greenbank Road drainage areas. The OPC estimate for each option is presented in Table 10-2 below. Note that the estimated costs include a 40% contingency.

Table 10-2: Trunk Storm Sewer Estimated Cost Comparison

	Opinion of Probable Cost
Trunk Sewers/MHs INCLUDING P&R and New Greenbank	$3,240,000
Trunk Sewers/MHs EXCLUDING P&R and New Greenbank	$2,656,000
Difference (City Share)	$584,000

Based on the above OPC, the oversizing of the BSUEA sewers to accommodate runoff generated by the Park & Ride and New Greenbank Road will be approximately $584,000. Hence, the City's proportionate share of the BSUEA trunk storm sewer works, for the conventional system, is estimated to be $584,000.

10.2.2 Storm Sewers with EES

In the EES servicing option, the Park & Ride and the New Greenbank Road ROW are tributary to trunk storm sewers along Kilbirnie Drive, New Greenbank Road and the East-west Collector. If the Park & Ride and New Greenbank Road drainage areas (totalling approximately 6 ha) are excluded from the system, then storm sewers can be reduced in size, as indicated in Table 10-3 below.

Table 10-3: Sewer Size Comparison with and without Park and Ride and New Greenbank Road

Street/Location	Upstream MH	Downstream MH	Pipe Size (mm) INCLUDING P&R and New Greenbank	Pipe Size (mm) EXCLUDING P&R and New Greenbank
Kilbirnie Drive	170	172	900	900
New Greenbank Road	172	174	1350	975

New Greenbank Road	174	176	1350	975
New Greenbank Road	176	152	1350	975
New Greenbank Road	177	152	675	N/A[11]
East-west Collector	152	154	1500	1050
East-west Collector	154	156	1500	1050
East-west Collector	156	158	1500	1200
East-west Collector	158	P2-In	1500	1200

An OPC was prepared for the aforementioned trunk sewer systems and is presented in Appendix K. The OPC estimates are based on both sewer and maintenance hole sizes and were completed for a storm sewer system with and without the Park & Ride and New Greenbank Road drainage areas. The OPC for each scenario is presented in Table 10-4 below. Note that the estimated costs include a 40% contingency.

Table 10-4: Trunk Storm Sewer Estimated Cost Comparison

	Opinion of Probable Cost
Trunk Sewers/MHs INCLUDING P&R and New Greenbank	$2,178,000
Trunk Sewers/MHs EXCLUDING P&R and New Greenbank	$1,680,000
Difference (City Share)	$498,000

Based on the above OPC estimates, the oversizing of the BSUEA storm sewers to accommodate runoff generated by the Park & Ride and New Greenbank Road is $498,000. Hence, the City's proportionate share of the BSUEA trunk storm sewer works, for the EES servicing option, is estimated to be $498,000.

10.3 Development Charge Infrastructure Projects

Development charges are one-time fees levied by municipalities on new residential and non-residential properties to help pay for a portion of the growth-related capital infrastructure requirements. (City of Ottawa, 2017)

It is anticipated that some of the proposed trunk storm sewers in the BSUEA which are equal to or greater than 1800 mm in diameter may be eligible for Development Charge (DC) repayment, according to the current 2014 DC By-law. In terms of the Conventional storm sewer system option, this would apply to storm sewers on New Greenbank Road (245 m), the East-West Collector (215 m) and the southern limit of the BSUEA/Barnsdale Road (695 m). With regard to

[11] Sewer segment between MH 177 and 152 services solely the New Greenbank Road ROW, therefore, with this drainage area excluded, the sewer segment is not required.

the EES option, all of the proposed trunk storm sewers are less than 1800 mm in diameter and would, therefore, not qualify for DC recoveries.

The City of Ottawa 2014 Development Charges Study Report Update indicates that the benchmark for DC repayment for sanitary sewers is applicable to sewers equal to or greater than 450 mm in diameter with peak flows greater than 80 L/s. Although there are sanitary sewers that are 450 mm diameter and greater that are proposed to service the BSUEA, none of these sewers will convey peak flows greater than 80 L/s. On this basis, none of the proposed BSUEA sanitary sewers would qualify for DC recoveries.

DC repayment for watermains applies to watermains equal to or greater than 610 mm in diameter. DC repayment for watermains in the BSUEA would, therefore, not apply since the maximum watermain size proposed within the BSUEA is 406 mm in diameter.

The DC By-law also applies to ROWs which have a travelled roadway section that is wider than 11 m. Should Minto front-end the construction of the New Greenbank Road ROW then it is anticipated that the New Greenbank Road ROW would qualify for DC recoveries based on the EA ROW cross sections shown on Details Drawing DT1.

The eligibility for DC recovery of all proposed infrastructure servicing the BSUEA should be re-assessed upon passing of the updated DC By-law anticipated for 2019.

11.0 Implementation and Phasing

11.1 Adaptability of the MSS within the EA Amendment Process

As per section 9.1, once the Class EA has been approved, construction of services can proceed. However, it is acknowledged that there may be changes prior to the construction being completed. The development should proceed as per the Class EA or as consistent with the intent of the approved Class EA as possible. If circumstances arise that were not anticipated or could not be clearly foreseen, this may trigger changes to the MSS as approved. There are two (2) classes of changes that may occur: i) minor changes that do not have significant changes to the environmental impacts of the work and which remain as per the intent of the EA, and ii) major changes which substantially change the environmental impacts. Conversely, a major change would require an addendum to the MSS which would outline the implications for the change, and would have to be made available for public review.

The nature of major and minor changes is set out further below.

11.1.1 Minor Changes

These include changes that could be considered to be typical and arise frequently on projects as the project is refined through the detailed design and planning process. Changes in alignments or footprints could also be considered minor provided that they do not adversely impact other landowners. Minor changes are approved through the City's development review process.

11.1.2 Major Changes

Deviations from the CDP and MSS that would substantially alter the impact to the environment are deemed as major changes. Major changes can also occur when the environmental conditions for the project change, which will have a significant impact on the environment. Major changes could include the requirement for pump and/or booster stations or the discovery of Species at Risk.

Should a major change occur, then the EA's recommendations and conclusions would need to be updated. This process would have to be carried out through an amendment to the EA. The amendment would identify the associated impacts of the change and the proposed mitigation measures. Following review and input by the stakeholders and external agencies, a Notice of the Addendum would need to be posted and would be open to public review. It should be noted that only the parts of the EA where changes occurred would be subject to public review. All other parts could not be reviewed.

11.2 Detail Design

The objective of the MSS is to provide a high level servicing solution, which can demonstrate that development is feasible in accordance with municipal and provincial standards. Street-by-street detailed design would still be required; however, this process would occur at the Plan of Subdivision or Site Plan applications stage. Minor changes to the MSS design are expected to occur as further field information is processed and the design is further detailed, which could in turn impact grade raises and ROW grading

11.3 Infrastructure Phasing

It is intended that development generally proceeds from the eastern boundary of the CDP towards the west. In parallel, a portion of the study area located in the northwest corner adjacent to Half Moon Bay is also expected to proceed. The majority of the proposed services are intended to connect to existing services in the existing urban boundary on the western side of the CDP.

The intended phasing for the BSUEA is set out below and shown in Figure 11-1.

- Minto Lands
    - Phase 1: Minto Lands north of the East-West Collector and east of New Greenbank Road
    - Phase 2: Minto Lands south of the East-West Collector and east of New Greenbank Road
    - Phase 3: Minto Lands west of New Greenbank Road
- Mattamy Lands East
    - All one phase which could be constructed jointly with the Half Moon Bay South development.
- Mattamy Lands West
    - All one phase which could be constructed jointly with the Half Moon Bay West development.
- Brazeau and Drummond Aggregate Extraction Areas
    - Each Aggregate Extraction Area can proceed once filling up to the minimum rehabilitation elevation has been met although in terms of land use the restrictions around operating Aggregate Extraction Areas must continue to be adhered to until both areas stop operations.

The servicing needs for each of the three (3) services are set out below.

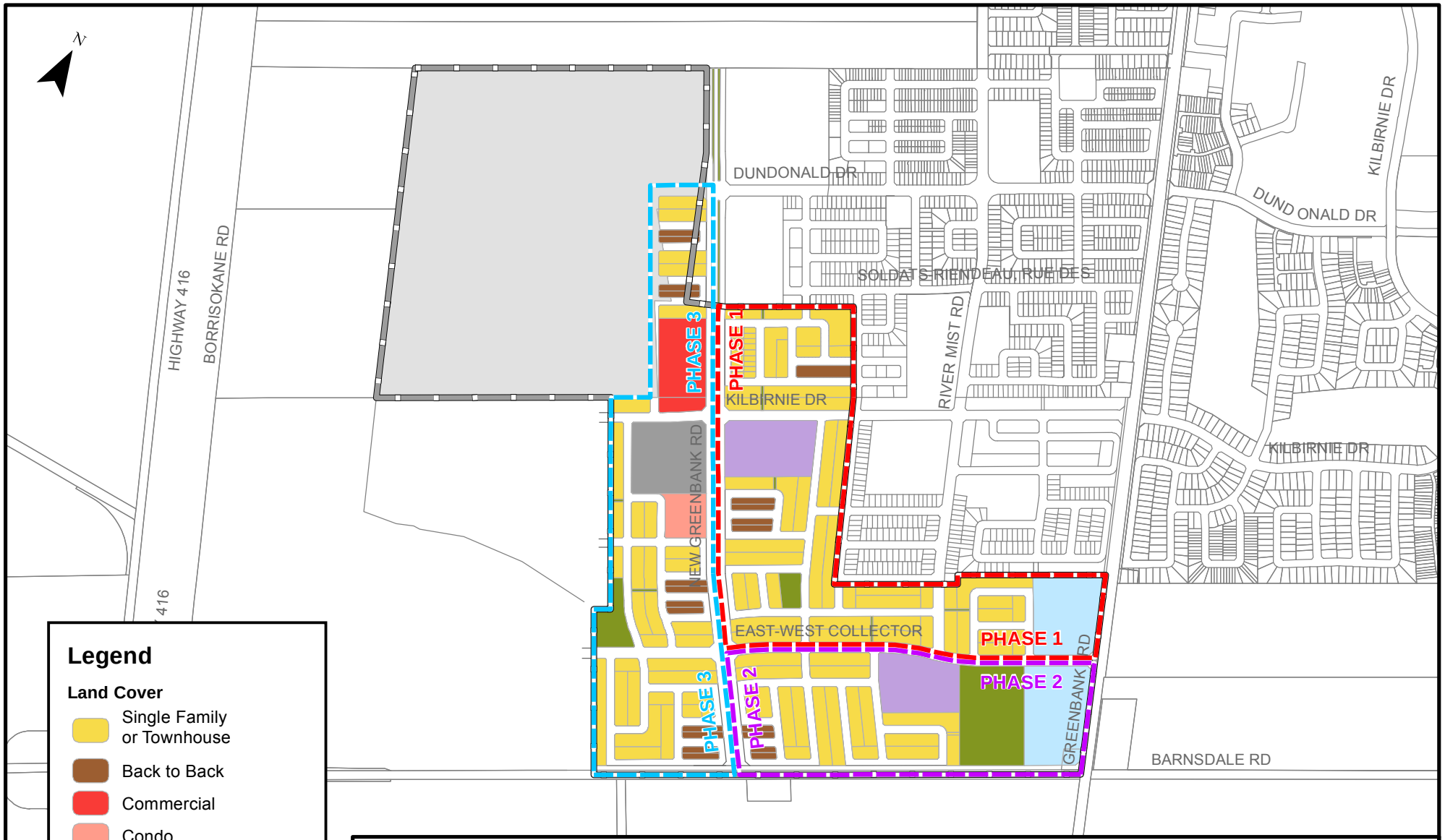
11.3.1 Storm Drainage and Servicing

11.3.1.1 Minto Lands under the conventional system

Phase 1 of the Minto Lands can proceed once Wet Pond 1 is in place and operational. The control orifice structure will need to be designed (size, location, etc.) and installed along the existing 1800 mm diameter storm sewer system of Quinn's Pointe, upstream of the Greenbank Road trunk sewer system. This proposed infrastructure will limit the pond's discharge.

11.3.1.2 Minto Lands under EES

Phase 1 of the Minto Lands can proceed once Dry Pond 1 is in place and operational. The control orifice structure will need to be designed (size, location, etc.) and installed along the existing 1800 mm diameter storm sewer system of Quinn's Pointe, upstream of the Greenbank Road trunk sewer system. This



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PHASING PLAN

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FIGURE 11-1

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proposed infrastructure will limit the pond's discharge. To support the development of Phase 1, the hydro dynamic separator (HDS) located between both dry ponds will also need to be in place to provide quality control for the East-West Collector Road. In addition, a small cell of Dry Pond 2 will be required. Volume, shape and configuration of this cell to be determine at detailed design.

11.3.1.3 Mattamy Lands East

The Mattamy Lands East can be developed once the weir of the Todd Pond is increased from 30 m to 48 m in length as noted in the Todd Pond Model Keeper Analysis Re-Assessment of Existing System Capacity report (JFSA, 2015). The remainder of the servicing for the Half Moon Bay South Phase 4 subdivision must be in place and operational prior to the Mattamy Lands East servicing being operational.

11.3.1.4 Mattamy Lands West

The hydrological analyses completed have shown that a spill-over dry pond will be required prior to construction of the Mattamy Lands West unless sufficient street sag storage can be provided in the subdivision's grading.

11.3.2 Wastewater Servicing

The proposed BSUEA trunk sanitary sewers will discharge to existing/planned sanitary sewers at six (6) locations: The Future Collector Road, New Greenbank Road, Flameflower Street, Alex Polowin Avenue, Kilbirnie Drive, and Greenbank Road. Development will need to proceed from these points and extend westerly.

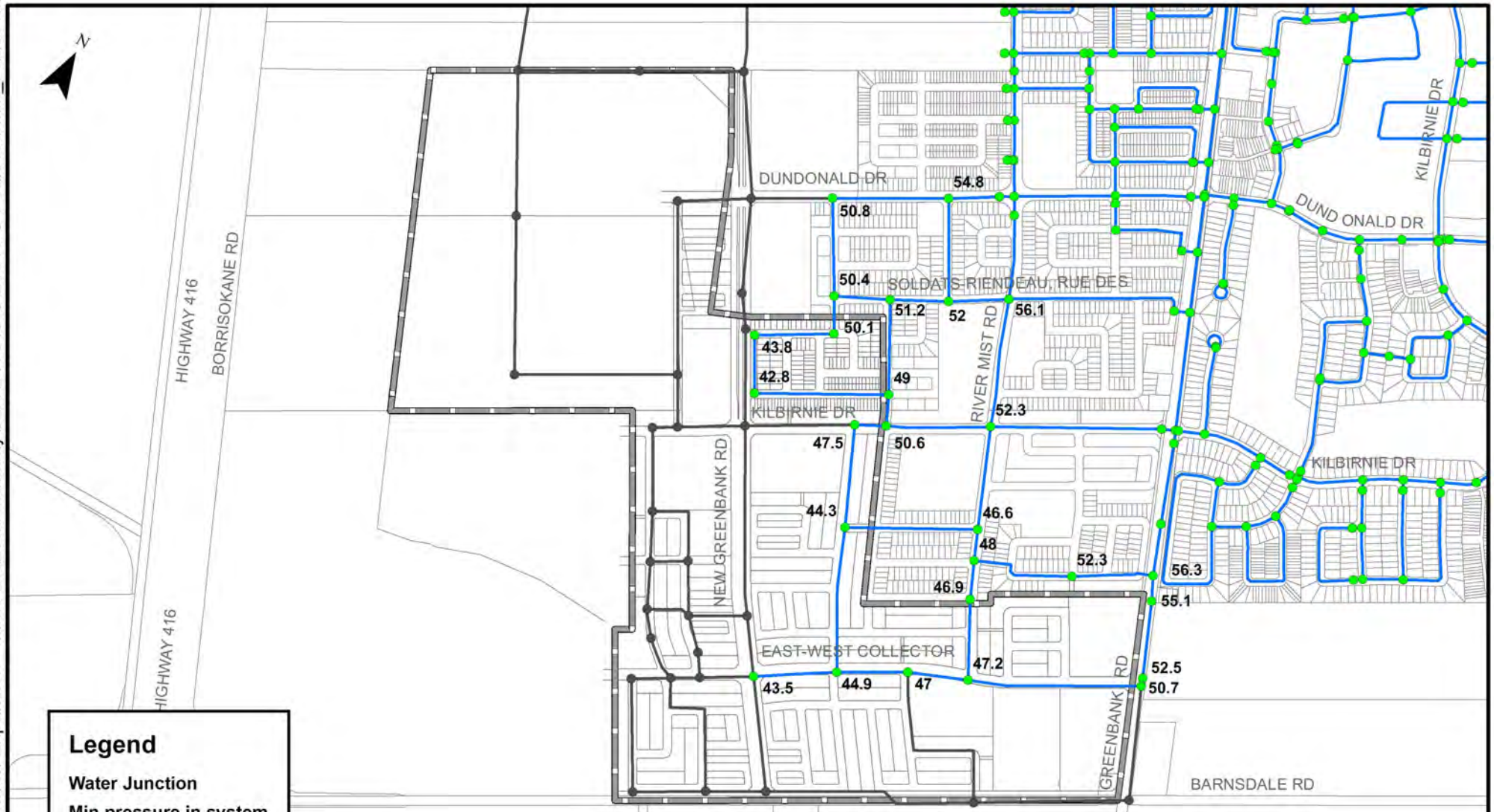
11.3.3 Water Supply Servicing

Water distribution systems are often vulnerable during the initial phases of development and as such the performance of Phase 1 was evaluated under peak hour and maximum day plus fire flow. Phase 1 would require the construction of part of the 400 mm and 300 mm diameter watermain extensions and local watermains.

The evaluation was carried out using the existing condition model (2016). Simulation results are as follows:

- Under PKHR condition, the minimum pressures during this 72-hour simulation (Figure 11-2) range between 42.8 psi (295 kPa) and 55.1 psi (380 kPa). Hence, all nodes within Phase 1 exceed the minimum pressure constraint of 40 psi (276 kPa); and
- Under a simultaneous maximum day and fire flow condition (Figure 11-3), fire flow availabilities, in general, exceed the minimum fire flow of 13,000 L/min or 217 L/s. However, there are two (2) nodes part of Phase 1 that will not meet the fire flow of 13,000 L/min. Both nodes are located within the Mattamy Lands East, and are the most western nodes next to New Greenbank Road. At those locations, fire flow availability of 187 L/s to 195 L/s was simulated.

Given that Peak Hour minimum pressures for Phase 1 are above 40 psi (276 kPa), fire flow availability exceeds the minimum fire flow cap of 10,000 L/min and that the minimum fire flow of 13,000 L/min (217 L/s) would be achieved met once the 300 mm diameter feedermain along New Greenbank Road is constructed, only local watermains need to be extended for Phase 1 to proceed. To increase fire flow availability in the Mattamy Lands East, it is recommended that hydrant spacing be carried out to locate proposed hydrants closest to existing Half Moon Bay rather than New Greenbank Road. By using this spacing approach, fire flow availability would be greater than what has been shown on (Figure 11-3).



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PEAK HOUR MINIMUM (2016)
PHASE 1

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FIGURE 11-2

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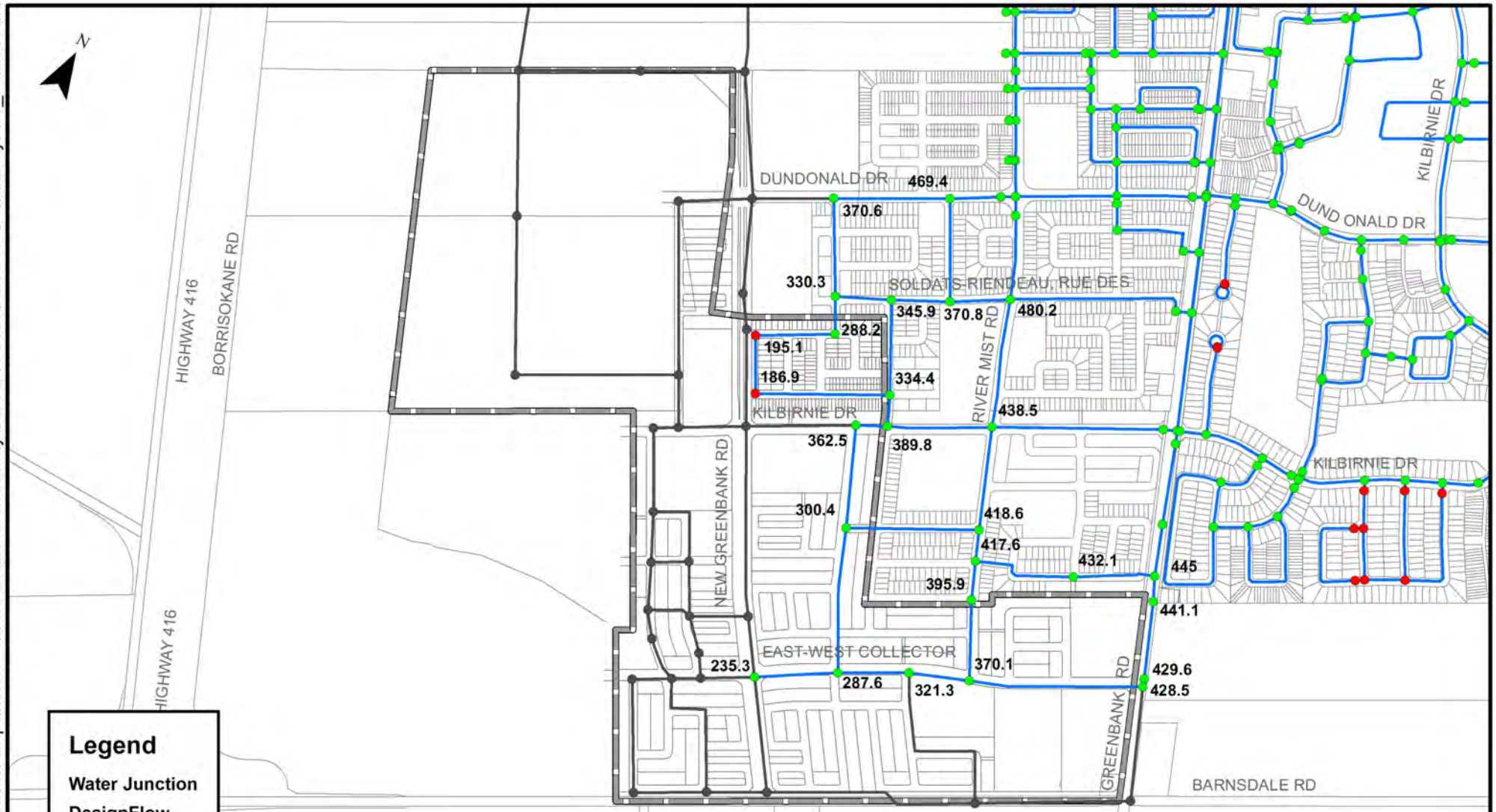

Legend

Water Junction
DesignFlow
- < 217 psi
- > 217 psi
- Inactive

Watermain
- Inactive
- Active

Study Area

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA
OTTAWA, ONTARIO

DRAWING:

MAX DAY PLUS FIRE CONDITION (2016)
PHASE 1

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FIGURE 11-3

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12.0 Conclusions

This MSS has identified a recommended a high level servicing strategy for storm, wastewater and water servicing of the BSUEA CDP. The servicing strategy is a functional design which demonstrates the feasibility of servicing the proposed development. The design criteria utilized to develop the servicing strategy can be used to develop the detailed design. It is anticipated that the detailed design to be carried out in the Plan of Subdivision application phase, will be consistent with the MSS but will adapt for any alterations to the road and layout configurations. The MSS has been developed with this flexibility in the design.

Principal findings of the MSS are set out below:

Storm Drainage and Stormwater Management

- The design of the storm drainage system has been undertaken using the dual-drainage approach. The Master Servicing Study (MSS) sets out the design criteria for future draft plan and site plan applications for the BSUEA. The design criteria are consistent with current design standards.
- Two (2) separate storm servicing solutions were developed; one conventional servicing strategy and one that incorporates the Etobicoke Exfiltration System (EES), which was recommended. Should the performance of Phase 1's EES be inconclusive, then the feasibility of an infiltration gallery servicing the Phase 2 lands was reviewed. The high level assessment found that an infiltration gallery incorporated within the proposed spill-over dry pond next to Barnsdale Road could provide sufficient storage for part of Minto's Phase 2 lands.
- The downstream boundary conditions or flow criteria to achieve are developed in the MSS and were used in the design constraints.
- A preliminary grading plan was developed and used to depict drainage areas.
- The trunk sewer network was designed based on the preferred demonstration plan and modelled to ensure that the hydraulic grade line (HGL) elevations along the system maintained a 300 mm freeboard, which corresponds to 2 metres below proposed centreline elevations.
- Allowable minor system release rates were set at the required storm event and future design should maintain the same release rate criteria.
- The stormwater management solution incorporates two (2) stormwater management ponds adjacent to Greenbank Road, one spill-over dry pond west of the CDP boundary and a potential spill-over dry pond within the Mattamy West Lands.
- An additional two (2) potential stormwater management facilities have been identified in the stormwater management solution for the aggregate extraction areas.

Wastewater Servicing

- The residual capacities in the surrounding wastewater services were assessed to determine viable servicing outlets for the BSUEA wastewater.

- Six (6) outlet connection points have been identified for the BSUEA with sufficient residual capacity to provide wastewater servicing.
- The existing constructed and planned wastewater system network is capable to accommodate servicing for the BSUEA.
- Upsizing of some planned currently unconstructed wastewater infrastructure is recommended.
- The MSS contains design criteria which are to be used for the BSUEA in future draft plan and site plan applications. The design criteria are consistent with current design standards.
- The trunk wastewater system layout is designed based on the preferred demonstration plan and associated land use densities.
- The MSS servicing evaluation has identified that wastewater servicing of the BSUEA is feasible based on the downstream residual capacities and the proposed trunk sanitary sewer network.

Water Distribution

- The BSUEA can be serviced from the BARR pressure zone with watermain extensions from the surrounding existing watermains.
- The analysis confirmed that there are no upgrades to the planned distribution network identified in the 2013 Infrastructure Master Plan.
- Demand allocation for water supply servicing has been set at a high level based on the preferred demonstration plan and associated densities.
- Trunk watermain sizing has been carried out based on the demonstration plan and existing watermains at the boundary of the BSUEA lands.
- The BSUEA has set design criteria which is to be used for the BSUEA in future draft plan and site plan applications. The design criteria are consistent with current design standards.
- Mitigation measures are proposed for residential development with centreline elevations above 108 m to minimize the inconvenience of low minimum pressures in the distribution system above this elevation.

The MSS component of the BSUEA CDP satisfies the requirements of Phases 1 and 2 of the Municipal Class EA process. Infrastructure projects that will be undertaken as a result of development of the BSUEA, along with their phasing and schedule classification, are contained within the report.

The MSS demonstrates that the proposed CDP land use can be serviced by extending existing municipal water and wastewater infrastructure; upsizing planned future wastewater infrastructure, and constructing stormwater management facilities.

This report has been prepared for the exclusive use of Minto Communities Inc. and Mattamy Homes Ltd, for the stated purpose, for the Barrhaven South Urban Expansion Area. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Minto Communities Inc. and Mattamy Homes Ltd and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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Appendix A

Study Terms of Reference

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Barrhaven South Urban Expansion Area (BSUEA)
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

INTRODUCTION

Minto Communities (Minto) along with Mattamy Homes (Mattamy), herein referred to as the Owner, have retained a Consultant Team to undertake a series of deliverables in support of the Barrhaven South Urban Expansion Area Community Design Plan (CDP) process, which will be implemented as an Amendment to the City of Ottawa Official Plan (OP). The study process will include the Minto and Mattamy lands as well as the Brazeau and Drummond lands all within the limits of the Barrhaven South Urban Expansion Area (BSUEA). A number of deliverables will be prepared in support of the CDP, including an Existing Conditions Report (ECR), an Environmental Management Plan (EMP), a Community Transportation Study (CTS) and a Master Servicing Study (MSS) for water, wastewater, storm and stormwater management as well as site grading. The following Terms of Reference (TOR) have been revised to incorporate comments issued by the City on February 12, 2016. Task 1 described below relates to finalization of the TOR while Task 3 with the completion of the ECR and those associated with the preparation of the MSS in Tasks 3 to 5.

J.L. Richards & Associates Limited (JLR) was retained by Minto and Mattamy to complete part of the ECR that relates to water resources as well as the preparation of the MSS that will act as a supporting document to the Official Plan Amendment (OPA) and the CDP. The latter document will be completed to fulfill Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) Process.

STUDY OBJECTIVES

The main objective of the JLR portion of this study is to develop a Master Servicing Study for the BSUEA that will fulfill the requirements of both municipal and provincial standards. Prior to preparing this Master Servicing Study, the first step of this study will be to review, evaluate and assess water resources in the area as well as the identification and evaluation of stream crossings and storm infrastructure. These tasks will be carried out at the onset of the study where findings will be consolidated and synthesized in the ECR. This document will also be supplemented by a series of biological findings, by Dillon, as well as a water budget analysis that will be completed by JLR in consultation with the hydrogeotechnical engineer. Once the ECR has been completed, the impact of the Barrhaven South Urban Expansion Area (BSUEA) on the existing services will be assessed and mitigation strategies considered, as part of the subsequent tasks and a preferred internal servicing plan will be identified from a series of alternatives.

The development of alternatives and selection of the preferred servicing alternative will follow the master planning process, where Phase 1 and 2 of the Municipal Class Environmental Assessment (MCEA) Process will be fulfilled. The preferred internal servicing plan will be developed to meet regulatory requirements and will be free of conflicts between the various

CANADA'S BEST MANAGED COMPANIES

infrastructure components (water, wastewater, storm and stormwater infrastructure). The following sections present the anticipated scope of work for JLR to complete the work noted herein for the following:

- Task 1 (Finalization of TOR),
- Task 2 (Existing Conditions Report),
- Task 3 (Vision, Objectives & Targets),
- Task 4 (Preliminary Concept Plans),
- Task 5 (Preferred Concept Plan, Demonstration Plan & Design guidelines,
- Task 6 (Barrhaven South Expansion Area Community Design Plan), and
- Task 7 (Implementation).

It should be noted that these TOR were prepared to satisfy Task 1 of the CDP process.

Barrhaven South Urban Expansion Area
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

TASK 1: FINALIZATION OF THE TERMS OF REFERENCE

The latest TOR (issued on December 3, 2015) was revised to integrate comments from the City and the RVCA issued on February 12, 2016. The following TOR document will form the basis of subsequent analyses to support the CDP.

TASK 2: EXISTING CONDITIONS REPORT

The scope of work to complete the Existing Conditions Report will include the following undertakings:

2.1 Review and Consolidate

To complete the ECR, the review of background reports that impact the Study Area will be completed. We anticipate that this review will include the following reports, which has been assumed that the documents would be provided in a digital format:

- Lower Rideau River Subwatershed Strategy (RVCA, 2005)
- Jock River Reach 1 and Jock River Reach 2 Subwatershed Plans (RVCA, 2007)
- Jock River Subwatershed Report (RVCA, 2010)
- Corrigan Storm Water Management Facility (CP), by IBI Group, dated July 2010
- Jock River – Barrhaven Catchment Data Sheet (RVCA, 2010)
- Mud Creek Subwatershed Study Existing Conditions Report, Phase 1 subwatershed (RVCA, 2011)
- Infrastructure Master Plan (City, 2013)
- Mud Creek Subwatershed Study, City of Ottawa (October 2015), approved by council in January 2016.
- Barrhaven South Master Servicing Study (Stantec, 2007)
- Barrhaven South Master Servicing Study Addendum Draft Report (Stantec, November 2014); document to be finalized in 2016
- Site Servicing Report, Quinn's Pointe, (J.L. Richards & Associates limited, July 29, 2015)
- Model Keeper Analysis for Todd Pond, (J.F. Sabourin and Associates Inc., updated 2015)
- Thomas Baxter Municipal Drain Engineer's Report
- Geotechnical Reports

Included in this task is the review of other information provided by the City and the RVCA. This would include, but not be limited to, mapping of surficial geology, hydrography, topography, LIDAR information, existing and upcoming topographical surveys (obtained on behalf of the Owner), floodplain mapping for the Jock River and Mud Creek, land use, vegetation, etc., as well as other data compiled by the Consultant Team's geotechnical engineer and biologist. Should information gaps be noted during

the completion of this task, JLR will inform the Owner.

2.2 Prepare Inventory of Water Crossings

Based on topographical survey completed by Stantec, JLR will compile and consolidate the data, in a standard report form, for the following water crossings along:

i) Barnsdale Road,
ii) Greenbank Road, and
iii) Cedarview Road.

2.3 Identify and Assess Capacity of Existing Conveyance Systems

Based on topographical maps/surveys and servicing reports of existing developments adjacent to limits of the CDP, free flowing capacity of watercourses (if any), roadside ditches and water crossings will be carried out.

2.4 Water Budget

In consultation with the hydrogeological engineer, JLR will carry out a Water Budget Analysis that will assess the balance between infiltration, runoff, and evapotranspiration under existing conditions. This analysis will be completed in accordance with the methodology described in Section 3.2 of the MOE publication entitled “Stormwater Management Planning & Design Manual, March 2003” using Environment Canada’s Thornthwaite Climatic Water Balance information derived from 30 years of monthly data. The existing conditions Water Budget Analysis will then be used as baseline condition as part of the MSS to predict/evaluate the potential changes to the hydrologic cycle resulting from urbanization.

2.5 Watershed Delineation

Upon the review of the background reports, the topographical maps/surveys and LIDAR compiled for the City, watersheds and sub-watersheds delineation will be carried out. If applicable, attention will be given to sub-watersheds that are found to be tributary to the Jock River versus those tributary to the Thomas Baxter Municipal Drain, one of Mud’s Creek tributaries.

2.6 Hydrological Modelling

Once the watershed limits have been further refined, a hydrologic model will be

developed to estimate peak flows and hydrographs under various recurrences for each sub-watershed and outlet. This analysis will be conducted with SWMHYMO under the design storm types and recurrences (1:2 year to 1:100 year) and hydrological parameters described in the Ottawa Sewer Design Guidelines. The analysis will consider the drainage features inventoried as part of the topographical survey (open ditch, culverts, etc.) as well as drainage divides between watersheds. Surface flows will be calculated based on the existing flow patterns for the various outlets; drainage ditches, culverts, and storm sewers, if applicable. Drainage Plans will be prepared depicting the various drainage features and sub-watershed limits as well as flow patterns and drainage patterns.

2.7 Floodplain Mapping

It is standard practice to hydraulically evaluate conveyance capabilities of watercourses as part of an ECR using models such as HECRAS, or HEC2. Results of this analysis include the calculation of water levels, which is in turn is used to delineate the 1:100 year floodplain limit.

Based on preliminary findings from the Consultant Team's biologist, there were no watercourses inventoried when the assessment for the "Headwater Drainage Features Guidelines" was completed as the various hydrography systems shown in the City's mapping within the BSUEA limit was non-existent. Hence, there is neither floodplain mapping nor water level calculations anticipated at this time. Should the final findings from the biologist show defined watercourses within the BSUEA, and then the 1:100 year floodplain would be generated based on the hydrological findings of Task 3.6 with the HEC-RAS software platform. Additional survey would then be required to gather geodetic data of the active channel and floodplain as well as at various water crossings. In this event, the floodplain (1:100 year) would be delineated on topographical maps.

2.8 Identification of Direct Watercourse Receivers and Geomorphological Assessment

As previously noted, there was no watercourse inventoried by the biologist within the limits of the BSUEA. The data collected to date show that a significant portion of the surface flows are either trapped/infiltrated on-site or sheet flows to a series of open ditches/culverts; some of which appear to convey flows westerly along Barnsdale towards Highway 416 and others easterly towards Greenbank Road, where the open ditch system flowing north is intercepted by the Greenbank Road trunk storm sewer system near Kilbirnie Drive. The existing condition drainage patterns will be confirmed when mapping and topographical surveys are reviewed. At this time, it appears that there will not be any need to carry out a geomorphological assessment of the receiving stream nor to investigate potential thermal impacts. Should there be a need identified during the course of the preparation of the ECR or MSS, the Owner will retain the services of a geomorphologist to carry out a geomorphological assessment and thermal

impacts would further be investigated with the assistance of the biologist.

2.9 Coordination and Liaise with Other Disciplines

The EMP and ECR will consolidate findings from all disciplines including, surficial geology, hydrogeology, water budget, hydrology, ecology (aquatic resources and natural areas), etc., which will establish the existing environmental conditions. Since the existing conditions hydrological regime is often influenced by natural environmental features, there will be efforts dedicated to coordinate and liaise with the other disciplines. The coordination will ensure that the hydrologic analysis considers natural environmental inventories and constraints.

2.10 Identify Constraints/Opportunities and Recharge/Discharge Areas

Based on the findings from the various disciplines, drawings will be prepared by each discipline to identify natural resources, existing conditions constraints and potential opportunities, which may impact storm and stormwater servicing or other municipal infrastructure. Similarly, recharge and discharge areas will be identified and depicted by others based on the hydrogeologist's findings.

2.11 Evaluation and Assessment of Storm Design Criteria and Objectives

Based on the findings of the natural resource inventories, storm criterion for both water quality and quantity will be established from a consensus with other disciplines. Once adopted by the Consultant Team, the storm criteria will be presented and confirmed by regulatory agencies during one of the scheduled meetings. The design criteria will be established to protect/enhance the environmental resources.

2.12 Assist Drainage Engineer with Hydrological Calculations for the Thomas Baxter Municipal Drain

Should the refinement of the watershed limits show that surface flows from part of the BSUEA is currently tributary to the Thomas Baxter Municipal Drain and that the divide is found to differ from the Drainage Report on record (January 1967), then there might be a need for the Owner to retain the services of a Drainage Engineer licensed under the Ontario Drainage Act to update the above Drainage Report. If this requirement is confirmed, JLR acting as the hydrological engineer will coordinate and prepare information requested by the Drainage Engineer to serve as background to an amendment to the Drainage Report.

2.13 Attend Core Project Team (CPT) and Technical Advisory Committee (TAC) Meetings

To facilitate coordination between all disciplines, project meetings will be scheduled with other disciplines. JLR intends to meet and liaise with the geotechnical and hydrogeological engineer as well as the biologist. To supplement the above, there will be one CPT meeting and one TAC meeting that will be held to obtain feedback from other disciplines and to identify any gaps in the records. It is also anticipated that pre-consult meeting(s) will be held with both MOECC and RVCA to identify whether supplemental inventories are required. These meetings will be held during the course of this task and prior to the preparation of a Draft Existing Conditions Report.

2.14 Prepare Sections for the Draft Existing Conditions Report

Based on the Table of Contents developed by Fotenn/Parsons, JLR will prepare sections of the Existing Conditions Report, including figures/drawings, data collected for the water crossings, modelling input and output files, appendices, etc. The Report will also reflect the discussions held as part of the CPT and TAC meetings and the input received from the regulatory agencies.

2.15 Review Comments and Finalize the Existing Conditions Report

Upon the review of the comments issued from the TAC members and during the CPT, the Draft Existing Conditions Report will be revised to address comments made by the TAC and/or regulatory agencies such as RVCA and the MOECC on JLR's sections of the ECR.

Barrhaven South Urban Expansion Area
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

TASK 3: VISION, OBJECTIVES & TARGETS

This task will establish the Vision, Objectives and Targets for the upcoming CDP. From a Master Infrastructure Servicing perspective, this task will include a thorough consolidation of the documents listed in Section 3.1, investigate and quantify residual capacities and servicing constraints while keeping in mind the environmental constraints identified as part of the ECR. More specifically, it is envisioned that the following tasks be completed:

3.1 Coordinate and Liaise with Geotechnical Engineer

In consultation with the geotechnical engineer, JLR will:

- Review specific grade raise restrictions on a zone by zone basis to better understand the potential grading constraints versus potential land use;
- Review the soil's characteristics to better understand whether they are conducive to infiltration measures;
- Review the soil's structural capabilities from a support/strength perspective;
- Review the areas of either recharge or discharge potential; and
- Review of future potential pit rehabilitation along with its impact on both municipal infrastructure and water budget.

3.2 Coordinate and Liaise with the Hydrogeologist

In consultation with the hydrogeologist, the existing conditions water budget analysis will be reviewed in greater details to identify the zones conducive to infiltration measures. These measures could potentially be used to mitigate impacts on the hydrological regime. As part of this task, low impact development (LID) strategies will be reviewed, at a conceptual level, to determine their viability and effectiveness in maintaining the existing conditions water budget.

3.3 Coordinate and Liaise with Biologist

In consultation with the biologist, the environmental constraints described in Task 3.10 will be further reviewed to better understand their sensitivity and tolerances to various land uses and their proximity. Given that there were no watercourses inventoried within the limits of the BSUEA, the objectives and targets from a storm discharge perspective will be based on the on-site environmental constraints as well as the limitations of the downstream watercourses.

3.4 Review Topographical Maps and Survey and Complete Inventory of Existing Infrastructure

Once all constraints have been compiled as part of Tasks 3.1 to 3.3, a further review of topographical maps and surveys will be completed as well as the drainage patterns identified under existing conditions. As part of this task, existing services and outlets will be inventoried for wastewater, water and storm. The assessment of residual capacities for existing services is proposed to be conducted as part of Task 5. If required, additional survey data may be required to supplement as-built information.

3.5 Attend CPT No. 2 and TAC No. 2

Under this task, a Draft Vision, Objectives and Targets will be adopted based on the discussion that will be held as part of the CPT No. 2. Once adopted, it will be further reviewed and examined as part of TAC No. 2. It is also expected that the proposed storm discharge criteria (quantity and quality) will be confirmed by regulatory agencies as a part of the acceptance of the ECR.

3.6 Prepare and Attend POH No. 1

Once CPT No. 2 and TAC No. 2 are completed, the Consultant Team will prepare background material that will be made available for the first public consultation (POH No. 1). During this meeting, findings of the Existing Conditions Report will be presented. The second part of the meeting will be held as a workshop, which will facilitate an exchange between the TAC members and the community; the project will be introduced, and the community will be engaged in defining a Draft Vision, Objectives and Targets for the BSUEA lands. It should be noted that POH No. 1 will be a voluntary public consultation part of Phase 1 of the MCEA process.

Barrhaven South Urban Expansion Area
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

TASK 4: PRELIMINARY CONCEPT PLANS

After the completion of Tasks 3 and 4, the Consulting Team will develop preliminary CDP Concept Plans based on the findings of the ECR, comments compiled to date from the TAC members and the input received from the public during POH No. 1. At this stage of the project, conceptual servicing will be investigated for the preparation of the preliminary CDP Concept Plans. However, in regard to the pit areas, a more in-depth review of the ECR findings and the servicing requirements will be carried out in advance of developing the preliminary CDP Concept Plans. The evaluation will measure the extent of the rehabilitation works required to service the pit areas, which in turn will assist in proposing workable land use for this area. Consequently, the extent of the rehabilitation works required to service the pit areas and proposed land use will determine the level of effort required in evaluating the municipal servicing requirements described below in Section 4.2.

4.1 Attend CPT No. 3 and TAC No. 3

The preliminary CDP Concept Plans will be further reviewed by the Consultant Team as part of CPT No. 3. During this meeting, it is envisioned that the preliminary CDP Concept Plans will be refined based on the interaction between the disciplines. Once the meeting completed, the refined CDP Concept Plans will be adopted for presentation to the TAC.

The evaluation findings for the proposed CDP Concept Plans will be shared with other TAC members as part of the TAC No. 3 meeting. Once comments and feedback have been received and addressed, final CDP Concept Plans will be adopted and municipal servicing will be evaluated.

4.2 Evaluation of Municipal Servicing Requirements for the Selected Concept Plans

JLR will evaluate infrastructure servicing requirements in support of the selected CDP Concept Plans. The tasks envisioned include the following:

4.2.1 Grading

1. Develop a macro level Grading Plan for the Concept Plans based on the constraints identified by the geotechnical engineer.
2. Grading to be developed in accordance with the criteria described in the Design Guidelines.
3. Generate cut/fill volumes, on a macro level, for the Concept Plans.

4.2.2 Water Infrastructure

1. Confirm pressure objectives with the City along feedermains (300 mm diameter or larger) under both domestic and fire flow conditions.
2. Calculate domestic demands (average, maximum day and peak hour) based on "system level parameters" under the build-out condition of the proposed land use for the selected Concept Plans. The said parameters will be provided by the City.
3. Calculate theoretical domestic demands for a maximum of three (3) phases of development based on a comprehensive phasing strategy.
4. Acquire hydraulic boundary conditions at each of the connection points of the existing water distribution system. It is envisioned that three (3) sets of boundary conditions will be provided; one reflecting today's operating characteristics of the pressure zone (BAR pressure zone), one that reflects the future reconfigured pressure zone (3C pressure zone) as well as the projected 2031 operating condition.
5. Develop and populate a base water model (H2OMAP software platform) for the selected Concept Plans. The H2OMAP model will be set based on 3 phases of development assuming the extension of existing trunk feedermains.
6. Evaluate the performance of the distribution system against municipal requirements under domestic demand conditions for the Concept Plans and three development phases for both current and future supply characteristics of the pressure zone.
7. Evaluate the performance of the proposed distribution system under a maximum day plus fire flow conditions for the Concept Plans and three development phases for both current and future supply characteristics of the pressure zone in accordance with Technical Bulletin ISDTB-2014-02.
8. Review Stantec's findings of their high level water servicing analysis when incorporating water demands from the BSUEA. These findings are proposed to be presented in the Barrhaven South Master Servicing Study Addendum that will be finalized in 2016.
9. Assess and identify deficiencies and develop system upgrades, if required, to meet municipal requirements from both pressure and demand criteria. This will include the review of system upgrades and larger feedermains, at-ground tanks, new pressure zone, etc.
10. Identify whether there will be concerns with water quality under the three phases of development or at build-out of the BSUEA lands. If required, assess using H2OMAP's water age analysis.
11. Prepare a Water Servicing Plan for the CDP Concept Plans. This Servicing Plan will show watermains with nominal diameters of 300 mm and greater.
12. Identify any expected servicing block, easement, or property requirements for the City.
13. Conduct reliability analysis of the proposed system by evaluating the impact of feedermain breaks. Assess whether basic day flow plus fire flow can be fulfilled in the BSUEA.

14. Assess residual capacities, if any, for the 2031 planning horizon.
15. Summarize findings for the Water Component for presentation at workshop (Charrette meeting).

4.2.3 Wastewater Infrastructure

1. Based on the sanitary sewer outlets inventoried as part of Task 3, assess residual capacities.
2. Develop sewershed boundaries based on existing sanitary sewer outlets and topography.
3. Develop peak wastewater flows based on the land use and density using the Harmon equation and population projections for the different land uses associated with the Concept Plans (Fotenn).
4. Prepare a Sanitary Drainage Area Plan and Sanitary Design Sheets for each Concept Plan.
5. Review trunk sanitary sewer routes, establish preliminary invert elevations based on topography and existing outlets.
6. Prepare Sanitary Servicing Plan and assess impact of phasing on infrastructure.
7. Identify servicing constraints, potential crossing conflicts and adjust, as required once the Storm Servicing Plan has been completed.
8. Assess residual capacities, beyond the BSUEA population, under existing and the 2031 planning horizon based on those reported in Stantec's Draft Barrhaven South Master Servicing Study (2014).
9. Review Stantec's findings of their high level wastewater servicing analysis when incorporating the BSUEA. These findings are proposed to be presented in Barrhaven South Master Servicing Study Addendum that will be finalized in 2016.
10. Identify potential system upgrades.
11. Summarize findings for Wastewater Component for presentation at workshop (Charrette meeting).

4.2.4 Storm Servicing and Stormwater Management

1. Based on the ECR's findings, confirm storm design criteria (quantity and quality) with the RVCA, MOECC and the City and discuss potential impacts.
2. Review topographic survey and maps.
3. Based on the storm sewer outlets inventoried as part of Task 4, confirm outlet locations and inverts, and assess residual capacities and drainage patterns, etc.
4. Review existing conditions hydrological analysis to establish the baseline condition.
5. Finalize capacity assessment of existing surface outlets using desktop calculations.
6. In consultation with the model keepers (JFSA and IBI) or Stantec, assess residual capacities in existing systems using either XPSWMM or PCSWMM.

7. Determine minor and major system drainage boundaries for the Concept Plans based on residual capacities of the existing.
8. Carry out post-development Water Budget based on the Concept Plans.
9. Identify and assess water budget deficits for each Concept Plan.
10. In consultation with the hydrogeologist:
    - Investigate, at the conceptual level, the integration of low impact development (LID) strategies within the BSUEA based on zones identified by the hydrogeologist, in particular with the Kars esker,
    - evaluate potential infiltration measures, and
    - assess conceptually the performance of the LID strategies and infiltration measures with respect to the potential water budget deficits.
11. Based on the minor and major system boundaries, prepare post-development Storm Drainage Area Plan and Servicing Layout for each Concept Plan.
12. Rehabilitation and servicing of the aggregate pits will be reviewed and developed in consultation with the geotechnical consultant.
13. If proposed servicing impacts the Thomas-Baxter Municipal Drain (Spence Branch), JLR will liaise with; i) the team's biologist to assess the impacts under low flow conditions, and ii) the City's municipal engineer to discuss potential requirements under the Ontario Drainage Act.
14. Pending the impacts on the Thomas-Baxter Municipal Drain, there might be a need for the Owner to retain the services of a Drainage Engineer and to conduct a low flow analysis using a continuous hydrological model.
15. Calculate theoretical runoff coefficients & imperviousness based on proposed land uses.
16. Prepare Storm Sewer Design Sheets using the Rational Method to establish 1:5 and 1:10 year peak flows (arterials) for each Concept Plan.
17. Calculate the 1:5 year and 1:10 year inlet capture for the various types of land use and arterials.
18. Develop trunk storm sewer routes and assess trunk sewer sizes for the Concept Plans based on the Rational Method.
19. Based on the outlet sewers and topography, establish trunk storm sewer obverts and inverts for each Concept Plan.
20. Review and assess potential end-of-pipe solutions that would satisfy the storm criteria (water quality and quantity).
21. Review potential dry pond location(s) west of the future Greenbank Road to prevent major overland flow cascading onto the arterial.
22. Investigate and identify end-of-pipe locations for each Concept Plan.
23. Assess water quality storage requirements based on total imperviousness for the Concept Plans. Calculations to be carried out in accordance with protection level and SWMP type as defined in Section 3.3.3 of the MOE SWMPDM.
24. Assess on-site storage volume requirements based on topography, land use, and ROW widths. This assessment will dictate a design criterion for on-site storage.
25. Develop stage-storage-outflow relationship for each end-of-pipe solution to satisfy the water quantity criterion.
26. Based on the existing conditions peak flow analysis, evaluate storage volume

requirements to meet the storm discharge criterion for quantity control.

27. Based on the storage volume target obtained from the peak flow analysis, establish the facilities siting for the Concept Plans. Siting to be based on topography, soil type, groundwater conditions, etc. In addition, siting of facilities to consider sub-watershed boundaries and capacity constraints of the Drain and/or watercourse.
28. Based on the siting of the facilities, establish footprint of the end-of-pipe facilities in accordance with the guidance described in Section 4 of the MOE SWMPDM.
29. Design elements of the end-of-pipe facilities to be reviewed conceptually based on Section 4 of the MOE SWMPDM.
30. Prepare post-development hydrological model that incorporates on-site storage volumes, dry ponds along with the end-of-pipe controls.
31. Evaluate the effectiveness of proposed measures for the Concept Plans.
32. Conduct a post- versus pre-development peak flow analysis (1:2 year to 1:100 year, per OSDG) to demonstrate compliance with the storm discharge criterion adopted for the project. Adjust the control measures accordingly until the storm discharge criterion is achieved.
33. Provide a Drawing to Fotenn that identifies blocks dedicated for SWM for the Concept Plans.
34. Identify servicing constraints, potential crossing conflicts and adjust, as required.
35. Establish typical roadway sag configuration and conduct a major overland flow analysis to assess total depth of flow. The analysis will generate the 1:100 year dynamic flow depth to be combined with typical static storage as well as the climate change event (as defined in the Ottawa Sewer Design Guidelines).
36. Calculate potential underside of footings elevations along the roadways based on land use.
37. Export the computed hydrographs generated by SWMHYMO to XPSWMM (or PCSWMM).
38. Carry out a hydraulic grade line (HGL) analysis of the proposed storm sewer system to evaluate the freeboard between the potential underside of footings and the 1:100 year storm. The analysis is to include the evaluation under the climate change event in accordance with the OSDG.
39. Assess impact of phasing on proposed storm infrastructure.
40. Export XPSWMM's (or PCSWMM) outflow hydrographs at each outlet; data to be provided to the model keeper of the Corrigan SWMF and Todd Pond.
41. Summarize findings for Stormwater Management Component for presentation at workshop (Charette meeting).

4.2.5 Opinion of Probable Cost (OPC) and Phasing

1. Coordination with other disciplines to finalize phasing for the Concept Plans in regard to servicing constraints.
2. Prepare an opinion of probable cost for municipal servicing for the Concept Plans.

4.3 Workshops (Design Charette)

It is anticipated that an open-discussion workshop meeting (Design Charette) will be conducted during Task 5. Topics discussed will include proposed infrastructure routes, location and type of end-of-pipe facility(ies), servicing alternatives and infrastructure requirements as well as comments and feedback received during the first meeting. Once comments and feedback have been received during both meetings, the municipal infrastructure servicing will be finalized for the Concept Plans.

4.4 TAC No. 3

The evaluation of servicing alternatives for the final Concept Plans will be shared with other members from the TAC as part of TAC No. 3 meeting. During this meeting, servicing alternatives and requirements will be discussed and comments will be sought. Once reviewed and revisions made, the servicing alternatives and requirements will be adjusted and finalized.

4.5 Prepare and Attend POH No. 2

Once the servicing alternatives for the CDP Concept Plans have been finalized based on the comments received at TAC No. 3, the information will then be presented to the public as part of POH No. 2, which will be advertised as the mandatory Public Open House under Phase 2 of the Class EA. At that meeting, the findings of the Final Existing Conditions Report will be provided to the community and their comments will be sought with respect to the CDP Concept Plans and their associated servicing evaluation.

4.6 Selection of Preferred Concept Plan

Once comments from POH No. 2 have been received, consolidated and integrated, a preferred Concept Plan will be recommended and presented to the CPT by the Consultant Team.

TASK 5: PREFERRED CONCEPT PLAN, DEMONSTRATION PLAN & DESIGN GUIDELINES

As part of this task, the preferred Concept Plan selected as part of Task 5 will be further refined and the Consultant Team will develop a Demonstration Plan and associated Design Guidelines. The preferred Concept Plan will be further analyzed to ensure full integration of both underground services and stormwater management.

5.1 CPT No. 4 and TAC No. 4

The preferred/refined Concept Plan and Design Guidelines will be presented and reviewed as part of CPT No. 4 and TAC No. 4. Comments will be received and gathered and adjustments will be made to the preferred Concept Plan and the Design Guidelines.

5.2 Attend POH No. 3

Once comments from CPT No. 4 and TAC No. 4 have been integrated, the Concept Plan and Design Guidelines will be presented as part during POH No. 3. This event will be advertised as the second mandatory public open house of Phase 2 of the Class EA, where alternatives will be presented to the general public to obtain their comments with respect to the final Concept Plan and Design Guidelines.

5.3 Preparation of a Draft Master Servicing Study

Based on the analyses completed as part of Task 4.2, a comprehensive Draft Master Servicing Study (MSS) document will be prepared that will synthesize the tasks conducted. This Draft MSS will identify infrastructure requirements and will be circulated to TAC members for their comments.

Barrhaven South Urban Expansion Area
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

TASK 6: THE BARRHAVEN SOUTH EXPANSION AREA COMMUNITY DESIGN PLAN

This task represents the finalization of the Community Design Plan, which will be a joint effort by the Consultant Team and members from the CPT. To support the CDP, the Mater Infrastructure Servicing Plan will be finalized based on both Task 5 and Task 6 findings. From JLR's perspective, the following tasks are envisioned:

6.1 Consolidate and Integrate Comments from CPT No. 4, TAC No. 4 and POH No. 3

Comments that have been received under Task 6 will be reviewed and consolidated. Once this review completed, the Concept Plan and Design Guidelines will be finalized. At that time, the CDP will be prepared. From a servicing perspective, the following will be completed:

- Finalize the Existing Conditions Report.
- Finalize the Design Guidelines.
- Finalize the Master Servicing Study (MSS). This document will:

  i) Summarize previously completed Reports in regard to infrastructure;
  ii) Confirm the capacity constraints of the existing infrastructure;
  iii) Identify proposed infrastructure for water, wastewater, storm and stormwater management; and
  iv) Identify servicing upgrades and associated financial implications.

6.2 CPT No. 5 and TAC No. 5

The CDP, Design Guidelines and other deliverables will be presented as part of CPT No. 5 and TAC No. 5. Comments will be received and gathered and adjustments will be made to CDP and other deliverables.

Barrhaven South Urban Expansion Area
Community Design Plan

Existing Conditions Report & Master Servicing Study
Terms of Reference (Revised March 23, 2016)

TASK 7: IMPLEMENTATION

Once the review completed by TAC, the CDP and supporting studies and deliverables will be finalized. The CDP will be implemented as an amendment to the Official Plan. A public meeting will be held at the Planning Committee to consider the CDP and implementing the OPA for City council approval.

CANADA'S BEST MANAGED COMPANIES

Appendix B

Existing Conditions Report

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.

BARRHAVEN SOUTH URBAN EXPANSION AREA

EXISTING CONDITION REPORT

March 2016
Revised September 2016
Revised February 2017
Revised September 2017

Prepared for:

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EXISTING CONDITION REPORT

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

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EXECUTIVE SUMMARY

Minto Communities Inc. (Minto) and Mattamy Homes (Mattamy), herein referred to as the Owner, have retained a Consultant Team to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA) Community Design Plan (CDP), which will be implemented as an Amendment to the City of Ottawa Official Plan (OP). J.L. Richards & Associates Limited (JLR) has been retained to prepare a Master Servicing Study (MSS) to outline water, wastewater, storm, and stormwater management servicing strategies for the BSUEA. In advance of preparing the MSS, an Existing Conditions Report is required to evaluate and assess existing water resources and servicing infrastructure in and around the BSUEA, and to identify constraints and opportunities that will provide the baseline conditions of an Environmental Management Plan (EMP).

The BSUEA consists of 121 ha of land that is bounded by Cambrian Road to the north and Barnsdale Road to the south. The BSUEA is located immediately west of the current City of Ottawa Urban Boundary and approximately 360 m east of Borrisokane Road. The subject site is an undeveloped mix of former agricultural land and forested areas spread generally across the southern portion of the site. It contains two (2) ongoing aggregate extraction operations in the northern area of the site, extending west to the Borrisokane Road / Highway 416 corridor. Woodlots and pasture areas are adjacent to the site to the north, and recent urban development abuts the eastern boundary. The topography across the site has significant undulations and there is a knoll in the BSUEA located approximately 1 km north of Barnsdale Road. At the intersection of Borrisokane Road and Barnsdale Road, southwest of the site, there is an existing waterbody that appears to be man-made.

Based on interpreting the LiDAR data and the topographical survey compiled by Stantec (Geomatics), the BSUEA is tributary to three (3) sub-watersheds: the Jock River, Mud Creek via the Thomas Baxter Municipal Drain, and the Rideau River via the Hawkins Municipal Drain. The investigations completed by the Team's biologist did not identify any formal conveyance channels within the BSUEA. The absence of channels or formal watercourses was confirmed by the LiDAR data. The absence of such waterways is generally indicative of areas exhibiting particularly low surface runoff potential.

Catchment areas within the BSUEA have been delineated based on LiDAR data compiled on behalf of the City of Ottawa, as well as any surface infrastructure such as roads, which tend to

form a drainage path barrier, and culverts, where flow will concentrate into a point source. An understanding of the existing conditions in terms of capacity of the culverts and expected flow rates can be achieved from an accurate existing conditions hydrological model.

The SWMHYMO hydrological model for the BSUEA is a single event model for the purpose of estimating flood flows at the boundary control points of the site for storm events ranging from the 1:2 year and 1:100 year recurrence. The model was developed based on generally accepted standard hydrological parameters that fairly represent the land use, soil characteristics, types of flow paths, and topography. The simulated area included the BSUEA, as well as the lands up to the external boundary points: Cambrian Road, Borrisokane Road, and Barnsdale Road.

The SWMHYMO model results show relatively low flow rates at each of the culverts due to the high infiltration capability of the soils in the area and the low impervious ratio. In general, during larger and infrequent events, runoff will increase as the infiltration capability decreases due to saturation of the soils.

The water budget of a given area is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces, or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. The analysis of the water budget is often carried out to establish the baseline condition and assess any future changes in infiltration to subsurface water-bearing zones and, consequently, to surface runoff resulting from a significant land cover modification such as urbanization. It is also used to predict changes to the hydrological cycle that will result from urbanization of lands.

An understanding of the water budget within a given study area can be gained through the use of a continuous hydrological model. The PCSWMM software platform was used for this study, which included simplified groundwater and snowmelt modules that allowed the continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall, and snowmelt.

A long term simulation was carried out for the site and was based on 30 years of hourly precipitation and temperature. Based on the long-term simulation results, infiltration accounts for approximately 40% of the total annual precipitation of 844 mm, while surface runoff accounts for approximately 0% on a yearly average. Specifically, surface runoff accounts, on average, for 1 mm per year out of the total annual precipitation of 844 mm.

A review of the existing and planned infrastructure (sanitary sewers, watermains, storm sewers, and stormwater management facilities) in the vicinity of the BSUEA was undertaken to assess available servicing opportunities and constraints for the BSUEA.

The existing Greenbank Road trunk sanitary sewer was identified as the wastewater outlet for the existing Barrhaven South Community sanitary sewer system, which includes the Cambrian Road and River Mist Road trunk sanitary sewers. Based on the theoretical peak flow calculations, the existing Greenbank Road trunk sanitary sewer has sufficient capacity to accommodate the anticipated peak flows generated within the BSUEA. Furthermore, the total peak flow at downstream MH 522A (located at the intersection of Half Moon Bay Road and the existing Greenbank Road, immediately south of the Jock River) is anticipated to be less than 590 L/s. This was made a requirement by Stantec based on their 2013 Wastewater Collection System Assessment, which concluded that downstream wastewater infrastructure, including the South Nepean Collector and the West Rideau Collector, could accommodate a peak flow of 590 L/s from the Barrhaven South Community and the BSUEA, with no risk of surcharging and/or basement flooding. Measures to mitigate infiltration into the sanitary sewer system in the BSUEA are anticipated based on existing sewer and groundwater elevations.

Potable water will be provided to the BSUEA predominantly via extensions of existing and planned feedermains located along the existing Greenbank Road, Cambrian Road, River Mist Road, the future realigned Greenbank Road and a future Collector Road. Findings presented in the City of Ottawa Water Supply Optimization Study Report prepared by Delcan in 2008 recommended a Pressure Zone reconfiguration consisting of an expanded Zone 3C within areas previously identified as Pressure Zone BARR, including the Barrhaven South Community and the future BSUEA. Several water distribution projects were identified in the 2013 Infrastructure Master Plan to achieve the recommended zone reconfiguration. Certain growth areas, including the BSUEA, were identified as having low pressures notwithstanding the full zone reconfiguration. Hydraulic simulations showed that pressures less than 40 psi are anticipated along the future water distribution system servicing the elevated portion of the BSUEA. As a result, it is anticipated that a localized portion of the BSUEA may require a booster pumping station or, alternatively, oversized services combined with jet pumps. This condition, as well as water servicing specifics such as watermain looping and sizing of the feedermains for the BSUEA, will be addressed at the MSS stage by a hydraulic network analysis (HNA).

The existing Barrhaven South Community is currently serviced by two (2) stormwater management facilities (SWMFs) known as the Corrigan Pond and the Todd Pond. Three (3) additional SWMFs are planned to service the Barrhaven South Community in accordance with the Jock River Subwatershed Study and the Barrhaven South Master Servicing Study. These planned SMWFs are referred to as the Clarke Pond, Greenbank Pond and Cedarview Pond. Although all five (5) existing/planned SWMFs in Barrhaven South have residual water quality

volumes and have available residual capacity in their associated trunk infrastructure, all existing and planned storm sewer systems in Barrhaven South have relatively high hydraulic grade line elevations. The Corrigan and Todd Pond tributary areas also have major system ponding depths which are generally at or exceeding the maximum allowable depth of 0.35 m.

Given the limitations of the existing minor and major systems in the Barrhaven South Community, opportunities to provide stormwater servicing and stormwater management for the BSUEA via the three (3) planned SWMFs (Clarke, Cedarview and Greenbank) and their associated trunk storm sewers, will be reviewed in detail and evaluated as part of the BSUEA Master Servicing Study. Additionally, the servicing of a 5.6 ha parcel of land owned by Mattamy via the Todd Pond will be further reviewed. This parcel was previously allocated to the Todd Pond under an 'ultimate' scenario as part of the 2015 Clarke Pond Model Keeper Analysis completed by JFSA. Should a new wet pond facility be required, then the naturally low-lying topography at the southeastern corner of the Study Area would be the optimal location. This pond could provide both stormwater quantity and quality control for the BSUEA before outletting to the existing Greenbank Road trunk storm sewer.

EXISTING CONDITION REPORT

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

B1.0 INTRODUCTION

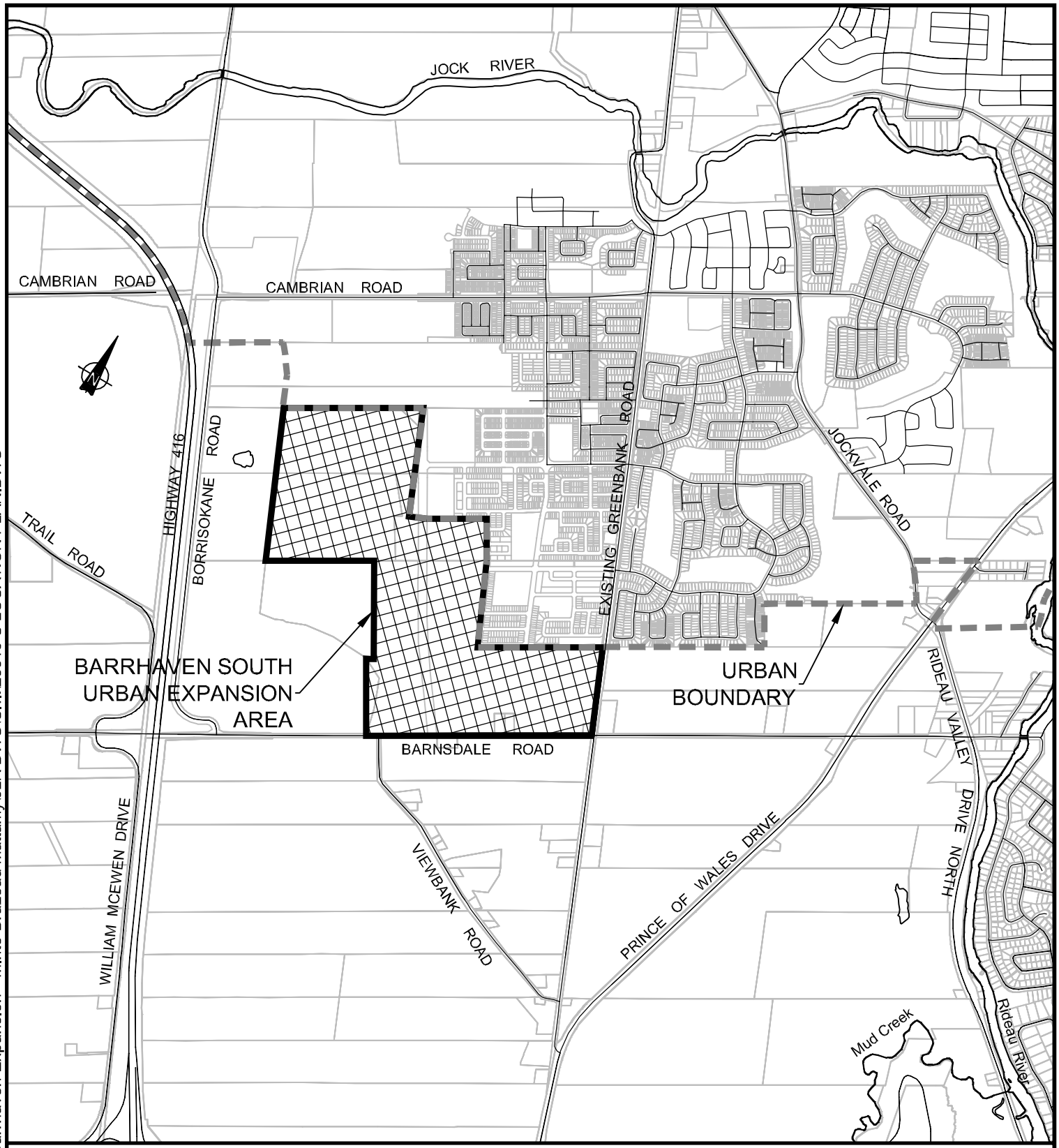
Minto Communities Inc. (Minto) and Mattamy Homes (Mattamy), herein referred to as the Owner, have retained a Consultant Team to prepare a series of comprehensive documents to support the Barrhaven South Urban Expansion Area (BSUEA) Community Design Plan (CDP), which will be implemented as an Amendment to the City of Ottawa Official Plan (OP). J.L. Richards & Associates Limited (JLR) has been retained to prepare a Master Servicing Study (MSS) to outline water, wastewater, storm, and stormwater management servicing strategies for the BSUEA. In advance of preparing the MSS, an Existing Conditions Report is required to evaluate and assess existing water resources and servicing infrastructure in and around the BSUEA, and to identify constraints and opportunities that will provide the baseline conditions of an Environmental Management Plan (EMP).

B2.0 STUDY AREA

B2.1 Location

The BSUEA consists of 121 ha of land that is bounded by Cambrian Road to the north and Barnsdale Road to the south. The BSUEA is located immediately west of the current City of Ottawa Urban Boundary and approximately 360 m east of Borrisokane Road, as shown in **Figure 2-1**.

The BSUEA CDP area shown in **Figure 2-1** represents the latest boundary limits. Although there has been no change to the overall CDP area of 121 ha, prior to these limits being established under a provisional agreement with the City of Ottawa, the boundary limit along the existing Greenbank Road was further west, approximately following an extension of River Mist Road. A corresponding area on the west side was then included, following the boundary of property PIN 045921577. The new CDP boundary, as presented in **Figure 2-1**, will allow for a more logical development pattern, with improved phasing opportunities and more efficient connection to surrounding development.



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

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DESIGN: HM	JLR NO: 26610
DRAWN: TB	DRAWING NO.: FIGURE 2-1
CHECKED: HM	

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C LOCATION PLAN.DWG

PLOT DATE: December 19, 2016 2:43:27 PM

B2.2 Characteristics

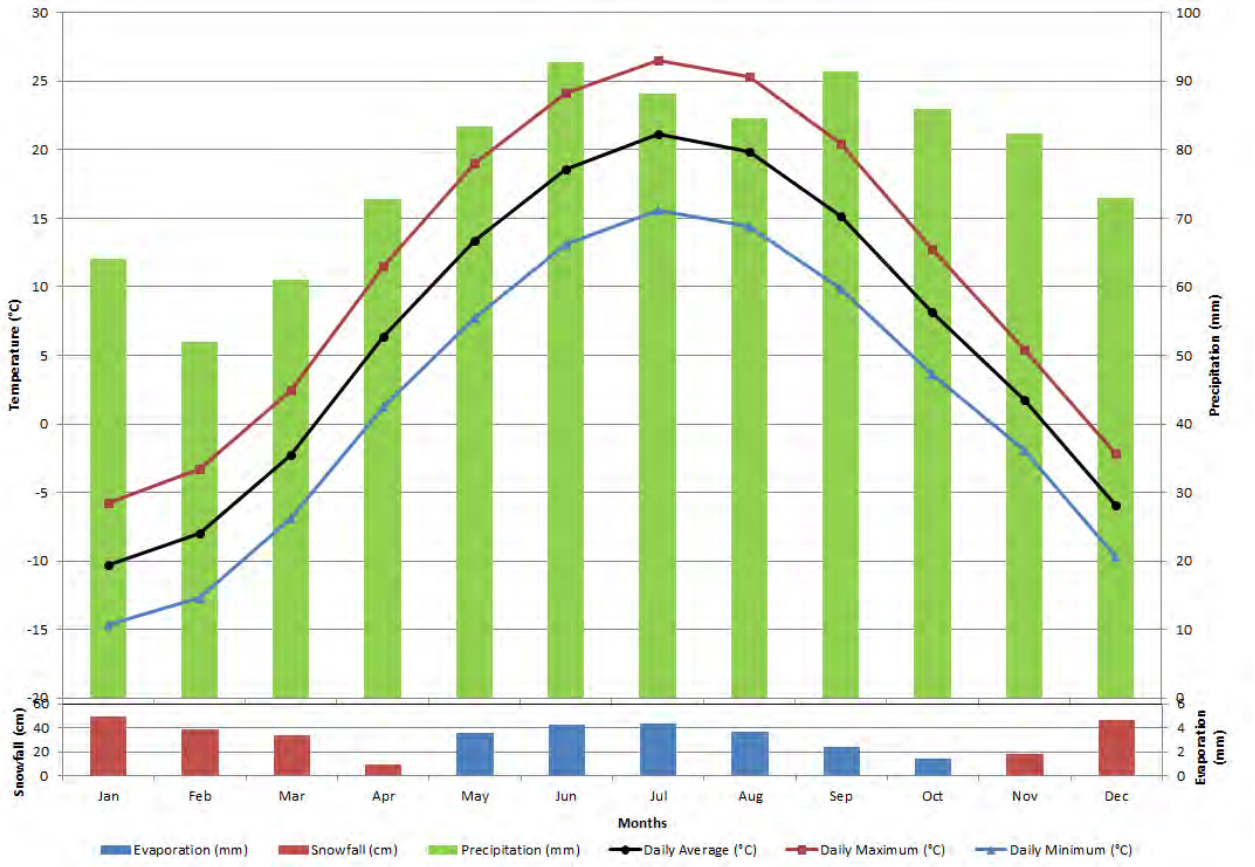
The subject site is an undeveloped mix of former agricultural land and forested areas. It contains two (2) ongoing aggregate extraction operations (Brazeau and Drummond). The southern portion of the site is generally former agricultural land, with some woodlot areas. The aggregate extraction operations are in the northern area of the site, extending west to the Borrisokane Road / Highway 416 corridor. Woodlots and pasture areas are adjacent to the site to the north, and recent urban development abuts the eastern boundary. The topography across the site has significant undulations, with elevations generally varying from approximately 111 m at the peak to approximately 99 m at the lowest point. However, there is also a knoll in the BSUEA south of the Brazeau lands where the existing ground is above 111 m. At the intersection of Borrisokane Road and Barnsdale Road, southwest of the site, there is an existing waterbody that appears to be man-made.

B2.3 Climate

Environment Canada collects meteorological data at two (2) weather stations within the vicinity of the study area: the Ottawa CDA at the Experimental Farm (16 km to the northeast) and the Ottawa MacDonald Cartier International Airport (10 km to the northeast). The averages of the data collected at these two (2) stations provide some information on the climate expected in the study area (**Figure 2-2**).

The average temperature for the BSUEA varies between about -10°C in the winter and over 20°C in the summer. The daily maximum and minimum averages vary between 3.7 and 5.5 degrees from the average, with the greatest difference observed in the summer months. Evaporation is high in the summer, and negligible in the winter. Snowfall is highest during the December/January period. Generally, precipitation volumes are higher in the summer months, although the season variation is not as pronounced compared to temperature: the seasonal differences are usually no more than 40 mm and for three quarters (75%) of the year the variation in precipitation is no more than 20 mm.

Figure 2-2: Environment Canada, Ottawa Climate Normals



B3.0 BACKGROUND DOCUMENTS

There are a large number of documents and reports that have been prepared regarding the lands covered by the BSUEA and/or lands surrounding the site. The documents include subwatershed studies of the Jock River, covering the areas north of the site, and Mud Creek, covering the south of the site, and servicing strategies for the surrounding urban development lands northeast of the site.

The Reports listed below have been summarized in **Appendix 'B1'**. The Reports can be classified in the following four (4) categories:

1. Reports covering a large geographical area, including the site:

- *Jock River Reach One Subwatershed Study Final Report*. Stantec Consulting Ltd. (June 2007). City of Ottawa.
- *Jock River Subwatershed Report 2010: A report on the environmental condition of the Jock River*. Rideau Valley Conservation Authority. (April 2011).

- *Mud Creek Subwatershed Study*. City of Ottawa, Planning and Growth Management. (October 2015).
- *Mud Creek Subwatershed Existing Conditions Report Phase I Summary*. City of Ottawa Land Use and Natural Systems Policy Group. 2011.
- *Jock River Reach 2 & Mud Creek Subwatershed Study Existing Conditions Report (Final)*. Marshall Macklin Monaghan Limited and Water & Earth Sciences Associates. (May 2009). City of Ottawa.
- *Lower Rideau River Subwatershed Report 2012: A report on the environmental condition of the Lower Rideau River*. Rideau Valley Conservation Authority. (February 2013).
- *Lower Rideau Watershed Strategy Final Report*. Aquafor Beech / Robinson Consultants Inc. (September 2005). Rideau Valley Conservation Authority.
- *Barrhaven South Official Plan Amendment Submission*. David McManus Engineering Ltd. (August 2008). Minto Communities Inc.
- *Aggregate Resource Designated Lands Study, 3882 Barnsdale Road, Ottawa, Ontario*. Paterson Group Inc. (February 2012). Minto Communities Inc.

2. Site Servicing Strategies for adjacent urban development sites:

- *Barrhaven South Master Servicing Study Final Report*. Stantec Consulting Ltd. (June 2007). City of Ottawa.
- *2013 Infrastructure Master Plan Wastewater Collection System Assessment.* Stantec Consulting Ltd. (September 17, 2013). City of Ottawa.
- *City of Ottawa 2013 Water Master Plan.* Stantec Consulting Ltd. (September 20, 2013). City of Ottawa.
- *Infrastructure Master Plan*. City of Ottawa. (November 2013).
- *Barrhaven South Master Servicing Study Addendum Draft Report*. Stantec Consulting Ltd. (November 2014). City of Ottawa.
- *Barrhaven MSS Draft Addendum* – Revised Potable Water and Sanitary Servicing Analysis for the BSUEA. Stantec Consulting Ltd. (October 19, 2016).
- *Manotick Master Drainage Plan Phase I*. A.J. Robinson and Associates Inc. (October 1993). Township of Rideau.
- *Manotick Master Drainage Plan Phase II*. Robinson Consultants Inc. (February 1996). Township of Rideau.

3. Surrounding Infrastructure Reports:

- *Corrigan Stormwater Management Facility Stormwater Management Report and Design Brief*. IBI Group (July 2010). McNeil Farm Limited.

- Stormwater Management Barrhaven South. IBI Group (October 2014). Minto Communities Inc.
- Letter Report (June 9, 2015) entitled "Respond to the City of Ottawa Comment – Corrigan SWM Facility" addressed to J.L. Richards & Associates Limited.

- *Todd Pond and Clarke Pond Model Keeper Update Analysis / Update of Half Moon Bay South Subdivision Plan. Letter to David Schaeffer Engineering Limited*. J.F. Sabourin and Associates Inc. July 25, 2013.
- *Todd Pond Model Keeper Analysis Re-Assessment of Existing System Capacity*. J.F. Sabourin and Associates Limited. (April 2015). City of Ottawa.
- *Site Servicing Report Quinn's Pointe 3872 Greenbank Road*. J.L. Richards & Associates Limited. (July 2015). Minto Communities Inc.
- *Thomas R. Baxter Municipal Drain Engineers Report*. Graham, Berman & Associates Ltd. (May 1967). Township of Nepean.

4. Other background documents:

- *Final Geotechnical Investigation Proposed Barrhaven South Community 3872 Greenbank Road Ottawa*. Paterson Group Inc. (July 2014). Minto Communities Inc.
- *Supplementary Geotechnical Assessment Proposed Quinn's Pointe Development Barrhaven South 3872 Greenbank Road – Ottawa. Letter to Minto Communities Inc*. Paterson Group Inc. May 19, 2015.
- *Geotechnical Recommendations Greenbank Road Trunk Services Extension Quinn's Pointe Development - Ottawa. Letter to Minto Communities Inc*. Paterson Group Inc. July 23, 2015.
- *Summary of the Jock River Reach 2 Subwatershed Existing Conditions*. City of Ottawa Land Use and Natural Systems Policy Group. (2011).

B4.0 GEOLOGY AND PHYSIOGRAPHY

A geotechnical investigation was carried out by Paterson Group Inc. (Paterson) to assess general subsoil and groundwater conditions within the BSUEA and to provide geotechnical recommendations for the design of municipal services associated with the proposed development. A field program, consisting of 30 boreholes and 125 test pits, was carried out in November and December 2015. A supplemental program followed in July 2016 with 6 boreholes and 36 permeameter tests. The boreholes/test pits were advanced to depths ranging from 2.6 m to 9.8 m below existing ground surface. The test hole locations for the current investigation were distributed in a manner to provide general coverage of the BSUEA and adjacent properties. Previous investigations had been carried out in 2003 and 2011, which consisted of 27 test pits that were advanced to

depths ranging from 2.7 m to 7.0 m. Detailed findings and recommendations have been compiled in the Report entitled "Geotechnical Investigation Proposed Barrhaven South Urban Expansion Area - Community Design Plan, Paterson Group Inc., January 26, 2017. The general findings of the above-noted Report are summarized in Sections B4.1 to B4.3 (below).

B4.1 Surficial Geology

Mapping reviewed by the geology team indicated that overburden soils at the site consist of primarily glaciofluvial deposits to the north with reworked glaciofluvial sand deposits to the west and southwest. The results of the sub-surface investigations were generally consistent with the mapping. Overburden thicknesses were found to be around 10 m to 17 m across the site. The overburden generally consisted of topsoil over silty sand to a sandy silt deposit.

B4.2 Bedrock

Based on digital geological mapping produced by Natural Resources Canada, sourced from the Geological Survey of Canada, the bedrock in this area consists of dolomite of the Oxford formation with an overburden drift thickness of 15 m to 25 m depth. Bedrock was not encountered in any of the boreholes or test pits ordered across the site.

B4.3 Aquifer Systems and Groundwater

Aquifer systems are geological material which permits the movement of groundwater under hydraulic gradients. The overburden soils at the site are, according to the geotechnical report, relatively deep and consist of moderate to high hydraulic conductivities. Three (3) aquifer systems are present across the site: the underlying bedrock aquifer, the deeper overburden aquifer, and a shallower overburden aquifer.

Monitoring wells were installed in the overburden to assess the hydrogeological characteristics across the site. The results of the testing suggest that the permeable overburden aquifer is acting as a recharge area for the esker and bedrock aquifers. The saturated conditions are considered by the geotechnical team to be representative of the long term water table and will vary in level seasonally and with precipitation events.

Groundwater levels were found to be generally highest in the centre of the site with groundwater elevations of up to 101 m above sea level. However, the analysis by Paterson found that, when compared to potential grading on the site, groundwater levels could be within 3.5 to 4.5 m of the surface at the southeastern corner of the site around the existing Greenbank Road / Barnsdale Road intersection.

B5.0 SITE HYDROLOGY AND HYDRAULICS

B5.1 General

Based on interpreting the LiDAR data and the topographical survey compiled by Stantec (Geomatics), the BSUEA is tributary to three (3) sub-watersheds: the Jock River, Mud Creek via the Thomas Baxter Municipal Drain, and the Rideau River via the Hawkins Municipal Drain. The area tributary to the above-noted sub-watersheds has been depicted in Figure 5-1. Based on the study area limits, approximately 99 ha is tributary to the Jock River while areas of approximately 11 ha and approximately 13 ha are tributary to Mud Creek and Rideau River, respectively. It is noted that although the Spence Branch of the Thomas Baxter Municipal Drain (shown at the bottom of Figure 5-2) is mapped by the City as Municipal Drain, it was not found during site observations. All flows appear to go to the Dynes Branch west of Borrisokane Road.

The investigations completed by the Team's biologist did not identify any formal conveyance channels within the BSUEA. The absence of channels or formal watercourses was confirmed by the LiDAR data. The absence of such waterways is generally indicative of areas exhibiting particularly low surface runoff potential. As a result, runoff generated from the site is carried as overland sheet flow to the natural low points at the culvert outlet locations.

B5.2 Water Crossings

A total of thirteen culvert crossings were inventoried, which can be grouped into the following two (2) categories:

1. Boundary: There are five (5) culvert crossings acting as boundary control points to the area being modelled. Two (2) are located along Cambrian Road to the north of the BSUEA and three (3) are along Barnsdale Road to the south of the BSUEA. These five (5) crossings form the downstream boundary of the modeled area, where overland sheet flow forms a concentrated point flow external to the site;
2. Internal to the model: There are eight (8) culvert crossings that are internal to the area being modelled. These crossings currently provide conveyance across access routes to property and farmland along Borrisokane Road and Barnsdale Road.

The inventoried crossings have been summarized in **Table 5-1** and **Table 5-2**, below, while **Figure 5-2** depicts the location of the culvert crossings along with the general site hydrology. It should be noted that none of the inventoried water crossings are within the BSUEA limits, although BDR-C5 is on the boundary of the BSUEA.

CLARKE WEST MUNICIPAL DRAIN
(TO BE PARTIALLY ENCLOSED
UNDER BSMSS 2007)

CLARKE EAST MUNICIPAL DRAIN
(TO BE PARTIALLY ENCLOSED
UNDER BSMSS 2007)

TODD POND

CAMBRIAN RD

CAMBRIAN RD

FUTURE COLLECTOR RD

REALIGNED GREENBANK RD

DUNDONALD DR

CEDARVIEW RD

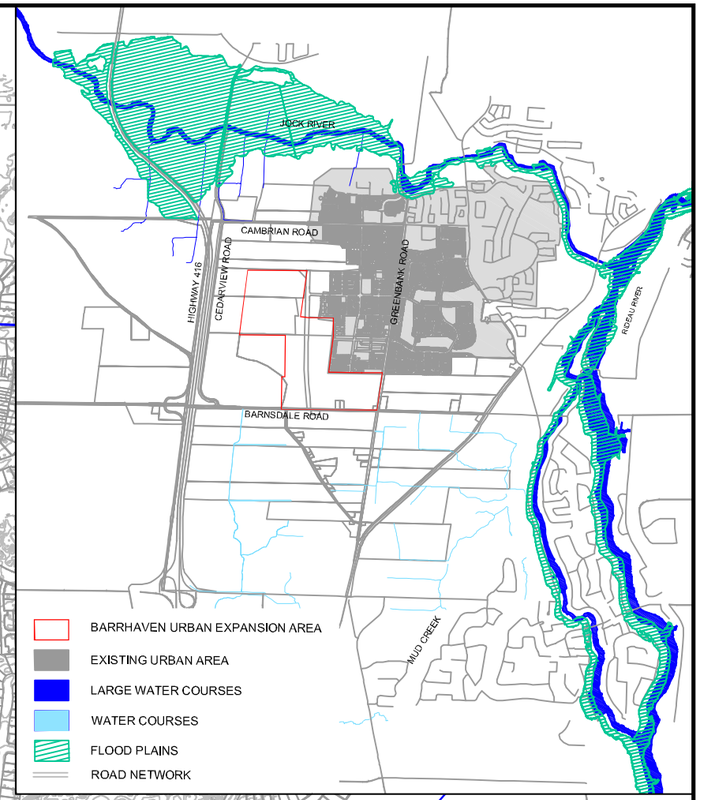
HIGHWAY 416

BARRHAVEN SOUTH URBAN EXPANSION
AREA

BARNSDALE RD

THOMAS BAXTER
(DYNES BR.) MUNICIPAL DRAIN

THOMAS BAXTER
(SPENCE BR.) MUNICIPAL DRAIN



LEGEND

- URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- WATERCOURSE/ MUNICIPAL DRAINS
- AGGREGATE EXTRACTION AREA
- TRIBUTARY AREA TO JOCK RIVER SUBWATERSHED
- TRIBUTARY AREA TO MUD CREEK SUBWATERSHED
- TRIBUTARY AREA TO RIDEAU RIVER WATERSHED
- CATCHMENT AREA TO HYDROLOGIC BOUNDARY CONTROL POINTS
- WATER BODIES
- FLOOD PLAIN

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

STUDY AREA & DRAINAGE DIVIDE

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DESIGN: BP/GF	JLR NO: 26610
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Table 5-1: Inventory of Model Boundary Water Crossings

Culvert ID	Location	Type	Size (mm)
CR-C1	On Cambrian Road, 910 m east of Borrisokane Road, carries Clarke West Municipal Drain	Circ. CSP	1650
CR-C2	On Cambrian Road at Borrisokane Road	Circ. CSP	N/A
BDR-C4	On Barnsdale Road, 50 m west of Borrisokane Road	Circ. CSP	1200
BDR-C5	On Barnsdale Road, 500 m west of the existing Greenbank Road	Circ. CSP	500
BDR-C6	On Barnsdale Road, 60 m west of the existing Greenbank Road	Circ. CSP	400

It should be noted that culvert CR-C2 was not included as part of the topographical survey and size is currently unknown.

The 2014 Barrhaven South Master Servicing Study Draft Addendum (Draft 2014 BSMSSA) prepared by Stantec, notes that water crossing CR-C1 is to be replaced with storm sewers when the Clarke West Municipal Drain is enclosed as part of the adjacent development and the Clarke Stormwater Management Facility is constructed. The Draft 2014 BSMSSA also indicated that culvert CR-C2 is to be maintained, and will accommodate flows from the existing catchment area south of Cambrian Road up to the 1:100 year event. Should future development occur south of the woodlot draining to CR-C2, grading and servicing from the future development area in the vicinity of the woodlot should be developed to maximize overland sheet flow drainage (not channelized) towards the woodlot.

Table 5-2: Inventory of Model Water Crossings (Internal)

Culvert ID	Location	Type	Size (mm)
CVR-C1	East of Borrisokane Road along the north corner of the BSUEA	Circ. CSP	500
CVR-C2	East of Borrisokane Road at Field Entrance	Circ. CSP	450
CVR-C3	East of Borrisokane Road at Field Entrance	Circ. CSP	400
CVR-C4	Borrisokane Road Crossing north of Barnsdale Road	Circ. CSP	1200
BDR-C1	Viewbank Road Crossing	Circ. CSP	400
BDR-C2	Field Entrance Crossing South of Barnsdale Road	Circ. CSP	400
BDR-C3	Field Entrance Crossing South of Barnsdale Road	Circ. CSP	500
BDR-C7	Barnsdale Road Crossing close to the existing Greenbank Road Intersection	Circ. CSP	500

Table 5-2, above, summarizes the various culvert crossings within the BSUEA. As shown above, all the culverts are 500 mm in diameter or less with the exception of CVR-C4, which is 1200 mm in diameter.

CAMBRIAN RD

CR–C2

CAMBRIAN RD

CLARKE WEST MUNICIPAL DRAIN

CR–C1

CLARKE EAST MUNICIPAL DRAIN

CAMBRIAN RD

A1
18.6 ha

A2
35.4 ha

A3
12.7 ha

A4
13.9 ha

CVR–C1

TRAIL RD

HIGHWAY 416

A5
12.7 ha

A6
11.7 ha

A7
15.5 ha

DUNDONALD DR

RIVER MIST RD

GREENBANK RD

JOCKVALE RD

DUNDONALD DR

BORRISOKANE RD

A8
42.2 ha

DES SOLDATS

RIENDEAU STREET

A9
5.1 ha

KILBIRNIE DR

A10
5.5 ha

ALEX POLOWIN AVENUE

KILBIRNIE DR

A13
24.6 ha

CVR–C2

A11
15.2 ha

A12
60.0 ha

A14
22.4 ha

CVR–C3

A15
3.5 ha

CVR–C4

A18
0.5 ha

A16
2.9 ha

A17
9.8 ha

BDR–C6

BDR–C4

BDR–C3

BDR–C2

BDR–C1

BDR–C5

BARNSDALE RD

BDR–C7

A19
1.01 ha

A20
4.8 ha

A21
1.5 ha

THOMAS BAXTER MUNICIPAL DRAIN (DYNES BRANCH)

THOMAS BAXTER MUNICIPAL DRAIN (SPENCE BRANCH)

LEGEND

- URBAN EXPANSION STUDY AREA
- SUBCATCHMENT AREA BOUNDARY
- SURFACE FLOW DIRECTION
- WATERCOURSE
- AGGREGATE EXTRACTION AREA
- CDR — CEDARVIEW ROAD CULVERTS
- CR — CAMBRIAN ROAD CULVERTS
- BDR — BARNSDALE ROAD CULVERTS

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

SWMHYMO SITE DRAINAGE PLAN

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B5.3 Watershed Delineation

Catchment areas within the BSUEA have been delineated based on LiDAR data compiled on behalf of the City of Ottawa, as well as any surface infrastructure such as roads, which tend to form a drainage path barrier, and culverts, where flow will concentrate into a point source. The delineated catchment areas are split by the three (3) watershed areas: Jock River to the north of the site, Mud Creek to the south and the Rideau River watershed to the east. The catchment areas are summarized in Table 5-3 and are shown in Figure 5-2.

Table 5-3: Subcatchment Summary

Watershed	Downstream Culvert	Catchment ID	Area (ha)
Jock River	CR-C2	A1	18.6
	CR-C1	A2	35.4
		A3	12.7
		A4	13.9
		A6	11.7
		A7	15.5
	CVR-C1	A5	12.7
		A8	42.2
	Overland flow	A9	5.1
		A13	24.6
		A14	22.4
	Subwatershed Total		**214.8**
Mud Creek	CVR-C2	A10	5.5
	CVR-C3	A11	15.2
	CVR-C4	A12	60.0
	BDR-C4	A15	3.5
	Subwatershed Total		**84.2**
Rideau River	BDR-C5	A16	2.9
	BDR-C7	A17	9.8
	Watershed Total		**12.7**
Total			**311.7**

B5.4 Hydrological Modeling

Since the 1980s, hydrological models have become the principal tool used to calculate flood flows under extreme conditions and assess flooding impacts along water bodies and within urban areas.

An understanding of the existing conditions, in terms of capacity of the culverts and expected flow rates, can be achieved from an accurate existing conditions hydrological model. To simulate the hydrological response of a given area, a hydrologic model should ideally be calibrated to actual monitored flows to ensure a true representation of the physical characteristics of the catchment area during the recorded storm events. For this project, surface flows were not monitored within the limits of the BSUEA and, consequently, the hydrological model was not calibrated. The model was developed based on generally accepted standard hydrological parameters that fairly represent the land use, soil characteristics, types of flow paths, and topography.

The SWMHYMO hydrological model for the BSUEA is a single event model for the purpose of estimating flood flows at the boundary control points of the site for storm events ranging from the 1:2 year and 1:100 year recurrence. The simulated area included the BSUEA, as well as the lands up to the external boundary points: Cambrian Road, Borrisokane Road and Barnsdale Road. Figure 5-2 shows the extent of the simulated areas and the drainage areas delineated for the project.

B5.4.1 Aggregate Extraction Pits

Parts of the BSUEA continue to be used for aggregate extraction. These existing aggregate extraction pits act as large basins and will contain runoff on site until the trapped stormwater is lost to either infiltration or evaporation, or is pumped off site. This runoff condition is the result of man-made activities: originally, runoff would have left the site and contributed to flows at the boundary culvert. As a result, the pre-development condition model for the site was developed assuming the pre-extraction condition based on topography as per the plans submitted to the Ministry of Natural Resources and Forestry (MNRF), where available, or as a constantly sloped surface to the surrounding natural ground level where the original topography is unknown.

B5.5 Model Parameters

The site was modeled using the SCS Curve Number (CN) methodology to predict runoff. The CN number is selected based on the soil types in the area and the land cover, which in this case is predominately rural in nature with either agricultural or woodlot classifications. The site consists of ‘unimproved lands’, which consist of lands that are undeveloped open space with no current use. This classification was also used for the quarry areas. Land uses for the model area are shown in Figure 5-3, while a summary of the hydrological parameters is shown in Table 5-4.

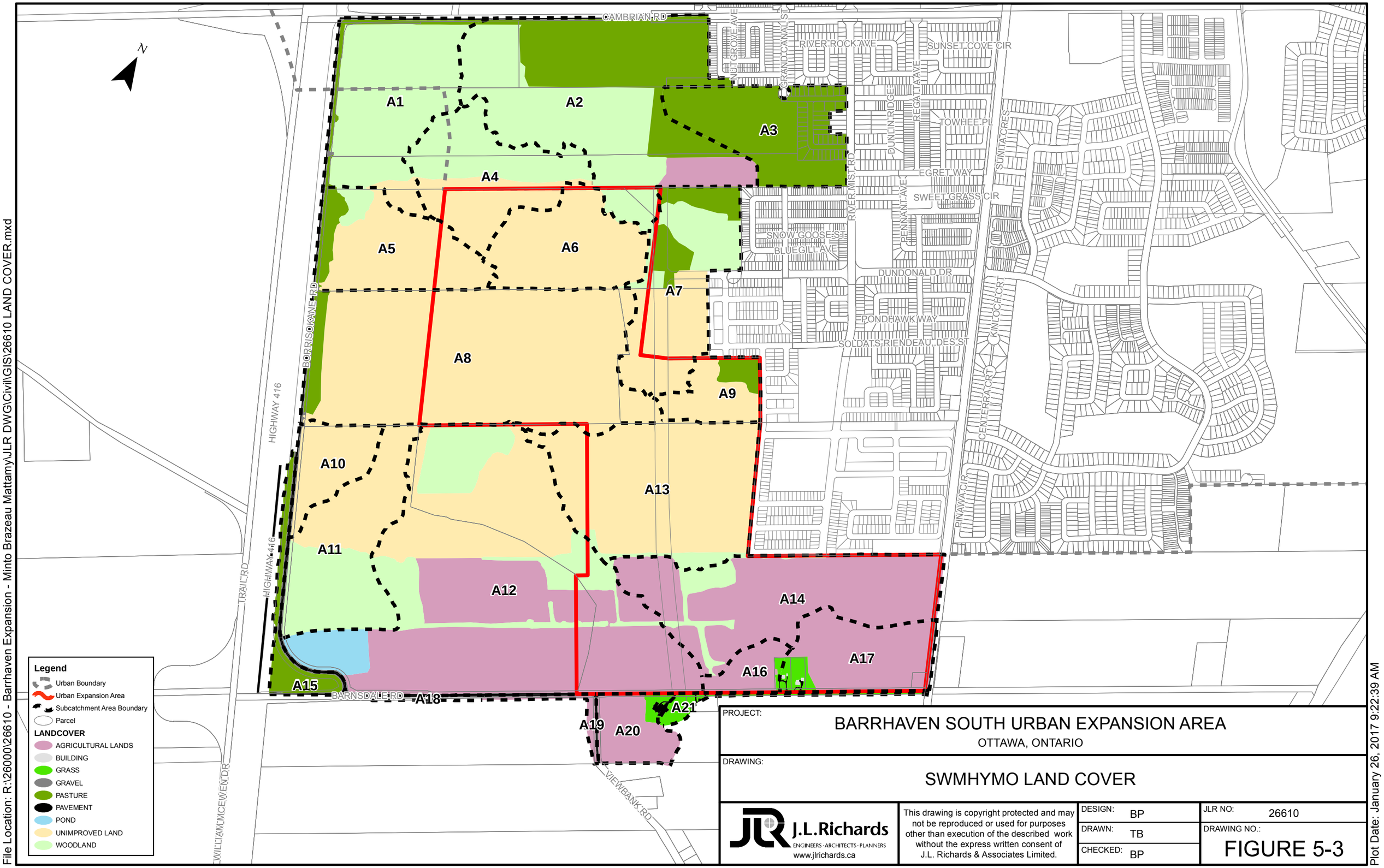
Table 5-4 - Model Parameter Summary

Drainage Area ID	Area (ha)	CN*	Initial Abstraction (mm)	Time to Peak (hrs)	% Impervious
A1	18.6	42	23.3	0.41	
A2	35.4	49	18.3	0.59	
A3	12.7	67	8.7	0.43	
A4	14.0	37	27.4	0.33	
A5	12.7	50	17.6	0.39	
A6	11.7	53	15.6	0.27	
A7	15.5	51	16.9	0.72	
A8	42.3	53	15.6	0.74	
A9	5.1	50	17.6	0.25	
A10	5.5	55	14.4	0.27	
A11	15.2	55	14.4	1.27	
A12	60.0	51	16.9	0.95	
A13	24.6	52	16.2	0.5	
A14	22.4	40	25.3	1.5	
A15	3.5	61	11.1	0.39	
A16	2.9	37	27.4	0.24	
A17	9.8	44	21.5	0.42	
A18	0.5	66	9.4	See Note 1	26%
A19	1.0	72	10.4	See Note 1	20%
A20	4.8	49	18.3	0.32	
A21	1.5	57	13.2	See Note 1	27%

Note 1: Areas A18, A19 and A21 are simulated using the Standhyd command and therefore do not use the Time to Peak parameter. The impervious ratio parameters for these drainage areas are shown.

The soil types in the area are predominately soils with high infiltration and low runoff potential, even when saturated. The Hydrologic Soil Group (HSG) Types A and AB dominate the site across nearly three quarters (75%) of the modeled area. HSG Type C, which are sandy clay loam soils with low infiltration rates when thoroughly saturated, and have a corresponding relatively higher runoff, occurs across approximately 1% of the site. Two percent (2%) of the area is impervious due to roads or dwellings while mid-range soils make up the remainder of the modeled area. Soil types by geotechnical description are depicted in Figure 5-4.

The model schematic is contained in **Appendix 'B2'** which also includes a detailed description of all the model parameters, including Time to Peak, Initial Abstraction, etc.



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PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

SWMHYMO LAND COVER

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CAMBRIAN RD

CAMBRIAN RD

CAMBRIAN RD

TRAIL RD

HIGHWAY 416

BORRISOKANE RD

RIVER MIST RD

GREENBANK RD

JOCKVALE RD

DUNDONALD DR

DUNDONALD DR

DES SOLDATS

RIENDEAU STREET

KILBIRNIE DR

KILBIRNIE DR

ALEX POLOWIN AVENUE

BARNSDALE RD

A1

A2

A3

A4

A5

A6

A7

A8

A9

A10

A11

A12

A13

A14

A15

A16

A17

A18

A19

A20

A21

LEGEND

URBAN EXPANSION STUDY AREA

SUBCATCHMENT AREA BOUNDARY

SURFACE FLOW DIRECTION

HSG A

HSG AB

HSG B

HSG BC

HSG C

HSG = HYDROLOGIC SOIL SETUP

NOTE: SOIL GROUPS DEFINED FROM A VARIETY OF GEOLOGICAL SOIL MAPPING SOURCES

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

SOILS IN SWMHYMO MODEL

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JLR NO: 26610

DRAWING NO.:

FIGURE 5-4

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PLOT DATE: January 26, 2017 9:23:39 AM

B5.5.1 Storm Distribution

The hydrological response of the BSUEA and abutting lands was simulated under a 6 hour, 12 hour and 24 hour SCS Type II storm distribution. The SCS Type II storm distribution was developed by the American Soil Conservation Service and is generally used for estimating flows in rural areas. The critical storm event under pre-development conditions, with the highest peak runoff, was found to occur under the 12 hour SCS Type II storm distribution.

B5.6 Modeling Results

The pre-development SWMHYMO simulation results, predicting flows at each of the culverts for the critical storm event, are shown in Table 5-5, below. The estimated capacity and level of service of each culvert is also provided. The details of culvert CR-C2, crossing Cambrian Road at Borrisokane Road, could not be obtained in the field due to obstructions and/or structural failure. Hence, the capacity and level of service at this culvert could not be confirmed.

Table 5-5: Hydrological Simulation Results at Culvert Locations (12 hour SCS Type II storm)

Culvert ID	Flow (m^3/s) at culvert location for return period (recurrence)						Estimated Culvert Capacity (m^3/s)	Estimated Level of Service (years)
	1:2 yr	1:5 yr	1:10 yr	1:25 yr	1:50 yr	1:100 yr		
CR-C1	0.3	0.7	1.0	1.6	2.0	2.5	5.5	1:100
CR-C2	0.2	0.4	0.7	1.0	1.3	1.6	N/A	N/A
CVR-C1	0.1	0.3	0.5	0.8	1.0	1.3	0.4	1:5
CVR-C2	0.0	0.1	0.1	0.2	0.2	0.3	0.2	1:25
CVR-C3	0.0	0.1	0.2	0.2	0.3	0.4	0.3	1:50
CVR-C4	0.2	0.4	0.6	0.9	1.1	1.4	2.6	1:100
BDR-C1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	1:100
BDR-C2	0.0	0.1	0.1	0.1	0.2	0.2	0.2	1:50
BDR-C3	0.1	0.1	0.1	0.2	0.2	0.3	0.5	1:100
BDR-C4	0.2	0.4	0.6	0.9	1.2	1.5	2.6	1:100
BDR-C5	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1:100
BDR-C6	0.0	0.0	0.1	0.1	0.2	0.2	0.2	1:100
BDR-C7	0.1	0.1	0.1	0.2	0.3	0.4	0.3	1:50
Total Flow to Thomas Baxter Municipal Drain	0.2	0.5	0.7	1.1	1.3	1.6	N/A	N/A

The SWMHYMO model results show relatively low flow rates at each of the culverts, due to the high infiltration capability of the soils in the area and the low impervious ratio. In general, during larger and infrequent events, runoff will increase as the infiltration capability decreases due to saturation of the soils.

The culverts crossing the main boundary roads to the site, CR-C1, CR-C2, BDR-C4, BDR-C5 and BDR-C6, have high estimated levels of service (in excess of 1:100 years), with the exception of two (2) culverts on Barnsdale Road and the culvert on Cambrian Road, which is unrecorded. Since these roads are classified as arterial or collector roads, they would be expected to have a higher level of service compared to the culverts internal to the site or under access roads south of Barnsdale Road.

B5.6.1 Hydraulics and Floodplain Mapping

There are no well-defined watercourses on the site which are suitable to hydraulic analysis or to prepare floodplain mapping. Flow conveyance for the majority of the site occurs by means of overland sheet flow, and flow in small, intermittent channels. The floodplain of the Jock River subwatershed extends close to the site but remains within the northwestern quadrant of the Cambrian Road / Borrisokane Road intersection (**Figure 5-1**). The floodplains of the Rideau River and Mud Creek do not extend to the site.

B6.0 WATER BUDGET

The water budget of a given area is often studied by hydrologists and hydrogeologists to better understand the movement of water through its various stages. Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to the groundwater system, evaporation from water surfaces, or transpiration from vegetation, completing the natural cycle back into atmospheric moisture and precipitation. The analysis of the water budget is often carried out to establish the baseline condition and assess any future changes in infiltration to subsurface water-bearing zones and, consequently, to surface runoff resulting from a significant land cover modification such as urbanization. It is also used to predict changes to the hydrological cycle that will result from urbanization of lands. Figure 6-1 summarizes graphically the natural hydrological cycle describing the continuous movement of water on, above, and below the surface.

In simple terms, the general water budget assesses the change in water storage resulting from the difference in water inputs and outputs for a given area or watershed. To estimate the water budget, the following simplified equation is used:

$$P = ET + SW + GW + \Delta S$$

Where:

- P is precipitation;
- ET is evapotranspiration;
- SW is surface runoff;
- GW is groundwater; and
- ΔS is the difference in water storage.

As a fundamental requirement, the water budget developed for the existing conditions will be used as the baseline condition when assessing the effectiveness of any stormwater management (SWM) strategies under the post-development condition. Future SWM strategies should adhere to the recent provincial guidance from the MOECC in their publication entitled “Expectation interpretation bulletin, February 2015”, as well as relevant provincial policy statement. One of the objectives of the upcoming Master Servicing Study will be to develop a storm servicing strategy that will incorporate mitigation measures to minimize the water deficit in an effort to offset the potential impact of urbanization.

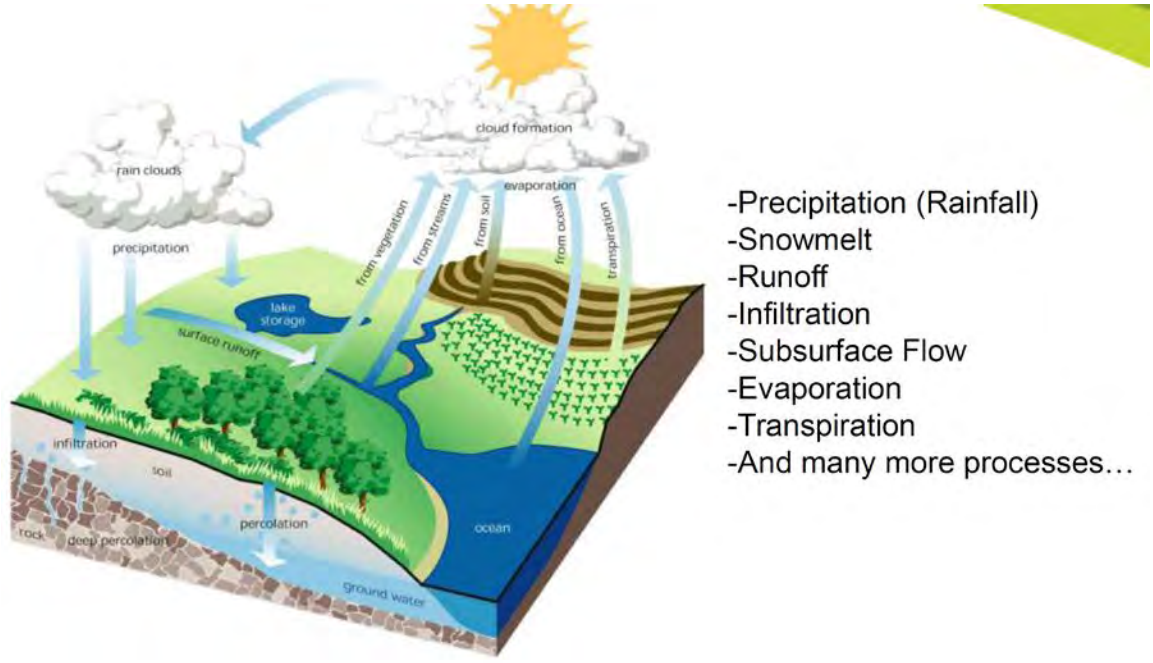

Figure 6-1: Water Budget Cycle

B6.1 Continuous Simulation Modeling

An understanding of the water budget within a given study area can be gained through the use of a continuous hydrological model. The Toronto and Region Conservation

Authority (TRCA), in their publication entitled “Stormwater Management Criteria, August 2012”, recommend the use of a continuous model such as QUALHYMO or PCSWMM.

The PCSWMM model to be used for this study includes simplified groundwater and snowmelt modules that allow the continuous simulation of the water budget, including the elements of evapotranspiration, the groundwater table (lower saturated zone), snowfall, and snowmelt. Due to its capabilities and versatility, the PCSWMM modeling tool will also be used to assess the impact of development and effectiveness of the proposed Low Impact Development (LID).

B6.1.1 Infiltration Parameters

Saturated field hydraulic conductivity of the surficial soils for the southern and eastern parts of the study area was measured on-site by Paterson. The saturated field hydraulic conductivity (Kfs) blocks ranged from $2.7x10^{-7}$ m/s to less than $8x10^{-5}$ m/s. The Ontario Ministry of Municipal Affairs and Housing (MMAH) Building Code Supplementary Standard SB-6 (2012) provides guidance on converting saturated field hydraulic conductivity (Kfs) to infiltration rate via the Percolation Time (an extract of this Supplementary Standard is included in **Appendix 'B3'**). For permeable gravel sand mixtures, which have saturated field hydraulic conductivities in the range of $1x10^{-4}$ to $1x10^{-6}$ m/s, the percolation rate is in the range of 12 to 4 mins/cm, which is equivalent to 50 to 150 mm/hr. Therefore, the range of infiltration rates across the extent tested by Paterson varies between 49.8 mm/hr and 106.8 mm/hr.

In the PCSWMM model, subcatchments were delineated based on the saturated field hydraulic conductivity blocks and maximum, median, and minimum infiltration values selected for each block. Field testing was not available to determine the Saturated Infiltration coefficient for the Horton infiltration method (minimum or final infiltration rate). Consequently, the values of the final infiltration capacity were estimated based on the initial infiltration capacity and the soil type. **Table 6-1,** below, summarizes the various ranges of saturated field hydraulic conductivities and their corresponding range of maximum infiltration rates as well as the selected final infiltration coefficient used in the water budget model.

It should be noted that a decay constant, k, of 4.14 hr^{-1}, was used in the PCSWMM model to mimic the decreasing infiltration capacity of the soil over time during wet weather events.

Table 6-1: Horton Coefficients for Water Budget Model

Range of Kfs (m/s)	Max Range Infiltration Values (mm/hr)	Estimated Soil Groupings (based on infiltration values)[1]	Range of Expected Final Infiltration Values (mm/hr)[1]	Selected Final Infiltration Coefficient (mm/hr)
$2.7x10^{-7}$ – $9.9x10^{-7}$	49.8 – 50.0	Moist Loam Soils	3.8 - 7.6	4
$1.0x10^{-6}$ – $9.9x10^{-6}$	50.0 – 53.2	Moist Loam soils	3.8 - 7.6	4 - 7
$1.0x10^{-5}$ – $8.0x10^{-5}$	53.2 – 106.8	Moist to Dry Sandy Soils	7.6 – 11.4	7 - 11

B6.1.2 Precipitation and Evaporation

The continuous simulation model was run using precipitation data from the Environment Canada weather stations at Ottawa Macdonald-Cartier International Airport and the Experimental Farm in Ottawa (approximately 10 km and 15 km from the BSUEA respectively). In excess of 30 years of hourly data, between January 1, 1960 and October 31, 1990, was used to undertake the water budget analysis. The average annual rainfall during this period was 844 mm, while maximum and minimum daily temperatures from the same weather stations and time period were also used.

The model undertakes evaporation calculations based on average monthly rates of evaporation (as reported by Environment Canada, refer to Section **B2.3**) and from the available standing water that is "trapped" in natural depressions within the subcatchment surfaces as a result of the initial abstraction depth.

B6.1.3 Groundwater

PCSWMM analyzes groundwater flow for each subcatchment independently. It represents the subsurface region beneath a subcatchment as an unsaturated upper zone that lies above a lower saturated zone. The elevation of the lower saturated zone, the water table, varies in time depending on the rates of flow into and out of the lower saturated zone. The flow to the lower saturated zone is controlled by percolation, which is dictated by the soil characteristics. The upper unsaturated zone receives water via infiltration from surface runoff. Evapotranspiration occurs from the upper unsaturated zone; it can also occur from the lower saturated zone, depending on root depth. If the water table, or elevation of the lower saturated zone, reaches the surface level then all the soil is saturated and infiltration will no longer occur.

[1] Akan, A. O., *Urban Stormwater Hydrology: A Guide to Engineering Calculations.* Lancaster: Technomic Publishing Co., Inc., 1993 (extract contained in **Appendix 'B3'**).

For the purposes of modelling the water budget's existing condition, subcatchments were delineated by each hydrologic soils group (HSG) within the BSUEA. Properties currently operating as aggregate pits were delineated as separate subcatchments. The soil parameters associated with each HSG are detailed in **Appendix 'B3'**.

B6.1.4 Snowmelt

Snowmelt is an additional mechanism by which runoff may be generated in a continuous simulation model. The current PCSWMM software platform utilizes the Canadian SWMM snowmelt routines with extensions for long term continuous modelling.

Snowfall rates are determined directly from hourly precipitation data by using a pre-set temperature: snowfall will occur when the temperature is below the pre-set point and rainfall when above. Snowmelt is handled differently by PCSWMM, depending on the occurrence of rainfall. During rain on snowmelt events, the model takes into account the rainfall intensity and the air temperature as well as the saturation vapour pressure. When snowmelt occurs without any rainfall, the snowmelt is linearly proportional to the air temperature, which varies with the user supplied melt coefficients. The parameters used in the snowmelt module are detailed in **Appendix 'B3'**.

For the existing condition model it has been assumed that all snow occurs on pervious land cover and there is no snow removal.

B6.1.5 Continuous Simulation Results

A long term simulation was carried out for the maximum, minimum, and median of each of the infiltration ranges of each block. The summary of the simulation results is given in **Table 6-2**, below, which has been grouped based on the above noted ranges of infiltration. These results show that there is no significant variation within the range of values for each set of infiltration values. This is expected, as the peak rainfall events over a 30-year simulation period are generally lower than the infiltration rates (ranging between ±50 mm/hr and ±105 mm/hr) within the frequent event ranges and are, therefore, not affected. Only the infrequent large peak rainfall events will be affected by the change in infiltration within the range of values.

Table 6-2: Comparison of Results with Range of Infiltration Values

Annual Water Budget Components	Minimum Infiltration	Median Infiltration	Maximum Infiltration
Precipitation (mm/year)	844	844	844
Evapotranspiration (mm/year)	506	506	506
Infiltration (mm/year)	336	337	338
Surface Runoff (mm/year)	2	1	1

Since there is negligible variability in the simulation results shown above, only the median infiltration values will be considered going forward with the water budget analysis. Based on the medium infiltration, the continuous simulation results have been summarized for each of the three (3) subwatersheds as shown in **Table 6-3**, below.

Table 6-3: Water Budget Continuous Simulation Results

Annual Water Budget Components	Annual Average Depth (mm)				Budget %
	To Jock River	To Mud Creek	To Rideau River	Area Weighted Total	
Precipitation	844	844	844	844	100%
Evapotranspiration	506	506	506	506	60%
Infiltration	338	336	336	337	40%
Surface Runoff	1	2	2	1	0%

Based on the above long-term simulation results, infiltration accounts for approximately 40% of the total annual precipitation of 844 mm, while surface runoff accounts for approximately 0% on a yearly average. Specifically, surface runoff accounts, on average, for 1 mm per year out of the total annual precipitation of 844 mm, representing approximately 0.1%.

Although the average annual total depth of runoff is virtually non-existent percentage wise, the model computed surface flows when precipitation depths were encountered that exceeded a 1:5 year recurrence or when peak intensities were greater than a 1:2 year recurrence. Based on the review of the 30-year simulation results, a peak flow of 3.27 m^3/s was computed as the largest flow by the model. This peak flow was generated from the overall BSUEA and sheet flow draining towards the three (3) sub-watershed outlets; a peak flow of 2.44 m^3/s was computed as being directed to the Jock River as summarized in **Table 6-4**, below.

The event resulting in the largest peak runoff occurred on August 4, 1988 and is one of the historical storms listed in the City of Ottawa Sewer Design Guidelines to be simulated to assess the performance of drainage systems. However, the large events

are infrequent in nature; the peak flow generated on August 4, 1988 was experienced once during the 30-year simulation. **Table 6-4**, below, summarizes the five (5) greatest and smallest peak flow events generated by the model with the associated rainfall depth and peak intensity as well as its corresponding frequency.

Table 6-4: Top Five Largest and Smallest Peak Flow Events

Date	Peak Runoff to Jock (m^3/s)	Peak Runoff to Mud (m^3/s)	Peak Runoff to Rideau (m^3/s)	Storm Duration (hrs)	Peak Rainfall Intensity (mm/hr)	Equivalent Return Period	Total Rainfall Volume (mm)	Equivalent Return Period
August 4, 1988	2.44	0.40	0.43	4	37.4	10 year	77.0	100 year
August 8, 1973	0.42	0.15	0.16	7	30.2	5 year	60.5	10 year
June 16, 1981	0.35	0.14	0.15	2	36.9	10 year	38.3	5 year
June 11, 1973	0.34	0.14	0.15	3	33	5 year	42.4	5 year
August 8, 1973	0.31	0.07	0.10	8	30.2	5 year	60.5	10 year
June 11, 1976	0.02	0.01	0.02	2	24.6	2 year	24.9	2 year
Sept. 12, 1963	0.01	0.01	0.01	8	10.2	< 2 year	52.4	5 year
Sept. 11, 1986	0.01	0.01	0.01	14	14	< 2 year	42.9	5 year
July 1, 1979	0	0	0	5	14.0	< 2 year	26.3	< 2 year

Note: shaded columns above highlight the computed flows during two (2) historical storms.

The following conclusions can be drawn from the statistics summarized in the above table:

- The largest event, from a volumetric perspective, occurred on August 4, 1988 with a recorded volume of 77 mm over four (4) hours, which, compared to the City of Ottawa IDF curve, has a frequency greater than a 1:100 year; and
- From a peak intensity perspective, the August 4, 1988 event was the largest with a recorded peak intensity of 37 mm/hr, which, compared to the City of Ottawa IDF curve, has a frequency of 1:10 year.

Three (3) events were recorded with a peak intensity of between 36 and 37 mm/hour, which, given that this is approximately a 1:10 year return period event, is true to the statistics. Only two (2) of these recorded any runoff as the total volume of runoff was insufficient to trigger flow.

In terms of rainfall volume, none of the events over the 30-year simulation period were greater than a 1:10 year event, other than the one which resulted in the largest peak flow

and one other 24-hour period, which did receive more rainfall than the 1:100 year volume; however, the peak intensity was 20 mm/hr, less than a 1:2 year event. Due to the low peak intensity, this other 1:100 year event did not trigger any runoff flows.

The City of Ottawa has three (3) historical events that are used to assess how a system would function under historical extreme events. The 1988 event triggered the largest runoff flow from the BSUEA; however, the 1979 event did not result in any runoff. The simulation uses hourly rainfall data that averages the intensities within the hour period and creates an average peak, which will be of less significance when compared to any peak intensities identified in the 5-minute data.

A preliminary high level scenario of a potential future water budget was simulated for a development having a total imperviousness of 65%, of which 58.5% is Directly Connected Impervious area (i.e., 90% of the total imperviousness was assumed to be directly connected) without any Best Management Practices to promote infiltration. The results indicate that the percentage of infiltration will reduce from 40% (existing condition) to 28% (post-development without BMPs) of the overall annual water budget. Simulation results have also shown reductions in evapotranspiration as a result of the decrease in vegetation which, in turn, generates increases in surface runoff. Consequently, stormwater management measures promoting infiltration will be necessary to meet the target of maintaining pre-development infiltration levels.

B7.0 EXISTING INFRASTRUCTURE AND SERVICING SUMMARY

B7.1 Trunk Wastewater Servicing

In 2007, as part of the Barrhaven South Master Servicing Study (BSMSS), Stantec modelled the existing South Nepean Collector (SNC) and West Rideau Collector (WRC) trunk sewers to determine whether they could both accommodate peak flows from new development in Barrhaven South, up to the current Urban Boundary. Their analysis consisted of the following two (2) scenarios:

- Peak flows for existing development were established based on monitored flow data while peak flows for future development in Barrhaven South were calculated based on theoretical flow generation parameters given in the 2004 City of Ottawa Sewer Design Guidelines[2]; and

[2] As the BSMSS was completed in 2007, the 2004 Sewer Design Guidelines were current at that time. The Design Guidelines were updated in 2012; however, the 2007 BSMSS still references the 2004 version.

- Peak flows for both existing and future development were calculated based on the theoretical flow generation parameters given in the 2004 Ottawa Sewer Design Guidelines.

Modeling results showed that under Scenario 1, the existing SNC and WRC could accommodate the additional flow generated from Barrhaven South; however, under Scenario 2, the SNC and WRC showed risk of surcharging and basement flooding at certain locations.

In September 2013, Stantec completed a City-wide Wastewater Collection System Assessment to identify areas in need of wastewater collection system upgrades to accommodate projected growth to 2031 and 2060. This assessment served as the basis of the wastewater component of the City's 2013 Infrastructure Master Plan (IMP). To complete the assessment, Stantec developed a hydrodynamic model using PCSWMM that included all existing and planned (approved) sanitary trunk sewers (i.e., greater than 450 mm in diameter), pumping stations, and associated wastewater infrastructure in the City. Simulations were carried out based on monitored flow data obtained from 31 locations throughout the City under dry weather conditions and wet weather flow parameters established from two (2) historical rainfall events and one synthetic storm event (the 1:100 year storm). Flow generation for future development areas was based on average flow rates consistent with the 2012 Design Guidelines. Based on the simulation results, the 2013 Stantec Assessment did not identify any growth-related areas at risk nor recommend system upgrades in Barrhaven South under both the 2031 and 2060 planned growth horizons. Consequently, no wastewater projects were identified within Barrhaven South as part of the November 2013 IMP.

In 2014, Stantec issued a draft addendum to their 2007 BSMSS. In this addendum, herein referred to as the Draft 2014 BSMSSA, the peak flow projected in 2007 was re-calculated to account for actual peak flow values from developments that had been approved and/or constructed since the completion of the 2007 BSMSS. These developments included Mattamy's Half Moon Bay and Half Moon Bay South and Tamarack Homes' The Meadows at Half Moon Bay. The Draft 2014 BSMSSA also considered the design parameters prescribed in the 2012 Design Guidelines for calculating both existing and future development peak flows in Barrhaven South. The total peak sanitary flow re-calculated for the Barrhaven South Community as part of the Draft 2014 BSMSSA was found to be significantly less than the peak flow allocated for Barrhaven South as part of the 2013 Wastewater Collection System Assessment by Stantec. Consequently, as indicated in the Draft 2014 BSMSSA, Stantec concluded that downstream wastewater infrastructure, including the SNC and WRC, could accommodate the peak flows from the Barrhaven South Community with no risk of surcharging or basement flooding. **Table 7-1** provides the peak flows calculated for

Barrhaven South, up to the current Urban Boundary, as part of the three (3) aforementioned studies. These peak flows were calculated at downstream sanitary maintenance hole 522A, located at the intersection of the existing Greenbank Road and Half Moon Bay Road, immediately south of the Jock River.

Table 7-1: Total Sanitary Peak Flow for Barrhaven South

Study	Barrhaven South Peak Flow (l/s)
2007 BSMSS	388
2013 IMP Model	590
Draft 2014 BSMSSA	412

B7.1.1 Existing Sanitary Sewers

Wastewater servicing for existing development in Barrhaven South was designed in general conformance with the 2007 BSMSS and the Draft 2014 BSMSSA (refer to the Sanitary Servicing Plan prepared by Stantec in **Appendix 'B4'**). The southerly portion of the existing Barrhaven South Community is serviced by the following three (3) main trunk sanitary sewers as shown on **Figure 7-1**:

- Existing Greenbank Road Trunk Sanitary Sewer
  This sewer extends approximately 2 km south of the Jock River up to the current Urban Boundary. At its upstream end, at the Urban Boundary, this sewer is 600 mm in diameter, with a 0.25% slope, an obvert elevation of 91.77 m and is 6.7 m below existing ground.

- Cambrian Road Trunk Sanitary Sewer
  This sewer extends approximately 1 km west of the existing Greenbank Road up to the future realigned Greenbank Road. At its upstream end, at the future realigned Greenbank Road, this sewer is 500 mm in diameter, with a 0.20% slope, an obvert elevation of 89.53 m and is 4.1 m below existing ground.

- River Mist Road Trunk Sanitary Sewer
  This sewer extends approximately 1.7 km south of Cambrian Road to the southern limit of the current Urban Boundary (within Minto's Quinn's Pointe subdivision). At its upstream end, at the Urban Boundary, this sewer is 200 mm in diameter, with a 0.32% slope, an obvert elevation of 100.44 m and is 3.3 m below existing ground. As its downstream end, at Cambrian Road, this sewer is 375 mm in diameter.

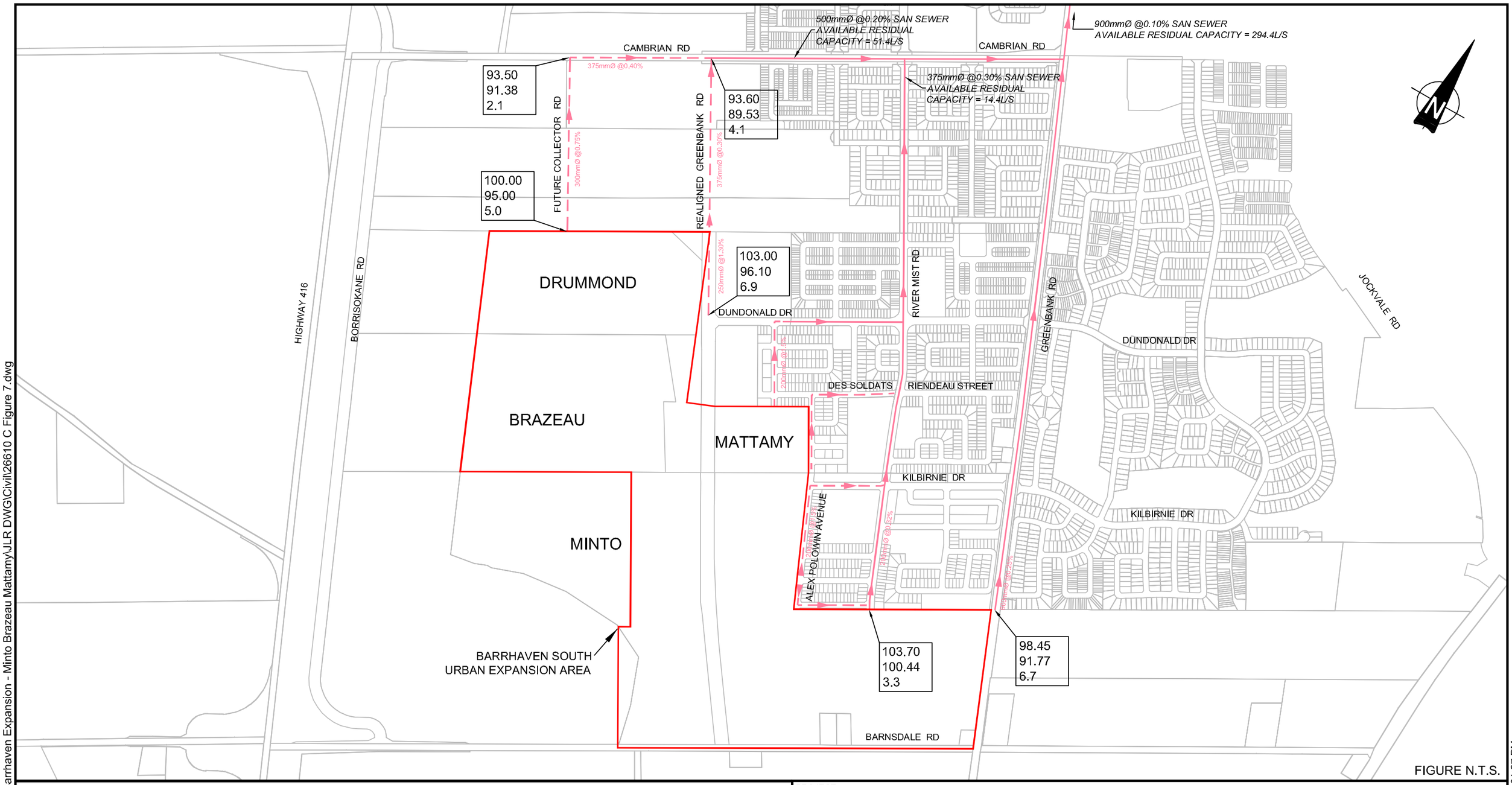

FIGURE N.T.S.

LEGEND

EXISTING SANITARY SEWER

PLANNED SANITARY SEWER

98.45
91.77
6.7

EXISTING GROUND
SANITARY SEWER OBVERT
COVER DEPTH (m)

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

EXISTING AND FUTURE SANITARY SERVICING INFRASTRUCTURE

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DESIGN: HM
DRAWN: CJM
CHECKED: LD

JLR NO: 26610

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FIGURE 7-1

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C Figure 7.dwg

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The Cambrian Road and River Mist Road trunk sanitary sewers convey wastewater to the existing Greenbank Road trunk sanitary sewer, which outlets to the SNC and, ultimately, to the WRC.

A review of the trunk sanitary sewers in Barrhaven South was undertaken to evaluate whether there is available capacity in the existing sanitary sewer system to service additional lands outside the current Urban Boundary. Design sheets for the three (3) existing trunk sanitary sewers listed above were reviewed to identify the limiting pipe reach in terms of available residual capacity. It should be noted that the review was based on theoretical peak flow calculations and not monitored flow data. Based on the theoretical peak flows presented in the Draft 2014 BSMSSA Sanitary Sewer Design Sheet prepared by Stantec (a copy of which is provided in **Appendix 'B4'**), the limiting residual capacity in each trunk sanitary sewer is shown in Table 7-2, below.

Table 7-2: Available Residual Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Limiting Pipe Reach	Residual Capacity (L/s)
Existing Greenbank Road	MH 45 to MH45A	295.4
Cambrian Road	MH13A to MH15A	51.4
River Mist Road	MH 102A to MH17A	17.8

Furthermore, as part of the detailed design of the Quinn's Pointe subdivision, tributary areas were reassigned from the existing Greenbank Road trunk sanitary sewer to the River Mist Road trunk sanitary sewer due to a change in the alignment of River Mist Road that was implemented following the issuance of the Draft 2014 BSMSSA. As a result, a higher peak flow is conveyed to the River Mist Road trunk sanitary sewer in comparison to the allocated flow in the Draft 2014 BSMSSA. Therefore, the available residual capacity in the River Mist Road trunk sanitary sewer is slightly less than that indicated in Table 7-2 above, as summarized in **Table 7-3**.

Table 7-3: River Mist Road Trunk Sanitary Sewer Available Residual Capacity

Quinn's Pointe Allocation per Draft 2014 BSMSSA	10.40 L/s
Peak flow per Quinn's Pointe detailed design	13.77 L/s
Difference	3.37 L/s additional
River Mist Residual Capacity per Table 7-2	17.8 L/s
River Mist Revised Residual Capacity	**14.4 L/s**

It should be noted that the critical pipe reach on the existing Greenbank Road trunk sanitary sewer is located downstream of the Cambrian Road and River Mist Road trunk sanitary sewers (refer to the Sanitary Servicing Plan in **Appendix 'B4'**). Should future

development require the use of the entire theoretical residual capacities of the River Mist Road and Cambrian Road trunk sanitary sewers (i.e., 14.4 L/s and 51.4 L/s, respectively), then the allowable peak flow that could be conveyed by the existing Greenbank Road trunk sanitary sewer downstream of Cambrian Road is 229.6 L/s (i.e., 295.4 – 51.4 – 14.4 = 229.6 L/s).

B7.1.2 Planned Trunk Sanitary Sewers

There are also trunk sanitary sewers in Barrhaven South within the current Urban Boundary that have yet to be constructed, as shown in the Draft 2014 BSMSSA. These planned trunk sanitary sewers are identified by dashed lines in **Figure 7-1** and are described as follows:

- Future Cambrian Road Trunk Sanitary Sewer
  This sewer is to extend approximately 400 m west of the existing Cambrian Road trunk sanitary sewer to the future Collector Roadway located approximately 500 m east of Borrisokane Road. As per the Draft 2014 BSMSSA, this sewer is proposed to be 375 mm in diameter, with a 0.40% slope and an upstream obvert elevation of 91.38 m at the future Collector, which is 2.1 m below existing ground.

- Future Collector Road Trunk Sanitary Sewer
  This sewer is to extend approximately 550 m south of Cambrian Road along a future Collector located between the future realigned Greenbank Road and Borrisokane Road. As per the Draft 2014 BSMSSA, this sewer is to be 300 mm in diameter, with a 0.75% slope and an upstream obvert elevation of 95.00 m, which is 5.0 m below existing ground.

- Future Realigned Greenbank Road Trunk Sanitary Sewer
  This sewer is to extend approximately 800 m south of Cambrian Road along the future realigned Greenbank Road. As per the Draft 2014 BSMSSA, this sewer is proposed to have an upstream diameter of 250 mm, with a 1.30% slope and an obvert elevation of 96.10 m north of Dundonald Drive, which is 6.9 m below existing ground.

Similar to the existing trunk sanitary sewers, these planned (future) trunk sanitary sewers in Barrhaven South will convey wastewater to the existing Greenbank Road trunk sanitary sewer which ultimately outlets to the SNC.

B7.2 Water Servicing

B7.2.1 Existing Conditions

The existing Barrhaven South Community is part of the City's Pressure Zone BARR which is fed from Pressure Zone 2W via the following two (2) source transmission mains:

1. The Woodroffe Avenue 1200 mm diameter watermain (from Baseline Road to Fallowfield Road); and
2. The Fallowfield Road 762 mm diameter watermain.

The Barrhaven Reservoir, located off of Fallowfield Road, acts as balancing storage for Zone 2W and feeds the Barrhaven Pumping Station (BPS), which boosts water to the Pressure Zone BARR.

B7.2.2 Future Zone Reconfiguration

Findings presented in the City of Ottawa Water Supply Optimization Study Report prepared by Delcan in 2008, and more recently in the Draft 2014 BSMSSA, showed that a reconfiguration of pressure zones within the South Urban Community (which includes the Barrhaven South Community) would eliminate the need for a new pumping station, minimize system fragmentation (dead-ends), and generally improve system reliability and operation. This recommended zone reconfiguration consists of an expanded Zone 3C within areas originally identified as Pressure Zone BARR, including the Barrhaven South Community and the future BSUEA. The City elected to move forward with the zone reconfiguration and has, therefore, identified several water distribution projects in their 2013 IMP that are required to achieve the recommended zone reconfiguration and meet future growth and reliability needs up to the 2031 planning horizon within the South Urban Community. These IMP projects are as follows:

- Barrhaven Reservoir Pumping Station Upgrade;
- Fallowfield Road Watermain Upgrade (from the Barrhaven Reservoir to Borrisokane Road);
- Barrhaven Pumping Station Upgrade;
- Barrhaven-3C Feedermain (from Foxfield at Holitman to Via Chianti Grove); and
- Existing Greenbank Road Watermain (from north of Jockvale to south of the Jock River).

Refer to extracts from the 2013 IMP provided in **Appendix 'B5'** for details on the above-noted projects.

It should be noted that as part of the City of Ottawa 2013 Water Master Plan analyses, Stantec has highlighted a particular constraint in terms of providing water servicing for the BSUEA. Hydraulic simulation results for growth areas within the South Urban Community up to the 2031 planning horizon have shown that low pressures (i.e., less than 40 psi) are anticipated along the future water distribution system that will be servicing the elevated portion of the BSUEA (refer to Figure 5-5: Residual Pressure Distribution – SUC – 2031 provided in **Appendix 'B5')**. As a result, a new booster pumping station and oversized services or jet pumps are anticipated to be required in order to provide adequate water servicing within the BSUEA.

B7.2.3 Existing Watermains and Operating Pressures

Water servicing for existing development in the Barrhaven South Community was developed in general conformance with the 2007 BSMSS and the more recent Draft 2014 BSMSSA (refer to the Water Servicing Plan prepared by Stantec in **Appendix 'B5'**). Potable water is supplied to the southerly portion of the existing Barrhaven South Community by the following existing feedermains, as shown in **Figure 7-2**:

- Existing Greenbank Road 406 mm Diameter Feedermain
  This feedermain extends approximately 2 km south of the Jock River up to the southerly limit of the current Urban Boundary.

- Existing Cambrian Road 406 mm Diameter Feedermain
  This feedermain extends from the existing Greenbank Road to the future realigned Greenbank Road.

- Existing River Mist Road 305 mm Diameter Feedermain
  This feedermain extends the entire length of River Mist Road from River Run Avenue up to the southerly limit of the current Urban Boundary. The actual alignment of this feedermain was slightly revised from the Draft 2014 BSMSSA, which showed a 305 mm diameter feedermain along Alex Polowin Avenue, from Kilbirnie Drive up to the southerly limit of the Urban Boundary (refer to **Figure 7-2** and the Draft 2014 BSMSSA Water Servicing Plan provided in **Appendix 'B5'**).

B7.2.4 Future Watermains and Operating Pressures

As part of the long-term infrastructure needs, there will also be a requirement to extend existing feedermains that are planned but are yet to be constructed within the current Urban Boundary. These future planned watermains, which have been identified in the Draft 2014 BSMSSA, include the following and are shown as dashed lines on **Figure 7-2**.

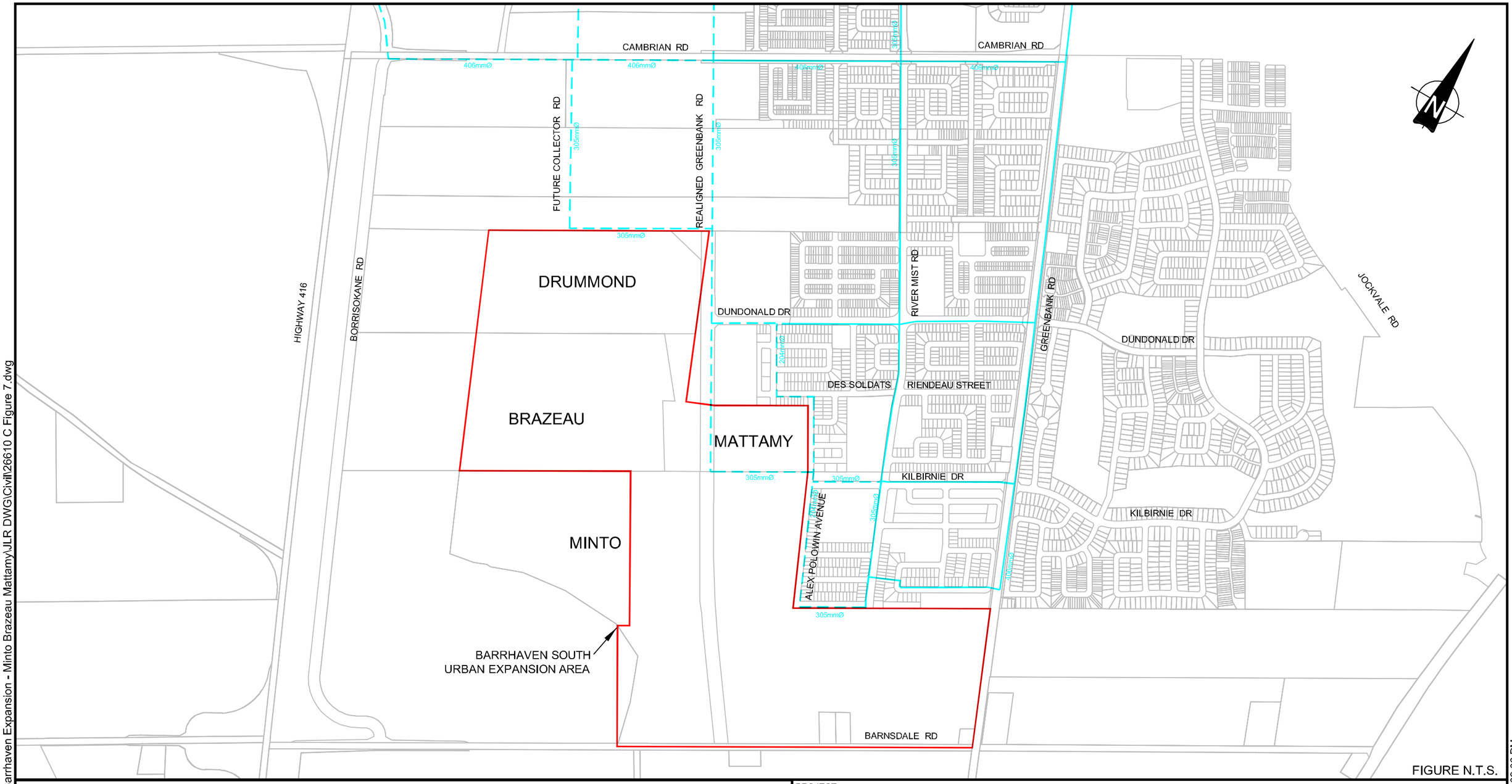

FIGURE N.T.S.

LEGEND

EXISTING WATERMAIN

PLANNED WATERMAIN

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

EXISTING AND FUTURE WATER MAIN SERVICING INFRASTRUCTURE

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JLR NO: 26610

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FIGURE 7-2

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PLOT DATE: December 19, 2016 2:02:06 PM

- Future 305 mm diameter feedermain on the future realigned Greenbank Road
  This feedermain is to extend by approximately 2 km south of Cambrian Road, past the current Urban Boundary and about 500 m east to River Mist Road to complete a 305 mm diameter watermain loop.

- Future 406 mm diameter feedermain on Cambrian Road
  This feedermain is to extend from the future realigned Greenbank Road to Borrisokane Road.

- Future 305 mm diameter feedermain on future Collector Road
  This feedermain, located along the future Collector Road between Borrisokane Road and the future realigned Greenbank Road, is to extend approximately 550 m south of Cambrian Road to the current Urban Boundary and approximately 430 m east to the future realigned Greenbank Road feedermain to complete a system loop.

In terms of the existing operating pressures and hydraulic grade lines (HGL) in Pressure Zone BARR under domestic and fire flow conditions, the following information was extracted from the Draft 2014 BSMSSA:

- The HGL in Pressure Zone BARR is dependent on the water levels in the Moodie Drive Tank, the pump discharge pressure, and the system head losses. When those elements are factored in, the HGL is found to typically vary from a minimum of 147 m to a maximum of 160 m under fire flow and domestic demands.
- Ground elevations in Pressure Zone BARR range between a minimum elevation of 84 m and a maximum elevation of 117 m. The range in Barrhaven South is between a minimum of 83 m and a maximum of 110 m, while the ground elevations in the BSUEA range between 99 m and 111 m.
- During basic day demand and under the maximum operating HGL of 160 m, pressures in Barrhaven South are expected to range between 489 kPa (71 psi) and 751 kPa (109 psi), assuming no system head loss. As noted in Section 5.2.1 of the Draft 2014 BSMSSA, low lying areas will experience pressures greater than 80 psi (552 kPa).
- During peak hour and under the minimum operating HGL of 147 m, pressures in Barrhaven South are expected to range between 365 kPa (53 psi) and 627 kPa (91 psi), assuming no system head losses.

B7.2.5 Future Operating Pressures in the BSUEA

Water servicing needs in the BSUEA will be investigated and evaluated as part of the upcoming Master Servicing Study (MSS) for the BSUEA. The existing and planned trunk feedermains, as depicted on **Figure 7-2**, will serve as the backbone of the future trunks

within the BSUEA. The Draft 2014 BSMSSA has to be finalized before the BSUEA MSS can begin. The Draft 2014 BSMSSA will evaluate the performance of the water distribution system at a preliminary level, to determine whether the system can support the urbanization of the BSUEA, referred to as Area 7. This work will be finalized early in 2017, in advance of adopting the Community Design Plan. Results from this undertaking will be extracted and included in this section of the Existing Condition Report when made available.

As previously noted, Barrhaven South, as well as the BSUEA, will be serviced from an expanded Zone 3C by future watermain extensions. As per the Draft 2014 BSMSSA, potable water will originate from the Barrhaven Pumping Station where a constant 147 m discharge HGL will be maintained under the various range of demands. Table 7-4 summarizes the operating pressures in Barrhaven South and the BSUEA (information extracted from the Draft 2014 BSMSSA).

Table 7-4: Residual Pressure during Basic and Peak Hour Demands

Area	Zone	Basic Day Maximum Pressure kPa (psi)	Peak Hour Minimum Pressure kPa (psi)
Barrhaven South	3C	372 (54) - 607 (88)	296 (43) - 503 (73)

B7.3 BSUEA Stormwater Servicing and Stormwater Management

A preferred stormwater management (SWM) strategy for Barrhaven South up to the current Urban Boundary was first identified in the Jock River Reach One Subwatershed Study prepared by Stantec in June 2007. This preferred SWM strategy included five (5) wet pond facilities that would provide quality control (to an MOE enhanced level of protection, 80% suspended solids removal) before discharging to the Jock River. The 2007 Jock River Reach One Subwatershed Study served as the basis for the 2007 BSMSS, also prepared by Stantec, which outlined tributary areas and trunk storm sewers to convey stormwater to the five (5) wet pond facilities. These five (5) facilities were strategically located south of the Jock River and referred to as Corrigan, Todd, Clarke, Borrisokane and Greenbank (refer to **Appendix 'B6'** for a copy of the 2007 BSMSS Conceptual SWM Storm Servicing Plan, Drawing ST1, prepared by Stantec).

A Draft Addendum to the 2007 BSMSS was subsequently issued by Stantec in 2014 to address changes in SWM criteria established in the 2012 Design Guidelines and associated Technical Bulletins. The Draft 2014 BSMSSA also incorporated the detailed designs of the Corrigan and Todd Ponds and their tributary infrastructure, which were completed since the issuance of the 2007 BSMSS.

The following provides an overview of existing and planned stormwater infrastructure for both minor and major systems in Barrhaven South that is associated with each of the five (5) designated wet pond facilities. The minor storm system is comprised of street gutters, catch basins, inlet control devices, junction chambers, and storm sewers and conveys stormwater during frequent storm events (i.e., generally up to the 1:5 year storm event). The major system is comprised of swales, roadway sags, streets, etc. and generally conveys stormwater flows overland, up to the 1:100 year storm event, when flows are in excess of the minor system capacity.

B7.3.1 Corrigan Pond

In 2008, the detailed design of the Corrigan Pond was carried out by the IBI Group (IBI). Construction of the Pond was completed in 2010. The Corrigan Pond is located south of the Jock River, east of the existing Greenbank Road, and currently services a tributary area of approximately 148 ha within the eastern portion of the existing Barrhaven South Community, as shown on the Drainage Schematic (dated June 2015) prepared by IBI, and provided in **Appendix 'B6'**.

Minor System

Existing trunk storm sewers that outlet to the Corrigan Pond include the following, as shown in **Figure 7-3** and on the Drainage Schematic prepared by IBI provided in **Appendix 'B6'**:

- Existing Tucana Way Trunk Storm Sewer
  This sewer extends approximately 450 m south of the Corrigan Pond to Cambrian Road.

- Existing Cambrian Road Trunk Storm Sewer
  This sewer extends approximately 400 m west of Tucana Way to the existing Greenbank Road.

- Existing Greenbank Road Trunk Storm Sewer
  This sewer extends from Cambrian Road to approximately 1.7 km south of Cambrian Road, at the southern limit of the current Urban Boundary. At its upstream end, at the Urban Boundary, this sewer is 1800 mm in diameter, with a 0.16% slope, an obvert elevation of 94.07 m and is about 3.9 m below existing ground.

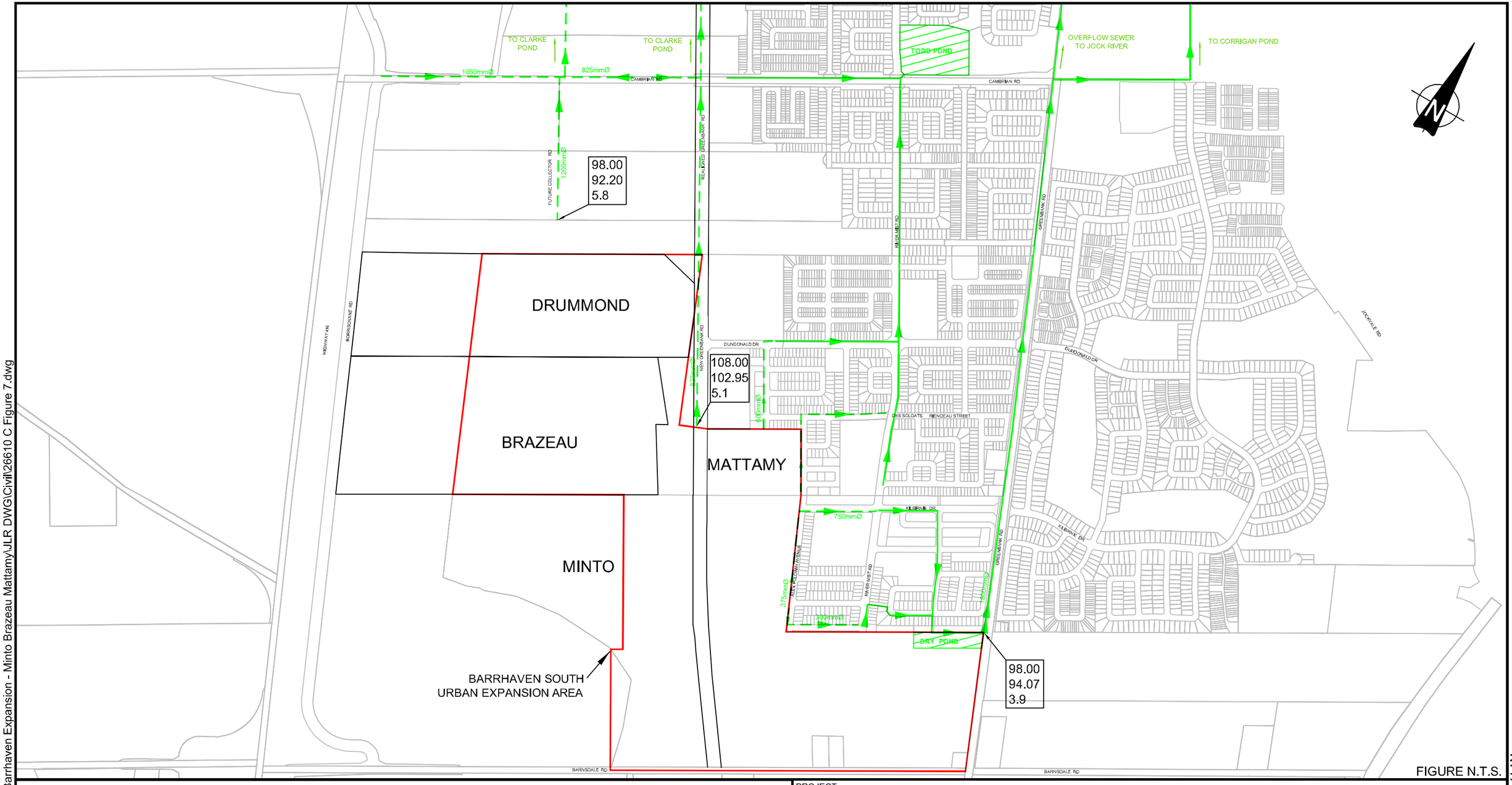

FIGURE N.T.S.

LEGEND

EXISTING STORM SEWER

PLANNED STORM SEWER

98.00
94.07
3.9

EXISTING GROUND
STORM SEWER OBVERT
COVER DEPTH (m)

NOTE:

PLANNED INFORMATION IS IN ACCORDANCE WITH THE STANTEC DRAFT 2014 BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (BSMSSA), THE JLR 2015 QUINN'S POINTE DETAILED SERVICING DESIGN AND THE STANTEC 2015 HALF MOON BAY SOUTH DRAFT PLAN #3 DETAILED SERVICING DESIGN.

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

DRAWING:

EXISTING AND FUTURE STORM SERVICING INFRASTRUCTURE

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It should also be noted that there is another storm sewer along the existing Greenbank Road, north of Cambrian Road. This storm sewer serves as an overflow; diverting flows of approximately 6.8 m^3/s of stormwater directly to the Jock River during the 1:100 year storm event (refer to IBI's Drainage Schematic provided in **Appendix 'B6'**).

In terms of hydraulic grade line (HGL) along the existing trunk storm sewers, simulation results provided in IBI's 2014 Stormwater Management Barrhaven South Report indicate that although certain portions of the trunk storm sewers experience surcharging under the 1:100 year storm event (SCS Type II), the minimum required freeboard of 30 cm to the underside of footing (USF) of each unit is still achieved throughout the system. The minimum freeboard in the system is 0.32 m at MH 104B on the existing Greenbank Road.

In terms of water quality analysis, the latest June 9, 2015 letter issued by IBI confirmed that the existing Corrigan Pond exceeds the required water quality volume to achieve an MOE enhanced level of protection for the current 147.5 ha tributary area, which is inclusive of the most recent detailed design of Minto's Quinn's Pointe subdivision. The existing Corrigan Pond has 1700 m^3 of residual permanent pool storage and 100m^3 of residual extended detention storage.

Major System

Major system flows generated from existing development located south of Cambrian Road and east of the existing Greenbank Road are tributary to the Corrigan Pond. Since overland flow is not permitted to cross arterial roadways (i.e., Cambrian Road and the existing Greenbank Road) as per the Design Guidelines, major system flows generated within these lands are conveyed overland to designated storage areas where they are released, at a restricted flow rate, back into the minor system of the Corrigan Pond. These storage areas consist of a parking lot and park which are identified as Areas B5D and B6, respectively, on the Dual Drainage Cascading Flow Figure prepared by IBI and provided in **Appendix 'B6'**. This Figure also shows that major system flows generated from existing development located to the north of Cambrian Road and to the east of the existing Greenbank Road outlet directly to the Jock River.

Major system flows generated in Minto's Quinn's Pointe subdivision are also ultimately conveyed to the Corrigan Pond. Since the subdivision is located to the west of the existing Greenbank Road, major system flows are first conveyed and captured by a dry pond located at the southern limit of Quinn's Pointe where they are released, at a restricted rate, to the Corrigan Pond minor system. As per the July 2015 Site Servicing Report for Quinn's Pointe prepared by JLR, the maximum major system street ponding depth in the subdivision is 35 cm (static and dynamic), in accordance with City Design Guidelines.

With the exception of the Quinn's Pointe subdivision, the remainder of the major system flow generated from lands to the west of the existing Greenbank Road is conveyed to the Todd Pond.

B7.3.2 Todd Pond

The detailed design of the Todd Pond was carried out by J.F. Sabourin and Associates Inc. (JFSA) in 2008. It is located in the northeast quadrant of the Cambrian Road and River Mist Road intersection. It is noted that the existing Todd Pond configuration is slightly different than the proposed configuration outlined in the 2007 BSMSS since the existing pond is not bisected by Cambrian Road.

The Todd Pond currently services a tributary area of approximately 141 ha within the existing central portion of Barrhaven South. This tributary area includes the Half Moon Bay, The Meadows and Half Moon Bay South subdivisions as shown in the Overall Drainage Area to Todd Pond (Figure 2) prepared by JFSA, and included in **Appendix 'B6'**. The latest model keeper analysis for the Todd Pond, completed by JFSA in April 2015, confirmed that the existing Todd Pond exceeds the MOECC's water quality volume requirement to achieve an enhanced level of protection for its tributary area based on the detailed designs of developments in Barrhaven South. The Todd Pond has approximately 6900 m^3 of residual permanent pool storage.

Minor System

Existing trunk storm sewers servicing the southerly portion of the Todd Pond tributary area include the following, as shown on **Figure 7-3**:

- Existing River Mist Road Trunk Storm Sewer
  This sewer extends from the Todd Pond to approximately 1.2 km south of Cambrian Road.

- Existing Cambrian Road Trunk Storm Sewer
  This sewer extends from the Todd Pond to approximately 500 m west of River Mist Road.

For the existing Half Moon Bay and a portion of The Meadows and Half Moon Bay South subdivisions, HGL analyses of the existing storm sewers tributary to the Todd Pond were completed at detailed design and approved based on the 1:100 year 3-hour Chicago design storm only. Based on this design storm, these developments meet the City's minimum freeboard requirement of 30 cm between the HGL and the USF, as indicated in the April 2015 Todd Pond Model Keeper Analysis.

The HGL analyses for these existing/approved developments did not, however, consider the 1:100 year 24-hour SCS Type II design storm and 1:100 year + 20% climate change stress test. As a result, under these two (2) designs storms, the minimum 30 cm freeboard is not always achieved, as noted by JFSA in the 2015 Todd Pond Model Keeper Analysis. However, the HGL was identified by JFSA as always below the finished basement floor elevation of existing units, as shown in Figure I-1: Lots with less than 30 cm freeboard, prepared by JFSA and provided in **Appendix 'B6'**. As indicated on Figure I-1, the minimum freeboard was found to be 23 cm above USF during the 1:100 year 24-hour SCS Type II design storm. Although the 30 cm freeboard for HGL and USF criterion was not respected, JFSA concluded that the existing units were not at risk of basement flooding.

As part of the latest Todd Pond Model Keeper Analysis completed in April 2015, JFSA analysed an 'ultimate' tributary area to the Todd Pond, which included minor system flows from 5.6 ha of future development lands, owned by Mattamy, located outside of the current Urban Boundary and within the BSUEA (refer to Figure 3, prepared by JFSA and provided in **Appendix 'B6',** for ultimate tributary area boundary). It is noted that the HGL analysis results summarized on Figure I-1, prepared by JFSA, include this ultimate drainage area and therefore existing basements would not be at risk of flooding with the addition of the 5.6 ha area. JFSA concluded that, in order for the Todd Pond to accommodate minor system flows from the additional 5.6 ha of future development area (based on an imperviousness of 56%), the current 30 m long Todd Pond outlet weir would have to be extended to a length of 48 m.

Major System

Major system flows generated from existing subdivisions west of the existing Greenbank Road including Half Moon Bay, The Meadows and Half Moon Bay South are conveyed to the Todd Pond. Since the Todd Pond is located immediately north of Cambrian Road, which is an arterial roadway, all major overland flow up to the 1:100 year storm was designed to be captured by the minor system just south of Cambrian Road so that the flows are conveyed to the Todd Pond without crossing Cambrian Road overland. Furthermore, the minor system also captures major system flow up to the 1:100 year storm at the northern property limit of Half Moon Bay South and The Meadows so that overland flow is not conveyed between subdivisions during the 1:100 year storm, with the exception of 2.33 m^3/s conveyed from Half Moon Bay South at Penant Avenue to Regatta Avenue in The Meadows.

As noted in the JFSA 2015 Todd Pond Model Keeper Analysis, some of the existing road sag storage areas exceed the maximum allowable ponding depth of 30 cm (static and dynamic for new developed areas) during the 1:100 year storm, in contravention of the 2012 Design Guidelines. These road sags are identified on Figure I-2, prepared by JFSA

and provided in **Appendix 'B6'.** It is also noted that some of these road storage areas exceed a maximum ponding depth of 35 cm (static and dynamic) during the 1:100 year storm, in contravention of more recent guidelines, specifically, Technical Bulletin PIEDTB-2016-01.

Major system flows generated by Minto's Quinn's Pointe subdivision were originally identified to flow overland to the Half Moon Bay South subdivision and, ultimately, to the Todd Pond as per the 2007 BSMSS. Quinn's Pointe was allocated a total allowable major overland flow rate of 1.2 m³/s (divided into 0.9 m³/s and 0.3 m³/s at two (2) outlets). However, the 2014 Stormwater Management Report for Quinn's Pointe (formerly referred to as Barrhaven South Phase 1), prepared by IBI, showed that the proposed Quinn's Pointe development would exceed the allowable major system release rate of 1.2 m³/s to Half Moon Bay South. Consequently, an alternative SWM solution was developed where the 1.2 m³/s major system release rate to existing development was not required. This solution consisted of a dry pond, located at the low-lying southeastern corner of Quinn's Pointe, to which major system flows were conveyed and released back into the minor system. This SWM approach was implemented in JLR's detailed design for the subdivision, the construction of which has recently been completed.

The 5.6 ha of future development lands owned by Mattamy outside of the current Urban Boundary within the BSUEA were also accounted for as part of the major overland flows tributary to the Todd Pond. In JFSA's 2015 Todd Pond Model Keeper Analysis, both minor and major system flows generated from these future lands were allocated under the 'ultimate' scenario – refer to Figure 3, prepared by JFSA and provided in **Appendix 'B6'**. It is noted that the ponding depths shown on Figure I-2, prepared by JFSA, consider this ultimate drainage area. The analysis concluded that in order for the Todd Pond to be able to accommodate minor and major flows from these future lands, the Todd Pond outlet weir would have to be extended from 30 m to 48 m in length.

B7.3.3 Clarke Pond

As per the Draft 2014 BSMSSA, the Clarke Pond is proposed to be located approximately 250 m north of Cambrian Road and approximately 780 m west of River Mist Road. It is intended to service the southwestern portion of Barrhaven South up to the southern limit of the current Urban Boundary. The analysis and sizing of the Clarke Pond was initiated by JFSA in 2011 and has since been updated in 2013 to incorporate the detailed designs of developments in Barrhaven South that were completed since 2011.

Minor System

The following planned trunk storm sewers were identified in the Draft 2014 BSMSSA to convey stormwater generated from the southern portion of Barrhaven South (up to the current Urban Boundary) to the Clarke Pond, as shown in **Figure 7-3**:

- Future Realigned Greenbank Road Trunk Storm Sewer
  This sewer is to extend approximately 1.2 km south of the Clarke Pond to the limit of the current Urban Boundary. At its upstream end, at the Urban Boundary, it is anticipated that, as per the Draft 2014 BSMSSA, this sewer will have a diameter of 825 mm, a slope of 1.0%, an obvert elevation of 102.95 (invert of 102.11), and a cover depth of 5.1 m.

- Future Collector Road Trunk Storm Sewer
  This sewer is to extend from the Clarke Pond to approximately 350 m south of Cambrian Road. At its upstream end, it is anticipated that, as per the Draft 2014 BSMSSA, this sewer will have a diameter of 1200 mm, a slope of 0.55%, an obvert elevation of 92.20 m (invert of 90.98), and a cover depth of 5.8 m.

- Future Cambrian Road Trunk Storm Sewer
  Planned sewers on Cambrian Road are to convey stormwater either towards the planned future realigned Greenbank Road trunk sewer or to the planned future Collector Road trunk storm sewer.

Due to the grade raise constraints within the northern portion of Barrhaven South and the normal water level in the Jock River, it is anticipated that the majority of the planned storm sewers outletting to the Clarke Pond will be partially submerged, as shown on the Draft 2014 BSMSSA Drainage Area Plan provided in **Appendix 'B6'**. Maintenance solutions to minimize the accumulation of sediments within the submerged sewers are to be addressed at detailed design, as indicated in the Draft 2014 BSMSSA.

Major System

Areas bounded by Cambrian Road and the future realigned Greenbank Road are to provide on-site storage to contain major system flow up to the 1:100 year storm such that the flows do not cross these arterials. Major system flows generated from lands located north of Cambrian Road and west of the future realigned Greenbank Road are to be conveyed directly to the Clarke Pond, as shown on the Draft 2014 BSMSSA Drainage Area Plan prepared by Stantec and provided in **Appendix 'B6'**.

B7.3.4 Cedarview Pond

Cedarview Pond is a future SWM facility that is proposed to be located immediately south of the Jock River, west of the future realigned Greenbank Road as per the Draft

2014 BSMSSA. The detailed design of the Pond has not yet been initiated; however, it is intended to serve as an outlet for planned minor system storm sewers servicing the northwestern portion of Barrhaven South (refer to Cedarview Pond Drainage Area Plan prepared by Stantec, provided in **Appendix 'B6'**). Furthermore, most major system flow generated within the Cedarview Pond tributary area is intended to be conveyed overland directly to the Jock River as shown on Stantec's Cedarview Drainage Plan in **Appendix 'B5'**.

B7.3.5 Greenbank Pond

Greenbank Pond is a future SWM facility that is proposed immediately south of the future realigned Greenbank Road and southwest of the Jock River as per the Draft 2014 BSMSSA. The detailed design of the Pond has been initiated by David Schaeffer Engineering Limited (DSEL) as part of Mattamy's Half Moon Bay Phase 7 Subdivision. The Greenbank Pond is to serve as an outlet for planned minor system storm sewers servicing the central northern portion of Barrhaven South - refer to the Draft 2014 BSMSSA Greenbank Pond Drainage Area Plan prepared by Stantec and provided in **Appendix 'B6'**. Furthermore, major system flow for tributary lands located south of the future realigned Greenbank Road is intended to be conveyed overland to the Greenbank Pond, while major system flow to the north of the future realigned Greenbank Road is intended to be conveyed overland directly to the Jock River, as per the Greenbank Pond Drainage Plan provided in **Appendix 'B6'**.

B8.0 OPPORTUNITIES AND CONSTRAINTS

B8.1 Drainage Network

The review of LiDAR data and the Headwater Drainage Feature Assessment concluded that there were no waterways or watercourses within the limits of the BSUEA. The lack of waterways is generally indicative of the low frequency in the flow generation potential for a given area. Based on the measured saturated hydraulic conductivities and corresponding calculated infiltration rates, the surface water flow component accounts for 1.2% of the total annual precipitation depth of 844 mm. As part of storm servicing, some constraints such as modification to drainage may be reviewed and/or permitted as part of the MSS. However, these modifications will need to follow the appropriate levels of approvals. Any modification to the hydrological regime of either Mud Creek (Thomas Baxter Municipal Drain) or Rideau River (Hawkins Municipal Drain) will need to be completed in accordance with the Drainage Act. Minor adjustments to the drainage divide between sub-watersheds are generally permitted while a significant diversion may trigger the requirement of additional investigations. This requirement would permit the

evaluation of the impact on the natural environment and the identification of mitigation measures. Should there be an adjustment contemplated with the drainage divide, the MSS would then be the vehicle that would determine whether the proposed mitigation measures are adequate or, alternatively, if there will be a need to complete a Schedule C Class EA.

B8.1.1 Area Tributary to the Jock River

Historically, three (3) municipal drains provided conveyance to the Jock River. However, these drains are being enclosed and abandoned as the urban development extends south. The former Todd Municipal Drain is now enclosed downstream of the Todd Pond, the Clarke East Municipal Drain is now partially enclosed, and there are plans for the Clarke West Municipal Drain to be partially enclosed as development proceeds. Where partial enclosure is proposed, the works will be subject to the requirements of the Federal Fisheries Act. Modification or abandonment of these municipal drains will need to be completed in accordance with Section 78 of the Drainage Act, chapter D.17, R.S.O. 1990. Based on topography, approximately 99 ha of the study area (refer to the drainage limits depicted in **Figure 5-1**) is tributary to the Jock River.

B8.1.2 Area Tributary to Mud Creek

The Thomas Baxter Municipal Drain is immediately south of the Study Area at Barnsdale Road and carries flow from Barnsdale Road to Mud Creek. There are no plans to abandon or enclose the drain. Based on topography, approximately 11 ha of the southwestern portion of the study area (refer to drainage limits depicted on **Figure 5-1**) is tributary to Mud Creek via the above-noted Drain. In July 2016 the Council approved the appointment of Robinson Consultants Ltd to prepare a report under Section 78 of the Drainage Act to inform the Council of any drainage works projects required on the Municipal Drain as a result of the future servicing of the BSUEA.

B8.1.3 Area Tributary to the Rideau River

The area tributary to the Rideau River drains via roadside ditches along Barnsdale Road and the existing Greenbank Road which in turn drains to the Hawkins Municipal Drain system to the east of the existing Greenbank Road and south of Barnsdale Road. Based on topography, approximately 13 ha of the southeastern portion of the study area (refer to the drainage limits depicted in **Figure 5-1**) is tributary to the Rideau River via the above-noted Drain. In July 2016 the Council approved the appointment of Robinson Consultants Ltd to prepare a report under Section 78 of the Drainage Act to inform the Council of any drainage works projects required on the Municipal Drain as a result of the future servicing of the BSUEA.

B8.2 Aquatic Habitat and Natural Heritage

Natural heritage features have been identified by Dillon Consulting in their March 2016 report based on the fieldwork undertaken. The report was prepared to identify, amongst other features, wetlands and fish habitat. Based on this undertaking, there were no watercourses found within the study area, and the only water features identified were man-made ponds resulting from aggregate extraction.

B8.3 Floodplains

Lands which are part of the BSUEA are not restricted by any regulation floodplains.

B8.4 Water Quantity Control

Water quantity criteria will be affected by site constraints and municipal and provincial requirements. Water quantity control for lands that drain to the Jock River will be governed by available capacity in existing and planned minor and major systems in the existing Barrhaven South Community. Since the existing and planned infrastructure was designed to service lands up to the current Urban Boundary, there is limited or no available capacity in existing and planned minor and major systems. Table 8-1 summarizes the minimum residual capacity of trunk sewers, the minimum freeboard between USF, and the 1:100 year HGL and maximum street ponding depth for each stormwater management facility (SWMF) outlet. As shown in **Table 8-1** below, all minor systems are either close to or exceeding the minimum allowable freeboard between HGL and USF of 0.30 m as required by the Design Guidelines. Additionally, the major system through which the Todd Pond outlets does not meet the maximum allowable street ponding depth (static and dynamic) of 35 cm per Technical Bulletin PIEDTB-2016-01.

For lands that drain to Mud Creek, flows will need to be limited to the capacity of the Thomas Baxter Drain. Any additional flow discharge to the Thomas Baxter Drain should not aggravate the risk of flooding. Any modifications to this Drain or to its flow regime will need to be assessed and approved in accordance with Section 78 of the Drainage Act, Chapter D.17, R.S.O., 1990.

In addition, Barnsdale Road is classified as an arterial roadway, which means that major flow from events up to the 1:100 year may not be conveyed across it.

Similarly, lands tributary to the Rideau River will be subject to the capacity limits of the downstream watercourse, namely, the Hawkins Municipal Drain as well as the overland flow conveyance restrictions due to the arterial road. Any additional flow discharge to the Hawkins Municipal Drain should not aggravate the risk of flooding. Any modifications to this Drain will need to be assessed and approved in accordance with Section 78 of the Drainage Act, Chapter D.17, R.S.O., 1990.

Table 8-1: Available Capacity in Existing and Planned Minor and Major Storm Systems in Barrhaven South

Outlet (SWMF)	Sewer Status	Minimum available capacity in trunk storm sewers	Minimum clearance (freeboard) between 1:100 yr & USF	Maximum street ponding (static + dynamic)
Corrigan Pond	Existing	735 L/s (MH 105-106A) (1)	0.32 m @ MH 104B on the existing Greenbank Road (2)	0.35m (3)
Todd Pond	Existing	136 L/s (MH 643-640) (5)	0 m (i.e., no freeboard, HGL is 0.23 m above USF and 0.02 m below basement floor) (5)	11 roadway sags with flow depth in excess 400 mm (5)
Clarke Pond	Planned	237 L/s (MH 211-211A) (6)	Not available - conceptual HGL at 0.08 m below T/G of MH 304 (4)	Information has not been reported
Cedarview Pond	Planned	165 L/s (MH 506-505) (6)	Not available, conceptual HGL at 0.20 m below T/G of MH 304 (6)	Information has not been reported
Greenbank Pond	Planned	167 L/s (MH415-409) (6)	Not available, conceptual HGL at 0.47m below T/G of MH N403A (6)	Information has not been reported

References
(1) IBI Storm Sewer Design Sheet Dated May 2010
(2) IBI SWM Barrhaven South October 2014
(3) JLR Quinn's Pointe Site Servicing Report Dated July 29, 2016
(4) JFSA July 25, 2013 Todd Pond and Clarke Pond Model Keeper Analysis / Update of Half Moon Bay South Subdivision Plan
(5) JFSA April 2015 Todd Pond Model Keeper Re-Assessment of Existing System Capacity
(6) Stantec Draft 2014 BSMSSA

Within the BSUEA, the realigned Greenbank Road will be classified as an arterial road; major overland flow generated by events up to 1:100 year will, therefore, not be able to cross the realigned Greenbank Road. Since the realigned Greenbank Road will bisect the BSUEA, this restriction on overland flow conveyance will have implications for stormwater management within the development.

B8.5 Water Quality Control

Water quality treatment will need to be provided in accordance with the relevant subwatershed studies. The Jock River Reach One Subwatershed Study states that, for areas tributary to the Jock River, an enhanced level of water quality treatment, in accordance with the MOE 2003 SWMPDM, is required. It is noted that currently all existing and planned SWMFs in Barrhaven South exceed the MOECC water quality storage requirement to achieve an enhanced level of protection for their current drainage areas, as summarized in **Table 8-2,** below.

Table 8-2: Water Quality Storage Assessment for Existing and Planned SWMFs

SWMF	SWMF Status	Water Quality Storage (m^3) in Excess of Minimum MOECC Requirements	
		Wet Permanent Pool	Extended Detention Volume
Corrigan Pond	Existing	1700 (1)	100 (1)
Todd Pond	Existing	6936 (2)	Information has not been reported
Clarke Pond	Planned	2804 (3)	Information has not been reported
Cedarview Pond	Planned	211 (4)	Information has not been reported
Greenbank Pond	Planned	582 (4)	Information has not been reported

Notes

(1) As per IBI June 9, 2015 Letter Report - Corrigan SWM Facility

(2) As per JFSA April 2015 Todd Pond Model Keeper Re-Assessment of Existing System Capacity (Appendix E)

(3) As per JFSA July 25, 2013 Todd Pond and Clarke Pond Model Keeper Analysis / Update of Half Moon Bay South Subdivision Plan

(4) As per Stantec Draft 2014 BSMSSA

The Mud Creek Subwatershed Study does not make any specific water quality protection requirements but states that surface water contamination from point and non-point sources must be managed. Additionally, the Lower Rideau Subwatershed Study has set an objective to manage the quality and quantity of non-point source runoff and to manage surface and groundwater contamination from point source discharges.

B8.6 Infiltration

The Hydrogeological Study undertaken by Paterson confirms that, in general, soils within the BSUEA have a moderate to high hydraulic conductivity (refer to Figure C-1 and Figure C-2, **Appendix 'B3'**). The moderate are observed in the eastern portion while the highest are observed in the northwestern portion of the study area. Such soils are considered to act as a recharge zone for underlying aquifers. The presence of soils with high hydraulic conductivity means that the site is suitable for providing groundwater recharge and appropriate practices must be implemented to maximize the rate of infiltration.

Non-structural Best Management Practices such as discharging impervious runoff, including roof runoff, to lawns are required regardless of soil capacity, in accordance with the Jock River Reach One Subwatershed Study. In addition, the study should consider the potential to incorporate LID in areas that are conducive to infiltration, to reduce the anticipated infiltration deficit and maintain pre-development infiltration levels.

Based on fulfilling the objective of maintaining pre-development infiltration levels, storm servicing solutions incorporating infiltration measures will be developed at the MSS in order to achieve a water balance. These infiltration measures will be incorporated within all areas of the BSUEA, striving to maintain pre-development infiltration levels for the Jock River, Rideau River (via the Hawkins Municipal Drain), and Mud Creek (via the Thomas Baxter Municipal Drain) sub-watersheds. As part of storm servicing, some constraints such as modification to drainage may be reviewed and/or permitted as part of the MSS. However, these modifications will need to follow the appropriate levels of approvals. Any modification to the hydrological regime of either Mud Creek (Thomas Baxter Municipal Drain) or Rideau River (Hawkins Municipal Drain) will need to be completed in accordance with the Drainage Act.

Any future redevelopment of the sand and gravel resource area, as per Official Plan policy 3.7.4, should ensure that the groundwater recharge function be maintained.

The Mud Creek Subwatershed Study identified that there are significant groundwater recharge areas including the Kars Esker, a Mississippi-Rideau Sourcewater Protection Region Significant Groundwater Recharge Area, across the majority of the western portion of the BSUEA. These pre-development recharge conditions must be maintained. A water balance will be required to demonstrate adherence to this requirement. The Mud Creek Subwatershed Study also recommends avoiding infiltration of poor quality runoff from paved surfaces without pre-treatment, and to consider the use of LID and Best Management Practices for stormwater management quality and quantity control.

B8.7 Existing Servicing Infrastructure

The following opportunities and constraints have been identified for the existing and planned servicing infrastructure in Barrhaven South. These will be reviewed and evaluated in greater detail as part of the BSUEA MSS.

B8.7.1 Wastewater Servicing

Wastewater servicing for the BSUEA is ultimately governed by the available residual capacities in the existing downstream trunk sanitary sewers in Barrhaven South. Based on the theoretical available residual capacities for existing trunk sanitary sewers identified in Section B7.1 of this Report, an approximate equivalent residential development area was calculated using an average peak flow rate per hectare of 1.77 L/s/ha. This average peak flow rate is based on an average unit density of 34 units/ha (as per the 2006 Barrhaven South CDP) a population density of 2.7 persons/unit, an average flow rate of 350 L/cap/day, a residential peaking factor of 4.0, and an infiltration allowance of 0.28 L/s/ha in accordance with the Design Guidelines. It is noted that a peaking factor of 4.0 is relatively high; however, it provides a more

conservative estimate. Based on an average peak flow rate of 1.77 L/s/ha, it appears that the existing trunk sanitary sewers could service the following future residential development:

Table 8-3: Available Tributary Area Capacity in Existing Trunk Sanitary Sewers

Trunk Sanitary Sewer	Residual Capacity (L/s)	Equivalent Residential Development Area (ha)
Existing Greenbank Road	295.4	167
Cambrian Road	51.4	29
River Mist Road	14.4	8

As indicated in Section **B7.1** of this Report, the existing Greenbank Road trunk sanitary sewer serves as the main outlet for the existing Barrhaven South sanitary sewer system, which includes the Cambrian Road and River Mist Road trunk sanitary sewers. Based on the theoretical peak flow calculations summarized in **Table 8-3** above, the existing Greenbank Road trunk sanitary sewer has sufficient capacity to accommodate the peak flows generated within the BSUEA. It can accommodate approximately 167 ha of additional residential area, which is more than the 121 ha area of the BSUEA. Furthermore, based on the conclusions of the 2013 IMP wastewater model, total peak flows conveyed downstream of the existing Greenbank Road trunk sanitary sewer at MH 522A (located at the intersection of Half Moon Bay Road, immediately south of the Jock River) should be limited to 590 L/s to prevent potential adverse impacts to the HGL in the existing downstream sanitary sewer system. Stantec concluded in the 2013 Wastewater Collection System Assessment that downstream wastewater infrastructure, including the SNC and WRC, could accommodate a peak flow of 590 L/s from the Barrhaven South Community and the BSUEA, with no risk of surcharging and/or basement flooding.

It should also be noted that based on the depth of the existing Greenbank Road trunk sanitary sewer at the current Urban Boundary (i.e., obvert elevation of 91.77 m) and the groundwater elevations observed by Paterson within the eastern portion of the BSUEA (i.e., ± 95.00 m), it is anticipated that a portion of the trunk sanitary sewer near the eastern limit of the BSUEA will be lower than the groundwater table. This could result in increased infiltration into the sewer system and lowering of the groundwater table.

B8.7.2 Water Servicing

Low pressures (i.e., less than 40 psi) are anticipated during domestic water demand conditions in the BSUEA in localized areas where the existing ground elevation is relatively high. Further opportunities and constraints will be identified upon completion of a detailed Hydraulic Network Analysis (HNA) as part of the BSUEA MSS.

B8.7.3 Stormwater Servicing and Stormwater Management

Stormwater servicing and SWM opportunities and constraints associated with each existing and planned SWMF outlet in the Barrhaven South Community are summarized in Table 8-4.

Table 8-4: Stormwater Servicing and SWM Opportunities and Constraints in Barrhaven South

SWMF Outlet	Opportunity	Constraint
Corrigan Pond	Available residual capacity in existing sewers and pond storage volume	Max Ponding depth of 35 cm & min HGL freeboard of 32 cm
Todd Pond	Available residual capacity in existing sewers pond storage volume	Max. ponding depth & min. HGL freeboard not being met
Clarke Pond	Available residual capacity in planned sewers and pond storage volume	Minimal HGL freeboard anticipated
Cedarview Pond	Available residual capacity in planned sewers and pond storage volume	Minimal HGL freeboard anticipated
Greenbank Pond	Available residual capacity in planned sewers and pond storage volume	Minimal HGL freeboard anticipated
Notes Refer to **Table 8-1** and **Table 8-2 above** for details		

Although all five (5) existing/planned SWMFs in Barrhaven South have residual water quality volumes, as shown in **Table 8-2**, and have available residual capacity in their associated trunk infrastructure, as shown in **Table 8-1**, all storm sewer systems in Barrhaven South are ultimately limited by high HGL elevations. The Corrigan and Todd Ponds are also limited by the major system ponding depths which are generally at or exceeding the maximum allowable depth of 0.35 m. Although the planned trunk storm sewers are anticipated to have high HGL elevations as per the Draft 2014 BSMSSA, opportunities to provide stormwater servicing and SWM for the BSUEA via the three (3) planned wet pond facilities (Clarke, Cedarview and Greenbank) and their associated trunk storm sewers will be reviewed in detail and evaluated as part of the BSUEA Master Servicing Study (MSS).

In addition, as noted in Section **B7.3.2** of this Report, both minor and major system flows generated from the 5.6 ha parcel of land owned by Mattamy within the BSUEA (i.e., east of the future realigned Greenbank Road) were allocated to the Todd Pond under an 'ultimate' scenario as part of the 2015 Clarke Pond Model Keeper Analysis completed by JFSA. Their analysis showed that the Todd Pond can provide adequate water quality control for this future development land if the length of the facility outlet weir is extended from 30 m to 48 m. Servicing this 5.6 ha land parcel via the Todd Pond would, however,

require that the City accept a deviation from their Guidelines with respect to minimum freeboard to the underside of footing, as well as to the maximum street ponding depth.

B9.0 SUMMARY AND RECOMMENDATIONS

The following provides a series of recommendations to be considered when preparing the BSUEA MSS, in the context of the opportunities and constraints discussed above.

B9.1 Wastewater Servicing

Assuming that the Brazeau and Drummond lands (totalling ± 45 ha) will ultimately be developed as commercial/employment, it is anticipated that the northern portion of the BSUEA will be serviced by the planned trunk sanitary sewers along the Future Collector Road and/or the future realigned Greenbank Road, which both converge at the Cambrian Road trunk sanitary sewer (refer to **Figure 7-1**). It should be noted that **Figure 7-1** indicates obvert elevations at the upstream end of the Future Collector and future realigned Greenbank Road trunk sanitary sewers, in accordance with the Draft 2014 BSMSSA; however, opportunities to reduce the slope and lower the upstream obvert elevation of these future sewers will be reviewed as part of the MSS. Revisions to the design of these future sewers at the MSS stage are anticipated, to improve the serviceability of the existing low-lying aggregate pit areas within the northern portion of the BSUEA.

It is anticipated that the 5.6 ha parcel of land owned by Mattamy east of the future realigned Greenbank Road within the BSUEA will be serviced by the existing River Mist Road trunk sanitary sewer as per the existing Half Moon Bay Phase 3 design. It is also anticipated that the Mattamy lands west of the future realigned Greenbank Road will outlet to the River Mist Road trunk sanitary sewers either via the Half Moon Bay or Quinn's Pointe local sanitary sewers. Based on the natural topography of the remaining 66 ha of the BSUEA, it is anticipated that these lands could outlet by gravity to the existing Greenbank Road trunk sanitary sewer.

To minimize infiltration into the existing Greenbank Road sanitary sewer system where it is anticipated to be below the groundwater table (i.e., eastern portion of the BSUEA), the following measures can be assessed and implemented:

- Concrete pressure pipe (CPP);
- Higher class PVC pipes;
- Higher percentage silica fume in maintenance hole structures;
- Cretex seals in maintenance holes; and

- Clay seals along the service trench.

B9.2 Water Servicing

Water servicing for the BSUEA will be developed to fulfill regulatory requirements under both domestic and fire flow conditions. It is anticipated that there will be an area in the BSUEA that will not fulfill the minimum pressure requirements during domestic demand conditions, due to topography. As a result, this localized area may require a booster pumping station or, alternatively, oversized services combined with jet pumps. This condition, as well as water servicing specifics such as watermain looping and sizing of the feedermains for the BSUEA, will be addressed at the MSS stage by a hydraulic network analysis (HNA). The HNA for the BSUEA MSS will be carried out in accordance with the most recent Design Guidelines and Technical Bulletins.

B9.3 Stormwater Servicing and Stormwater Management

The planned trunk storm sewer along the Future Collector Road, which outlets to the future Clarke Pond, is anticipated to have the lowest upstream obvert elevation (at the northern limit of the BSUEA) compared to the other planned and existing trunk storm sewers surrounding the Study Area, as indicated in **Figure 7-3**. For this reason, the Future Collector Road trunk storm sewer would be the optimal minor system outlet for the existing low-lying aggregate pit areas within the northern portion of the BSUEA. This servicing strategy would, however, have to be reviewed in conjunction with JFSA (the Clarke Pond model keeper) to assess whether the planned Future Collector trunk storm sewer and the Clarke Pond could be designed to accommodate these additional lands.

Opportunities to utilize the future Cedarview Pond as a minor system outlet for the BSUEA will also be reviewed and assessed as part of the MSS. It should be noted that since both the future Clarke and Cedarview Ponds are planned to be located north of Cambrian Road, which is an arterial roadway, major system flows up to the 1:100 year would have to be contained upstream of Cambrian Road using a dry pond facility.

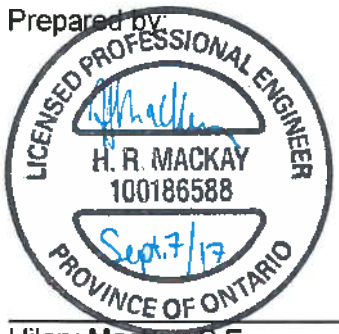
Should a new wet pond facility be required to provide SWM for the southern portion of the BSUEA, then the naturally low-lying topography at the southeastern corner of the Study Area would be the optimal location. It is anticipated that this pond could provide both stormwater quantity and quality control and could potentially outlet to the existing Greenbank Road trunk storm sewer. Quantity control would be required so that the integrity of the existing Greenbank Road storm sewer system is maintained. Major system flows could also be conveyed overland to this future wet pond, with the exception of those generated west of the future realigned Greenbank Road. Since this road is designated as an arterial roadway, major system flow up to the 1:100 year event generated within the BSUEA lands west of the future realigned Greenbank Road would

either have to be contained within a separate dry pond facility or captured via an oversized minor system and conveyed beneath the future realigned Greenbank Road.

Depending on the preferred SWM selected to service the BSUEA, it is anticipated that diverting some stormwater away from the Thomas Baxter Municipal Drain (Mud Creek) towards the Jock River may occur. The impact of diverting a small proportion of the watershed should have minor significance to the watercourse since the continuous simulation modeling found that there is no surface runoff response in events smaller than a 1:5 year event. The MSS will outline any requirements, triggered by a change in watershed boundaries, to meet the Municipal Class Environmental Assessment process, including if a Schedule C EA is required as a result of the selected SWM strategy.

LID measures to promote infiltration are to be incorporated as part of the overall servicing of the BSUEA to achieve the targeted water balance for each of the three (3) subwatersheds. Special attention should be devoted towards infiltrating "clean water" across the area of the Kars Esker while Best Management Practices (BMPs) to reduce runoff should be included in all locations where there is an increase in imperviousness. BMPs can include draining roofs to rear-yards and increasing vegetation areas.

Prepared by:



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APPENDIX 'B1'

SYNOPSIS OF BACKGROUND DOCUMENTS

EXISTING CONDITION REPORT – APPENDIX B1
SYNOPSYS OF BACKGROUND DOCUMENTS

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

1.0 REPORTS COVERING A LARGE GEOGRAPHICAL AREA WHICH ENCOMPASS THE SITE

1.1 *Jock River Reach One Subwatershed Study Final Report*. Stantec Consulting Ltd. (June 2007). City of Ottawa

In 2005 the Jock River Reach One Subwatershed Study (JRROSS) was undertaken by Stantec on behalf of the principal landowners and the City of Ottawa in response to the growing development pressures in Barrhaven and surrounds. The subwatershed study was completed to identify the existing environmental condition of the river and associated natural resources and to provide the environmental and conceptual stormwater management requirements to allow for the Barrhaven South Community and other areas within the subwatershed to be developed while protecting, restoring or enhancing the significant natural features and functions. .The subwatershed study was meant to support a Community Design Plan that was being undertaken in parallel to the study for the lands located south of the Jock River.

The study found that all tributaries of the Jock River, including the main tributaries south of the Jock River (West Clarke Drain, East Clarke Drain and Todd Drain), support fisheries however they provide only highly seasonal and marginal fish habitat for a handful of warm water tolerant fish species. The tributaries can run dry or low after high spring water levels and they have been largely modified by channel straightening. Other features of the subwatershed identified in the report south of the Jock River included:

- Five woodlots considered significant woodlands, two of which contain forest interior habitat;
- Recharge area function is associated with the sand and gravel resource areas south of Cambrian Road; and,
- The Jock River is classified as a Policy 2 watercourse for phosphorus which requires a net reduction in phosphorus loadings to the river.

The resulting Stormwater Management Design Criteria for the areas south of the Jock River includes:

- Quantity control storage as required by the capacity of rehabilitated tributaries

- No erosion control storage required as the rehabilitated tributaries should be designed to withstand the erosive forces of stormwater runoff;
- Quantity control as per the Ministry of the Environment's enhanced level treatment (80% Total Suspended Solids (TSS) removal);
- All stormwater management facility outlets to be designed to augment low flows to the extent possible; and,
- Structural infiltration practices to be implemented in areas of suitable soil and non-structural best management practices should be implemented elsewhere to reduce the magnitude of system runoff.

The South of Jock River Management Plan which results from the design criteria includes the following recommendations:

- One centralized stormwater management facility (wet pond) for each of the Cedarview catchment area and West Clarke Drain catchment area. Two centralized facilities in the Todd Drain catchment area;
- The partial closure of West Clarke Drain, the full enclosure of East Clarke Drain and the rehabilitation of the remaining drains to convey stormwater to the Jock River. The partial closure of Todd Drain and the rehabilitation of the remaining Todd Drain to convey flows to the Jock River;
- Protection of the significant woodlands identified in Cedarview catchment area and conservation and integration, where feasible, of the woodlot in the West Clarke Drain catchment area; and,
- Creation of new fish habitat areas for loss of the closed drains in accordance with the Barrhaven South Conceptual Fish Habitat Compensation Plan.

1.2 *Jock River Subwatershed Report 2010: A report on the environmental condition of the Jock River*. Rideau Valley Conservation Authority. (April 2011).

The latest subwatershed report card for the Jock River was released by the Rideau Valley Conservation Authority in 2010 and is due for review in 2016. The report looks at the subwatershed in terms of four indicators: forest cover, wetlands, riparian cover and water quality. The Jock River subwatershed is broken up into 12 catchment areas with part of the study area covered by the data sheet for the Barrhaven Catchment. The data sheet provides data on the catchment features and summarizes the catchment under the four areas of surface water quality, riparian zone conditions, catchment land cover, groundwater resources, surface water resources and watershed monitoring projects.

For the Barrhaven catchment of the Jock River:

- the water quality is Fair with 11 exceedances of E.coli and 65 exceedances of Total Phosphorus against provincial guidelines in the period 2004 to 2009;
- the riparian margin (30 metres adjacent land cover) is 56% vegetated compared to a recommended 75%;
- 63% of instream habitat has had some significant human alterations;
- the 335 ha of woodlands occupies 11% of the drainage area which is below the minimum 30% recommended in order to sustain forest bird species;
- the shallowest underlying bedrock aquifers are considered to be vulnerable to land use impacts due to the thin overlying protective soil cover though this is not considered an existing problem; and,
- there are rural clean water projects and tree planting projects within the area and 15% of the drainage area is within regulation limits which affords protection to the habitat and water resource systems.

1.3 *Mud Creek Subwatershed Study*. City of Ottawa, Planning and Growth Management. (October 2015).

1.4 *Mud Creek Subwatershed Existing Conditions Report Phase I Summary*. City of Ottawa Land Use and Natural Systems Policy Group. 2011.

1.5 *Jock River Reach 2 & Mud Creek Subwatershed Study Existing Conditions Report (Final)*. Marshall Macklin Monaghan Limited and Water & Earth Sciences Associates. (May 2009). City of Ottawa.

The Mud Creek Subwatershed drains to the Rideau River just north of the Village of Manotick. The subwatershed also includes Mahogany Creek, a small catchment adjacent to Mud Creek, which drains directly to the Rideau River. In 2003 a joint subwatershed study was initiated with Mud Creek and Reach 2 of the Jock River however delays to the process meant that the full process was never realised after the Existing Conditions Report was published in 2009. A summary report was published by the City in 2011 with intent to start Phase II. The project was fully restarted in 2015 as a new subwatershed study undertaken by the City of Ottawa, with information collated from studies by the City of Ottawa and the Rideau Valley Conservation Authority, to examine the existing conditions of the subwatershed and identify any actions which would be required to improve the environmental health and condition of the subwatershed over the long term.

The issues and opportunities identified in the study included the following which may be relevant within the Barrhaven South Urban Expansion Area:

- Mud Creek is a cool-water system with a variety of fish species, however water quality is being negatively impacted by runoff from adjacent land uses;

- The Kars Esker is a valuable source of groundwater and is recognized in the Source Water Protection Plan as a highly vulnerable aquifer; and,
- The subwatershed includes several features contained in the City's natural heritage system including significant woodlands and unevaluated wetlands.

The report has made several recommendations some of which may have impacts within the Study Area:

- Existing programs offered by the City of Ottawa and the Rideau Valley Conservation Authority should be used to encourage stewardship of the creeks and other aquatic features;
- The significant groundwater recharge area (including the feature known as the Kars Esker) should be appropriately protected under the development review process;
- Sections of Mud Creek which have been identified as significant valley-lands or linkages should be added to the Natural Heritage System overlay in the City's Official Plan and although the unevaluated wetlands should not be added they should be considered as subject to the Official Plan policies for the protection of the Natural Heritage System.

1.6 *Lower Rideau River Subwatershed Report 2012: A report on the environmental condition of the Lower Rideau River.* Rideau Valley Conservation Authority. (February 2013).

The latest Subwatershed Report Card for the Lower Rideau River was issued by the Rideau Valley Conservation Authority in 2012. The Lower Rideau River watershed is broken up into 16 catchments, one of which is the Mud Creek subwatershed. The individual catchment reports contains information on the general subwatershed, water quality, riparian vegetation and aquatic habitat, land use, and stewardship and protection. For the Mud Creek catchment:

- The water quality rating dropped to Poor for the 2006-2011 period partly due to an increase in E-Coli contamination, continued contamination from heavy metals and low readings of benthic invertebrates;
- The riparian margins are 45% and 54% vegetated on the left and right banks respectively, compared to a recommended target of 75%;
- Approximately 26% of the instream habitat has had some human alteration;
- Only 19% of the catchment area is woodlot, below the minimum 30% recommended for preservation of forest bird species; and,
- there are rural clean water projects and tree planting projects within the area, however only 1% of the drainage area is within regulation limits which means limited protection to the habitat and water resource systems.

1.7 *Lower Rideau Watershed Strategy Final Report*. Aquafor Beech / Robinson Consultants Inc. (September 2005). Rideau Valley Conservation Authority

The Lower Rideau Subwatershed Strategy was prepared in 2005 by Aquafor Beech Ltd and Robinson Consultants for the Rideau Valley Conservation Authority. The strategy initiative began in 2002 in order to adopt an ecosystem based approach to the responsibilities for the watershed and river management within the Lower Rideau watershed which includes the Mud Creek subwatershed. The strategy was developed through consensus at the Technical Advisory Committee level with the conservation authority, City of Ottawa and provincial and federal organisations part of the committee. The major issues identified as needing to be addressed included:

- Loss of headwater tributaries due to rural and urban drainage practices and channelization of those tributaries that remained;
- Removal of natural riparian vegetation which coupled with altered hydrology results in instream erosion and loss of habitats leading to reduced biodiversity and poor quality fish communities; and,
- Excessive nutrient loading from land use activities both agricultural and urban which often resulted in levels exceeding provincial guidelines.

An Adaptive Management Strategy was created with a series of actions to address the key issues. The implementation of the strategy is being managed through a three tier working group structure composing of the Lower Rideau Watershed Management Steering Committee, The Lower Rideau Watershed Strategy Implementation Committee and the Lower Rideau Watershed Management Working Groups with a working group for each of the following priority management actions:

- Public Education and Community Outreach to promote a conservation ethic to landowners and develop a streamlined approval process;
- Managing inputs of nutrients, bacteria and other contaminants to develop new stormwater management standards and improve current stormwater runoff quality;
- River and stream corridor management to prioritize the completion of subwatershed studies, protect, manage and rehabilitate the riparian margin, and protect habitats;
- Control of flows and water levels to improve the management of spring/fall water levels and address fisheries concerns; and,
- Integrated watershed monitoring and reporting to integrate monitoring programs and ensure that the correct parameters and indicators are being collected.

1.8 *Barrhaven South Official Plan Amendment Submission*. David McManus Engineering Ltd. (August 2008). Minto Communities Inc.

In August 2008 Minto Communities, on behalf of themselves and adjoining landowners, submitted a report in support of amending the City of Ottawa's Official Plan to include an urban expansion of the Barrhaven South Community Design Plan. The amendment submission covered a wider area than the current study area, east from Borrisokane Road to Prince of Wales Drive north of Barnsdale Road to the urban boundary.

The report presented a land use plan for the site with a focus on residential development with some employment or industrial areas. Servicing requirements for the Barrhaven South amendment area were presented along with recommendations for enabling the servicing requirements to be met. The recommendations included:

- Water infrastructure could be serviced from the adjoining Zone BAR with a 15% increase in demand met with improvements already required in the adjoining zone and relocation of a proposed water tower for Manotick Village closer to the service area;
- Sanitary loading could result in a 10% increase in flows in the West Rideau Collector and overall system infrastructure studies may be required to determine surcharges to be expected at full build-out;
- Stormwater servicing would utilise existing infrastructure and construct post to pre management facilities to control flows; and,
- Transportation network improvements would be required but these could be covered through development charges.

The report set out a rationale that the proposed boundary expansion to the amendment lands would be consistent with the Provincial Policy Statement and policies of the City of Ottawa's Official Plan.

1.9 *Aggregate Resource Designated Lands Study, 3882 Barnsdale Road, Ottawa, Ontario*. Paterson Group Inc. (February 2012). Minto Communities Inc.

An assessment of the viability of lands as an extractable resource was carried out in consideration of the lands immediately north of Barnsdale Road between Borrisokane Road and Greenbank Road. The work included investigation by means of compiling all available site specific borehole and test pit data of the subsurface conditions, determination of the suitability of the aggregates based on gradations and provision of an assessment of viability of the site for future extraction. A total of 27 test pits were analysed and the findings indicated that the site does not contain aggregate suitable for

extraction but there is suitable geotechnical conditions to support residential development with gravity servicing and conventional foundations.

2.0 SITE SERVICING STRATEGIES FOR ADJACENT URBAN DEVELOPMENT SITES

2.1 Barrhaven South Master Servicing Study Final Report. Stantec Consulting Ltd. (June 2007). City of Ottawa.

In 2007, Stantec completed the BSMSS to identify wastewater, stormwater and potable water servicing strategies for Barrhaven South up to the current Urban Boundary. These strategies are as follows:

- A network of trunk sanitary sewers to convey wastewater generated from the BSC to a main trunk sanitary sewer on Greenbank Road and ultimately to the South Nepean Collector (SNC) and the West Rideau Collector (WRC);
- Stormwater servicing and stormwater management based on the preferred SWM approach identified in the 2007 Jock River Reach One Subwatershed Study consisting of five wet pond facilities to provide quality control (80% TSS removal) before discharging to the Jock River; and
- A network of collector watermains to provide potable water to the BSC fed by existing transmission watermains on Woodroffe Avenue and Fallowfield Road which are boosted by the existing Barrhaven Pump Station and the existing Barrhaven Reservoir.

2.2 *2013 Infrastructure Master Plan Wastewater Collection System Assessment.* Stantec Consulting Ltd. (September 17, 2013). City of Ottawa.

This City-wide wastewater collection system assessment was completed by Stantec to identify system upgrades required to accommodate projected growth up to 2031 and 2060. Findings presented in this report served as the basis for the wastewater component of the City's 2013 Infrastructure Master Plan.

2.3 *City of Ottawa 2013 Water Master Plan.* Stantec Consulting Ltd. (September 20, 2013). City of Ottawa.

This City-wide water supply and distribution system assessment was completed by Stantec to determine upgrade requirements to meet growth, reliability and renewal needs within the 2031 and 2060 planning horizons. Findings presented in this report served as the basis for the water component of the City's 2013 Infrastructure Master Plan.

2.4 *Infrastructure Master Plan. City of Ottawa. (November 2013).*

The purpose of the City of Ottawa's IMP is to support the City-wide Official Plan by ensuring that there is sufficient infrastructure capacity to support the development and redevelopment levels contained within the Official Plan. The IMP sets out to achieve this by taking high level directions on infrastructure growth, operation and renewal for the planning horizon of the Official Plan, until 2031 and beyond until 2060.

2.5 *Barrhaven South Master Servicing Study Addendum Draft Report.* Stantec Consulting Ltd. (November 2014). City of Ottawa.

In 2014, Stantec issued a draft Addendum to their original 2007 BSMSS document. This Addendum incorporated new design parameters prescribed in the updated 2012 Ottawa Sewer Design Guidelines (herein referred to as the Design Guidelines) as well as the detailed design of three Barrhaven South residential developments that were completed since the issuance of the original 2007 BSMSS. These developments include Mattamy's Half Moon Bay, Tamarack's The Meadows at Half Moon Bay and Mattamy's Half Moon Bay South. Specific revisions to the servicing strategies included:

- Updates to sanitary peak flows based on actual unit counts in the three aforementioned residential developments;
- Updates to the stormwater servicing and SWM analysis based on design criteria established in the 2012 Design Guidelines and subsequent Technical Bulletins as well as updates to storm drainage areas based on the detailed designs for Half Moon Bay, The Meadows and Half Moon Bay South; and
- An updated hydraulic model for the water distribution network based on the 2010 City of Ottawa Water Distribution Guidelines and the 2013 Ottawa Water Master Plan Update (WMPU).

2.6 *Manotick Master Drainage Plan Phase I.* A.J. Robinson and Associates Inc. (October 1993). Township of Rideau.

2.7 *Manotick Master Drainage Plan Phase II.* Robinson Consultants Inc. (February 1996). Township of Rideau.

Work on preparation of a Master Drainage Plan for Manotick was started in 1990. Phase I was completed in 1993 and Phase II commenced following work on a Secondary Plan for Manotick and was completed in 1996. The Master Drainage Plan covers the area of Manotick and the Mud Creek catchment south of Baxter Road and east of First Line Road. The plan study area includes the point at which the Thomas Baxter Municipal Drain from the south of the BSUEA flows into Mud Creek.

The report made recommendations which mostly related to drainage in Manotick but some of which may affect the BSUEA discharges in the Mud Creek catchment. The report found that erosion control is required along some sections of Mud Creek which the report proposed could be addressed through stabilization and vegetation planting and also potentially check dams to control velocities. Two online wet ponds were included in the Master Drainage Plan, one at the downstream end of Mud Creek and one at the confluence with the Wilson-Cowan Drain. In addition, the report recommended that measures should be considered to reduce peak flows from future developments within the Manotick Drainage Master Plan area, however no specific control targets were included in the report. There were no targets set for quality control in the recommendations.

3.0 SURROUNDING INFRASTRUCTURE REPORTS

3.1 *Corrigan Stormwater Management Facility Stormwater Management Report and Design Brief*. IBI Group (July 2010). McNeil Farm Limited

The Corrigan SWMF SWM Report and Design Brief was first issued by IBI in 2008 and later updated in July 2010 to incorporate the detailed designs of development completed in Barrhaven South since 2008. The Corrigan Pond is an end-of-pipe SWMF located south of the Jock River and east of Greenbank Road and is part of the servicing strategy outlined for Barrhaven South in the 2007 Jock River Reach One Subwatershed Study and the 2007 BSMSS. The facility was designed to service a 145 ha tributary area and provide 80 % TSS removal before outletting to the Jock River.

3.2 *Stormwater Management Barrhaven South.* IBI Group (October 2014). Minto Communities Inc.

In October 2014, IBI issued a report entitled “Stormwater Management Barrhaven South” to support the development of Minto’s Quinn’s Pointe subdivision (formerly referred to as Barrhaven South Phase 1) as well as to provide an updated SWM analysis for the Corrigan Pond based on parameters prescribed in the 2012 Design Guidelines and subsequent Technical Bulletins. Although major system flows from Quinn’s Pointe were originally allocated to the Todd Pond, IBI indicated that the proposed Quinn’s Pointe development would exceed the allowable major system release rate allocated as part of the Todd Pond design. Therefore, IBI proposed a dry pond at the south end of Minto’s lands to capture major overland flows before releasing, at a restricted rate, back into the minor system.

3.3 Respond to the City of Ottawa Comment – Corrigan SWM Facility. IBI Group (June 9, 2015). J.L. Richards and Associates Limited.

In June 2015, IBI Group issued a letter in which they confirmed that the existing Corrigan Pond exceeds the water quality volume requirement to achieve 80% TSS removal for its current tributary area of 147.5 ha. This represented an increase in tributary area of 2.5 ha from the original pond design.

3.4 *Todd Pond and Clarke Pond Model Keeper Update Analysis / Update of Half Moon Bay South Subdivision Plan. Letter to David Schaeffer Engineering Limited*. J.F.Sabourin and Associates Inc. July 25, 2013.

This report includes a model keeper analysis update for the future Clarke Pond located west of the future Realigned Greenbank Road and north of Cambrian Road. This update includes revisions to the Clarke Pond minor and major system drainage boundaries resulting from changes associated with the detailed design of the Half Moon Bay South subdivision.

3.5 *Todd Pond Model Keeper Analysis Re-Assessment of Existing System Capacity*. J.F.Sabourin and Associates Limited. (April 2015). City of Ottawa.

In April 2015, JFSA confirmed that the Todd Pond has adequate water quality volume to achieve 80% TSS removal for its current tributary area and its 'interim' tributary area of ± 170 ha (including 29 ha of external rural drainage). JFSA also analysed an 'ultimate' drainage area scenario which included 5.6 ha of future developed lands within the BSUEA. The results of this analysis concluded that the Todd Pond would be able to accommodate this additional area if the outlet weir to the Jock River were to be extended.

3.6 *Site Servicing Report Quinn's Pointe 3872 Greenbank Road*. J.L. Richards and Associates Limited. (July 2015). Minto Communities Inc.

Quinn's Pointe is a residential subdivision currently being developed Minto located adjacent to the BSUEA at the south eastern boundary. The subdivision is bounded by Greenbank Road to the east and the Half Moon Bay South subdivision to the north. The Site Servicing Report was completed by J.L. Richards in 2015 and outlines the water supply, wastewater and stormwater servicing strategies for the site. The strategies are in general conformance with the Draft 2014 BSMSSA and the 2014 Stormwater Management Barrhaven South Report prepared by IBI which recommends the use of an on-site dry pond facility to capture major system flows rather than convey major system flows to the Todd Pond as per the original 2007 BSMSS.

3.7 *Thomas R. Baxter Municipal Drain Engineers Report*. Graham, Berman & Associates Ltd. (May 1967). Township of Nepean.

The Spence Branch of the Thomas R. Baxter Municipal Drain originates on the south side of Barnsdale Road on the southern boundary of the study area. The Engineer's Report for the municipal drain was completed in 1967 and recommended deepening and enlarging the main drain to a size sufficient to relieve flooding conditions along it with the necessary increases in the road culvert crossings. It was with this report that construction of the Spence Branch was recommended to relieve flooding conditions.

4.0 OTHER BACKGROUND REPORTS

4.1 *Final Geotechnical Investigation Proposed Barrhaven South Community 3872 Greenbank Road Ottawa*. Paterson Group Inc. (July 2014). Minto Communities Inc.

4.2 *Supplementary Geotechnical Assessment Proposed Quinn's Pointe Development Barrhaven South 3872 Greenbank Road – Ottawa. Letter to Minto Communities Inc*. Paterson Group Inc. May 19, 2015.

4.3 *Geotechnical Recommendations Greenbank Road Trunk Services Extension Quinn's Pointe Development - Ottawa. Letter to Minto Communities Inc*. Paterson Group Inc. July 23, 2015.

Geotechnical documents have been produced to support some of the infrastructure surrounding the site including reports for the Greenbank Road Trunk Services Extension, supplementary information for Quinn Pointe Subdivision, and the Barrhaven South Community to the west of the study area.

4.4 *Summary of the Jock River Reach 2 Subwatershed Existing Conditions*. City of Ottawa Land Use and Natural Systems Policy Group. (2011).

The subwatershed of reach 2 of the Jock River is upstream of Highway 416 and west of the BSUESA. The Existing Conditions report, prepared by the City of Ottawa in 2011, analysed various aspects of the subwatershed reach including climate, geology and physiography, surface and ground water hydrology and hydraulics, water quality and ecology and land use planning.

APPENDIX 'B2'

HYDROLOGICAL MODELING PARAMETERS AND RESULTS

BARRHAVEN SOUTH EXPANSION AREA

EXISTING CONDITION - SWMHYMO INPUT PARAMETERS

September 2017

Drainage Area ID	Total Area (ha)	Land Use	Hydrologic Soil Group (HSG)	Area (ha)	CN	A x CN	Weighted CN	S	I_A (mm)	CN*	Tp (hrs)
A1	18.64	Asphalt	N.A	0.38	98	37	45	310	23.3	42	0.41
		Gravel	AB	0.16	81	13					
			BC	0.03	87	3					
			B	0.09	85	8					
		Woodlot	A	5.13	30	154					
			B	1.85	58	107					
			AB	8.76	44	385					
			C	0.03	71	2					
		Pasture	AB	0.76	50	38					
			B	0.19	61	11					
			C	0.11	74	8					
		Unimproved Lands	A	1.15	55	63					
A2	35.36	Asphalt	N.A	0.26	98	26	51	244	18.3	49	0.59
		Gravel	AB	0.06	81	4					
			BC	0.03	87	2					
		Woodlot	A	8.61	30	258					
			AB	5.53	44	243					
			BC	3.44	65	223					
		Pasture	AB	6.74	50	337					
			BC	8.18	68	557					
		Agricultural Lands	BC	2.51	68	170					
A3	12.71	Pasture	BC	11.32	68	770	69	114	8.6	67	0.43
			C	1.39	74	103					
A4	13.95	Woodlot	A	7.83	30	235	41	366	27.4	37	0.33
		Unimproved Lands	A	6.13	55	337					
A5	12.65	Asphalt	N.A	0.11	98	11	52	234	17.6	50	0.39
		Gravel	A	0.11	76	8					
			B	0.02	85	2					
		Woodlot	A	0.86	30	26					
			B	0.01	58	0					
		Pasture	A	1.27	39	49					
			B	0.14	61	9					
		Unimproved Lands	A	10.14	55	558					
A6	11.73	Unimproved Lands	A	11.73	55	645	55	208	15.6	53	0.27
A7	15.53	Woodlot	A	1.97	30	59	53	225	16.9	51	0.72
			BC	2.50	65	163					
		Pasture	A	1.46	39	57					
			BC	1.70	68	115					
		Unimproved Lands	A	7.90	55	435					
A8	42.25	Asphalt	N.A	0.15	98	15	55	208	15.6	53	0.74
		Gravel	A	0.19	76	15					
		Pasture	A	1.60	39	63					
		Unimproved Lands	A	40.31	55	2217					
A9	5.08	Pasture	A	1.10	39	43	52	234	17.6	50	0.25
		Unimproved Lands	A	3.98	55	219					
A10	5.53	Asphalt	N.A	0.13	98	12	57	192	14.4	55	0.27
		Gravel	A	0.14	76	10					
		Unimproved Lands	A	5.27	55	290					
A11	15.20	Asphalt	N.A	0.11	98	11	57	192	14.4	55	1.27
		Gravel	A	0.00	76	0					
			B	0.12	85	10					
		Woodlot	B	7.71	58	447					
		Unimproved Lands	A	6.98	55	384					
			B	0.27	65	17					
A12	60.01	Asphalt	N.A	0.600	98	59	53	225	16.9	51	0.95
		Gravel	A	0.046	76	4					
			B	0.152	85	13					
		Woodlot	A	7.37	30	221					
			B	3.25	58	188					
		Unimproved Lands	A	14.39	55	791					
			B	0.42	65	27					
		Agricultural Lands	A	7.42	39	289					
			B	23.15	61	1412					
		Pond/Lake	N.A	2.93	50	147					
A13	24.60	Woodlot	A	1.27	30	38	54	216	16.2	52	0.50
		Unimproved Lands	A	23.33	55	1283					
A14	22.41	Woodlot	A	2.36	30	71	43	337	25.3	40	1.50
		Agricultural Lands	A	16.3	39	635					
			BC	1.54	68	104					
			C	2.23	74	165					

Drainage Area ID	Total Area (ha)	Land Use	Hydrologic Soil Group (HSG)	Area (ha)	CN	A x CN	Weighted CN	S	I_A (mm)	CN*	Tp (hrs)
A15	3.47	Asphalt	N.A	0.42	98	41	63	149	11.2	61	0.39
		Gravel	A	0.11	76	8					
			B	0.21	85	18					
		Pasture	A	0.65	39	25					
			B	2.08	61	127					
A16	2.87	Asphalt	N.A	0.10	98	10	41	366	27.4	37	0.24
		Gravel	A	0.02	76	2					
		Agricultural Lands	A	2.57	39	100					
		Grass	A	0.17	39	7					
A17	9.75	Asphalt	N.A	0.40	98	39	47	286	21.5	44	0.42
		Gravel	A	0.08	76	6					
			BC	0.05	87	4					
		Agricultural Lands	A	6.59	39	257					
			BC	1.88	68	127					
		Grass	A	0.75	39	29					
A18	0.50	Asphalt	N.A	0.13	98	13	67	125	9.4	66	N.A
		Gravel	A	0.04	76	3					
			B	0.04	85	3					
		Grass	A	0.15	39	6					
			B	0.14	61	8					
A19	1.01	Asphalt	N.A	0.20	98	20	71	104	10.4	72	N.A
		Gravel	B	0.13	85	11					
		Grass	B	0.68	61	42					
A20	4.78	Asphalt	N.A	0.23	98	22	51	244	18.3	49	0.32
		Gravel	A	0.02	76	2					
			B	0.07	85	6					
		Grass	A	0.38	39	15					
		Agricultural Lands	A	2.35	39	91					
			B	1.74	61	106					
A21	1.50	Asphalt	N.A	0.40	98	40	59	177	13.2	57	N.A
		Gravel	A	0.13	76	10					
			BC	0.01	87	1					
		Grass	A	0.94	39	37					
			BC	0.02	83	1.5					

EXISTING CONDITION REPORT – APPENDIX B
SWMHYMO MODEL DESCRIPTION

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

1.0 NASHYD

In catchment areas with an area of impervious less than 20% the NASHYD command was used.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description</th></tr>
<tr><td>Catchment Area</td><td>ha</td><td>The catchment area was delineated using the supplied contours and took account of quarries. In the Pre-development model no changes are made to the catchment areas but the pits are assumed to be filled to the surrounding ground level.</td></tr>
<tr><td>CN</td><td></td><td>The modified CN* value is used in the model. The CN values are based on hydrological soil types from OMAFRA mapping and MTO Design Chart 1.08 and land cover as per the aerial photography. The MTO drainage manual Design Chart 1.09 was used to assign CN values. The following CN values have been used:
<table>
<tr><th rowspan="2">Land Cover</th><th colspan="4">CN for Hydrologic Soil Group</th></tr>
<tr><th>A</th><th>AB</th><th>B</th><th>BC</th></tr>
<tr><td>Asphalt</td><td colspan="4">98</td></tr>
<tr><td>Agricultural</td><td>39</td><td></td><td>61</td><td>68</td></tr>
<tr><td>Grass</td><td>39</td><td></td><td>61</td><td></td></tr>
<tr><td>Gravel</td><td>76</td><td>81</td><td></td><td></td></tr>
<tr><td>Pasture</td><td>39</td><td>50</td><td></td><td>68</td></tr>
<tr><td>Pond/Lake</td><td colspan="4">50</td></tr>
<tr><td>Unimproved Lands</td><td>49</td><td></td><td></td><td></td></tr>
<tr><td>Woodlot</td><td>30</td><td></td><td>58</td><td></td></tr>
</table>
The CN values were area weighted for each catchment area.</td></tr>
<tr><td>Initial Abstraction</td><td>mm</td><td>Initial Abstraction values are 0.075S for areas with CN value less than 70 and 0.1S for areas with CN values greater than 70. (Visual Otthymo Manual)</td></tr>
<tr><td>Time to Peak</td><td>hrs</td><td>The time to peak is 0.6 of the Time of Concentration which was calculated using Uplands Method.</td></tr>
</table>

2.0 STANDHYD

In catchment areas with impervious greater than 20% of the area, the STANDHYD command was used.

Parameter	Units	Description
Catchment Area	ha	The catchment area was delineated using the supplied contours and took account of quarries. In the Pre-development model no changes are made to the catchment areas but the pits are assumed to be filled to the surrounding ground level.
Imperviousness		The total imperviousness (TIMP) was calculated from land cover based on the aerial photography. Lands that are sealed such as parking lots or roads are included as impervious. The directly connected imperviousness (XIMP) (the percentage of impervious surface not routed through a pervious surface) is negligible as there is no storm sewer network to collect the flow from these areas.
Horton Coefficients		Horton methods are used to calculate the infiltration. The Horton coefficients entered are from the City of Ottawa manual and are typical for the Ottawa area. The values are f_c = 13.2 mm/hr, f_o = 76.2 mm/hr, k = 0.0015 s^{-1}.
Initial Abstraction	mm	Initial abstraction values are as per the City of Ottawa drainage manual: 4.67 mm for pervious areas and 1.57 mm for impervious areas.
Slope	%	Slope was read from the contour data and averaged across the catchment area for the pervious slope parameter. The impervious slope parameter is based on the cross grade on a typical road section.
Flow Length	m	The pervious flow length is based on the longest flow path from contour data, the impervious flow length is half a typical road width.
Manning's n		The pervious Manning's n value is 0.25 to be representative of sheet flow through grassland or pasture. Impervious Manning's n value is 0.013 to be representative of an asphalt surfacing.

BARRHAVEN SOUTH EXPANSION AREA
EXISTING CONDITIONS - HYDROLOGIC MODEL RESULTS AT CULVERT LOCATIONS
September 2017

Table 2: SWMHYMO Summary Results - Culvert Flows

Return Period	6 hr SCS Type II											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.218	0.103	0.027	0.036	0.121	0.009	0.032	0.046	0.13	0.001	0.009	0.047
1:5	0.574	0.288	0.069	0.087	0.322	0.03	0.045	0.062	0.344	0.006	0.037	0.072
1:10	0.905	0.462	0.108	0.136	0.51	0.051	0.078	0.102	0.542	0.013	0.065	0.125
1:25	1.389	0.717	0.164	0.206	0.782	0.084	0.127	0.162	0.83	0.024	0.110	0.205
1:50	1.825	0.947	0.214	0.269	1.027	0.114	0.174	0.218	1.088	0.036	0.151	0.281
1:100	2.307	1.203	0.269	0.338	1.299	0.147	0.226	0.279	1.374	0.05	0.198	0.365
Return Period	**12 hr SCS Type II**											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.287	0.139	0.036	0.045	0.158	0.012	0.039	0.055	0.169	0.001	0.014	0.057
1:5	0.689	0.349	0.086	0.106	0.385	0.038	0.051	0.065	0.411	0.008	0.046	0.080
1:10	1.044	0.536	0.129	0.159	0.585	0.062	0.084	0.105	0.623	0.016	0.078	0.133
1:25	1.574	0.817	0.191	0.236	0.884	0.099	0.134	0.163	0.939	0.03	0.128	0.217
1:50	1.996	1.04	0.24	0.298	1.122	0.129	0.176	0.212	1.189	0.042	0.17	0.285
1:100	2.456	1.284	0.293	0.365	1.381	0.162	0.223	0.267	1.463	0.057	0.216	0.363
Return Period	**24 hr SCS Type II**											
	Flow at Culvert Locations (m^3/s)											
	CR-C1	CVR-C1	CVR-C2	CVR-C3	CVR-C4	BDR-C1	BDR-C2	BDR-C3	BDR-C4	BDR-C5	BDR-C6	BDR-C7
1:2	0.309	0.154	0.04	0.049	0.176	0.014	0.019	0.026	0.189	0.002	0.016	0.03
1:5	0.678	0.352	0.084	0.106	0.391	0.038	0.05	0.059	0.416	0.009	0.047	0.076
1:10	0.993	0.52	0.12	0.154	0.574	0.06	0.077	0.09	0.61	0.016	0.076	0.12
1:25	1.453	0.767	0.171	0.223	0.842	0.091	0.118	0.137	0.892	0.029	0.12	0.188
1:50	1.869	0.989	0.216	0.285	1.083	0.12	0.156	0.181	1.147	0.041	0.161	0.253
1:100	2.323	1.232	0.266	0.352	1.346	0.152	0.198	0.229	1.425	0.055	0.207	0.326

Table 3: SWMHYMO Summary Results - Potential Culvert at Cambrian Road CR-C2

Return Period	Design Storm		
	6 hr SCS Type II	12 hr SCS Type II	24 hr SCS Type II
	Flow at Culvert Location (m^3/s)	Flow at Culvert Location (m^3/s)	Flow at Culvert Location (m^3/s)
	CR-C2	CR-C2	CR-C2
1:2	0.115	0.157	0.176
1:5	0.34	0.415	0.419
1:10	0.557	0.651	0.632
1:25	0.882	1.01	0.947
1:50	1.179	1.3	1.236
1:100	1.511	1.619	1.552

Table 4: Estimated Culvert Level of Service

Culvert ID	Location	Design Storm																		Estimated Culvert Capacity		Culvert Level of Service (Year)	
		6 hr SCS Type II						12 hr SCS Type II						24 hr SCS Type II						Flow for the Head at Edge of Pavement Elevation	Flow for the Head at Edge of Gravel Elevation	At Edge of Pavement Elevation	At Edge of Gravel Elevation
		Flow at Culvert Locations (m^3/s)						Flow at Culvert Locations (m^3/s)						Flow at Culvert Locations (m^3/s)									
		Return Period						Return Period						Return Period						Q_{EP} (m^3/s)	Q_{EG} (m^3/s)		
		1:2	1:5	1:10	1:25	1:50	1:100	1:2	1:5	1:10	1:25	1:50	1:100	1:2	1:5	1:10	1:25	1:50	1:100				
CR-C1	Cambrian Road	0.218	0.574	0.905	1.389	1.825	2.307	0.287	0.689	1.044	1.574	1.996	2.456	0.309	0.678	0.993	1.453	1.869	2.323	5.490	N/A	1:100	N/A
CR-C2	Cambrian Road	0.115	0.34	0.557	0.882	1.179	1.511	0.157	0.415	0.651	1.010	1.300	1.619	0.176	0.419	0.632	0.947	1.236	1.552	N/A	N/A	N/A	N/A
CVR-C1	Cedarview Road	0.103	0.288	0.462	0.717	0.947	1.203	0.139	0.349	0.536	0.817	1.040	1.284	0.154	0.352	0.52	0.767	0.989	1.232	0.500	0.4	1:5	1:5
CVR-C2	Cedarview Road	0.027	0.069	0.108	0.164	0.214	0.269	0.036	0.086	0.129	0.191	0.240	0.293	0.04	0.084	0.12	0.171	0.216	0.266	N/A	0.2	N/A	1:25
CVR-C3	Cedarview Road	0.036	0.087	0.136	0.206	0.269	0.338	0.045	0.106	0.159	0.236	0.298	0.365	0.049	0.106	0.154	0.223	0.285	0.352	N/A	0.3	N/A	1:50
CVR-C4	Cedarview Road	0.121	0.322	0.51	0.782	1.027	1.299	0.158	0.385	0.585	0.884	1.122	1.381	0.176	0.391	0.574	0.842	1.083	1.346	2.900	2.6	1:100	1:100
BDR-C1	Barnsdale Road	0.009	0.03	0.051	0.084	0.114	0.147	0.012	0.038	0.062	0.099	0.129	0.162	0.014	0.038	0.06	0.091	0.12	0.152	0.240	0.2	1:100	1:100
BDR-C2	Barnsdale Road	0.032	0.045	0.078	0.127	0.174	0.226	0.039	0.051	0.084	0.134	0.176	0.223	0.019	0.05	0.077	0.118	0.156	0.198	N/A	0.2	N/A	1:50
BDR-C3	Barnsdale Road	0.046	0.062	0.102	0.162	0.218	0.279	0.055	0.065	0.105	0.163	0.212	0.267	0.026	0.059	0.09	0.137	0.181	0.229	N/A	0.5	N/A	1:100
BDR-C4	Barnsdale Road	0.13	0.344	0.542	0.83	1.088	1.374	0.169	0.411	0.623	0.939	1.189	1.463	0.189	0.416	0.61	0.892	1.147	1.425	2.800	2.6	1:100	1:100
BDR-C5	Barnsdale Road	0.001	0.006	0.013	0.024	0.036	0.05	0.001	0.008	0.016	0.030	0.042	0.057	0.002	0.009	0.016	0.029	0.041	0.055	0.330	0.3	1:100	1:100
BDR-C6	Barnsdale Road	0.009	0.037	0.065	0.110	0.151	0.198	0.014	0.046	0.078	0.128	0.170	0.216	0.016	0.047	0.076	0.120	0.161	0.207	0.240	0.2	1:100	1:50
BDR-C7	Barnsdale Road	0.047	0.072	0.125	0.205	0.281	0.365	0.057	0.080	0.133	0.217	0.285	0.363	0.03	0.076	0.12	0.188	0.253	0.326	0.350	0.3	1:50	1:50
Total to Thomas Baxter Municipal Drain		0.159	0.403	0.629	0.952	1.24	1.556	0.207	0.475	0.716	1.069	1.347	1.647	0.215	0.473	0.69	1.004	1.286	1.592				

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
*#  Date        : February 2, 2016
*#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
*#  Company     : J. L. Richards & Associates Limited
*#  License #   :  4418403
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    ["2ySCS6.stm"]
*
READ STORM          STORM_FILENAME=["STORM.001"]
*%------------------|-----------------------------------------------------|
*
*#########################################################################
*#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS               #
*#########################################################################
*
*************************************************************
*NORTH PORTION OF THE SITE - Culvert at Cambrian Rd - CR-C1  *
*************************************************************
*
*******************************
*SUB-CATCHMENT A6             *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A6"], DT=[1]min, AREA=[11.73](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[16](mm),
                    N=[3], TP=[0.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[3], MajNHYD=["MAJA6"],
*                    MINID=[2], MinNHYD=["INFA6"],
*                    TMJSTO=[32146](cu-m)
*%------------------|-----------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA6"]
*                    HYD_COMMENT=["Infiltration at A6 area"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A4             *
*******************************
*
CALIB NASHYD        ID=[4], NHYD=["A4"], DT=[1]min, AREA=[13.95](ha),
                    DWF=[0](cms),  CN/C=[37], IA=[27](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[4], MajNHYD=["MAJA4"],
*                    MINID=[2], MinNHYD=["INFA4"],
*                    TMJSTO=[27238](cu-m)
*%------------------|-----------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA4"]
*                    HYD_COMMENT=["Infiltration at A4 area"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A3             *
*******************************
*
CALIB NASHYD        ID=[5], NHYD=["A3"], DT=[1]min, AREA=[12.71](ha),
                    DWF=[0](cms),  CN/C=[67], IA=[9](mm),
                    N=[3], TP=[0.43]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[5], MajNHYD=["MAJA3"],
*                    MINID=[2], MinNHYD=["INFA3"],
*                    TMJSTO=[21119](cu-m)
*%------------------|-----------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA3"]
*                    HYD_COMMENT=["Infiltration at A3 area"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A2             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A2"], DT=[1]min, AREA=[35.36](ha),
                    DWF=[0](cms),  CN/C=[49], IA=[18](mm),
                    N=[3], TP=[0.59]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A7             *
*******************************
*
CALIB NASHYD        ID=[2], NHYD=["A7"], DT=[1]min, AREA=[15.53](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[17](mm),
                    N=[3], TP=[0.72]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT CAMBRIAN ROAD 1600mm CSP Culvert - CR-C1
*************************************************************************
*
ADD HYD             IDsum=[7], NHYD=["CR-C1"], IDs to add=[1+2+3+4+5]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[7],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CR-C1"]
                    HYD_COMMENT=["Flow at Cambrian Road Culvert-1600mm CSP"]
*%------------------|-----------------------------------------------------|
*
*************************************************************
*CENTRAL AREA OF THE SITE - Culvert at Cambrian Rd - CR-C2  *
*************************************************************
*
*******************************
*SUB-CATCHMENT A8             *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A8"], DT=[1]min, AREA=[42.25](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[16](mm),
                    N=[3], TP=[0.74]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*COMPUTE DUALHYD     IDin=[1], CINLET=[0.00000001388889](cms), NINLET=[1],
*                    MAJID=[3], MajNHYD=["MAJA8"],
*                    MINID=[2], MinNHYD=["INFA8"],
*                    TMJSTO=[551827](cu-m)
*%------------------|-----------------------------------------------------|
*
*SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
*                    HYD_FILENAME=["INFA8"]
*                    HYD_COMMENT=["Infiltration at A8 area"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A5             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A5"], DT=[1]min, AREA=[12.65](ha),
                    DWF=[0](cms),  CN/C=[50], IA=[18](mm),
                    N=[3], TP=[0.39]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 500mm CSP Culvert - CVR-C1
*************************************************************************
*
ADD HYD             IDsum=[4], NHYD=["CVR-C1"], IDs to add=[1+3]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C1"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-500mm CSP"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A1             *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A1"], DT=[1]min, AREA=[18.64](ha),
                    DWF=[0](cms),  CN/C=[42], IA=[23](mm),
                    N=[3], TP=[0.41]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT CAMBRIAN ROAD CULVERT - CR-C2
*************************************************************************
*
ADD HYD             IDsum=[5], NHYD=["CR-C2"], IDs to add=[1+4]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CR-C2"]
                    HYD_COMMENT=["Flow at Cambrain Road Culvert - CR-C2"]
*%------------------|-----------------------------------------------------|
*
*************************************************************
*SOUTH AREA OF THE SITE                                     *
*************************************************************
*
*******************************
*SUB-CATCHMENT A10            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A10"], DT=[1]min, AREA=[5.53](ha),
                    DWF=[0](cms),  CN/C=[55], IA=[14](mm),
                    N=[3], TP=[0.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C2"]
                    HYD_COMMENT=["Flow at Cedarview Road 450mm CSP Culvert"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A11            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A11"], DT=[1]min, AREA=[15.20](ha),
                    DWF=[0](cms),  CN/C=[55], IA=[14](mm),
                    N=[3], TP=[1.27]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 400mm CSP Culvert - CVR-C3
*************************************************************************
*
READ HYD            ID=[2],  NHYD=["CVR-C2"],
                    HYD_FILENAME=["CVR-C2"]
*%------------------|-----------------------------------------------------|
*
ADD HYD             IDsum=[3], NHYD=["CVR-C3"], IDs to add=[1+2]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C3"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-400mm CSP"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A12            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A12"], DT=[1]min, AREA=[60.00](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[17](mm),
                    N=[3], TP=[0.95]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT CEDARVIEW ROAD 1200mm CSP Culvert - CVR-C4
*************************************************************************
*
ADD HYD             IDsum=[8], NHYD=["CVR-C4"], IDs to add=[1+3]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[8],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["CVR-C4"]
                    HYD_COMMENT=["Flow at Cedarview Road Culvert-1200mm CSP"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A15            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A15"], DT=[1]min, AREA=[3.47](ha),
                    DWF=[0](cms),  CN/C=[61], IA=[11](mm),
                    N=[3], TP=[0.39]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 1200mm CSP Culvert - BDR-C4
*************************************************************************
*
ADD HYD             IDsum=[9], NHYD=["BDR-C4"], IDs to add=[1+8]
*%------------------|-----------------------------------------------------|
*
SAVE HYD            ID=[9],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C4"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-1200mm CSP"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A20            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A20"], DT=[1]min, AREA=[4.78](ha),
                    DWF=[0](cms),  CN/C=[49], IA=[19](mm),
                    N=[3], TP=[0.32]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-----------------------------------------------------|
*
*************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C1
*************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C1"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-----------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A19            *
*******************************
*
```

```
CALIB STANDHYD      ID=[1], NHYD=["A19"], DT=[1](min), AREA=[1.01](ha),
                    XIMP=[0.001], TIMP=[0.385], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[0.55](%),
                                         LGP=[450](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C2
*******************************************************************************
*
READ HYD            ID=[2],  NHYD=["BDR-C1"],
                    HYD_FILENAME=["BDR-C1"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[10], NHYD=["BDR-C2"], IDs to add=[1+2]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[10],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C2"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A18            *
*******************************
*
CALIB STANDHYD      ID=[1], NHYD=["A18"], DT=[1](min), AREA=[0.50](ha),
                    XIMP=[0.001], TIMP=[0.455], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[0.30](%),
                                         LGP=[330](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert - BDR-C3
*******************************************************************************
*
ADD HYD             IDsum=[2], NHYD=["BDR-C3"], IDs to add=[1+10]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C3"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-500mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW DOWNSTREAM OF BARNSDALE ROAD 1200mm CSP Culvert - BDR-C4
*******************************************************************************
*
READ HYD            ID=[9],  NHYD=["BDR-C4"],
                    HYD_FILENAME=["BDR-C4"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[1], NHYD=["FTBD"], IDs to add=[2+9]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["FTBD"]
                    HYD_COMMENT=["Flow to Thomas Bakster Drain"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A16            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A16"], DT=[1]min, AREA=[2.87](ha),
                    DWF=[0](cms),  CN/C=[37], IA=[27](mm),
                    N=[3], TP=[0.24]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert - BDR-C5
*******************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C5"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-500mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A17            *
*******************************
*
CALIB NASHYD        ID=[1], NHYD=["A17"], DT=[1]min, AREA=[9.75](ha),
                    DWF=[0](cms),  CN/C=[44], IA=[21](mm),
                    N=[3], TP=[0.42]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 400mm CSP Culvert - BDR-C6
*******************************************************************************
*
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C6"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A21            *
*******************************
*
CALIB STANDHYD      ID=[1], NHYD=["A21"], DT=[1](min), AREA=[1.50](ha),
                    XIMP=[0.001], TIMP=[0.427], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                            DCAY=[4.14](/hr), F=[0](mm),
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[1.2](%),
                                         LGP=[750](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.0](%),
                                         LGI=[4.5](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*TOTAL FLOW AT BARNSDALE ROAD 500mm CSP Culvert located west of GBR (BDR-C7)
*******************************************************************************
*
READ HYD            ID=[2],  NHYD=["BDR-C5"],
                    HYD_FILENAME=["BDR-C5"]
*%------------------|-------------------------------------------------------------|
*
READ HYD            ID=[3],  NHYD=["BDR-C6"],
                    HYD_FILENAME=["BDR-C6"]
*%------------------|-------------------------------------------------------------|
*
ADD HYD             IDsum=[4], NHYD=["BDR-C7"], IDs to add=[1+2+3]
*%------------------|-------------------------------------------------------------|
*
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[-1]
                    HYD_FILENAME=["BDR-C7"]
                    HYD_COMMENT=["Flow at Barnsdale Road Culvert-400mm CSP"]
*%------------------|-------------------------------------------------------------|
*
*******************************************************************************
*                SELF CONTAINED AREAS (A9, A13 and A14)
*******************************************************************************
*
*******************************
*SUB-CATCHMENT A9             *
*******************************
*
CALIB NASHYD        ID=[2], NHYD=["A9"], DT=[1]min, AREA=[5.08](ha),
                    DWF=[0](cms),  CN/C=[50], IA=[18](mm),
                    N=[3], TP=[0.25]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A13            *
*******************************
*
CALIB NASHYD        ID=[3], NHYD=["A13"], DT=[1]min, AREA=[24.60](ha),
                    DWF=[0](cms),  CN/C=[52], IA=[16](mm),
                    N=[3], TP=[0.46]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*******************************
*SUB-CATCHMENT A14            *
*******************************
*
CALIB NASHYD        ID=[4], NHYD=["A14"], DT=[1]min, AREA=[22.41](ha),
                    DWF=[0](cms),  CN/C=[40], IA=[25](mm),
                    N=[3], TP=[1.5]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*
*6 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    ["5ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    ["10ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    ["25ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    ["50ySCS6.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    ["100SCS6.stm"]
*
*12 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[202]
                    ["2ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[205]
                    ["5ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[210]
                    ["10ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[225]
                    ["25ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[250]
                    ["50ySCS12.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[300]
                    ["100SCS12.stm"]
*
*24 HR SCS Type II STORM
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[302]
                    ["2ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[305]
                    ["5ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[310]
                    ["10ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[325]
                    ["25ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[350]
                    ["50ySCS24.stm"]
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[400]
                    ["100SCS24.stm"]
*
*%------------------|-------------------------------------------------------------|
FINISH
```

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO         999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O       9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##   9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O        9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
                                                         9   9  9   9   # 4418403
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
 *********                  Ottawa, Ontario: (613) 836-3884             *********
 *********                  Gatineau, Quebec: (819) 243-6858            *********
 *********                  E-Mail: swmhymo@jfsa.com                    *********
 ********************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: J. L. Richards & Associates Limited          +++++++++
 +++++++++                SERIAL#:4418403                             +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :    10             *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).    *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.             *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).       *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).       *****
 *****    *:   see WARNING or NOTE message printed at end of run.         *****
 *****   **:   see  ERROR  message printed at end of run.                 *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 ********************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2017-09-05     TIME: 14:00:30     RUN COUNTER: 000120          *
 ********************************************************************************
 * Input   filename: C:\RUNS\PRE-DE~1\26610EXB.dat                              *
 * Output  filename: C:\RUNS\PRE-DE~1\26610EXB.out                              *
 * Summary filename: C:\RUNS\PRE-DE~1\26610EXB.sum                              *
 * User comments:                                                               *
 * 1:_____________________________________________________________________      *
 * 2:_____________________________________________________________________      *
 * 3:_____________________________________________________________________      *
 ********************************************************************************


#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
  ** END OF RUN :   1

********************************************************************************




 RUN:COMMAND#
 002:0001----------------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   2 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*******************************************************************************
 002:0002----------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=   6.00:PTOT=  37.20]
################################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
################################################################################
 002:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .041 No_date    3:25    1.82
.049
       [CN= 53.0: N= 3.00]
       [Tp=  .27:DT= 1.00]
 002:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .003 No_date    4:33     .24
.006
       [CN= 37.0: N= 3.00]
       [Tp=  .33:DT= 1.00]
 002:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .118 No_date    3:32    5.19
.139
       [CN= 67.0: N= 3.00]
       [Tp=  .43:DT= 1.00]
 002:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .054 No_date    3:58    1.30
.035
       [CN= 49.0: N= 3.00]
       [Tp=  .59:DT= 1.00]
 002:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .026 No_date    4:08    1.54
.042
       [CN= 51.0: N= 3.00]
       [Tp=  .72:DT= 1.00]
 002:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .054 No_date    3:58    1.30
n/a
                     +  02:A7            15.53     .026 No_date    4:08    1.54
n/a
                     +  03:A6            11.73     .041 No_date    3:25    1.82
n/a
                     +  04:A4            13.95     .003 No_date    4:33     .24
n/a
                     +  05:A3            12.71     .118 No_date    3:32    5.19
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28     .218 No_date    3:37    1.80
n/a
 002:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28     .218 No_date    3:37    1.80
n/a
       fname :C:\RUNS\PRE-DE~1\CR-C1.002
       remark:Flow at Cambrian Road Culvert-1600mm CSP
 002:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .083 No_date    4:08    1.82
.049
       [CN= 53.0: N= 3.00]
       [Tp=  .74:DT= 1.00]
 002:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .025 No_date    3:39    1.35
.036
       [CN= 50.0: N= 3.00]
       [Tp=  .39:DT= 1.00]
 002:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .025 No_date    3:39    1.35
n/a
                     +  03:A8            42.25     .083 No_date    4:08    1.82
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
 002:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C1.002
       remark:Flow at Cedarview Road Culvert-500mm CSP
 002:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .012 No_date    3:55     .55
.015
       [CN= 42.0: N= 3.00]
       [Tp=  .41:DT= 1.00]
 002:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .012 No_date    3:55     .55
n/a
                     +  04:CVR-C1        54.90     .103 No_date    4:00    1.71
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .115 No_date    4:00    1.42
n/a
 002:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54     .115 No_date    4:00    1.42
n/a
       fname :C:\RUNS\PRE-DE~1\CR-C2.002
       remark:Flow at Cambrain Road Culvert - CR-C2
 002:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .027 No_date    3:23    2.33
.063
       [CN= 55.0: N= 3.00]
       [Tp=  .27:DT= 1.00]
 002:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .027 No_date    3:23    2.33
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C2.002
       remark:Flow at Cedarview Road 450mm CSP Culvert
 002:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .029 No_date    4:53    2.33
.063
       [CN= 55.0: N= 3.00]
       [Tp= 1.27:DT= 1.00]
 002:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .027 No_date    3:23    2.33
n/a
       Filename = C:\RUNS\PRE-DE~1\CVR-C2.002
       Comment  = Flow at Cedarview Road 450mm CSP Culvert
 002:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .029 No_date    4:53    2.33
n/a
                     +  02:CVR-C2         5.53     .027 No_date    3:23    2.33
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
 002:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C3.002
       remark:Flow at Cedarview Road Culvert-400mm CSP
 002:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .085 No_date    4:32    1.54
.042
       [CN= 51.0: N= 3.00]
       [Tp=  .95:DT= 1.00]
 002:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .085 No_date    4:32    1.54
n/a
                     +  03:CVR-C3        20.73     .036 No_date    4:37    2.33
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
 002:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
       fname :C:\RUNS\PRE-DE~1\CVR-C4.002
       remark:Flow at Cedarview Road Culvert-1200mm CSP
 002:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .023 No_date    3:30    3.64
.098
       [CN= 61.0: N= 3.00]
       [Tp=  .39:DT= 1.00]
 002:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .023 No_date    3:30    3.64
n/a
                     +  08:CVR-C4        80.73     .121 No_date    4:33    1.75
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
 002:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
       fname :C:\RUNS\PRE-DE~1\BDR-C4.002
       remark:Flow at Barnsdale Road Culvert-1200mm CSP
 002:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .009 No_date    3:34    1.17
.032
       [CN= 49.0: N= 3.00]
       [Tp=  .32:DT= 1.00]
 002:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .009 No_date    3:34    1.17
n/a
       fname :C:\RUNS\PRE-DE~1\BDR-C1.002
       remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .024 No_date    3:45   12.18
.327
       [XIMP=.00:TIMP=.38]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
```

```
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C1         4.78     .009 No_date    3:34    1.17
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.002
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 002:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A19            1.01     .024 No_date    3:45   12.18
n/a
                        +  02:BDR-C1         4.78     .009 No_date    3:34    1.17
n/a
      [DT= 1.00]  SUM=  10:BDR-C2          5.79     .032 No_date    3:43    3.09
n/a
 002:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            10:BDR-C2         5.79     .032 No_date    3:43    3.09
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A18             .50     .014 No_date    3:41   13.27
.357
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A18             .50     .014 No_date    3:41   13.27
n/a
                        +  10:BDR-C2         5.79     .032 No_date    3:43    3.09
n/a
      [DT= 1.00]  SUM=  02:BDR-C3          6.29     .046 No_date    3:42    3.90
n/a
 002:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            02:BDR-C3         6.29     .046 No_date    3:42    3.90
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.002
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 002:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.002
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 002:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             02:BDR-C3         6.29     .046 No_date    3:42    3.90
n/a
                        +  09:BDR-C4        84.20     .130 No_date    4:27    1.82
n/a
      [DT= 1.00]  SUM=  01:FTBD           90.49     .159 No_date    3:56    1.97
n/a
 002:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:FTBD          90.49     .159 No_date    3:56    1.97
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.002
      remark:Flow to Thomas Bakster Drain
 002:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A16            2.87     .001 No_date    4:20     .23
.006
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 002:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A16            2.87     .001 No_date    4:20     .23
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.002
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 002:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A17            9.75     .009 No_date    3:49     .77
.021
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 002:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A17            9.75     .009 No_date    3:49     .77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A21            1.50     .037 No_date    3:47   12.84
.345
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 002:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C5         2.87     .001 No_date    4:20     .23
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.002
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 002:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            03:BDR-C6         9.75     .009 No_date    3:49     .77
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.002
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 002:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A21            1.50     .037 No_date    3:47   12.84
n/a
                        +  02:BDR-C5         2.87     .001 No_date    4:20     .23
n/a
                        +  03:BDR-C6         9.75     .009 No_date    3:49     .77
n/a
      [DT= 1.00]  SUM=  04:BDR-C7         14.12     .047 No_date    3:47    1.95
n/a
 002:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:BDR-C7        14.12     .047 No_date    3:47    1.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.002
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 002:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A9             5.08     .012 No_date    3:25    1.35
.036
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 002:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A13           24.60     .062 No_date    3:42    1.76
.047
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 002:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A14           22.41     .006 No_date    6:17     .38
.010
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :   4

*******************************************************************************
```

```
 RUN:COMMAND#
 005:0001---------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   5 ]
#*****************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*****************************************************************************
 005:0002---------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=   6.00:PTOT=  50.40]
###############################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
###############################################################################
 005:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A6            11.73     .119 No_date    3:21    4.56
.090
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 005:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A4            13.95     .024 No_date    3:37    1.20
.024
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 005:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        05:A3            12.71     .247 No_date    3:29   10.29
.204
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 005:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A2            35.36     .166 No_date    3:49    3.54
.070
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 005:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A7            15.53     .074 No_date    3:59    4.02
.080
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 005:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A2            35.36     .166 No_date    3:49    3.54
n/a
                        +  02:A7            15.53     .074 No_date    3:59    4.02
n/a
                        +  03:A6            11.73     .119 No_date    3:21    4.56
n/a
                        +  04:A4            13.95     .024 No_date    3:37    1.20
n/a
                        +  05:A3            12.71     .247 No_date    3:29   10.29
n/a
      [DT= 1.00]  SUM=  07:CR-C1           89.28     .574 No_date    3:34    4.35
n/a
 005:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            07:CR-C1         89.28     .574 No_date    3:34    4.35
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.005
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 005:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A8            42.25     .227 No_date    4:00    4.56
.090
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 005:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A5            12.65     .079 No_date    3:32    3.67
.073
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 005:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A5            12.65     .079 No_date    3:32    3.67
n/a
                        +  03:A8            42.25     .227 No_date    4:00    4.56
n/a
      [DT= 1.00]  SUM=  04:CVR-C1          54.90     .288 No_date    3:51    4.35
n/a
 005:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:CVR-C1        54.90     .288 No_date    3:51    4.35
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.005
      remark:Flow at Cedarview Road Culvert-500mm CSP
 005:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A1            18.64     .055 No_date    3:39    1.99
.039
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 005:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A1            18.64     .055 No_date    3:39    1.99
n/a
                        +  04:CVR-C1        54.90     .288 No_date    3:51    4.35
n/a
      [DT= 1.00]  SUM=  05:CR-C2           73.54     .340 No_date    3:49    3.75
n/a
 005:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            05:CR-C2         73.54     .340 No_date    3:49    3.75
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.005
      remark:Flow at Cambrain Road Culvert - CR-C2
 005:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A10            5.53     .069 No_date    3:20    5.43
.108
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 005:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A10            5.53     .069 No_date    3:20    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.005
      remark:Flow at Cedarview Road 450mm CSP Culvert
 005:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A11           15.20     .069 No_date    4:43    5.43
.108
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 005:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:CVR-C2         5.53     .069 No_date    3:20    5.43
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.005
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 005:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A11           15.20     .069 No_date    4:43    5.43
n/a
```

```
                    +  02:CVR-C2         5.53     .069 No_date    3:20    5.43
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
 005:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.005
      remark:Flow at Cedarview Road Culvert-400mm CSP
 005:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .238 No_date    4:20    4.02
.080
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 005:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .238 No_date    4:20    4.02
n/a
                    +  03:CVR-C3        20.73     .087 No_date    3:27    5.43
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
 005:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.005
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 005:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15           3.47     .052 No_date    3:27    7.69
.153
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 005:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15           3.47     .052 No_date    3:27    7.69
n/a
                    +  08:CVR-C4        80.73     .322 No_date    4:21    4.38
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
 005:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.005
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 005:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20           4.78     .030 No_date    3:27    3.33
.066
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 005:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20           4.78     .030 No_date    3:27    3.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19           1.01     .029 No_date    4:09   21.01
.417
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1        4.78     .030 No_date    3:27    3.33
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.005
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 005:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19           1.01     .029 No_date    4:09   21.01
n/a
                    +  02:BDR-C1        4.78     .030 No_date    3:27    3.33
n/a
      [DT= 1.00]  SUM=  10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
 005:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18            .50     .018 No_date    3:59   22.70
.450
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18            .50     .018 No_date    3:59   22.70
n/a
                    +  10:BDR-C2        5.79     .045 No_date    3:37    6.42
n/a
      [DT= 1.00]  SUM=  02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
 005:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.005
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 005:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.005
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 005:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3        6.29     .062 No_date    4:00    7.71
n/a
                    +  09:BDR-C4        84.20     .344 No_date    4:15    4.52
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .403 No_date    4:08    4.74
n/a
 005:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .403 No_date    4:08    4.74
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.005
      remark:Flow to Thomas Bakster Drain
 005:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16           2.87     .006 No_date    3:28    1.20
.024
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 005:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16           2.87     .006 No_date    3:28    1.20
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.005
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 005:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17           9.75     .037 No_date    3:38    2.45
.049
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 005:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17           9.75     .037 No_date    3:38    2.45
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21           1.50     .043 No_date    4:13   21.89
.434
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 005:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5        2.87     .006 No_date    3:28    1.20
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.005
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 005:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6        9.75     .037 No_date    3:38    2.45
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.005
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 005:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21           1.50     .043 No_date    4:13   21.89
n/a
                    +  02:BDR-C5        2.87     .006 No_date    3:28    1.20
n/a
                    +  03:BDR-C6        9.75     .037 No_date    3:38    2.45
n/a
      [DT= 1.00]  SUM=  04:BDR-C7       14.12     .072 No_date    4:06    4.26
n/a
 005:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7       14.12     .072 No_date    4:06    4.26
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.005
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 005:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9            5.08     .041 No_date    3:20    3.67
.073
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 005:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13          24.60     .174 No_date    3:37    4.40
.087
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 005:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14          22.41     .025 No_date    5:32    1.59
.031
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :   9

************************************************************************



 RUN:COMMAND#
 010:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  10 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*********************************************************************
 010:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  59.40]
#############################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                   #
#############################################################################
 010:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .192 No_date    3:20    7.01
.118
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 010:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .052 No_date    3:32    2.26
.038
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 010:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .355 No_date    3:29   14.47
.244
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 010:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .274 No_date    3:47    5.61
.094
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 010:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .119 No_date    3:56    6.28
.106
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 010:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .274 No_date    3:47    5.61
n/a
                    +  02:A7            15.53     .119 No_date    3:56    6.28
n/a
                    +  03:A6            11.73     .192 No_date    3:20    7.01
n/a
                    +  04:A4            13.95     .052 No_date    3:32    2.26
n/a
                    +  05:A3            12.71     .355 No_date    3:29   14.47
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28     .905 No_date    3:33    6.65
n/a
 010:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .905 No_date    3:33    6.65
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.010
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 010:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .360 No_date    3:57    7.01
.118
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
```

```
 010:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .133 No_date    3:30    5.80
.098
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 010:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .133 No_date    3:30    5.80
n/a
                    +  03:A8            42.25     .360 No_date    3:57    7.01
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
 010:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.010
      remark:Flow at Cedarview Road Culvert-500mm CSP
 010:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .103 No_date    3:35    3.42
.058
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 010:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .103 No_date    3:35    3.42
n/a
                    +  04:CVR-C1        54.90     .462 No_date    3:49    6.73
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .557 No_date    3:45    5.89
n/a
 010:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .557 No_date    3:45    5.89
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.010
      remark:Flow at Cambrain Road Culvert - CR-C2
 010:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .108 No_date    3:19    8.14
.137
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 010:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .108 No_date    3:19    8.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.010
      remark:Flow at Cedarview Road 450mm CSP Culvert
 010:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .105 No_date    4:40    8.14
.137
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 010:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .108 No_date    3:19    8.14
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.010
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 010:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .105 No_date    4:40    8.14
n/a
                    +  02:CVR-C2         5.53     .108 No_date    3:19    8.14
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
 010:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.010
      remark:Flow at Cedarview Road Culvert-400mm CSP
 010:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .382 No_date    4:16    6.28
.106
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 010:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .382 No_date    4:16    6.28
n/a
                    +  03:CVR-C3        20.73     .136 No_date    3:25    8.14
n/a
     [DT= 1.00]  SUM=  08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
 010:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.010
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 010:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .077 No_date    3:27   11.11
.187
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 010:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .077 No_date    3:27   11.11
n/a
                    +  08:CVR-C4        80.73     .510 No_date    4:17    6.75
n/a
     [DT= 1.00]  SUM=  09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
 010:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.010
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 010:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .051 No_date    3:25    5.36
.090
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 010:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .051 No_date    3:25    5.36
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .044 No_date    3:57   27.41
.461
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .051 No_date    3:25    5.36
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.010
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 010:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .044 No_date    3:57   27.41
n/a
                    +  02:BDR-C1         4.78     .051 No_date    3:25    5.36
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
 010:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .025 No_date    3:50   28.91
.487
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .025 No_date    3:50   28.91
n/a
                    +  10:BDR-C2         5.79     .078 No_date    3:36    9.20
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
 010:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.010
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 010:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.010
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 010:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .102 No_date    3:48   10.77
n/a
                    +  09:BDR-C4        84.20     .542 No_date    4:11    6.93
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .629 No_date    4:01    7.20
n/a
 010:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .629 No_date    4:01    7.20
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.010
      remark:Flow to Thomas Bakster Drain
 010:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .013 No_date    3:23    2.26
.038
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 010:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .013 No_date    3:23    2.26
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.010
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 010:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .065 No_date    3:35    4.08
.069
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 010:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .065 No_date    3:35    4.08
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .065 No_date    4:00   28.32
.477
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 010:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .013 No_date    3:23    2.26
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.010
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 010:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .065 No_date    3:35    4.08
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.010
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 010:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .065 No_date    4:00   28.32
n/a
                    +  02:BDR-C5         2.87     .013 No_date    3:23    2.26
n/a
                    +  03:BDR-C6         9.75     .065 No_date    3:35    4.08
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .125 No_date    3:52    6.28
n/a
 010:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .125 No_date    3:52    6.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.010
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 010:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .069 No_date    3:19    5.80
.098
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 010:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .280 No_date    3:35    6.78
.114
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 010:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .046 No_date    5:19    2.85
.048
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  24

********************************************************************************



 RUN:COMMAND#
 025:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  25 ]
#*******************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
```

```
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*****************************************************************************
 025:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  70.20]
###############################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                   #
###############################################################################
 025:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .299 No_date    3:19   10.51
.150
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 025:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .100 No_date    3:28    3.92
.056
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 025:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .501 No_date    3:28   20.10
.286
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 025:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .436 No_date    3:45    8.61
.123
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 025:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .187 No_date    3:54    9.52
.136
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 025:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .436 No_date    3:45    8.61
n/a
                    +  02:A7            15.53     .187 No_date    3:54    9.52
n/a
                    +  03:A6            11.73     .299 No_date    3:19   10.51
n/a
                    +  04:A4            13.95     .100 No_date    3:28    3.92
n/a
                    +  05:A3            12.71     .501 No_date    3:28   20.10
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28    1.389 No_date    3:32    9.92
n/a
 025:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    1.389 No_date    3:32    9.92
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.025
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 025:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .555 No_date    3:55   10.51
.150
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 025:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .213 No_date    3:29    8.90
.127
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 025:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .213 No_date    3:29    8.90
n/a
                    +  03:A8            42.25     .555 No_date    3:55   10.51
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
 025:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.025
      remark:Flow at Cedarview Road Culvert-500mm CSP
 025:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .178 No_date    3:33    5.60
.080
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 025:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .178 No_date    3:33    5.60
n/a
                    +  04:CVR-C1        54.90     .717 No_date    3:46   10.14
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .882 No_date    3:43    8.99
n/a
 025:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .882 No_date    3:43    8.99
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.025
      remark:Flow at Cambrain Road Culvert - CR-C2
 025:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .164 No_date    3:18   11.96
.170
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 025:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .164 No_date    3:18   11.96
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.025
      remark:Flow at Cedarview Road 450mm CSP Culvert
 025:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .157 No_date    4:37   11.96
.170
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 025:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .164 No_date    3:18   11.96
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.025
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 025:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .157 No_date    4:37   11.96
n/a
                    +  02:CVR-C2         5.53     .164 No_date    3:18   11.96
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
 025:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.025
      remark:Flow at Cedarview Road Culvert-400mm CSP
 025:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .593 No_date    4:13    9.52
.136
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 025:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .593 No_date    4:13    9.52
n/a
                    +  03:CVR-C3        20.73     .206 No_date    3:24   11.96
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
 025:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.025
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 025:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .112 No_date    3:26   15.82
.225
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 025:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .112 No_date    3:26   15.82
n/a
                    +  08:CVR-C4        80.73     .782 No_date    4:14   10.15
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
 025:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.025
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 025:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .084 No_date    3:23    8.31
.118
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 025:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .084 No_date    3:23    8.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .064 No_date    3:48   34.86
.497
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .084 No_date    3:23    8.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.025
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 025:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .064 No_date    3:48   34.86
n/a
                    +  02:BDR-C1         4.78     .084 No_date    3:23    8.31
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
 025:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .036 No_date    3:42   37.07
.528
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .036 No_date    3:42   37.07
n/a
                    +  10:BDR-C2         5.79     .127 No_date    3:34   12.94
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
 025:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.025
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 025:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.025
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 025:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .162 No_date    3:39   14.86
n/a
                    +  09:BDR-C4        84.20     .830 No_date    4:08   10.38
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .952 No_date    3:57   10.69
n/a
 025:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .952 No_date    3:57   10.69
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.025
      remark:Flow to Thomas Bakster Drain
 025:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .024 No_date    3:21    3.92
.056
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 025:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .024 No_date    3:21    3.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.025
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 025:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .110 No_date    3:33    6.50
.093
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 025:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .110 No_date    3:33    6.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .093 No_date    3:51   36.09
.514
      [XIMP=.00:TIMP=.43]
```

```
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 025:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .024 No_date    3:21    3.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.025
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 025:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .110 No_date    3:33    6.50
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.025
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 025:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .093 No_date    3:51   36.09
n/a
                     +  02:BDR-C5         2.87     .024 No_date    3:21    3.92
n/a
                     +  03:BDR-C6         9.75     .110 No_date    3:33    6.50
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .205 No_date    3:43    9.12
n/a
 025:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .205 No_date    3:43    9.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.025
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 025:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .111 No_date    3:18    8.90
.127
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 025:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .435 No_date    3:33   10.18
.145
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 025:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A14           22.41     .079 No_date    5:11    4.79
.068
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  49

************************************************************************************




 RUN:COMMAND#
 050:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  50 ]
#************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#************************************************************************
 050:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=   6.00:PTOT=  78.60]
##########################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS              #
##########################################################################
 050:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A6            11.73     .396 No_date    3:18   13.61
.173
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 050:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A4            13.95     .147 No_date    3:27    5.50
.070
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 050:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        05:A3            12.71     .626 No_date    3:27   24.88
.317
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 050:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A2            35.36     .585 No_date    3:44   11.30
.144
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 050:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A7            15.53     .247 No_date    3:53   12.42
.158
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 050:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .585 No_date    3:44   11.30
n/a
                     +  02:A7            15.53     .247 No_date    3:53   12.42
n/a
                     +  03:A6            11.73     .396 No_date    3:18   13.61
n/a
                     +  04:A4            13.95     .147 No_date    3:27    5.50
n/a
                     +  05:A3            12.71     .626 No_date    3:27   24.88
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.825 No_date    3:31   12.83
n/a
 050:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    1.825 No_date    3:31   12.83
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.050
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 050:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .730 No_date    3:54   13.61
.173
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 050:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .286 No_date    3:28   11.67
.149
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 050:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .286 No_date    3:28   11.67
n/a
                     +  03:A8            42.25     .730 No_date    3:54   13.61
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
 050:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.050
      remark:Flow at Cedarview Road Culvert-500mm CSP
 050:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .251 No_date    3:32    7.61
.097
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 050:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .251 No_date    3:32    7.61
n/a
                     +  04:CVR-C1        54.90     .947 No_date    3:45   13.17
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.179 No_date    3:41   11.76
n/a
 050:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.179 No_date    3:41   11.76
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.050
      remark:Flow at Cambrain Road Culvert - CR-C2
 050:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A10            5.53     .214 No_date    3:17   15.32
.195
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 050:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A10            5.53     .214 No_date    3:17   15.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.050
      remark:Flow at Cedarview Road 450mm CSP Culvert
 050:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A11           15.20     .202 No_date    4:36   15.32
.195
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 050:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:CVR-C2         5.53     .214 No_date    3:17   15.32
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.050
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 050:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A11           15.20     .202 No_date    4:36   15.32
n/a
                     +  02:CVR-C2         5.53     .214 No_date    3:17   15.32
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
 050:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.050
      remark:Flow at Cedarview Road Culvert-400mm CSP
 050:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A12           60.00     .784 No_date    4:12   12.42
.158
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 050:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A12           60.00     .784 No_date    4:12   12.42
n/a
                     +  03:CVR-C3        20.73     .269 No_date    3:23   15.32
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
 050:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.050
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 050:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A15            3.47     .143 No_date    3:25   19.87
.253
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 050:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A15            3.47     .143 No_date    3:25   19.87
n/a
                     +  08:CVR-C4        80.73    1.027 No_date    4:13   13.16
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.088 No_date    4:07   13.44
n/a
 050:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            09:BDR-C4        84.20    1.088 No_date    4:07   13.44
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.050
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 050:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A20            4.78     .114 No_date    3:23   10.96
.139
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 050:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A20            4.78     .114 No_date    3:23   10.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A19            1.01     .081 No_date    3:43   41.36
.526
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C1         4.78     .114 No_date    3:23   10.96
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.050
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 050:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A19            1.01     .081 No_date    3:43   41.36
n/a
                     +  02:BDR-C1         4.78     .114 No_date    3:23   10.96
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
 050:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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     CALIB STANDHYD     01:A18             .50     .045 No_date    3:38   43.46
.553
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .045 No_date    3:38   43.46
n/a
                     +  10:BDR-C2         5.79     .174 No_date    3:33   16.27
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .218 No_date    3:35   18.43
n/a
 050:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3          6.29     .218 No_date    3:35   18.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.050
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 050:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4         84.20    1.088 No_date    4:07   13.44
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.050
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 050:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3          6.29     .218 No_date    3:35   18.43
n/a
                     +  09:BDR-C4         84.20    1.088 No_date    4:07   13.44
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.240 No_date    3:55   13.78
n/a
 050:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.240 No_date    3:55   13.78
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.050
      remark:Flow to Thomas Bakster Drain
 050:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16             2.87     .036 No_date    3:19    5.50
.070
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 050:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16             2.87     .036 No_date    3:19    5.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.050
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 050:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17             9.75     .151 No_date    3:32    8.71
.111
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 050:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17             9.75     .151 No_date    3:32    8.71
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21             1.50     .118 No_date    3:46   42.72
.544
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 050:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5          2.87     .036 No_date    3:19    5.50
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.050
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 050:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6          9.75     .151 No_date    3:32    8.71
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.050
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 050:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21             1.50     .118 No_date    3:46   42.72
n/a
                     +  02:BDR-C5         2.87     .036 No_date    3:19    5.50
n/a
                     +  03:BDR-C6         9.75     .151 No_date    3:32    8.71
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .281 No_date    3:38   11.67
n/a
 050:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .281 No_date    3:38   11.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.050
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 050:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9              5.08     .150 No_date    3:17   11.67
.149
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 050:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13            24.60     .574 No_date    3:33   13.19
.168
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 050:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14            22.41     .109 No_date    5:07    6.61
.084
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN :  99

**********************************************************************************




 RUN:COMMAND#
 100:0001---------------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on       0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 100 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************************
 100:0002---------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=   6.00:PTOT=  87.00]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 100:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6             11.73     .503 No_date    3:17   17.02
.196
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 100:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4             13.95     .202 No_date    3:25    7.31
.084
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 100:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3             12.71     .760 No_date    3:27   29.95
.344
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 100:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2             35.36     .751 No_date    3:43   14.28
.164
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 100:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7             15.53     .315 No_date    3:52   15.60
.179
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 100:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2             35.36     .751 No_date    3:43   14.28
n/a
                     +  02:A7             15.53     .315 No_date    3:52   15.60
n/a
                     +  03:A6             11.73     .503 No_date    3:17   17.02
n/a
                     +  04:A4             13.95     .202 No_date    3:25    7.31
n/a
                     +  05:A3             12.71     .760 No_date    3:27   29.95
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    2.307 No_date    3:30   16.01
n/a
 100:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1          89.28    2.307 No_date    3:30   16.01
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.100
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 100:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8             42.25     .924 No_date    3:53   17.02
.196
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 100:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5             12.65     .368 No_date    3:27   14.74
.169
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 100:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5             12.65     .368 No_date    3:27   14.74
n/a
                     +  03:A8             42.25     .924 No_date    3:53   17.02
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.203 No_date    3:44   16.49
n/a
 100:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1         54.90    1.203 No_date    3:44   16.49
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.100
      remark:Flow at Cedarview Road Culvert-500mm CSP
 100:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1             18.64     .334 No_date    3:31    9.88
.114
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 100:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1             18.64     .334 No_date    3:31    9.88
n/a
                     +  04:CVR-C1         54.90    1.203 No_date    3:44   16.49
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.511 No_date    3:40   14.81
n/a
 100:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2          73.54    1.511 No_date    3:40   14.81
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.100
      remark:Flow at Cambrain Road Culvert - CR-C2
 100:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10             5.53     .269 No_date    3:17   18.98
.218
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 100:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10             5.53     .269 No_date    3:17   18.98
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.100
      remark:Flow at Cedarview Road 450mm CSP Culvert
 100:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11            15.20     .252 No_date    4:34   18.98
.218
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 100:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2          5.53     .269 No_date    3:17   18.98
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.100
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 100:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11            15.20     .252 No_date    4:34   18.98
n/a
                     +  02:CVR-C2          5.53     .269 No_date    3:17   18.98
n/a
      [DT= 1.00]  SUM=  03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
 100:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.100
      remark:Flow at Cedarview Road Culvert-400mm CSP
 100:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12            60.00     .996 No_date    4:11   15.60
.179
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 100:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12            60.00     .996 No_date    4:11   15.60
n/a
                     +  03:CVR-C3         20.73     .338 No_date    3:23   18.98
n/a
      [DT= 1.00]  SUM=  08:CVR-C4         80.73    1.299 No_date    4:11   16.47
n/a
```

```
 100:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            08:CVR-C4        80.73     1.299 No_date    4:11   16.47
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.100
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 100:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A15            3.47     .176 No_date    3:25   24.23
.278
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 100:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A15            3.47     .176 No_date    3:25   24.23
n/a
                      +  08:CVR-C4        80.73     1.299 No_date    4:11   16.47
n/a
      [DT= 1.00]  SUM=  09:BDR-C4         84.20     1.374 No_date    4:06   16.79
n/a
 100:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            09:BDR-C4        84.20     1.374 No_date    4:06   16.79
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.100
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 100:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A20            4.78     .147 No_date    3:22   13.91
.160
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 100:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A20            4.78     .147 No_date    3:22   13.91
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A19            1.01     .099 No_date    3:39   47.80
.549
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C1         4.78     .147 No_date    3:22   13.91
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.100
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 100:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A19            1.01     .099 No_date    3:39   47.80
n/a
                      +  02:BDR-C1         4.78     .147 No_date    3:22   13.91
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
 100:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A18             .50     .054 No_date    3:35   49.96
.574
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A18             .50     .054 No_date    3:35   49.96
n/a
                      +  10:BDR-C2         5.79     .226 No_date    3:30   19.82
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
 100:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.100
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 100:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            09:BDR-C4        84.20     1.374 No_date    4:06   16.79
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.100
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 100:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             02:BDR-C3         6.29     .279 No_date    3:32   22.22
n/a
                      +  09:BDR-C4        84.20     1.374 No_date    4:06   16.79
n/a
      [DT= 1.00]  SUM=  01:FTBD           90.49     1.556 No_date    3:54   17.17
n/a
 100:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:FTBD           90.49     1.556 No_date    3:54   17.17
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.100
      remark:Flow to Thomas Bakster Drain
 100:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A16            2.87     .050 No_date    3:19    7.31
.084
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 100:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A16            2.87     .050 No_date    3:19    7.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.100
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 100:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A17            9.75     .198 No_date    3:31   11.19
.129
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 100:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A17            9.75     .198 No_date    3:31   11.19
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A21            1.50     .142 No_date    3:42   48.99
.563
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 100:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C5         2.87     .050 No_date    3:19    7.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.100
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 100:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            03:BDR-C6         9.75     .198 No_date    3:31   11.19
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.100
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 100:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A21            1.50     .142 No_date    3:42   48.99
n/a
                      +  02:BDR-C5         2.87     .050 No_date    3:19    7.31
n/a
                      +  03:BDR-C6         9.75     .198 No_date    3:31   11.19
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .365 No_date    3:35   14.42
n/a
 100:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:BDR-C7        14.12     .365 No_date    3:35   14.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.100
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 100:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A9             5.08     .193 No_date    3:17   14.74
.169
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 100:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A13           24.60     .729 No_date    3:32   16.50
.190
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 100:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A14           22.41     .145 No_date    5:04    8.68
.100
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 201

************************************************************************




 RUN:COMMAND#
 202:0001---------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 202 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 202:0002---------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  43.20]
#####################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS           #
#####################################################################
 202:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A6            11.73     .057 No_date    6:19    2.93
.068
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 202:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A4            13.95     .006 No_date    6:53     .58
.014
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 202:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        05:A3            12.71     .147 No_date    6:27    7.34
.170
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 202:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A2            35.36     .075 No_date    6:51    2.19
.051
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 202:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A7            15.53     .035 No_date    7:01    2.54
.059
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 202:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A2            35.36     .075 No_date    6:51    2.19
n/a
                      +  02:A7            15.53     .035 No_date    7:01    2.54
n/a
                      +  03:A6            11.73     .057 No_date    6:19    2.93
n/a
                      +  04:A4            13.95     .006 No_date    6:53     .58
n/a
                      +  05:A3            12.71     .147 No_date    6:27    7.34
n/a
      [DT= 1.00]  SUM=  07:CR-C1          89.28     .287 No_date    6:33    2.83
n/a
 202:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            07:CR-C1         89.28     .287 No_date    6:33    2.83
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.202
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 202:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A8            42.25     .111 No_date    7:01    2.93
.068
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 202:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A5            12.65     .035 No_date    6:33    2.27
.053
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 202:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A5            12.65     .035 No_date    6:33    2.27
n/a
                      +  03:A8            42.25     .111 No_date    7:01    2.93
n/a
      [DT= 1.00]  SUM=  04:CVR-C1         54.90     .139 No_date    6:54    2.78
n/a
 202:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:CVR-C1        54.90     .139 No_date    6:54    2.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.202
      remark:Flow at Cedarview Road Culvert-500mm CSP
 202:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       01:A1            18.64     .019 No_date    6:46    1.10
.025
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 202:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .019 No_date    6:46    1.10
n/a
                      +  04:CVR-C1        54.90     .139 No_date    6:54    2.78
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .157 No_date    6:53    2.35
n/a
 202:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .157 No_date    6:53    2.35
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.202
      remark:Flow at Cambrain Road Culvert - CR-C2
 202:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .036 No_date    6:18    3.60
.083
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 202:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .036 No_date    6:18    3.60
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.202
      remark:Flow at Cedarview Road 450mm CSP Culvert
 202:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .036 No_date    7:42    3.60
.083
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 202:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .036 No_date    6:18    3.60
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.202
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 202:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .036 No_date    7:42    3.60
n/a
                      +  02:CVR-C2         5.53     .036 No_date    6:18    3.60
n/a
      [DT= 1.00]  SUM=  03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
 202:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.202
      remark:Flow at Cedarview Road Culvert-400mm CSP
 202:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .113 No_date    7:21    2.54
.059
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 202:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .113 No_date    7:21    2.54
n/a
                      +  03:CVR-C3         20.73     .045 No_date    6:25    3.60
n/a
      [DT= 1.00]  SUM=  08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
 202:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.202
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 202:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .029 No_date    6:25    5.33
.123
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 202:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .029 No_date    6:25    5.33
n/a
                      +  08:CVR-C4         80.73     .158 No_date    7:22    2.81
n/a
      [DT= 1.00]  SUM=  09:BDR-C4         84.20     .169 No_date    7:15    2.92
n/a
 202:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4         84.20     .169 No_date    7:15    2.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.202
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 202:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .012 No_date    6:27    2.03
.047
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 202:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .012 No_date    6:27    2.03
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .027 No_date    6:42   12.96
.300
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .012 No_date    6:27    2.03
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.202
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 202:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .027 No_date    6:42   12.96
n/a
                      +  02:BDR-C1         4.78     .012 No_date    6:27    2.03
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
 202:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .016 No_date    6:38   14.41
.334
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .016 No_date    6:38   14.41
n/a
                      +  10:BDR-C2         5.79     .039 No_date    6:40    3.94
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
 202:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.202
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 202:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .169 No_date    7:15    2.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.202
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 202:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .055 No_date    6:39    4.77
n/a
                      +  09:BDR-C4        84.20     .169 No_date    7:15    2.92
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .207 No_date    6:50    3.04
n/a
 202:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .207 No_date    6:50    3.04
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.202
      remark:Flow to Thomas Bakster Drain
 202:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .001 No_date    6:41     .58
.014
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 202:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .001 No_date    6:41     .58
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.202
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 202:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .014 No_date    6:41    1.43
.033
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 202:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .014 No_date    6:41    1.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .042 No_date    6:43   13.83
.320
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 202:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .001 No_date    6:41     .58
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.202
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 202:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .014 No_date    6:41    1.43
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.202
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 202:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .042 No_date    6:43   13.83
n/a
                      +  02:BDR-C5         2.87     .001 No_date    6:41     .58
n/a
                      +  03:BDR-C6         9.75     .014 No_date    6:41    1.43
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .057 No_date    6:43    2.57
n/a
 202:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .057 No_date    6:43    2.57
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.202
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 202:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .018 No_date    6:19    2.27
.053
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 202:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .084 No_date    6:36    2.83
.065
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 202:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .009 No_date    9:02     .83
.019
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 204

************************************************************************




 RUN:COMMAND#
 205:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 205 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 205:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  57.60]
#######################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS             #
#######################################################################
 205:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .149 No_date    6:16    6.48
.113
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 205:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       04:A4            13.95     .033 No_date    6:31    2.02
.035
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 205:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .286 No_date    6:26   13.60
.236
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 205:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .204 No_date    6:45    5.16
.090
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 205:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .090 No_date    6:55    5.79
.101
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 205:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .204 No_date    6:45    5.16
n/a
                    +  02:A7            15.53     .090 No_date    6:55    5.79
n/a
                    +  03:A6            11.73     .149 No_date    6:16    6.48
n/a
                    +  04:A4            13.95     .033 No_date    6:31    2.02
n/a
                    +  05:A3            12.71     .286 No_date    6:26   13.60
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28     .689 No_date    6:30    6.15
n/a
 205:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .689 No_date    6:30    6.15
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.205
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 205:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .274 No_date    6:55    6.48
.113
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 205:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .099 No_date    6:27    5.34
.093
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 205:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .099 No_date    6:27    5.34
n/a
                    +  03:A8            42.25     .274 No_date    6:55    6.48
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
 205:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.205
      remark:Flow at Cedarview Road Culvert-500mm CSP
 205:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .071 No_date    6:34    3.11
.054
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 205:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .071 No_date    6:34    3.11
n/a
                    +  04:CVR-C1        54.90     .349 No_date    6:47    6.22
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .415 No_date    6:44    5.43
n/a
 205:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .415 No_date    6:44    5.43
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.205
      remark:Flow at Cambrain Road Culvert - CR-C2
 205:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .086 No_date    6:16    7.56
.131
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 205:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .086 No_date    6:16    7.56
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.205
      remark:Flow at Cedarview Road 450mm CSP Culvert
 205:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .081 No_date    7:36    7.56
.131
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 205:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .086 No_date    6:16    7.56
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.205
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 205:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .081 No_date    7:36    7.56
n/a
                    +  02:CVR-C2         5.53     .086 No_date    6:16    7.56
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .106 No_date    6:21    7.56
n/a
 205:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .106 No_date    6:21    7.56
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.205
      remark:Flow at Cedarview Road Culvert-400mm CSP
 205:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .287 No_date    7:14    5.79
.101
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 205:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .287 No_date    7:14    5.79
n/a
                    +  03:CVR-C3        20.73     .106 No_date    6:21    7.56
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .385 No_date    7:14    6.25
n/a
 205:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .385 No_date    7:14    6.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.205
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 205:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .062 No_date    6:24   10.39
.180
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 205:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .062 No_date    6:24   10.39
n/a
                    +  08:CVR-C4        80.73     .385 No_date    7:14    6.25
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
 205:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.205
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 205:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .038 No_date    6:22    4.92
.085
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 205:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .038 No_date    6:22    4.92
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .030 No_date    7:08   21.15
.367
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .038 No_date    6:22    4.92
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.205
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 205:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .030 No_date    7:08   21.15
n/a
                    +  02:BDR-C1         4.78     .038 No_date    6:22    4.92
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
 205:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .018 No_date    6:58   22.96
.399
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .018 No_date    6:58   22.96
n/a
                    +  10:BDR-C2         5.79     .051 No_date    6:29    7.75
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
 205:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.205
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 205:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.205
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 205:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .065 No_date    6:57    8.96
n/a
                    +  09:BDR-C4        84.20     .411 No_date    7:08    6.42
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .475 No_date    7:04    6.59
n/a
 205:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .475 No_date    7:04    6.59
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.205
      remark:Flow to Thomas Bakster Drain
 205:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .008 No_date    6:21    2.02
.035
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 205:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .008 No_date    6:21    2.02
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.205
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 205:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .046 No_date    6:33    3.72
.065
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 205:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .046 No_date    6:33    3.72
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .044 No_date    7:11   22.10
.384
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 205:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .008 No_date    6:21    2.02
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.205
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 205:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .046 No_date    6:33    3.72
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.205
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 205:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .044 No_date    7:11   22.10
n/a
```

```
                    +  02:BDR-C5         2.87     .008 No_date    6:21    2.02
n/a
                    +  03:BDR-C6         9.75     .046 No_date    6:33    3.72
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .080 No_date    6:48    5.33
n/a
 205:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .080 No_date    6:48    5.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.205
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 205:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9            5.08     .053 No_date    6:16    5.34
.093
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 205:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .212 No_date    6:32    6.27
.109
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 205:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .031 No_date    8:18    2.57
.045
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 209

************************************************************************************




 RUN:COMMAND#
 210:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 210 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************************
 210:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  67.20]
###################################################################################
#                BARRHAVEN EXPANSION - EXISTING CONDITION FLOWS                   #
###################################################################################
 210:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .230 No_date    6:15    9.48
.141
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 210:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .065 No_date    6:26    3.42
.051
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 210:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .396 No_date    6:25   18.48
.275
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 210:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .322 No_date    6:43    7.72
.115
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 210:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .139 No_date    6:53    8.56
.127
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 210:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .322 No_date    6:43    7.72
n/a
                    +  02:A7            15.53     .139 No_date    6:53    8.56
n/a
                    +  03:A6            11.73     .230 No_date    6:15    9.48
n/a
                    +  04:A4            13.95     .065 No_date    6:26    3.42
n/a
                    +  05:A3            12.71     .396 No_date    6:25   18.48
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28    1.044 No_date    6:29    8.96
n/a
 210:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    1.044 No_date    6:29    8.96
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.210
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 210:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .417 No_date    6:53    9.48
.141
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 210:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .158 No_date    6:26    7.98
.119
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 210:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .158 No_date    6:26    7.98
n/a
                    +  03:A8            42.25     .417 No_date    6:53    9.48
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
 210:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.210
      remark:Flow at Cedarview Road Culvert-500mm CSP
 210:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .124 No_date    6:31    4.95
.074
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 210:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .124 No_date    6:31    4.95
n/a
                    +  04:CVR-C1        54.90     .536 No_date    6:45    9.14
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .651 No_date    6:41    8.08
n/a
 210:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .651 No_date    6:41    8.08
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.210
      remark:Flow at Cambrain Road Culvert - CR-C2
 210:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10           5.53     .129 No_date    6:15   10.84
.161
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 210:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10           5.53     .129 No_date    6:15   10.84
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.210
      remark:Flow at Cedarview Road 450mm CSP Culvert
 210:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11          15.20     .119 No_date    7:33   10.84
.161
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 210:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2        5.53     .129 No_date    6:15   10.84
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.210
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 210:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11          15.20     .119 No_date    7:33   10.84
n/a
                    +  02:CVR-C2         5.53     .129 No_date    6:15   10.84
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
 210:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.210
      remark:Flow at Cedarview Road Culvert-400mm CSP
 210:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12          60.00     .442 No_date    7:11    8.56
.127
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 210:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12          60.00     .442 No_date    7:11    8.56
n/a
                    +  03:CVR-C3        20.73     .159 No_date    6:20   10.84
n/a
     [DT= 1.00]  SUM=  08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
 210:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.210
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 210:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15           3.47     .088 No_date    6:23   14.45
.215
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 210:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15           3.47     .088 No_date    6:23   14.45
n/a
                    +  08:CVR-C4        80.73     .585 No_date    7:11    9.15
n/a
     [DT= 1.00]  SUM=  09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
 210:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.210
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 210:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20           4.78     .062 No_date    6:21    7.43
.111
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 210:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20           4.78     .062 No_date    6:21    7.43
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19           1.01     .044 No_date    6:56   27.14
.404
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1        4.78     .062 No_date    6:21    7.43
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.210
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 210:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19           1.01     .044 No_date    6:56   27.14
n/a
                    +  02:BDR-C1         4.78     .062 No_date    6:21    7.43
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .084 No_date    6:27   10.87
n/a
 210:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2        5.79     .084 No_date    6:27   10.87
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18            .50     .025 No_date    6:49   28.65
.426
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18            .50     .025 No_date    6:49   28.65
n/a
                    +  10:BDR-C2         5.79     .084 No_date    6:27   10.87
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .105 No_date    6:45   12.28
n/a
 210:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3        6.29     .105 No_date    6:45   12.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.210
```

```
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 210:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.210
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 210:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             02:BDR-C3         6.29     .105 No_date    6:45   12.28
n/a
                        + 09:BDR-C4        84.20     .623 No_date    7:05    9.37
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .716 No_date    6:58    9.57
n/a
 210:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:FTBD          90.49     .716 No_date    6:58    9.57
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.210
      remark:Flow to Thomas Bakster Drain
 210:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A16           2.87     .016 No_date    6:18    3.42
.051
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 210:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A16           2.87     .016 No_date    6:18    3.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.210
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 210:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A17           9.75     .078 No_date    6:30    5.78
.086
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 210:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A17           9.75     .078 No_date    6:30    5.78
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD      01:A21           1.50     .064 No_date    7:00   28.09
.418
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 210:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:BDR-C5        2.87     .016 No_date    6:18    3.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.210
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 210:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            03:BDR-C6        9.75     .078 No_date    6:30    5.78
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.210
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 210:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A21           1.50     .064 No_date    7:00   28.09
n/a
                        + 02:BDR-C5        2.87     .016 No_date    6:18    3.42
n/a
                        + 03:BDR-C6        9.75     .078 No_date    6:30    5.78
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .133 No_date    6:40    7.67
n/a
 210:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:BDR-C7        14.12     .133 No_date    6:40    7.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.210
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 210:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A9            5.08     .085 No_date    6:14    7.98
.119
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 210:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A13          24.60     .327 No_date    6:31    9.18
.137
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 210:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A14          22.41     .053 No_date    8:08    4.21
.063
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 224

************************************************************************************




 RUN:COMMAND#
 225:0001---------------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 225 ]
#************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#************************************************************************
 225:0002---------------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  79.20]
################################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                    #
################################################################################
 225:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A6            11.73     .352 No_date    6:15   13.85
.175
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 225:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        04:A4            13.95     .121 No_date    6:23    5.62
.071
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 225:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        05:A3            12.71     .549 No_date    6:25   25.23
.319
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 225:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A2            35.36     .502 No_date    6:41   11.50
.145
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 225:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        02:A7            15.53     .213 No_date    6:51   12.63
.160
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 225:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A2            35.36     .502 No_date    6:41   11.50
n/a
                        + 02:A7            15.53     .213 No_date    6:51   12.63
n/a
                        + 03:A6            11.73     .352 No_date    6:15   13.85
n/a
                        + 04:A4            13.95     .121 No_date    6:23    5.62
n/a
                        + 05:A3            12.71     .549 No_date    6:25   25.23
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.574 No_date    6:28   13.04
n/a
 225:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            07:CR-C1         89.28    1.574 No_date    6:28   13.04
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.225
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 225:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        03:A8            42.25     .631 No_date    6:52   13.85
.175
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 225:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A5            12.65     .247 No_date    6:25   11.88
.150
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 225:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A5            12.65     .247 No_date    6:25   11.88
n/a
                        + 03:A8            42.25     .631 No_date    6:52   13.85
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
 225:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.225
      remark:Flow at Cedarview Road Culvert-500mm CSP
 225:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A1            18.64     .211 No_date    6:28    7.76
.098
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 225:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A1            18.64     .211 No_date    6:28    7.76
n/a
                        + 04:CVR-C1        54.90     .817 No_date    6:43   13.39
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.010 No_date    6:39   11.97
n/a
 225:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            05:CR-C2         73.54    1.010 No_date    6:39   11.97
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.225
      remark:Flow at Cambrain Road Culvert - CR-C2
 225:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A10            5.53     .191 No_date    6:14   15.57
.197
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 225:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            01:A10            5.53     .191 No_date    6:14   15.57
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.225
      remark:Flow at Cedarview Road 450mm CSP Culvert
 225:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A11           15.20     .175 No_date    7:31   15.57
.197
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 225:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD            02:CVR-C2         5.53     .191 No_date    6:14   15.57
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.225
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 225:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A11           15.20     .175 No_date    7:31   15.57
n/a
                        + 02:CVR-C2         5.53     .191 No_date    6:14   15.57
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
 225:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.225
      remark:Flow at Cedarview Road Culvert-400mm CSP
 225:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A12           60.00     .674 No_date    7:09   12.63
.160
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 225:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A12           60.00     .674 No_date    7:09   12.63
n/a
                        + 03:CVR-C3        20.73     .236 No_date    6:19   15.57
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
 225:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD            08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.225
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 225:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD        01:A15            3.47     .125 No_date    6:22   20.17
.255
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 225:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD             01:A15            3.47     .125 No_date    6:22   20.17
n/a
                        + 08:CVR-C4        80.73     .884 No_date    7:09   13.39
n/a
```

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      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
 225:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.225
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 225:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A20            4.78     .099 No_date    6:19   11.17
.141
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 225:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A20            4.78     .099 No_date    6:19   11.17
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A19            1.01     .062 No_date    6:48   34.32
.433
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C1         4.78     .099 No_date    6:19   11.17
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.225
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 225:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A19            1.01     .062 No_date    6:48   34.32
n/a
                     +  02:BDR-C1         4.78     .099 No_date    6:19   11.17
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
 225:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A18             .50     .035 No_date    6:43   36.51
.461
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A18             .50     .035 No_date    6:43   36.51
n/a
                     +  10:BDR-C2         5.79     .134 No_date    6:26   15.21
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
 225:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.225
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 225:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.225
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 225:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             02:BDR-C3         6.29     .163 No_date    6:36   16.90
n/a
                     +  09:BDR-C4        84.20     .939 No_date    7:03   13.67
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.069 No_date    6:54   13.89
n/a
 225:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:FTBD          90.49    1.069 No_date    6:54   13.89
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.225
      remark:Flow to Thomas Bakster Drain
 225:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A16            2.87     .030 No_date    6:16    5.62
.071
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 225:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A16            2.87     .030 No_date    6:16    5.62
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.225
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 225:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A17            9.75     .128 No_date    6:28    8.88
.112
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 225:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            01:A17            9.75     .128 No_date    6:28    8.88
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD      01:A21            1.50     .091 No_date    6:51   35.74
.451
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 225:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            02:BDR-C5         2.87     .030 No_date    6:16    5.62
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.225
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 225:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD            03:BDR-C6         9.75     .128 No_date    6:28    8.88
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.225
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 225:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A21            1.50     .091 No_date    6:51   35.74
n/a
                     +  02:BDR-C5         2.87     .030 No_date    6:16    5.62
n/a
                     +  03:BDR-C6         9.75     .128 No_date    6:28    8.88
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .217 No_date    6:36   11.07
n/a
 225:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:BDR-C7        14.12     .217 No_date    6:36   11.07
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.225
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 225:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A9             5.08     .133 No_date    6:13   11.88
.150
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 225:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A13           24.60     .497 No_date    6:30   13.42
.169
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 225:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A14           22.41     .089 No_date    8:01    6.75
.085
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 249

************************************************************************




 RUN:COMMAND#
 250:0001---------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 250 ]
#************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#************************************************************************
 250:0002---------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  87.60]
##########################################################################
#            BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS              #
##########################################################################
 250:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A6            11.73     .448 No_date    6:14   17.27
.197
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 250:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        04:A4            13.95     .169 No_date    6:22    7.45
.085
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 250:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        05:A3            12.71     .666 No_date    6:24   30.33
.346
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 250:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A2            35.36     .647 No_date    6:40   14.50
.166
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 250:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        02:A7            15.53     .272 No_date    6:50   15.84
.181
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 250:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A2            35.36     .647 No_date    6:40   14.50
n/a
                     +  02:A7            15.53     .272 No_date    6:50   15.84
n/a
                     +  03:A6            11.73     .448 No_date    6:14   17.27
n/a
                     +  04:A4            13.95     .169 No_date    6:22    7.45
n/a
                     +  05:A3            12.71     .666 No_date    6:24   30.33
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.996 No_date    6:27   16.25
n/a
 250:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            07:CR-C1         89.28    1.996 No_date    6:27   16.25
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.250
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 250:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        03:A8            42.25     .800 No_date    6:51   17.27
.197
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 250:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A5            12.65     .319 No_date    6:24   14.97
.171
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 250:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A5            12.65     .319 No_date    6:24   14.97
n/a
                     +  03:A8            42.25     .800 No_date    6:51   17.27
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
 250:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.250
      remark:Flow at Cedarview Road Culvert-500mm CSP
 250:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD        01:A1            18.64     .284 No_date    6:27   10.05
.115
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 250:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD             01:A1            18.64     .284 No_date    6:27   10.05
n/a
                     +  04:CVR-C1        54.90    1.040 No_date    6:42   16.74
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.300 No_date    6:37   15.04
n/a
 250:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD            05:CR-C2         73.54    1.300 No_date    6:37   15.04
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.250
      remark:Flow at Cambrain Road Culvert - CR-C2
 250:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       01:A10            5.53     .240 No_date    6:14   19.25
.220
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 250:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .240 No_date    6:14   19.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.250
      remark:Flow at Cedarview Road 450mm CSP Culvert
 250:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .218 No_date    7:30   19.25
.220
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 250:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .240 No_date    6:14   19.25
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.250
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 250:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .218 No_date    7:30   19.25
n/a
                    +  02:CVR-C2         5.53     .240 No_date    6:14   19.25
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
 250:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.250
      remark:Flow at Cedarview Road Culvert-400mm CSP
 250:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .860 No_date    7:08   15.84
.181
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 250:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .860 No_date    7:08   15.84
n/a
                    +  03:CVR-C3        20.73     .298 No_date    6:19   19.25
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
 250:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.250
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 250:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .154 No_date    6:22   24.55
.280
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 250:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .154 No_date    6:22   24.55
n/a
                    +  08:CVR-C4        80.73    1.122 No_date    7:08   16.72
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
 250:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.250
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 250:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .129 No_date    6:19   14.13
.161
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 250:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .129 No_date    6:19   14.13
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .076 No_date    6:44   40.10
.458
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .129 No_date    6:19   14.13
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.250
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 250:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .076 No_date    6:44   40.10
n/a
                    +  02:BDR-C1         4.78     .129 No_date    6:19   14.13
n/a
      [DT= 1.00]  SUM=  10:BDR-C2        5.79     .176 No_date    6:25   18.66
n/a
 250:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .176 No_date    6:25   18.66
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .042 No_date    6:40   41.79
.477
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .042 No_date    6:40   41.79
n/a
                    +  10:BDR-C2         5.79     .176 No_date    6:25   18.66
n/a
      [DT= 1.00]  SUM=  02:BDR-C3        6.29     .212 No_date    6:32   20.50
n/a
 250:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .212 No_date    6:32   20.50
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.250
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 250:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.250
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 250:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .212 No_date    6:32   20.50
n/a
                    +  09:BDR-C4        84.20    1.189 No_date    7:02   17.04
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.347 No_date    6:52   17.28
n/a
 250:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.347 No_date    6:52   17.28
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.250
      remark:Flow to Thomas Bakster Drain
 250:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .042 No_date    6:15    7.45
.085
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 250:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .042 No_date    6:15    7.45
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.250
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 250:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .170 No_date    6:28   11.38
.130
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 250:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .170 No_date    6:28   11.38
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .110 No_date    6:47   41.08
.469
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 250:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .042 No_date    6:15    7.45
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.250
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 250:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .170 No_date    6:28   11.38
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.250
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 250:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .110 No_date    6:47   41.08
n/a
                    +  02:BDR-C5         2.87     .042 No_date    6:15    7.45
n/a
                    +  03:BDR-C6         9.75     .170 No_date    6:28   11.38
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .285 No_date    6:34   13.73
n/a
 250:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .285 No_date    6:34   13.73
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.250
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 250:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .173 No_date    6:13   14.97
.171
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 250:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .633 No_date    6:29   16.75
.191
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 250:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .120 No_date    7:58    8.83
.101
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
   ** END OF RUN : 299

************************************************************************




 RUN:COMMAND#
 300:0001---------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN   = 300 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 300:0002---------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT=  96.00]
#########################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS         #
#########################################################################
 300:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .553 No_date    6:14   20.97
.218
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 300:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .225 No_date    6:21    9.49
.099
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 300:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .789 No_date    6:24   35.69
.372
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 300:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .806 No_date    6:39   17.77
.185
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 300:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .337 No_date    6:49   19.32
.201
      [CN= 51.0: N= 3.00]
```

```
      [Tp=  .72:DT= 1.00]
 300:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .806 No_date    6:39   17.77
n/a
                    +  02:A7            15.53     .337 No_date    6:49   19.32
n/a
                    +  03:A6            11.73     .553 No_date    6:14   20.97
n/a
                    +  04:A4            13.95     .225 No_date    6:21    9.49
n/a
                    +  05:A3            12.71     .789 No_date    6:24   35.69
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28    2.456 No_date    6:27   19.72
n/a
 300:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    2.456 No_date    6:27   19.72
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.300
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 300:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .985 No_date    6:50   20.97
.218
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 300:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .398 No_date    6:24   18.33
.191
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 300:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .398 No_date    6:24   18.33
n/a
                    +  03:A8            42.25     .985 No_date    6:50   20.97
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
 300:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.300
      remark:Flow at Cedarview Road Culvert-500mm CSP
 300:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .365 No_date    6:27   12.58
.131
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 300:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .365 No_date    6:27   12.58
n/a
                    +  04:CVR-C1        54.90    1.284 No_date    6:41   20.36
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.619 No_date    6:37   18.39
n/a
 300:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54    1.619 No_date    6:37   18.39
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.300
      remark:Flow at Cambrain Road Culvert - CR-C2
 300:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .293 No_date    6:13   23.20
.242
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 300:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .293 No_date    6:13   23.20
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.300
      remark:Flow at Cedarview Road 450mm CSP Culvert
 300:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .266 No_date    7:29   23.20
.242
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 300:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .293 No_date    6:13   23.20
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.300
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 300:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .266 No_date    7:29   23.20
n/a
                    +  02:CVR-C2         5.53     .293 No_date    6:13   23.20
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .365 No_date    6:19   23.20
n/a
 300:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .365 No_date    6:19   23.20
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.300
      remark:Flow at Cedarview Road Culvert-400mm CSP
 300:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00    1.063 No_date    7:07   19.32
.201
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 300:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00    1.063 No_date    7:07   19.32
n/a
                    +  03:CVR-C3         20.73     .365 No_date    6:19   23.20
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
 300:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.300
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 300:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .185 No_date    6:22   29.20
.304
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 300:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .185 No_date    6:22   29.20
n/a
                    +  08:CVR-C4        80.73    1.381 No_date    7:07   20.32
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
 300:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.300
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 300:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .162 No_date    6:18   17.37
.181
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 300:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .162 No_date    6:18   17.37
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .091 No_date    6:41   45.32
.472
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .162 No_date    6:18   17.37
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.300
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 300:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .091 No_date    6:41   45.32
n/a
                    +  02:BDR-C1         4.78     .162 No_date    6:18   17.37
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
 300:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .050 No_date    6:37   47.23
.492
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .050 No_date    6:37   47.23
n/a
                    +  10:BDR-C2         5.79     .223 No_date    6:24   22.24
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
 300:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.300
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 300:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.300
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 300:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .267 No_date    6:30   24.23
n/a
                    +  09:BDR-C4        84.20    1.463 No_date    7:02   20.68
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.647 No_date    6:51   20.93
n/a
 300:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.647 No_date    6:51   20.93
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.300
      remark:Flow to Thomas Bakster Drain
 300:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .057 No_date    6:14    9.49
.099
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 300:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .057 No_date    6:14    9.49
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.300
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 300:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .216 No_date    6:27   14.12
.147
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 300:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .216 No_date    6:27   14.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .130 No_date    6:44   46.43
.484
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 300:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .057 No_date    6:14    9.49
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.300
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 300:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .216 No_date    6:27   14.12
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.300
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 300:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .130 No_date    6:44   46.43
n/a
                    +  02:BDR-C5         2.87     .057 No_date    6:14    9.49
n/a
                    +  03:BDR-C6         9.75     .216 No_date    6:27   14.12
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .363 No_date    6:32   16.61
n/a
 300:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .363 No_date    6:32   16.61
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.300
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 300:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .215 No_date    6:12   18.33
.191
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 300:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .780 No_date    6:29   20.35
.212
      [CN= 52.0: N= 3.00]
```

```
      [Tp=  .46:DT= 1.00]
 300:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A14           22.41     .154 No_date    7:56   11.15
.116
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 301

*******************************************************************************




 RUN:COMMAND#
 302:0001---------------------------------------------------------------------------
----
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 302 ]
#*****************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*****************************************************************************
 302:0002---------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=15.00:SDUR=  24.00:PTOT=  48.00]
################################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
################################################################################
 302:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .065 No_date   12:12    3.98
.083
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 302:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .008 No_date   12:42     .97
.020
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 302:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .151 No_date   12:20    9.27
.193
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 302:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .084 No_date   12:43    3.06
.064
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 302:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .039 No_date   12:53    3.49
.073
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 302:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .084 No_date   12:43    3.06
n/a
                     +  02:A7            15.53     .039 No_date   12:53    3.49
n/a
                     +  03:A6            11.73     .065 No_date   12:12    3.98
n/a
                     +  04:A4            13.95     .008 No_date   12:42     .97
n/a
                     +  05:A3            12.71     .151 No_date   12:20    9.27
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28     .309 No_date   12:25    3.81
n/a
 302:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28     .309 No_date   12:25    3.81
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.302
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 302:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .123 No_date   12:54    3.98
.083
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 302:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .040 No_date   12:24    3.17
.066
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 302:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .040 No_date   12:24    3.17
n/a
                     +  03:A8            42.25     .123 No_date   12:54    3.98
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
 302:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.302
      remark:Flow at Cedarview Road Culvert-500mm CSP
 302:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .022 No_date   12:37    1.66
.035
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 302:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .022 No_date   12:37    1.66
n/a
                     +  04:CVR-C1        54.90     .154 No_date   12:46    3.79
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .176 No_date   12:44    3.25
n/a
 302:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54     .176 No_date   12:44    3.25
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.302
      remark:Flow at Cambrain Road Culvert - CR-C2
 302:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .040 No_date   12:11    4.78
.100
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 302:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .040 No_date   12:11    4.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.302
      remark:Flow at Cedarview Road 450mm CSP Culvert
 302:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .040 No_date   13:36    4.78
.100
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 302:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .040 No_date   12:11    4.78
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.302
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 302:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .040 No_date   13:36    4.78
n/a
                     +  02:CVR-C2         5.53     .040 No_date   12:11    4.78
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
 302:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.302
      remark:Flow at Cedarview Road Culvert-400mm CSP
 302:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .127 No_date   13:14    3.49
.073
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 302:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .127 No_date   13:14    3.49
n/a
                     +  03:CVR-C3        20.73     .049 No_date   12:16    4.78
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
 302:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.302
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 302:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .031 No_date   12:18    6.87
.143
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 302:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .031 No_date   12:18    6.87
n/a
                     +  08:CVR-C4        80.73     .176 No_date   13:14    3.82
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
 302:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.302
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 302:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .014 No_date   12:18    2.87
.060
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 302:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .014 No_date   12:18    2.87
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .013 No_date   13:31   12.76
.266
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C1         4.78     .014 No_date   12:18    2.87
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.302
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 302:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A19            1.01     .013 No_date   13:31   12.76
n/a
                     +  02:BDR-C1         4.78     .014 No_date   12:18    2.87
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
 302:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A18             .50     .008 No_date   13:17   13.82
.288
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A18             .50     .008 No_date   13:17   13.82
n/a
                     +  10:BDR-C2         5.79     .019 No_date   12:25    4.59
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
 302:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.302
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 302:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.302
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 302:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            02:BDR-C3         6.29     .026 No_date   13:19    5.33
n/a
                     +  09:BDR-C4        84.20     .189 No_date   13:09    3.95
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49     .215 No_date   13:10    4.05
n/a
 302:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:FTBD          90.49     .215 No_date   13:10    4.05
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.302
      remark:Flow to Thomas Bakster Drain
 302:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB NASHYD       01:A16            2.87     .002 No_date   12:35     .97
.020
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 302:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .002 No_date   12:35     .97
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.302
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 302:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .016 No_date   12:34    2.08
.043
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 302:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .016 No_date   12:34    2.08
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .019 No_date   13:35   13.47
.281
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 302:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .002 No_date   12:35     .97
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.302
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 302:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .016 No_date   12:34    2.08
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.302
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 302:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .019 No_date   13:35   13.47
n/a
                    +  02:BDR-C5         2.87     .002 No_date   12:35     .97
n/a
                    +  03:BDR-C6         9.75     .016 No_date   12:34    2.08
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .030 No_date   13:24    3.07
n/a
 302:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .030 No_date   13:24    3.07
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.302
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 302:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .021 No_date   12:11    3.17
.066
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 302:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .093 No_date   12:29    3.84
.080
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 302:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .010 No_date   14:38    1.31
.027
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 304

************************************************************************************




 RUN:COMMAND#
 305:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2      (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 305 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 441803
#*************************************************************************
 305:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  62.40]
###########################################################################
#              BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS             #
###########################################################################
 305:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .148 No_date   12:10    7.93
.127
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 305:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .034 No_date   12:21    2.68
.043
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 305:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .272 No_date   12:19   15.97
.256
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 305:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .205 No_date   12:38    6.38
.102
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 305:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .091 No_date   12:48    7.12
.114
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 305:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .205 No_date   12:38    6.38
n/a
                    +  02:A7            15.53     .091 No_date   12:48    7.12
n/a
                    +  03:A6            11.73     .148 No_date   12:10    7.93
n/a
                    +  04:A4            13.95     .034 No_date   12:21    2.68
n/a
                    +  05:A3            12.71     .272 No_date   12:19   15.97
n/a
      [DT= 1.00]  SUM=  07:CR-C1        89.28     .678 No_date   12:22    7.50
n/a
 305:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .678 No_date   12:22    7.50
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.305
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 305:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .275 No_date   12:48    7.93
.127
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 305:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .099 No_date   12:20    6.61
.106
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 305:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .099 No_date   12:20    6.61
n/a
                    +  03:A8            42.25     .275 No_date   12:48    7.93
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
 305:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.305
      remark:Flow at Cedarview Road Culvert-500mm CSP
 305:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .072 No_date   12:26    3.98
.064
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 305:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .072 No_date   12:26    3.98
n/a
                    +  04:CVR-C1        54.90     .352 No_date   12:40    7.62
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .419 No_date   12:37    6.70
n/a
 305:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .419 No_date   12:37    6.70
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.305
      remark:Flow at Cambrain Road Culvert - CR-C2
 305:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .084 No_date   12:09    9.14
.147
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 305:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .084 No_date   12:09    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.305
      remark:Flow at Cedarview Road 450mm CSP Culvert
 305:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .082 No_date   13:29    9.14
.147
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 305:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .084 No_date   12:09    9.14
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.305
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 305:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .082 No_date   13:29    9.14
n/a
                    +  02:CVR-C2         5.53     .084 No_date   12:09    9.14
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
 305:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.305
      remark:Flow at Cedarview Road Culvert-400mm CSP
 305:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .291 No_date   13:07    7.12
.114
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 305:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .291 No_date   13:07    7.12
n/a
                    +  03:CVR-C3        20.73     .106 No_date   12:14    9.14
n/a
      [DT= 1.00]  SUM=  04:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
 305:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.305
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 305:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .059 No_date   12:17   12.36
.198
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 305:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .059 No_date   12:17   12.36
n/a
                    +  08:CVR-C4        80.73     .391 No_date   13:08    7.64
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
 305:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.305
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 305:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .038 No_date   12:15    6.12
.098
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 305:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .038 No_date   12:15    6.12
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     CALIB STANDHYD     01:A19            1.01     .025 No_date   13:05   19.64
.315
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .038 No_date   12:15    6.12
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.305
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 305:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .025 No_date   13:05   19.64
n/a
                    +  02:BDR-C1         4.78     .038 No_date   12:15    6.12
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
 305:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .015 No_date   12:55   20.90
.335
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .015 No_date   12:55   20.90
n/a
                    +  10:BDR-C2         5.79     .050 No_date   12:19    8.48
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
 305:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.305
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 305:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.305
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 305:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .059 No_date   12:40    9.47
n/a
                    +  09:BDR-C4        84.20     .416 No_date   13:03    7.83
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .473 No_date   13:00    7.95
n/a
 305:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .473 No_date   13:00    7.95
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.305
      remark:Flow to Thomas Bakster Drain
 305:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .009 No_date   12:12    2.68
.043
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 305:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .009 No_date   12:12    2.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.305
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 305:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .047 No_date   12:25    4.70
.075
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 305:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .047 No_date   12:25    4.70
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .037 No_date   13:09   20.39
.327
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 305:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .009 No_date   12:12    2.68
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.305
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 305:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .047 No_date   12:25    4.70
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.305
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 305:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .037 No_date   13:09   20.39
n/a
                    +  02:BDR-C5         2.87     .009 No_date   12:12    2.68
n/a
                    +  03:BDR-C6         9.75     .047 No_date   12:25    4.70
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .076 No_date   12:36    5.96
n/a
 305:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .076 No_date   12:36    5.96
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.305
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 305:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .053 No_date   12:09    6.61
.106
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 305:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .211 No_date   12:25    7.67
.123
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 305:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .032 No_date   14:10    3.34
.054
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 309

************************************************************************************
```

```
 RUN:COMMAND#
 310:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 310 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   : 4418403
#*************************************************************************
 310:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  72.00]
##########################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
##########################################################################
 310:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .218 No_date   12:09   11.15
.155
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 310:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .065 No_date   12:18    4.24
.059
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 310:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .365 No_date   12:18   21.10
.293
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 310:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .312 No_date   12:36    9.16
.127
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 310:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .135 No_date   12:45   10.12
.140
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 310:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .312 No_date   12:36    9.16
n/a
                    +  02:A7            15.53     .135 No_date   12:45   10.12
n/a
                    +  03:A6            11.73     .218 No_date   12:09   11.15
n/a
                    +  04:A4            13.95     .065 No_date   12:18    4.24
n/a
                    +  05:A3            12.71     .365 No_date   12:18   21.10
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28     .993 No_date   12:21   10.52
n/a
 310:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28     .993 No_date   12:21   10.52
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.310
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 310:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .405 No_date   12:46   11.15
.155
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 310:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .151 No_date   12:19    9.47
.131
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 310:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .151 No_date   12:19    9.47
n/a
                    +  03:A8            42.25     .405 No_date   12:46   11.15
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
 310:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.310
      remark:Flow at Cedarview Road Culvert-500mm CSP
 310:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .121 No_date   12:23    6.01
.083
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 310:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .121 No_date   12:23    6.01
n/a
                    +  04:CVR-C1        54.90     .520 No_date   12:38   10.76
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54     .632 No_date   12:35    9.56
n/a
 310:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .632 No_date   12:35    9.56
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.310
      remark:Flow at Cambrain Road Culvert - CR-C2
 310:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .120 No_date   12:09   12.66
.176
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 310:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .120 No_date   12:09   12.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.310
      remark:Flow at Cedarview Road 450mm CSP Culvert
 310:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .117 No_date   13:27   12.66
.176
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 310:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .120 No_date   12:09   12.66
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.310
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
```

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 310:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .117 No_date   13:27   12.66
n/a
                    +  02:CVR-C2          5.53     .120 No_date   12:09   12.66
n/a
     [DT= 1.00]  SUM=  03:CVR-C3         20.73     .154 No_date   12:14   12.66
n/a
 310:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .154 No_date   12:14   12.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.310
      remark:Flow at Cedarview Road Culvert-400mm CSP
 310:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .432 No_date   13:05   10.12
.140
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 310:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .432 No_date   13:05   10.12
n/a
                    +  03:CVR-C3        20.73     .154 No_date   12:14   12.66
n/a
     [DT= 1.00]  SUM=  08:CVR-C4         80.73     .574 No_date   13:05   10.77
n/a
 310:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .574 No_date   13:05   10.77
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.310
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 310:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .082 No_date   12:16   16.66
.231
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 310:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .082 No_date   12:16   16.66
n/a
                    +  08:CVR-C4         80.73     .574 No_date   13:05   10.77
n/a
     [DT= 1.00]  SUM=  09:BDR-C4         84.20     .610 No_date   13:00   11.01
n/a
 310:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .610 No_date   13:00   11.01
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.310
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 310:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .060 No_date   12:14    8.85
.123
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 310:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .060 No_date   12:14    8.85
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .035 No_date   12:54   24.34
.338
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .060 No_date   12:14    8.85
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.310
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 310:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .035 No_date   12:54   24.34
n/a
                    +  02:BDR-C1         4.78     .060 No_date   12:14    8.85
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .077 No_date   12:18   11.55
n/a
 310:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .077 No_date   12:18   11.55
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .020 No_date   12:48   25.33
.352
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .020 No_date   12:48   25.33
n/a
                    +  10:BDR-C2         5.79     .077 No_date   12:18   11.55
n/a
     [DT= 1.00]  SUM=  02:BDR-C3         6.29     .090 No_date   12:32   12.65
n/a
 310:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .090 No_date   12:32   12.65
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.310
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 310:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .610 No_date   13:00   11.01
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.310
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 310:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .090 No_date   12:32   12.65
n/a
                    +  09:BDR-C4        84.20     .610 No_date   13:00   11.01
n/a
     [DT= 1.00]  SUM=  01:FTBD          90.49     .690 No_date   12:54   11.12
n/a
 310:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49     .690 No_date   12:54   11.12
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.310
      remark:Flow to Thomas Bakster Drain
 310:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .016 No_date   12:10    4.24
.059
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 310:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .016 No_date   12:10    4.24
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.310
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 310:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .076 No_date   12:23    6.95
.097
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 310:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .076 No_date   12:23    6.95
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0045---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .051 No_date   12:58   24.93
.346
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 310:0046---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .016 No_date   12:10    4.24
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.310
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 310:0047---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .076 No_date   12:23    6.95
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.310
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 310:0048---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .051 No_date   12:58   24.93
n/a
                    +  02:BDR-C5         2.87     .016 No_date   12:10    4.24
n/a
                    +  03:BDR-C6         9.75     .076 No_date   12:23    6.95
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .120 No_date   12:32    8.31
n/a
 310:0049---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .120 No_date   12:32    8.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.310
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 310:0050---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .081 No_date   12:09    9.47
.131
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 310:0051---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .312 No_date   12:23   10.80
.150
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 310:0052---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .053 No_date   14:01    5.16
.072
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 324

************************************************************************




 RUN:COMMAND#
 325:0001---------------------------------------------------------------------
----
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN    = 325 ]
#*********************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*********************************************************************
 325:0002---------------------------------------------------------------------
----
      READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  84.00]
##########################################################################
#          BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                #
##########################################################################
 325:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .318 No_date   12:09   15.77
.188
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 325:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .114 No_date   12:16    6.64
.079
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 325:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .493 No_date   12:18   28.11
.335
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 325:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A2            35.36     .469 No_date   12:34   13.19
.157
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 325:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A7            15.53     .200 No_date   12:44   14.43
.172
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 325:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A2            35.36     .469 No_date   12:34   13.19
n/a
                    +  02:A7            15.53     .200 No_date   12:44   14.43
n/a
                    +  03:A6            11.73     .318 No_date   12:09   15.77
n/a
                    +  04:A4            13.95     .114 No_date   12:16    6.64
n/a
                    +  05:A3            12.71     .493 No_date   12:18   28.11
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28    1.453 No_date   12:20   14.84
n/a
 325:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    1.453 No_date   12:20   14.84
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.325
      remark:Flow at Cambrian Road Culvert-1600mm CSP
```

```
 325:0010----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .593 No_date   12:45   15.77
.188
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 325:0011----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .228 No_date   12:17   13.61
.162
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 325:0012----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A5            12.65     .228 No_date   12:17   13.61
n/a
                    +  03:A8            42.25     .593 No_date   12:45   15.77
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
 325:0013----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.325
      remark:Flow at Cedarview Road Culvert-500mm CSP
 325:0014----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .197 No_date   12:21    9.04
.108
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 325:0015----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A1            18.64     .197 No_date   12:21    9.04
n/a
                    +  04:CVR-C1        54.90     .767 No_date   12:36   15.27
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54     .947 No_date   12:32   13.69
n/a
 325:0016----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54     .947 No_date   12:32   13.69
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.325
      remark:Flow at Cambrain Road Culvert - CR-C2
 325:0017----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .171 No_date   12:09   17.64
.210
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 325:0018----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A10            5.53     .171 No_date   12:09   17.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.325
      remark:Flow at Cedarview Road 450mm CSP Culvert
 325:0019----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .166 No_date   13:25   17.64
.210
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 325:0020----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:CVR-C2         5.53     .171 No_date   12:09   17.64
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.325
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 325:0021----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .166 No_date   13:25   17.64
n/a
                    +  02:CVR-C2         5.53     .171 No_date   12:09   17.64
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
 325:0022----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.325
      remark:Flow at Cedarview Road Culvert-400mm CSP
 325:0023----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A12           60.00     .639 No_date   13:02   14.43
.172
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 325:0024----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A12           60.00     .639 No_date   13:02   14.43
n/a
                    +  03:CVR-C3        20.73     .223 No_date   12:13   17.64
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
 325:0025----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.325
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 325:0026----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .113 No_date   12:16   22.64
.270
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 325:0027----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A15            3.47     .113 No_date   12:16   22.64
n/a
                    +  08:CVR-C4        80.73     .842 No_date   13:03   15.26
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
 325:0028----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.325
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 325:0029----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .091 No_date   12:13   12.83
.153
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 325:0030----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A20            4.78     .091 No_date   12:13   12.83
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0031----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A19            1.01     .048 No_date   12:47   29.85
.355
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0032----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C1         4.78     .091 No_date   12:13   12.83
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.325
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 325:0033----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .048 No_date   12:47   29.85
n/a
                    +  02:BDR-C1         4.78     .091 No_date   12:13   12.83
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
 325:0034----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0035----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A18             .50     .027 No_date   12:41   31.10
.370
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0036----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .027 No_date   12:41   31.10
n/a
                    +  10:BDR-C2         5.79     .118 No_date   12:17   15.80
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
 325:0037----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.325
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 325:0038----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.325
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 325:0039----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .137 No_date   12:22   17.01
n/a
                    +  09:BDR-C4        84.20     .892 No_date   12:57   15.56
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.004 No_date   12:49   15.66
n/a
 325:0040----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.004 No_date   12:49   15.66
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.325
      remark:Flow to Thomas Bakster Drain
 325:0041----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A16            2.87     .029 No_date   12:09    6.64
.079
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 325:0042----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A16            2.87     .029 No_date   12:09    6.64
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.325
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 325:0043----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A17            9.75     .120 No_date   12:21   10.28
.122
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 325:0044----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:A17            9.75     .120 No_date   12:21   10.28
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0045----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .069 No_date   12:50   30.47
.363
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 325:0046----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .029 No_date   12:09    6.64
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.325
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 325:0047----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .120 No_date   12:21   10.28
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.325
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 325:0048----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .069 No_date   12:50   30.47
n/a
                    +  02:BDR-C5         2.87     .029 No_date   12:09    6.64
n/a
                    +  03:BDR-C6         9.75     .120 No_date   12:21   10.28
n/a
      [DT= 1.00]  SUM=  04:BDR-C7        14.12     .188 No_date   12:26   11.68
n/a
 325:0049----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .188 No_date   12:26   11.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.325
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 325:0050----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .121 No_date   12:08   13.61
.162
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 325:0051----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .458 No_date   12:22   15.29
.182
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 325:0052----------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .086 No_date   13:55    7.91
.094
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 349

************************************************************************



 RUN:COMMAND#
 350:0001----------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
```

```
      [NSTORM=   1 ]
      [NRUN  = 350 ]
#*************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #   :  4418403
#*************************************************************************
 350:0002-------------------------------------------------------------------------------
----
      READ STORM
       Filename = STORM.001
       Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT=  93.60]
##########################################################################
#                BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS          #
##########################################################################
 350:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A6            11.73     .408 No_date   12:09   19.88
.212
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 350:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       04:A4            13.95     .163 No_date   12:15    8.89
.095
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 350:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       05:A3            12.71     .604 No_date   12:18   34.13
.365
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
 350:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A2            35.36     .613 No_date   12:33   16.81
.180
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 1.00]
 350:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       02:A7            15.53     .260 No_date   12:43   18.30
.196
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
 350:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A2            35.36     .613 No_date   12:33   16.81
n/a
                     +  02:A7            15.53     .260 No_date   12:43   18.30
n/a
                     +  03:A6            11.73     .408 No_date   12:09   19.88
n/a
                     +  04:A4            13.95     .163 No_date   12:15    8.89
n/a
                     +  05:A3            12.71     .604 No_date   12:18   34.13
n/a
      [DT= 1.00]  SUM=  07:CR-C1         89.28    1.869 No_date   12:20   18.70
n/a
 350:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           07:CR-C1         89.28    1.869 No_date   12:20   18.70
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.350
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 350:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       03:A8            42.25     .762 No_date   12:44   19.88
.212
      [CN= 53.0: N= 3.00]
      [Tp=  .74:DT= 1.00]
 350:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A5            12.65     .298 No_date   12:17   17.34
.185
      [CN= 50.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 350:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A5            12.65     .298 No_date   12:17   17.34
n/a
                     +  03:A8            42.25     .762 No_date   12:44   19.88
n/a
      [DT= 1.00]  SUM=  04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
 350:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.350
      remark:Flow at Cedarview Road Culvert-500mm CSP
 350:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A1            18.64     .270 No_date   12:20   11.83
.126
      [CN= 42.0: N= 3.00]
      [Tp=  .41:DT= 1.00]
 350:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A1            18.64     .270 No_date   12:20   11.83
n/a
                     +  04:CVR-C1        54.90     .989 No_date   12:35   19.30
n/a
      [DT= 1.00]  SUM=  05:CR-C2         73.54    1.236 No_date   12:31   17.40
n/a
 350:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           05:CR-C2         73.54    1.236 No_date   12:31   17.40
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.350
      remark:Flow at Cambrain Road Culvert - CR-C2
 350:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A10            5.53     .216 No_date   12:08   22.04
.236
      [CN= 55.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 350:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A10            5.53     .216 No_date   12:08   22.04
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.350
      remark:Flow at Cedarview Road 450mm CSP Culvert
 350:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A11           15.20     .211 No_date   13:23   22.04
.236
      [CN= 55.0: N= 3.00]
      [Tp= 1.27:DT= 1.00]
 350:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:CVR-C2         5.53     .216 No_date   12:08   22.04
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.350
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 350:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A11           15.20     .211 No_date   13:23   22.04
n/a
                     +  02:CVR-C2         5.53     .216 No_date   12:08   22.04
n/a
      [DT= 1.00]  SUM=  03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
 350:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.350
      remark:Flow at Cedarview Road Culvert-400mm CSP
 350:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A12           60.00     .827 No_date   13:01   18.30
.196
      [CN= 51.0: N= 3.00]
      [Tp=  .95:DT= 1.00]
 350:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A12           60.00     .827 No_date   13:01   18.30
n/a
                     +  03:CVR-C3        20.73     .285 No_date   12:13   22.04
n/a
      [DT= 1.00]  SUM=  08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
 350:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C4.350
      remark:Flow at Cedarview Road Culvert-1200mm CSP
 350:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A15            3.47     .140 No_date   12:15   27.85
.298
      [CN= 61.0: N= 3.00]
      [Tp=  .39:DT= 1.00]
 350:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A15            3.47     .140 No_date   12:15   27.85
n/a
                     +  08:CVR-C4        80.73    1.083 No_date   13:02   19.26
n/a
      [DT= 1.00]  SUM=  09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
 350:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.350
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 350:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A20            4.78     .120 No_date   12:12   16.42
.175
      [CN= 49.0: N= 3.00]
      [Tp=  .32:DT= 1.00]
 350:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A20            4.78     .120 No_date   12:12   16.42
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C1.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A19            1.01     .059 No_date   12:42   34.48
.368
      [XIMP=.00:TIMP=.38]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .55:LGP= 450.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           02:BDR-C1         4.78     .120 No_date   12:12   16.42
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.350
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 350:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A19            1.01     .059 No_date   12:42   34.48
n/a
                     +  02:BDR-C1         4.78     .120 No_date   12:12   16.42
n/a
      [DT= 1.00]  SUM=  10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
 350:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB STANDHYD     01:A18             .50     .032 No_date   12:37   36.18
.387
      [XIMP=.00:TIMP=.46]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP= .30:LGP= 330.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            01:A18             .50     .032 No_date   12:37   36.18
n/a
                     +  10:BDR-C2         5.79     .156 No_date   12:16   19.57
n/a
      [DT= 1.00]  SUM=  02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
 350:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.350
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 350:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      READ HYD           09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C4.350
      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 350:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      ADD HYD            02:BDR-C3         6.29     .181 No_date   12:21   20.89
n/a
                     +  09:BDR-C4        84.20    1.147 No_date   12:56   19.62
n/a
      [DT= 1.00]  SUM=  01:FTBD          90.49    1.286 No_date   12:47   19.70
n/a
 350:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:FTBD          90.49    1.286 No_date   12:47   19.70
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.350
      remark:Flow to Thomas Bakster Drain
 350:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A16            2.87     .041 No_date   12:09    8.89
.095
      [CN= 37.0: N= 3.00]
      [Tp=  .24:DT= 1.00]
 350:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A16            2.87     .041 No_date   12:09    8.89
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.350
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 350:0043---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      CALIB NASHYD       01:A17            9.75     .161 No_date   12:20   13.31
.142
      [CN= 44.0: N= 3.00]
      [Tp=  .42:DT= 1.00]
 350:0044---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
      SAVE HYD           01:A17            9.75     .161 No_date   12:20   13.31
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C6.350
```

```
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB STANDHYD     01:A21            1.50     .085 No_date   12:45   35.43
.379
      [XIMP=.00:TIMP=.43]
      [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
      [Pervious     area: IAper= 4.67:SLPP=1.20:LGP= 750.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=2.00:LGI=   5.:MNI=.013:SCI=   .0]
 350:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           02:BDR-C5         2.87     .041 No_date   12:09    8.89
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C5.350
      Comment  = Flow at Barnsdale Road Culvert-500mm CSP
 350:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     READ HYD           03:BDR-C6         9.75     .161 No_date   12:20   13.31
n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C6.350
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 350:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A21            1.50     .085 No_date   12:45   35.43
n/a                   +  02:BDR-C5         2.87     .041 No_date   12:09    8.89
n/a                   +  03:BDR-C6         9.75     .161 No_date   12:20   13.31
n/a
     [DT= 1.00]  SUM=  04:BDR-C7        14.12     .253 No_date   12:24   14.76
n/a
 350:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .253 No_date   12:24   14.76
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.350
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 350:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .158 No_date   12:08   17.34
.185
      [CN= 50.0: N= 3.00]
      [Tp=  .25:DT= 1.00]
 350:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A13           24.60     .590 No_date   12:22   19.30
.206
      [CN= 52.0: N= 3.00]
      [Tp=  .46:DT= 1.00]
 350:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A14           22.41     .118 No_date   13:52   10.47
.112
      [CN= 40.0: N= 3.00]
      [Tp= 1.50:DT= 1.00]
  ** END OF RUN : 399

************************************************************************************




 RUN:COMMAND#
 400:0001---------------------------------------------------------------------------
----
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 400 ]
#*********************************************************************************
#  Project Name: [Barrhaven-Expansion]    Project Number: [26610]
#  Date        : February 2, 2016
#  Modeller    : [Ivan Dzeparoski - Water Resources Intern]
#  Company     : J. L. Richards & Associates Limited
#  License #    4418403
#*********************************************************************************
 400:0002---------------------------------------------------------------------------
----
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=15.00:SDUR=  24.00:PTOT= 103.20]
################################################################################
#           BARRHAVEN EXPANSION - EXISITNG CONDITION FLOWS                     #
################################################################################
 400:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A6            11.73     .506 No_date   12:08   24.34
.236
      [CN= 53.0: N= 3.00]
      [Tp=  .27:DT= 1.00]
 400:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       04:A4            13.95     .219 No_date   12:14   11.41
.111
      [CN= 37.0: N= 3.00]
      [Tp=  .33:DT= 1.00]
 400:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       05:A3            12.71     .721 No_date   12:17   40.46
.392
      [CN= 67.0: N= 3.00]
      [Tp=  .43:DT= 1.00]
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R.C.-
     CALIB NASHYD       01:A2            35.36     .771 No_date   12:33   20.76
.201
      [CN= 49.0: N= 3.00]
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R.C.-
     CALIB NASHYD       02:A7            15.53     .324 No_date   12:42   22.50
.218
      [CN= 51.0: N= 3.00]
      [Tp=  .72:DT= 1.00]
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R.C.-
     ADD HYD            01:A2            35.36     .771 No_date   12:33   20.76
n/a                   +  02:A7            15.53     .324 No_date   12:42   22.50
n/a                   +  03:A6            11.73     .506 No_date   12:08   24.34
n/a                   +  04:A4            13.95     .219 No_date   12:14   11.41
n/a                   +  05:A3            12.71     .721 No_date   12:17   40.46
n/a
     [DT= 1.00]  SUM=  07:CR-C1         89.28    2.323 No_date   12:19   22.88
n/a
 400:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           07:CR-C1         89.28    2.323 No_date   12:19   22.88
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C1.400
      remark:Flow at Cambrian Road Culvert-1600mm CSP
 400:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       03:A8            42.25     .946 No_date   12:43   24.34
.236
      [CN= 53.0: N= 3.00]
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 400:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A5            12.65     .375 No_date   12:17   21.40
.207
      [CN= 50.0: N= 3.00]
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R.C.-
     ADD HYD            01:A5            12.65     .375 No_date   12:17   21.40
n/a                   +  03:A8            42.25     .946 No_date   12:43   24.34
n/a
     [DT= 1.00]  SUM=  04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
 400:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C1.400
      remark:Flow at Cedarview Road Culvert-500mm CSP
 400:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A1            18.64     .351 No_date   12:19   14.92
.145
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R.C.-
     ADD HYD            01:A1            18.64     .351 No_date   12:19   14.92
n/a                   +  04:CVR-C1        54.90    1.232 No_date   12:34   23.66
n/a
     [DT= 1.00]  SUM=  05:CR-C2         73.54    1.552 No_date   12:30   21.44
n/a
 400:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           05:CR-C2         73.54    1.552 No_date   12:30   21.44
n/a
      fname :C:\RUNS\PRE-DE~1\CR-C2.400
      remark:Flow at Cambrain Road Culvert - CR-C2
 400:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A10            5.53     .266 No_date   12:08   26.79
.260
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R.C.-
     SAVE HYD           01:A10            5.53     .266 No_date   12:08   26.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C2.400
      remark:Flow at Cedarview Road 450mm CSP Culvert
 400:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A11           15.20     .259 No_date   13:22   26.79
.260
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R.C.-
     READ HYD           02:CVR-C2         5.53     .266 No_date   12:08   26.79
n/a
      Filename = C:\RUNS\PRE-DE~1\CVR-C2.400
      Comment  = Flow at Cedarview Road 450mm CSP Culvert
 400:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A11           15.20     .259 No_date   13:22   26.79
n/a                   +  02:CVR-C2         5.53     .266 No_date   12:08   26.79
n/a
     [DT= 1.00]  SUM=  03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
 400:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
      fname :C:\RUNS\PRE-DE~1\CVR-C3.400
      remark:Flow at Cedarview Road Culvert-400mm CSP
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R.C.-
     CALIB NASHYD       01:A12           60.00    1.033 No_date   13:00   22.50
.218
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R.C.-
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n/a                   +  03:CVR-C3        20.73     .352 No_date   12:13   26.79
n/a
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n/a
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R.C.-
     SAVE HYD           08:CVR-C4        80.73    1.346 No_date   13:00   23.60
n/a
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      remark:Flow at Cedarview Road Culvert-1200mm CSP
 400:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A15            3.47     .170 No_date   12:15   33.39
.324
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R.C.-
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n/a                   +  08:CVR-C4        80.73    1.346 No_date   13:00   23.60
n/a
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n/a
 400:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C4.400
      remark:Flow at Barnsdale Road Culvert-1200mm CSP
 400:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       01:A20            4.78     .152 No_date   12:12   20.34
.197
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R.C.-
     SAVE HYD           01:A20            4.78     .152 No_date   12:12   20.34
n/a
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      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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.383
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R.C.-
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n/a
      Filename = C:\RUNS\PRE-DE~1\BDR-C1.400
      Comment  = Flow at Barnsdale Road Culvert-400mm CSP
 400:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A19            1.01     .071 No_date   12:38   39.51
n/a                   +  02:BDR-C1         4.78     .152 No_date   12:12   20.34
n/a
     [DT= 1.00]  SUM=  10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
 400:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
```

```
     SAVE HYD           10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C2.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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.401
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 400:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            01:A18             .50     .038 No_date   12:34   41.38
n/a
                    +  10:BDR-C2         5.79     .198 No_date   12:16   23.68
n/a
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n/a
 400:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           02:BDR-C3         6.29     .229 No_date   12:20   25.09
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C3.400
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 400:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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n/a
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      Comment  = Flow at Barnsdale Road Culvert-1200mm CSP
 400:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     ADD HYD            02:BDR-C3         6.29     .229 No_date   12:20   25.09
n/a
                    +  09:BDR-C4        84.20    1.425 No_date   12:54   24.00
n/a
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n/a
 400:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           01:FTBD          90.49    1.592 No_date   12:45   24.08
n/a
      fname :C:\RUNS\PRE-DE~1\FTBD.400
      remark:Flow to Thomas Bakster Drain
 400:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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.111
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R.C.-
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n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C5.400
      remark:Flow at Barnsdale Road Culvert-500mm CSP
 400:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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.161
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R.C.-
     SAVE HYD           01:A17            9.75     .207 No_date   12:20   16.66
n/a
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      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
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.394
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R.C.-
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n/a
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R.C.-
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n/a
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R.C.-
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n/a
                    +  02:BDR-C5         2.87     .055 No_date   12:08   11.41
n/a
                    +  03:BDR-C6         9.75     .207 No_date   12:20   16.66
n/a
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n/a
 400:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     SAVE HYD           04:BDR-C7        14.12     .326 No_date   12:22   18.14
n/a
      fname :C:\RUNS\PRE-DE~1\BDR-C7.400
      remark:Flow at Barnsdale Road Culvert-400mm CSP
 400:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
R.C.-
     CALIB NASHYD       02:A9             5.08     .198 No_date   12:07   21.40
.207
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R.C.-
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.229
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R.C.-
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.129
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     WARNINGS / ERRORS / NOTES
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   Simulation ended on 2017-09-05     at 14:00:48
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Report to
Rapport au:

Agriculture and Rural Affairs Committee
Comité de l'agriculture et des affaires rurales
29 June 2016 / 29 juin 2016

and Council
et au Conseil
13 July 2016 / 13 juillet 2016

Submitted on May 25, 2016
Soumis le 25 mai 2016

Submitted by
Soumis par:
Susan Jones, Acting Deputy City Manager / Directrice municipale adjointe par intérim, City Operations / Opérations municipales

Contact Person
Personne ressource:
Dixon Weir, General Manager / Directeur général, Environmental Services / Services environnementaux
613-580-2424, x22002 Dixon.Weir@ottawa.ca

Ward: RIDEAU-GOULBOURN (21)
BARRHAVEN (3)

File Number: ACS2016-COS-ESD-0024

SUBJECT: Thomas Baxter Municipal Drain – Appointment of Engineer

OBJET: Drain municipal Thomas Baxter – Nomination d'un ingénieur

REPORT RECOMMENDATIONS

That the Agriculture and Rural Affairs Committee recommend that Council appoint Mr. Andy Robinson, P. Eng of Robinson Consultants Inc. as the engineer of record to prepare a report under Section 78 of the *Drainage Act* to inform Council on the drainage works project, if any, that is required to address the proposed residential subdivision that will outlet into the Thomas Baxter Municipal Drain.

RECOMMANDATIONS DU RAPPORT

Que le Comité de l'agriculture et des affaires rurales recommande au Conseil de nommer M. Andy Robinson, ingénieur de la firme Robinson Consultants Inc., comme ingénieur chargé de rédiger un rapport aux termes de l'article 78 de la *Loi sur le drainage*, afin d'informer le Conseil au sujet du projet de travaux de drainage, le cas échéant, nécessaire pour le lotissement résidentiel proposé dont les eaux pluviales se déverseront dans le drain municipal Thomas Baxter.

BACKGROUND

A developer of lands within the existing watershed of the Thomas Baxter Municipal Drain is proposing a new residential subdivision with stormwater management facilities that will outlet into the Dynes Branch of the Thomas Baxter Municipal Drain.

Staff therefore recommends that Council appoint an engineer to prepare a report under Section 78 of the *Drainage Act* to review proposed residential subdivision and the impact of the proposed establishment of stormwater management facilities within the watershed of the Thomas Baxter Municipal Drain, for Council's consideration.

DISCUSSION

Pursuant to Section 78 of the *Drainage Act*, a report of an Engineer, appointed by Council, is required to address land use changes and potential modifications within the watershed of the Thomas Baxter Municipal Drain. The Dynes Branch of the Thomas Baxter Municipal Drain is located in Rideau-Goulbourn Ward South of Barnsdale Road along Cedarview Road and Brophy Road and Highway 416 and was first constructed in 1967, under a report by Graham, Berman & Associates Ltd., by the former City of Nepean (now Rideau-Goulbourn Ward).

Proposed development within the existing legal watershed of the Thomas Baxter Municipal Drain requires a review and possible update to the 1967 Engineers Report to

reflect the proposed land use changes within the watershed of the drainage works, by a Council-appointed Drainage Engineer in accordance with Section 78 of the *Drainage Act*. A report under Section 78 of the *Drainage Act* will also include a review of the outlet for the surface, subsurface and stormwater management facility waters generated by the development lands.

The watershed of the Thomas Baxter Municipal Drain is adjacent to the watershed of the Hawkins Municipal Drain. The proposed development is assessed into both watersheds. The 1975 Engineers' Report for the Hawkins Municipal Drain is being updated under a separate staff report (ACS2016-COS-ESD-0023).

Staff are recommending the appointment of Mr. Andy Robinson, P.Eng. of Robinson Consultants Inc., as the engineer of record as he has over 40 years experience with similar *Drainage Act* projects, a specialized field of engineering in Ontario.

This report has no tax or budget implications. All costs associated with the engineer's report will be initially paid by the Surface Water Branch of the City but eventually recovered from the proponents. The estimated cost of the initial review by the Drainage Engineer is $25,000. Additional costs are expected if the Engineer determines that modifications and improvements to the drainage works are required. However, these would be assessed back to all benefiting landowners. Funding is available in the 2016 Approved Rate Supported Capital Budget, Municipal Drains Program.

The *Drainage Act* prescribes the process and timelines that must be followed for any modification or construction of a municipal drain.

Schedule for the Thomas Baxter Municipal Drain

Should the Agricultural and Rural Affairs Committee and Council approve the appointment of the Engineer, Mr. Andy Robinson P. Eng. of Robinson Consultants Inc., the anticipated schedule will be as follows:

- Council appointment of Engineer to prepare a report for Council's consideration – June 2016
- Preparation of engineer's report – June 2016 to December 2016
- Submission of engineer's report and staff report containing staff's recommendation to Council – December 2016
- Consideration of report and Council decision under Section 78 based on implications and evaluation in the engineer's report and staff's recommendation to Council – December 2016

- Court of Revision – January 2017
- Drainage Tribunal 40 day appeal period – Q1 of 2017

RURAL IMPLICATIONS

The proposed subdivision will benefit from this undertaking through improved drainage, storm water management and reduced risk of flooding.

CONSULTATION

Consultation with the Ward Councillors, and City staff is ongoing.

COMMENTS BY THE WARD COUNCILLOR(S)

The Ward Councillors are aware of this report.

LEGAL IMPLICATIONS

For the reasons that follow, there are no legal impediments to the implementation of the recommendation in this report.

The outlet for the surface, subsurface and stormwater management facility waters generated by the development lands is a drain that is subject to an existing engineer's report under the Drainage Act and the City has a legislated duty to maintain and repair all drains under Drainage Act (Sections 78 and 79 of the Drainage Act).

The City may be liable for any damages incurred by owners of land within the watershed of the Thomas Baxter Municipal Drain if the City fails to appoint an engineer under Section 78 of the *Drainage Act* to prepare a report evaluating whether the proposed change in use of lands justifies any improvements to the drainage works and/or a variation of the assessments for maintenance and repair of the drainage works under the 1967 Engineer's Report.

If the drainage engineer appointed under Section 78 reports that a drainage works project is required to address the proposed land use changes and establishment of stormwater management facilities within the watershed of the Thomas Baxter Municipal Drain, the existing 1967 drainage engineer's report will need to be updated and new schedules of assessment produced for the following:

i. the construction of the required improvements, and

ii. the future maintenance and repair of the drainage works.

RISK MANAGEMENT IMPLICATIONS

There are no risk implications associated with this report.

FINANCIAL IMPLICATIONS

This report has no tax or budget implications. The estimated cost of the initial review by the Drainage Engineer is $25,000. Additional costs are expected if the Engineer determines that modifications and improvements to the drainage works are required. However, these would be assessed back to all benefiting landowners. Funding is available in the 2016 Approved Rate Supported Capital Budget, Municipal Drains Program. Once approved by Council, a separate new internal order will be created for this specific drain and all necessary funding will be transferred to it.

ACCESSIBILITY IMPACTS

There are no accessibility impacts associated with this report.

ENVIRONMENTAL IMPLICATIONS

The drainage works are associated with final approval of the subdivision. Any proposed works will require compliance with City, provincial and federal policies, standards, regulations and legislation.

TERM OF COUNCIL PRIORITIES

The proposed drainage works will fulfill the City’s Strategic Plan’s environment and infrastructure protection priorities.

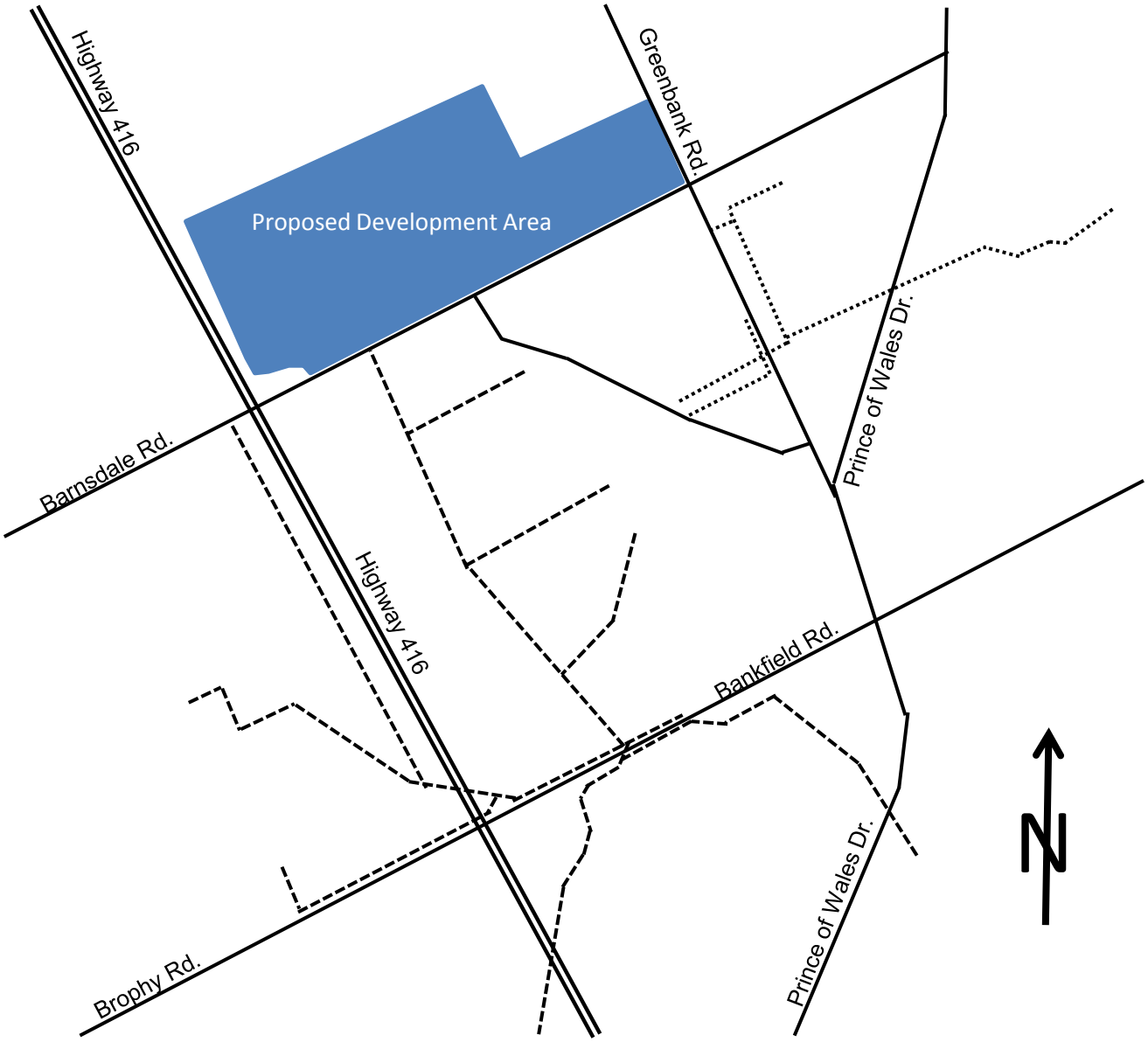
SUPPORTING DOCUMENTATION

Document 1 – Location Plan

DISPOSITION

The Drainage Superintendent shall notify all affected landowners and the local conservation authority of the decision of Council.

Location Plan



Road
Highway 416
Thomas Baxter Municipal Drain
Hawkins Municipal Drain
Proposed Development Area

Report to
Rapport au:

Agriculture and Rural Affairs Committee
Comité de l'agriculture et des affaires rurales
29 June 2016 / 29 juin 2016

and Council
et au Conseil
13 July 2016 / 13 juillet 2016

Submitted on May 25, 2016
Soumis le 25 mai 2016

Submitted by
Soumis par:
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Ward: RIDEAU-GOULBOURN (21)
BARRHAVEN (3)

File Number: ACS2016-COS-ESD-0023

SUBJECT: Hawkins Municipal Drain – Appointment of Engineer

OBJET: Drain municipal Hawkins – Nomination d'un ingénieur

REPORT RECOMMENDATIONS

That the Agriculture and Rural Affairs Committee recommend that Council appoint Mr. Andy Robinson, P. Eng of Robinson Consultants Inc. as the engineer of record to prepare a report under Section 78 of the *Drainage Act* to inform Council on the drainage works project, if any, that is required to address the proposed residential subdivision that will outlet into the Hawkins Municipal Drain.

RECOMMANDATIONS DU RAPPORT

Que le Comité de l'agriculture et des affaires rurales recommande au Conseil de nommer M. Andy Robinson, ingénieur de la firme Robinson Consultants Inc., comme ingénieur chargé de rédiger un rapport aux termes de l'article 78 de la *Loi sur le drainage*, afin d'informer le Conseil au sujet du projet de travaux de drainage, le cas échéant, nécessaire pour le lotissement résidentiel proposé dont les eaux pluviales se déverseront dans le drain municipal Hawkins.

BACKGROUND

A developer of lands within the existing watershed of the Hawkins Municipal Drain is proposing a new residential subdivision with stormwater management facilities that will outlet into Branch A of the Hawkins Municipal Drain.

Staff therefore recommends that Council appoint an engineer to prepare a report under Section 78 of the *Drainage Act* to review proposed the proposed residential subdivision within the Hawkins Municipal Drain watershed and the impact of the proposed establishment of stormwater management facilities that will outlet into the watershed of the Hawkins Municipal Drain, for Council's consideration.

DISCUSSION

Pursuant to Section 78 of the *Drainage Act*, a report of an Engineer, appointed by Council, is required to address land use changes and potential modifications within the watershed of the Hawkins Municipal Drain. The Hawkins Municipal Drain is located in Rideau-Goulbourn Ward east of Highway 416 near the intersection of Greenbank Road and Barnsdale Road and was first constructed in 1975, under a report by Kostuch Engineering Limited, by the former City of Nepean (now Rideau-Goulbourn Ward).

Proposed development within the existing legal watershed of the Hawkins Municipal Drain requires a review and possible update to the 1975 Engineers Report to reflect the proposed land use changes within the watershed of the drainage works, by a Council-

appointed Drainage Engineer in accordance with Section 78 of the *Drainage Act*. A report under Section 78 of the *Drainage Act* will also include a review of the outlet for the surface, subsurface and stormwater management facility waters generated by the development lands.

The watershed of the Hawkins Municipal Drain is adjacent to the watershed of the Thomas Baxter Municipal Drain. The proposed development is assessed into both watersheds. The 1967 Engineers' Report for the Thomas Baxter Municipal Drain is being updated under a separate staff report (ACS2016-COS-ESD-0024).

Staff are recommending the appointment of Mr. Andy Robinson, P.Eng. of Robinson Consultants Inc., as the engineer of record as he has over 40 years experience with similar *Drainage Act* projects, a specialized field of engineering in Ontario.

This report has no tax or budget implications. All costs associated with the engineer's report will be initially paid by the Surface Water Branch of the City but eventually recovered from the proponents. The estimated cost of the initial review by the Drainage Engineer is $25,000. Additional costs are expected if the Engineer determines that modifications and improvements to the drainage works are required. However, these would be assessed back to all benefiting landowners. Funding is available in the 2016 Approved Rate Supported Capital Budget, Municipal Drains Program.

The *Drainage Act* prescribes the process and timelines that must be followed for any modification or construction of a municipal drain.

Schedule for the Hawkins Municipal Drain

Should the Agricultural and Rural Affairs Committee and Council approve the appointment of the Engineer, Mr. Andy Robinson P. Eng. of Robinson Consultants Inc., the anticipated schedule will be as follows:

- Council appointment of Engineer to prepare a report for Council's consideration – June 2016
- Preparation of engineer's report – June 2016 to December 2016
- Submission of engineer's report and staff report containing staff's recommendation to Council – December 2016
- Consideration of report and Council decision under Section 78 based on implications and evaluation in the engineer's report and staff's recommendation to Council – December 2016
- Court of Revision – January 2017

- Drainage Tribunal 40 day appeal period – Q1 of 2017

RURAL IMPLICATIONS

The proposed subdivision will benefit from this undertaking through improved drainage, storm water management and reduced risk of flooding.

CONSULTATION

Consultation with the Ward Councillors, and City staff is ongoing.

COMMENTS BY THE WARD COUNCILLOR(S)

The Ward Councillors are aware of this report.

LEGAL IMPLICATIONS

For the reasons that follow, there are no legal impediments to the implementation of the recommendation in this report.

The outlet for the surface, subsurface and stormwater management facility waters generated by the development lands is a drain that is subject to an existing engineer's report under the *Drainage Act* and the City has a legislated duty to maintain and repair all drains under *Drainage Act* (Sections 78 and 79 of the *Drainage Act*).

The City may be liable for any damages incurred by owners of land within the watershed of the Hawkins Municipal Drain if the City fails to appoint an engineer under Section 78 of the *Drainage Act* to prepare a report evaluating whether the proposed change in use of lands justifies any improvements to the drainage works and/or a variation of the assessments for maintenance and repair of the drainage works under the 1975 Engineer's Report.

If the drainage engineer appointed under Section 78 reports that a drainage works project is required to address the proposed land use changes and establishment of stormwater management facilities within the watershed of the Hawkins Municipal Drain, the existing 1975 drainage engineer's report will need to be updated and new schedules of assessment produced for the following:

i. the construction of the required improvements, and

ii. the future maintenance and repair of the drainage works.

RISK MANAGEMENT IMPLICATIONS

There are no risk implications associated with this report.

FINANCIAL IMPLICATIONS

This report has no tax or budget implications. The estimated cost of the initial review by the Drainage Engineer is $25,000. Additional costs are expected if the Engineer determines that modifications and improvements to the drainage works are required. However, these would be assessed back to all benefiting landowners. Funding is available in the 2016 Approved Rate Supported Capital Budget, Municipal Drains Program. Once approved by Council, a separate new internal order will be created for this specific drain and all necessary funding will be transferred to it.

ACCESSIBILITY IMPACTS

There are no accessibility impacts associated with this report.

ENVIRONMENTAL IMPLICATIONS

The drainage works are associated with final approval of the subdivision. Any proposed works will require compliance with City, provincial and federal policies, standards, regulations and legislation.

TERM OF COUNCIL PRIORITIES

The proposed drainage works will fulfill the City’s Strategic Plan’s environment and infrastructure protection priorities.

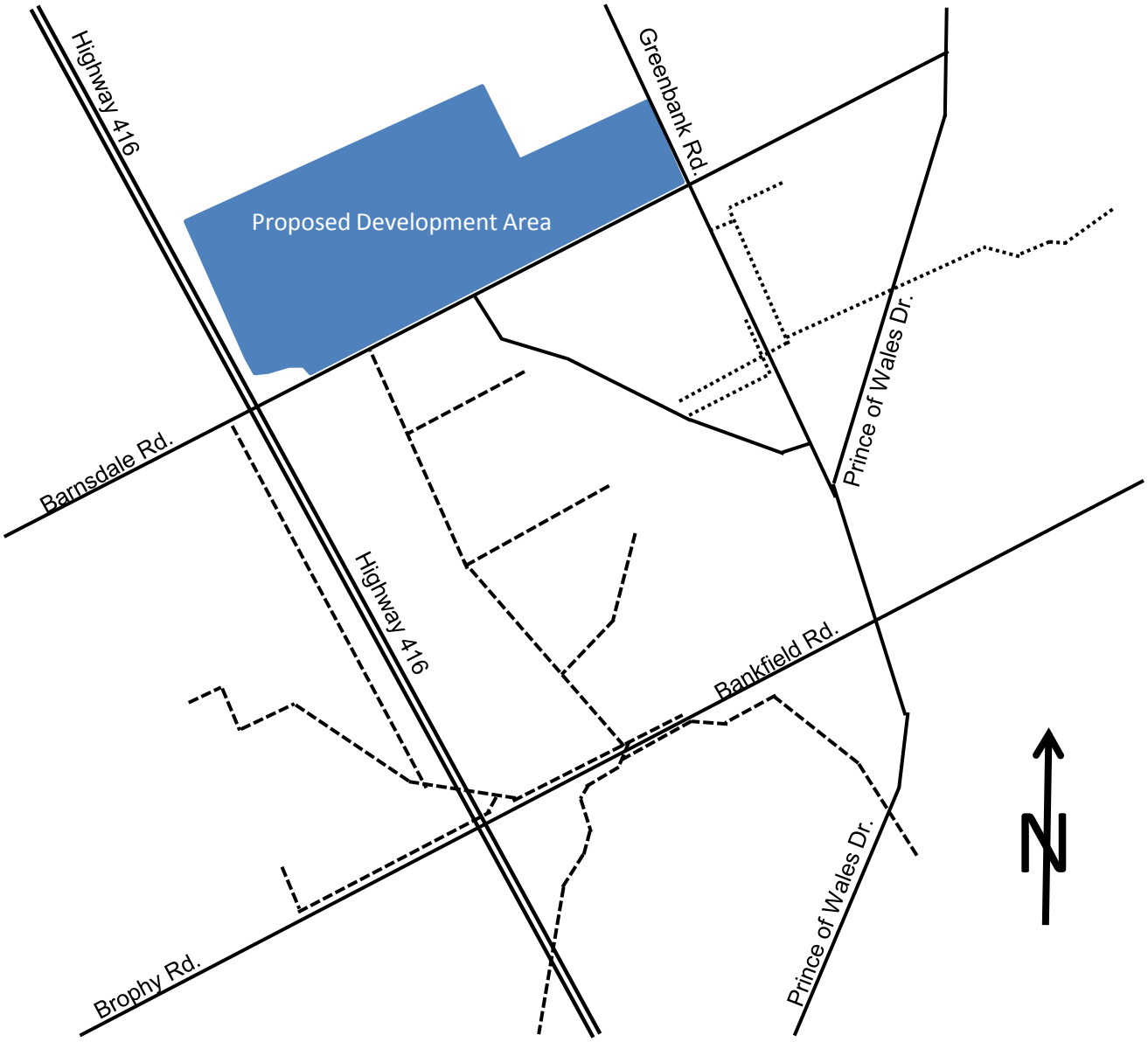
SUPPORTING DOCUMENTATION

Document 1 – Location Plan

DISPOSITION

The Drainage Superintendent shall notify all affected landowners and the local conservation authority of the decision of Council.

Location Plan



Road
Highway 416
Thomas Baxter Municipal Drain
Hawkins Municipal Drain
Proposed Development Area

APPENDIX 'B3'

WATER BUDGET ANALYSIS

EXISTING CONDITION REPORT – APPENDIX B3
PCSWMM WATER BUDGET MODEL DESCRIPTION

MINTO COMMUNITIES INC. & MATTAMY HOMES LTD.
BARRHAVEN SOUTH URBAN EXPANSION AREA

The tables below describe the parameters and values used for the water balance modeling in PCSWMM. In some cases values are required to be entered which, in this specific model scenario, are not used but must still be entered. Where a value does not affect the model or is not used the row is in grey.

1.0 CATCHMENTS

Parameter	Units	Description
Name	-	The name of the subcatchment. Format used is generally *Overland Outlet_Groundwater Outlet_Max Infiltration Value*.
Tag	-	The watercourse which the overland flow will discharge to.
Rain Gauge	-	The Storm used in the model simulation. In this case OTTRAIN is the name for the continuous simulation time series used.
Outlet	-	The downstream major system node to which the subcatchment drains
Area	ha	The area is calculated internally by PCSWMM
Width / Flow Length	m	Flow path lengths for the subcatchments were identified based on the GIS flow path analysis and the longest length through the subcatchment selected as the flow path. The width is then internally calculated in PCSWMM from the flow path length and drainage area.
Slope	%	Averaged from the GIS analysis of the LiDAR surface data.
Imperv	%	Area weighted value from the SWMHYMO model parameters.
N Imperv	-	A constant of 0.02 is selected as the Manning's N for impervious surfaces such as roads.
N Perv	-	A constant of 0.25 is selected as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).

Parameter	Units	Description
DStore Imperv	mm	A constant of 1.57 mm is used as the impervious depression storage as per the City of Ottawa Sewer Design Guidelines 2012 Section 5.4.5.4.
DStore Perv	mm	The value is area weighted from the SWMHYMO model parameters.
Zero Imperv	%	Used to represent areas where there is no depression storage in impervious areas such as water bodies. Not used in this model.
Subarea Routing	-	All catchments are completely drained to the outlet. The parameter would be used if any impervious areas were being drained via a storm sewer system.
Percent Routed	%	Used to determine the percent of sub-area being routed as per the parameter above. In this case 100% is going to the outlet.
Maximum Infiltration Rate	mm/hr	The maximum rate on the Horton Infiltration Curve, taken from the conversion of the Paterson field tested Hydraulic Conductivity values.
Minimum Infiltration Rate	mm/hr	The minimum rate on the Horton Infiltration Curve. This rate is based on the soil type assumed from the Paterson field testing.
Decay Constant	hr^{-1}	City of Ottawa standard value of 4.14 used.
Drying Time	days	The time for a fully saturated soil to completely dry is set at 7 days.
Maximum Volume	mm	The maximum volume of runoff which can be infiltrated and no limit has been applied in this model.

Curb length, LID Controls and Erosion parameters are not used in the model. Curb length relates to pollution control, there are no LID controls in the pre development scenario and there is no application of soil sediment loss in the model.

2.0 SNOWMELT

Parameter	Units	Description
Dividing Temperature	°C	The temperature below which precipitation will fall as snow. Generally accepted as being 0°C. **Value: 0**

Parameter	Units	Description
Snow Capture Factor	Fraction	It is assumed that the data from Environment Canada has captured all snowfall in the gauges. This factor can be used to increase snowfall where the gauges may not be accurate. **Value: 1.0**
ATI Weight	Fraction	Applied over the entire subwatershed, the ATI weighting factor is an indication of the thickness of the surface layer of snow. A low value will indicate a thicker surface layer with weighting to temperatures over the previous week while a value closer to 0.5 will indicate a normal surface layer. The lower the ATI Weight the snow will cool and warm more slowly. A value of 0.5 has been found to give reasonable results in watersheds and has been used here. **Value: 0.5**
Negative Melt Ratio	Fraction	The effect of the heat transfer during non-melt periods and the standard value is used. **Value 0.6**
Elevation above MS	m	The elevation will affect atmospheric pressure for the melt calculations. **Value: 107**
Latitude	°	The latitude will dictate the sunrise and sunset times in temperature calculations. **Value: 45.0**
Longitude Correction	minutes	Used to correct for in separation of the position of site versus the meridian of the standard time zone. This will have negligible effects. **Value: 0**
Melt Coefficients	mm/hr/°C	The Melt Coefficient has been taken from the AES snowmelt equations for southern Ontario (MNR Technical Guide Flooding Hazard Limit, 2002). The AES equations have a melt coefficient of 3.66 mm/day/°C for mean daily air temperatures. This equates to 0.1525 mm/hr/°C. **Value: 0.153**
Base Temperature	°C	The base temperature at which the snowpack will melt has been assumed as 0°C. A lower value could be used for rooftops where there will be heat transfer through the roof. **Value: 0**

Parameter	Units	Description
Fraction Free Water Capacity	Fraction	Since snow is considered a porous medium some of the melt water may be contained within the snow pack. The fraction of the free water capacity is the fraction of the snow pack void space which will retain meltwater. This fraction is normally less than 0.1 and 0.05 has been used here to represent a deep snowpack. A value of 0.25 may represent a shallow slush layer. **Value: 0.05**
Initial Snow Depth	mm	The initial snow depth on the site is considered as zero. **Value: 0**
Initial Free Water	mm	Since there is no initial snow depth the initial free water has also been considered as zero. **Value: 0**
Depth at 100% Cover	mm	The snowmelt model assumes that there will always be a depth of snow above which there will be 100% coverage of the snow, even in areas which may be affected by shading, drifting of topography. Typical depths are 25 mm to 100 mm. Since the area is relatively open with limited shading then the lower end of the value range has been used. **Value: 25**
Areal Depletion	Fraction	The areal depletion curve represents the area of snow cover for depths of the snow less than the depth at 100% coverage. Natural areal depletion curves are suggested by the software and are used here.

No parameters were used related to mechanical snow removal as it is assumed that there are no snow removal operations on the BSUEA currently.

3.0 GROUNDWATER

3.1 Groundwater Parameters

<table>
<tr><th>Parameter</th><th>Units</th><th>Description</th></tr>
<tr><td>Aquifer Name</td><td>-</td><td>Name of the aquifer representing soil conditions. Four Aquifers were created based on different soil conditions from OSG mapping. Only two of the aquifers are used within the study area.
<table>
<tr><th>Aquifer</th><th>Description</th><th>Clay content (%)</th><th>Sand content (%)</th></tr>
<tr><td>A</td><td>Sand</td><td>5</td><td>92</td></tr>
<tr><td>B</td><td>Sandy Loam</td><td>10</td><td>65</td></tr>
<tr><td>C (not used)</td><td>Sandy Clay Loam</td><td>28</td><td>60</td></tr>
<tr><td>D (not used)</td><td>Clay Loam</td><td>34</td><td>33</td></tr>
</table></td></tr>
<tr><td>Receiving Node</td><td>-</td><td>Name of the receiving node for groundwater outflow to baseflow. This is based on the groundwater subwatershed delineation.</td></tr>
<tr><td>Surface Elevation</td><td>m</td><td>Elevation of the ground surface for the subcatchment was averaged from the Patterson report.
Value: 107</td></tr>
<tr><td>Coefficients</td><td></td><td>The coefficients were set for the saturated groundwater zone to represent a storage reservoir where outflow is linear proportional to the water table depth without surface water interaction. It was considered that the nearest open water channels were sufficiently far to have negligible impact on groundwater levels. The groundwater equation used is:
$f_G = A1\ (d_L - h_{sw})$
Where:
f_G = groundwater flow
d_L = depth of the lower saturated subsurface zone
h_{sw} = height of surface water above the bottom of the groundwater zone
A1 = Calibration factor (estimated at 0.05)
Value: 0.05</td></tr>
<tr><td>Surface Water Depth</td><td>m</td><td>Set as 0.5 metres to allow flow from the water table to surrounding watercourses.
Value: 0.5</td></tr>
</table>

Parameter	Units	Description
Initial Elevation	m	Initial elevation of the water table **Value: 95.5**
		All other parameters used as per the receiving node or aquifer

3.2 Aquifer Parameters

Parameter	Units	Description / Values
Porosity	Fraction	The following values were used for the volumetric water content of the soil at saturation (i.e. volume of water per total volume): **Soil Group** / **A** / **B** / **C** / **D** Porosity / 0.436 / 0.450 / 0.432 / 0.472 *(Source: SPAW Calculator)*
Wilting Point	Fraction	This is soil moisture contact at which plants cannot obtain sufficient moisture from the soil to meet transpiration requirements and they will die. It is roughly equivalent to the moisture content of soil at 15 atmospheres. The following values were used: **Soil Group** / **A** / **B** / **C** / **D** Wilting Point / 0.050 / 0.081 / 0.183 / 0.213 *(Source: SPAW Calculator)*
Field Capacity	Fraction	Considered to be the amount of water a well-drained soil holds after free water has drained off. The following values were used: **Soil Group** / **A** / **B** / **C** / **D** Field Capacity / 0.094 / 0.179 / 0.283 / 0.350 *(Source: SPAW Calculator)*
Conductivity	mm/hr	Within the Aquifer Parameters, the soil saturated conductivity is a governing parameter of the percolation rate between the upper unsaturated soil layer and the lower saturated soil layer. This is not the same as any hydraulic conductivity used for the surface infiltration. The values have been selected from the SPAW calculator and are: **Soil Group** / **A** / **B** / **C** / **D** Conductivity (mm/hr) / 114 / 50.3 / 7.8 / 4.6 *(Source: SPAW Calculator)*

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Conductivity Slope</td><td>-</td><td>Conductivity slope measures the rate at which a soil's hydraulic conductivity decreases with decreasing moisture content. Regression analysis has shown it can be estimated with the following relationship:

Conductivity Slope = 0.48(% Sand) + 0.85(% Clay)

Based on this relationship the following values were used:

<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Conductivity Slope</td><td>48</td><td>40</td><td>53</td><td>45</td></tr>
</table>
</td></tr>
<tr><td>Tension Slope</td><td></td><td>Used for backward compatibility in the software and not used in this model</td></tr>
<tr><td>Upper Evaporation Factor</td><td>Fraction</td><td>This factor determines the fraction of available subsurface evaporation rate used in the upper subsurface zone (compared to the lower subsurface zone). A higher evaporation rate is associated with looser soils, lower water table elevations and shallow root zones. It was assumed that in all soils 80% of the available subsurface evaporation would be used in the upper zone due to the depth of the water table.

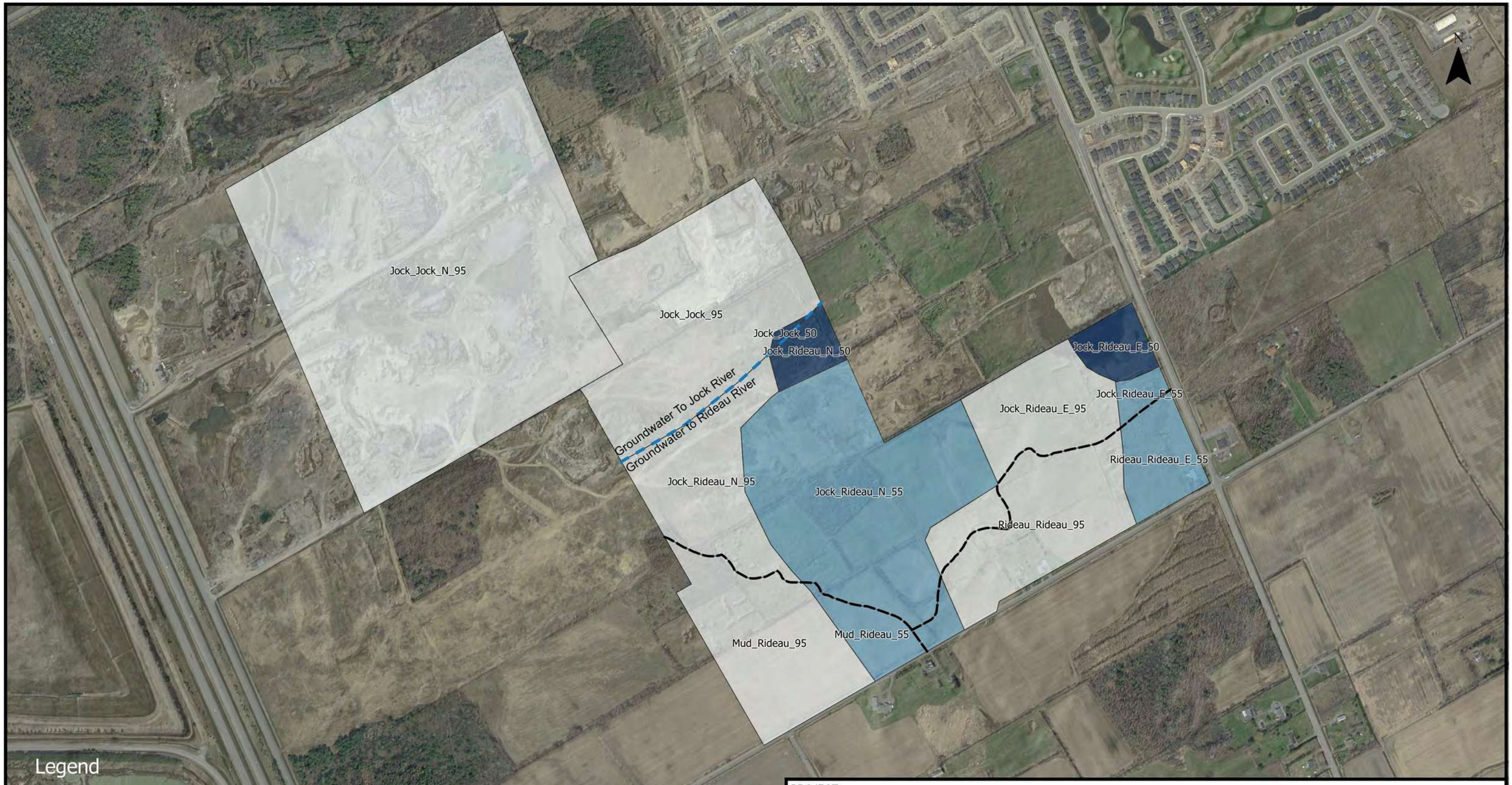
Value: 0.8</td></tr>
<tr><td>Lower Evaporative Depth</td><td>m</td><td>The depth of the lower subsurface zone which can be used for evapotranspiration should be approximate to the expected average depth of root penetration. The following values were used:

<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Evaporative Depth (m)</td><td>1.5</td><td>2.4</td><td>3.0</td><td>5.2</td></tr>
</table>
(Source: Shah et al 2007 from EPA 2015)</td></tr>
<tr><td>Lower Groundwater Loss Rate</td><td>mm/hr</td><td>This is the rate of percolation from the lower subsurface zone to a deep aquifer and is approximate to the rate at which the water table elevation will drop over a prolonged dry period. The saturated hydraulic conductivity of a compacted clay soil was used in all cases.

Value: 0.004</td></tr>
<tr><td>Bottom Elevation</td><td>m</td><td>The elevation of the bedrock as averaged from the Patterson 2016 report.

Value: 85</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Unsaturated Zone Moisture</td><td></td><td>The moisture content of the unsaturated upper subsurface zone at the start of the simulation. Cannot be less than the wilting point and cannot be more that porosity. Assumed to be an approximate value between the wilting point and porosity fractions.
<table>
<tr><th>Soil Group</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>Evaporative Depth (m)</td><td>0.25</td><td>0.22</td><td>0.32</td><td>0.35</td></tr>
</table>
</td></tr>
</table>



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

PCSWMM WATER BALANCE SUBCATCHMENTS

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN: BP	JLR NO: 26610
DRAWN: BP	DRAWING NO: **Figure C-1**
CHECKED: BP	

MMAH Supplementary Standard SB-6

Percolation Time and Soil Descriptions

September 14, 2012

COMMENCEMENT

MMAH Supplementary Standard SB-6 comes into force on the 1st day of January, 2014.

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SB-6 Percolation Time and Soil Descriptions

ESTIMATION OF PERCOLATION TIME

(a) The purpose of this Section and the associated Tables and Charts is to provide assistance to those who must decide on the percolation time(s) to be used in design. Suggested relationships between percolation time, coefficient of permeability and soils of various types are given. IT MUST BE EMPHASIZED THAT, PARTICULARLY FOR FINE GRAINED SOILS, THERE IS NO CONSISTENT RELATIONSHIP DUE TO THE MANY FACTORS INVOLVED. The following guidance is presented for the soil types outlined in the Unified Soil Classification System (Table 1). In order to assess a particular soil.
  (i) Table 2 and Table 3 - Approximate relationship of soil types to permeability and percolation time.
  (ii) Charts 1 to 14 - Typical grain size distribution curves for soil types in the Unified Soil Classification System.

(b) In Table 2 and Table 3, a range of values of "K" and of "T" are given for various soil descriptions. The principal modifiers which will influence selection of a "T" value within the range given are:
  (i) The structure - "massive" fine-grained soils have high values of "T".
  (ii) The density - For a given soil higher density produces a higher value of "T".
  (iii) The percentage of clay - the higher the percentage the higher the value of "T".
  (iv) The mineralogy of the clay portion - The more it "swells" the higher the value of "T".
  (v) The plasticity of the soil - The higher the plasticity index the higher the value of "T".
  (vi) Liquid Limit - the higher the liquid limit the higher the value of "T".
  (vii) Organic content - The presence of fine organic particles, detectable by colouration and odour, can significantly reduce the permeability and raise the value of "T".

Table 1
Unified Soil Classification

Coarse - Grained Soils		Fine - Grained Soils	
Group Symbols	Typical Names	Group Symbols	Typical Names
GW	Well-graded gravels, gravel-sand mixtures, little or no fines	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
GM	Silty gravels, gravel-sand-silt mixtures	OL	Organic silts and organic silty clays of low plasticity
GC	Clayey gravels, gravel-sand-clay mixtures	MH	Inorganic silts, micoceous or diatomaceous fine sandy or silty soils, elastic silts
SW	Well-graded sands, gravelly sands, little or no fines	CH	Inorganic clays of high plasticity, fat clays
SP	Poorly-graded sands, gravelly sands, little or no fines	OH	Organic clays of medium to high plasticity, organic silts
SM	Silty sands, sand-silt mixtures		
SC	Clayey sands, sand-clay mixtures	PT (highly organic soils)	Peat and other highly organic soils
Column 1	2	3	4

Table 2
Approximate Relationship of Coarse Grained Soil Types to Permeability and Percolation Time

Soil Type (Unified Soil Classification) Coarse Grained More than 50% Larger than #200	Coefficient of Permeability, K - cm/sec	Percolation Time, T - mins/cm	Comment
G.W. - Well graded gravels, gravel-sand mixtures, little or no fines.	10^{-1}	<1	very permeable unacceptable
G.P. - Poorly graded gravels, gravel-sand mixtures, little or no fines.	10^{-1}	<1	very permeable unacceptable
G.M. - Silty gravels, gravel-sand-silt mixtures.	10^{-2} - 10^{-4}	4 - 12	Permeable to medium permeable depending on amount of silt.
G.C. - Clayey gravels, gravel-sand-clay mixtures.	10^{-4} - 10^{-6}	12 - 50	Important to estimate amount of silt and clay
S.W. - Well graded sands, gravelly sands little or no fines.	10^{-1} - 10^{-4}	2 - 12	medium permeability
S.P. - Poorly graded sands, gravelly sand, little or no fines.	10^{-1} - 10^{-3}	2 - 8	medium permeability
S.M. - Silty sands, sand-silt mixtures.	10^{-3} - 10^{-5}	8 - 20	medium to low permeability
S.C. - Clayey sands, sand-clay mixtures.	10^{-4} - 10^{-6}	12 - 50	medium to low permeability depending on amount of clay
Column 1	2	3	4

Table 3
Approximate Relationship of Coarse Grained Soil Types to Permeability and Percolation Time

Soil Type (Unified Soil Classification) Fine Grained More than 50% Passing #200	Coefficient of Permeability, K - cm/sec	Percolation Time, T - mins/cm	Comment
M.L. - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, clayey silts with slight plasticity	10^{-5} - 10^{-6}	20 - 50	medium to low permeability
C.L. - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	10^{-6} and less	over 50	unacceptable
O.L. - Organic silts, organic silty clays of low plasticity; liquid limit less than 50	10^{-5} and less	20 - over 50	acceptable depends on clay content
M.H. - Inorganic silts, micareaous or diatomageous fine sandy or silty soils, elastic silts	10^{-6} and less	over 50	unacceptable
C.H. - Inorganic clays of medium to high plasticity, organic silts	10^{-7} and less	over 50	unacceptable
O.H. - Organic clays of medium to high plasticity organic silt; liquid limit over 50	10^{-6} and less	over 50	unacceptable
Column 1	2	3	4

SELECTION OF "T" TIME FROM THE ABOVE TABULATION

A range of "T" times for each soil type is shown above. Select from within this range by determining if the soil is within the low, middle or high part of the range considering the soil identifiers and soil characteristics. Consider structure, density, colour, prevalence or organics, the clay content and mineralogy, the plasticity index and liquid limit and the functioning of existing systems in similar soils in the area.

Notes:

The following Ministry of the Environment Reports provide further information on the relationship between grain size, coefficient of permeability and percolation time.

1. "Study on the Feasibility of Correlating Percolation Time with Laboratory Permeability" - 1975 - Research Report No. S56 by H. T. Chan, PhD., P.Eng.

2. "Study of Conventional Tile Fields in Fine-Grained Soils" - 1979 Research Report 74 by H. T. Chan, PhD., P.Eng.

Horton Equation

One of the oldest and most widely used infiltration equations was developed by Horton (1939). This equation was used in this study to compare the measured equation parameters with published literature values. The equation is as follows:

$$f = f_c + (f_o - f_c)e^{-kt} \quad (1\text{-}1)$$

where:
f= infiltration capacity (in/hr),
f_o = initial infiltration capacity (in/hr),
f_c = final infiltration capacity (in/hr),
k = empirical constant (hr^{-1})

This equation assumes that the rainfall intensity is greater than the infiltration capacity at all times and that the infiltration rate decreases with time (Bedient and Huber 1992). The capacity of the soil decreases as the time of the storm increases because the pores in the soil become saturated with water and do not allow water to continuously infiltrate through the surface (Bedient and Huber 1992). The Horton equation's major drawback is that it does not consider storage availability in the soil after varying amounts of infiltration have occurred, but only considers infiltration as a function of time (Akan 1993).

It is recommended that f_c, f_o, and k all be obtained through field data, but they are rarely measured locally. More commonly, they are determined through calibration of relatively complex stormwater drainage models, or by using values published in the literature. The use of published values in place of reliable field data is the cause of much concern by many (Akan 1993). The following lists include commonly used Horton infiltration parameter values:

Soil Type	f_o (in/hr)
Dry sandy soils with little to no vegetation	5
Dry loam soils with little to no vegetation	3
Dry clay soils with little to no vegetation	1
Dry sandy soils with dense vegetation	10
Dry loam soils with dense vegetation	6
Dry clay soils with dense vegetation	2
Moist sandy soils with little to no vegetation	1.7
Moist loam soils with little to no vegetation	1
Moist clay soils with little to no vegetation	0.3
Moist sandy soils with dense vegetation	3.3
Moist loam soils with dense vegetation	2
Moist clay soils with dense vegetation	0.7

Soil Type	f_c mm/hr	(in/hr)	k (1/min)
Clay loam, silty clay loams	0–1.3	(0–0.05)	0.069
Sandy clay loam	1.3–3.8	(0.05–0.15)	0.069
Silt loam, loam	3.8–7.6	(0.15–0.30)	0.069
Sand, loamy sand, sandy loams	7.6–11.4	(0.30–0.45)	0.069

Source: Akan 1993.

The above k values are not divided into categories, with only a single value used for all conditions (Akan 1993). The units of the k value are listed as 1/min instead of 1/hr because the time steps commonly used in urban hydrology are measured in minutes, while the infiltration rates are commonly measured in units of inches per hour. These values will be compared to the measured values obtained during this study by calibrating the Horton equation.

BARRHAVEN SOUTH EXPANSION AREA
EXISTING CONDITION - PCSWMM WATER BALANCE MODEL
January 2017

	Name	Jock_Jock_50	Jock_Jock_71	Jock_Jock_N_71	Jock_Rideau_E_50	Jock_Rideau_E_52	Jock_Rideau_E_71	Jock_Rideau_N_50	Jock_Rideau_N_52	Jock_Rideau_N_71	Jock_Rideau_S_71	Mud_Rideau_52	Mud_Rideau_71	Rideau_Rideau_71	Rideau_Rideau_E_52	Rideau_Rideau_S_52
INPUT PARAMETERS	Tag	Jock	Jock	Jock	Jock	Jock	Jock	Jock	Jock	Jock	Jock	Mud	Mud	Rideau	Rideau	Rideau
	Rain Gage	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN	OTTRAIN
	Outlet	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Jock_River	Mud_Creek	Mud_Creek	Rideau_River	Rideau_River	Rideau_River
	Area (ha)	0.1481	16.3882	46.5183	1.7974	0.7394	5.4548	1.5272	17.3901	7.3243	1.3141	1.9861	8.7617	7.9425	3.0763	0.6559
	Width (m)	76.482	487.719	445.943	101.918	99.938	203.828	137.029	324.07	205.716	142.299	176.652	254.197	200.409	182.801	81.033
	Flow Length (m)	19.364	336.017	1043.144	176.357	73.986	267.618	111.451	536.615	356.039	92.348	112.43	344.681	396.314	168.287	80.942
	Slope (%)	1	5	5	1	1	1	1	1	5	1	5	1	1	1	1
	Imperv. (%)	0	0	0	0	0	0	0	0	0	0	0.001	0	0	0	0
	N Imperv	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N Perv	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Dstore Imperv (mm)	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
	Dstore Perv (mm)	16.4	16.848	16.884	8.8	8.8	8.8	16.4	11.425	15.101	8.8	9.4	9.4	7.713	7.5	8.3
	Zero Imperv (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Subarea Routing	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
	Percent Routed (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Curb Length	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Snow Pack	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa	Existing_OpenSpa
	Max. Infil. Rate (mm/hr)	49.9	71.1	71.1	49.9	51.6	71.1	49.9	51.6	71.1	71.1	51.6	71.1	71.1	51.6	51.6
	Min. Infil. Rate (mm/hr)	5.5	9	9	5.5	6	9	5.5	6	9	9	6	9	9	6	6
	Decay Constant (1/hr)	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	Drying Time (days)	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Groundwater	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Aquifer Name	C	A	A	C	B	A	C	B	A	A	B	A	A	B	B
	Receiving Node	Jock_River	Jock_River	Jock_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River	Rideau_River
	Surface Elevation (m)	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107
	A1 Coefficient	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	B1 Exponent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	A2 Coefficient	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	B2 Exponent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	A3 Coefficient	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Surface Water Depth (m)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Threshold Water Table Elev. (m)	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99
	Bottom Elevation (m)	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99
	Initial Elevation (m)	95.5	96.5	98	95.5	95.5	95.5	95.5	97	98	97	97	98.5	95.5	95	95.5
	Initial Moisture (fraction)	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99
RESULTS	Precipitation (mm)	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1	26026.1
	Runon (mm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Evaporation (mm)	58.89	14.67	14.67	58.21	45.77	14.33	59.74	48.57	14.5	14	45.59	14.33	14.33	46.46	45.62
	Infiltration (mm)	25911.9	26007.26	26012.53	25881.3	25870.3	25995.28	25941.06	25962.91	26004.46	25978.81	25865.73	25999.65	25996.52	25887.81	25866.77
	Runoff Depth (mm)	158.95	18.71	8.91	145.9	190.48	35.02	74.17	46.03	22.37	66.75	209.25	27.4	30.62	149.23	194.33
	Runoff Volume (ML)	0.24	3.07	4.15	2.62	1.41	1.91	1.13	8	1.64	0.88	4.16	2.4	2.43	4.59	1.27
	Peak Runoff (m^3/s)	0.01	0.56	0.65	0.11	0.06	0.18	0.09	0.44	0.26	0.08	0.16	0.23	0.2	0.18	0.05
	Runoff Coefficient	0.006	0.001	0	0.006	0.007	0.001	0.003	0.002	0.001	0.003	0.008	0.001	0.001	0.006	0.007
	GW Evaporation (mm)	15573.57	15586.29	15586.29	15574.07	15578.61	15586.42	15572.76	15576.58	15586.29	15586.58	15578.51	15586.42	15586.42	15578.29	15578.84
	GW Seepage (mm)	516.1	516.1	516.1	516.1	516.1	516.1	516.1	516.1	516.1	516.1	516.1	516.11	516.1	516.09	516.1
	GW Outflow (mm)	9695.45	9863.8	10134.55	9664.82	9206.33	9674.97	9724.42	9628.48	10126.81	9924.67	9533.76	10210.57	9676.12	9112.84	9202.69
	GW Max. Outflow (m^3/s)	0	0.74	5.28	0	0	0	0	1.21	0.83	0.09	0.14	1.19	0	-0.07	0
	GW Avg. Moisture	0.33	0.27	0.27	0.33	0.27	0.27	0.33	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
	GW Avg. Table (m)	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5
	GW Final Moisture	0.33	0.27	0.27	0.33	0.27	0.27	0.33	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
	GW Final Table (m)	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5

APPENDIX 'B4'

WASTEWATER SERVICING

Existing `Critical' Downstream Sanitary Sewers

Area:

BARRHAVEN SOUTH
MASTER SERVICING STUDY

DATE: 11/28/2014
REVISION: 1
DESIGNED BY: LP
CHECKED BY: DT

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 163400999

Colour code:
Hard coded values
Caculated value
Value from subdivision design
Most US MH
Estimated value
MH receiving flow from 2 or more sewers

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 L/p/day	MINIMUM VELOCITY	0.60 m/s	As per CDP (units/ha)	
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 L/ha/day	MAXIMUM VELOCITY	3.00 m/s	LOW DENSITY RESIDENTIAL	26
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 L/ha/day	MANNINGS n	0.013	SEMI-DETACHED	52
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 L/ha/day	BEDDING CLASS	B	TOWN HOUSES	82
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 L/ha/day	MINIMUM COVER	2.50 m	APARTMENTS	120
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 L/s/ha			COMMUNITY CORE	60
PERSONS / APARTMENT	1.8					AVERAGE PERSONS/ha	107

LOCATION				RESIDENTIAL AREA AND POPULATION										COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER		FROM M.H.	TO M.H.	DEV AREA (ha)	DEV POP	ADD'N RES AREA (ha)	ADD'N POP	TOTAL AREA (ha)	TOTAL POP	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	SLOPE (%)	CAP. (FULL) (L/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
MSS-A-23		MA11	MA10	0.00	0	14.23	1,523	14.23	1,523	14.23	1,523	3.67	22.6	0.00	0.00	0.00	0.00	0.00	0.00	2.80	2.80	2.50	2.50	2	19.53	19.53	5.5	30.1	482.1	300	PVC	0.75	87.6	34%	1.20	1.08
MSS-A-22		**MA10**	MH57A	0.00	0	12.81	1371	12.81	1,371	27.04	2,894	3.46	40.6	0.00	0.00	0.00	0.00	0.00	0.00	7.22	10.02	14.49	16.99	8.7	34.52	54.05	15.1	64.4	449.7	375	PVC	0.40	115.1	56%	1.01	1.04
Realigned Greenbank Road																																			
MSS-A-21		MA14	MA13	0.00	0	4.79	513	4.79	513	4.79	513	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	7.45	7.45	0.00	0.00	6.5	12.24	12.24	3.4	18.2	295.0	250	PVC	1.30	71.4	25%	1.40	1.12
N-4		**MA13**	MH57A	0.00	0	10.99	1176	10.99	1,176	15.78	1,689	3.64	24.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.45	0.53	0.53	6.5	11.52	23.76	6.7	38.1	413.1	375	PVC	0.30	100.3	38%	0.88	0.81
Cambrian Road																																			
N-5		MH57A	MH13A	0.00	0	4.29	458	4.29	458	4.29	5,041	3.24	66.2	3.44	3.44	0.00	0.00	0.00	0.00	0.00	17.47	0.00	17.52	18.2	7.73	85.54	24.0	108.4	216.5	500	CPP	0.25	188.2	58%	0.96	1.00
N-2		**MH13A**	MH15A	6.18	631	0.03	3	6.21	634	10.50	5,675	3.19	73.3	0.00	3.44	0.00	0.00	0.00	0.00	0.00	17.47	0.00	17.52	18.2	6.21	91.75	25.7	117.2	165.2	500	CPP	0.20	168.6	70%	0.86	0.94
N-6		**MH15A**	MH17A	5.59	868	0.02	2	5.61	870	16.11	6,545	3.13	83.0	0.00	3.44	0.00	0.00	0.00	0.00	0.00	17.47	0.00	17.52	18.2	5.61	97.36	27.3	128.5	202.0	600	CPP	0.13	230.7	56%	0.79	0.81
River Mist Road																																			
MSS-A-18	Stantec	MH163	162	6.51	543	0.00	0	6.51	543	6.51	543	3.96	8.7	0.00	0.00	0.00	0.00	0.00	0.00	2.77	2.77	0.90	0.90	2.4	10.18	10.18	2.9	14.0	36.3	200	PVC	1.15	35.8	39%	1.12	1.04
	Stantec	162	161	0.00	0	0.00	0	0.00	0	6.51	543	3.96	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	0.00	10.18	2.9	14.0	87.2	250	PVC	1.15	67.3	21%	1.32	1.00
	Stantec	161	EX151	0.00	0	0.00	0	0.00	0	6.51	543	3.96	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	0.00	10.18	2.9	14.0	75.6	250	PVC	1.15	67.3	21%	1.32	1.00
	Stantec	EX151	MH142	0.00	0	0.00	0	0.00	0	6.51	543	3.96	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	0.00	10.18	2.9	14.0	44.4	300	PVC	1.40	119.0	12%	1.63	1.08
N-14	Stantec	**MH142**	EX139	8.23	825	0.96	102	9.19	927	15.70	1,470	3.69	22.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	9.19	19.37	5.4	29.8	74.8	300	PVC	0.40	63.5	47%	0.87	0.85
	Stantec	EX139	EX136	0.00	0	0.00	0	0.00	0	15.70	1,470	3.69	22.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	0.00	19.37	5.4	29.8	64.7	300	PVC	0.40	63.5	47%	0.87	0.85
	Stantec	EX136	MH126	0.00	0	0.00	0	0.00	0	15.70	1,470	3.69	22.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.90	2.4	0.00	19.37	5.4	29.8	78.9	300	PVC	0.41	64.2	46%	0.88	0.86
N-15	Stantec	**MH126**	EX123	16.46	954	0.00	0	16.46	954	32.16	2,424	3.52	34.6	0.00	0.00	0.00	0.00	0.00	0.00	2.06	4.83	0.00	0.90	4.2	18.52	37.89	10.6	49.4	71.3	375	PVC	0.45	122.0	40%	1.07	1.01
	Stantec	EX123	MH112	0.00	0	0.00	0	0.00	0	32.16	2,424	3.52	34.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	0.00	37.89	10.6	49.4	90.3	375	PVC	0.42	118.6	42%	1.04	0.99
N-16	Stantec	**MH112**	EX102	8.33	689	0.00	0	8.33	689	40.49	3,113	3.43	43.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	8.33	46.22	12.9	60.4	68.0	375	PVC	0.31	101.5	60%	0.89	0.93
	Stantec	EX102	EX101	0.00	0	0.00	0	0.00	0	40.49	3,113	3.43	43.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	0.00	46.22	12.9	60.4	34.0	375	PVC	0.29	98.0	62%	0.86	0.91
	IBI	EX101	MH43A	0.00	0	0.00	0	0.00	0	40.49	3,113	3.43	43.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	0.00	46.22	12.9	60.4	38.0	375	PVC	0.30	100.3	60%	0.88	0.92
N-12	IBI	**MH43A**	MH44A	6.56	352	0.00	0	6.56	352	47.05	3,465	3.39	47.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	6.56	52.78	14.8	66.6	81.0	375	PVC	0.30	100.3	66%	0.88	0.95
	IBI	MH44A	MH45A	0.00	0	0.00	0	0.00	0	47.05	3,465	3.39	47.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	0.00	52.78	14.8	66.6	64.0	375	PVC	0.30	100.3	66%	0.88	0.95
	IBI	MH45A	MH46A	0.00	0	0.00	0	0.00	0	47.05	3,465	3.39	47.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	0.90	4.2	0.00	52.78	14.8	66.6	85.0	375	PVC	0.30	100.3	66%	0.88	0.95
N-10	IBI	**MH46A**	MH47A	8.40	562	0.00	0	8.40	562	55.45	4,027	3.33	54.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	1.60	2.50	4.2	10.00	62.78	17.6	76.1	41.0	375	PVC	0.30	100.3	76%	0.88	0.98
	DSEL	MH47A	MH101A	0.00	0	0.00	0	0.00	0	55.45	4,027	3.33	54.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	2.50	4.2	0.00	62.78	17.6	76.1	64.0	375	PVC	0.30	100.3	76%	0.88	0.98
	DSEL	MH101A	MH102A	0.00	0	0.00	0	0.00	0	55.45	4,027	3.33	54.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	2.50	4.2	0.00	62.78	17.6	76.1	64.0	375	PVC	0.30	100.3	76%	0.88	0.98
N-7	DSEL	**MH102A**	MH17A	4.03	291	1.21	129	5.24	420	60.69	4,447	3.29	59.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	0.00	2.50	4.2	5.24	68.02	19.0	82.5			PVC	0.30	100.3	82%	0.88	0.99
Cambrian Road																																			
N-3		MH17A	MH21A	26.01	1956	0.00	0	26.01	1,956	102.81	12,948	2.84	149.0	0.00	3.44	0.00	0.00	0.00	0.00	2.96	25.26	5.10	25.12	24.9	34.07	199.45	55.8	229.7	204.3	750	CPP	0.13	419.5	55%	0.92	0.94
N-8		**MH21A**	MH45	7.04	408	0.00	0	7.04	408	109.85	13,356	2.83	153.1	0.00	3.44	0.00	0.00	0.00	0.00	0.00	25.26	2.89	28.01	24.9	9.93	209.38	58.6	236.6	277.8	750	CPP	0.13	419.5	56%	0.92	0.95
Greenbank Road																																			
MSS-A-14	IBI	MH205A	MH98A	0.00	0	20.99	2246	20.99	2,246	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	20.99	20.99	5.9	38.2	126.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH98A	MH99A	0.00	0	0.00	0	0.00	0	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	20.99	5.9	38.2	125.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH99A	MH100A	0.00	0	0.00	0	0.00	0	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	20.99	5.9	38.2	108.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH100A	MH204A	0.00	0	0.00	0	0.00	0	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	20.99	5.9	38.2	105.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH204A	MH206A	0.00	0	0.00	0	0.00	0	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	20.99	5.9	38.2	103.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH206A	MH97A	0.00	0	0.00	0	0.00	0	20.99	2,246	3.55	32.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	20.99	5.9	38.2	125.0	600	CPP	0.25	321.2	12%	1.10	0.73
N-13, N-13-R	IBI	**MH97A**	MH96A	19.89	1625	0.06	6	19.95	1,631	40.94	3,877	3.35	52.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.81	0.0	20.76	41.75	11.7	64.3	98.0	600	CPP	0.30	350.4	18%	1.20	0.89
	IBI	MH96A	MH95A	0.00	0	0.00	0	0.00	0	40.94	3,877	3.35	52.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	0.00	41.75	11.7	64.3	129.0	600	CPP	0.30	350.4	18%	1.20	0.89
	IBI	MH95A	MH201A	0.00	0	0.00	0	0.00	0	40.94	3,877	3.35	52.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	0.00	41.75	11.7	64.3	123.0	600	CPP	0.30	350.4	18%	1.20	0.89
N-11, N-11-R	IBI	**MH201A**	MH201B	12.13	787	0.00	0	12.13	787	53.07	4,664	3.27	61.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	12.13	53.88	15.1	76.9	124.0	600	CPP	0.30	350.4	22%	1.20	0.94
	IBI	MH201B	MH200A	0.00	0	0.00	0	0.00	0	53.07	4,664	3.27	61.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	0.00	53.88	15.1	76.9	68.0	600	CPP	0.30	350.4	22%	1.20	0.94
	IBI	MH200A	MH200C	0.00	0	0.00	0	0.00	0	53.07	4,664	3.27	61.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	0.00	53.88	15.1	76.9	48.0	600	CPP	0.50	452.6	17%	1.55	1.12
	IBI	MH200C	MH45	0.00	0	0.00	0	0.00	0	53.07	4,664	3.27	61.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.0	0.00	53.88	15.1	76.9	26.0	600	CPP	0.12	221.9	35%	0.76	0.68
MSS-A-15		MH45	MH435A	0.00	0	5.12	548	5.12	548	168.04	18,568	2.68	201.6	0.00	3.44	0.00	0.00	0.00	0.00	0.00	25.26	0.00	28.82	24.9	5.12	268.38	75.1	301.6	296.6	900	CPP	0.10	597.0	51%	0.91	0.91
North																																			
MSS-A-9		MA9	MA8	0.00	0	22.23	2378	22.23	2,378	22.23	2,378	3.53	34.0	0.00	0.00	0.00	0.00	0.00	0.00	2.45	2.45	9.54	9.54	2.1	34.22	34.22	9.6	45.7	507.5	450	CPP	0.11	98.4	46%	0.60	0.59
MSS-A-8		**MA8**	MA7	0.00	0	2.88	308	2.88	308	25.11	2,686	3.48	37.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.78	10.32	2.1	3.66	37.88	10.6	50.6	317.1	450	CPP	0.11	98.4	51%	0.60	0.60
MSS-A-7		**MA7**	MA6	0.00	0	18.50	1979	18.50	1,979	43.61	4,665	3.27	61.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.00	10.32	2.1	18.50	56.38	15.8	79.7	573.1	450	CPP	0.11	98.4	81%	0.60	0.67
MSS-A-6		**MA6**	MA5	0.00	0	21.68	2320	21.68	2,320	65.29	6,985	3.11	88.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.00	10.32	2.1	21.68	78.06	21.9	112.0	473.9	525	CPP	0.10	140.5	80%	0.63	0.71
MSS-A-5		**MA5**	MA4	0.00	0	9.53	1020	9.53	1,020	74.82	8,005	3.05	98.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.00	10.32	2.1	9.53	87.59	24.5	125.5	439.4	525	CPP	0.10	140.5	89%	0.63	0.72
MSS-A-4		**MA4**	MH521A	0.00	0	8.07	863	8.07	863	82.89	8,868	3.01	108.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	2.42	12.74	2.1	10.49	98.08	27.5	137.7	530.7	525	CPP	0.10	140.5	98%	0.63	0.73
N-1		**MH521A**	MH522A	3.29	177	0.51	54	3.80	231	86.69	9,099	3.00	110.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.02	12.76	2.1	3.82	101.90	28.5	141.2	49.9	600	CPP	0.10	201.5	70%	0.69	0.75
		MH522A	MH435A	0.00	0	0.00	0	0.00	0	86.69	9,099	3.00	110.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	0.00	12.76	2.1	0.00	101.90	28.5	141.2	11.1	600	CPP	0.10	201.5	70%	0.69	0.75
		MH435A	MH501A	0.00	0	0.00	0	0.00	0	254.73	27,667	2.51	281.3	0.00	3.44	0.00	0.00	0.00	0.00	0.00	27.71	0.00	41.58	27.0	0.00	370.28	103.7	412.0	13.3	900	CPP	0.10	597.0	69%	0.91	0.99

Cambrian:
51.4 L/s res. cap

River Mist:
17.8 L/s res. cap*

Greenbank:
295.4 L/s res. cap

*Note that Quinn's Pointe (JLR, 2015) conveys 3.4 L/s additional flow to River Mist sewer than was originally allocated as part of the 2014 Draft BSMSSA
Therefore, residual capacity MH 102A - MH117A = 17.8 L/s - 3.4 L/s = 14.4 L/s

Refer to Stantec Sanitary Sewer System (FIG 3-5), for critical sanitary sewer locations

BARRHAVEN SOUTH
MASTER SERVICING STUDY

DATE: 11/28/2014
REVISION: 1
DESIGNED LP
CHECKED AP

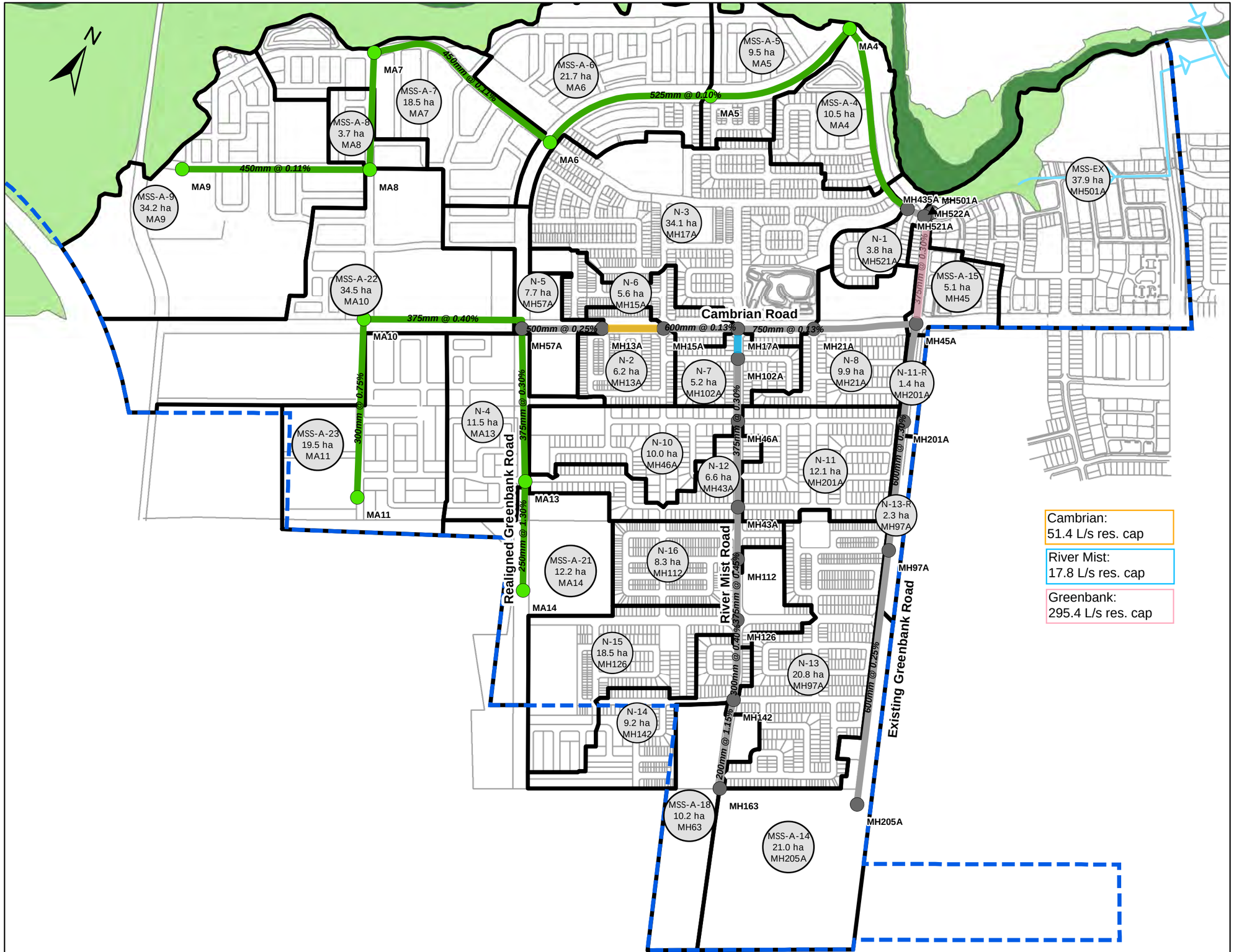
SANITARY SEWER DESIGN SHEET

PIPE DESIGN

FILE NUME 163400999

Colour code:
Hard coded values
Caculated value
Value from subdivision design
Most US MH
Estimated value
MH receiving flow from 2 or more sewers

LOCATION				CALCULATED VALUES			UPSTREAM				DOWNSTREAM			
AREA ID NUMBER		FROM M.H.	TO M.H.	ACTUAL PIPE SIZE (mm)	AREA (m^2)	HYDR. RADIUS	GROUND ELEVATION (m)	OBVERT ELEVATION (m)	INVERT ELEVATION (m)	U/S COVER (m)	GROUND ELEVATION (m)	OBVERT ELEVATION (m)	INVERT ELEVATION (m)	D/S COVER (m)
MSS-A-23		**MA11**	MA10	305.00	0.073	0.076	100.00	95.000	94.700	5.00	93.50	91.384	91.296	2.12
MSS-A-22		**MA10**	MH57A	381.00	0.114	0.095	93.50	91.324	90.949	2.18	93.60	89.525	89.410	4.07
														^ must be above 88.01
Realigned Greenbank Road														
MSS-A-21		**MA14**	MA13	254.00	0.051	0.064	103.00	96.100	95.850	6.90	95.00	92.265	92.194	2.74
N-4		**MA13**	MH57A	381.00	0.114	0.095	95.00	89.500	89.125	5.50	93.60	88.261	88.161	5.34
														^ must be above plug @
Cambrian Road														
N-5		**MH57A**	MH13A	500.00	0.196	0.125	93.60	88.010	87.510	5.59	95.00	87.469	87.281	7.53
N-2		**MH13A**	MH15A	500.00	0.196	0.125	95.00	87.469	86.969	7.53	95.00	87.139	86.970	7.86
N-6		**MH15A**	MH17A	610.00	0.292	0.152	95.00	87.139	86.539	7.86	97.00	86.876	86.645	10.12
River Mist Road														
MSS-A-18	Stantec	**MH163**	162	203.00	0.032	0.050	100.00	96.000	95.797	4.00	99.55	95.580	95.380	3.97
	Stantec	162	161	254.00	0.051	0.064	99.55	95.580	95.330	3.97	98.55	94.580	94.327	3.97
	Stantec	161	EX151	254.00	0.051	0.064	98.55	94.540	94.292	4.00	97.88	93.670	93.423	4.21
	Stantec	EX151	MH142	305.00	0.073	0.076	97.88	93.670	93.373	4.21	97.48	93.050	92.752	4.42
N-14	Stantec	**MH142**	EX139	305.00	0.073	0.076	97.48	93.030	92.732	4.44	96.84	92.730	92.433	4.11
	Stantec	EX139	EX136	305.00	0.073	0.076	96.84	92.710	92.411	4.13	96.66	92.450	92.152	4.21
	Stantec	EX136	MH126	305.00	0.073	0.076	96.66	91.650	91.350	5.01	96.85	91.320	91.024	5.53
N-15	Stantec	**MH126**	EX123	381.00	0.114	0.095	96.85	91.330	90.959	5.52	96.41	91.010	90.639	5.39
	Stantec	EX123	MH112	381.00	0.114	0.095	96.41	90.990	90.616	5.42	96.22	90.610	90.236	5.61
N-16	Stantec	**MH112**	EX102	381.00	0.114	0.095	96.22	90.590	90.213	5.63	95.71	90.380	90.003	5.33
	Stantec	EX102	EX101	381.00	0.114	0.095	95.71	90.360	89.984	5.35	95.69	90.260	89.884	5.43
	IBI	EX101	MH43A	381.00	0.114	0.095	95.69	90.259	89.884	5.43	95.60	90.084	89.709	5.52
N-12	IBI	**MH43A**	MH44A	381.00	0.114	0.095	95.60	90.064	89.689	5.54	95.50	89.820	89.445	5.68
	IBI	MH44A	MH45A	381.00	0.114	0.095	95.50	89.800	89.425	5.70	95.00	89.598	89.223	5.40
	IBI	MH45A	MH46A	381.00	0.114	0.095	95.00	89.588	89.213	5.41	94.20	89.333	88.958	4.87
N-10	IBI	**MH46A**	MH47A	381.00	0.114	0.095	94.20	89.313	88.938	4.89	94.20	89.175	88.800	5.03
	DSEL	MH47A	MH101A	381.00	0.114	0.095	94.20	89.175	88.800	5.03	94.20	88.983	88.608	5.22
	DSEL	MH101A	MH102A	381.00	0.114	0.095	94.20	88.963	88.588	5.24	93.80	88.771	88.396	5.03
N-7	DSEL	**MH102A**	MH17A	381.00	0.114	0.095	93.80	88.687	88.312	5.11	93.40	88.445	88.070	4.96
Cambrian Road														
N-3		**MH17A**	MH21A	762.00	0.456	0.190	97.00	86.876	86.126	10.12	95.00	86.436	86.017	8.56
N-8		**MH21A**	MH45	762.00	0.456	0.190	95.00	86.436	85.686	8.56	94.50	86.400	85.650	8.10
Greenbank Road														
MSS-A-14	IBI	**MH205A**	MH98A	610.00	0.292	0.152	97.80	90.770	90.170	7.03	97.40	90.455	89.855	6.95
	IBI	MH98A	MH99A	610.00	0.292	0.152	97.40	90.433	89.833	6.97	96.90	90.120	89.520	6.78
	IBI	MH99A	MH100A	610.00	0.292	0.152	96.90	90.095	89.495	6.81	96.60	89.825	89.225	6.77
	IBI	MH100A	MH204A	610.00	0.292	0.152	96.60	89.793	89.193	6.81	96.20	89.530	88.930	6.67
	IBI	MH204A	MH206A	610.00	0.292	0.152	96.20	89.507	88.907	6.69	95.80	89.250	88.650	6.55
	IBI	MH206A	MH97A	610.00	0.292	0.152	95.80	89.250	88.650	6.55	95.40	88.938	88.338	6.46
N-13, N-13-R	IBI	**MH97A**	MH96A	610.00	0.292	0.152	95.40	88.928	88.328	6.47	95.20	88.633	88.033	6.57
	IBI	MH96A	MH95A	610.00	0.292	0.152	95.20	88.633	88.033	6.57	95.00	88.246	87.646	6.75
	IBI	MH95A	MH201A	610.00	0.292	0.152	95.00	88.246	87.646	6.75	94.50	87.877	87.277	6.62
N-11, N-11-R	IBI	**MH201A**	MH201B	610.00	0.292	0.152	94.50	87.877	87.277	6.62	94.70	87.504	86.904	7.20
	IBI	MH201B	MH200A	610.00	0.292	0.152	94.70	87.500	86.900	7.20	94.40	87.297	86.697	7.10
	IBI	MH200A	MH200C	610.00	0.292	0.152	94.40	87.231	86.631	7.17	94.80	86.991	86.391	7.81
	IBI	MH200C	MH45	610.00	0.292	0.152	94.80	86.991	86.391	7.81	94.50	86.395	85.795	8.11
MSS-A-15		**MH45**	MH435A	914.00	0.656	0.228	94.50	86.395	85.495	8.11	92.00	86.098	85.501	5.90
North														
MSS-A-9		**MA9**	MA8	457.00	0.164	0.114	92.75	88.828	88.378	3.92	92.35	88.270	88.172	4.08
MSS-A-8		**MA8**	MA7	457.00	0.164	0.114	92.35	88.210	87.760	4.14	92.90	87.861	87.763	5.04
MSS-A-7		**MA7**	MA6	457.00	0.164	0.114	92.90	87.801	87.351	5.10	93.90	87.171	87.073	6.73
MSS-A-6		**MA6**	MA5	533.00	0.223	0.133	93.90	87.111	86.586	6.79	93.50	86.637	86.497	6.86
MSS-A-5		**MA5**	MA4	533.00	0.223	0.133	93.50	86.577	86.052	6.92	92.00	86.138	85.998	5.86
MSS-A-4		**MA4**	MH521A	533.00	0.223	0.133	92.00	86.078	85.553	5.92	92.00	85.547	85.407	6.45
N-1		**MH521A**	MH522A	610.00	0.292	0.152	92.00	85.527	84.927	6.47	92.00	85.477	85.276	6.52
		MH522A	MH435A	610.00	0.292	0.152	92.00	85.477	84.877	6.52	92.00	85.466	85.265	6.53
		MH435A	MH501A	914.00	0.656	0.228	92.00	85.406	84.506	6.59	92.00	85.393	84.796	6.61



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Stantec

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Legend

- BARRHAVEN SOUTH COMMUNITY BOUNDARY
- EXISTING NODES
- PROPOSED NODES
- EXISTING SEWERS
- PROPOSED SEWERS
- EXISTING SEWERS (FROM 2007 MSS)
- RIVER
- 100 YEAR FLOOD PLAIN
- SANITARY CATCHMENTS
- Area Name / Area (ha) / Manhole — SANITARY CATCHMENT INFORMATION

Revision	By	Appd.	YY.MM.DD
1 ISSUED FOR MSS ADDENDUM	LP	AP	14.11.28

File Name: 163400999-SAN-Figure3-5.MXD	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	LP	AP	LP	14.11.28

Permit-Seal

Client/Project
CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM
Ottawa, ON

Title
SANITARY SEWER SYSTEM

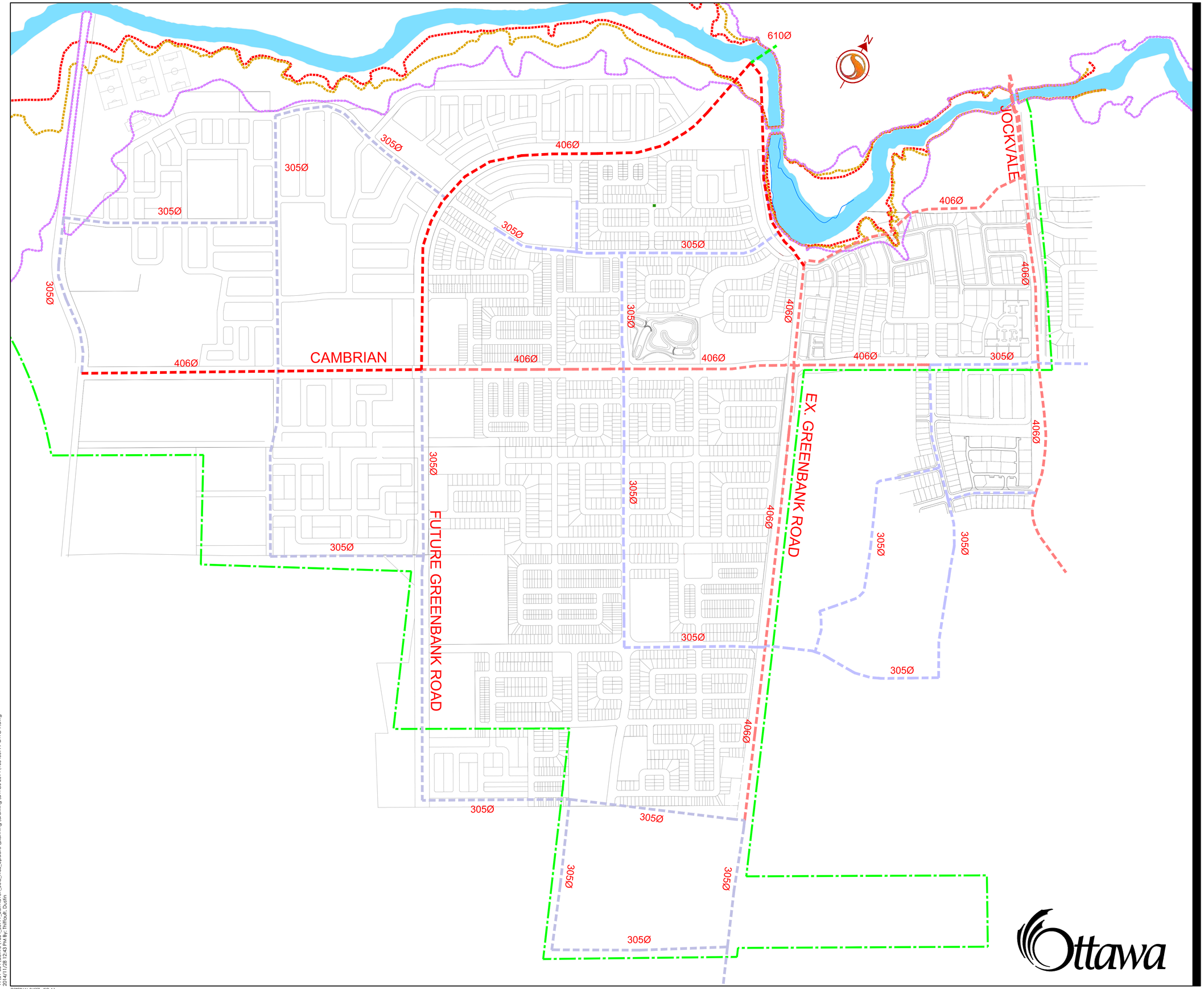
Project No.
163400999

Scale 0 35 70 140 210 280 Meters

Drawing No. FIG 3-5 | Sheet 5 of 5 | Revision 1

APPENDIX 'B5'

WATER SERVICING



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Legend

- EXISTING 305Ø WATERMAIN
- EXISTING 406Ø WATERMAIN
- 305Ø WATERMAIN
- 406Ø WATERMAIN
- 610Ø WATERMAIN
- 10 YEAR FLOOD LINE
- 25 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- LIMIT OF CDP BOUNDARY
- 106.20 PROPOSED ELEVATION
- 106.00 EXISTING ELEVATION

Notes

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.
2. CONCEPTUAL GRADING BASED ON AVAILABLE GRADE RAISE RESTRICTIONS, CONTOUR MAPPING, AND PRELIMINARY PROFILES FOR THE GREENBANK ROAD REALIGNMENT.

Revision	By	Appd.	YY.MM.DD
1 ISSUED FOR MSS ADDENDUM	ST	KA	14.11.28

File Name: 163400999-DWG 9.DWG	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	ST	AP	KA	14.11.21

Permit-Seal

Client/Project

CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM

Ottawa, ON

Title

WATER SERVICING PLAN

Project No. 163400999

Scale 1:5000 (0 50 150 250m)

Drawing No. A-9

Sheet 9 of 9

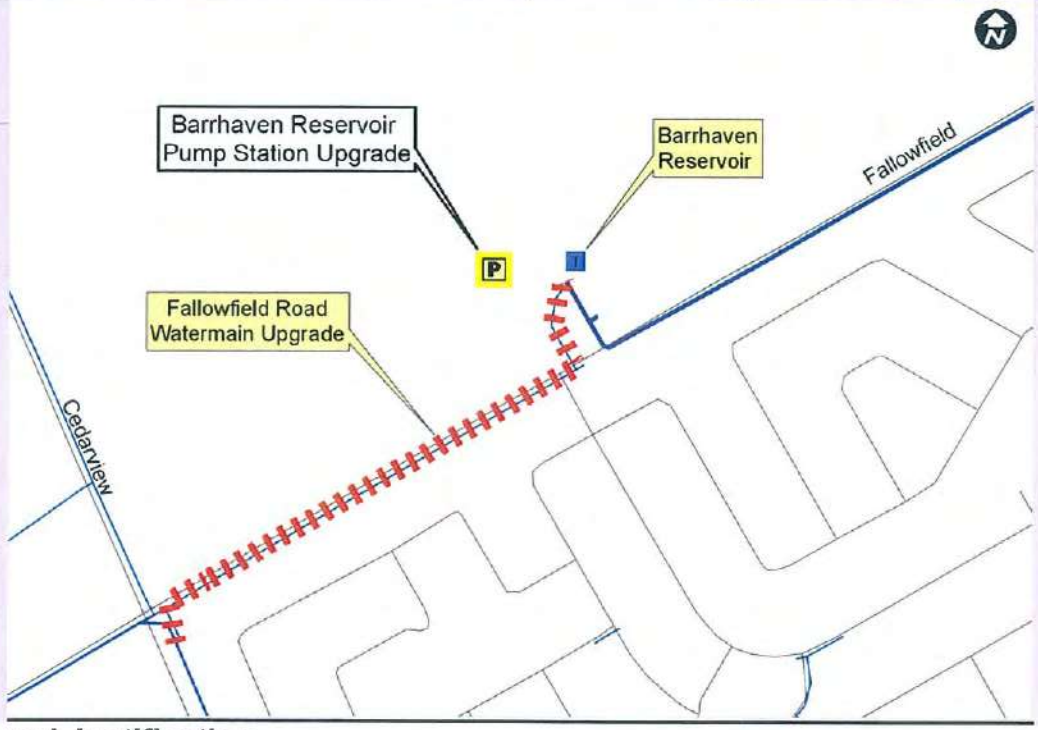
Revision 1

Ottawa

V:\01-634\active\1634_00999_Barrhaven_SUC_MSS_Update\planning\drawing\DWGS 2014\163400999-DWG 9.dwg
2014/11/28 12:43 PM By: Thiffault, Dustin

ORIGINAL SHEET - ISO A1

Barrhaven Reservoir Pump Station (BRPS) Upgrade



Scope and Justification

Increase pumping capacity and provide back-up powerat the BRPS (to Zone BARR) to provide adequate back-up and peaking supply demands to Zone BARR.

Timing

2013-2018: Complete upgrades to the BRPS

Action Item Funding

Construction Cost Estimate = $0.6M
Capital Cost Estimate* = $1.2M (90% Development Charges, 10% Rate)
**including construction cost, engineering, city internal costs and contingency allowance. Funding split subject to review as part of 2014 Development Charges by-law.*

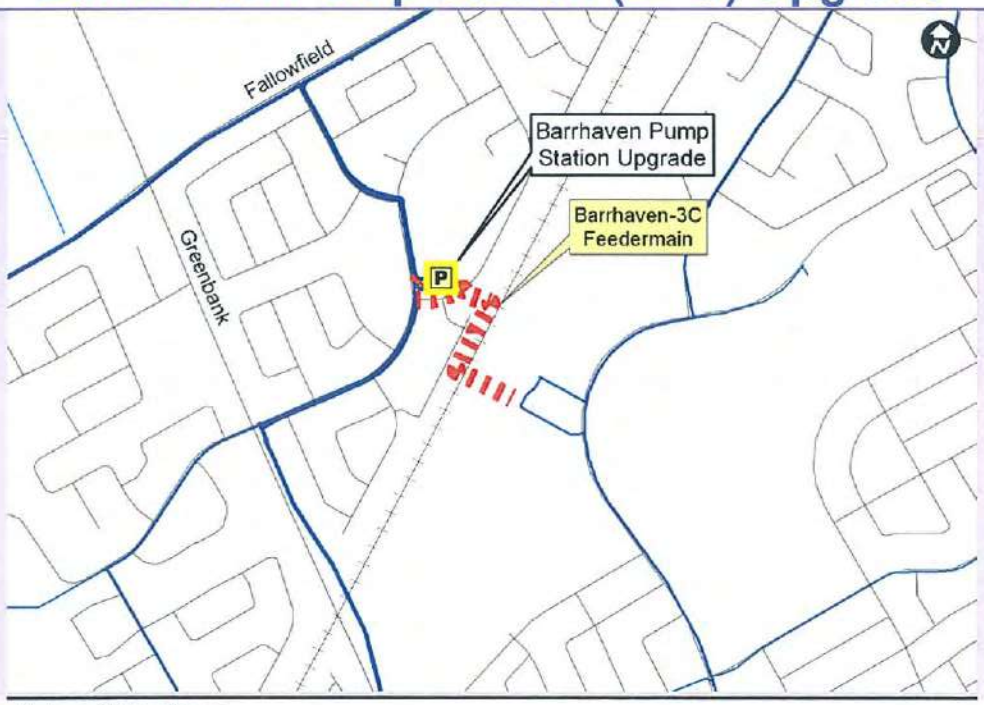
EA Requirements and Consultation

Class EA Schedule 'A' project. No consultation required prior to implementation.

Follow Up Actions

Review future capacity needs at the design stage to confirm the increase required. Coordinate with Fallowfield watermain project (needed to provide adequate station discharge capacity).

Barrhaven Pump Station (BPS) Upgrade



Scope and Justification

Reconfigure BPS to provide dual zone service (3C and BARR). Replace all pumping units to contribute to 2031 peak demand and back-up supply requirements for Zone 3C and Zone BARR. Upgrade back-up power.

Timing

2013-2018: Reconfigure and upgrade station (Phase 1)
2019-2024: Zone 3C capacity increase (Phase 2)

Action Item Funding

Phase 1 Construction Cost Estimate = $1.7M
Phase 1 Capital Cost Estimate* = $3.5M (90% Development Charges, 10% Rate)
Phase 2 Construction Cost Estimate = $0.3M
Phase 2 Capital Cost Estimate* = $0.6M (90% Development Charges, 10% Rate)
**including construction cost, engineering, city internal costs and contingency allowance. Funding split subject to review as part of 2014 Development Charges by-law.*

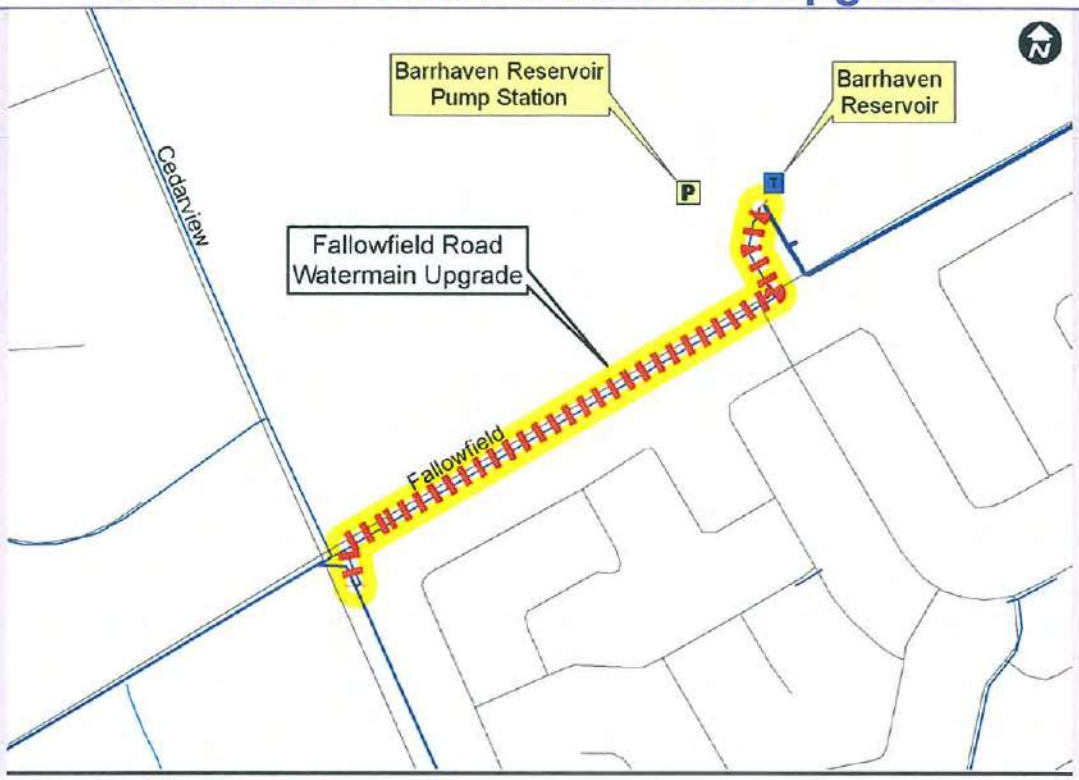
EA Requirements and Consultation

Class EA Schedule 'A' project. No consultation required prior to implementation.

Follow Up Actions

Review future capacity needs at the design stage to confirm the increase required. Coordinate works with 2017 electrical renewal.

Fallowfield Road Watermain Upgrade



Scope and Justification

Construct 406 mm watermain along Fallowfield Rd. from Barrhaven Reservoir to Cedarview Rd. to increase effective discharge capacity available for the Barrhaven Reservoir Pump Station (BRPS). The capacity increase is needed to support growth and reliability requirements for Zone Barr.

Timing

2013-2018: Construct watermain

Action Item Funding

Construction Cost Estimate = $0.7M
Capital Cost Estimate* = $1.3M (90% Development Charges, 10% Rate)
**including construction cost, engineering, city internal costs and contingency allowance. Funding split subject to review as part of 2014 Development Charges by-law.*

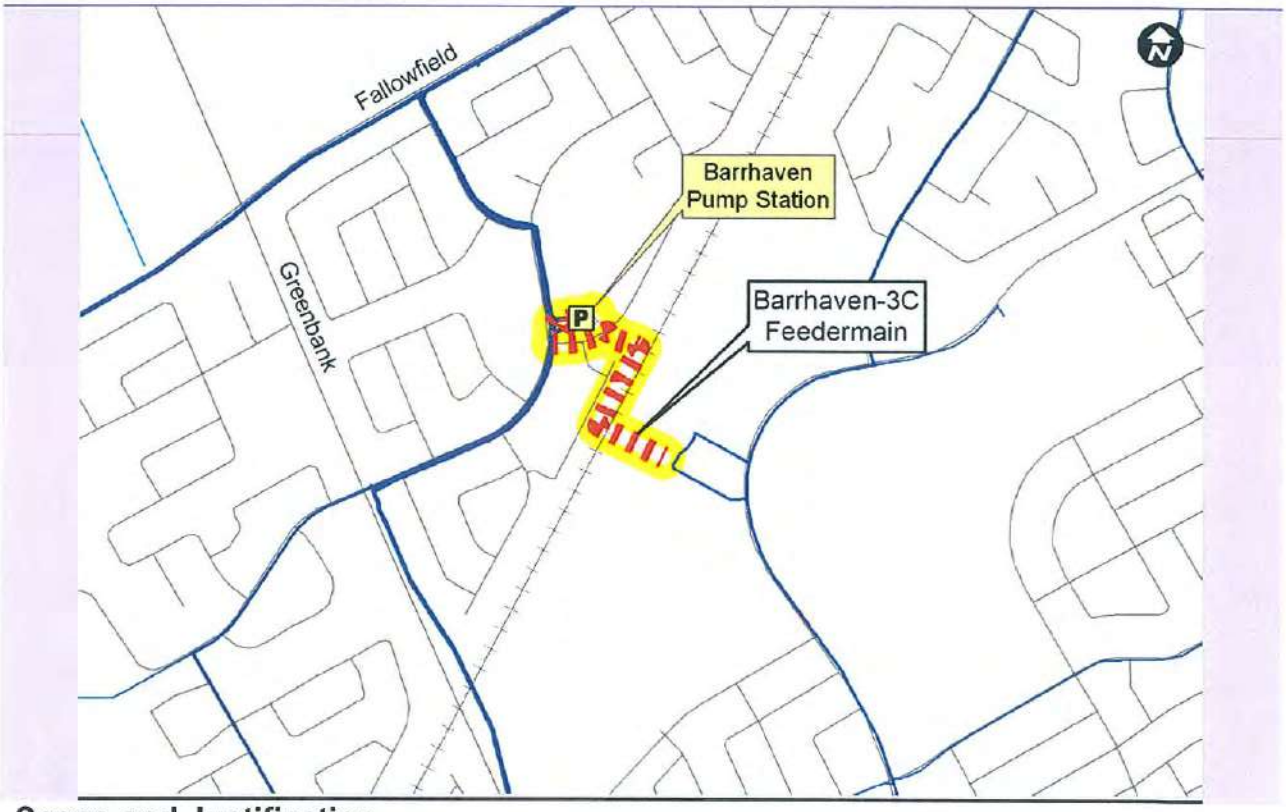
EA Requirements and Consultation

This is a Schedule 'A' project – No consultation required prior to implementation.

Follow Up Actions

Coordinate with BRPS upgrade.

Barrhaven-3C Feedermain



Scope and Justification

Construct 610 mm watermain from Foxfield at Holitman, across rail line and Transitway to Via Chianti Grove. The feedermain is needed to facilitate the zone reconfiguration and to meet 2031 growth and reliability requirements.

Timing

2013-2018: Construct feedermain

Action Item Funding

Construction Cost Estimate = $2.0M
Capital Cost Estimate* = $2.5M (90% Development Charges, 10% Rate)
**including construction cost, engineering, city internal costs and contingency allowance. Funding split subject to review as part of 2014 Development Charges by-law.*

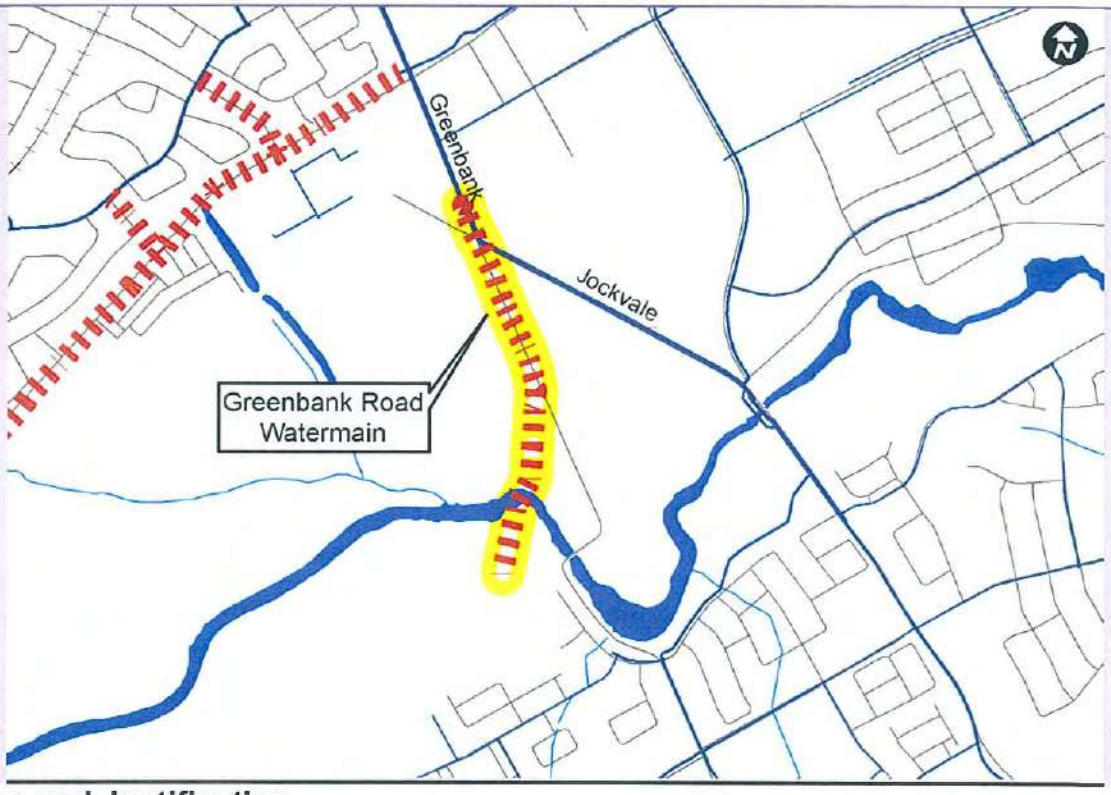
EA Requirements and Consultation

This is a Schedule 'A' project – No consultation required prior to implementation.

Follow Up Actions

Verify provisions needed for short term operations prior to Barrhaven Pump Station upgrade.

Greenbank Road Watermain



Scope and Justification

Construct 610 mm watermain along Greenbank Rd. from North of Jockvale to South of Jock River. This project is needed to support development south of the Jock River.

Timing

2013 – 2018 Construct feedermain

Action Item Funding

Construction Cost Estimate = $3.9M

Capital Cost Estimate* = $7.4M (90% Development Charges, 10% Rate)

**including construction cost, engineering, city internal costs and contingency allowance. Funding split subject to review as part of 2014 Development Charges by-law.*

EA Requirements and Consultation

This is a Schedule 'B' project as it requires a major water crossing – Notices, consultation and filing of Environmental Project File for public review required.

Follow Up Actions

Coordinate project with growth needs. Finalize alignment as part of detailed planning and design process.

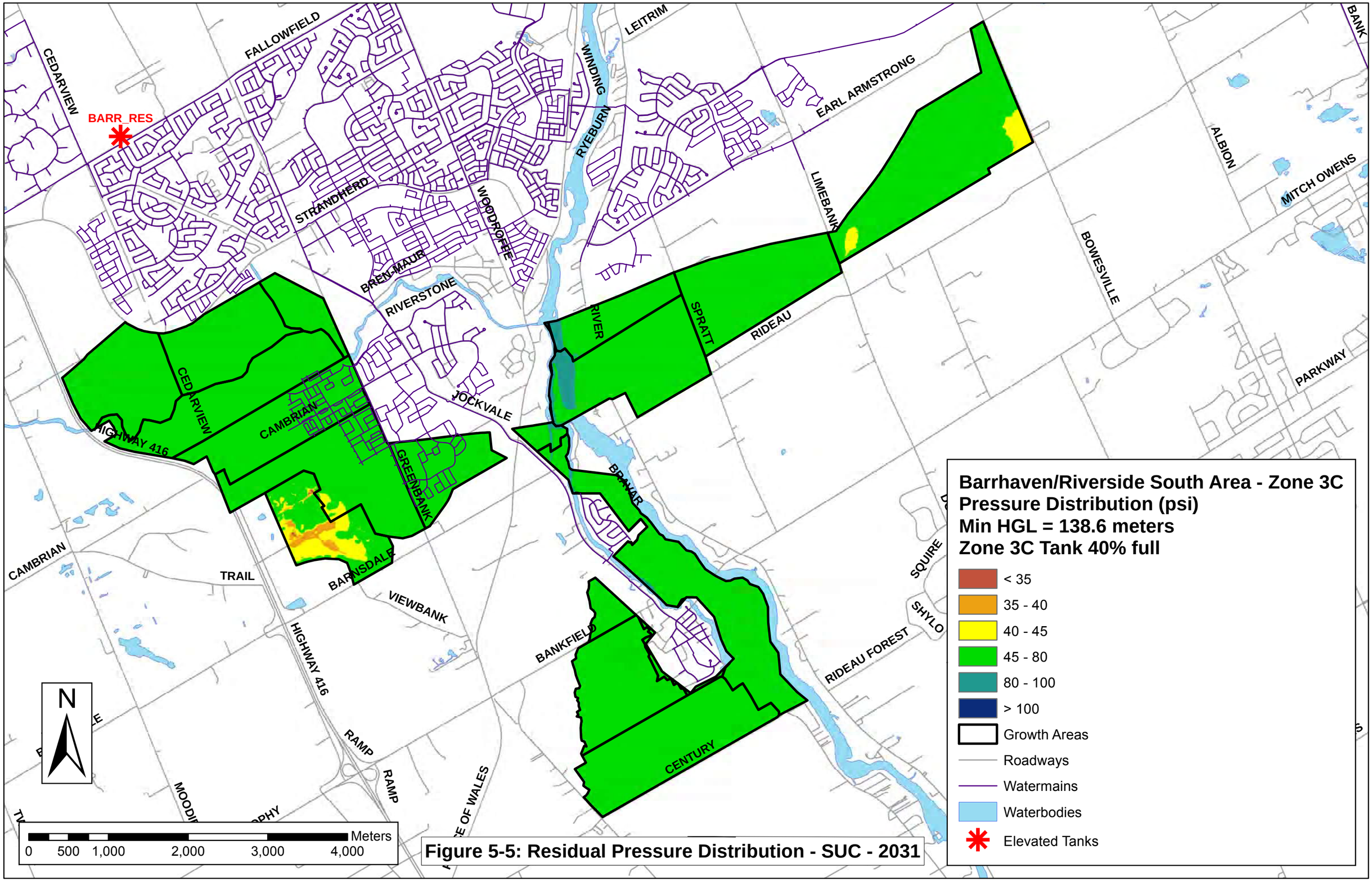


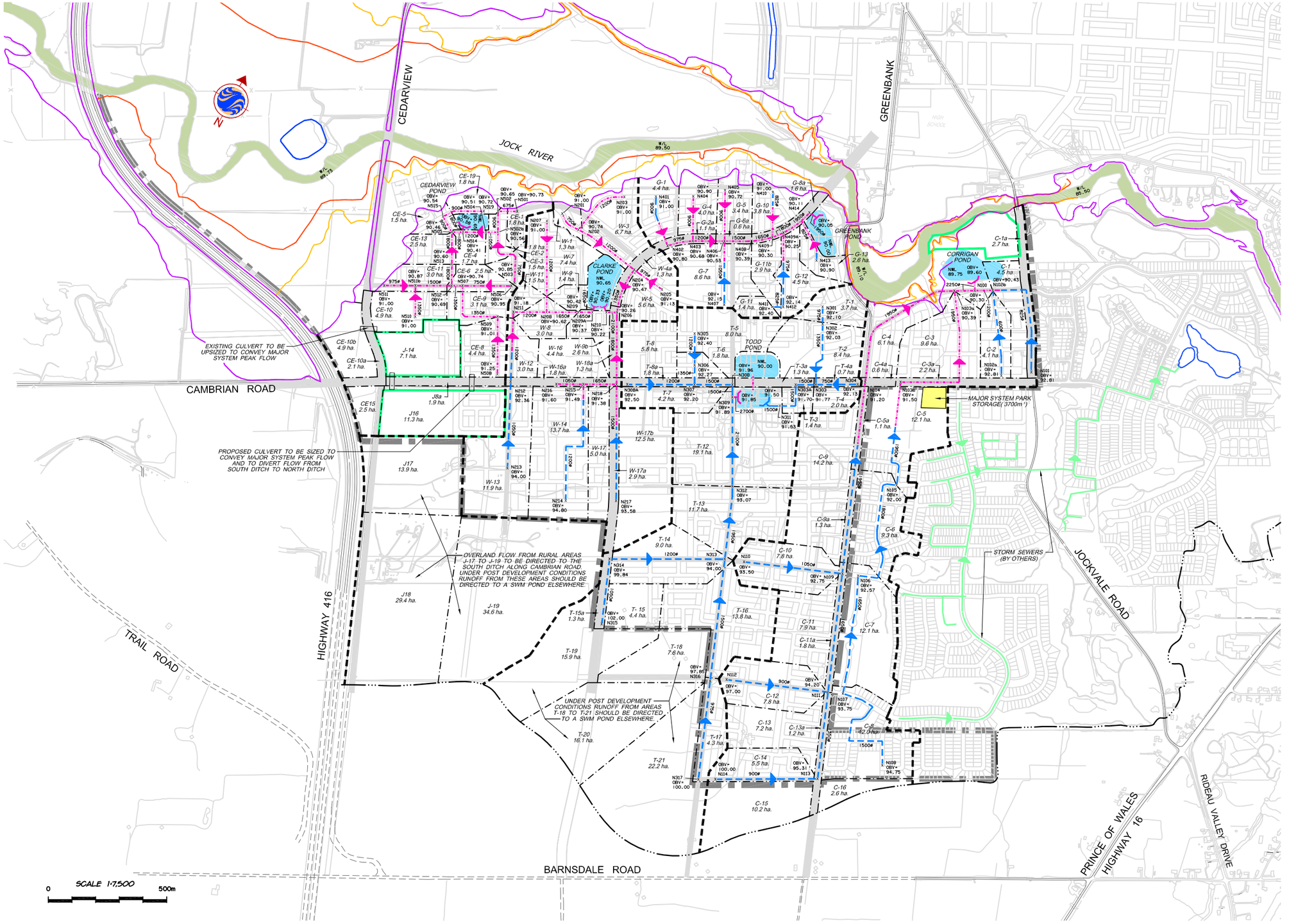
Figure 5-5: Residual Pressure Distribution - SUC - 2031

APPENDIX 'B6'

STORMWATER SERVICING

BARRHAVEN SOUTH
MASTER SERVICING STUDY

CONCEPTUAL SWM
STORM SERVICING - MINOR



- Proposed Stormwater Facility
- Existing Storm Water Facility
- Limit of CDP Boundary (Urban Boundary)
- Existing Storm Sewer
- Proposed Storm Sewer
- Proposed Storm Sewer With Standing Water From Pond
- Surface Storage
- Wood Lot
- Watershed Boundary
- N232a — Manhole Node
- 10 Year Flood Line
- 25 Year Flood Line
- 100 Year Flood Line
- W/L 89.50 — River Normal Water Level
- Sub-drainage Area Limit
- *T-29* — Sub-drainage Area I.D.
- *12 ha.* — Sub-drainage Area Size

Note:

1. All Foundations To Be 0.30m Above The 100 Year HGL.
2. All Building Foundations To Drain By Gravity To The Storm Sewer System.

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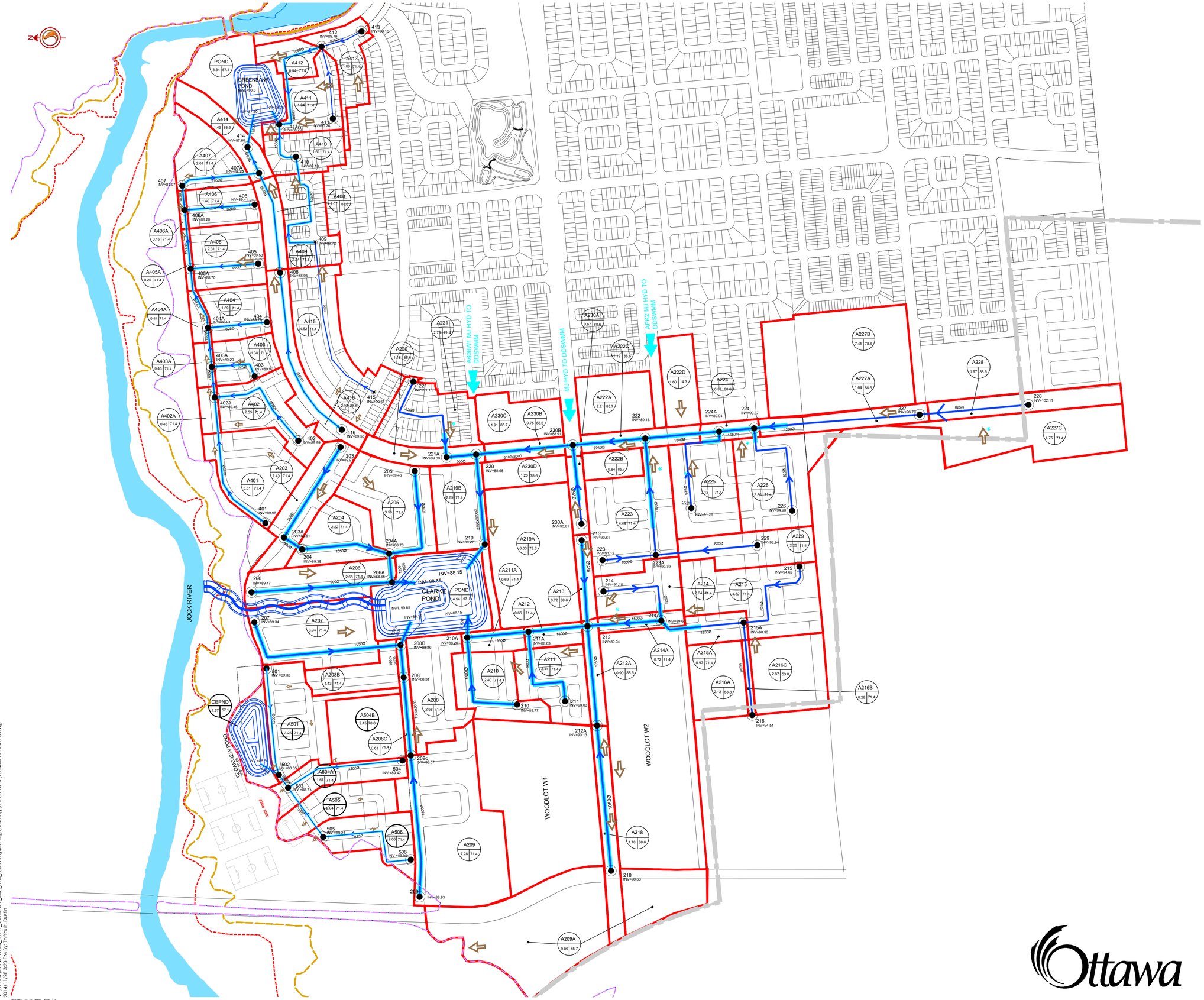
Ottawa

JUNE 2007

ST1



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Legend

- A414 — AREA ID
- 1.45 / 88.6 — TOTAL IMPERVIOUSNESS (%)
- AREA (ha)
- PROPOSED STORM SEWER
- PROPOSED STORM SEWERWITH STANDING WATER FROM POND
- 1050Ø — PIPE DIAMETER
- 417 — MANHOLE LOCATION WITH IDENTIFIER
- DRAINAGE BOUNDARY
- 10 YEAR FLOOD LINE
- 25 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- LIMIT OF CDP BOUNDARY
- GREENBANK POND — PROPOSED STORMWATER FACILITY
- OVERLAND FLOW DIRECTION

Notes

1. ALL FOUNDATIONS TO BE 0.3m ABOVE THE 100 YEAR HGL
2. ALL BUILDING FOUNDATIONS TO DRAIN BY GRAVITY TO THE STORM SEWER SYSTEM

Revision	By	Appd.	YY.MM.DD
1 ISSUED FOR MSS ADDENDUM	ST	AP	14.11.28

File Name: 163400999-DWG 5.DWG	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	ST	AP	AP	14.11.21

Permit-Seal

Client/Project

CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM

Ottawa, ON

Title

STORM WATER SERVICING PLAN

Project No. 163400999

Scale 1:4000 (0 40 120 200m)

Drawing No. A-5

Sheet 5 of 9

Revision 1

Ottawa

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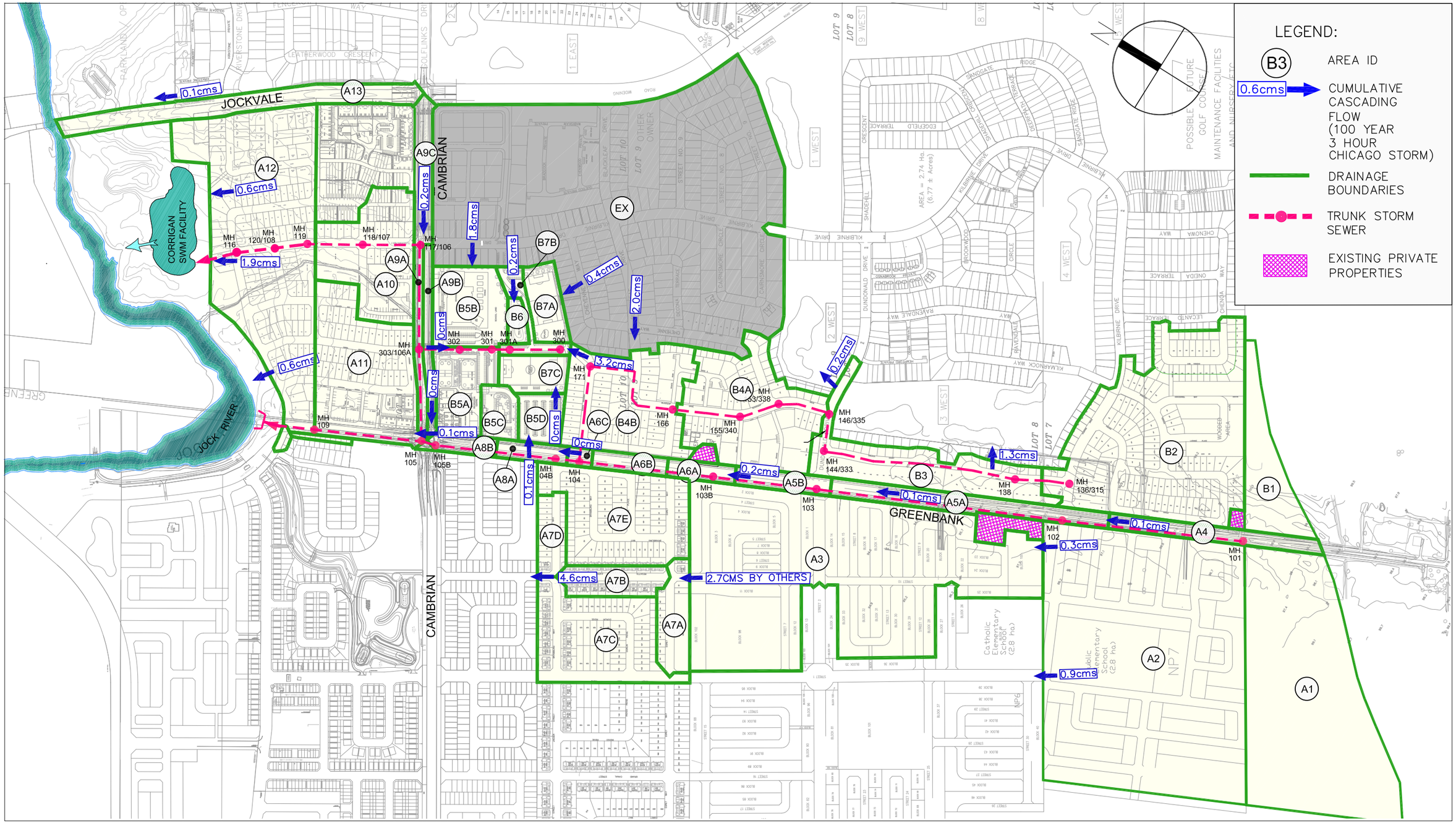
ORIGINAL SHEET - ISO A1



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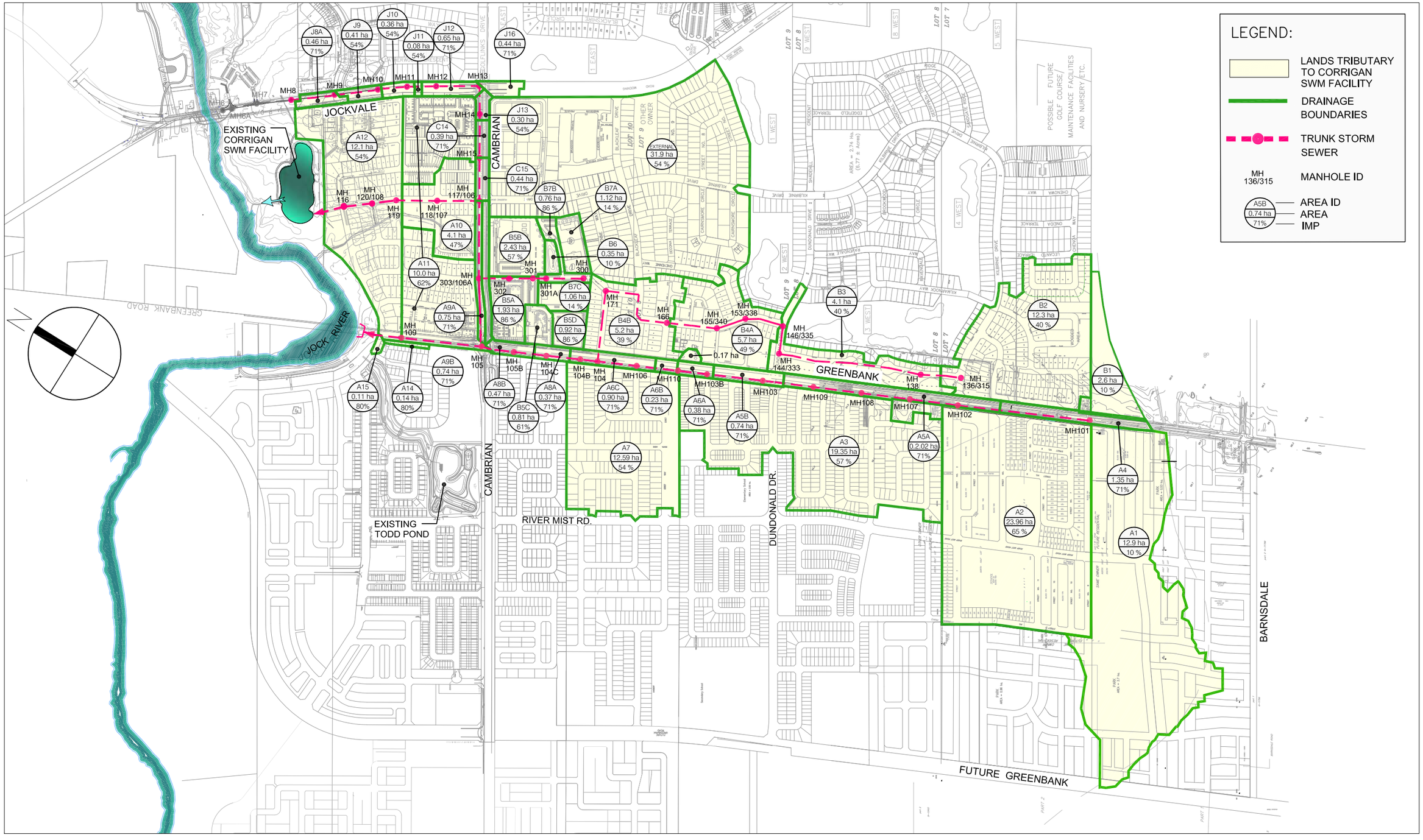
IBI GROUP

Scale: 1:7500

Project Title: CORRIGAN STORMWATER MANAGEMENT FACILITY

Drawing Title: DUAL DRAINAGE CASCADING FLOW

Sheet No.: FIGURE 3



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Plot Style: ---- Plot Scale: 1:1 Plotted At: Jun. 9, 15 1:04 PM Printed By: SLAVICA VUKIC Last Saved By: SVUKIC Last Saved At: Jun. 9, 15

IBI GROUP

Scale

1:10000

Project Title

CORRIGAN STORMWATER MANAGEMENT FACILITY

Drawing Title

DRAINAGE SCHEMATIC

Sheet No.

FIGURE A

J.F. Sabourin and Associates Inc.
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GATINEAU (819) 243-6858
OTTAWA (613) 836-3884

CLIENT :

MATTAMY homes
50 HINES ROAD, SUITE 100
KANATA, ONTARIO K2K 2M5
(613) 831-3502

PROJECT :

TODD POND MODEL KEEPER ANALYSIS

SCALE:

0 50 100 150 200 250 300m

TITLE :

LOTS WITH LESS THAN 30 CM FREEBOARD

FIGURE 1-1

No.	BY	DATE	DESCRIPTION	BY

LEGEND:

DURING THE 100-YEAR 24-HOUR SCS TYPE II DESIGN STORM :

- FREEBOARD BETWEEN 0 CM AND 30 CM (I.E. LESS THAN 30 CM FREEBOARD, BUT BELOW UNDERSIDE OF FOOTING ELEVATION)
- FREEBOARD BETWEEN -23 CM AND 0 CM (I.E. ABOVE THE UNDERSIDE OF FOOTING ELEVATION, BUT BELOW BASEMENT FLOOR ELEVATION)

DURING THE 100-YEAR + 20% CLIMATE CHANGE STRESS TEST :

- FREEBOARD BETWEEN 0 CM AND 30 CM (I.E. LESS THAN 30 CM FREEBOARD, BUT BELOW UNDERSIDE OF FOOTING ELEVATION)
- FREEBOARD BETWEEN -23 CM AND 0 CM (I.E. ABOVE THE UNDERSIDE OF FOOTING ELEVATION, BUT BELOW BASEMENT FLOOR ELEVATION)

DESIGNED :	
DRAWN :	LP
VERIFIED :	JFS
APPROVED :	JFS
DATE	PROJECT No.
Apr/15	598(04)-11

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
GATINEAU (819) 243-6858
OTTAWA (613) 836-3884

CLIENT :

MATTAMY homes
50 HINES ROAD, SUITE 100
KANATA, ONTARIO K2K 2M5
(613) 831-3502

PROJECT :

TODD POND MODEL KEEPER ANALYSIS

SCALE:

0 50 100 150 200 250 300m

TITLE :

ROADS WITH GREATER THAN 30 CM WATER DEPTH

FIGURE 1-2

No.	BY	DATE	DESCRIPTION	BY

LEGEND:

DURING THE 100-YEAR 3-HOUR CHICAGO DESIGN STORM :

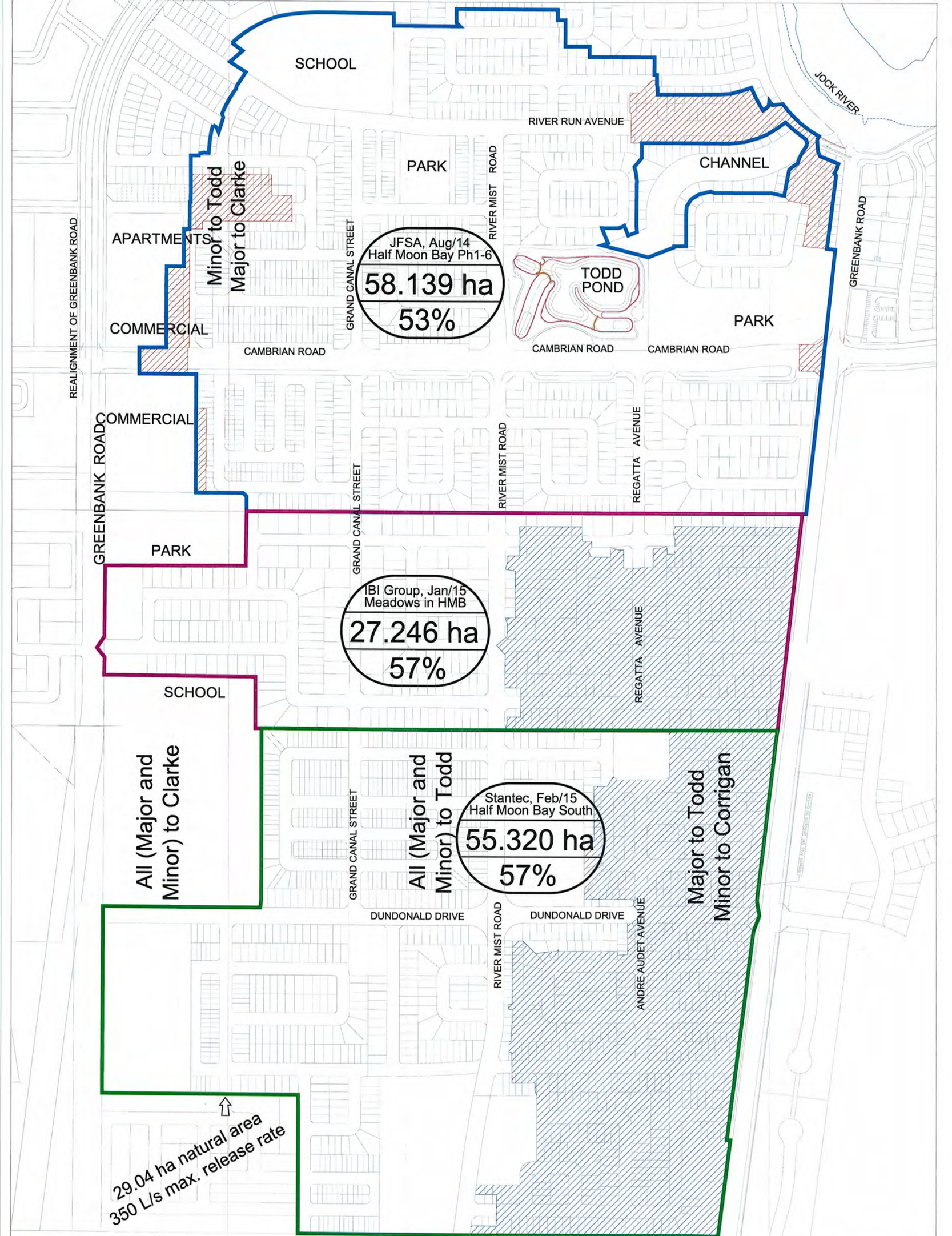
LOCATION OF PONDING AREA WITH GREATER THAN 30 CM TOTAL WATER DEPTH (STATIC + DYNAMIC) ON THE ROAD

DURING THE 100-YEAR + 20% CLIMATE CHANGE STRESS TEST :

LOCATION OF PONDING AREA WITH GREATER THAN 30 CM TOTAL WATER DEPTH (STATIC + DYNAMIC) ON THE ROAD

NOTE : ALL WATER DEPTHS ARE BELOW THE LOWEST NEARBY BUILDING OPENING ELEVATIONS

DESIGNED :	
DRAWN :	LP
VERIFIED :	JFS
APPROVED :	JFS
DATE	PROJECT No.
Apr/15	598(04)-11



J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
GATINEAU (819) 243-6858
OTTAWA (613) 836-3884

CLIENT:

MATTAMY homes
50 HINES ROAD, SUITE 100
KANATA, ONTARIO K2K 2M5
(613) 831-3502

PROJECT:

TODD POND MODEL KEEPER ANALYSIS

SCALE:

0 50 100 150 200 250 300m

TITLE: OVERALL DRAINAGE AREA TO TODD POND
PROPOSED INTERIM BOUNDARIES

FIGURE 2

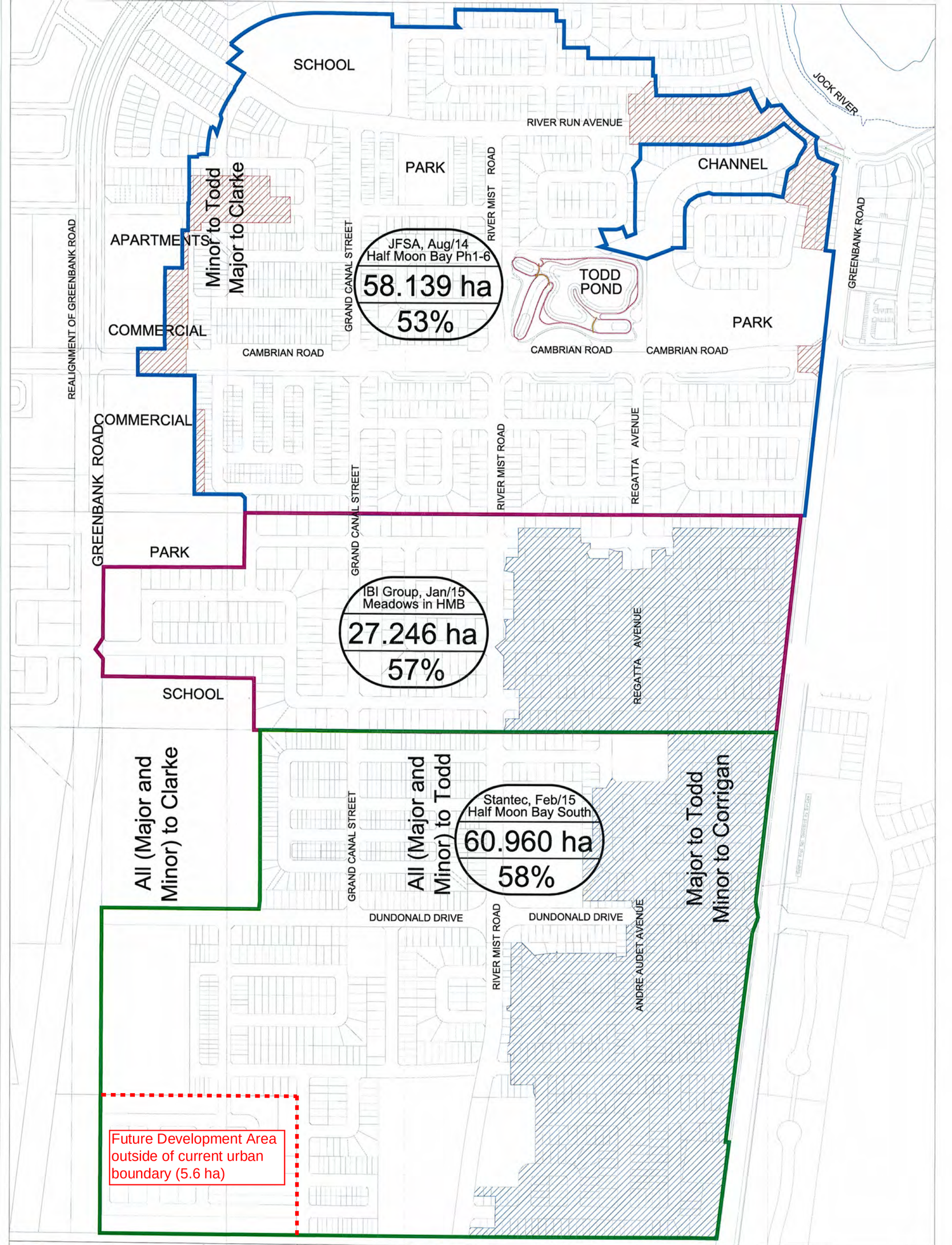
No.	BY	DATE	DESCRIPTION	BY

LEGEND:

JFSA, Aug/14 Half Moon Bay Ph1-6 — CONSULTANT, DATE, DEVELOPMENT NAME
58.139 ha — DRAINAGE AREA
53% — AVERAGE IMPERVIOUSNESS

- HALF MOON BAY PHASE 1-6 (JFSA, AUG 2014) DRAINAGE AREA
- HALF MOON BAY SOUTH (STANTEC, FEB 2015) DRAINAGE AREA
- MEADOWS IN HALF MOON BAY (IBI, JAN 2015) DRAINAGE AREA
- MAJOR SYSTEM DRAINAGE ONLY (MINOR TO CORRIGAN POND)
- MINOR SYSTEM DRAINAGE ONLY (MAJOR TO CLARKE OR OTHER)

DESIGNED :	
DRAWN :	LP
VERIFIED :	JFS
APPROVED :	JFS
DATE	PROJECT No.
Apr/15	598(04)-11



J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
GATINEAU (819) 243-6858
OTTAWA (613) 836-3884

CLIENT: MATTAMY HOMES
50 HINES ROAD, SUITE 100
KANATA, ONTARIO K2K 2M5
(613) 831-3502

PROJECT: TODD POND MODEL KEEPER ANALYSIS

SCALE: 0 50 100 150 200 250 300m

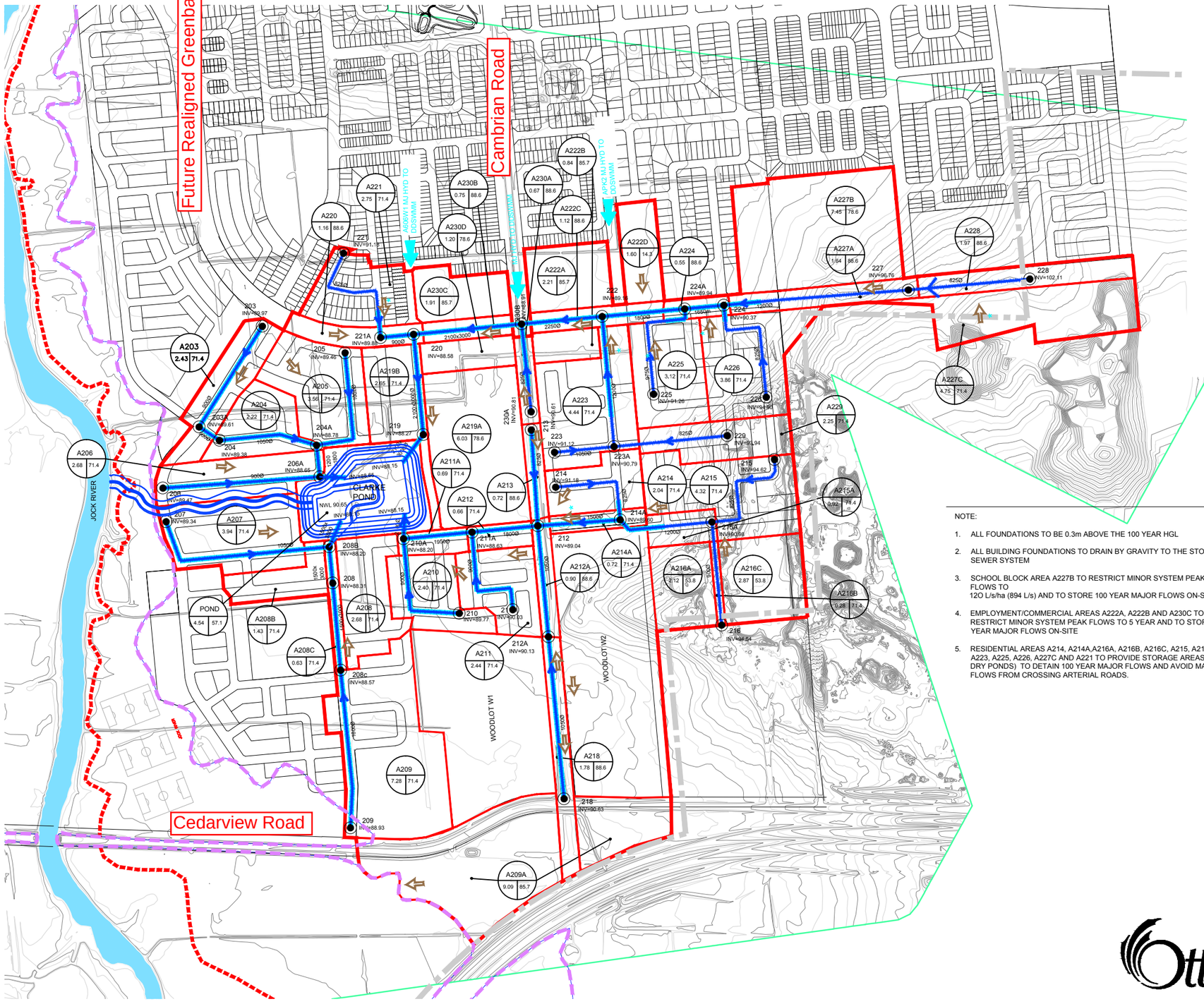
TITLE: OVERALL DRAINAGE AREA TO TODD POND PROPOSED ULTIMATE BOUNDARIES

FIGURE 3

No.	BY	DATE	DESCRIPTION	BY

LEGEND:
- JFSA, Aug/14 Half Moon Bay Ph1-6 / 58.139 ha / 53% — CONSULTANT, DATE, DEVELOPMENT NAME; DRAINAGE AREA; AVERAGE IMPERVIOUSNESS
- HALF MOON BAY PHASE 1-6 (JFSA, AUG 2014) DRAINAGE AREA
- HALF MOON BAY SOUTH (STANTEC, FEB 2015) DRAINAGE AREA
- MEADOWS IN HALF MOON BAY (IBI, JAN 2015) DRAINAGE AREA
- MAJOR SYSTEM DRAINAGE ONLY (MINOR TO CORRIGAN POND)
- MINOR SYSTEM DRAINAGE ONLY (MAJOR TO CLARKE OR OTHER)

DESIGNED :	
DRAWN :	LP
VERIFIED :	JFS
APPROVED :	JFS
DATE	PROJECT No.
Apr/15	598(04)-11



NOTE:

1. ALL FOUNDATIONS TO BE 0.3m ABOVE THE 100 YEAR HGL
2. ALL BUILDING FOUNDATIONS TO DRAIN BY GRAVITY TO THE STORM SEWER SYSTEM
3. SCHOOL BLOCK AREA A227B TO RESTRICT MINOR SYSTEM PEAK FLOWS TO 120 L/s/ha (894 L/s) AND TO STORE 100 YEAR MAJOR FLOWS ON-SITE
4. EMPLOYMENT/COMMERCIAL AREAS A222A, A222B AND A230C TO RESTRICT MINOR SYSTEM PEAK FLOWS TO 5 YEAR AND TO STORE 100 YEAR MAJOR FLOWS ON-SITE
5. RESIDENTIAL AREAS A214, A214A,A216A, A216B, A216C, A215, A215A, A223, A225, A226, A227C AND A221 TO PROVIDE STORAGE AREAS (i.e. DRY PONDS) TO DETAIN 100 YEAR MAJOR FLOWS AND AVOID MAJOR FLOWS FROM CROSSING ARTERIAL ROADS.

Ottawa

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Legend

- A214 / 1.45 / 88.6 — AREA ID; TOTAL IMPERVIOUSNESS (%); AREA (ha)
- PROPOSED STORM SEWER
- PROPOSED STORM SEWERWITH STANDING WATER FROM POND
- 1050ø — PIPE DIAMETER
- 217 — MANHOLE LOCATION WITH IDENTIFIER
- DRAINAGE BOUNDARY
- 10 YEAR FLOOD LINE
- 25 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- LIMIT OF CDP BOUNDARY
- PROPOSED STORMWATER FACILITY
- MAJOR FLOW HYDROGRAPHS FROM EXTERNAL AREAS
- OVERLAND FLOW DIRECTION

Revision	By	Appd.	YY.MM.DD
1 ISSUED FOR MSS ADDENDUM	ST	AP	14.11.28

File Name: 163400999-FIG 4 1-3.DWG — Dwn. ST; Chkd. AP; Dsgn. AP; 14.11.21

Permit-Seal

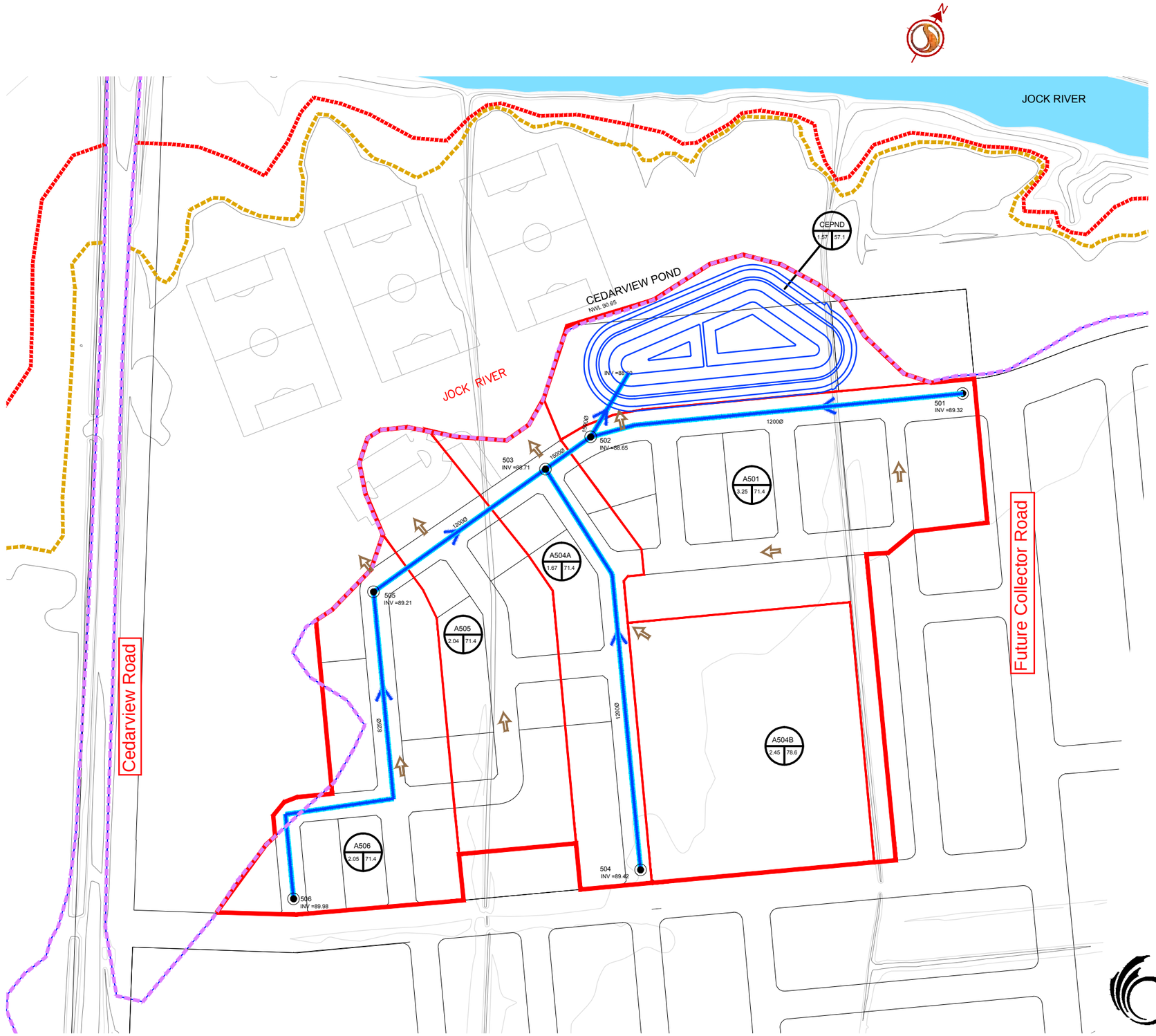
Client/Project
CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM
Ottawa, ON

Title
CLARKE POND DRAINAGE PLAN

Project No. 163400999
Scale 0 40 120 200m
Drawing No. FIG 4-2
Sheet 2 of 3
Revision 1

Y:\01-CA\active\163\400999_Barrhaven_SWS_MSS_Update\planning\drawing\DWGS 2014\163400999-FIG 4 1-3.dwg
2014/11/28 12:34 PM By: Thiffault, Dustin
ORIGINAL SHEET - ISO A1



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Legend

- AREA ID / TOTAL IMPERVIOUSNESS (%) / AREA (ha)
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER WITH STANDING WATER FROM POND
- 1050Ø PIPE DIAMETER
- 501 MANHOLE LOCATION WITH IDENTIFIER
- DRAINAGE BOUNDARY
- 10 YEAR FLOOD LINE
- 25 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- LIMIT OF CDP BOUNDARY
- PROPOSED STORMWATER FACILITY
- OVERLAND FLOW DIRECTION

Notes

1. ALL FOUNDATIONS TO BE 0.3m ABOVE THE 100 YEAR HGL
2. ALL BUILDING FOUNDATIONS TO DRAIN BY GRAVITY TO THE STORM SEWER SYSTEM

1	ISSUED FOR MSS ADDENDUM	ST	AP	14.11.28
Revision		By	Appd.	YY.MM.DD
File Name: 163400999-FIG 4 1-3.DWG		ST	AP	14.11.21
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM
Ottawa, ON

Title
CEDARVIEW POND DRAINAGE PLAN

Project No.	Scale	Drawing No.	Sheet	Revision
163400999	0 12.5 37.5 62.5m	FIG 4-1	1 of 3	1

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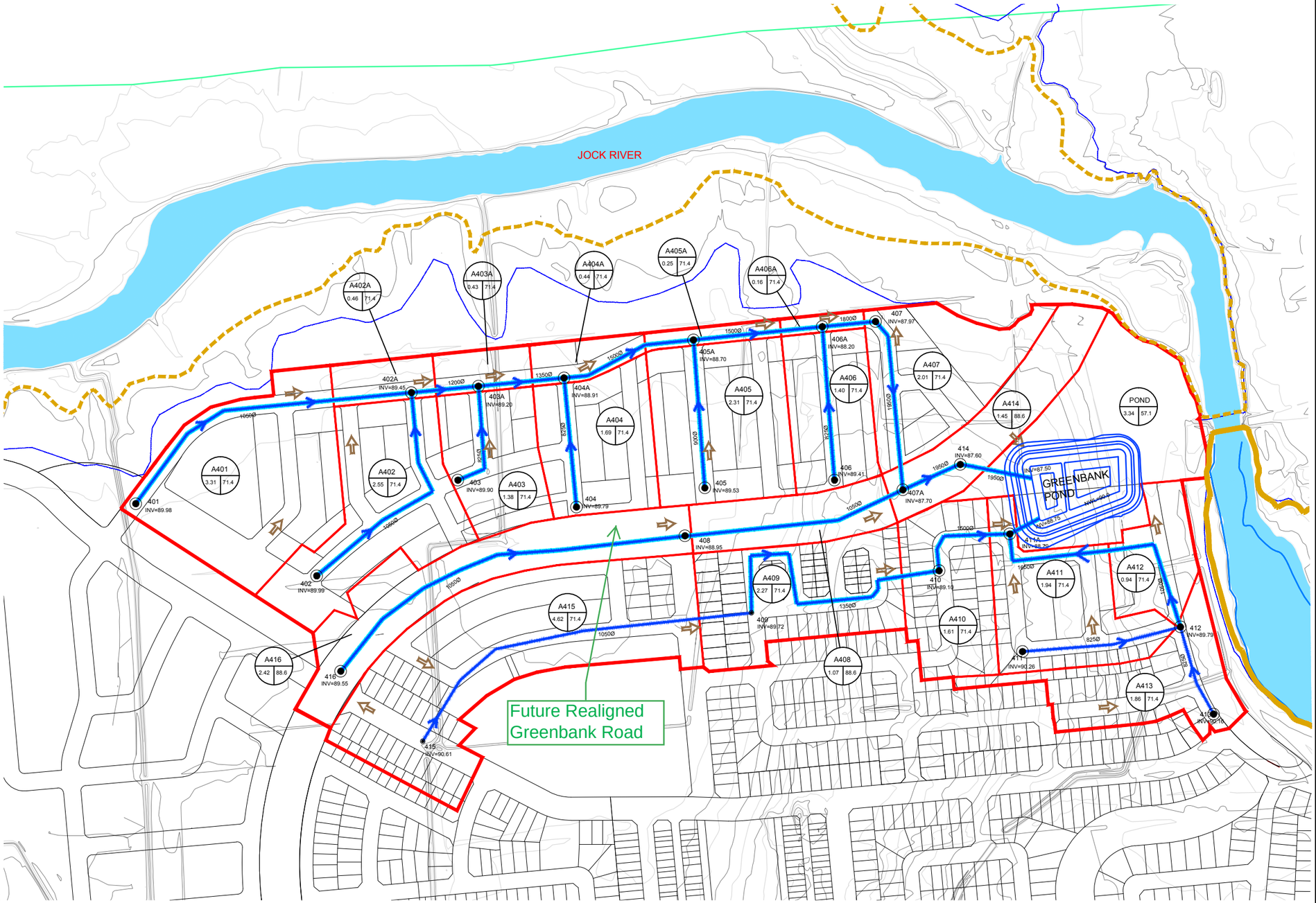
2014/11/28 12:34 PM By: Thiffault, Dustin

ORIGINAL SHEET - ISO A1



Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

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Legend

- AREA ID / TOTAL IMPERVIOUSNESS (%) / AREA (ha)
- PROPOSED STORM SEWER
- PROPOSED STORM SEWERWITH STANDING WATER FROM POND
- 1050Ø PIPE DIAMETER
- 417 MANHOLE LOCATION WITH IDENTIFIER
- DRAINAGE BOUNDARY
- 10 YEAR FLOOD LINE
- 25 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- LIMIT OF CDP BOUNDARY
- PROPOSED STORMWATER FACILITY
- OVERLAND FLOW DIRECTION

Notes

1. ALL FOUNDATIONS TO BE 0.3m ABOVE THE 100 YEAR HGL
2. ALL BUILDING FOUNDATIONS TO DRAIN BY GRAVITY TO THE STORM SEWER SYSTEM

1	ISSUED FOR MSS ADDENDUM	ST	AP	14.11.28
Revision		By	Appd.	YY.MM.DD
File Name: 163400999-FIG 4 1-3.DWG		ST	AP	14.11.21
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM
Ottawa, ON

Title
GREENBANK POND DRAINAGE PLAN

Project No.	Scale	
163400999	1:2000	0 20 60 100m
Drawing No.	Sheet	Revision
FIG 4-3	3 of 3	1

V:\01-ISA\active\163400999_Barrhaven_SWC_MSS_Update\Planning\drawing\DWGS 2014\163400999-FIG 4 1-3.dwg
2014/11/28 12:34 PM By: Thiffault, Dustin

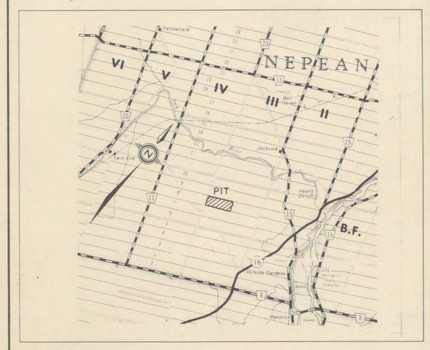
ORIGINAL SHEET - ISO A1

Appendix C

Aggregate Extraction Area Documents

1991 M.O.E. WELL DATA

Con.	Lot	Well No.	Well Elev.	Water Found	Static Water
4	8	15-17287	106.68m	82.46m	10.36m
3	8	15-6040	103.90m	20.42m	6.40m
3	9	15-6037	92.96m	36.58m	5.79m



KEY MAP

EXISTING FEATURES - GENERAL

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 35.5 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUCTION WITH AN APPLICATION FOR A CLASS A LICENCE UNDER THE AGGREGATE RESOURCES ACT AND REGULATIONS.
5. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
6. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

MINISTRY OF NATURAL RESOURCES
CARLETON PLACE, ONT.
JUN 15 1992
RECEIVED

ARA No. 4219

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- W — WELL
- STANDING WATER
- TEST HOLE
- S H G B S O — BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED, O-OFFICE.
- W/L 35.3 — LAKE/POND AND WATER LEVEL
- WATERCOURSE: DOUBLE, SINGLE. FLOW ARROW.
- MIXED FOREST — CONIFEROUS AND DECIDUOUS FOREST - M/F
- CON. FOREST — CONIFEROUS FOREST - C/F
- DEC. FOREST — DECIDUOUS FOREST - D/F
- A A' — CROSS SECTION

LANDUSE:

AGRI	AGRICULTURE
RES	RESIDENTIAL

ZONING CLASSIFICATION:

MX	MINERAL EXTRACTION
C	COMMERCIAL GENERAL
I	INSTITUTIONAL
RU	RURAL
SR	SPECIAL RURAL - PIT

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		NOV. 1990
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	1 METRE	SEPT. 1991		

SCALE IS APPROXIMATE

AMENDMENTS	DATE
indicate existing scrap area + fuel tanks inside storage shed. GM	~~Oct 7/97~~ Nov 20/97

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE _____ DATE June 17/92

PAGE 1 OF 4 | CONTRACT C459-90

OFFICE COPY

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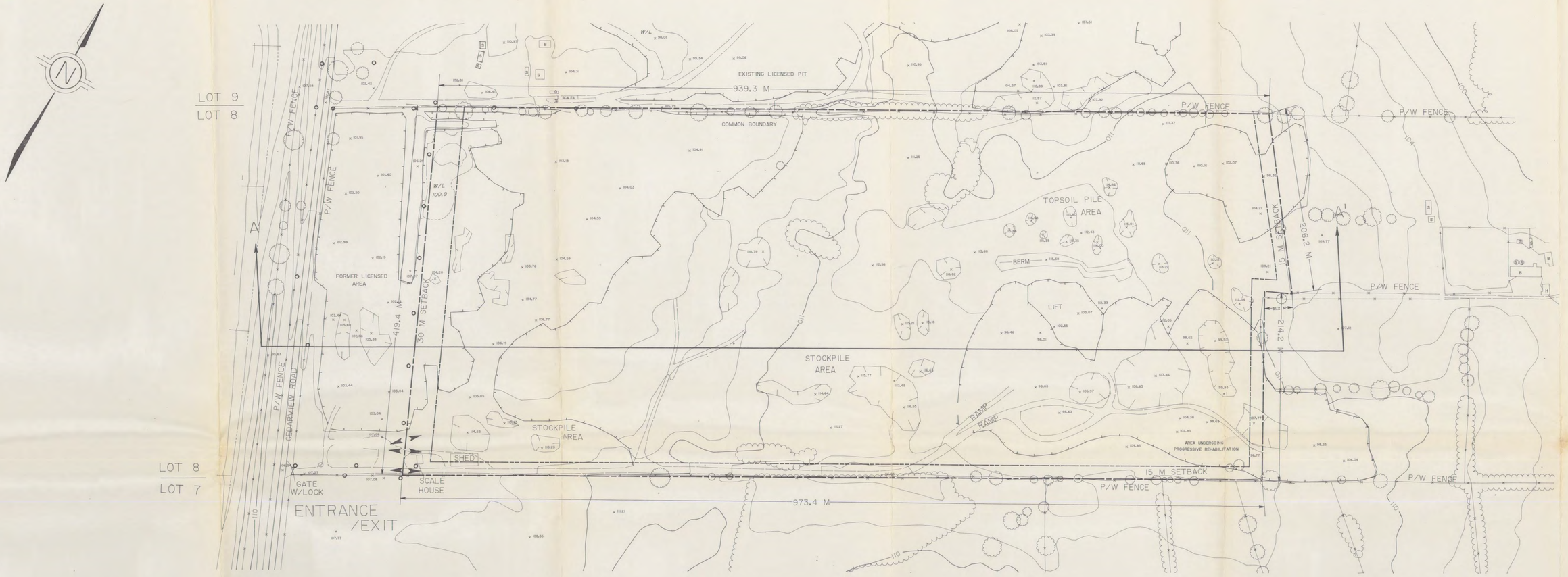
THE BASE MAPPING CO. LTD.

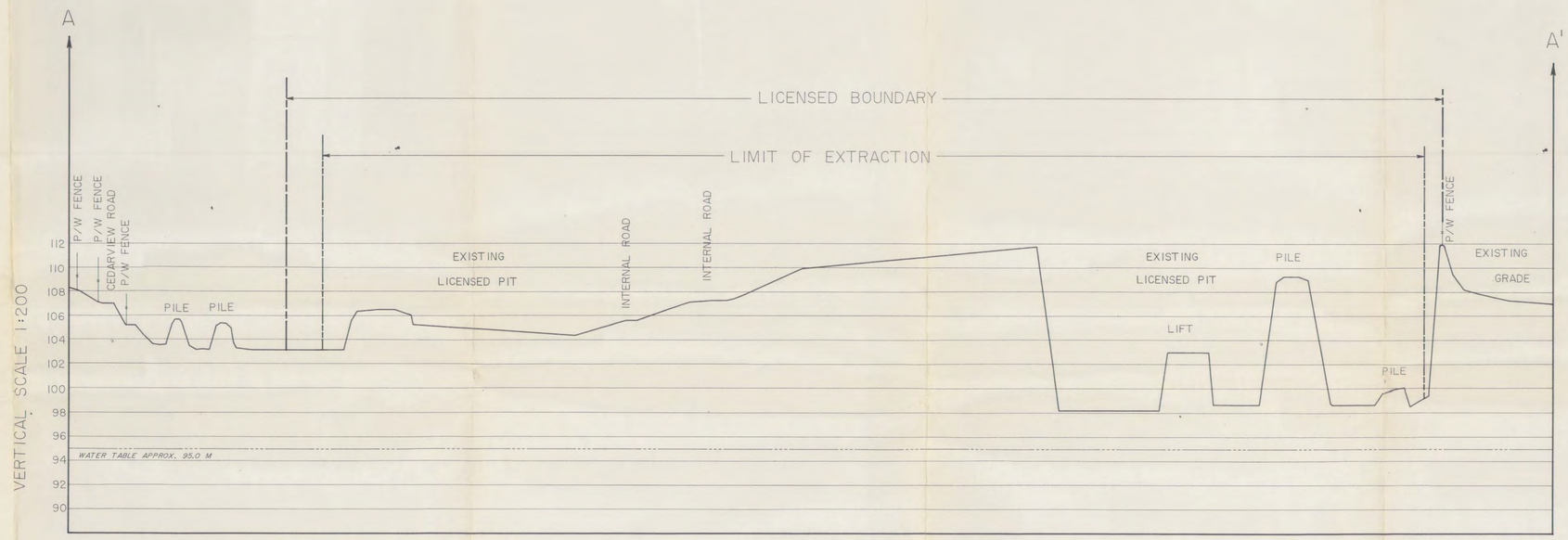
"I hereby certify that this site plan has been prepared under my direction." Douglas J Sadowski, O.L.S. Ontario Land Surveyor

D Sadowski

UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723-8100 FAX: (613) 723-8569



BUILDINGS	SIZE IN M^2
1. SCALE HOUSE	70
2. MAINTENANCE BUILDING	436



HORIZONTAL SCALE 1:2000

EXISTING FEATURES

The entrance/exit is off Cedarview Road. There is a licensed pit directly adjacent to the north (George Drummond). There is a common boundary agreement on file with M.N.R.. There is a fair to good post and wire fence along this boundary. The west boundary has a post and wire fence in fair to very poor condition. There is an existing post and wire fence along the south boundary in poor condition. There is an electric, single strand fence, just outside the east boundary, used to keep cattle away.

The Regional Municipality of Ottawa Carleton operate the land-fill site to the west. The property to the south are vacant fields. The fields to the east are used for pasturing cattle.

The easterly portion of the south boundary is presently being backfilled with clean material excavated from construction sites off the property. It is being backfilled to the original ground elevation and width to restore the setback in that area and then sloped.

Rehabilitation has already begun along the east face.

Surface drainage is via natural seepage into the granular sub-base.

The scale house and maintenance building are located on part of the 30 metres setback along the south boundary.

There are several stockpiles of peat located behind the scale house and maintenance building. Several small stockpiles of topsoil are located in the northeast area of the licensed property.

To establish the water elevation of ±95.0 meters we have utilized information from test hole data rather than the data from M.O.E. well records.

SEE PAGE 1 OF 4

MINISTRY OF NATURAL RESOURCES
CARLETON PLACE OFFICE
JUN 15 1992
RECEIVED

KEY MAP

EXISTING FEATURES - SITE

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 38.1 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUCTION WITH AN APPLICATION FOR A CLASS A LICENCE UNDER THE AGGREGATE RESOURCES ACT AND REGULATIONS.
5. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
6. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION/SETBACK LINE
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
- LAKE/POND AND WATER LEVEL
- WATERCOURSE: DOUBLE,SINGLE. FLOW ARROW.
- BRIDGE/CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991

MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN
1:2000	2 METRE	SEPT. 1991

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE _____ DATE June 17/92

PAGE 2 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE _____ DATE June 17/92

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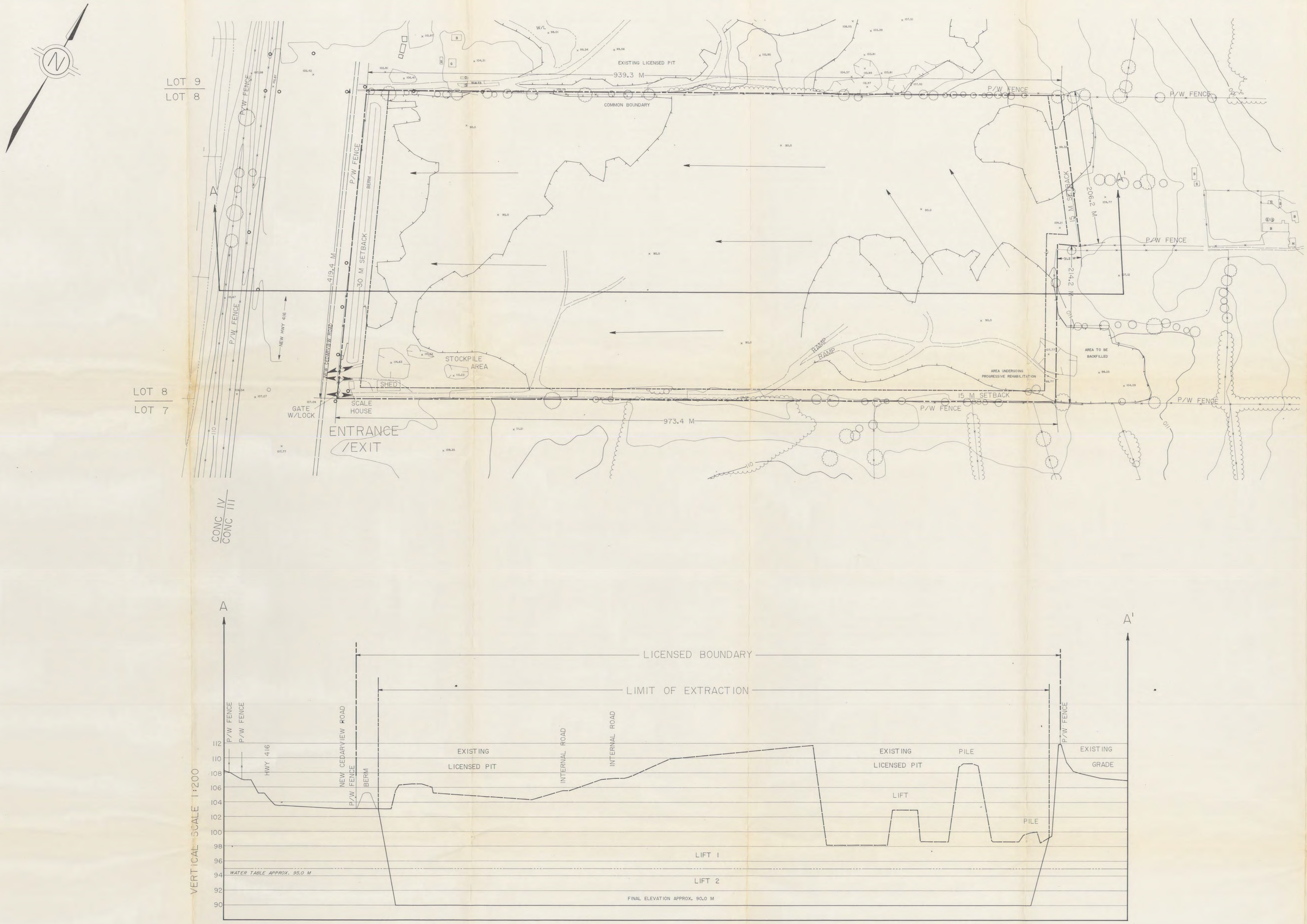
THE BASE MAPPING CO. LTD.
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723-8100 FAX: (613) 723-8569

"I hereby certify that this site plan has been prepared under my direction." Douglas J. Sadowski, O.L.S. Ontario Land Surveyor

D. Sadowski



OPERATION PLAN

Portable equipment will be used on the site and will include trucks, bulldozers, front-end loaders, and screening equipment and will be moved as needed around the site.

A new berm will be constructed along the newly located west boundary during the construction of Highway 416 in the summer/fall of 1992. The berm will be approximately 5.5 metres high and width of approximately 23 metres with 2:1 slope. Berm will be topsoiled and seeded to prevent erosion. A new post and wire fence will be placed along the western boundary. Two double sets of farm gates will go at the two entrances/exits as shown on the plan.

The existing fence along the south boundary adequately marks this area.

Gravel is located on the easterly half of the site. Most of the sand is located on the remaining west half of the property. Generally the pit will operate from an east to west direction, however, sand is being removed from the western part at the same time, at a higher elevation. The excavation for the most part will be carried out in 2 lifts to a final floor elevation of 90.0 metres. Lift 1 will mine down to approximately 1 metre above the water table at 95.0 metres. Material below the water will be removed using a hihoe. This operation above and below the water may be carried out simultaneously.

The area below water will be backfilled to an elevation approximately 2 metres above the water table (97.0 metres). Backfilling will follow operations as closely as possible in order that final rehabilitation can be completed progressively.

Minor Site Plan Amendment
Lic. 4219, Marcel Brazeau Ltd., Lot 8, Con. III, Nepean. Manufacturing of topsoil for resale and rehabilitation needs permitted on site. 46,000 m3 of topsoil will be produced and/or retained by the year 2011 for rehabilitation purposes. The rehabilitation topsoil will be stored in the berm along Cedarview Rd. and in a stockpile in the southwest corner of the site.

Marcel Brazeau Ltd. Date: Nov 28/91

MNR, R.A. Paquette Date: Nov 2/91

4219

SEE PAGE 1 OF 4

MINISTRY OF NATURAL RESOURCES
CARLETON PLACE, ONT.
JUN 15 1992
RECEIVED

KEY MAP

OPERATIONAL PLAN

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 38.1 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
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TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
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- HYDRO TOWER
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- MARSH
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- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991

MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN
1:2000	2 METRE	SEPT. 1991

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.
SIGNATURE _____ DATE June 17/92

PAGE 3 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE _____ DATE June 17/92
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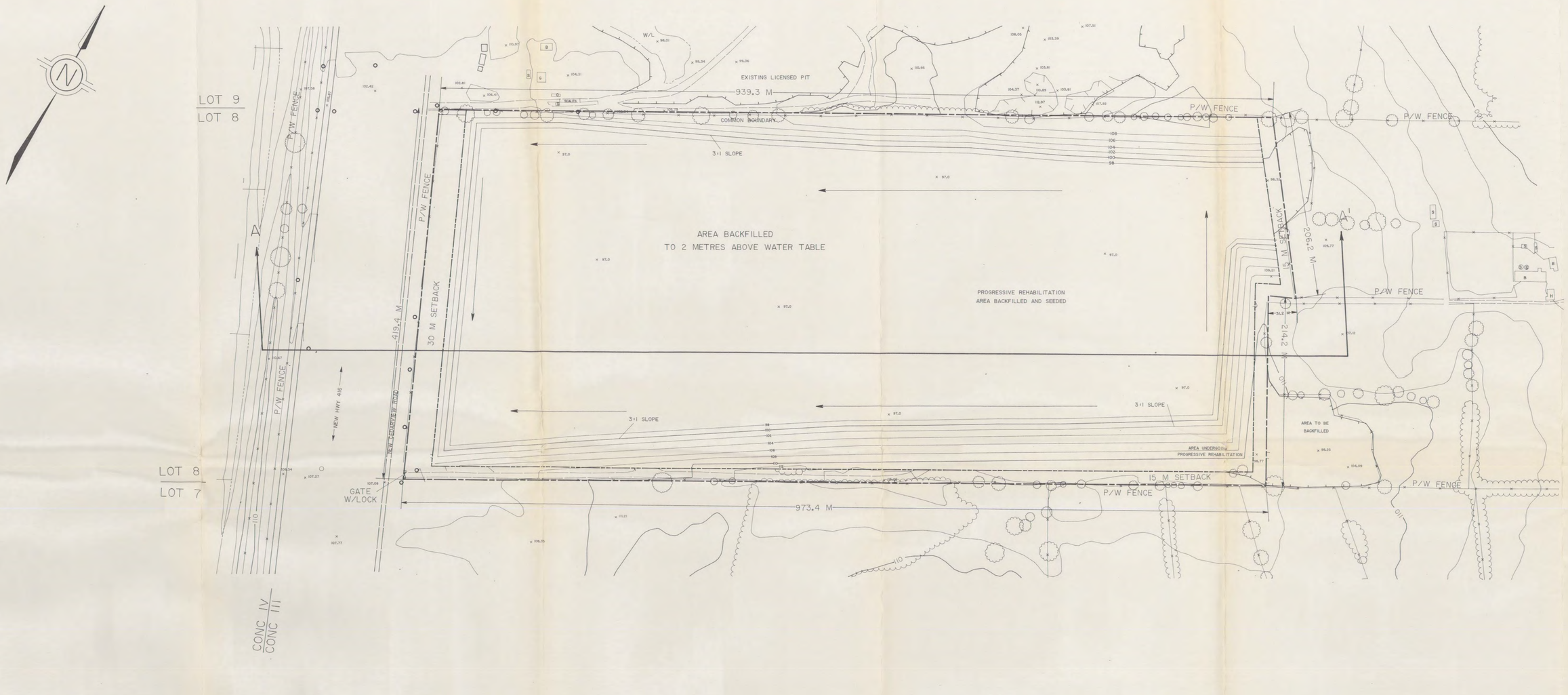
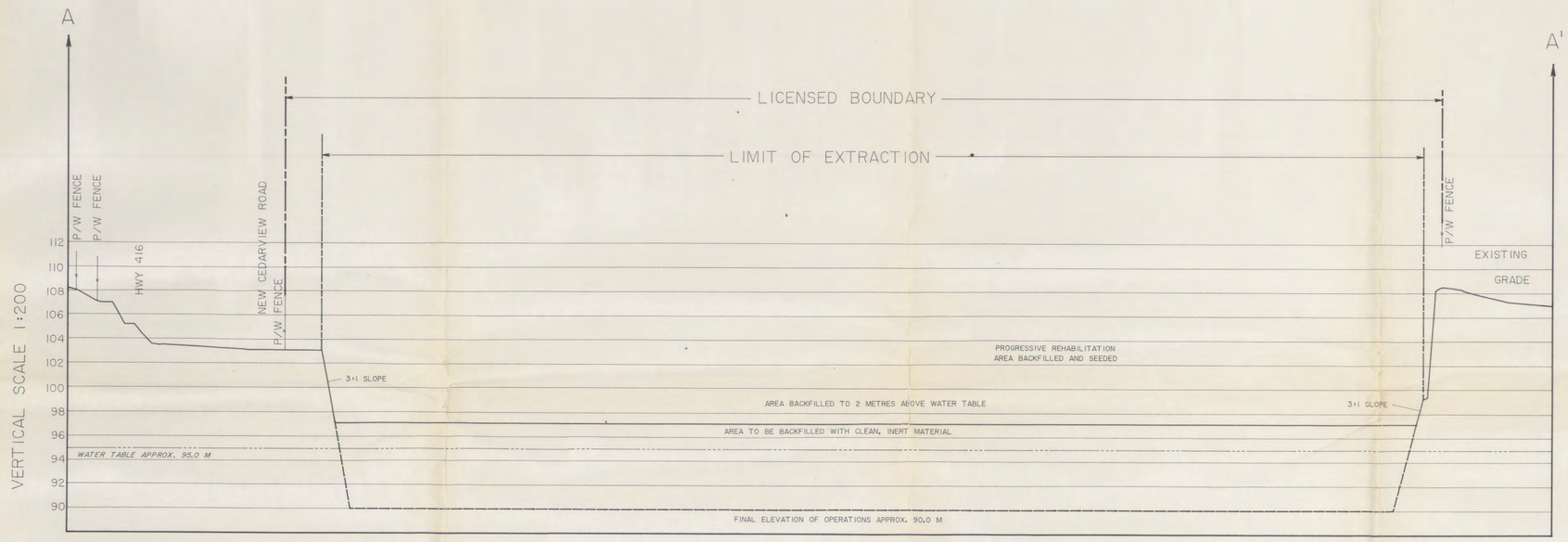
THE BASE MAPPING CO. LTD.
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
(613) 723-8100 FAX: (613) 723-8569

"I hereby certify that this site plan has been prepared under my direction." Douglas J. Sadowski, O.L.S. Ontario Land Surveyor





HORIZONTAL SCALE 1:2000

REHABILITATION

The backfill will be imported onto the site from excavated material from construction sites or other clean fill from ditching.

The north face will be backfilled to meet the final floor of the adjacent pit (104 metres). Most of the east face, except the south east corner, has been sloped.

The backfilling of the open water will commence at the east end once the operation has progressed sufficiently west so that product below water is not contaminated by the backfill.

When enough area has been backfilled to above water, it will be topsoiled/seeded to reduce the open area requiring rehabilitation as quickly as possible. The area will be seeded with a grass/legume mixture suitable for the backfilled material. It will be maintained to ensure healthy growth.

All pit faces will be sloped to a 3:1 gradient, topsoiled, and seeded.

The drainage will continue as seepage into the subsoil. The property will remain as a grassy field. Future use will be determined by the City of Nepean at a later date.

SEE PAGE 1 OF 4

MINISTRY OF NATURAL RESOURCES
CARLETON PLACE, ONT.
JUN 15 1992
RECEIVED

KEY MAP

PROGRESSIVE REHABILITATION AND FINAL REHABILITATION PLANS

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 38.1 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
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7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

TODD PIT

PART OF LOT 8, CONCESSION III

CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION/SETBACK LINE
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
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- BRIDGE/CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	2 METRE	SEPT. 1991		

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE _____ DATE June 17/92

PAGE 4 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE _____ DATE June 17/92

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UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
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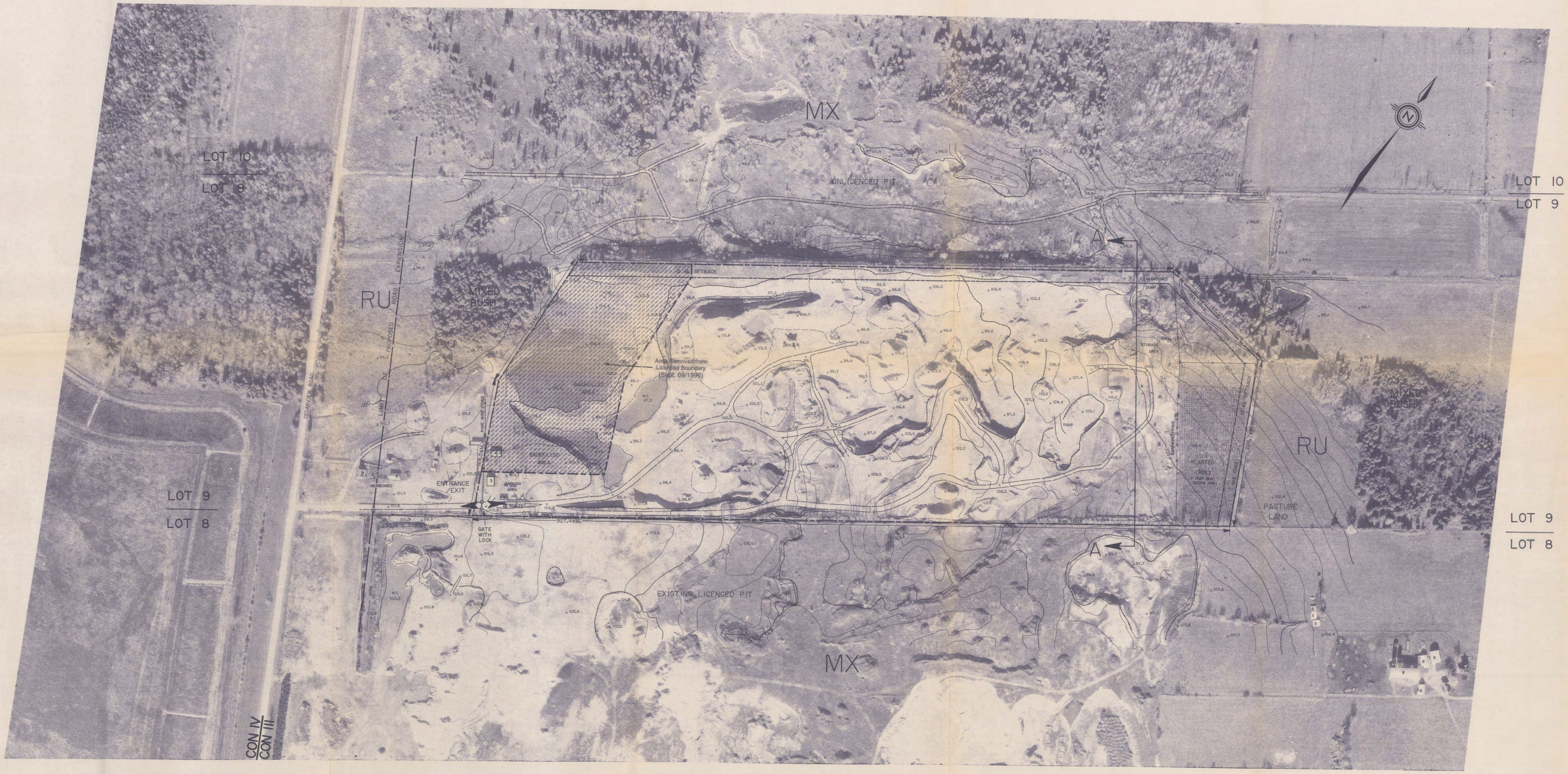


EXISTING FEATURES

Property licenced for pit operation as designated under the authority of the Aggregate Resources Act 1989.

A pit area presently exists on the majority of the licenced area. Natural drainage of the property is by seepage into the soil and surface drainage to the east.

A weigh scale, garage, office and barn all present on the site near the entrance/exit to the pit.

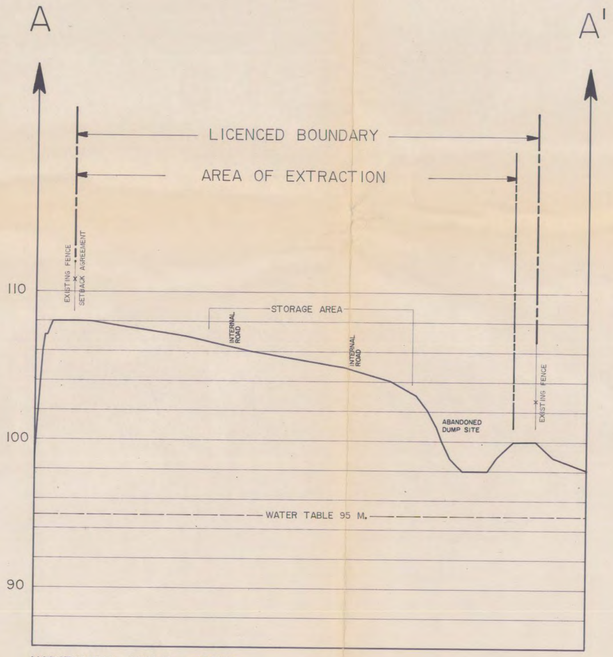
Fencing is not required along the north boundary. Fencing and setback is not required along the south boundary as there exists a boundary agreement between Brazeau and George W. Drummond Ltd., owners of the two properties in concern.

There is no setback along the west boundary as the adjacent property is owned by George Drumond.

A tree plantation of 7 year old Scots pine exists on the licenced property located at the east end. This area has been leased out by Drumond until 2002.

INDEX OF SITE BUILDINGS

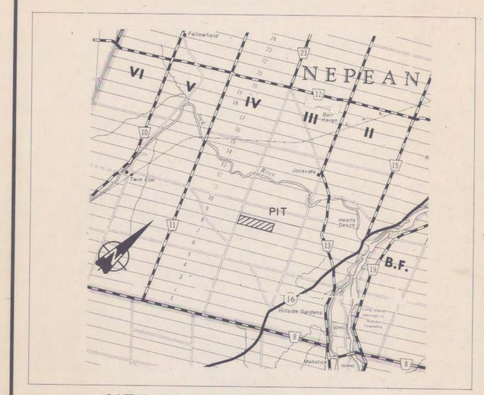
	Classification	Area (m²)
1.	Weigh Scale Office	12.8
2.	Office Trailer	25.0
3.	Storage Garage	109.6
4.	Barn	98.6



HORIZONTAL SCALE - 2000
VERTICAL SCALE - 200

M.O.E. Well Water Data 1991 (in metres)

Con.	Lot	Well No.	Elevation Ft.	Water Found	Static Water Level
III	8	15-6040	97m	20.4	6.4



KEY MAP CITY OF NEPEAN

EXISTING FEATURES

NOTES

	Revision Values as of Sept. 09/1996
1. LICENCED AREA 27.5 ± HECTARES.	23.5 ± ha
2. AREA OF OPERATION 25.8 ± HECTARES.	22.3 ± ha
3. EXISTING DISTURBED AREA 22 ± HECTARES.	20.5± ha

4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUNCTION WITH AN APPLICATION FOR A CLASS A LICENCE UNDER THE AGGREGATE RESOURCES ACT & REGULATIONS.
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7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

OFFICE COPY

COSTELLO PIT

ARA No. 4074

PART OF LOT 9, CONCESSION III
CITY OF NEPEAN

GEORGE W. DRUMMOND LIMITED
30 RIDEAU HEIGHTS DRIVE
NEPEAN, ONTARIO K2E 7A6

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION (SETBACK LINE)
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
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- BRIDGE, CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION
- Area Removed from Licenced Boundary

PHOTO SCALE	ROLL No.	EXPOSURE No.	LINE No.	PHOTO DATE
1:15000	90066	37-39	1	NOV. 1990

MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN
1:2000	1 METRE	DEC. 1990

0 50 100 150 metres

AMENDMENTS	DATE
Modified licenced boundary and corresponding calculations and notes.	Sept. 09, 1996

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES
SIGNATURE
DATE Sept 17/96

PAGE 1 of 2 | CONTRACT C 419 - 90

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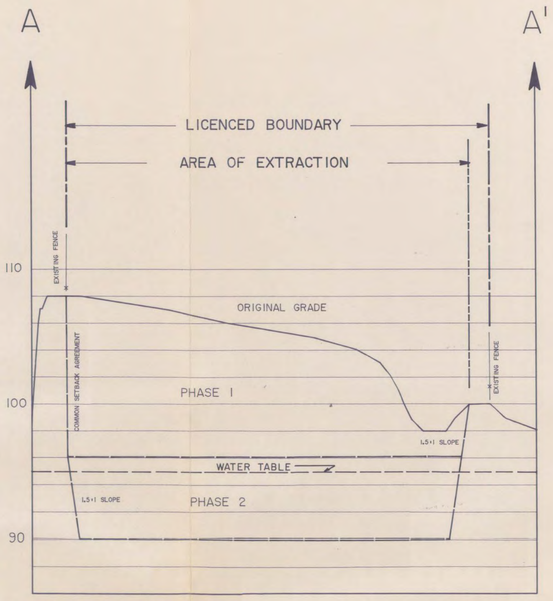
THE BASE MAPPING CO. LTD.
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723 - 8100 FAX: (613) 723 - 8569

D. Lebrasseur
SEP 10 1996

OPERATION PLAN



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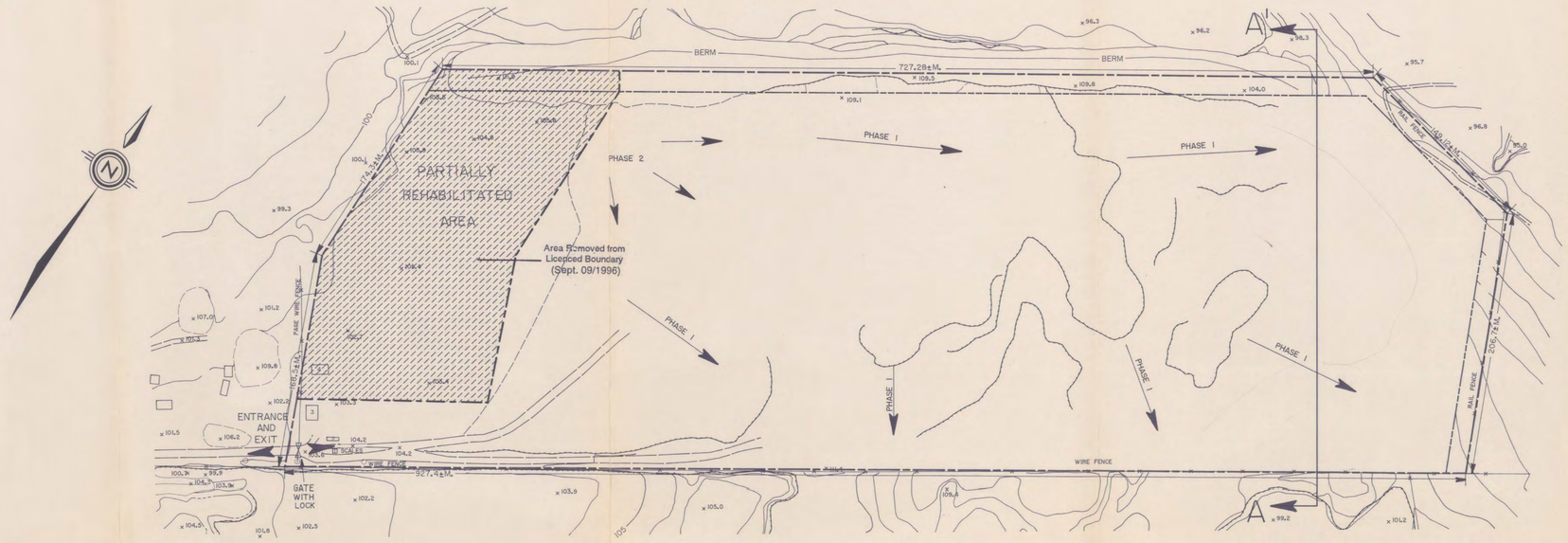
VERTICAL SCALE - 200



GENERAL

The pit will operate in accordance with the Aggregate Resources Act 1989.

Fencing and setback is not required along the south limits of the pit as agreed upon by Marcel Irazeau (pit owner to the south of Drummond) and George W. Drummond Ltd. Fencing is also not required for the north boundary. Various locations, where fences need not be established, have been agreed upon by the Ministry of Natural Resources.

The entrance/exit to the pit has a gate with a lock on it.

The entrance/exit to the pit is from Cedarview Road.

There exists no limitations to the types or location of excavation equipment which may operate on the site. All machinery is equipped with noise and dust suppressors.

Information pertaining to water wells is indicated on the Existing Features Plan.

Product stockpiles are stored within the confines of the limit of extraction.

Recycling of asphalt is permitted within the extraction limits. Area for recycling will be kept 10 metres from any open water.

The tree plantation area lease, upon its expiry date, will be subject to mining activity. Operation of this area will fall into regular mining phases as described within the Operation notes.

OPERATION

The licenced pit hectarage will be mined in two phases of operation. Phase 1 above water table, Phase 2 below water table.

Phase 1 mining is active, operating to a depth of approximately 95 metres as indicated on the Operation Plan. Direction of operation moves from the west towards the east.

Phase 2 mining will follow the Phase 1 mining pattern beginning from the westerly limits of the licenced property and proceeding in a easterly direction, as indicated on the Operation Plan.

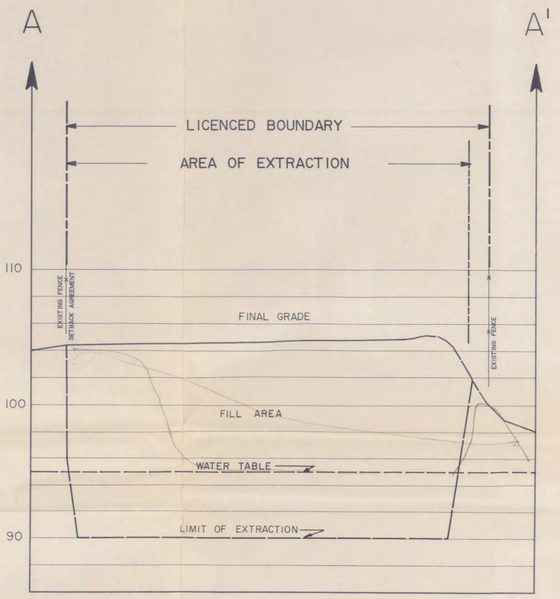
Phase 2 will begin mining operation upon completion of Phase 1. Mining will be below the water table. Extraction of the material will be by dragline methods. No pumping or letting of water will be needed. Final operation depth will be approximately 90 metres.

Amendment - April 29/99

Import topsoil to process for resale.

To allow Phases 1 & 2 to operate concurrently and simultaneous in various locations due to the differently quality of material throughout the site and also the high concentration of clay ridges.

PROGRESSIVE REHABILITATION AND FINAL REHABILITATION PLAN



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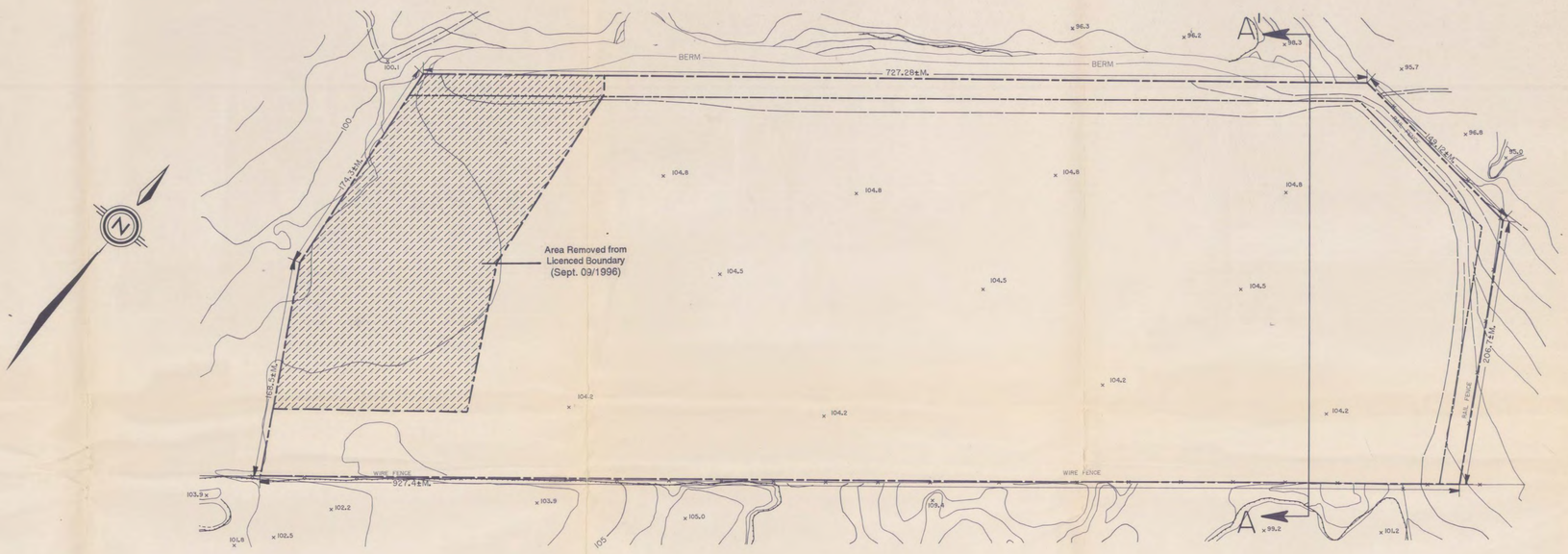
VERTICAL SCALE - 200



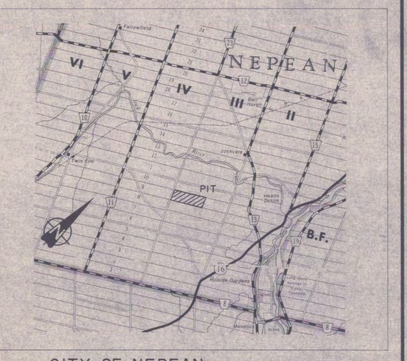
REHABILITATION

Maximum hectarage to be rehabilitated is approximately 22.3 hectares. Progressive rehabilitation will be carried out on the site. In the general this would be carried out by filling from a westerly to easterly direction.

The pit will be backfilled with acceptable inert material. The final site elevation will be approximately 104 metres, sloping slightly to the south, as indicated on the Rehabilitation Plan. The sloped surface will then be sewn with a grass legume mixture.

Adequate soil would be spread on the site to facilitate an adequate growth for grass legume mixture.

The site can then be adequately utilized for building development or pasture.



KEY MAP CITY OF NEPEAN

OPERATION & REHAB PLAN

NOTES	Revision Values as of Sept. 09/1996
1. LICENCED AREA 27.5± HECTARES.	23.5 ± ha
2. AREA OF OPERATION 25.9± HECTARES.	22.3 ± ha
3. EXISTING DISTURBED AREA 16.4± HECTARES.	16.4 ± ha

4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUNCTION WITH AN APPLICATION FOR A CLASS 'A' LICENCE UNDER THE AGGREGATE RESOURCES ACT & REGULATIONS.
5. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
6. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

COSTELLO PIT

ARA No. 4074

PART OF LOT 9, CONCSSION III

CITY OF NEPEAN

GEORGE W. DRUMMOND LIMITED
30 RIDEAU HEIGHTS DRIVE
NEPEAN, ONTARIO K2E 7A6

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION (SETBACK LINE)
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
- LAKE/POND
- WATERCOURSE: DOUBLE, SINGLE, FLOW ARROW
- BRIDGE, CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION
- Area Removed from Licenced Boundary

PHOTO SCALE	ROLL No.	EXPOSURE No.	LINE No.	PHOTO DATE
1:15000	90066	37-39	1	NOV. 1990
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	1 METRE	DEC. 1990		

0 50 100 150 metres

AMENDMENTS	DATE
Modified licenced boundary and corresponding, calculations and notes.	Sept. 09, 1996
See amendment dated April 29/99	May 17/99

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE DATE

PAGE 2 of 2	CONTRACT C 419 - 90

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SEP 10 1996

UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
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Appendix D

Corrigan Pond Documents

Servicing Brief Appendix G
32846-5.3.1.5

Stormwater Management Barrhaven South

Prepared for Minto Communities Inc.
by IBI Group

2014-10

Document Control Page

CLIENT:	Minto Communities Inc.
PROJECT NAME:	Barrhaven South
REPORT TITLE:	Stormwater Management Barrhaven South
IBI REFERENCE:	32846
VERSION:	
DIGITAL MASTER:	[File Location]
ORIGINATOR:	[Name]
REVIEWER:	[Name]
AUTHORIZATION:	[Name]
CIRCULATION LIST:	
HISTORY:	

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1 Introduction 1
1.1 Background 1
1.2 Objective 1
1.3 Summary of Site Servicing Requirements 1
2 Hydrological Evaluation 2
2.1 Land Use and Drainage Areas 2
2.2 Storm Events and Input Parameters 2
3 Hydraulic Evaluation 4
4 Summary of the Conceptual Phase 1 Dry Facility 6
5 Conclusions and Recommendations 7

1 Introduction

A Servicing Brief is being prepared on behalf of Minto Communities Inc. (Minto) for a portion of its lands in Barrhaven South. The first phase of Minto's development (Phase 1) is located at 3872 Greenbank Road, north of Barnsdale Road.

1.1 Background

The subject site is part of the lands tributary to the Corrigan Stormwater Management (SWM) Facility, which was designed to service a drainage area of 145 ha. The storm servicing of the lands tributary to the Corrigan SWM Facility and the detailed design of the pond were carried out by IBI Group, presented in "Corrigan Stormwater Management Facility Stormwater Management Report and Design Brief," originally completed in 2008 and updated in 2010. The Corrigan SWM Facility is designed to control urban runoff for the 145 ha catchment area.

Minto's lands west of Greenbank Road were represented by Areas A1 and A2 in the Corrigan SWM Report and Design Brief. The drainage area plan from the report is enclosed in **Attachment A** for reference. In the Corrigan SWM Report and Design Brief, Area A1 represents rural lands, while Area A2 is designated for development. The minor system capture from A1 is the total flow, while from A2 is a combination of 85 l/s/ha for residential development and 20 l/s/ha for park area. The minor system flow is conveyed by the Greenbank Road trunk storm sewer to the Corrigan SWM Facility. The maximum release rate from A1 and A2 to the trunk storm sewer is 3 cms. With respect to major system flow, approximately 1.2 cms cascades overland to the downstream development to the north, tributary to the Todd SWM Facility.

Construction of the Corrigan SWM facility was completed in 2010.

1.2 Objective

IBI Group has been retained to provide stormwater management support and to update the previous study with respect to the Phase 1 development, taking into consideration updated City of Ottawa stormwater management guidelines presented in City of Ottawa Technical Bulletins ISDTB-2012-1 (January 31, 2012), ISDTB-2012-4 (June 20, 2012), and ISDTB-2014-1 (February 5, 2014).

1.3 Summary of Site Servicing Requirements

The following is a summary of the stormwater management site servicing requirements as established by the Corrigan SWM Servicing and Design Brief:

- The maximum minor system flow capture in the Greenbank trunk storm sewer from Areas A1 and A2 is 3 cms.
- The major flow cascading downstream from Areas A1 and A2 is 1.2 cms (0.9 cms at the western overflow location and 0.3 cms at the eastern overflow location).

2 Hydrological Evaluation

Preliminary modeling of the subject site has indicated that to meet the release flow rates summarized in Section 1.3, the surface ponding in the Phase 1 street sags is insufficient to achieve City of Ottawa guidelines. It is therefore proposed to retain the major flow in a dry facility. This provides an opportunity to eliminate the major system overflow from Phase 1, minimizing impact on the downstream lands.

The location of Phase 1 development in relation to the overall Corrigan SWM System is indicated on **Figure G-1**. It is proposed to build a temporary Phase 1 dry facility in the south-east corner of Phase 1.

The preliminary sizing of the Phase 1 dry facility was completed using SWMHYMO. This technique offers a single storm event flow generation and routing. It is also consistent with the hydrological evaluation completed for the overall Corrigan SWM System. Land use, storm events and input parameters are discussed in this section. A model schematic is presented on **Figure G-2** and model files are enclosed in **Attachment A**.

The hydrographs generated in the SWMHYMO model representative of the Phase 1 development were exported to the XPSWMM model of the Corrigan SWM System, discussed in **Section 3**.

2.1 Land Use and Drainage Areas

Phase 1 development measures 23.96 ha (interim pond inclusive) and is comprised of single family units, townhouses, park and a school. The majority of the Phase 1 development, 20.8 ha, contributes minor runoff to the Greenbank Road trunk storm sewer and major flow to the proposed Phase 1 dry facility. The remainder of the site, 2.2 ha, contributes total runoff directly to the Greenbank Road trunk storm sewer. The Greenbank Road trunk storm sewer conveys flow to the Corrigan SWM Facility.

In addition to the major flow from the 20.8 ha urban development, 22.6 ha of upstream rural lands contribute runoff to the Phase 1 dry facility.

The drainage area plan is presented on **Figure G-2**.

Table 2.1 Drainage areas

DRAINAGE AREA		OUTLET	AREA (HA)
PH1A	Phase 1 development	Minor flow to Greenbank Road trunk storm sewer; major flow to Phase 1 dry facility	20.8
PH1B	Phase 1 development	Total flow to Greenbank Road Trunk Storm Sewer	2.2
RURAL	Upstream rural area	Total flow to Phase 1 dry Facility	22.6

2.2 Storm Events and Input Parameters

The main hydrology parameters are summarized below and supporting calculations are provided in **Attachment A**.

- **Storm Events** The sizing of the Phase 1 dry facility was completed using the 100 year 24 hour SCS Type II storm event. This is consistent with the evaluation completed for the overall Corrigan SWM System.

- **Imperviousness** The imperviousness value for Phase 1 development is based on the runoff coefficient applied by JL Richards, who are completing the subdivision design. The runoff coefficient is a value applied to developments of similar land use.
- **Time to Peak** Time to peak for the upstream rural area was established using the Uplands Method, which accounts for elevation, distance and land use within the drainage area to estimate velocity of runoff. The time of concentration (Tc) is then calculated based on velocity, from which time to peak is determined applying the formula 0.6Tc (based on the SWMHYMO User's Manual). It is the time to peak (Tp) that is applied in the model. Supporting calculations are enclosed in **Attachment A**.
- **Infiltration** For Phase 1 development, infiltration losses were selected to be consistent with the City of Ottawa Sewer Design Guidelines (2004). The Horton values are as follows: f_o = 76.2 mm/h, f_c = 13.2 mm/h, k = 0.00115 s^{-1}. The SCS methodology was applied to the upstream rural area. A CN value of 77 was selected, consistent with the value applied in the evaluation of the overall Corrigan SWM System. It should be noted that evaluation of the overall Corrigan SWM System was completed applying the SCS methodology in the Corrigan SWM Report and Design Brief.
- **Length** The impervious length applied is based on an average measured length through the catchment and the calculated length based on the SWMHYMO User's Manual. The pervious length is based on average lot depth. This approach is consistent with the City of Ottawa Sewer Design Guidelines. Supporting calculations are enclosed in **Attachment A**.
- **Initial Abstraction (Depression Storage)** Depression storage depths of 0.8 mm and 1.5 mm were used for impervious and pervious areas, respectively. These values are more conservative than those in the City of Ottawa Sewer Design Guidelines.
- **Manning's Roughness** Manning's roughness coefficients of 0.013 and 0.25 were used for impervious and pervious areas, respectively.
- **Slope** A slope of 0.2% was used for impervious surfaces and a slope of 2% was used for pervious areas (lot grading).
- **Allowable Release Rates** As noted above, due to topographical constraints, runoff from approximately 2.2 ha of the Phase 1 development adjacent to Greenkbank Road will drain directly to the Greenbank Road trunk storm sewer. The allowable minor system release rate from the remaining Phase 1 development has been optimized based on the available capacity in the Greenbank Road trunk storm sewer less that used by the 2.2 ha and by the dry pond outflow. An outflow of 500 l/s is proposed for the pond. The allowable release rates have been coordinated with JL Richards.
- **On-site Storage** On-site storage was applied to the Phase 1 development as follows: 50 cu-m/ha was applied to the 2.2 ha portion of Phase 1 and 40 cu-m/ha was applied to the remaining Phase 1 development. The on-site storage has been coordinated with JL Richards.

The main hydrological parameters applied in the SWMHYMO model are summarized in the below table.

Table 2.2 Summary of input parameters

DRAINAGE AREA ID	AREA (HA)	IMP (%) [TIME TO PEAK (H)]	LENGTH, LGI (M)	MINOR SYSTEM CAPTURE (CMS)	SURFACE STORAGE
PH1A	20.8	65	424	2.290	40 cu-m/ha = 832 cu-m
PH1B	2.2	65	196	0.510	50 cu-m/ha = 110 cu-m
RURAL	22.6	[0.67]	N/A	N/A	N/A

3 Hydraulic Evaluation

The hydrographs generated in SWMHYMO representative of the Phase 1 development were downloaded to the overall XPSWMM model for hydraulic grade line (HGL) analysis of the existing Corrigan SWM System. The XPSWMM model schematic is enclosed in **Attachment A**. The hydraulic grade line analysis was evaluated using the 100 year SCS Type II storm event, consistent with the evaluation of the overall Corrigan SWM System.

During the 100 year event, the trunk storm sewer operates under free flow conditions, with the exception of the maintenance holes listed in the below table, at which surcharge occurs (refer to maintenance hole locations indicated on **Figure G-1**). At the locations where there are residential connections, the under-side of footing (USF) elevation is noted, and freeboard indicated. Otherwise, if there are no residential connections at the location of the maintenance hole, the USF elevation is indicated as not applicable (N/A), and only surcharge above the pipe obvert is indicated.

Table 3.1 Summary of HGL

MH	LOCATION	USF (M)	PIPE OBVERT (M)	HGL (M)	SURCHARGE (HGL – OBV) (M)	FREEBOARD (USF-HGL) (M)
119	Tucana Way	92.040	90.628	90.651	0.023	1.389
118	Tucana Way	92.250	90.765	90.848	0.083	1.402
117	Cambrian Road at Tucana Way	N/A	90.888	91.106	0.218	N/A
106A	Cambrian Road, west of Tucana Way	N/A	91.105	91.442	0.337	N/A
105B	Greenbank Road, south of Cambrian Road	N/A	91.615	91.834	0.219	N/A
104C	Greenbank Road	N/A	91.770	91.944	0.174	N/A
104B	Greenbank Road	92.375	91.863	92.056	0.193	0.319
104	Greenbank Road	92.500	91.914	92.104	0.190	0.396
106	Greenbank Road	N/A	92.070	92.274	0.204	N/A

MH	LOCATION	USF (M)	PIPE OBVERT (M)	HGL (M)	SURCHARGE (HGL – OBV) (M)	FREEBOARD (USF-HGL) (M)
110	Greenbank Road	N/A	92.240	92.454	0.214	N/A
103B	Greenbank Road	93.000	92.325	92.584	0.259	0.416
103	Greenbank Road	N/A	92.644	92.728	0.084	N/A

The 0.3 m minimum clearance between HGL and under-side of footing elevation is maintained along the existing trunk storm sewer tributary to the Corrigan SWM Facility. It is therefore concluded that the stormwater management concept proposed for the Phase 1 development does not negatively impact the performance of the overall system from a hydraulic grade line perspective.

4 Summary of the Conceptual Phase 1 Dry Facility

The conceptual dry facility profile is indicated on **Figure G-3**. It is proposed to provide the facility with a ditch inlet catch basin that will function as the outlet structure. The top of grate elevation will correspond to the lowest elevation of the pond at 97.0 m. Runoff will cascade through the top of grate and exit via an outlet pipe, which will be provided with an inlet control device to control the flow rate. The outlet pipe will tie in to the trunk storm sewer servicing Phase 1, proposed to extend from west to east along the southern Phase 1 property boundary. Orifice calculations to support the conceptual outlet structure design are enclosed in **Attachment A**. During 100 year conditions, the maximum storage used by the facility is 0.71 ha-m. The corresponding water level in the facility is 98.25 m, which has been shown on **Figure G-3**.

5 Conclusions and Recommendations

The first phase of Minto's Barrhaven South development (Phase 1) is located at 3872 Greenbank Road, north of Barnsdale Road.

The subject site is part of the lands tributary to the Corrigan Stormwater Management (SWM) Facility, which was designed to service a drainage area of 145 ha. The storm servicing of the lands tributary to the Corrigan SWM Facility and the detailed design of the pond were carried out by IBI Group, presented in "Corrigan Stormwater Management Facility Stormwater Management Report and Design Brief," originally completed in 2008 and updated in 2010. The Corrigan SWM Facility is designed to control urban runoff for the 145 ha catchment area. Construction of the Corrigan SWM facility was completed in 2010.

Minto's lands west of Greenbank Road were represented by Areas A1 and A2 in the Corrigan SWM Report and Design Brief. The drainage area plan from the report is enclosed in **Attachment A** for reference. In the Corrigan SWM Report and Design Brief, Area A1 represents rural lands, while Area A2 is designated for development. The minor system capture from A1 is the total flow, while from A2 is a combination of 85 l/s/ha for residential development and 20 l/s/ha for park area. Minor system flow is conveyed by the Greenbank Road trunk storm sewer to the Corrigan SWM Facility. The maximum release rate from A1 and A2 to the trunk storm sewer is 3 cms. With respect to major system flow, approximately 1.2 cms cascades overland to the downstream development to the north, tributary to the Todd SWM Facility.

The following is a summary of the stormwater management site servicing requirements as established by the Corrigan SWM Servicing and Design Brief:

- The maximum minor system flow capture in the Greenbank trunk storm sewer from Areas A1 and A2 is 3 cms.
- The major flow cascading downstream from Areas A1 and A2 is 1.2 cms (0.9 cms at the western overflow location and 0.3 cms at the eastern overflow location).

IBI Group has been retained to provide stormwater management support and to update the previous study with respect to the Phase 1 development, taking into consideration updated City of Ottawa stormwater management guidelines presented in City of Ottawa Technical Bulletins ISDTB-2012-1 (January 31, 2012), ISDTB-2012-4 (June 20, 2012), and ISDTB-2014-1 (February 5, 2014).

The Phase 1 development measures 23.96 ha (interim pond inclusive) and is comprised of single family units, townhouses, park and a school. The majority of the Phase 1 development, 20.8 ha, contributes minor runoff to the Greenbank Road trunk storm sewer and major flow to the proposed Phase 1 dry facility. The remainder of the site, 2.2 ha, contributes total runoff directly to the Greenbank Road trunk storm sewer. In addition to the major flow from the 20.8 ha urban development, 22.6 ha of upstream rural lands contribute runoff to the Phase 1 dry facility.

Preliminary modeling of the subject site has indicated that to meet the release flow rates summarized in Section 1.3, the surface ponding in the Phase 1 street sags is insufficient to achieve City of Ottawa guidelines. It is therefore proposed to retain major flow from the majority of Phase 1 in a dry facility. This provides an opportunity to eliminate the major system overflow from Phase 1, minimizing impact on the downstream lands.

The location of Phase 1 development in relation to the overall Corrigan SWM System is indicated on **Figure G-1**. It is proposed that the temporary Phase 1 dry facility be located in the south-east corner of Phase 1, abutting Greenbank Road to the west (refer to **Figure G-2**). The preliminary sizing of the Phase 1 dry facility was completed using SWMHYMO. This technique offers a single storm event flow generation and routing. It is also consistent with the hydrological evaluation completed for the overall Corrigan SWM System. A model schematic is presented on

Figure G-2 and model files are enclosed in **Attachment A**. The conceptual dry facility profile is indicated on **Figure G-3**.

The hydrographs generated in SWMHYMO representative of the Phase 1 development were downloaded to the overall XPSWMM model for hydraulic grade line (HGL) analysis of the existing Corrigan SWM System. The XPSWMM model schematic is enclosed in **Attachment A**. The hydraulic grade line analysis was evaluated using the 100 year SCS Type II storm event, consistent with the evaluation of the overall Corrigan SWM System.

The HGL elevations for those maintenance holes at which there is surcharge are presented in **Table 3.1**. If there are no residential connections at the location of the maintenance hole, the USF elevation is indicated as not applicable (N/A), and only surcharge above the pipe obvert is indicated. Otherwise, at the locations where there are residential connections, the under-side of footing (USF) elevation is noted, and freeboard indicated. The 0.3 m minimum clearance between HGL and under-side of footing elevation is maintained along the existing trunk storm sewer tributary to the Corrigan SWM Facility.

It is therefore concluded that the stormwater management concept proposed for the Phase 1 development does not negatively impact the performance of the overall system from a hydraulic grade line perspective and the Corrigan SWM System will perform as designed.

IBI GROUP

Peter Spal, P.Eng.
Associate Director

Shagha Attar, Ph.D.

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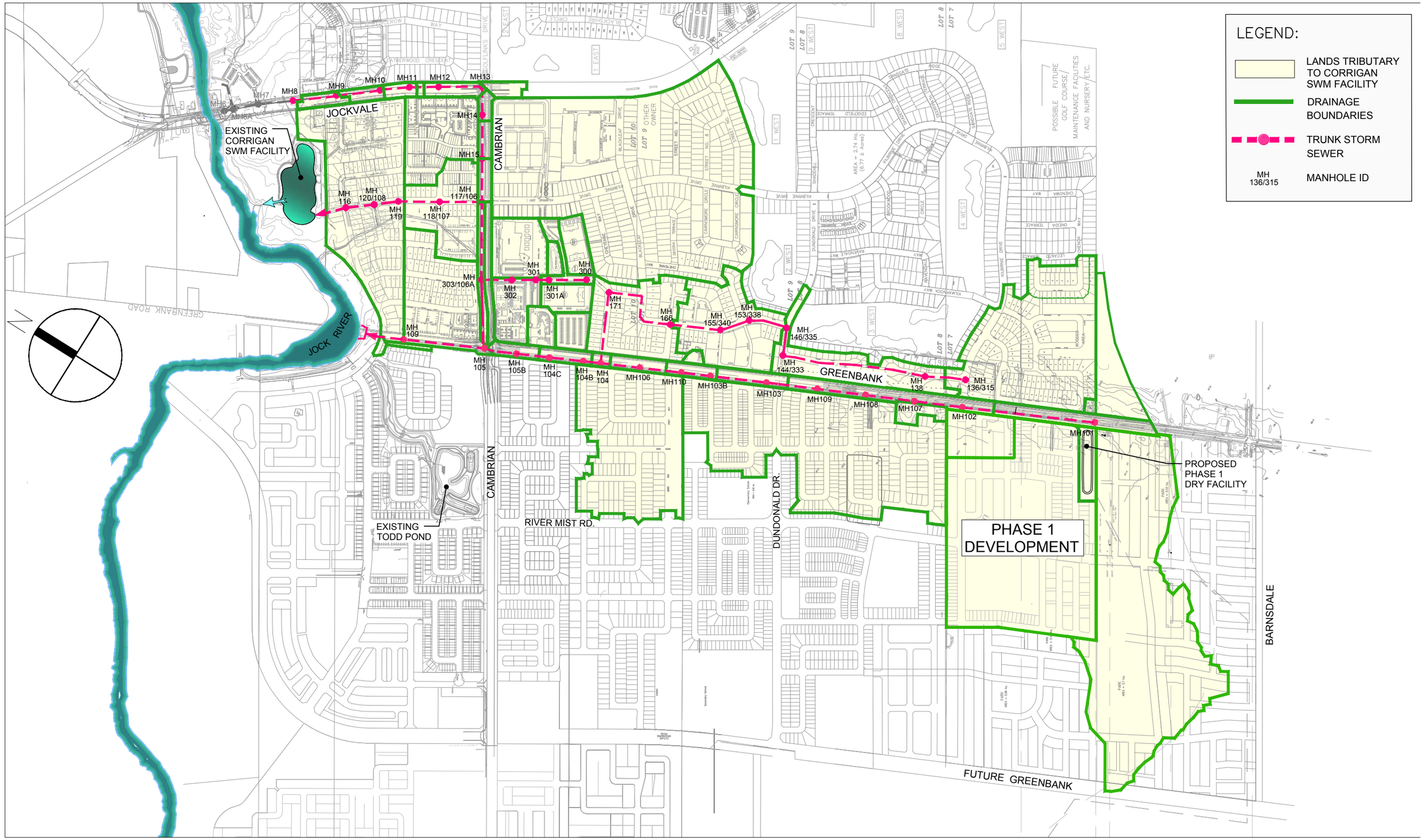

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IBI GROUP

Scale: 1:10000

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Drawing Title: PHASE 1 DEVELOPMENT AND CORRIGAN SWM SYSTEM

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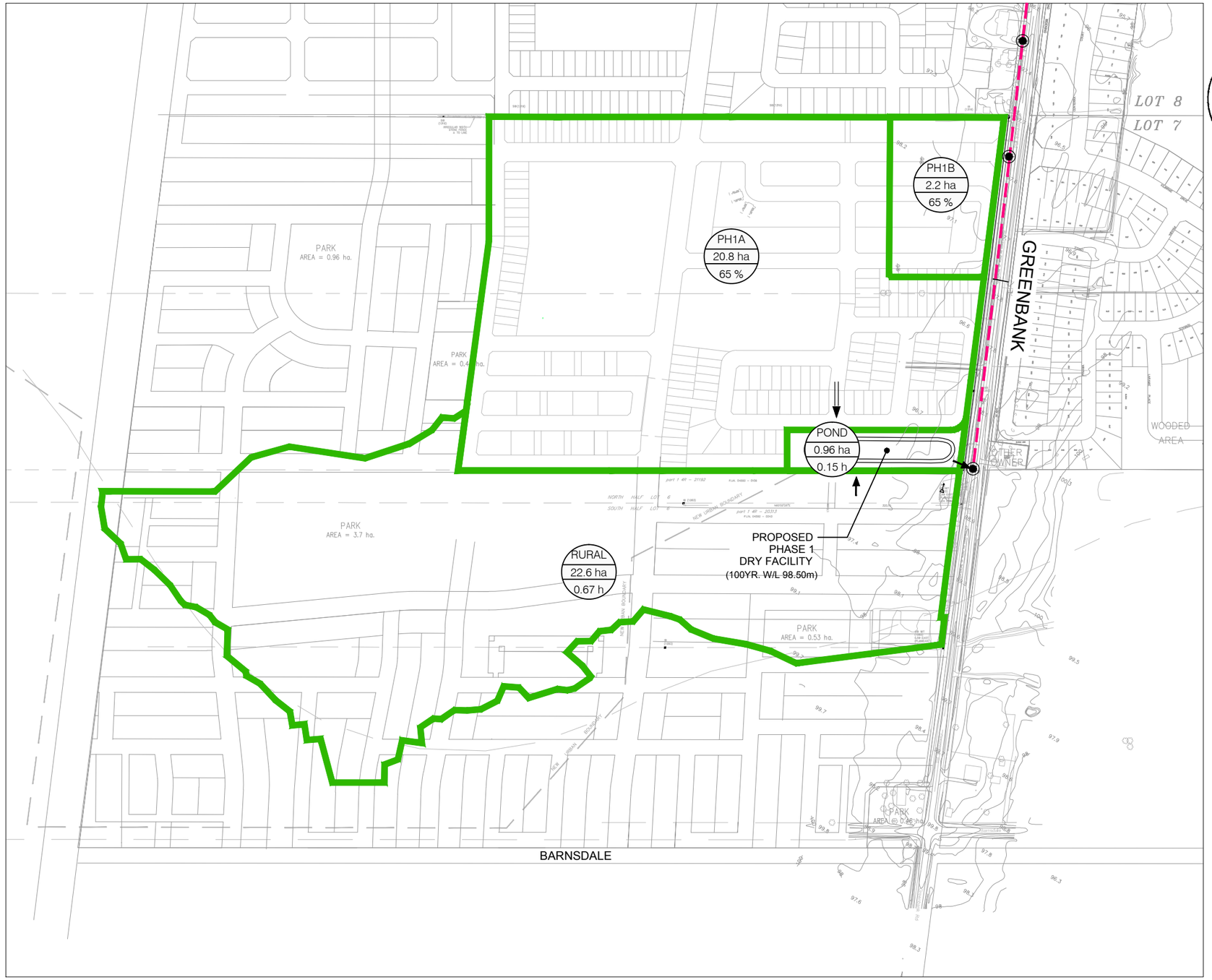
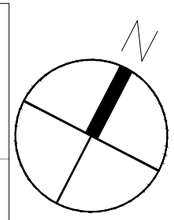




LEGEND:

PH1A
21.70 ha
65 %

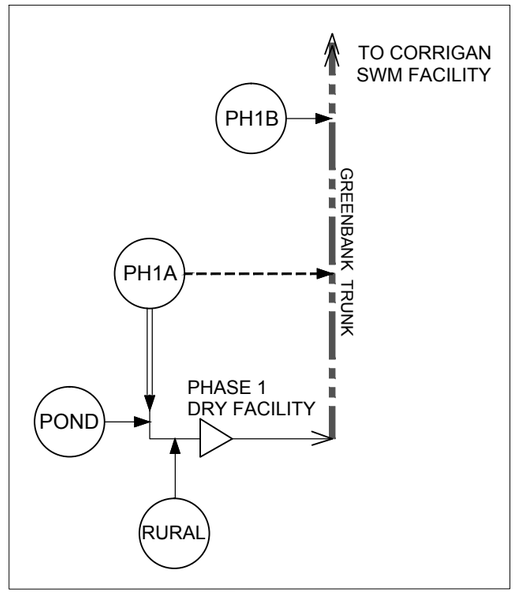
AREA ID
AREA (ha)
IMP (%) / Tp (h)

TOTAL FLOW

MINOR FLOW

MAJOR FLOW

SWMHYMO SCHEMATIC



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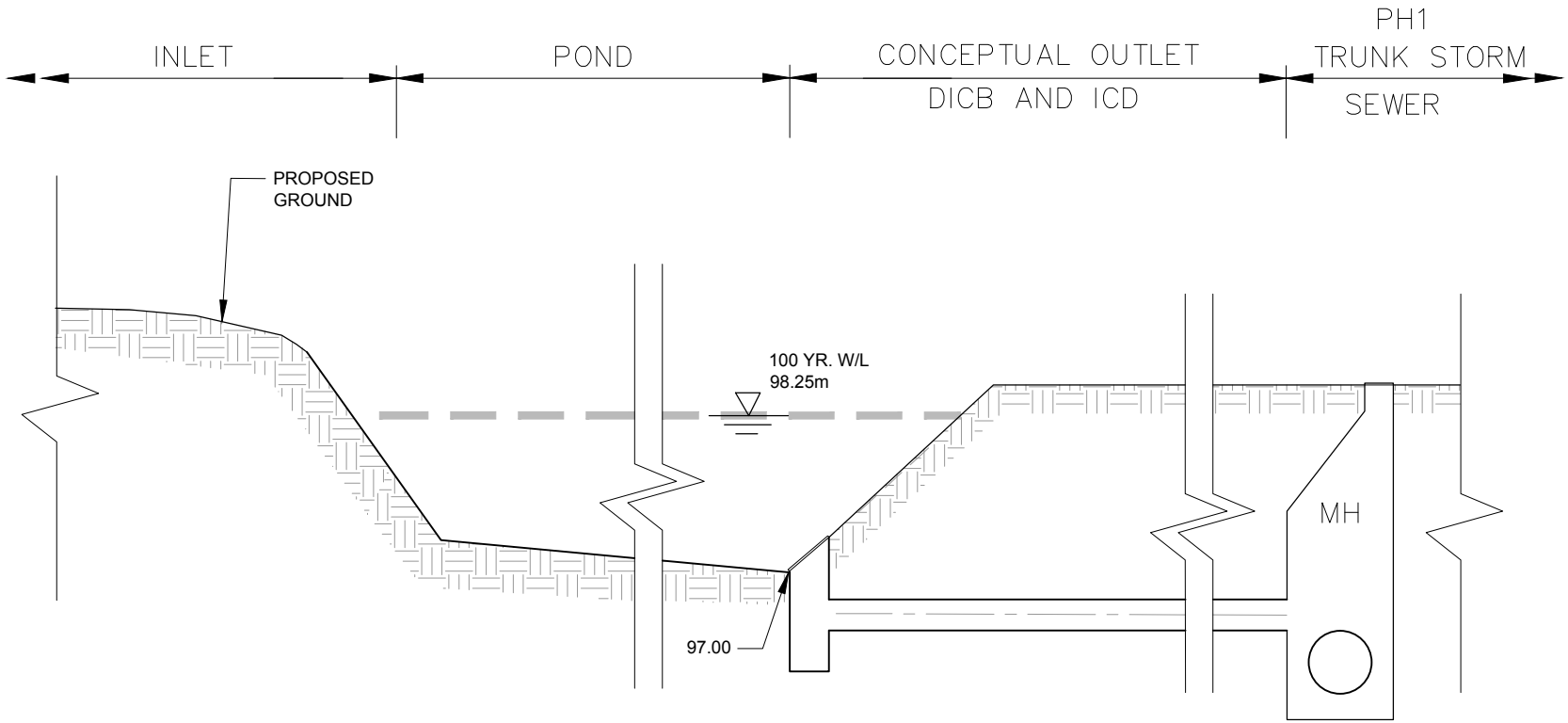
Project Title: BARRHAVEN SOUTH

Drawing Title: DRAINAGE SCHEMATIC

Sheet No.: FIGURE 2



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Scale

Project Title

BARRHAVEN SOUTH

Drawing Title

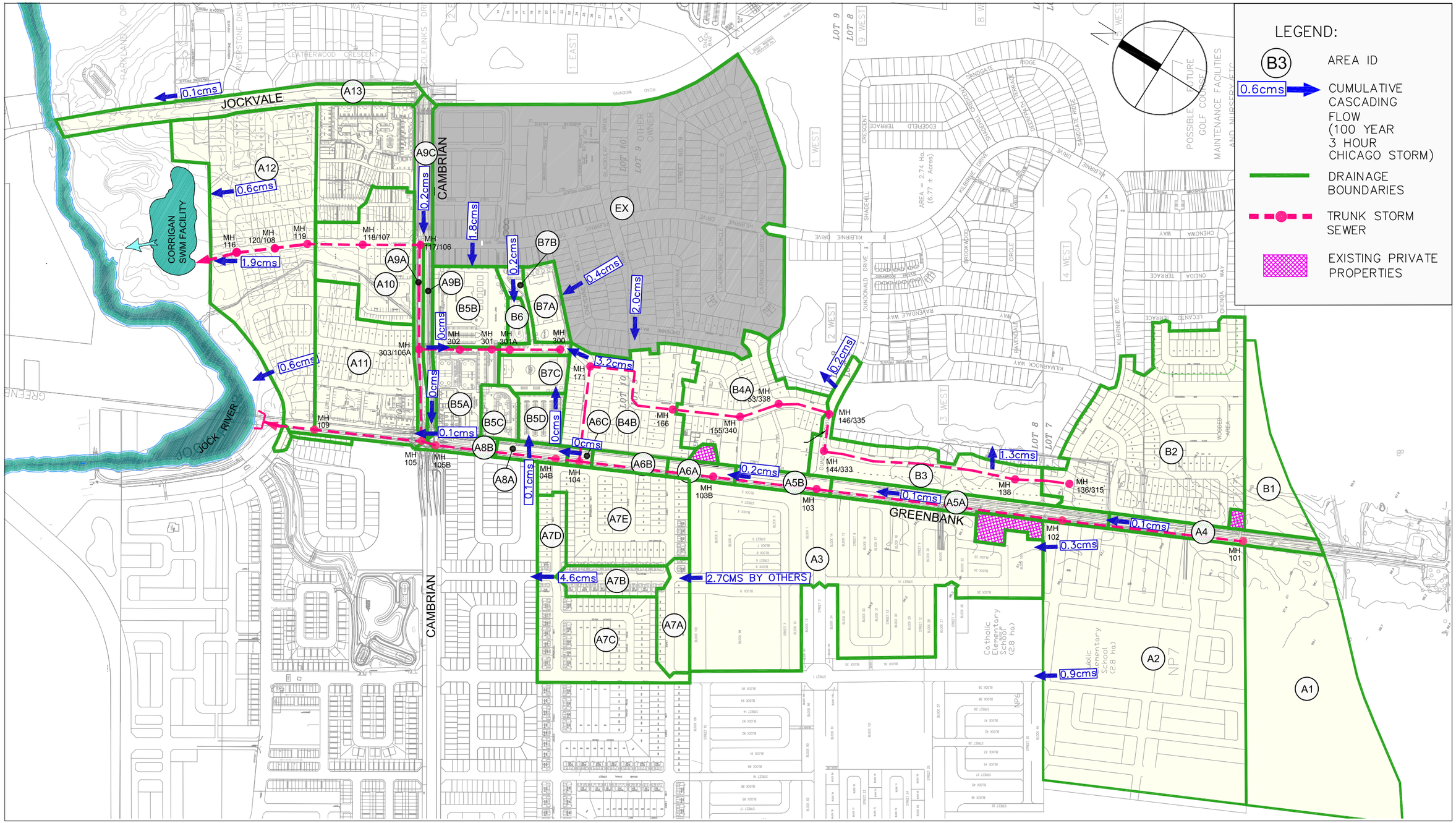
CONCEPTUAL POND PROFILE (NTS)

Sheet No.

FIGURE 3

ATTACHMENT A

RELEVANT BACKGROUND FIGURES, CALCULATIONS AND MODEL FILES



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Plot Style: ---- Plot Scale: 1:1 Plotted At: Jul. 30, 10 11:45 AM Printed By: MICHEL BEAUCHEMIN Last Saved By: MBEAUCHEMIN Last Saved At: Jul. 30, 10

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Scale: 1:7500

Project Title: CORRIGAN STORMWATER MANAGEMENT FACILITY

Drawing Title: DUAL DRAINAGE CASCADING FLOW

Sheet No.: FIGURE 3

Time to Peak Calculations

The time of concentration (Tc) calculation is based on the Uplands Method, SCS National Engineering Handbook, 1972. The time to peak (Tp) calculation is based on the SWMHYMO User's Manual.

Equations:

$$T_c = \frac{L}{v} \times \frac{1}{3600} \quad \text{and} \quad T_p = 0.6 \times T_c$$

where:

T_c	time of concentration (h)
T_p	time to peak (h)
L	hydraulic length of watershed (m)
v	velocity from Uplands Method relationship between watershed slope and velocity (m/s)
0.6	constant to multiply time of concentration by to determine time to peak (as outlined in SWMHYMO manual)

Rural Area:

Section I
L = 450 m
Slope = (108.0 m – 102.0 m) / 450 m x 100 = 1.33 %
Corresponding velocity (overland flow: pasture), v ≈ 0.25 m/s
T_c = (450 m / 0.25 m/s) x (1 h / 3600 s) = 0.50 h

Section II
L = 220 m
Slope = (102.0 m – 101.0 m) / 220 m x 100 = 0.45 %
Corresponding velocity (overland flow: pasture), v ≈ 0.13 m/s
T_c = (220 m / 0.13 m/s) x (1 h / 3600 s) = 0.47 h

Section III
L = 180 m
Slope = (101.0 m – 97.0 m) / 180 m x 100 = 2.22 %
Corresponding velocity (overland flow: pasture), v ≈ 0.34 m/s
T_c = (180 m / 0.34 m/s) x (1 h / 3600 s) = 0.15 h

Tp = 0.6 (0.50+0.47+0.15) = 0.67 h

Length Parameter

Area ID	Area (ha)	Calculated Length (m)	Measured Length (m)	LGI (m)
PH1A	20.8	475	372	**424**
PH1B	2.2	270	121	**196**

Where calculated length is based on the formula:

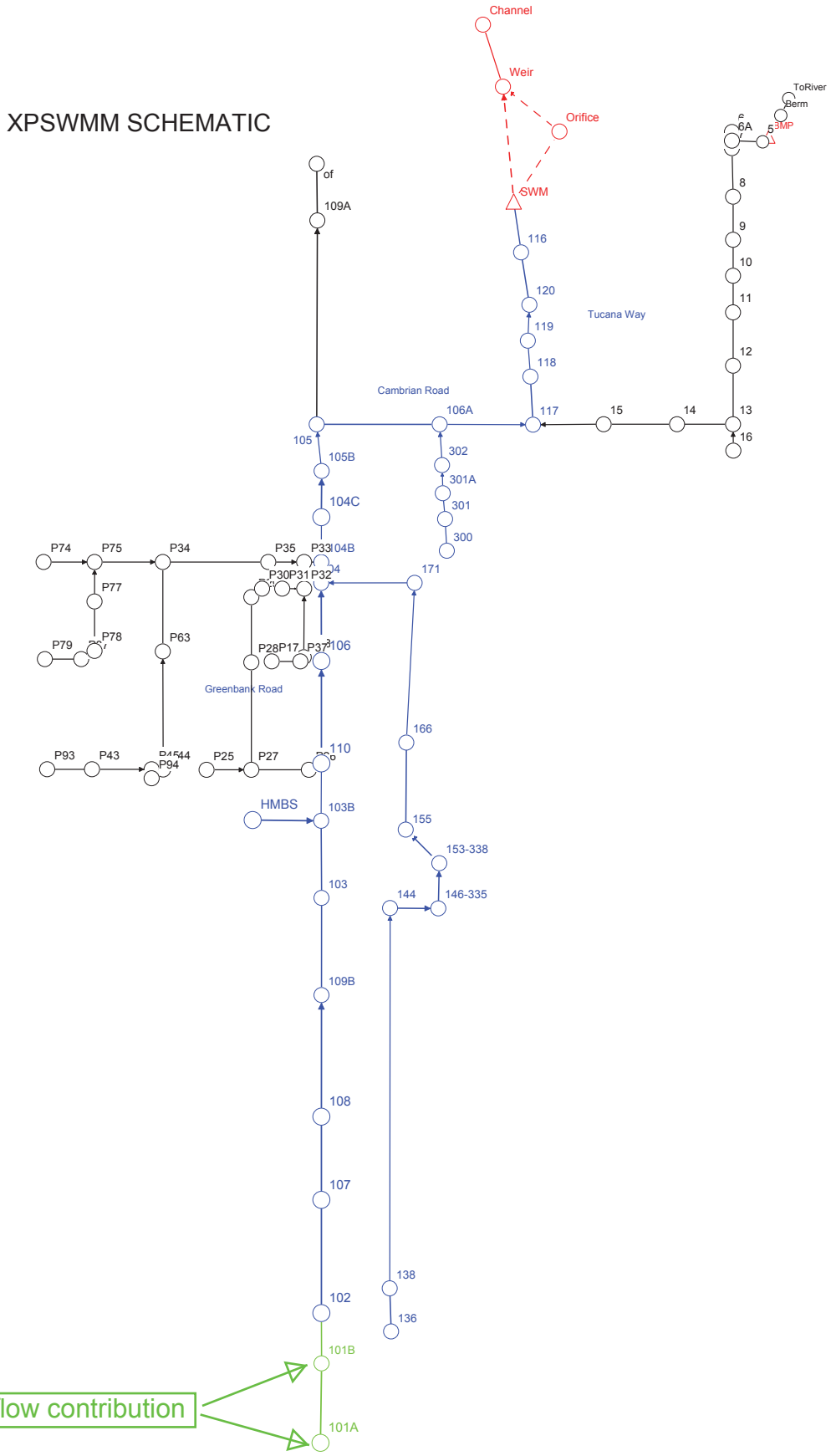
L_c = ((Area) / 1.5)$^{0.5}$
where area is measured in sq-m

Orifice Calculation

Location	Water Level (m)	Centre of Orifice (m)	Approx. Head (m)	Area a x a (m)	Actual Flow Q_a (l/s)
Pond Outlet	98.25	96.375	1.875	**0.150**	81.9
	97.75	96.375	1.375	**0.150**	70.1
	97.25	96.375	0.875	**0.150**	55.9
	96.75	96.375	0.375	**0.150**	36.6
C_v =	0.60				

Q = CvA(2gh)^0.5

XPSWMM SCHEMATIC



IBI GROUP
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Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

June 9, 2015

Mr. Guy Forget
Senior Water Resources Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place, Ottawa, ON K1Z 5M2

Dear Mr. Forget:

RESPOND TO THE CITY OF OTTAWA COMMENT - CORRIGAN SWM FACILITY

The purpose of this letter is to respond to the City of Ottawa comment:

"Please provide a table summarizing water quality volumes for the Corrigan SWM Facility. The Table should show updated drainage areas, imperviousness, permanent pool volume and extended detention storage volume. The areas and imperviousness values shown in Figure 2 of the July 2010 Corrigan SWM Facility Design Brief differ than what is shown in Appendix D1 of the JLR Submission. The table is required to confirm that the Corrigan SWM Facility will provide sufficient water quality volumes to achieve enhanced water quality treatment for Quinn's Pointe lands."

Subsequent to the submission the "Corrigan Stormwater Management Facility Stormwater Management Report and Design Brief" (July 2010), IBI Group completed a revision of the "Stormwater Management Barrhaven South" (October 2014). Revisions made to the drainage area as part of the most recent October 2014 Servicing Brief Report have been incorporated in this response to maintain consistency (see Table 1).

In addition, Figure A has been provided to present the most updated drainage area plan. Water quality volumes have been updated in Table 2 and have been compared to the July 2010 data. As outlined within the July 2010 report, the SWM facility provides 1.60 ha-m and 0.60 ha-m of permanent and extended storage, respectively, exceeding the water quality volume requirements. Supporting water quality volume calculations has been attached to these responses.

Sincerely yours,

IBI GROUP

Shagha Attar

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Table 1: Hydrologic Parameters – Post-Development Conditions (refer to Figure A)

Drainage Area ID	Drainage Area (ha)	Weighted IMP Ratio (%) [Time to Peak (h)]	
		Total	Directly Connected
A1	12.9	[0.36]	N/A
A2	**23.96**	0.52	0.42
A3	**19.35**	0.57	0.51
A4	1.35	0.71	0.71
A5A	2.02	0.71	0.71
A5B	0.74	0.71	0.71
A6A	**0.38**	0.71	0.71
A6B	**0.23**	0.71	0.71
A6C	**0.90**	0.71	0.71
A7	**12.59**	0.54	0.41
A8A	**0.37**	0.71	0.71
A8B	**0.47**	0.71	0.71
A9A	0.75	0.71	0.71
A9B	0.74	0.71	0.71
A9C	1.13	0.71	0.71
A10	4.1	0.47	0.35
A11	10.0	0.62	0.53
A12	12.1	0.54	0.41
A13	2.88	0.71	0.71
A14	0.14	0.80	0.70
A15	0.11	0.80	0.70
B1	2.6	[0.23]	N/A
B2	12.3	0.40	0.40
B3	4.1	0.40	0.40
B4A	5.7	0.49	0.49
B4B	5.2	0.39	0.39
B5A	1.93	0.86	0.86
B5B	2.43	0.57	0.57

Drainage Area ID	Drainage Area (ha)	Weighted IMP Ratio (%) [Time to Peak (h)]	
		Total	Directly Connected
B5C	0.81	0.61	0.61
B5D	0.92	0.86	0.86
B6	0.35	[0.25]	N/A
B7A	1.12	0.54	0.41
B7B	0.76	0.86	0.86
B7C	1.06	0.14	0.14
Private Property 1	0.12	0.51	0.38
Private Property 2	0.62	0.51	0.38
Private Property 3	0.17	0.51	0.38
Ext. Lands	31.9	0.54	0.41
Total Drainage Area*: 147.5 ha		**Total Weighted Imperviousness Ratio*: 47**	

* Excludes External Lands

Those areas that have been updated since July 2010 submission is shown in bold.

Table 2: Water Quality Volumes

	Enhanced Level of Protection – Hybrid Wet Pond Overall Removal Efficiency of TSS 80%			
	Drainage Area (ha)	Imperviousness Ratio (Unit Storage for Hybrid Wet Pond) (%)	Permanent Storage (m^3)	Extended Detention Storage (m^3)
June 2015	147.5	47	14307	5900
July 2010 submission	145.0	49	14210	5800

The SWM facility provides 1.60 ha-m and 0.60 ha-m of permanent and extended storage, respectively, exceeding the water quality volume requirements.

Mr. Guy Forget –June 9, 2015

Water Quality Volumes Calculations

The Stormwater Management Facility is being designed as a hybrid wet pond at an Enhanced Level of Protection.

Drainage area = 147.5 ha

Total weighted imperviousness ratio = 47%

From MOE Stormwater Management Planning and Design Manual, March 2003. p. 3-10:

Protection Level	SWMP Type	**Storage Volume (m^3/ha) for Impervious Level**	
		35 %	**55 %**
Enhanced 80% long-term S.S. removal	Hybrid Wet Pond	110	150

Total storage volume for hybrid wet pond:

$$Y_2 = Y_1 + ((X_2 – X_1)/(X_3 – X_1)) \times (Y_3 – Y_1)$$

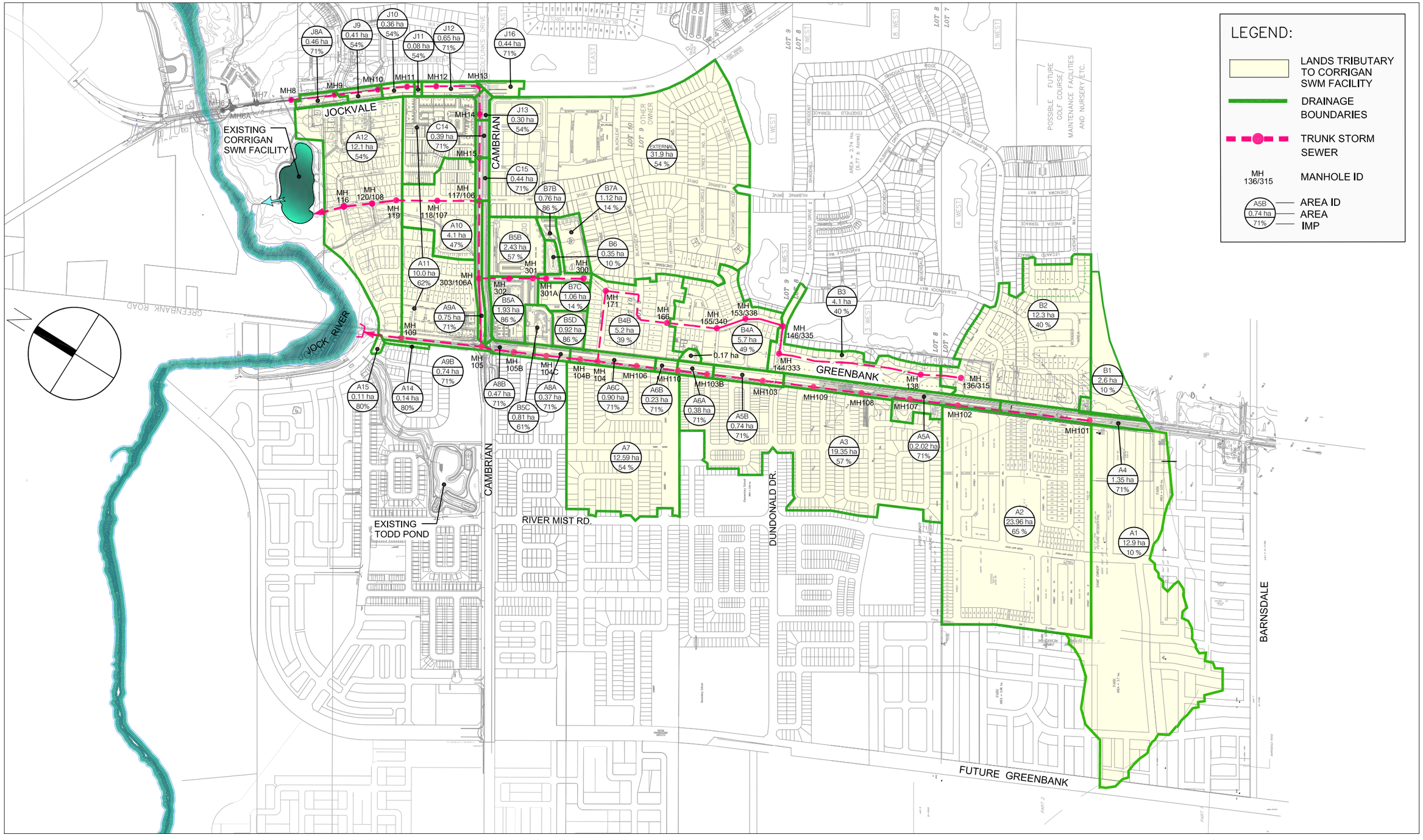
$$= 110 + ((47 – 35)/(55 – 35)) \times (150 – 110)$$

$$= 137 \text{ m}^3\text{/ha}$$

An imperviousness ratio of 47% corresponds to a total storage volume of 137 m^3/ha.

If extended detention = 40 m^3/ha
Then permanent storage = (137m^3/ha – 40 m^3/ha) = 97 m^3/ha

Therefore:
Permanent storage volume = 97 m^3/ha x 147.50 ha = 14307 m^3 = 1.43 ha-m
Extended detention volume = 40 m^3/ha x 147.50 ha = 5900 m^3 = 0.59 ha-m



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Project Title

CORRIGAN STORMWATER MANAGEMENT FACILITY

Drawing Title

DRAINAGE SCHEMATIC

Sheet No.

FIGURE A

Appendix E

EES Memoranda

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

MEMORANDUM

TO: Minto Communities

DATE: September 2, 2016

JOB NO.: 26610

FROM: Bobby Pettigrew, P.Eng.
Guy Forget, P.Eng.

CC:

RE: Barrhaven South Urban Expansion Area (BSUEA) – Potential Infiltration Measures

BACKGROUND

Based on regulatory requirements and the findings of the Geotechnical Engineer (Paterson), storm servicing for the BSUEA will need to be developed with infiltration measures to promote groundwater recharge in order to achieve a water balance and maintain the operation of the shallow overburden aquifer.

Infiltration measures are promoted in the MOECC 2003 Stormwater Management Planning and Design Manual (SWMPDM) as well as the Credit Valley Conservation 2010 Low Impact Development Stormwater Management Planning and Design Guide (LIDSWPDG). A summary of options from these two publications, with considerations for application in the BSUEA, is outlined below.

GENERAL CONSIDERATIONS

Defining pre-development site conditions is essential prior to screening of potential stormwater best management practices (BMP). All environmental features and functions, which need to be considered in accordance with provincial, municipal and conservation authority development regulations, should be identified. At this early stage, measures are being considered in order to maintain post- to pre-development levels of infiltration to the overburden aquifer within the BSUEA. For this site, consideration should be given to the following design factors:

Depth to high seasonal groundwater table or Bedrock

Where infiltration measures are being integrated as part of storm servicing, the distance between the Bedrock or the underlying water table to the invert of the infiltration measure should be greater than 1 metre to allow sufficient depth for infiltration. Water table elevations are being confirmed by the Geotechnical Engineer via their monitoring program. However, the final depths to the water table will depend on site grading.

Groundwater and Soil contamination

Most pollutants in urban runoff are generally retained within the infiltration material and soils and, therefore, have a low to moderate potential for causing contamination of the groundwater. The exceptions include chloride and sodium resulting from de-icing salts applied to roads and parking areas during winter. The chlorine and sodium are not well attenuated in soil and can easily travel to shallow overburden aquifer. Infiltration of de-icing salt constituents is also known to increase the mobility of certain heavy metals in soil (e.g., lead, copper and cadmium), thereby raising the potential for elevated concentrations in the shallow overburden aquifer. However, very few studies that have sampled groundwater below infiltration facilities or roadside ditches receiving de-icing salt laden runoff have found concentrations of heavy metals that exceed drinking water standards.

To minimize risk of groundwater contamination, it is recommended that stormwater infiltration practices not be implemented within areas experiencing high traffic where large amounts of de-icing salts are applied, nor from pollution hot spots (e.g., source areas where land uses or activities have the potential to generate highly contaminated runoff such as vehicle fuelling, servicing or demolition areas). The infiltration measures should be prioritized where runoff is from source areas that are comparatively less contaminated such as roofs, low traffic roads and parking areas. Sedimentation pre-treatment practices (e.g., oil and grit separators, grass swales or bio-retention) should ideally first be applied before infiltration of road or parking area runoff.

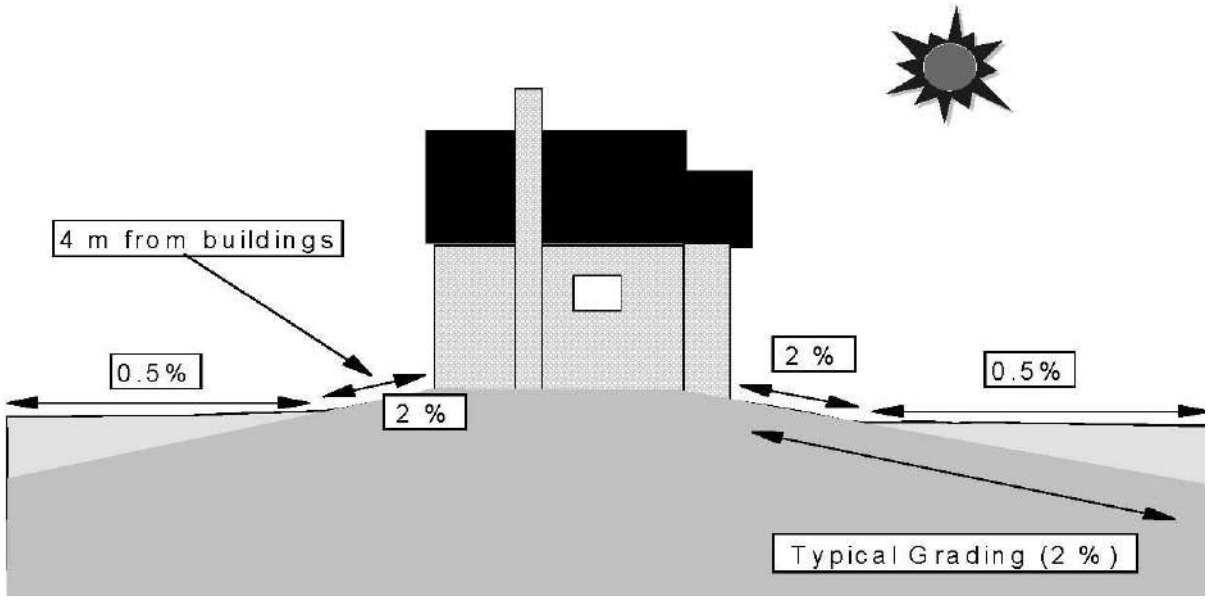
In terms of risk of soil contamination, the Credit Valley Conservation literature states that available evidence from monitoring studies indicates that small distributed stormwater infiltration practices do not contaminate underlying soils, even after 10 years of operation. Hence, at-source infiltration should be prioritized in the BSUEA.

SITE SPECIFIC LID MEASURES

Reduced Lot Grading

This method would promote infiltration as a result of using flat slopes along the grassed areas. This method can be contemplated when native soils exhibit percolation rates in excess of 15 mm/hr. If this percolation rate is exceeded, reduced lot grading down to 0.5% can be contemplated. Reduced slopes under post-development conditions would be used in the catchment parameters of the water balance modeling.

Figure 1: Schematic of Reduced Lot Grading (*MOECC 2003 SWMPDM*)



Key advantages of this infiltration method are:

- No additional servicing cost to the home builder;
- Reduced lot grading can be used along both front and rear yard grassed areas;
- Infiltration of rooftop runoff could also be promoted by the reduced slopes provided that eaves troughs are directed towards the grassed areas (rear and front);
- At-source infiltration; and
- No land loss by the home builder.

Key disadvantages of this infiltration method are:

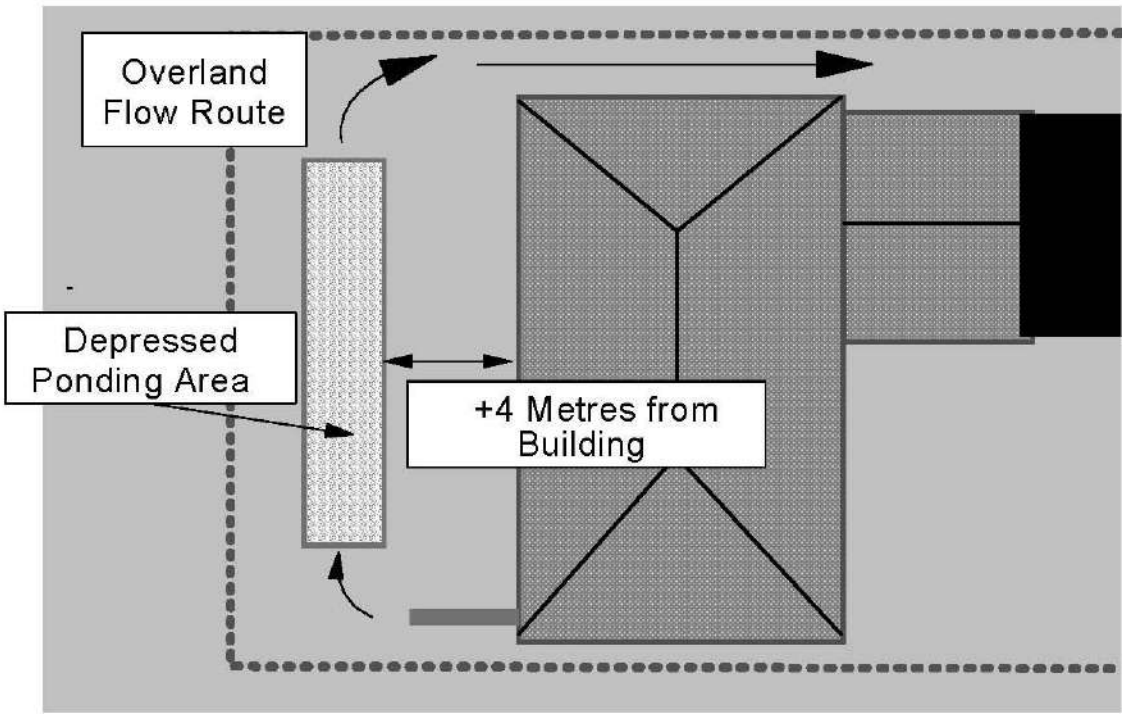
- Grading using 0.5% slope does not meet current design standards and would need to be further discussed with the City;
- Infiltration method could present some inconvenience to the property owner during larger precipitation events or during the spring freshet period when soils are partially frozen and less conducive to infiltration; and
- Reduced lot grading, although a low cost option, will not result in a significant increase in infiltration.

Operation and Maintenance: Since the measures would be located on private property, there would not be any operation and maintenance requirements for the City. However, property owners would need to be educated on the use and advantage of reduced lot grading and the requirement to continue to maintain a reduced grade along the grassed areas.

Roof Leader to Ponding Area

This method would promote infiltration by directing eaves troughs to a rear yard depressed area where the accumulated runoff would be infiltrated over a short period of time. This method can be contemplated when the native soils exhibit percolation rates in excess of 15 mm/hr.

Figure 2: Schematic of Roof Leader to Ponding Area (*MOECC 2003 SWMPDM*)



Key advantages of this infiltration method are:

- Minimum additional servicing cost to the home builder;
- Infiltration method could promote infiltration of runoff from both rooftop and grassed areas but would only be limited to the rear yard portion of the lot;
- At-source infiltration; and
- No land loss by the home builder.

Key disadvantages of this infiltration method are:

- Infiltration method could present some inconvenience to the property owner during larger precipitation events or during the spring freshet period when soils are still frozen and less conducive to infiltration;

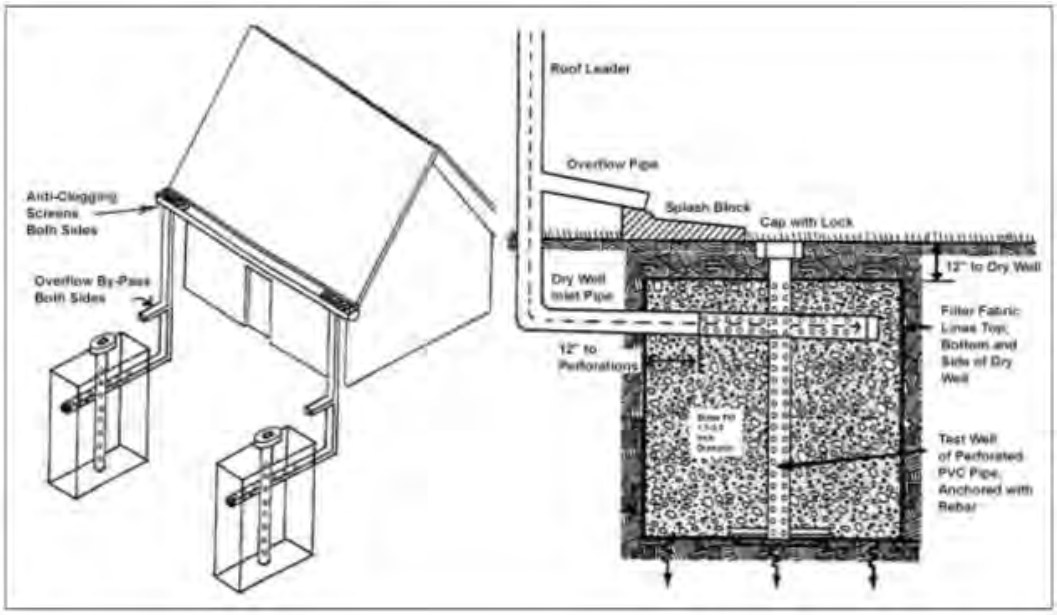
- Ponding area would be located on private property where the City would not have any control. Consequently, there will be a need to discuss with the City to ensure that the additional infiltration can be taken into consideration as part of the water balance analysis. Currently, rear yard storage cannot be accounted for in the modelling as per the Ottawa Sewer Design Guidelines.

Operation and Maintenance: Since the measures would be located on private property, there would not be any operation and maintenance requirements for the City. However, property owners would need to be educated on the use of the rear yard storage and continue to maintain the storage capacity following purchase of the lot. There should not be general maintenance requirements any greater than normal lawn maintenance particularly if the depressed area is designed with gentle slopes. However, the roof leaders will need to be kept directed away from impervious surfaces and the discharge area should be kept free of traffic so that the soil is not compacted.

Roof Leader to Soakaway Pit

This method would promote infiltration of the rooftop flows. This method can be contemplated when; i) the native soils exhibit percolation rates in excess of 15 mm/hr, and ii) when a minimum distance of 1 m can be observed between the bottom of the infiltration trench and the high seasonal groundwater table. Runoff reductions of up to 50% are estimated when used on HSG Class A and B soils, which are found over a large area of the BSUEA.

Figure 3: Schematic of a dry well soakaway (*Credit Valley Conservation 2010 LIDSWPDG*)



Key advantages of this infiltration method are:

- Infiltration method could promote infiltration originating from the rear rooftop area;
- Infiltration method is suited on deeper lots as the trench is to be located minimum 4 m away from the foundation;
- At source infiltration; and
- No land loss by the home builder.

Key disadvantages of this infiltration method are:

- Additional servicing cost to the home builder to construct onto the private property; i) the eaves troughs, and ii) the buried perforated pipe within the a trench;

- Infiltration method is not suited for small lots as the trench is to be located minimum 4 m away from the foundation;
- Soakaway pit would be located onto private property where the City would not have any control. Consequently, there will need to be some discussions with the City to ensure that the benefits of this method can be used as part of the water balance analysis.
- Only a relatively small drainage area would be serviced by this system.

Operation and Maintenance: Since the measures would be located on private property, there would not be any operation and maintenance requirements for the City. However, property owners would need to be educated on the use of the rear yard storage and continue to maintain the storage capacity following purchase of the lot.

Rear Yard Perforated Drainage System equipped with a Perched CB Outlet and Lead to the Front Yard
This method would promote infiltration of runoff originating from the rear portion of the lots. This method can be contemplated when the native soils exhibit percolation rates in excess of 15 mm/hr.

Key advantages of this infiltration method are:

- Runoff originating from both rooftop and grassed area (rear yard) could be infiltrated;
- Additional servicing cost to the home builder resulting from the additional sections of perforated pipe system and trench;
- At source infiltration; and
- No land loss by the home builder.

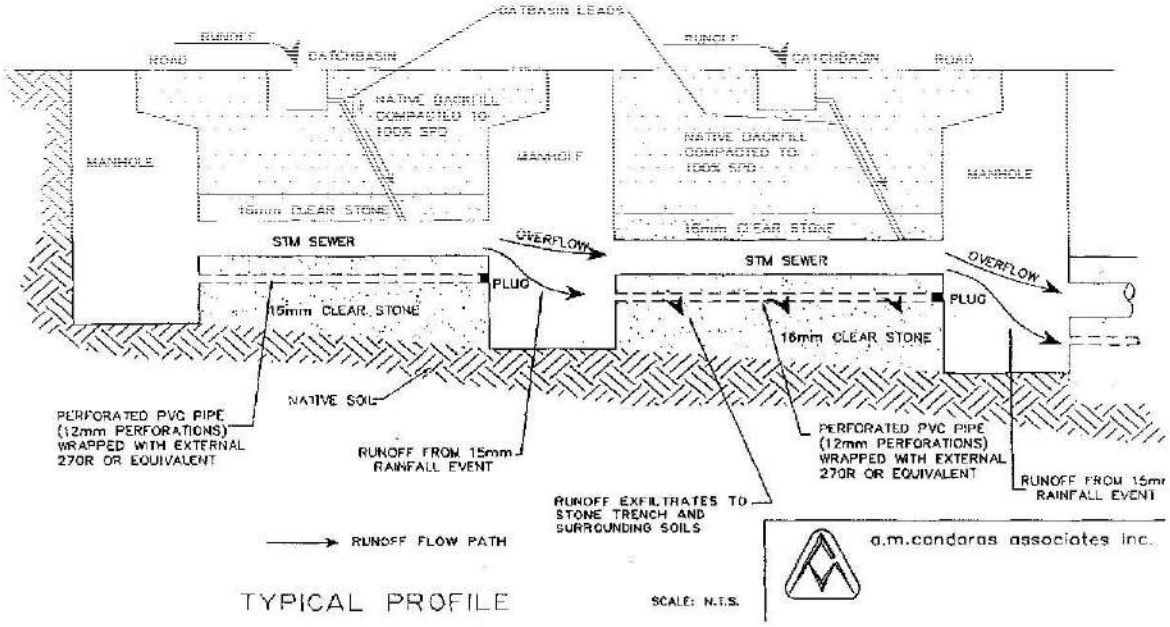
Key disadvantages of this infiltration method are:

- Infiltration method could present some inconvenience to the property owner due to ponding. This inconvenience could occur during larger precipitation events or during the spring freshet period when soils are partially frozen and less conducive to infiltration as ponding would occur at the perched CB; and
- Depressed area at the perched CB would be located at the back of the property where the City may have limited access though there could be easement arrangements set up. Consequently, there will need to be some discussions with the City to ensure that the benefits of this method can be used as part of the water balance analysis.

Operation and Maintenance: Regular inspection and cleaning out of the perched CB outlet would be required and property owners would need to be educated on the use of the system and to ensure operation is maintained following purchase of the lot.

Etobicoke Exfiltration System (ROW pervious pipe system)
This method would promote infiltration by intercepting runoff away from the main storm sewer system. This method can be contemplated when; i) the native soils exhibit percolation rates in excess of 15 mm/hr, and ii) when a minimum distance of 1 m can be observed between the invert of the perforated pipe and the high seasonal groundwater table.

Figure 4: Schematic of the City of Etobicoke Exfiltration System (*MOECC 2003 SWMPDM*)



Key advantages of this infiltration method are:

- infiltration method is carried out continuously along the ROW (i.e., not a single point) and relatively large areas can be treated;
- Perforated pipe systems have achieved runoff reductions of up to 95% in Ontario studies and are estimated to achieve runoff reductions of up to 85% in HSG Class A and B soils such as those found in the BSUEA.
- Modelling of this infiltration method for water balance would take advantage of the second pipe system and infiltration capabilities of the clear stone envelope and native material;
- infiltration system has proven its efficiency in Ontario; and
- infiltration method would result in no additional land loss by the developer.

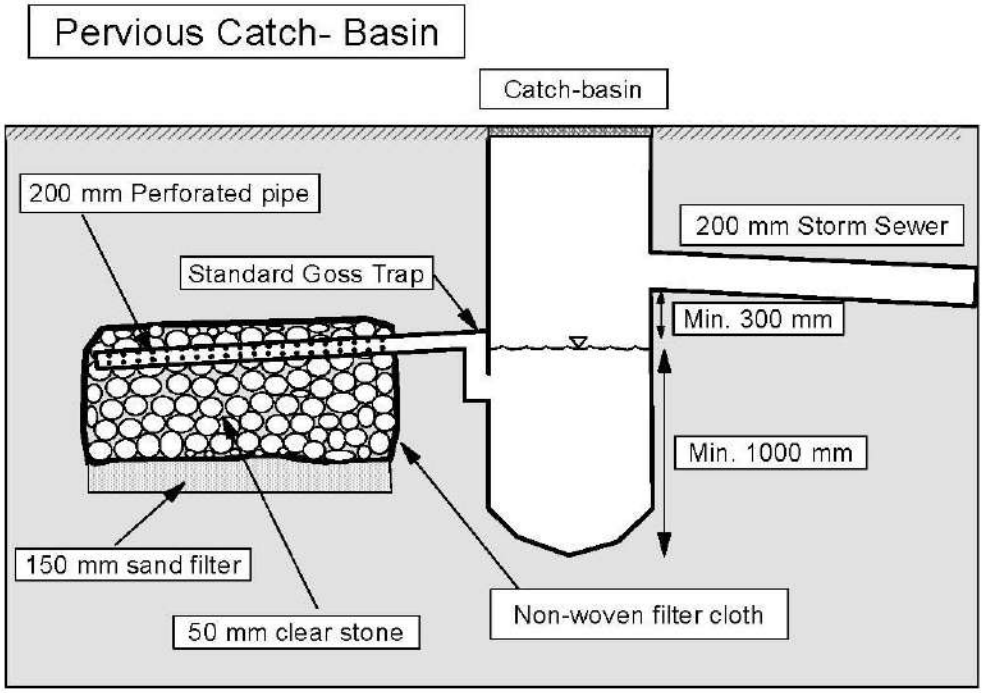
Key disadvantages of this infiltration method are:

- A greater servicing cost to the developer as a result of the construction of the perforated sewer system and the deeper excavation;
- Pre-treatment of the stormwater runoff is preferred, such as grass swales or leaf screens, to prevent clogging of the system; and
- Modelling of this infiltration method would easily be integrated in the water balance. However, the reduction in peak flows would likely not allow for a reduction in pipe of the main storm sewer system.

Operation and Maintenance: After its implementation, there would be a requirement for regular inspections to ensure that there is continual drainage function and drainage is completed within 72 hours following a storm event. If exfiltration to the shallow aquifer decreases over time, then pumping and cleaning with a high-pressure nozzle could be required or, alternatively, replacement of the filter media. Perforated pipe systems with grass swale pre-treatment have been observed to continue to function well up to 20 years following installation.

Pervious Catch Basins
Pervious catch basins are normal catch basins equipped with a larger sump or pre-treatment filters connected to an exfiltration storage medium. The exfiltration system could be an enlarged version of the roadway subdrains.

Figure 5: Schematic of Pervious Catchbasin (*MOECC 2003 SWMPDM*)



Key advantages of this infiltration method are:

- infiltration method is carried out continuously along the ROW (i.e., not a single point) and can effectively treat a relatively large area; and
- Incremental cost to the builder lies with the enlarged sumps or filters and the enlarged subdrain.

Key disadvantages of this infiltration method are:

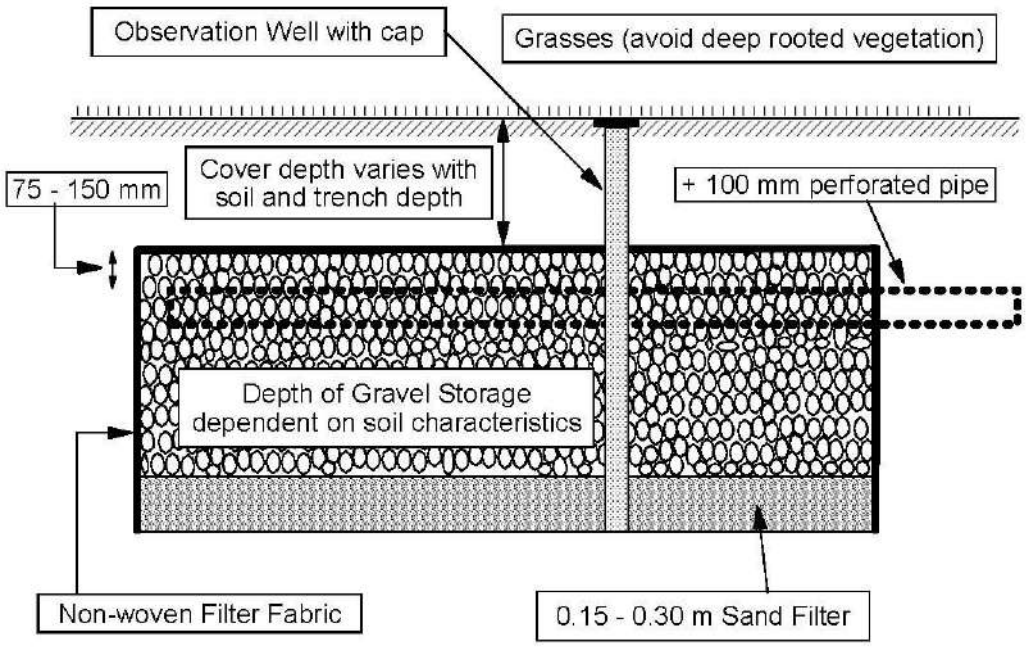
- Oversized sump or catch basin filters to provide TSS removal;
- Implementation of this method will require some discussions with the City (ROW group) to accept ownership of non-standard infrastructure (oversized sumps, enlarged subdrains, potential filters, etc.);
- Additional servicing cost to the developer as a result of the proposed non-standard infrastructure; and
- Discussions to be held with the City to ensure that the additional infiltration can be taken into consideration as part of the water balance analysis.

Operation and Maintenance: Catchbasins will need to be cleaned out on a regular basis to ensure effective operation. Inspections should be carried out to ensure that there is adequate exfiltration to the overburden (up to 72 hours to drain storms) after significant rainfall events. If there is a lack of drainage, then the filter medium may need to be replaced.

Infiltration Gallery
An infiltration gallery is a sub-surface collection system used to encourage and accelerate the process of groundwater recharge by allowing the captured runoff to infiltrate over time. This end-of-pipe facility would receive storm flows, which would be diverted from the conventional storm sewer system; pre-treatment is

highly recommended immediately upstream of the infiltration gallery to minimize clogging of medium. Infiltration systems can also include proprietary manufactured modular structures, which can be installed underground and have large void spaced and open bottoms to allow infiltration. These systems can be installed under car parks or in trench configurations. Runoff is expected to be reduced by around 85% based on previous testing in similar climates.

Figure 6: Subsurface Infiltration Trench (*MOECC 2003 SWMPDM*)



Key advantages of this infiltration method are:

- Modelling of this infiltration method for water balance would take advantage of the volume and infiltration of the native material.

Key disadvantages of this infiltration method are:

- Point source infiltration method unless trenches are set up over lengths or under a car park;
- Additional maintenance required by the City to prevent clogging by using pressure nozzle;
- Measures should be undertaken to reduce risk of soil or groundwater contamination;
- Additional servicing cost by the developer for the perforated pipes, manifold, geotextile, granular bedding, pre-treatment units, etc.; and
- Potential land loss by the home builder unless on park land or under car park areas.

Operation and Maintenance: Regular inspection is required to ensure continuity of function and that water drains away within 72 hours following a precipitation event. Replacement of the drainage medium may be required if a noticeable reduction in drainage time is observed. Infiltration trenches have been observed as continuing to function up to 30 years after installation.

Bio-retention

Bio-rentention or rain gardens are popular methods to promote overburden recharge. These infiltration practices are often easy to integrate into landscaped areas. This infiltration measure consists of a filter bed, which is a mixture of sand, fines and organic material under a mulch ground cover and plants adapted to stormwater practice. In cases where the rain garden does not have an underdrain and relies purely on

infiltration, then runoff reductions of up to 85% are estimated. However the use of an underdrain may be required depending on the soil characteristics.

Bio-retention is used in the Old Ottawa South area as part of the road landscape.

Figure 7: Bio-retention in Ottawa

Key advantages of this infiltration method are:

- Can be integrated into the landscaping features of the development
- Would achieve high levels of infiltration and the plant material would reduce soil and groundwater contamination risks.

Key disadvantages of this infiltration method are:

- Point source infiltration method unless used at each catch basin;
- Additional construction and maintenance costs; and
- Small potential land loss by the builder.

Operation and Maintenance: Regular inspection is required to ensure continuity of function and that water drains away within 72 hours following a precipitation event. Replacement of the drainage medium may be required if slow drainage exists. Rain gardens will require a similar level of maintenance as normal landscaped areas however landscape maintenance personnel may require additional training on the specific requirements for a rain garden or bio-retention cell.

Permeable Pavement

Permeable pavements are an alternate solution over traditional pavements as they allow stormwater to drain through them and infiltrate into the shallow overburden aquifer. Permeable pavement can be used in low trafficked roads, parking lots, driveways and pedestrianized walkways. They can be formed from interlocking pavers, grid pavers, pervious concrete or porous asphalt. Reductions in runoff of up to 85% without an underdrain are estimated based on previous studies. The use of an underdrain is dependent on the capacity of the underlying soils and may not be required above the esker.

Key advantages of this infiltration method are:

- Does not take up additional space to accommodate this infiltration measure.

Key disadvantages of this infiltration method are:

- If installed on private property, then education/awareness would need to be carried out to ensure the system is properly maintained;
- Risk of contamination from road salts. However, since the surface is free draining there is reduced need for road salts; and,
- Some specific maintenance measures are required depending on the type of permeable pavement used.

Operation and Maintenance: Regular inspection and twice annual surface sweeping is generally recommended. High pressure wash systems should not be used to prevent material being pushed further into the permeable membrane and blocking the system. Replacement of media is expected every 15-20 years.

CONCLUSION

A combination of techniques will be required within the BSUEA to promote recharge of the overburden aquifer to achieve a water balance. Some techniques will require acceptance from the City as well as commercial and institutional interests. A combination of techniques in a treatment train approach is preferred in order to reduce risks associated with contamination of groundwater from surface pollutants. The following measures when combined together would promote recharge of the overburden aquifer:

- Perforated pipe systems
- Bio-retention
- Permeable pavers
- Infiltration Galleries
- Roof Leaders to ponding areas / soakaway pits
- Permeable pavements in low trafficked areas or car parks (cul-de-sacs and the park and ride facility would be ideal areas for permeable pavements)

Other options which could be considered include:

- Reduced lot grading
- Pervious catchbasins

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MEMORANDUM

TO: John Bougadis P.Eng. City of Ottawa

DATE: March 23, 2017

JOB NO.: 26610

FROM: Bobby Pettigrew P.Eng.

CC:

RE: BSUEA Modelling of EES Infiltration

BACKGROUND

The Barrhaven South Urban Expansion Area (BSUEA) consists of an area of 121 ha located immediately west of the current City of Ottawa Urban Boundary with Barnsdale Road along the southern limit. To support the BSUEA, a series of comprehensive documents will be prepared including a Master Servicing Study (MSS), which will outline water, sanitary and stormwater management servicing strategies. The subject lands, consisting of soils of moderate to high hydraulic conductivity, have been identified by the hydrogeotechnical engineer as one of the source of recharge of the Kars esker and underlying bedrock aquifers. As a result, one of the objectives of the Existing Condition Report (JLR, February, 2017) recommends that the post-development infiltration levels be maintained to pre-infiltration levels. Given the types of soils present within the subject lands that are conducive to infiltration, appropriate practices will be implemented to maximize the rate of infiltration and maintain pre-development infiltration levels.

A Technical Memorandum (JLR, September 2016) was issued to the City of Ottawa (City), which outlined potential Best Management Practices (BMPs) to increase infiltration within the BSUEA. During a follow-up meeting on September 7, 2016, discussions with the City identified a preference to infiltration measures that are located outside of private residential property and are, therefore, able to be maintained by the City. Measures proposed on institutional or commercial lands would be subject to maintenance requirements by owner. The Etobicoke Exfiltration System (EES) is a measure which can increase infiltration while being located within the ROW corridor thereby satisfying the City requirements with respect to maintenance along municipal right-of-way's (ROW). Therefore, the purpose of this Memorandum is to set out a post development test model and demonstrate how the EES and other non-structural BMPs can be used to maintain pre-development infiltration levels.

POST DEVELOPMENT DESIGN PARAMETERS

The Existing Conditions Report for the BSUEA (JLR, February, 2017) outlined the modeling methodology undertaken for the existing condition water budget assessment, which was performed using the PCSWMM platform. The infiltration rates used in the PCSWMM model were set based on saturated field hydraulic conductivities measured by the hydrogeotechnical engineer as part of their field investigation program. Based on the measured saturated field hydraulic conductivities, infiltration rates set in the existing condition model were found to vary between 49.8 mm/hr and 106.8 mm/hr. These infiltration rates were calculated from the saturated filed hydraulic conductivities in accordance with the Ontario Ministry of Municipal Affairs and Housing (MMAH) Building Code Supplementary Standard SB-6 (2012). The medium of each of the ranges, 49.9 mm/hr to 71.1 mm/hr, were used in the Existing Conditions modeling following a sensitivity analysis.

Best practices dictate that the infiltration rate used to assess the performance of infiltration measures must incorporate a safety factor that compensates for potential reductions in soil permeability due to a number of

factors such as compaction or smearing during construction, gradual accumulation of fine sediments over the lifespan of the infiltration measure and uncertainty over measured values. Based on the approach found in Appendix C of the Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation Authority 2002), the recommended safety factor of 2.5 was used in the analysis. As a result, the post-development condition is simulated under infiltration rates in the range of 20 mm/hr (49.9 mm/hr / 2.5) to 28.4 mm/hr (71.1 mm/hr / 2.5).

Under the post-development conditions, three (3) types of residential development were considered with different levels of impervious land cover for each type (Table 1). The percent impervious is based on analysis of similar developments, mainly for the adjacent Quinn's Pointe development. The configuration of land cover is based on a conceptual layout of the development (See Figure 1, attached); however, there may be changes in the overall configuration during the remaining planning process.

The post-development condition model uses the same aquifers and groundwater parameters as the existing condition model. The same climate conditions are used as per the existing condition with the exception of the snow pack parameters, which are altered to reflect plowing potential across the impervious area as well as the potential for some snow may be removed from the catchment during the winter. This is a conservative assumption under post-development as it reduces the potential for infiltration during the snowmelt period.

Table 1: Land Use Impervious Values

Land Use Type	Area in Concept Plan	Percent Impervious
Single Family Units	23.3 ha	54%
Family Townhouses	6.4 ha	60%
Back to Back Units	2.3 ha	70%
Rear Lane Townhouses	1.1 ha	70%
Residential Weighted Average		56.8%
Local Roads	18.0 ha	70%
Collector Roads	6.5 ha	90%
Rear Lanes	0.3 ha	90%
ROW Weighted Average		75.5%

POST DEVELOPMENT CONDITION (WITHOUT ANY MEASURES) RESULTS

The PCSWMM model was updated to reflect the future condition parameters and was used in a continuous simulation mode. As envisioned, the model showed a reduction in the volume of infiltration due to the increased imperviousness as summarized in Table 2 below.

Table 2: Post Development Condition Water Budget Results

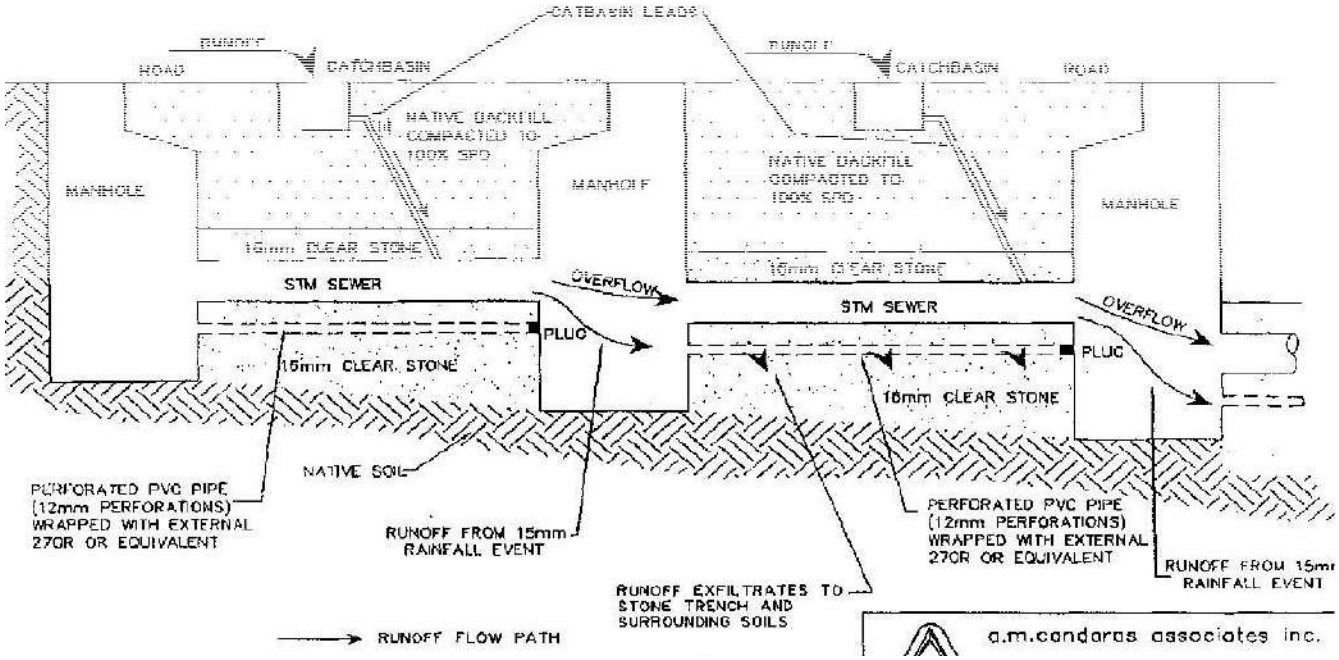
Annual Water Budget Components	Pre-development Annual Average Depth		Post Development Average Annual Depth	
Precipitation	844 mm	100%	844 mm	100%
Evapotranspiration	506 mm	60%	218 mm	26%
Infiltration	337 mm	40%	122 mm	14%
Surface Runoff	1 mm	0%	513 mm	61%

The above simulation results show a decrease in annual infiltration from 40% under pre-development conditions to 14% under post-development conditions. Hence, measures to re-infiltrate are required such that the objective of maintaining pre-development infiltration levels (40%) is achieved.

ETOBICOKE EXFILTRATION SYSTEM (EES)

The Etobicoke Exfiltration System (EES) (Figure 2) was developed, designed and constructed in the former City of Etobicoke (now part of the City of Toronto) in 1993. Its main objective was to restore the natural hydrologic cycle in an existing developed area. The EES consists of two perforated pipe sub drains constructed below the conventional storm sewer that is surrounded by a clear stone media, which collects and detains surplus stormwater runoff before reaching the conventional storm sewer line. The downstream ends of the perforated pipes are capped. The EES is intended to capture frequent storm events and the initial "first flush" of large storm events by trapping flow in the perforated pipe sub drain and surrounding media and infiltrate into the surrounding soils while larger events will overtop the capacity of the EES system and would then overflow to the conventional storm sewer system above as depicted on Figure 2.

Figure 2: Schematic of the City of Etobicoke Exfiltration System (*MOECC 2003 SWMPDM*)



EES MODELING APPROACH

With the modelling methodology used to assess the water budget under existing condition, and the water budget under post-development condition as detailed above, it is not possible to assess the impact from EES using the same modules; the above methodology uses only the Runoff module in SWMM and the EES has to be modelled as a hydraulic component. At this stage, a typical portion of the conceptual development has been extracted as a test area, with the addition of a conceptual stormwater sewer system and inclusion of the EES.

The test area consists of 8 subcatchments representing approximately 2 ha of residential development and 4 subcatchments representing approximately 460 m of ROW (see Figure 3 attached). The imperviousness of the residential catchments is the average of the residential land cover across the development as per Table 1

above and the ROW was set as having an imperviousness of 75.5% (based on the average of the different ROWs across the development). The width parameter will reflect the catchment flow lengths; however, all other parameters will remain as per the water balance modeling for the future condition above. Three (3) infiltration values will be utilised for the Horton Coefficient Parameters based on the infiltration values used in the full post development model above: a value at the maximum end of the range (28.44 mm/hr), a value at the lower end of the range (20.3 mm/hr) and the weighted average value of 26.7 mm/hr; these rates have been reduced by a safety factor of 2.5 as previously described above.

For testing purposes, it will be assumed that the depth of the EES's granular envelope will be 950 mm that will include two 200 mm sub drains running along it. The void ratio of the clear stone is assumed at 40%, which is consistent with the document entitled "Planning and Design Manual of the Etobicoke Exfiltration System for Stormwater Management, John Tran and James Li, Ryerson University". The width of the granular envelope is related to the sewer trench width and will be 2.4 m for the testing purposes.

The EES is simulated by use of storage nodes at the upstream of each storm sewer section in the PCSWMM model. The storage node has a base area equal to the void space (40%) bottom surface area of the EES system (0.4 x 2.4 m wide x pipe length = 0.96 m x pipe length) and the depth of the EES is the depth of the unit plus additional depth to account for the additional volume in the sub-drains. Three (3) seepage parameters are simulated for sensitivity analysis as per the maximum, minimum and average infiltration values used in the Horton Coefficient parameters for the test area.

STORM EVENT ANALYSIS

The continuous simulation undertaken for the Existing Conditions water budget assessment was analysed to rank the precipitation events and determine the percentile of storm events. The 95th percentile was identified and used as the design target of the system based on the recommendation of the document entitled "Planning and Design Manual of the Etobicoke Exfiltration System for Stormwater Management, John Tran and James Li, Ryerson University". Based on this requirement, a storm capture of 22 mm in total rainfall depth was found to be the 95th percentile based on historical meteorological data (Figure 4); those 22 mm storm events ranged from short storm duration storms to longer durations that often exceeding 8 hours.

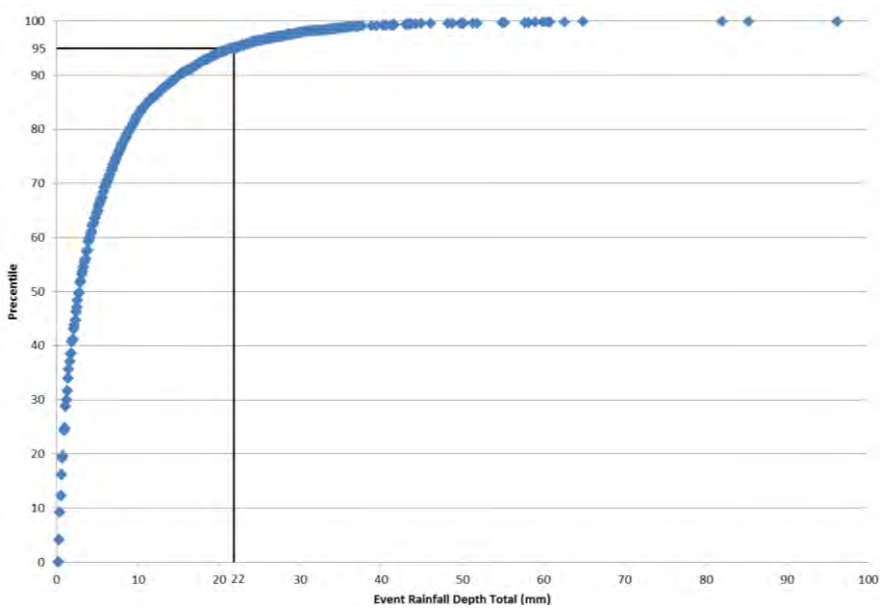


Figure 4: Rainfall Event Analysis

Based on the above statistical analysis, the proposed EES should be sized to accommodate storms of up to this depth without conventional storm flow occurring. Two (2) different storms were used as part of the performance evaluation of the EES; i) the 22 mm - 4 hour design storm (representing the 95th percentile), and ii) the standard 25 mm - 4 hour storm. The 4 hour duration is a conservative duration as those events have occurred over 5 hours to 40 hours during the 30 years of continuous data. Both storms are simulated as well as the continuous simulation of 30 years of precipitation data.

EES MODEL VERIFICATION

To verify that the test model is a true representation of the water balance of the area, the test model will be run under continuous simulation storm without the EES to determine if the performance of the test area has a similar future condition water balance as the study area as a whole. It should be noted that the overall model includes the two (2) existing aggregate extraction areas, which was not accounted for in the calculation of the weighted average for the land cover imperviousness or the weighted average of the infiltration value. Given that both aggregate extraction areas have licenses to continue their operations, full urbanization of these areas will not occur for some time. As a result, the performance of the EES excludes these areas. Additionally, the testing has not included any Institutional-Commercial-Industrial (ICI) land uses as it is envisioned that these areas will have an additional on-site infiltration target to achieve such that the proposed EES can be maintained along any types of land use without overloading the system. The targets for the ICI areas are described below in the "ICI Areas" section.

Given these differences between the study area as a whole and the test area, it is expected that the infiltration in the test area will be slightly higher and runoff slightly lower, which is shown in the results (Table 3).

Table 3: Post Development and Test Model Comparison

Annual Water Budget Components	Post Development Average Annual Depth		Test Model Continuous Simulation Average Annual Depth	
Precipitation	844 mm	100%	844 mm	100%
Evapotranspiration	218 mm	26%	251 mm	30%
Infiltration	122 mm	14%	161 mm	19%
Surface Runoff	513 mm	61%	417 mm	49%

Based on the above simulation results, it can be concluded that the test area is a suitable representation of the simulation of a residential area within the BSUEA. As a result, the test model is a suitable means to evaluate the performance of the EES and will be carried forward in the subsequent evaluations.

EES MODEL RESULTS

The target infiltration objective is to maintain the pre-development infiltration rate of approximately 40% under the post-development condition. The results summarized in the tables below show that the infiltration target is achieved in each of the infiltration scenarios and under both storm events as well as under the continuous simulation. It should be noted in the summary tables below, that the total infiltration is split between the catchment infiltration through the surface soils and the infiltration resulting from EES exfiltration; both of these components are added to obtain the total infiltration into the ground and aquifers.

Table 4: Performance Evaluation of EES: Continuous Simulation

Annual Water Budget Components	20.3 mm/hr Infiltration (Minimum)		26.7 mm/hr Infiltration (Weighted Average)		28.4 mm/hr Infiltration (Maximum)	
Precipitation	844 mm	100%	844 mm	100%	844 mm	100%
Evapotranspiration	251 mm	30%	251 mm	30%	251 mm	30%
Catchment Infiltration	159 mm	19%	161 mm	19%	162 mm	19%

Annual Water Budget Components	20.3 mm/hr Infiltration (Minimum)		26.7 mm/hr Infiltration (Weighted Average)		28.4 mm/hr Infiltration (Maximum)	
EES Exfiltration	387 mm	46%	386 mm	46%	386 mm	46%
Total Infiltration	546 mm	65%	547 mm	65%	548 mm	65%
Surface Runoff	32 mm	4%	31 mm	4%	31 mm	4%

Table 5: Performance Evaluation of EES: 22 mm - 4 hour Design Storm

Annual Water Budget Components	20.3 mm/hr Infiltration (Minimum)		26.7 mm/hr Infiltration (Weighted Average)		28.4 mm/hr Infiltration (Maximum)	
Precipitation	22 mm	100%	22 mm	100%	22 mm	100%
Evapotranspiration	0 mm	0%	0 mm	0%	0 mm	0%
Catchment Infiltration	7 mm	30%	7 mm	32%	7 mm	33%
EES Exfiltration	14 mm	65%	14 mm	64%	14 mm	62%
Total Infiltration	21 mm	95%	21 mm	96%	21 mm	95%
Surface Runoff	0.1 mm	0%	0 mm	0%	0.2 mm	1%

Table 6: Performance Evaluation of EES: 25 mm - 4 hour Design Storm

Annual Water Budget Components	20.3 mm/hr Infiltration (Minimum)		26.7 mm/hr Infiltration (Weighted Average)		28.4 mm/hr Infiltration (Maximum)	
Precipitation	25 mm	100%	25 mm	100%	25 mm	100%
Evapotranspiration	0 mm	0%	0 mm	0%	0 mm	0%
Catchment Infiltration	7 mm	27%	7 mm	29%	7 mm	30%
EES Exfiltration	15 mm	62%	15 mm	62%	15 mm	62%
Total Infiltration	22 mm	89%	23 mm	91%	23 mm	91%
Surface Runoff	2 mm	7%	1 mm	6%	1 mm	5%

The above simulation results show the following:

- Under the 95th percentile design storm (22 mm – 4 hour design event), there is marginal runoff occurring, which ranges between 0% and 1% of the annual precipitation depending on the simulated infiltration rate;

- Under the 95th percentile design storm (22 mm - 4 hour design event), the simulation results show that the greatest runoff occurred under the maximum infiltration rate scenario (28.4 mm/hr). The increase in surface runoff under the maximum infiltration scenario is due to more infiltration occurring along the surface in pervious areas that in turn will reduce the total flow entering the EES, which reduces the

wetted perimeter of storage in the EES. The latter is then used to calculate the exfiltration in the model and, therefore, the overall infiltration is reduced slightly.

- The overall impact of the varying infiltration values is found to be negligible across both design storms and the continuous simulation with only up to one (1) to two (2) millimetres difference in overall infiltration depth. Hence, setting the PCSWMM model with a constant infiltration rate of 26.7 mm/hr across the BSUEA would be a fair representation of the infiltration over the subject lands.

WATER QUALITY CONTROL

Table 3.2 of the MOECC of the publication entitled "Stormwater Management Planning and Design Manual, March 2003" sets the storage volume requirements for infiltration measures to achieve 80% TSS removal. Based on the average imperviousness used in the test model (i.e., 56.8% for the average residential area and 75.5% for the ROW), the required volume of water quality storage for the EES is 32 m³/ha. The storage volume increases to 42 m³/ha for areas with a 90% imperviousness level. Based on the sizing approach of the EES (95th percentile), the storage volume in the test model is on average 150 m³/ha. The proposed EES system, therefore, satisfies the requirements for water quality control in accordance with the MOECC for any of the proposed land uses. Any downstream end-of-pipe facility would then not be required to provide further water quality controls. On this basis, end-of-pipe facilities should be designed as dry detention facilities as the frequency of inflows will be limited to events likely exceeding 22 mm.

ICI AREAS

The test model was carried out in a residential area; however the runoff from ICI areas will contribute to the EES system through overland flow and captured by the conventional storm system. In order to maintain the same EES across the BSUEA, additional on-site controls will be needed as part of the servicing for any ICI developments to ensure that the EES is not overloaded and that its performance is not impacted under the 22 mm event as the results summarized above shows virtually no runoff during this storm event

Under a 22 mm storm event across a hectare of residential land (with an average percent impervious of 56.8%), 125 m³ of stormwater is captured and infiltrated with no runoff. Across a hectare of commercial area (with an average percent impervious of 90%), the same 125 m³ volume of stormwater is produced by 14 mm of rainfall. In order to maintain the same hydraulic loading to the EES to what is generated by residential areas, the commercial area would have to infiltrate on-site the difference between 14 mm and 22 mm. Hence, storm servicing for commercial blocks should be developed to infiltrate on-site the first 10 mm of surface runoff to maintain the same hydraulic loading and meet the performance objective of the EES. Similarly, for a hectare of institutional block with an assumed 70% imperviousness, the same 125 m³ volume of surface runoff is produced by 18 mm of rainfall. In order to maintain the hydraulic loading to the EES to the same than what is generated by residential areas, the institutional block would have to infiltrate the difference between 18 mm and 22 mm. Hence, storm servicing for institutional blocks should be developed to infiltrate the first 5 mm of surface runoff to maintain the same hydraulic loading and meet the performance objective of the EES.

In addition, servicing of the ICI areas would need to be developed to adhere to the Ottawa Sewer Design Guidelines where flows in excess of the storm sewer capacity must be detained on-site.

EES APPLICATION

Within urbanized areas, storm sewers will vary in size based on the extent of the serviced area. As a result, the trench for the storm sewer will also vary in width and will be designed in accordance to City standards. In addition, the proposed EES will need to be integrated into variable ROW corridor widths and be shared with other services including watermains and sanitary sewers and their associated service connections. To

accommodate the other services and reflect the different sewer sizes, the EES configuration and dimensions will need to be flexible to the various servicing constraints; however the design of the EES will require to maintain a volume per linear metre as per that modelled to ensure that the infiltration targets are met. To reflect the location of the storm sewer and EES within the ROW corridor, the service connections may have to be located either above or below the EES depending on the size of the storm sewers, its depth as well as the configuration of the sanitary sewers. Figures 5a – 5d (attached) show typical configurations along local and collector roads for both a 525 mm diameter and 1050 mm diameter storm sewers. At detailed design, the configuration of the EES will need to be adapted based on the local design constraints of each section of roadway

CONCLUSIONS AND RECOMMENDATIONS

The modeling demonstrates that the EES can be simulated with the hydraulic component of EPA SWMM and that when modelled, the EES can increase the post-development infiltration levels to above levels experienced under the pre-development condition, notwithstanding applying the recommended safety factor of 2.5 to the existing infiltration rates set based on the measured saturated hydraulic conductivities

Based on the conclusions above, the following recommendations are made:

- The EES is used to provide infiltration and water quality control as per the MOECC SWMPD for the residential and ROW runoff from the development with a Factor of Safety on the infiltration rates of 2.5.

- Storm servicing for any of the ICI areas be developed to achieve set target infiltration depths (on-site) of 10 mm and 5 mm for commercial and institutional areas, respectively in order to maintain the hydraulic loading to the EES the same to what is generated by residential development areas.

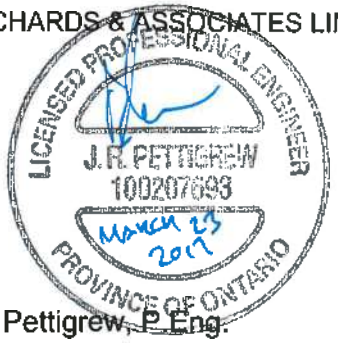
- Since the EES system can be modelled in PCSWMM, along with the hydraulic analysis of the storm sewer network and storage simulation, there is opportunity to be able to include the impact of such a system in the sewer and downstream dry pond facility design. By doing so, the benefits of the EES would be reflected in the end-of-pipe facility sizing.

- At the MSS stage, special attention should be devoted to areas having a high water table to determine whether an EES can be implemented within those areas as there must be a 1 m separation between the groundwater table and the bottom of the EES. When such areas are identified during the MSS, they will be accounted for in the analysis to confirm that the pre-infiltration levels have been achieved for all of the BSUEA, excluding the two (2) aggregate extraction areas. For such areas, alternate quality control measures will be investigated such as the provision of water quality units.

- Upon the acceptance in principle of the EES by regulatory agencies, recommendations from the geotechnical engineer will be sought to ensure that the structural integrity of the traditional storm sewer system is not impacted by the EES.

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED



Bobby Pettigrew, P.Eng.

Reviewed:

J.L. RICHARDS & ASSOCIATES LIMITED

Guy Forget, P.Eng.

N

Legend

- TestArea
- BacktoBack
- CollectorRoad
- FamilyTownhouses
- FutureCommercial
- LocalRoad
- Park
- ParkandRide
- Pond
- RearLane
- RearLaneTownhouses
- Road
- School
- SingleFamily

50 0 50 100 150 200 m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

CONCEPTUAL POST DEVELOPMENT LAND USE

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN: BP

DRAWN: BP

CHECKED: BP

JLR NO: 26610

DRAWING NO: **Figure 1**

Legend

- Outfalls
- Storages
- Conduits

Subcatchments

- ROW
- Residential

Lot Boundaries

N

50 m

PROJECT:

Barrhaven South Urban Expansion Area
OTTAWA, ONTARIO

DRAWING:

PCSWMM EES TEST MODEL - SCHEMATIC

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN:	BP	JLR NO.:	26610
DRAWN:	BP	DRAWING NO.:	Figure 3
CHECKED:	BP		

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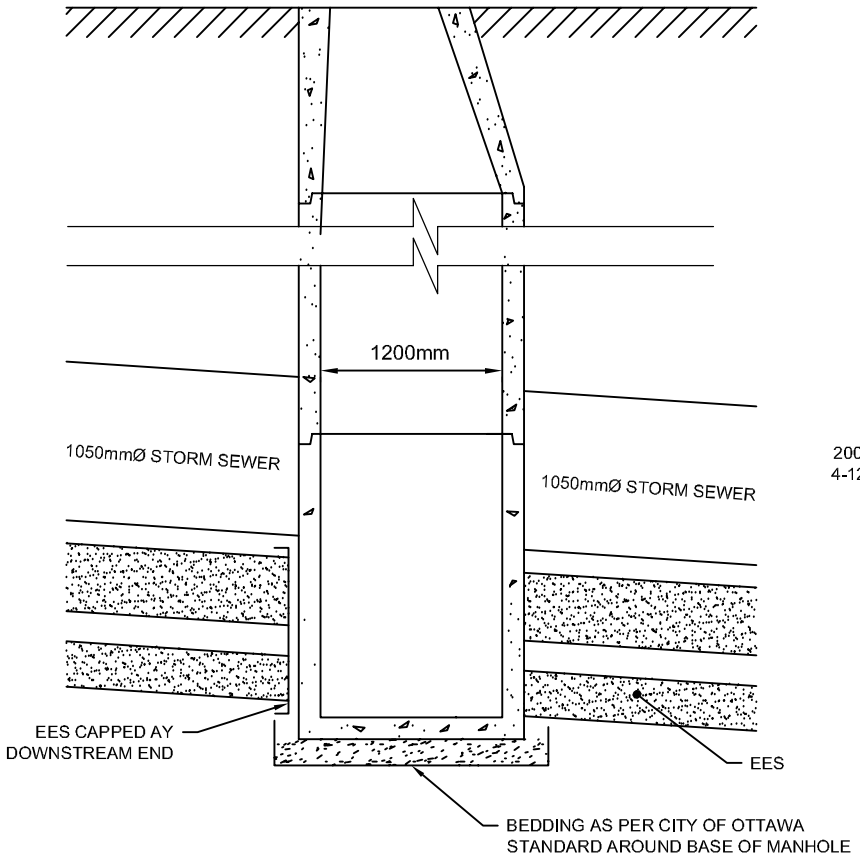

STORM MAINTENANCE HOLE DETAIL

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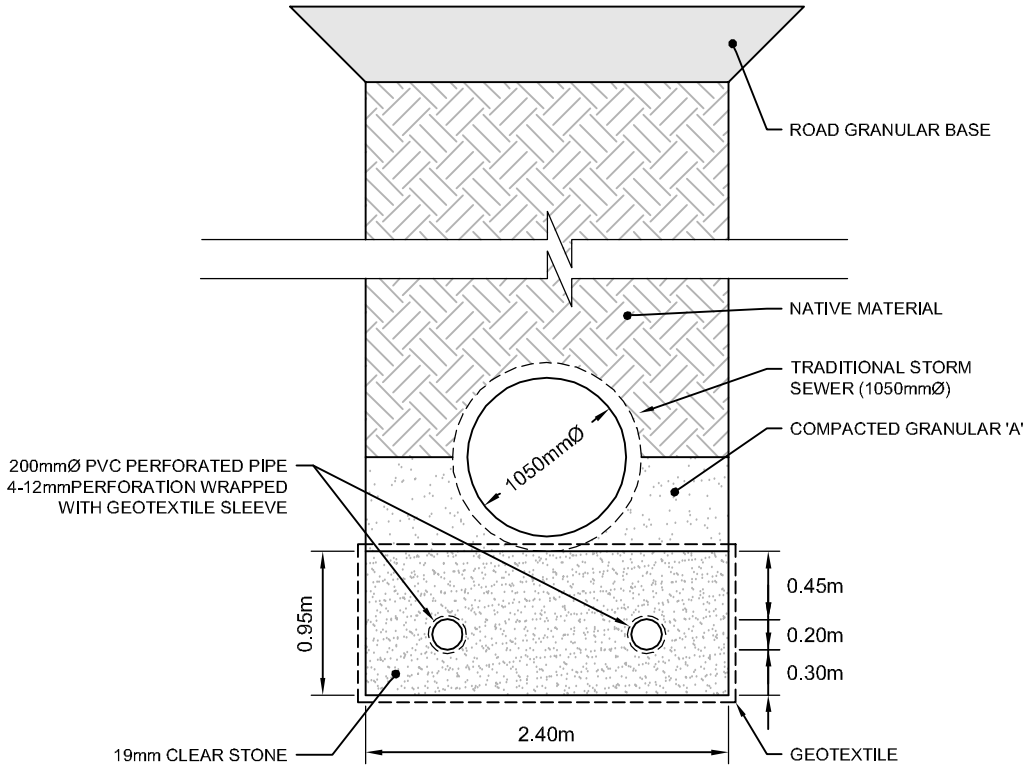

TRENCH FOR 1050mmØ STORM SEWER

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PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

STORM TRENCH DETAILS

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DESIGN: BP/GF	JLR NO: 26610
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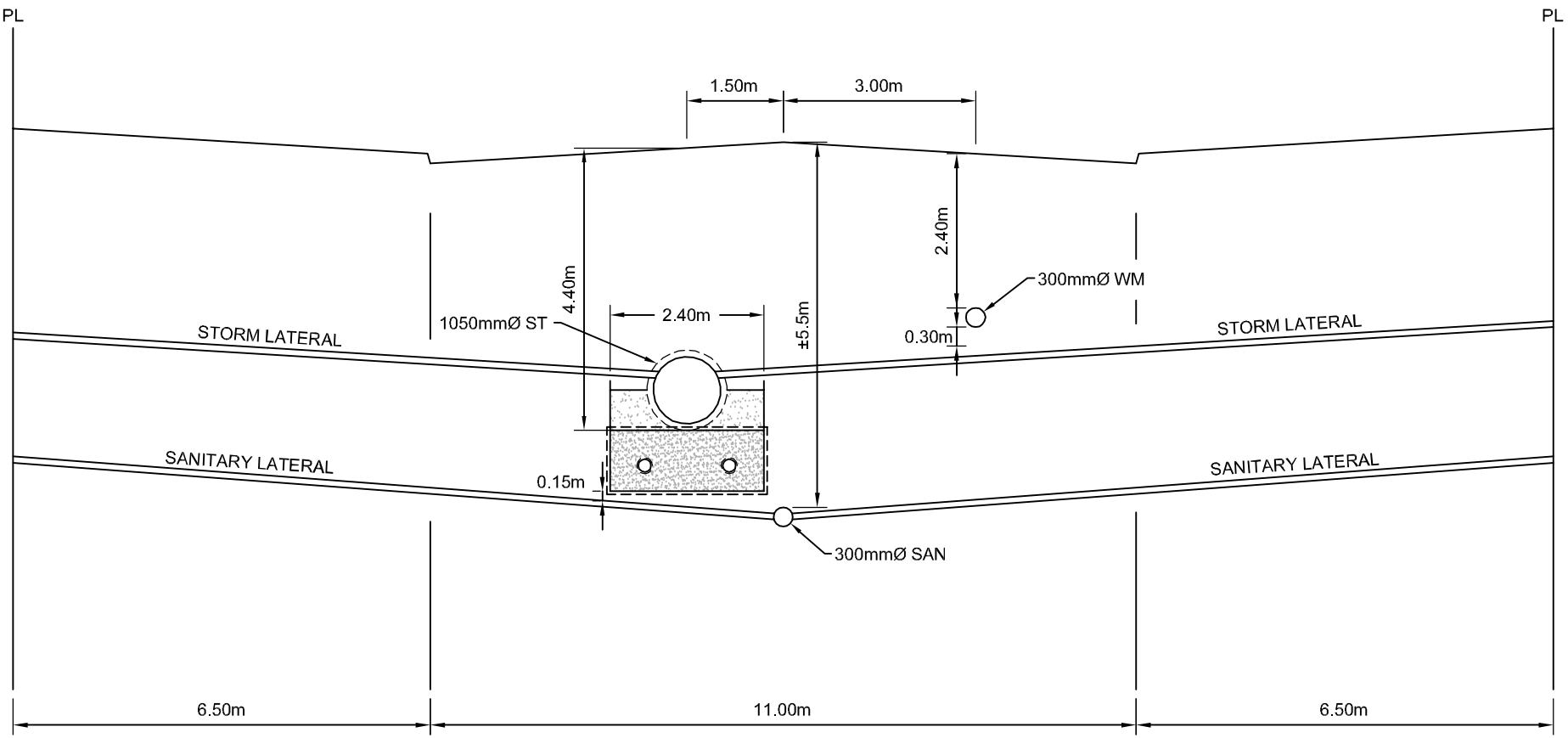
PLOT DATE: March 23, 2017 10:56:19 AM



COLLECTOR ROAD

SANITARY: -VARY 200mmØ TO 300mmØ
-SANITARY SEWER MAIN BELOW STORM SEWER MAIN

STORM: -VARY (1050mmØ AND LARGER)

Scale = 1:100

0 1 2 4 6 8m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

COLLECTOR ROAD CROSS SECTION

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
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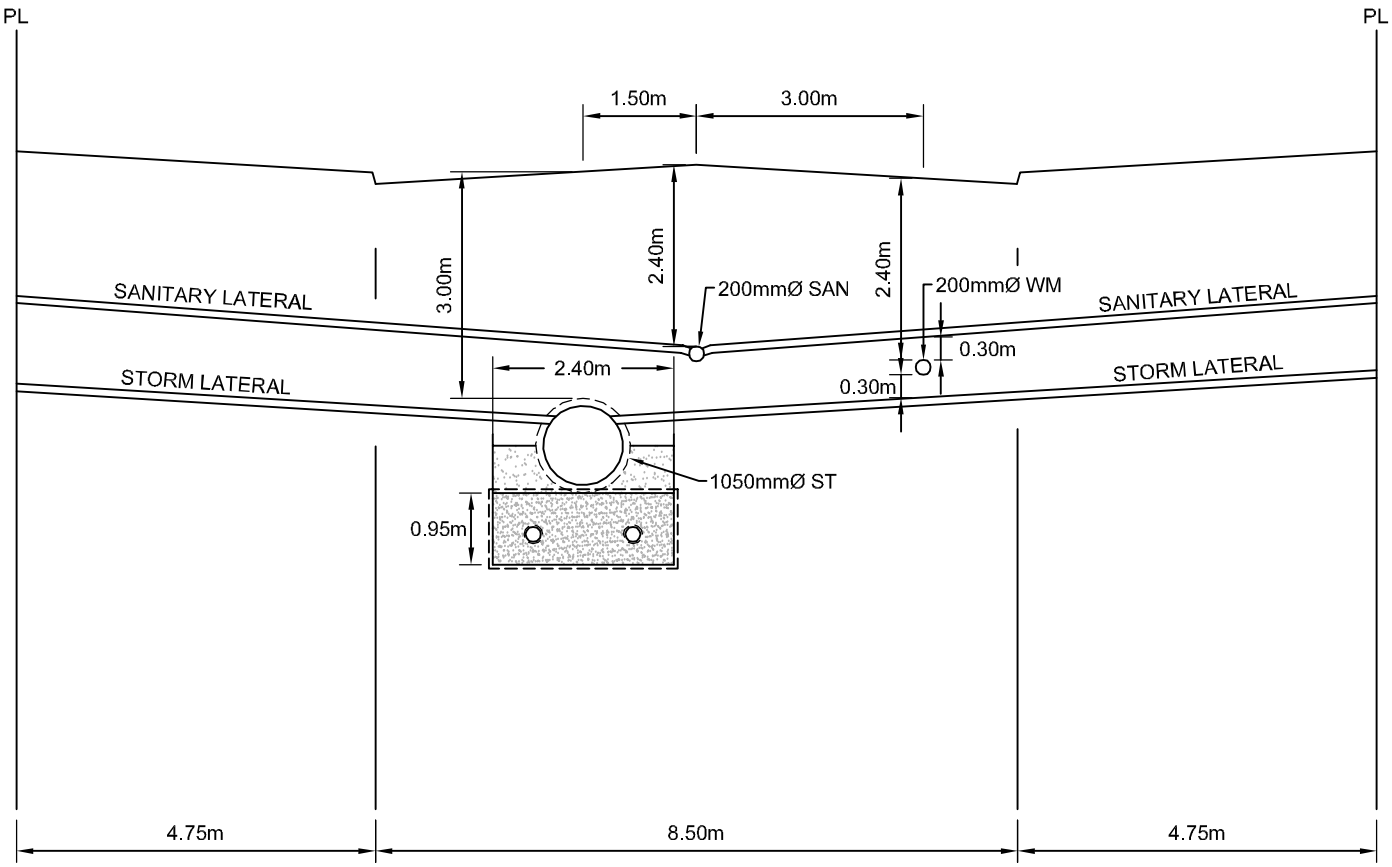
JLR NO: 26610

DRAWING NO.:

FIGURE 5b

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C ROAD SECTION AND ST DETAIL.dwg

PLOT DATE: March 23, 2017 10:57:02 AM



LOCAL ROAD

SANITARY: -200Ø
-SERVICE ABOVE WM

STORM: -LARGER (1050Ø AND LARGER)
-SERVICE BELOW SAN/WM

Scale = 1:100

0 1 2 4 6 8m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

LOCAL ROAD CROSS SECTION

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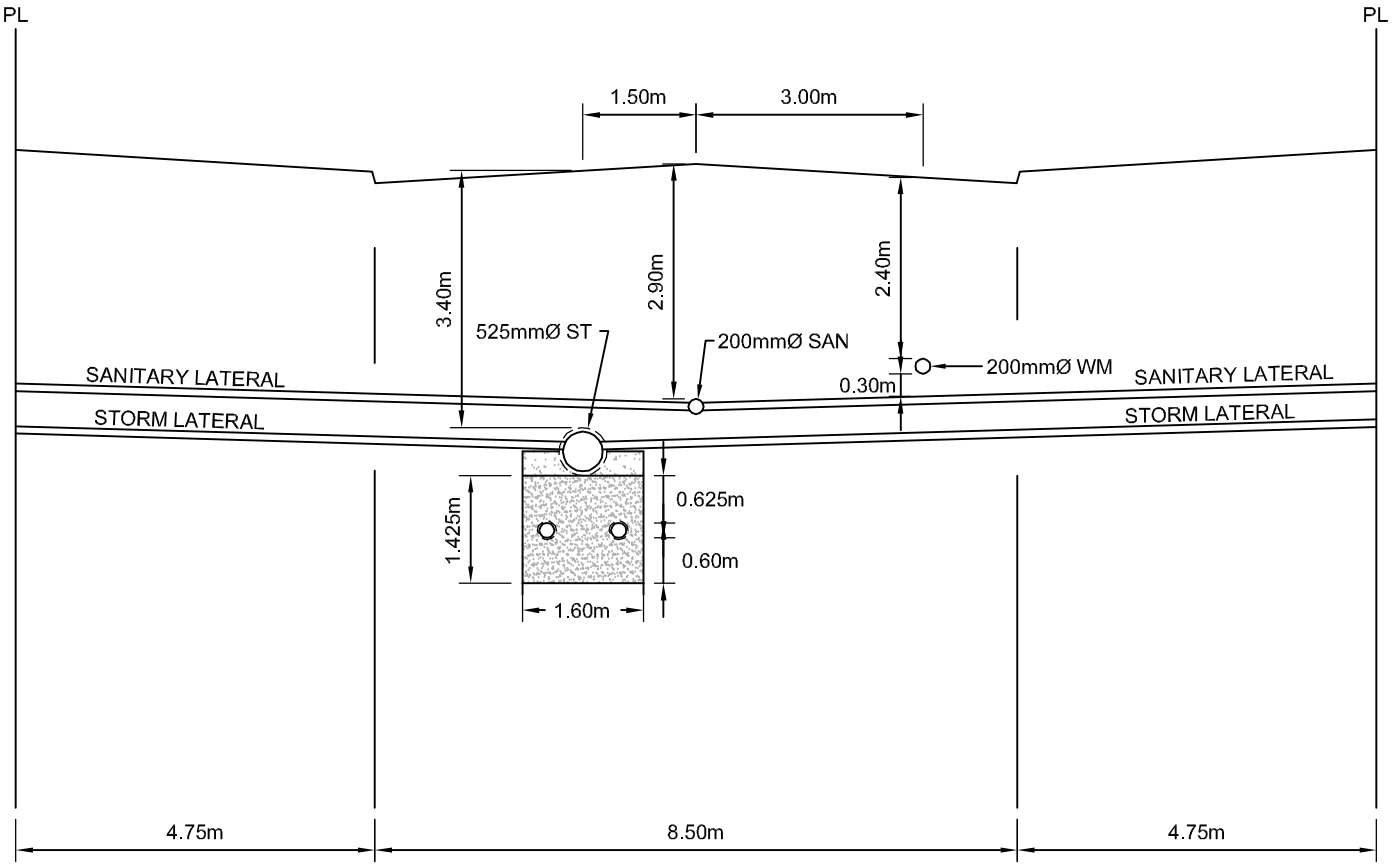
DESIGN: BP/GF	JLR NO: 26610
DRAWN: SK	DRAWING NO.: FIGURE 5c
CHECKED: BP/GF	

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C ROAD SECTION AND ST DETAIL.dwg

PLOT DATE: March 23, 2017 10:59:08 AM



LOCAL ROAD

SANITARY: -SHALLOW SANITARY SEWER (200mmØ)
-SERVICE BELOW WM

STORM: -DEEPER SEWER (SMALLER SIZE ±525mmØ))
-SERVICE BELOW SAN/WM

Scale = 1:100

0 1 2 4 6 8m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

LOCAL ROAD CROSS SECTION

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JLR NO: 26610
DRAWING NO.: FIGURE 5d

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C ROAD SECTION AND ST DETAIL.dwg

PLOT DATE: March 23, 2017 10:59:53 AM

MEMORANDUM

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

To: John Bougadis P.Eng.
Senior Project Manager, Infrastructure Planning
City of Ottawa

From: Bobby Pettigrew P.Eng.

Re: BSUEA – EES Modelling – Site Wide Application
Infiltration Rates

Date: June 16, 2017

Job No.: 26610

CC: Hugo Lalonde, MCIP, RPP
Land Development Manager
Minto Communities - Canada

Purpose of Undertaking

This Memorandum was prepared to assess infiltration within the Barrhaven South Urban Expansion Area (BSUEA) given that the Etobicoke Exfiltration System (EES) would only be implemented along local roads due to the potential adverse impact of roadway salts along collectors and arterials.

Background

The review of background data as part of the hydrologeological Existing Condition Report (Paterson Group) revealed that the permeable overburden in the BSUEA was acting as a recharge area for the esker and bedrock aquifers located in the underlain soils within the BSUEA. As a result, a number of recommendations were drawn to minimize the impact to the esker. These recommendations included; i) the preservation of the pre-infiltration levels, ii) incorporating infiltration measures as part of the Subdivision's servicing to maintain pre-infiltration levels, and iii) distributed infiltration of "clean runoff". As part of Existing Condition Report completed by J.L. Richards & Associates Limited (JLR), a water budget analysis was carried out to ascertain the pre-infiltration levels. Based on a long-term simulation of 30-year of hourly data (precipitation and temperature), pre-development infiltration was found to account for approximately 40% of the total annual water budget. A subsequent Memorandum issued to the City on March 23, 2017, investigated water budget under post-development conditions where the high level analysis indicated that infiltration levels would be reduced from 40% (pre-development) to 19% (post-development without any infiltration measures) for a subdivision with an average imperviousness of 65%.

A preliminary assessment of the infiltration capability was carried out using PCSWMM assuming the implementation of the Etobicoke Exfiltration System (EES) within the BSUEA. The modelling methodology and assumptions as well as the key findings of this analysis were summarized in the Memorandum, issued to the City on March 23, 2017 (copy of the Memo attached). The infiltration assessment was conducted with the simulation of a test area that reflected the various types of residential usages as well as a separate simulation with a typical commercial block. Modelling of the test area was carried out using post-development infiltration rates that were reduced by a safety factor of 2.5 as per the recommendations of the Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation Authority, 2010). Various development scenarios were simulated and corresponding post-development infiltrations estimated by PCSWMM. The resulting infiltrations have been summarized in the Table below for the various scenarios investigated:

Scenario	Infiltration Achieved
Existing Pre-development	40%
Post development with no EES infrastructure	19%
Rear yards and rear roof runoff only	30%
Commercial (30% roof area and only roof drainage to EES)	32%
All runoff captured into EES	65%

Based on the above simulation results, levels are anticipated to decrease from 40% under pre-development condition to 19% under post-development if no infiltration measures are adopted. Hence, to preserve the pre-infiltration levels, measures to promote infiltration such as the EES must be adopted. When servicing incorporates an EES sized to capture the 95th percentile (22 mm) storm, the infiltration under post-development conditions is increased to 65%. Consequently, the Memo recommended that an EES system be implemented within the BSUEA.

Concept and Demonstration Plans

A Concept Plan and Demonstration Plan (Figure 1 attached) were prepared by NAK Design Strategies and presented to the City as part of the Technical Advisory Committee (TAC) Meeting No. 4 (June 8, 2017). The various land uses and corresponding runoff coefficients (C-Factors) have been summarized in the Table below.

Land Use		**Area (ha)**	**Runoff Coefficient**
Residential	Back-to-back	2.8	0.70
	Single Family	29.8	0.58
	Condo	0.9	0.76
Roads	Local	15.7	0.69
	Collector	6.0	0.83
	Arterial	4.2	0.83
Parks		5.2	0.30
Park and Ride		2.6	0.87
School		4.4	0.75
Commercial		2.1	0.80
SWMF		5.4	0.69
Total		79.2	0.65

Impact of Salting Practice on Infiltration

One of the main recommendations of the Hydrogeological ECR was to preserve pre-infiltration levels by means of achieving distributed infiltration of “clean runoff” over the BSUEA. After further review and discussions of the salting practices within the City of Ottawa (refer to City of Ottawa Salt Management Plan, October 31, 2011), it was agreed that the EES could only be implemented along local roads given that collector and arterial roads rely more on salts as the abrasive agent. Consequently, the infiltration assessment was revisited assuming that the EES would only be implemented along local roads. A high level analysis was, therefore, carried out on a weighted basis to ascertain whether the pre-infiltration level of 40% can be preserved based on the attached Draft Demonstration Plan.

The infiltration assessment was conducted based on the following assumptions:

- No EES is placed on arterial and collector roads (refer to the attached revised Draft Demonstration Plan). As a result infiltration was excluded from these land use areas; however, assuming no infiltration on these areas is conservative as there will be some infiltration through the surface media along grass verges and pervious areas.

- Residential properties facing arterial and collector roads have only their rear yards and rear roofs draining to the EES on the adjoining local roads via rear yard catchbasins (refer to the attached revised Draft Demonstration Plan). A conservative assumption as there is likely to be some infiltration in the grassed/planted areas of front yards which is not counted in this analysis.

- All other residential areas and local roads are all serviced by EES and will achieve 65% infiltration as per the attached March 23, 2017 Memorandum.

- Along the commercial and institutional blocks, it is assumed that 30% of the block would consist of roof or other areas that would provide clean water runoff. Consequently, the analysis was conducted assuming that 30% of the blocks (roof areas) would have their own on-site infiltration system sized to capture and infiltrate the first 22 mm of clean runoff generated by the roofs. Runoff from the roofs in excess of 22 mm would be conveyed to the conventional system on the site. Runoff from the paved areas within those blocks would be detained on-site and treated by means of an on-site hydrodynamic separator (HDS). Once treated, runoff would be discharged pending its location to either a collector or arterial. This criterion is proposed as it is likely that salts might be used in the parking areas within those blocks and salted surfaces should only be discharge into sewer systems along collectors or arterials where no EES is present.

- Park blocks were not included in the test area simulation and so were assumed to maintain the post development infiltration level without any EES. This assumption is conservative as the post-development infiltration value of 19% is a result of higher impervious values across the site, which is not as great on the Park block, and, therefore, the infiltration across the pervious park will be higher.

- Infiltration for the Park and Ride block was excluded due to the small percentage of landscaped area. Any infiltration that will occur due to the small landscaped areas will be in excess of the percentages summarized below. Similarly, infiltration within the SWM blocks was excluded although the entire block will be landscaped. The exclusion of infiltration from the SWM blocks is based; i) very little infiltration along the relatively steep side slopes of the facilities, and ii) the higher groundwater table at both SWMF locations that will impact infiltration.

Based on the assumptions listed above, the areas and corresponding infiltration rates summarized in the following table was used in conducting the infiltration assessment (See Figures 2 and 3 attached).

Land Use		**Area (ha)**	**Runoff Coefficient**	**Infiltration Rate (%)**
Residential	Back-to-back	2.8	0.70	65
	Single Family[1]	23.5	0.58	65
		6.3	0.58	30
	Condo	0.9	0.76	65
Roads	Local	15.7	0.69	65
	Collector	6.0	0.83	0
	Arterial	4.2	0.83	0
Parks		5.2	0.30	19
Park and Ride		2.6	0.87	0
School		4.4	0.75	32
Commercial		2.1	0.80	32
SWMF		5.4	0.69	0
Total / Average		79.2	0.65	42

[1] Single Family blocks were modeled as part the revised Draft Demonstration Plan; blocks were split between local roads achieving 65% infiltration and collector/arterial, which achieves 30% infiltration due to the exclusion of the EES being installed on these types of streets.

Conclusion

Overall, with the above assumptions, the post-development infiltration across the BSUEA is expected to be approximately 42%. Therefore, the pre-development infiltration of 40% is expected to be met or slightly exceeded.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Bobby Pettigrew P.Eng.,
Water Resources Engineer

Reviewed by:

Guy Forget P.Eng.
Senior Water Resources Engineer

N

Legend

- Urban Expansion Area
- Urban Expansion Area excluding Pits

BSUEA Proposed Site Plan Land Cover:

- Arterial Roads
- Collector Roads
- Local Roads
- Single Family Homes
- Back-to-Back Lots
- Condominium
- Commercial
- Park and Ride Facility
- School Block
- Park Block
- SWM Block

75 0 75 150 225 300 m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

BSUEA Proposed Site Plan Land Cover

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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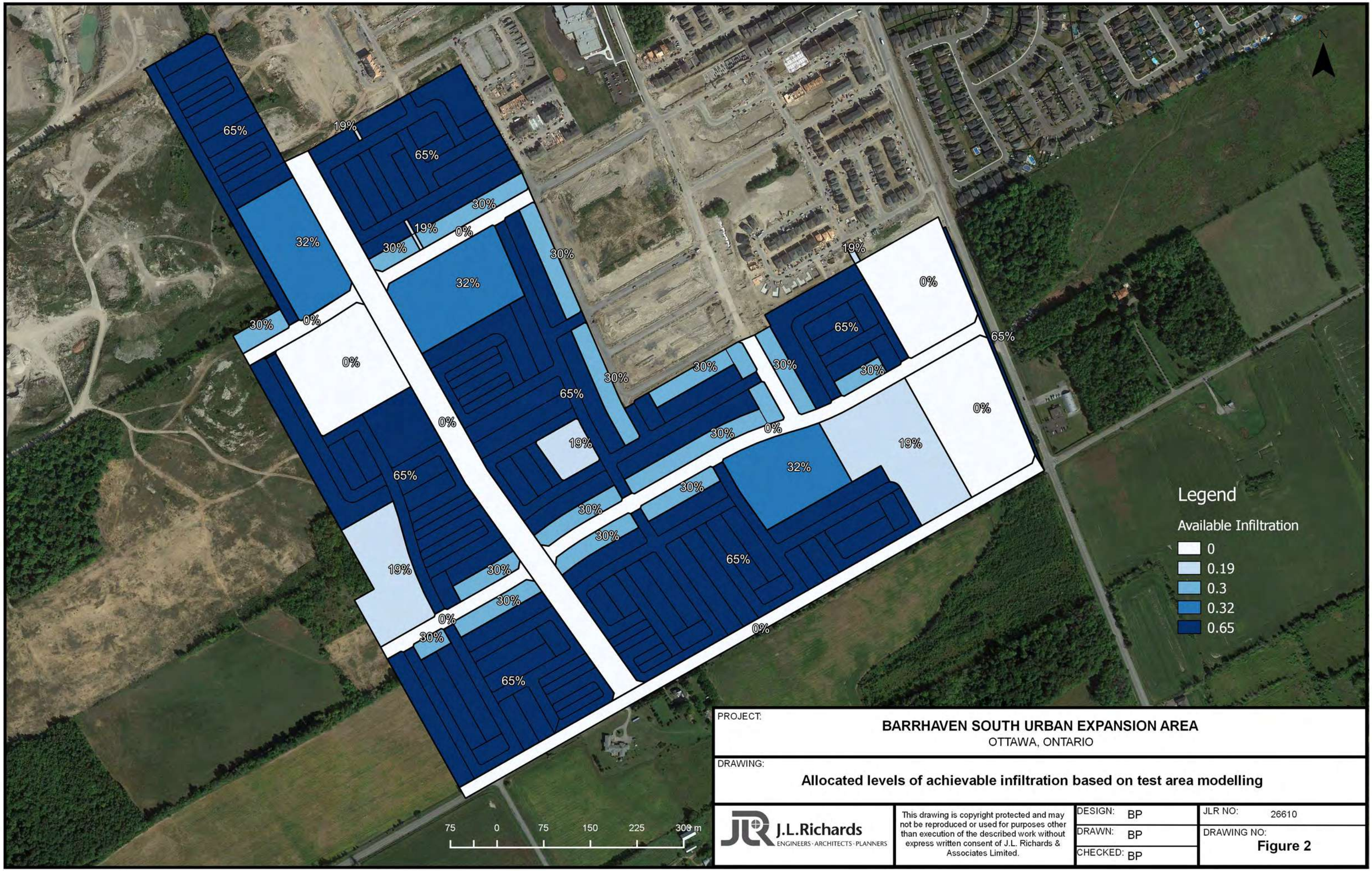
DESIGN: BP	JLR NO: 26610
DRAWN: BP	DRAWING NO: **Figure 1**
CHECKED: BP	



PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

Allocated levels of achievable infiltration based on test area modelling

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

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CHECKED: BP

JLR NO: 26610

DRAWING NO: **Figure 2**

N

Legend

- Urban Expansion Area
- Urban Expansion Area Excluding Pits

Land Cover and Infiltration

- Arterial Road, no EES
- Back-to-Back Units, EES infiltration
- Collector Road, no EES
- Commercial Block, infiltration of roof runoff
- Condominium Block, drains to local road EES
- Local Road, EES infiltration
- Park and Ride Block, no infiltration
- Park Block, assumed post-development infiltration
- School Block, infiltration of clean water runoff
- SWM Block, no infiltration
- Single Family Homes, EES infiltration
- Single Family Homes, EES infiltration of rear yard and rear roof only

75 0 75 150 225 300 m

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA

OTTAWA, ONTARIO

DRAWING:

EES and Infiltration Application Plan

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN: BP	JLR NO: 26610
DRAWN: BP	DRAWING NO: **Figure 3**
CHECKED: BP	

MEMORANDUM

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

To: John Bougadis P.Eng.
Senior Project Manager, Infrastructure Planning
City of Ottawa

From: Bobby Pettigrew, P.Eng.

Re: BSUEA Infiltration System Maintenance Requirements

Date: June 22, 2017

Job No.: 26610

CC: Hugo Lalonde, MCIP, RPP
Land Development Manager
Minto Communities - Canada

Purpose of Undertaking

The future Barrhaven South Urban Expansion Area (BSUEA) will be developed as a standard suburb subdivision that will include the typical range of land usages; residential, commercial, institutional, parks and a Park and Ride facility. Based on the findings of the Study Area Existing Conditions Reports, the servicing of the Subdivision will need to be developed with measures that will promote infiltration to preserve the pre-infiltration levels. This Memorandum was prepared to address operation and maintenance requirements for a system that would be solely implemented on local roads and that has been described in previous Memoranda as capable to maintain pre-infiltration levels.

Background

On May 24, 2017, a meeting was held at the City of Ottawa (City) to discuss advantages and disadvantages associated with two (2) servicing systems that could be implemented within the BSUEA to promote infiltration of “clean runoff” to maintain pre-infiltration levels. The first part of the meeting consisted of a presentation that described both servicing systems promoting infiltration; the Etobicoke Exfiltration System (EES) and the Clear Water Collector (CWC) system that was implemented in the former City of Vaughan. During the latter part of the meeting, the advantages and disadvantages of both systems were discussed over with operation staff. Both of these systems have been discussed in a previous Modelling Memorandum and were presented to the City on May 24, 2017, a copy of the presentation has been attached.

During the May 24, 2017 meeting, the City has requested further information on the increased maintenance requirements for a stormwater conveyance system that would be designed with infiltration capabilities. From the Operation Staff, it was understood that the current maintenance program for traditional stormwater conveyance systems consist of cleaning of the storm sewers by jet flushing and, subsequently, proceeding with a closed circuit television (CCTV) inspection. This process is generally completed on a 20-year frequency. This Memorandum has, therefore, been prepared using as the baseline condition, the 20-year maintenance frequency.

Reported Maintenance Requirements of Infiltration Systems

The requirements of a maintenance program can be based on experience with previous installations of the EES or CWC systems. The EES was first designed in 1993 in the former City of Etobicoke, now part of the City of Toronto. The system was subsequently constructed later in 1993 and spanning until 1994 as part of the municipality’s road reconstruction projects, which included the installation of 2.1 km of the EES as a means to provide water quality enhancement for existing serviced areas. From the 2.1 km of EES installed, three (3) small sections were subject to monitoring and reporting post-construction; the Princess Margaret and Queen Mary’s Drive sites as well as the Braecrest site (refer to the Table below for details for each of the sites).

The first two (2) sites comprises of an EES with Goss traps similar to what is proposed for the BSUEA while the latter site, Braecrest, is closer to the CWC system with some minor modifications. Each system was designed with capacity to capture the runoff generated from the 15 mm - 1 hour AES rainfall event. For comparison purposes, the system now being proposed for the BSUEA is sized to capture, detain and infiltrate the runoff generated by the 22 mm - 4 hour rainfall event.

Monitoring Sites	Sewer Length (m)	Tributary Area (ha)
Princess Margaret	415	0.4
Queen Mary's Drive	443	13.3[1]
Braecrest	209	2.4

Post construction monitoring of the above-noted systems was initiated on completion of construction. Once completed, the systems were cleaned by jet flushing and subsequently inspected via CCTV. Follow up monitoring was undertaken for a two year period between 1996 and 1998 (SWAMP, 2004) and subsequently by the TRCA in 2013 (presentation slides attached). The 1996-1998 monitoring information was reported; however, the recent monitoring has not been formally reported other than the information attached to the presentation slides.

Prior to the 2013 monitoring, there was no further cleaning undertaken and the infiltration capability of the EES installations were found to be very similar to the original infiltration condition after 18 years of operation. At the Princess Margaret site, the infiltration capability was virtually found to be the same than the original one as the system's drawdown time was found to take approximately only ten (10) minutes longer than found during the 1998 monitoring program. At the Queen Mary site, the 2013 monitoring results were reported after the cleaning phase of the program occurred and it was found that the average water level drawdown rate approximately doubled following the clean out. The information presented by the TRCA (see attached) on the monitoring program suggested that the maintenance frequency would vary depending on design of the EES and catchment characteristics. As a result, inspections should be carried out preferably at least every 5 years to verify that drawdown time does not exceed 48 hours.

The Sustainable Technologies Evaluation Program, led by the TRCA, has prepared a publication entitled "Low Impact Development Stormwater Management Practice Inspection and Maintenance Guide" (PIMG), which includes a section devoted to underground infiltration systems; however, this section of the PIMG does not specifically address the EES or CWC. The PIMG (i.e., Table 7.28, with relative sections extracted below) suggests recommended frequencies for routine maintenance tasks including clean out of sediments (flushing and removal) once an accumulated depth of 100 mm has been reached. Based on inspection photographs of the EES during the 2013 monitoring (see the sewer inspection photographs in the attached TRCA presentation), approximately 100 mm of sediment or less had accumulated over the 20 year period; this accumulation excludes what was accumulated in the catch basins. In addition, the PIMG document recommends maintenance procedures such as removing accumulated trash and debris in the catch basins on a more regular basis, up to twice per year. This inspection work could evidently be combined with an inspection program.

The 2003 Stormwater Management Planning and Design Manual (SWMPDM),from the Ontario Ministry of the Environment and Climate Change (MOECC), provides some guidance on maintenance required for similar infiltration / pervious pipe systems such as the EES that is proposed. Table 6.1 in the Manual identifies the need for general inspection, removal of accumulated sediments, pipe flushing, catchbasin cleaning, trash removal and closing of the system for winter months when in a high salt / sand area. By installing the EES solely along local roads, the maintenance activity of closing the system for the winter months is not required.

According to the Manual, inspections should take place at a greater frequency for the first two years, after every significant storm event, to better understand the system's performance and to ensure that the perforated pipe system is operating as designed. After the first two years, the frequency of inspections could be reduced to annual inspections. In terms of frequency of sediment removal and cleaning, the Manual indicates that the system, including catchbasins, should be cleaned out if there is greater than one third the design depth of water in the catch basin sump 48 hours after a storm or if there is visible accumulation of sediment in the bottom of the catchbasin sump. Cleaning could be carried out by means of standard flushing, radial washing where the pipe is pressurized to force water through the perforations and cleaning out the sediment, or alternatively, jet flushing via a pressurized hose nozzle that directs water under high velocities into the perforations to remove the accumulated sediment.

[1] Of the 13.3 ha tributary area to the monitored section of the Queen Mary's Drive site, only 3.7 ha was immediately tributary to the EES sewers, the remaining area was from conventional sewer systems upstream of the site.

Measures to Reduce Maintenance Requirements

The design of the EES can be carried out by incorporating measures to reduce the maintenance frequency of the system. The measures include; i) using Goss traps in the upstream catchbasins as a pre-treatment measure, and ii) by rotating the angle of perforations to 45° in the perforated pipe

Goss traps are used as standard in some Ontario municipalities including the City of Windsor and the City of Hamilton. They were used in the original sites of the EES in Etobicoke including those subject to the monitoring discussed above. This measure was adopted by the designers to: i) prevent debris collected in the catch basins from entering the perforated pipes, and ii) minimize oil trapped in the catch basins from entering the perforated pipes.

The alignment of the perforated pipe on its longitudinal axis is important in maximizing the efficiency of the system between maintenance visits and reducing the maintenance required. By placing the perforated pipes so that the perforations are not on the bottom of the pipe and are closer to the 4:30 and 7:30 locations on the clock, the perforated pipe will continue to function at full exfiltration capacity while sediment is deposited on the bottom. The need to clean out the sediment can be extended until sufficient sediment has built up to close up the angled perforations.

Recommended Maintenance Procedures and Frequency

Based on historical notes collected during the EES monitoring work, the review of the PIMG document (TRCA), the review of MOECC's SWPDM, best practices in operating conventional storm sewer systems and recent discussions held with stormwater professionals (refer to attached E-Mails), the following maintenance schedule is recommended:

Maintenance Schedule

Task	Frequency	Compared to conventional systems
Inspection of the system to ensure adequate operation including full drawdown of the sumps to below the perforated pipe invert level and ensuring that the plug part of the Goss trap is functioning properly by only allowing water from the deeper column to enter the catch basin lead	Once or twice per year - 48 hours or more after a significant storm event	Not required in conventional systems although could be considered good practice and preventative
Removal of accumulated trash and debris from sumps and grates	Twice per year	Best practice in conventional systems, part completed annually on grates with spring street clearing
Monitoring of the accumulated sediment depth in catch basins	Once a year	Best practice in conventional systems
Jet pressure wash and CCTV inspection of sewer and perforated pipes	At least every 20 years or when sediment levels reach 150 mm depth	As per conventional systems but only one sewer in conventional systems

From the table above, the increase in the maintenance requirements for an EES would consist of the following:

1. Annual or bi-annual inspections of the system at the manholes to confirm that drawdown is occurring within 48 hours following a storm event. If drawdown is not fully achieved after 48 hours, this could be indicative of the need to schedule flushing of the system; and

2. Jet pressure washing of the conventional storm sewer as well as the two (2) perforated pipes, from manhole to manhole, every 20 years. The increase in maintenance would be associated with the time to remove the mechanical plugs at the downstream end of the perforated pipes and to flush the perforated pipes. The mobilization cost will remain the same when compared to the single conventional sewer.

The additional maintenance requirement associated with item 2 above would not incur a significant time or a significant increase in costs. As previously noted, the time for the crew to mobilize would remain the same as what is anticipated for

a conventional system. The additional cost will be associated with jet pressure washing the additional length of sewers (i.e., perforated pipes) and potential for removing additional accumulated sediments, which is likely to occur in the perforated pipes when compared to conventional systems where the sediments can be washed away under self-cleansing flows.

An annual or bi-annual inspection of the EES at manholes would be the more costly of the two increased maintenance requirements as this task (checking drawdown time) is not currently completed and would require additional man-power (i.e, travel time and inspection time).

Estimated Maintenance Costs

A cost analysis of the increased maintenance is summarized below. In the event that the City has more recent costs for these tasks, then these would prevail. It should be noted that the costs listed below are in 2017 dollars.

- Anticipated number of manholes / catch basins for inspection: 250
- Time per manhole / catchbasin: 5 minutes
- Time for site: 21 hours
- Cost per hour: $53
- Total Cost for inspections: $1,120
- Annual cost: $2,240

- Anticipated length of EES sewer: 8.6 km
- Total Combo unit time: 86 hours
- Average cost per hour: $195
- Estimated cleaning cost: $16,770
- Estimated disposal: $500
- Annual equivalent cost: $870

Overall, the annual increase in cost for the City to undertake maintenance of the EES over the conventional storm sewer system is ±$3,500 a year on average for the anticipated sewer length within the CDP, excluding the aggregate extraction areas. It is considered that the increase in maintenance costs of the EES would be considerably less than the maintenance costs incurred with two wet pond structures, which is the alternative to provide similar levels of water quality control.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Bobby Pettigrew, P.Eng.,
Water Resources Engineer

Reviewed by:

Guy Forget, P.Eng.,
Senior Water Resources Engineer

Agenda

1. Introductory Remarks
2. Process: Community Design Plan and Master Servicing Plan
3. Hydrogeological Investigations, Findings & Recommendations
4. Water Budget – Summary of Findings
5. Review of Infiltration Measures
6. Recommended Infiltration Measure to achieve Water Balance
7. Etobicoke Exfiltration System
    1. Planning and Sizing
    2. Construction
    3. Maintenance
8. Other Infiltration Measure - Vaughan CWC
9. Infrastructure Requirements
10. EES vs CWC – Evaluation Matrix

24 May 2017 1

Introductory Remarks

- Study Area
- Minto's sub-consultant Team
- Existing Condition Report
- Public Consultations/Workshops
- Six (6) CDP Options, 2 developed by Minto & 4 by the Public

24 May 2017 2

Process: CDP & MSS

- Community Design Plan process started in Fall 2015. Integrated planning act/EA project. Completion and acceptance of the CDP is anticipated Fall 2017.
- Field work for Existing Conditions Reports started in 2015, completed in 2016/2017 by various disciplines. Existing Condition Reports are considered 99% final, or sufficiently to advance to next steps.
- 2 public Open Houses have been held to date. A third open house is planned in June 2017 to present preferred plan and draft master documents.

24 May 2017 3

Hydrologeological Investigations, Findings & Recommendations

- The Hydrogeological Existing Conditions report provided a characterization of the existing geological and hydrogeological conditions at the subject site.
- The proposed CDP boundaries are largely contained within the esker boundaries (as mapped by Chapman and Putnam, 1984).
- The surficial materials generally consist of lodgment till/diamicton, silty fine sand and/or sandy silt with 15-25 m of overburden.
- Filed investigations included saturated field hydraulic conductivity measurements
- The Significant Groundwater Recharge Area (as mapped by the Mississippi Rideau Source Protection Plan, 2014) was confirmed to exist over the majority of the site.
- City of Ottawa Trail Road Facility has a Dewatering Pond to artificially alter groundwater flow direction to prevent leachate migration.
- Distributed infiltration systems were recommended to return clean captured water to the environment as close to the source as possible to prevent changes to the watershed contribution.

24 May 2017 4

Water Budget: General

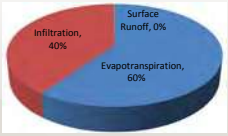
Natural watershed systems maintain a balance between precipitation, runoff to water bodies, infiltration to groundwater system, evaporation from water surfaces and transpiration from vegetation, completing the cycle back into atmospheric moisture and precipitation. The impact of urbanization on the natural hydrological cycle can be simplified graphically as follows:

24 May 2017 5

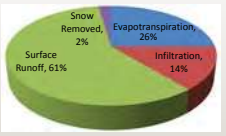
Water Budget: Summary of Findings

The water budget was assessed under pre- and post-development (uncontrolled) conditions over long-term simulation of 30-years of meteorological data. Simulation results have been synthesized graphically below:

Existing Pre-development



Uncontrolled Post Development



- Infiltration accounts for 40% and 14% of the total precipitation for the pre- and post-development (uncontrolled) conditions, respectively. An infiltration deficit of 26% is, therefore, anticipated if the subdivision excludes infiltration measures;
- Although surface runoff is virtually non-existent under pre-development (less than 0.5%), the model computed surface flows when precipitation depths exceeded a 1:5 year recurrence or when peak intensities were greater than a 1:2 year recurrence. Surface runoff increases to 61% under post-development (uncontrolled) conditions;
- Based on the above and MOECC's Interpretation Bulletin, storm servicing will include infiltration measures to preserve pre-development infiltration levels.

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Infiltration Measures to achieve Water Balance

As per the recommendations of the Existing Condition Report (JLR, April, 2017), infiltration measures should have the ability to:

- Maintain or exceed pre-development infiltration levels over the overall BSUEA; and
- Maintain or exceed pre-infiltration levels by means of re-introducing clean water over each of the three (3) sub-watersheds.

Various infiltration measures were reviewed that would promote recharge of the shallow overburden aquifer. This review included the measures described in the MOECC 2003 Stormwater Management Planning and Design Manual (SWMPDM) and the CVC 2010 Low Impact Development Stormwater Management Planning and Design Guide (LIDSWMPDG).

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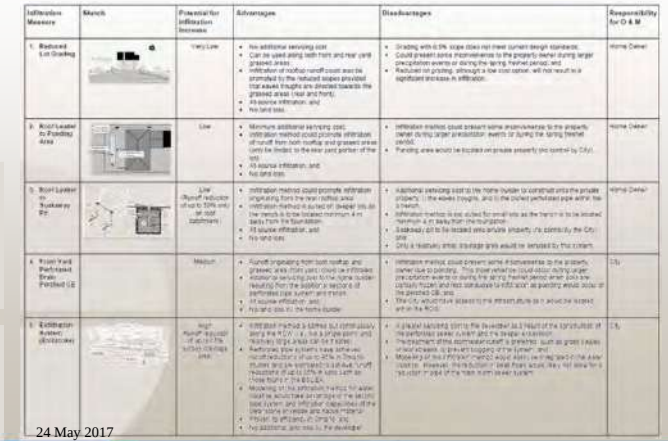
Review of Infiltration Measures



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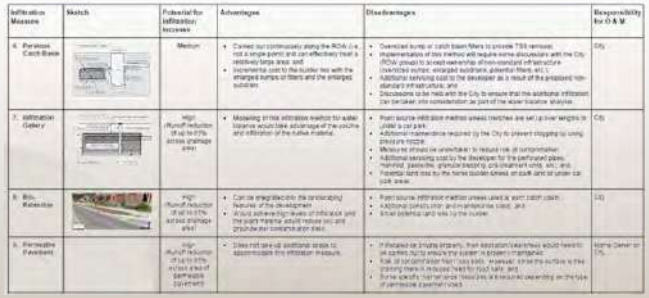
Review of Infiltration Measures

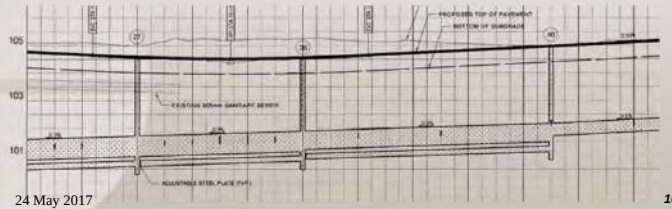


Following this review, the Etobicoke Exfiltration System (EES), including catchbasin filter trap, was recommended as the preferred infiltration measure due to the following advantages:

- Ability to achieve distributed infiltration of clean water over each of the three (3) sub-watersheds;
- Infrastructure fully contained on City owned lands; and
- Adaptability to be made inoperative in specific areas to minimize the infiltration of runoff impacted by road salts.

City of Ottawa Infiltration Measures

The City of Ottawa currently operates and maintains a similar infiltration system along Riverside Drive (MRC, 2012), Limebank Road to Hunt Club Road, Contract No. ISB07-5168

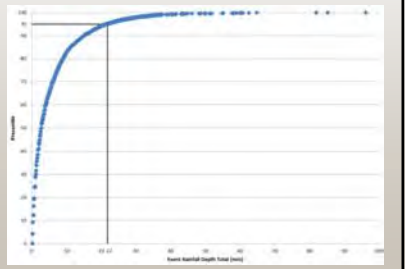


Etobicoke Exfiltration System: Planning & Sizing

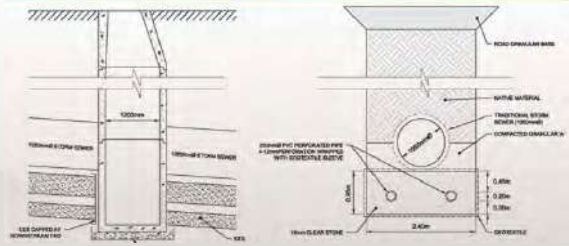
Steps in sizing the EES are based on the recommendations of the document entitled "Planning and Design Manual of the Etobicoke Exfiltration System for Stormwater Management, John Tran and James Li, Ryerson University":

- Design the storm sewer system in accordance with the local municipality (i.e., latest version of the Ottawa Sewer Design Guidelines, including Technical Bulletins);
- Carry out a statistical analysis by means of a rainfall event analysis of the hourly meteorological data collected at the Ottawa MacDonald Cartier International Airport;
- Identify the 95th percentile storm.

The analysis showed that a capture of 22 mm is equivalent to the 95th percentile storm.



EES Design Details

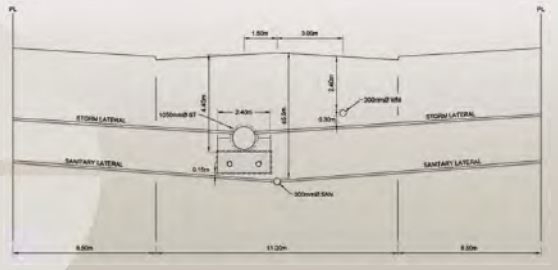


- Identify areas where a minimum distance of ±1 m can be provided between the high seasonal groundwater level and the invert of the EES;
- Develop the configuration of the granular envelope (19 mm clear stone - void ratio of 0.40) such that combined with the volume of the 2 perforated pipes (200 mm dia.) achieves the targeted volume;
- Target volume is 22 mm rainfall event capture. MOECC recommends a maximum target storage volume equal to the runoff from a 4 hour – 15 mm storm for pervious catch basins relying on exfiltration (refer to page 4-35 of the SWMPDM); and,
- The simulated granular envelope was defined as 2400 mm x 950 mm for test area.

Integration of EES

Review the configuration of the granular envelope and assess integration within ROW for various sewer sizes and depths

On **Collector** Road:
Sanitary sewer (200 mm dia. - 300 mm dia.) below the EES



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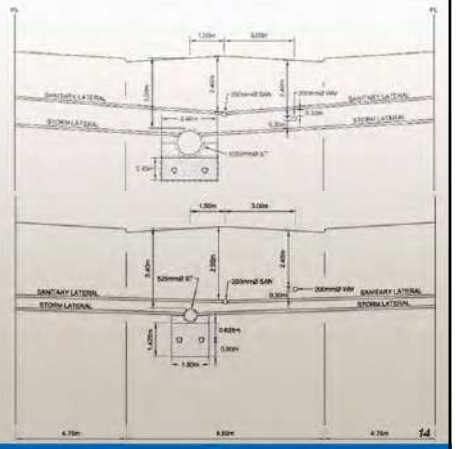
Integration of EES

On **Local** Road:
Sanitary sewer (200 mm dia.) above the EES



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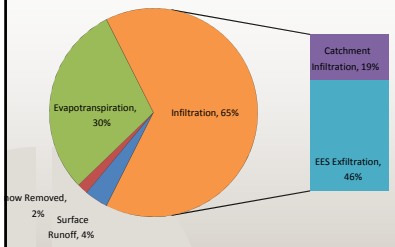
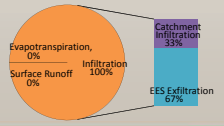
EES: Simulation Results (test area)



Residential and ROW lands draining to EES
30 years of continuous simulation
Residential lands Imperviousness based on average of residential types and lot configurations (average 56.8%)
Soil infiltration rates at 25.6 mm/hr, based on average rates across the site (excluding the pit areas), including factor of safety
Snow has been removed as part of the simulation based on 20% of impervious area being plowed and 80% of this snow being removed from the area

Same model as above, simulation of the 22mm - 4hour storm event
System sized to accommodate total runoff from 22 mm storm



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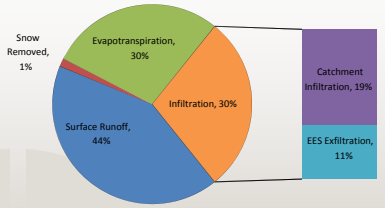
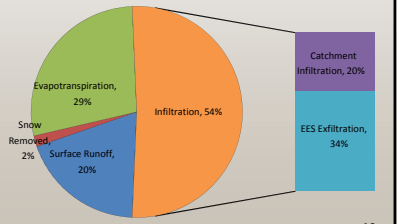
EES: Simulation Results (test area)



Same model as before, under 30 years of continuous simulation
Only rear yards (including rear of roof) draining to EES

Same model as before, under 30 years of continuous simulation
All Residential and ROW lands draining to EES but EES **only operational between April 15 and November 15** annually



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EES: Simulation Results - Commercial

- Under a 22mm storm event, 125 m³ is captured and infiltrated in residential areas.
- Runoff from commercial areas were assumed to be conveyed to the EES within the ROW. Modelling approach assumed that commercial areas were to "mimic" the performance of the residential areas and infiltration be maintained or slightly exceeded. This criterion was adopted to prevent overloading of EES, which in turn, would decrease the level of service.
- 125 m³ amounts to 14 mm depth across 1 ha of commercial land at an imperviousness of 90%.
- In order to maintain the same level of service, servicing of the commercial sites should be developed to capture, detain and infiltrate on-site the first 10 mm of runoff : (22 mm less 14 mm = 8 mm, rounded to 10 mm).

EES: Installation

Before construction, all necessary erosion and sediment control measures must be installed to prevent sediment laden runoff from leaving the construction sites.

EES: Installation

1. Proceed with excavation of the trench using standard construction techniques.
2. Install filter cloth around the trench, stakes are to be used to hold the fabric along the vertical sides of the trench.
3. Install the clear stone bedding (19 mm) from the bottom of the trench to the design invert of the perforated pipes.

EES: Installation

4. Wrap the two (2) 200 mm dia. perforated pipes with filer fabric, lay both perforated pipes on top of granular bedding and place mechanical plugs on both upstream and downstream ends of the perforated pipes.
5. Install clear stone bedding (19 mm) over and around the perforated pipes until reaching the invert elevation of the traditional storm sewer.

EES: Installation

6. Install the storm sewer over the clear stone layer.
7. Install CB and CB leads, and connect CB leads to storm sewer.

EES: Installation

8. Install clear stone material around the storm sewer until reaching the top of the sewer

EES: Installation

9. Install and wrap filter cloth over the clear stone with an overlapping width of 1 metre.
10. Backfill the trench with suitable soils.

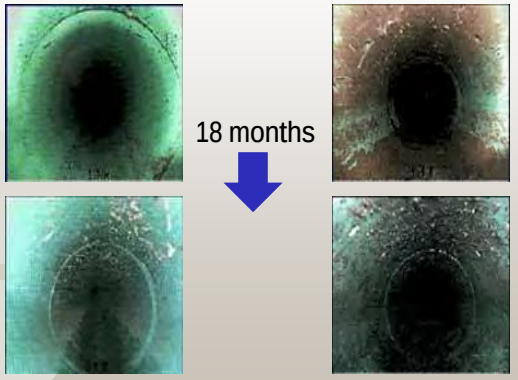
EES: Installation

11. Remove the mechanical plugs at the upstream end of each section of the system after all construction.

EES: Maintenance

Upstream

Downstream



EES: Maintenance

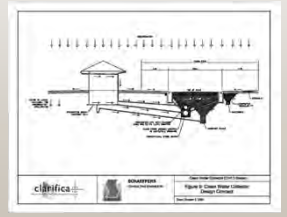
- Periodic maintenance is required
- Regular observation program would look at:
  - Visual evidence of overflows at sewer, water marks at the manhole, integrity of mechanical plug at the downstream manhole
  - Repair of minor deficiencies such as debris accumulation at the catchbasins including cleanout of any filter traps at the catchbasins
- Periodic Cleaning involves:
  - Removal of downstream mechanical plugs
  - Installation of temporary plug on upstream end of downstream pipe
  - High pressure water flusher inserted from downstream end to clean the walls of the perforated pipe
  - Debris flushed down to downstream manhole which is then pumped out by a vacuum truck
- Periodic Cleaning required approximately every ten years

Other Infiltration Measure: Vaughan's CWC

An alternate servicing method was used in Vaughan to promote infiltration and enhance groundwater recharge under post-development condition.

This system, referred to as the clean water collector (CWC), was implemented along the ROW and used as the infiltration measure to enhance ground water recharge.

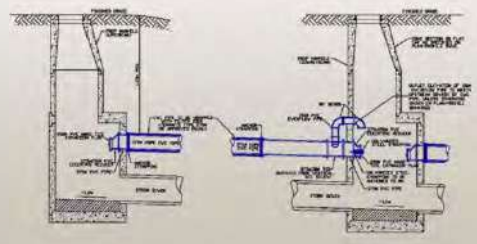
The CWC in Vaughan was sized to capture and infiltrate the first 22 mm of rain generated by rooftops only while events in excess of 22 mm could potentially overflow to the standard storm sewer.



Vaughan's CWC: Basic Components

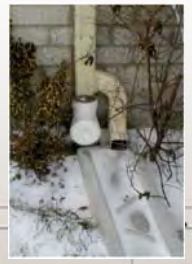
The CWC system was comprised of 5 components:

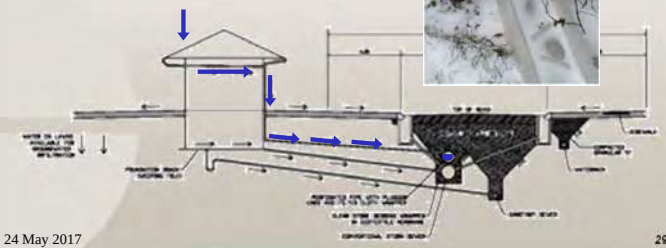
1. The 375 mm diameter HDPE perforated pipe.
2. Solid connector to the downstream manhole.
3. Overflow system to downstream storm manhole.
4. Pipe plugs.
5. Lateral house connection leads.



Vaughan's CWC: How it functions

Photo shows roof leader filter and overflow device





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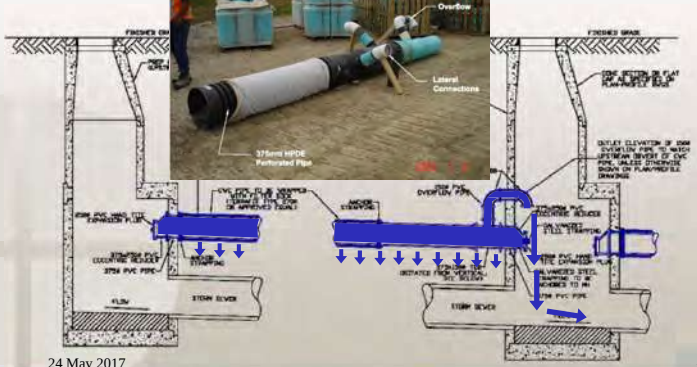
Vaughan's CWC: How it functions



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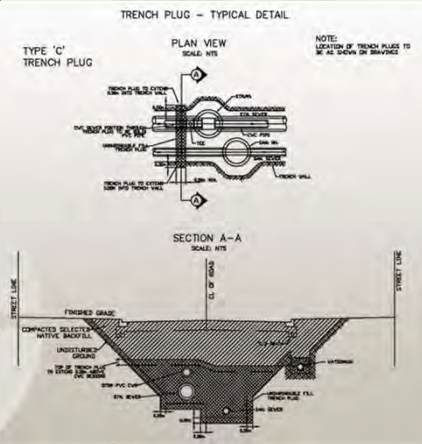
Vaughan's CWC: Design Details



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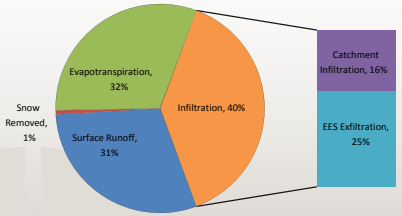
Vaughan's CWC: Performance

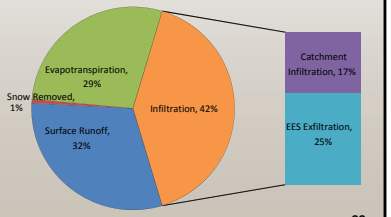


Same catchment parameters as EES under 30 years of continuous simulation

Only roof area draining to the CWC as per the configurations above

Same model as before under 30 years of continuous simulation

Roof areas and rear yards draining to the CWC system



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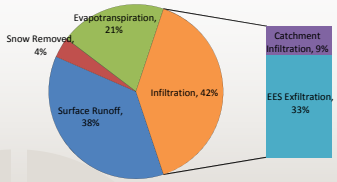
CWC: Simulation Results - Commercial



A separate CWC system would be needed for commercial areas:

- 1 ha of Commercial Land draining to CWC
- 30 years of continuous simulation
- 0.4 ha of Roof area at 100% Imperviousness and 0.6 ha of remaining area at 77% Imperviousness for an overall site C factor of 0.8
- Soil infiltration rates at 25.6 mm/hr, based on average rates across the site (excluding the pit areas) plus a factor of safety
- Snow has been removed as part of the simulation based on 80% of non-roof impervious area being plowed and 80% of this snow being removed from the area (conservative as it reduces the snow available for infiltration). No roof snow is removed.

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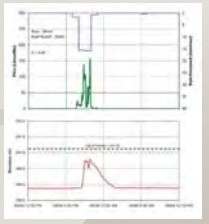
Vaughan's CWC: Monitoring

The CWC system was implemented at a Research Test Site in Vaughan for performance evaluation of the system via monitoring. The Test Site represented one lot and one half of the municipal ROW. The size of the trench was selected to provide, together with the perforated pipe, the volume required to capture the runoff from a 22 mm rainfall/snowmelt event over the roof area. Results of the monitoring was as follows:

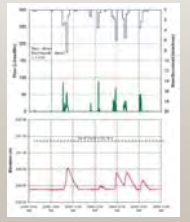
Event No. 1 (June 8, 2003) produced 34 mm of rainfall over ±4 hours; and

Event No. 2 (May 22, 2004) produced 45 mm of rainfall and spanned over 2 days.

Event No. 1 (June 8, 2003)



Event No. 2 (May 22, 2004)



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Vaughan's CWC: Monitoring

Monitoring of the Test Site has shown the following:

- For both events, the water levels in the trench responded quickly to inputs and also recovered quickly (refer to figure below);
- The fast system response time suggested effective performance of the pipe perforations, the storage utilization, and the infiltration into the surrounding soil significantly enhances the system performance during the same event or consecutive storms;
- Event No. 2 was comprised of several consecutive rainfall burst over short durations within 3 hours of each other (9.5 mm and 9.25 mm). The trench storage recovery occurs rapidly, even during relatively wet antecedent conditions;
- During the events, the water table did not rise to be measurable and the storage in the granular remained at about half of the storage capacity. This is indicative that:
  1. The Test Site did not infiltrate sufficient volume to affect the water table:
  2. The infiltration from all the surrounding pre-development areas was also not sufficient to affect the water table:
  3. There is efficient groundwater flow in the area – small changes in infiltration rates cause relatively rapid increases in groundwater flow.

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Infrastructure requirements - BSUEA

Key BBSS/ISR Objectives includes (page 3 of the September 13, 2016 presentation):

- Improve efficiency of land within the urban boundary
- Improving urban design and liveability
- Establishing appropriate Levels of Service and infrastructure standards that achieve economies in construction, maintenance and/or replacement costs
- Delivering infrastructure in more cost-effective ways.

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Infrastructure requirements - BSUEA

Water Quantity:

Design of the traditional storm sewer system in accordance to Technical Bulletin PIEDTB-2016-01; minor system capture to be set to the minimum 2-year capture or as required depending on the ROW designation

EES: capture and infiltrate 22 mm; this "loss" of runoff to the shallow aquifer will amount to 10% to 15% saving in quantity storage, which in turn, will have a footprint reduction to be assessed at the MSS.

CWC: capture and infiltrate 22 mm of all roofs; this "loss" of runoff to the shallow aquifer will amount to 5% to 10% saving in quantity storage, which in turn, will have a footprint reduction to be assessed at the MSS.

Infrastructure requirements - other constraints

The review of the Salting policy (Salt Management Plan, Appendix A, revision 3.2, October 31, 2011) shows the following:

On residential roads and lanes:

Requires that snow and ice be cleared and that ruts and/or potholes that may cause poor vehicle control be leveled off. Abrasive or de-icing materials are applied at intersections, hills and sharp curves:

Application ratio 5% by volume of CaCl, MgCl or multi chloride.

Given that a 5% salt mixture is only applied at intersections, hills and sharp curves, the impact of chlorides applied on local roads is found to be negligible. As a result, the EES with filtration system could be implemented on local roads.

Salt is applied on collector and arterial roads, which are limited in the BSUEA.

Quality Control

MOECC SWMPDM Table 3.2 requires:

Type	Imperviousness (%)	Storage Required (m^3/ha)	Total Storage (m^3)
Infiltration	66%	34	2,650
Wet Pond	66%	216	16,850

Storage provided in the EES is approximately 150m^3/ha on average, excluding the on-site capture required for ICI areas.

Vaughan's CWC vs EES

Criteria / Objective	EES	CWC
Maintains or exceed pre-development infiltration levels	✓	✓
Achieves distributed infiltration over 3 sub-watersheds	✓	✓
Achieves MOECC's Bulletin - Expectations for Stormwater Management	✓	✓
Additional maintenance of infrastructure is contained within ROW	✓	✓
Achieves water quality control on its own (80% TSS)	✓	✗
No need to be supplemented by other measure (wet pond or WQU)	✓	✗
Limits maintenance by the City to one water quality system	✓	✗
Can infiltrate runoff free of road salts	✓	✓
No operations required to switch between winter and summer operations	✗	✓

Vaughan's CWC vs EES

Criteria / Objective	EES	CWC
No additional land requirements for infiltration measure	✓	✓
Consistent with the City's Building Better Suburbs improved land efficiency project objective	✓	✓
Infrastructure fully contained on City lands	✓	✗
All maintenance responsibility of the City	✓	✗
Additional servicing cost to home builder to implement	✓	✓
No additional cost for each unit (home builder or home owner)	✓	✗
No additional servicing costs (deeper excavation)	✗	✓
No potential impact on life expectancy of standard sewer	✓	✗

Etobicoke Exfiltration System:
Monitoring and Evaluation

Tim Van Seters
Ryerson University
July 24, 2015

Presentation Outline

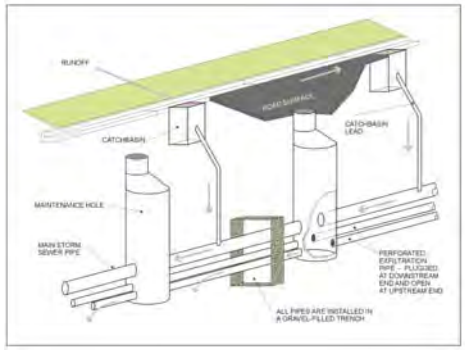
- Summary of 1994 – 1995 Candaras Associates study
- Summary of 1996-1998 SWAMP Study
- Follow up monitoring in 2013 and 2014
- Other exfiltration system designs

Performance Assessments

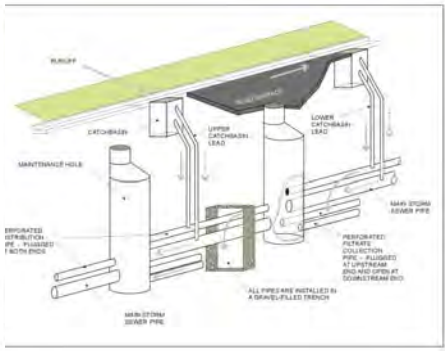
- Exfiltration system – Princess Margaret Blvd
- Exfiltration system – Queen Mary Drive
- Filtration System on Braecrest Avenue

SWAMP

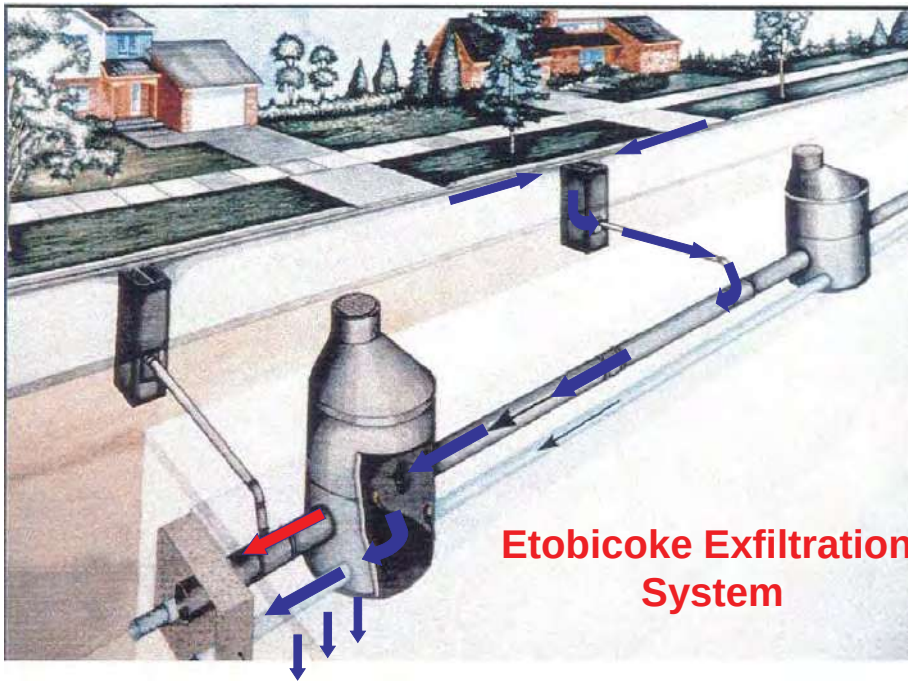
Exfiltration and Filtration Systems



Exfiltration System



Filtration System

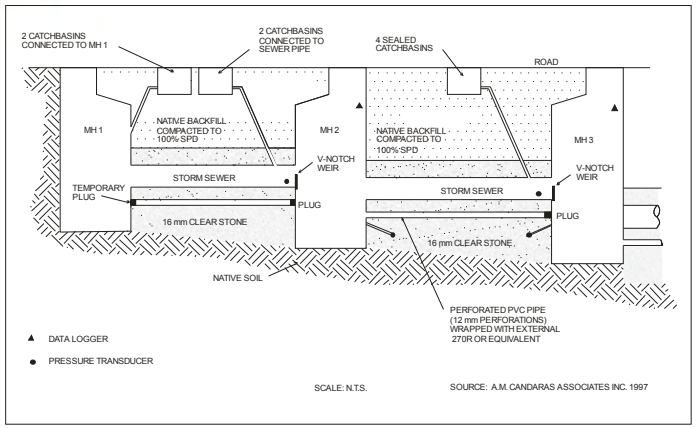


Princess Margaret Blvd Site

Princess Margaret Blvd
Site Characteristics and System Design

- 30.5 ha low density residential
- Clay to clay silt till over silty sand
- No groundwater interference
- Design storm was 15 mm, 1 hour AES storm, which was thought to be equivalent to the 90th percentile event
- Peak rainfall intensity = 56 mm/h or 4.7 mm/5 minutes

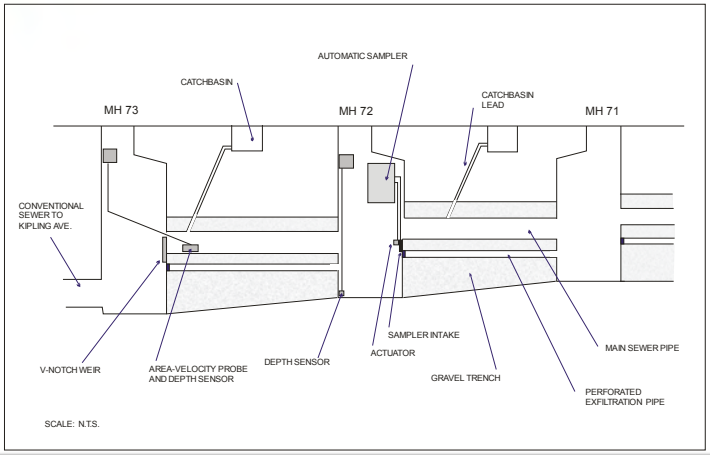
Candaras Associates Study
Princess Margaret Blvd



Candaras Associates Study
Princess Margaret Results

Date	Event Size	Peak Inflow	Peak Outflow	Trench Peak Water Level Upstream	Trench Peak Water Level Downstream	Water Level at which overflow occurs
May 26, 1994	28 mm over 22.5 hours	9.7 L/s	0.3 L/s	0 mm	65 mm	650 mm
May 31, 1994	11 mm over 0.5 hours	8.1 L/s	1.5 L/s	0 mm	5 mm	650 mm
June 24, 1994	24 mm over 24 hours	2.2 L/s	0.1 L/s	0 mm	3 mm	650 mm
Oct 5-6, 1995	63 mm over 18 hours	10 L/s	3.3 L/s	380 mm	500 mm	650 mm

SWAMP Study
Princess Margaret Monitoring Lay-out



SWAMP Study
Princess Margaret Results: 1996 - 1998

- No overflows in 1996 – 2 rain events above 15 mm
- No overflows in 1997 – 7 rain events above 15 mm
- 3 events caused overflow in 1998, no overflow from 2 events > 15 mm
  - 20.2 mm followed by 3.6 mm two days later
  - 14.9 mm followed by 11.9 mm the same day (26.8 mm total)
  - 15.3 mm, high intensity (9.7 mm in 5 minutes)
- 98% of rainfall runoff infiltrated
- Mean TSS concentrations in sewer were 164 mg/L and 81 mg/L in summer and winter, respectively

SWAMP Study
PM Large Event Summary

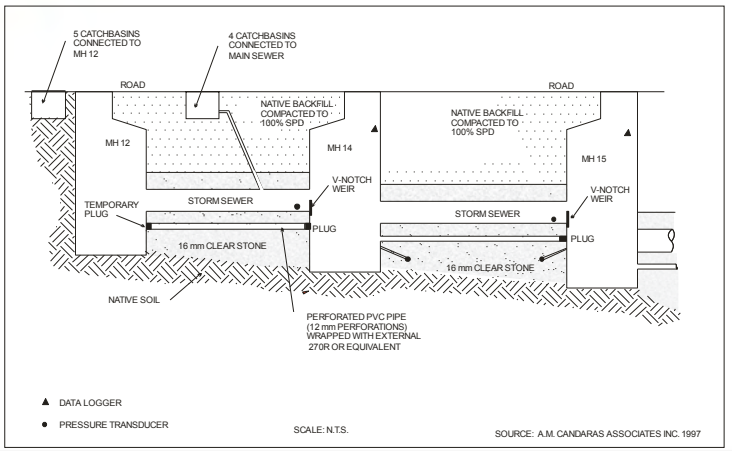
Date	Duration[1]	**Total Depth**	Maximum 5-minute	Maximum hour	**Overflow MH 72**
	(min)	**(mm)**	(mm)	(mm)	
Oct. 18, '96	840	**26.7**	n/a	14.0	**N**
Nov. 7-8, '96	600	**18.0**	n/a	5.9	**N**
Aug. 15, '97	240	**20.8**	n/a	11.0	**N**
Aug. 20-21, '97	1,140	**40.4**	n/a	5.6	**N**
Sep. 10, '97	600	**16.0**	n/a	3.6	**N**
Nov. 1, '97	660	**23.0**	n/a	5.0	**N**
May 10-11, '98	2,885	**42.8**	0.5	3.6	**N**
June 11-13, '98	420	**20.2**	1.4	4.6	**N**
June 13, '98	55	**3.6**	0.7	2.8	**Y**
June 30, '98	170	**26.8**	4.2	10.7	**Y**
Sept. 6, '98	45	**15.3**	9.7	14.8	**Y**

Queen Mary's Drive
Site Characteristics and System Design

- 13.3 ha low density residential
- Sand and silty sand native soils
- Roof and foundation drains directly connected to sewer
- Groundwater at 1.2 m from surface

Queen Mary's Drive Site

Candaras Associates Study
Queen Mary's Drive Study

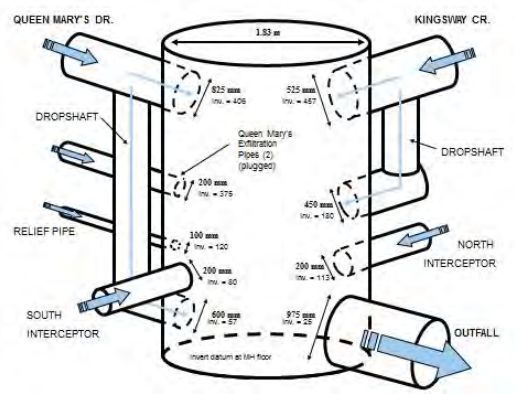


Candaras Associates Study
Queen Mary's Drive Study Results

Date	Event Size	Peak Inflow	Peak Outflow	Trench Peak Water Level Upstream	Trench Peak Water Level Downstream	Water Level at which overflow occurs
Sept 25, 1994	19.1 mm over 6 hours	52 L/s	6.5 L/s	220 mm	180 mm	650 mm
Oct. 5-6, 1995	63 mm over 18 hours	17.5 L/s	10 L/s	150 mm	550 mm	650 mm

Results of SWAMP EES monitoring
Queen Mary's Drive

- Inconclusive

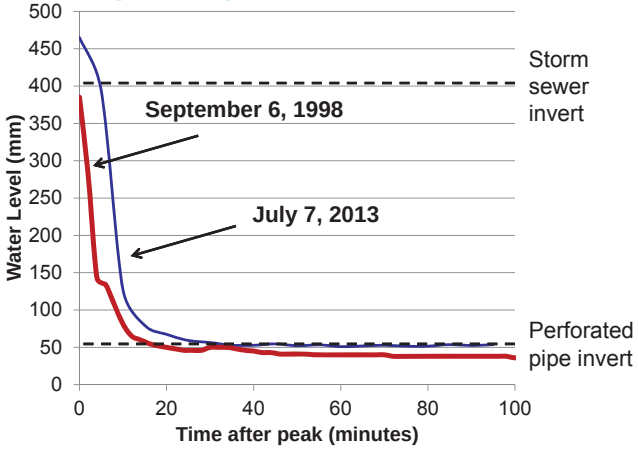


Follow up Monitoring in 2013-14

Princess Margaret Blvd
Sewer Inspection

PM Water Level Drawdown Rate in 1998 and 2013 (MH 72)

- Limited maintenance
- Still infiltrating well after 14 years



Princess Margaret Blvd

Large Event Summary

Date	Duration[1]	**Total Depth**	Maximum 5-minute	**Overflow MH 72**	**Overflow MH 71**
	(hh:mm)	**(mm)**	(mm)		
June 12, 2014	3:45	**24.8**	4.8	**Y**	**Y**
June 17, 2014	0:50	**13.4**	3.6	**Y**	**Y**
June 25, 2014	1:15	**19.6**	4.8	**Y**	**Y**
July 7, 2014	4:25	**12.0**	0.6	**N**	**N**
July 8, 2014	6:10	**14.6**	4.2	**N**	**N**
July 27. 2014	13:10	**35.0**	2.6	**N**	**Y**
August 12, 2014	1:50	**10.0**	1.4	**N**	**Y**
Sept 2, 2014	5:10	**20.8**	4.4	**N**	**Y**
Sept 5, 2014	10:55	**25.2**	0.8	**N**	**Y**
Sept 10, 2014	11:45	**35**	2.2	**Y**	**Y**
Sept 21, 2014	2:05	**13**	3.2	**N**	**Y**
Oct 3, 2014	12:50	**16**	3.6	**N**	**Y**
Nov 24, 2014	13:05	**22.4**	1.4	**N**	**N**

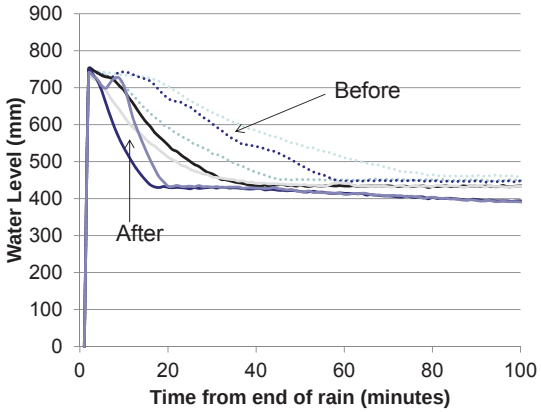
Queen Mary

Queen Mary Sewer Inspection

Queen Mary Clean Out

Queen Mary Water Level Drawdown Before and After Maintenance

- Average water level drawdown rate roughly doubled after maintenance



Queen Mary

Large Event Summary 2014

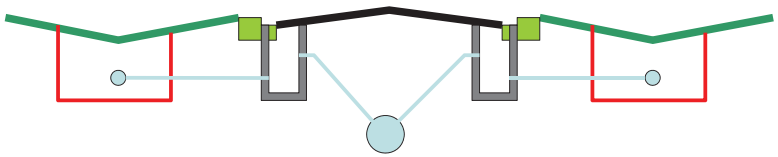
Date	Duration[1]	**Total Depth**	Maximum 5-minute	**Overflow**
	(hh:mm)	**(mm)**	(mm)	
June 12, 2014	3:45	**24.8**	4.8	**Y**
June 17, 2014	0:50	**13.4**	3.6	**Y**
June 25, 2014	1:15	**19.6**	4.8	**Y**
July 7, 2014	4:25	**12.0**	0.6	**Y**
July 8, 2014	6:10	**14.6**	4.2	**Y**
July 27. 2014	13:10	**35.0**	2.6	**Y**
August 12, 2014	1:50	**10.0**	1.4	**Y**
Sept 2, 2014	5:10	**20.8**	4.4	**Y**
Sept 5, 2014	10:55	**25.2**	0.8	**Y**
Sept 10, 2014	11:45	**35**	2.2	**Y**
Sept 21, 2014	2:05	**13**	3.2	**Y**
Oct 3, 2014	12:50	**16**	3.6	**N**
Nov 24, 2014	13:05	**22.4**	1.4	**Y**

General Conclusions

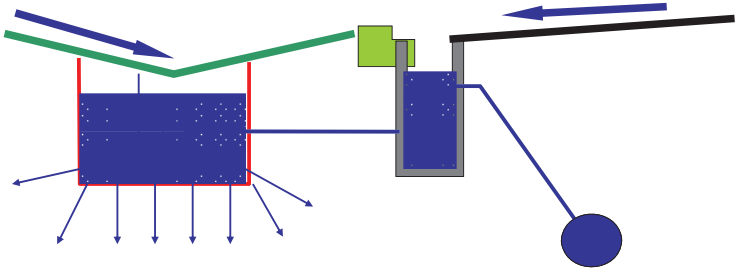
- PM exfiltration system continues to meet design target
- Overflows often occurred due to limited through put capacity rather than inadequate trench storage availability
- Higher density of perforations and/or larger pipes to facilitate rapid conveyance of runoff into trench
- Improved pre-treatment within the catchbasin or manhole would help reduce clogging of perforated pipes
- Trench dams preventing flow between trench sections may need further consideration
- Maintenance frequency variable depending on design and catchment characteristics – inspections required every 5 years

Other Exfiltration System Designs

Exfiltration system, North York

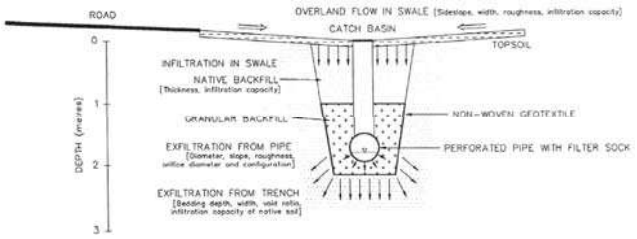


Exfiltration system, North York



Exfiltration Systems, Ottawa

- Curbless system with pretreatment through a grass swale
- After 20 years, and limited maintenance, the system continued to function very well



J.F. Sabourin & Associates, 2008

Edwards Gardens

Biofilter system

Courtesy: Schollen & Co. Inc.

Thank You

Tim Van Seters
Phone: 289-268-3902
Email: tvanseters@trca.on.ca

STEP website:
www.sustainabletechnologies.ca

Toronto and Region Conservation *for* The Living City

STEP Sustainable Technologies Evaluation Program

Bobby Pettigrew

From: Tim Van Seters <tvanseters@trca.on.ca>
Sent: May 25, 2017 12:16 PM
To: Bobby Pettigrew
Subject: Re: EES Maintenance Requirements Query

Hi Bobby,

We did a maintenance inspection and evaluation of the EES that looked a two system. In the Ryerson slides, the discussion is represented by two drawdown curves for Princess Margaret Blvd and Queen Mary. In a nutshell, this is what we found:

1. Princess Margaret Blvd. Monitored in the 1990s, returned in 2013 to monitor again. Drawdown of water into the exfiltration system (representing infiltration_ after large events was essentially the same as was monitored initially and again by SWAMP in the 1990s. This was surprising as we have no record of the system ever being maintained. There was some minor buildup of sediment in the perforated pipes and manhole, but surprisingly little (pictures provided in slides).

2. Queen Mary System. This one was located in a narrow residential street with a dense canopy of trees (unlike PM Blvd, which was more open, and a larger street overall). There was also some evidence that the system had a conventional sewer connection to the system along Prince Edward Drive, although this was not confirmed by our team. This one was also not maintained since installation, and showed buildup of sediment in the manhole and pipes, but was still infiltrating as shown by the draw down curves. We paid for a clean out of one leg of the perforated pipe at around 2 K, and only one of the two pipes, then compared drawdown before and after. We found that the drawdown rate (i.e. infiltration) doubled after cleanout of one pipe, so if both pipes were cleaned you may expect even better performance. Most of the sediment that collected in the pipes was very coarse and removable with readily available equipment.

Bottom line is that these systems seem to be very robust, and probably don't need cleaning more than once every 5 years or so (inspections should be done annually). The design of the EES is not optimized because the catchbasins do not provide sufficient pre-treatment of runoff. Installing a CB shield or other type of scour prevention type device would help retain more of the sediment/leaf litter in the catchbasin, the latter of which are cleaned annually or biannually. There are screens or other devices that may be added to keep the coarse sediment out of the EES.

We have not had a chance to write up this maintenance evaluation properly in a technical brief. However we do have our LID inspection and maintenance guide, that provides detailed advice on needs across a range of LID type BMPS. It is available at: http://www.sustainabletechnologies.ca/wp/home/urban-runoff-green-infrastructure/low-impact-development/low-impact-development-stormwater-practice-inspection-and-maintenance-guide/

Hope that helps

Tim

Tim Van Seters, M.E.S., H.B.Sc. | Senior Manager, Sustainable Technologies
Toronto and Region Conservation | 9520 Pine Valley Drive, Vaughan, ON, L4L 1A6 | Tel: 289-268-3902

Email: tvanseters@trca.on.ca | www.sustainabletechnologies.ca

From: Bobby Pettigrew <bpettigrew@jlrichards.ca>
To: "tvanseters@trca.on.ca" <tvanseters@trca.on.ca>,
Date: 05/24/2017 01:15 PM
Subject: EES Maintenance Requirements Query

Hi Tim

We have been undertaking some investigations into Stormwater infiltration systems, specifically the EES or similar CWC used in Vaughan. We came across your July 2015 presentation made as part of the seminar on the EES at Ryerson University.

Our land developer client is progressing on developing a 120 ha site and is required to maintain pre to post infiltration due to the underlying SGRA and associated esker. We are working with the City in identifying an infiltration measure which would be appropriate and the EES seems to be attractive. The hurdle we have is that the long term maintenance requirements of such a system seem to be relatively unknown. I was just wondering if there had been any further work following your presentation on the maintenance requirement of an EES network or if you have any contacts in the local municipalities who are looking after such a system?

Any advice or contacts would be appreciated. Any questions let me know.

Thanks
Bobby

Bobby Pettigrew, M.Eng., P.Eng.
Senior Water Resources Engineer

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Thank you."

Bobby Pettigrew

From: Ternier, Sabrina (MOECC) <Sabrina.Ternier@ontario.ca>
Sent: June 6, 2017 2:11 PM
To: Bobby Pettigrew
Cc: Guy Forget
Subject: RE: EES and CWC Maintenance Requirements Information

Hi Bobby,

I ran into Muneef the other day and he had given me a heads up I may be contacted regarding the EES. Yes I had the pleasure of having John Tran as a mentor as I did my masters on modelling the EES. While I didn't do any research on the maintenance, I do know that the design allows for easy clean-up of any sediment/debris within the perforated pipes by power flushing the sediment down the pipes (downstream plug removed) and into the downstream manhole to be removed by vacuum. During the 20+ years that it's been in use at the Princess Margaret Blvd and Queen Mary Dr sites, I believe there was no maintenance done to it until perhaps recently? When Tim was doing monitoring work (just a couple years ago), I believe he also took a look at the state of the system and possibly cleaned it out too? You'll have to verify with him, but I recall hearing that the Queen Mary site after all those decades had gotten quite a bit of debris/leaves because the downspouts aren't disconnected in that area and there were no clean outs.

Also, the location of the perforations along the pipe are key to maintaining long term performance. If the perforations are rotated 45 degrees to the vertical/horizontal, it allows for sedimentation on the bottom of the pipe without losing any perforations, until it gets really full.

Dr. James Li from Ryerson University was/is also involved with the EES. There is a draft manual of the EES on his university website that may be of help: http://www.civil.ryerson.ca/seminar/Papers/Draft%20Design%20manual%20of%20EES%20by%20Tran%20and%20Li%207-24-2015.pdf.

Hope that was of use. If you have any other questions please let me know.

Take care,
Sabrina

Sabrina Ternier| *Research Analyst | Ontario Ministry of the Environment and Climate Change | Environmental Innovations Branch | 416-325-8223 | Sabrina.Ternier@ontario.ca*

From: Bobby Pettigrew [mailto:bpettigrew@jlrichards.ca]
Sent: June-01-17 8:40 AM
To: Ternier, Sabrina (MOECC)
Cc: Guy Forget
Subject: EES and CWC Maintenance Requirements Information

Hi Sabrina

I have been passed on your contact details by other contacts and I was hoping you would be able to help. We are currently working on a subdivision for a land development client which is located over an esker and the City and Conservation Authority are keen on retaining infiltration over the area. We have been researching various means of

achieving infiltration and have identified the Etobicoke Exfiltration System (EES) and the Clearwater Collection system (CWC), which was used in the City of Vaughan, as possible solutions.

One of the hurdles we are facing in using either of these systems is the relative unknown in terms of maintenance requirements for these systems. I believe that you worked with the late John Tran in the EES and I was wondering if you had any follow up research on maintenance of the systems. We have already been in contact with Tim Van Seters at the TRCA and he pointed us to his work done in terms of the monitoring. Any other knowledge you have or any documents you can point us to would be greatly appreciated.

Thanks
Bobby

Bobby Pettigrew, M.Eng., P.Eng.
Senior Water Resources Engineer

J.L. Richards & Associates Limited
864 Lady Ellen Place, Ottawa, ON K1Z 5M2
Tel: 613-728-3571 Fax: 613-728-6012

Appendix F

Storm Sewer Design Sheets

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
ETOBICOKE EXFILTRATION SYSTEM (EES)

Designed by: A.T.
Checked by: L.D
Date:February 2018

Manning's Coefficient n =	0.013

Legend
- Proposed storm sewers within BSUEA
- Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
- Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

STREET	Maintenance Hole Number FROM	TO	BSUEA AREA RUNOFF COEFFICIENTS 0.20 5Yr	0.40 100Yr	0.66 5Yr	0.75 5 Yr	0.80 10Yr	0.85 5Yr	Total Area 5 Yr	10 Yr	100 Yr	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Yr Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Actual Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
CORRIGAN POND BSUEA AND QUINN'S POINTE CATCHMENT AREAS																																													
BSUEA AREAS ~ OUTLET TO POND 2 - SOUTH																																												
	DI-1	170		1.88								0.00	0.00	1.88	1.88	1.88	10.00	0.32							1.05	1.05	178.56	186.64		186.64	900	914.4	1.05	1935.2	2.95	56.09	1748.6			107.04	106.12		111.00		106.45	105.54	4.55
Kilbirnie Dr.	170	172				0.92		4.70				5.62	0.00	0.00	5.62	7.50	10.32	1.07	12.79	12.79	102.55	1311.99		0.00		1.05	175.71	183.67		1495.66	900	914.4	1.05	1935.2	2.95	188.50	439.6	111.00		106.45	105.54	4.55	107.63		104.47	103.56	3.16
New Greenbank Rd.	172	174					1.08					0.00	1.08	0.00	1.08	8.58	11.38	1.49		12.79	97.41	1246.31	2.40	2.40	114.16	274.20		1.05	166.83	174.38		1694.90	1350	1371.6	0.30	3049.8	2.06	184.40	1354.9	107.63		104.47	103.10	3.16	108.03		103.92	102.55	4.11
New Greenbank Rd.	174	176					1.03	0.90				0.90	1.03	0.00	1.93	10.51	12.87	1.27	2.13	14.92	91.13	1359.70	2.29	4.69	106.76	500.98		1.05	155.97	163.03		2023.70	1350	1371.6	0.30	3049.8	2.06	156.69	1026.1	108.03		103.92	102.55	4.11	107.00		103.45	102.08	3.55
New Greenbank Rd.	176	152										0.00	0.00	0.00	0.00	10.51	14.14	1.30		14.92	86.45	1289.93		4.69	101.26	475.16		1.05	147.89	154.59		1919.67	1350	1371.6	0.30	3049.8	2.06	161.41	1130.1	107.00		103.45	102.08	3.55	106.15		102.96	101.59	3.19
																	15.44																													
East-West Collector	150	152				1.08						1.08	0.00	0.00	1.08	1.08	10.00	4.80	1.98	1.98	104.19	206.47		0.00					0.00			206.47	675	685.8	0.15	339.6	0.92	264.59	133.2	105.50		102.30	101.61	3.20	106.15		101.90	101.22	4.25
																	14.80																													
New Greenbank Rd.	177	152					1.06					0.00	1.06	0.00	1.06	1.06	10.00	4.30		0.00			2.36	2.36	122.14	287.94		0.00				287.94	675	685.8	0.15	339.6	0.92	237.41	51.7	105.00		102.00	101.32	3.00	106.15		101.65	100.96	4.50
																	14.30																													
East-West Collector	152	154				0.82						0.82	0.00	0.00	0.82	13.47	15.44	1.25	1.50	18.41	82.16	1512.31		7.05	96.21	678.28		1.05	140.48	146.84		2337.43	1500	1524.0	0.35	4362.8	2.39	178.75	2025.4	106.15	0.20	101.45	99.93	4.70	105.20		100.82	99.30	4.38
East-West Collector	154	156				1.24	2.20					3.44	0.00	0.00	3.44	16.91	16.69	1.73	6.86	25.27	78.48	1983.05		7.05	91.88	647.75		1.05	134.13	140.20		2771.00	1500	1524.0	0.55	5469.1	3.00	311.71	2698.1	105.20	0.29	100.53	99.01	4.67	103.55		98.82	97.30	4.73
																	18.42																													
River Mist Rd.	705 (ex.)	163				1.15						1.15	0.00	0.00	1.15	1.15	10.00	0.53	2.11	2.11	104.19	219.85		0.00					0.00			219.85	525	533.4	0.42	290.8	1.30	41.53	100.0	103.80		100.82	100.29	2.98	103.65		100.65	100.12	3.00
River Mist Rd.	163	156										0.00	0.00	0.00	0.00	1.15	10.53	2.00		2.11	101.46	214.09		0.00					0.00			214.09	750	762.0	0.15	449.8	0.99	118.53	235.7	103.65		100.65	99.89	3.00	103.55		100.47	99.71	3.08
																	12.53																													
East-West Collector	156	158				0.91						0.91	0.00	0.00	0.91	18.97	18.42	1.13	1.67	29.05	73.92	2147.38		7.05	86.53	610.01		1.05	126.28	132.00		2889.39	1500	1524.0	0.55	5469.1	3.00	202.56	2579.7	103.55	0.96	97.86	96.33	5.69	99.90		96.74	95.22	3.16
East-West Collector	158	159										0.00	0.00	0.00	0.00	18.97	19.55	0.60		29.05	71.27	2070.17		7.05	83.40	587.99		1.05	121.70	127.21		2785.37	1500	1524.0	0.55	5469.1	3.00	108.09	2683.7	99.90	0.55	96.20	94.67	3.70	100.10		95.60	94.08	4.50
																	20.15																													
Pond 2 (South)	158	158A																													1500	1524.0	0.95	7204.6		40.00		99.90		96.74	95.22	3.16	95.60		97.13	95.60	-1.53
Pond 2 (South)	159	159A																													1500	1524.0	3.54	13875.8		43.00		95.60		95.60	94.08		95.60		97.13	95.60	-1.53
BSUEA AREAS (EES) ~ OUTLET TO POND 2 - SOUTH																																												
	DI-2	300		1.40								0.00	0.00	1.40	1.40	1.40	10.00	0.68							0.78	0.78	178.56	138.99		138.99	900	914.4	1.05	1935.2	2.95	121.05	1796.2	109.00		105.66	104.75	3.34	108.10		104.39	103.48	3.71
Street 3	300	302				3.42						3.42	0.00	0.00	3.42	4.82	10.68	1.65	6.28	6.28	100.71	631.96		0.00					0.78	0.78	178.56	134.30		766.26	900	914.4	0.35	1117.3	1.70	168.09	351.0	108.10		104.39	103.48	3.71	107.10	1.79	103.81	102.89	3.29
Street 3	302	304	0.27		0.12	3.37						3.76	0.00	0.00	3.76	8.58	12.33	0.97	6.47	12.74	93.30	1188.87		0.00					0.78	159.73	124.33		1313.21	900	914.4	0.94	1831.1	2.79	162.58	517.8	107.10		102.02	101.10	5.08	106.00		100.49	99.57	5.51
	304	321										0.00	0.00	0.00	0.00	8.58	13.30	0.78		12.74	89.47	1140.06		0.00					0.78	153.11	119.18		1259.24	1200	1219.2	0.15	1575.3	1.35	63.30	316.0	106.00		100.49	99.27	5.51	105.90		100.39	99.17	5.51
	321	322				1.97						1.97	0.00	0.00	1.97	10.55	14.08	1.09		12.74	86.64	1103.89		0.00					0.78	148.21	115.36		1219.26	1200	1219.2	0.15	1575.3	1.35	88.23	356.0	105.90		100.39	99.17	5.51	104.50		100.26	99.04	4.24
	322	323										0.00	0.00	0.00	0.00	10.55	15.17	0.93		12.74	83.00	1057.54		0.00					0.78	141.93	110.48		1168.01	1200	1219.2	0.15	1575.3	1.35	75.36	407.2	104.50		100.26	99.04	4.24	105.10		100.15	98.93	4.95
Street 3	323	324				1.71						1.71	0.00	0.00	1.71	12.26	16.11	1.21	3.14	15.88	80.15	1272.69		0.00					0.78	137.01	106.65		1379.34	1200	1219.2	0.35	2406.2	2.06	149.81	1026.9	105.10		100.15	98.93	4.95	103.50		99.62	98.40	3.88
																	17.32																													
Adjacent to Barnsdale Rd	320	324				2.64						2.64	0.00	0.00	2.64	2.64	10.00	2.21	4.84	4.84	104.19	504.70		0.00					0.00			504.70	825	838.2	0.15	580.0	1.05	139.15	75.3	102.80		99.83	98.99	2.97	103.50		99.62	98.78	3.88
																	12.21																													
Adjacent to Barnsdale Rd	324	330										0.00	0.00	0.00	0.00	14.90	17.32	1.74		20.72	76.75	1590.49		0.00					0.78	131.15	102.09		1692.58	1500	1524.0	0.15	2856.1	1.57	163.57	1163.6	103.50		99.62	98.10	3.88	105.10		99.38	97.85	5.72
Adjacent to Barnsdale Rd	330	332				2.51						2.51	0.00	0.00	2.51	17.41	19.06	1.53	4.61	25.33	72.39	1833.50		0.00					0.78	123.63	96.24		1929.74	1500	1524.0	0.15	2856.1	1.57	144.16	926.4	105.10		99.38	97.85	5.72	103.80		99.16	97.64	4.64
Adjacent to Barnsdale Rd	332	334				3.49						3.49	0.00	0.00	3.49	20.90	20.59	1.31	6.40	31.73	68.98	2188.77		0.00					0.78	117.76	91.66		2280.43	1650	1676.4	0.15	3682.6	1.67	131.10	1402.2	103.80		99.16	97.48	4.64	103.00		98.96	97.29	4.04
Adjacent to Barnsdale Rd	334	336				3.24						3.24	0.00	0.00	3.24	24.14	21.90	1.73	5.94	37.68	66.33	2499.28		0.00					0.78	113.21	88.12		2587.40	1650	1676.4	0.15	3682.6	1.67	173.27	1095.2	103.00		98.96	97.29	4.04	102.80	1.12	98.70	97.03	4.10
Adjacent to Barnsdale Rd	336	337		3.07								3.07	0.00	0.00	3.07	27.21	23.63	1.69	3.41	41.09	63.17	2595.65		0.00					0.78	107.76	83.88		2679.53	1650	1676.4	0.15	3682.6	1.67	168.77	1003.1	102.80		97.58	95.91	5.22	99.73		97.33	95.65	
	337	P2-IN										0.00	0.00	0.00	0.00	27.21	25.32	0.36		41.09	60.39	2481.53		0.00					0.78	102.98	80.16		2561.69	1650	1676.4	0.15	3682.6	1.67	35.99	1121.0	99.73		97.33	95.65		97.60		97.28	95.60	
																	25.68																													
BSUEA AREAS ~ OUTLET TO EXISTING GREENBANK RD.																																												
East-West Collector	159	825HDS										0.00	0.00	0.00	0.00	18.97	20.15	0.23		29.05	69.93	2031.44		7.05	81.84	576.95		1.05	119.40	124.81	594	594.00	1050	1066.8	0.35	1685.4	1.89	26.20	1091.4	100.10		95.15	94.08	4.95	100.10		95.05	93.99	5.05
Existing Greenbank Rd.	825HDS	822										0.00	0.00	0.00	0.00	18.97	20.38	2.22		29.05	69.43	2016.94		7.05	81.2	572.81		1.05	118.54	123.91		594.00	1200	1219.2	0.12	1409.0	1.21	160.80	815.0	100.10		95.05	93.84	5.05	98.10		94.86	93.64	3.24
BSUEA AREAS (EES) ~ OUTLET TO POND 1 - NORTH																																												
Street 1	314	316				4.36						4.36	0.00	0.00	4.36	4.36	10.00	2.30	8.00	8.00	104.19	833.52		0.00					0.00			833.52	1050	1066.8	0.15	1103.3	1.23	170.20	269.8	104.20		101.68	100.61	2.52	105.40		101.43	100.36	3.97
Street 1	316	318	0.29		0.06	2.94						3.29	0.00	0.00	3.29	7.65	12.30	1.19	5.62	13.62	93.44	1272.87		0.00					0.00			1272.87	1200	1219.2	0.15	1575.3	1.35	96.00	302.4	105.40		101.43	100.21	3.97	105.30		101.28	100.06	4.02
Street 4	318	364				2.48						2.48	0.00	0.00	2.48	10.13	13.48	1.80	4.55	18.17	88.80	1613.68		0.00					0.00			1613.68	1200	1219.2	0.58	3097.6	2.65	286.18	1483.9	105.30		101.28	100.06	4.02	103.65	0.52	99.62	98.40	4.03
Easement	364	362										0.00	0.00	0.00	0.00	10.13	15.28	0.50		18.17	82.66	1502.10		0.00					0.00			1502.10	1200	1219.2	0.70	3402.9	2.91	88.24	1900.9	103.65		99.10	97.88	4.55	101.25	0.70	98.48	97.26	2.77
Local Road	362	190				2.83						2.83	0.00	0.00	2.83	12.96	15.79	1.02	5.19	23.36	81.10	1894.90		0.00					0.00			1894.90	1200	1219.2	0.70	3402.9	2.91	177.70	1508.0	101.25		97.78	96.56	3.47	98.80	2.22	96.54	95.32	2.26
																	16.80																													
	361	190										0.00	0.00	0.00	0.00	0.00	10.00	1.25		0.00				0.00					0.00			0.00	600	609.6	0.67	524.3	1.80	134.44	524.3	99.90		95.83	95.22	4.07	98.80	0.61	94.93	94.32	3.87
																	11.25																													
	754	190										0.00	0.00	0.00	0.00	0.00		0.15														1800	1828.8	0.13	4378.8	1.67	15.00	4378.8	98.81		94.95	93.12	3.86	98.80		94.93	93.10	3.87
Pond block	190	190A										0.00	0.00	0.00	0.00	12.96	16.80	0.56		23.36	78.15	1826.04		0.00					0.00				1200	1219.2	0.07	1050.2	0.90	30.00	1050.2	98.80		94.32	93.10	4.48	95.00		94.30	93.08	0.70
Pond block	190A	190B										0.00	0.00	0.00	0.00	12.96	17.36	0.82												0.00	1200	1219.2	0.09	1252.8	1.07	52.70	1252.8	95.00		94.30	93.08	0.70	95.00		94.25	93.03	0.75
Pond block	190B	755										0.00	0.00	0.00	0.00	12.96	18.18	0.32												0.00	600	609.6	0.13	231.4	0.79	15.32	231.4	95.00		93.64	93.03	1.36	98.92		93.62	93.01	5.30
																	18.50																													
BSUEA AREAS ~ OUTLET TO KILBIRNIE SEWER MH 710 ~ TRIBUTARY TO POND 1 - NORTH																																												
Kilbirnie Dr.	110	111				0.81						0.81	0.00	0.00	0.81	0.81	10.00	0.50	1.49	1.49	104.19	154.85		0.00								154.85	450	457.2	2.70	488.7	2.98	89.42	333.9	107.00		102.90	102.44	4.10	103.50		100.49	100.03	3.01
Kilbirnie Dr.	111	112				0.72	2.42					3.14	0.00	0.00	3.14	3.95	10.50	0.75	6.37	7.85	101.62	798.02		0.00								798.02	675	685.8	0.90	831.9	2.25	101.15	33.9	103.50		100.49	99.80	3.01	103.40		99.58	98.89	3.82
																	11.25																													
Future Collector	313	112				0.86						0.86	0.00	0.00	0.86	0.86	10.00	1.35	1.58	1.58	104.19	164.41		0.00					0.00			164.41	525	533.4	0.74	385.9	1.73	140.00	221.5	105.60		100.60	100.06	5.00	103.40		99.56	99.03	3.84
																	11.35																													
Kilbirnie Dr.	112	710										0.00	0.00	0.00	0.00	4.81	11.35	0.45		9.43	97.56	920.08		0.00					0.00			920.08	675	685.8	1.30	999.9	2.71	73.34	79.8	103.40		99.56	98.87	3.84	101.18		98.61	97.92	2.57
																	11.80																													

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
ETOBICOKE EXFILTRATION SYSTEM (EES)

Designed by: A.T.

Checked by: L.D

Date:February 2018

Manning's Coefficient n =	0.013

Legend
- Proposed storm sewers within BSUEA
- Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
- Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

EXISTING STORM SEWERS WITHIN QUINN'S POINTE – OUTLET TO POND 1 - NORTH

STREET	Maintenance Hole Number		QUINN'S POINTE AREA RUNOFF COEFFICIENTS											Total Areas			Cum. Area 2 YR (ha)	Cum. Area 100 YR (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	2 YR PEAK FLOW					10 YR PEAK FLOW					100 YR PEAK FLOW					ICD FLOW	TOTAL	SEWER DATA						Residual	UPSTREAM					DOWNSTREAM				
	FROM	TO	0.20 2 Yr	0.30 2 Yr	0.49 2 Yr	0.51 2 Yr	0.53 2 Yr	0.63 2 Yr	0.69 2 Yr	0.63 2 Yr	0.70 2 Yr	0.75 2 Yr	0.82 2 Yr	2Yr	10 Yr	100 Yr					2.78AR	Cum. 2.78AR	2 Yr Intensity (mm/hr)	Peak Flow (L/s)		2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)		2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	(L/s)	Peak Flow (L/s)	PIPE Dia (mm)	Actual Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Capacity Q_{cap}, Q_d (L/s)	Center Line	Drop	Obvert	Invert	Cover	Center Line	Drop	Obvert	Invert	Cover
ADAPTED FROM QUINN'S POINTE ORIGINAL STORM DESIGN																																																		
Kilbirnie Dr.	112	710	BHSUEA DESIGN SHEET											0.00		0.00	4.81	0.00	11.35	0.45	0.00	9.43	71.98	678.83		0.00									0.00	678.83	675	686	1.30	999.9	2.7	73.34	321.0	103.40		99.56	98.87	3.84	101.18		98.61	97.92	2.57
																			11.80																															
Alex Polowin Avenue	712	711			0.16			0.46						0.62			0.62	0.00	10.00	0.68	1.10	1.10	76.81	84.51											84.51	375	381	2.56	292.7	2.57	104.28	208.2	104.98		102.031	101.650	2.95	102.80		99.361	98.980	3.44
Alex Polowin Avenue	711	710						0.45						0.45			1.07	0.00	10.68	0.84	0.86	1.96	74.30	145.89											145.89	450	457	1.32	342.0	2.08	104.38	196.1	102.80		99.407	98.950	3.39	101.17		98.027	97.570	3.14
																			11.51																															
Kilbirnie Drive	710	720			0.07		0.20		0.47					0.74			6.62	0.00	11.80	0.96	1.29	12.69	70.51	894.54											894.54	750	762	0.61	908.6	1.99	115.19	14.1	101.17		98.102	97.340	3.07	100.59		97.397	96.635	3.19
																			12.77																															
Block 252	753	754			0.72									0.72			27.00	0.30	18.34	0.61	0.98	47.32	54.87	2596.56											2744.01	1800	1829	0.11	3930.5	1.50	54.92	1186.5	95.00		95.008	93.179	1.82	95.00		94.949	93.120	0.05
Block 252	754	755															27.00	0.30	18.95	0.78	0.00	47.32	53.79	2545.28											2690.28	1800	1829	0.13	4323.7	1.65	76.85	1633.4	95.00		94.939	93.110	1.89	95.00		94.839	93.010	0.16
BSUEA Pond 1	755	822															27.00	0.30	19.73	0.80	0.00	47.32	52.47	2483.22											1448.00	1800	1829	0.13	4323.7	1.6	79.46	2875.69	95.00		94.84	93.01	1.99	95.00		94.74	92.91	0.26

STREET	Maintenance Hole Number		BSUEA AREA RUNOFF COEFFICIENTS											Total Area			Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW					10 YR PEAK FLOW					100 YR PEAK FLOW					ICD Flow	TOTAL	SEWER DATA						Residual	UPSTREAM					DOWNSTREAM				
	FROM	TO	0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.						5 Yr	10 Yr	100 Yr					2.78AR	Cum. 2.78AR	5 Yr Intensity (mm/hr)	Peak Flow (L/s)		2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)		2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	(L/s)	Peak Flow (L/s)	PIPE Dia (mm)	Actual Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Capacity Q_{cap}, Q_d (L/s)	Center Line	Drop	Obvert	Invert	Cover	Center Line	Drop	Obvert	Invert	Cover
EXISTING GREENBANK ROAD																																																			
Existing Greenbank Road	EX. 822	EX. 821	3.57											0.00	0.00	3.57	3.57	3.57	10.00	1.20	0.00	0.00											2.68	2.68	178.56	478.47		2520.47	1800	1828.8	0.14	4486.9	1.71	123.06	1966.4	98.10		94.07	92.24	4.03	97.75		93.90	92.07	3.85
Existing Greenbank Road	EX. 821	EX. 820												0.00	0.00		0.00	3.57	11.20	1.15	0.00	0.00											0.00	2.68	168.28	450.93	321.00	2492.93	1800	1828.8	0.15	4644.4	1.77	121.92	2151.5	97.75		93.90	92.07	3.85	97.84		93.71	91.88	4.13
																			12.35																															
Lauraleaf Crescent	EX. 748	EX. 747						0.52						0.00	0.00	0.52	0.52	0.52	10.00	1.43	0.00	0.00											1.00	1.00	178.56	178.11		178.11	600	609.6	0.20	282.9	0.97	83.06	104.8	99.11		95.95	95.34	3.16	98.81		95.79	95.18	3.02
Lauraleaf Crescent	EX. 747	EX. 746												0.00	0.00	0.00	0.00	0.52	11.43	0.09	0.00	0.00											0.00	1.00	166.48	166.06		166.06	600	609.6	0.99	636.9	2.18	12.14	470.8	98.81		95.72	95.11	3.09	98.78		95.60	94.99	3.18
Lauraleaf Crescent	EX. 746	EX. 744						0.27						0.00	0.00	0.27	0.27	0.79	11.52	1.17	0.00	0.00											0.52	1.52	165.76	251.18		251.18	600	609.6	0.20	287.7	0.99	69.38	36.6	98.78		95.58	94.97	3.20	98.80		95.44	94.83	3.36
																			12.69																															
Lauraleaf Crescent	EX. 743	EX. 744					0.66							0.00	0.00	0.66	0.66	0.66	10.00	0.65	0.00	0.00											1.19	1.19	178.56	212.56		212.56	450	457.2	1.31	340.9	2.08	81.44	128.4	99.02		95.59	95.13	3.43	98.80		94.52	94.06	4.28
																			10.65																															
Easement	EX. 744	EX. 820			0.27									0.27	0.00	0.00	0.27	0.27	12.69	0.12	0.38	0.38	91.83	35.15											0.00	2.71	157.19	425.31		460.46	675	685.8	0.52	632.4	1.71	12.40	171.9	98.80		93.76	93.08	5.04	97.84		93.70	93.01	4.14
																			12.81																															
Existing Greenbank Road	EX. 820	EX. 102												0.00	0.00	0.00	0.00	0.00	12.81		0.00	0.38	91.35	34.97											0.00	5.39	156.36	842.06		3240.03	1800	1828.8	0.16	4738.2	1.80	121.70	1498.2	97.84		93.71	91.88	4.13	98.15		93.52	91.69	4.63

BORRISOKANE DITCH

BRAZEAU AGGREGATE EXTRACTION AREA ~ OUTLET TO BRAZEAU SWM POND

	270	265					11.95							11.95	0.00	0.00	11.95	11.95	10.00	1.06	21.93	21.93	104.19	2284.52									0.00					2284.52	1500	1524.0	0.15	2856.1	1.57	100.00	571.6			99.45	97.93			1.30	99.30	97.78	
	265	260												0.00	0.00	0.00	0.00	11.95	11.06	3.80	0.00	21.93	98.89	2168.20									0.00	0.00				2168.20	1500	1524.0	0.15	2856.1	1.57	357.27	687.9			98.00	96.48				97.47	95.94	
	260	245												0.00	0.00	0.00	0.00	23.90	14.87	2.43	0.00	21.93	83.99	1841.51														1841.51	1500	1524.0	0.15	2856.1	1.57	227.85	1014.6			97.47	95.94				97.12	95.60	
																			17.29																															
	250	245					11.95							11.95	0.00	0.00	11.95	11.95	10.00	3.67	21.93	21.93	104.19	2284.52														2284.52	1500	1524.0	0.15	2856.1	1.57	344.99	571.6			97.64	96.12				97.12	95.60	
																			13.67																															
	245	240												0.00	0.00	0.00	0.00	11.95	17.29	0.72	0.00	43.85	76.81	3368.41														3368.41	2100	2133.6	0.15	7005.7	1.96	84.86	3637.3			97.12	94.99				97.00	94.86	
	240	Brazeau SWM Pond												0.00	0.00	0.00	0.00	11.95	18.01	2.06	0.00	43.85	74.93	3285.95														3285.95	2100	2133.6	0.15	7005.7	1.96	241.66	3719.8			97.00	94.86				96.63	94.50	
	Brazeau SWM Pond	235												0.00	0.00	0.00	0.00	241.66																	310.00	310.00	675	685.8	0.17	365.8	0.99	37.00	55.8			95.19	94.50				95.12	94.44	

DRUMMOND AGGREGATE EXTRACTION AREA OUTLET TO DRUMMOND SWM POND

	230	225					10.15							10.15	0.00	0.00	10.15	10.15	10.00	4.79	18.62	18.62	104.19	1940.41									0.00	0.00				1940.41	1500	1524.0	0.15	2856.1	1.57	450.00	915.7			97.66	96.14				96.99	95.46	
	225	215												0.00	0.00	0.00	0.00	10.15	14.79	2.34	0.00	18.62	84.24	1568.85														1568.85	1500	1524.0	0.15	2856.1	1.57	220.06	1287.3			96.99	95.46				96.66	95.13	
																			17.13																															
	220	215					10.15							10.15	0.00	0.00	10.15	10.15	10.00	4.35	18.62	18.62	104.19	1940.41														1940.41	1500	1524.0	0.15	2856.1	1.57	408.68	915.7			97.27	95.75				96.66	95.13	
																			14.35																															
	215	Drummond SWM Pond												0.00	0.00	0.00	0.00	20.30	17.13	2.98	0.00	37.25	77.25	2877.13														2877.13	2100	2133.6	0.15	7005.7	1.96	350.04	4128.6			96.66	94.52				96.13	94.00	
																			20.11																															
	Drummond SWM Pond	210												0.00	0.00	0.00	0.00	20.30		0.45	0.00															260.00	260.00	675	685.8	0.15	339.6	0.92	25.00	79.6			94.69	94.00				94.65	93.96	

BORRISOKANE DITCH

	235	210												0.00	0.00	0.00	0.00																			310.00	675	685.8	0.17	365.8	0.99	272.00	55.8			95.12	94.44				94.65	93.96	
	210	205												0.00	0.00	0.00	0.00																			570.00	825	838.2	0.17	624.7	1.13	223.00	54.7			94.65	93.81				94.26	93.42	
	205	Flood Plain												0.00	0.00	0.00	0.00																			570.00	825	838.2	0.17	624.7	1.13	817.00	54.7			94.26	93.42				92.84	92.00	

CLARKE POND ~ MATTAMY LANDS WEST OUTLET TO NEW GREENBANK RD.

Future Collector	900	227 (ex.)						1.46						0.00	0.00	1.46	1.46	1.46	10.00			0.00				0.00												0.00	975	990.6	0.15	905.5	1.17	120.0	905.5			97.93	96.94				97.75	96.76	

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
ETOBICOKE EXFILTRATION SYSTEM (EES)

Designed by: A.T.

Checked by: L.D

Date:February 2018

Manning's Coefficient n =	0.013

Legend
- Proposed storm sewers within BSUEA
- Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
- Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

TODD POND ~ MATTAMY LANDS EAST OUTLET TO ALEX POLOWIN AVE & FAMEFLOWER

STREET	Maintenance Hole Number		MATTAMY LANDS EAST AREA RUNOFF COEFFICIENTS																		Weighted Average		Total Area			Total	Cum.	Inlet	In Pipe	5 YR PEAK FLOW				TOTAL	SEWER DATA							Residual
			0.55		0.57		0.62		0.68		0.69		0.70		0.71		0.77				Runoff coeff.		5 Yr	10 Yr	100 Yr	Area	Area	Time	Flow Time	2.78AR	Cum. 2.78AR	5 Yr Intensity	Peak Flow	Peak Flow	PIPE Dia	Actual Dia.	Slope	Q full	V full	Length	Capacity Q_{cap} - Q_d
	FROM	TO	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr								(ha)	(ha)	(min.)	(min.)			(mm/hr)	(L/s)	(L/s)	(mm)	(mm)	(%)	(L/s)	(m/s)	(m)	(L/s)
	s723	s722											0.11								0.70		0.11	0.00	0.00	0.11	0.11	10.00	0.54	0.21	0.21	104.19	22.30	22.30	300	304.80	0.65	81.3	1.1	36.0	59.0
	s722	s721													0.30						0.71		0.30	0.00	0.00	0.30	0.41	10.54	1.08	0.59	0.81	101.43	81.78	81.78	375	381.00	0.65	147.5	1.3	83.7	65.7
																												11.62													
	s725	s724													0.40						0.71		0.40	0.00	0.00	0.40	0.40	10.00	1.23	0.79	0.79	104.19	82.26	82.26	375	381.00	1.00	182.9	1.6	118.2	100.6
																												11.23													
	s728	s727															0.30				0.74		0.30	0.00	0.00	0.30	0.30	10.00	1.72	0.64	0.64	104.19	66.91	66.91	300	304.80	0.65	81.3	1.1	115.2	14.4
	s727	s726																					0.00	0.00	0.00	0.00	0.30	11.72	0.16		0.64	95.90	61.58	61.58	300	304.80	0.65	81.3	1.1	10.6	19.8
	s726	s724			0.54																0.57		0.54	0.00	0.00	0.54	0.84	11.88	0.73	0.86	1.50	95.21	142.61	142.61	450	457.20	0.65	239.8	1.5	64.1	97.2
																												12.61													
	s724	s721											0.54								0.70		0.54	0.00	0.00	0.54	1.78	12.61	0.41	1.05	3.34	92.16	307.65	307.65	450	457.20	2.50	470.3	2.9	70.4	162.6
																												13.02													
	s721	s720																					0.00	0.00	0.00	0.00	2.19	13.02	0.26		4.14	90.54	375.26	375.26	600	609.60	0.80	572.9	2.0	31.1	197.7
	s720	s719											0.08								0.70		0.08	0.00	0.00	0.08	2.27	13.29	0.29	0.16	4.30	89.54	385.02	385.02	600	609.60	0.80	572.9	2.0	34.5	187.9
	s719	s717	0.40																		0.55		0.40	0.00	0.00	0.40	2.67	13.58		0.61	4.91	88.45	434.43	434.43	600	609.60	0.80	572.9	2.0	37.6	138.5
	s673	s672					0.28														0.62		0.28	0.00	0.00	0.28	0.28	10.00	0.54	0.48	0.48	104.19	50.28	50.28	300	304.80	2.00	142.7	2.0	63.0	92.4
	s672	s671			0.44																0.57		0.44	0.00	0.00	0.44	0.72	10.54	0.52	0.70	1.18	101.44	119.68	119.68	375	381.00	2.00	258.7	2.3	70.4	139.0
	s671	s670																					0.00	0.00	0.00	0.00	0.72	11.05	0.54		1.18	98.94	116.73	116.73	375	381.00	2.00	258.7	2.3	73.7	141.9
	s670	s659									0.76										0.69		0.76	0.00	0.00	0.76	1.48	11.60	0.46	1.46	2.64	96.46	254.43	254.43	450	457.20	2.00	420.6	2.6	70.5	166.2
																												12.05													
	s668	s667																					0.00	0.00	0.00	0.00	0.00	10.00	0.00		0.00				300	304.80	0.65	81.3	1.1	21.3	81.3
	s667	s666											0.24								0.70		0.24	0.00	0.00	0.24	0.24	10.00	0.16	0.47	0.47	104.19	48.66	48.66	300	304.80	0.65	81.3	1.1	11.0	32.7
	s666	s665							0.41												0.68		0.41	0.00	0.00	0.41	0.65	10.16	1.27	0.78	1.24	103.33	128.35	128.35	450	457.20	0.30	162.9	1.0	75.9	34.6
																												11.44													
	s669	s665															0.26				0.77		0.26	0.00	0.00	0.26	0.26	10.00	0.42	0.56	0.56	104.19	57.99	57.99	300	304.80	3.00	174.7	2.4	60.4	116.7
																												10.42													
	s665	s656															0.26				0.77		0.26	0.00	0.00	0.26	1.17	10.42	0.63	0.56	2.36	102.02	240.29	240.29	450	457.20	1.00	297.4	1.8	69.0	57.1
																												11.06													

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BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
CONVENTIONAL STORM SYSTEM

Designed by: A.T.
Checked by: H.M
Date: February 2018

Manning's Coefficient n = 0.013

Legend
- Proposed storm sewers within BSUEA
- Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
- Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

CORRIGAN POND BSUEA AND QUINN'S POINTE CATCHMENT AREAS

BSUEA ~ OUTLET TO EX. KILBIRNIE SEWER MH 710 (TRIBUTARY TO POND 1 - NORTH)

BSUEA DRAINAGE AREA RUNOFF COEFFICIENTS

STREET	Maintenance Hole Number FROM	TO	0.20 5Yr	0.20 100Yr	0.40 5Yr	0.66 5 Yr	0.75 5 Yr	0.80 10Yr	0.85 5Yr	Total Area 5 Yr	Total Area 10 Yr	Total Area 100Yr	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Yr Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}-Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
Kilbirnie	110	111				0.81						0.81	0.00		0.81	0.81	10.00	0.50	1.49	1.49	104.19	154.85			0.00	0.00					154.85	450	2.70	488.7	2.98	89.42	333.9	107.00		102.90	102.44	4.10	103.50		100.49	100.03	3.01
Kilbirnie	111	112				0.72	2.42					3.14	0.00		3.14	3.95	10.50	0.75	6.37	7.85	101.62	798.02			0.00	0.00					798.02	675	0.90	831.9	2.25	101.15	33.9	103.50		100.49	99.80	3.01	103.40		99.58	98.89	3.82
																	11.25																												
	113	112				0.86						0.86	0.00		0.86	0.86	10.00	1.35	1.58	1.58	104.19	164.41			0.00	0.00					164.41	525	0.74	385.9	1.73	140.00	221.5	105.60		100.60	100.06	5.00	103.40		99.56	99.03	3.84
																	11.35																												
Kilbirnie	112	710 (ex.)										0.00	0.00		0.00	4.81	11.35	0.45		9.43	97.56	920.08			0.00	0.00					920.08	675	1.30	999.9	2.71	73.34	79.8	103.40		99.56	98.87	3.84	101.18		98.61	97.92	2.57
																	11.80																												

QUINN'S POINTE DRAINAGE AREA RUNOFF COEFFICIENTS

STREET	Maintenance Hole Number FROM	TO	0.20 2Yr	0.30 2Yr	0.49 2Yr	0.51 2Yr	0.53 2Yr	0.63 2Yr	0.69 2Yr	0.63 2Yr	0.70 2Yr	0.75 2Yr	0.82 2Yr	Total Area 2 Yr	Total Area 10 Yr	Total Area 100 Yr	Cum. Area 2 YR (ha)	Cum. Area 100 YR (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	2 YR PEAK FLOW 2.78AR	Cum. 2.78AR	2 Yr Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW ICD (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}-Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
Ex.QUINN'S POINTE ~ OUTLET TO BSUEA POND 1 (EX. MH 754 & MH 755)																																												
Future Collector-Kilbimie	112	710	SEE ABOVE BSUEA DESIGN SHEET											0.00	0.00	0.00	4.81	0.00	11.35	0.45		9.43	71.98	678.83		0.00	0.00	0.00				678.83	675	1.30	999.86	2.71	73.34	321.0	103.40		99.56	98.87	3.84	101.18	0.00	98.61	97.92	2.57
																			11.80																												
Alex Polowin Avenue	712	711				0.16				0.46				0.62			0.62	0.00	10.00	0.7	1.10	1.10	76.81	84.51								84.51	375	2.56	292.68	2.57	104.28	208.2	104.98		102.031	101.650	2.95	102.80		99.361	98.980	3.44
Alex Polowin Avenue	711	710								0.45				0.45			1.07	0.00	10.68	0.8	0.86	1.96	74.30	145.89								145.89	450	1.32	342.00	2.08	104.38	196.1	102.80		99.407	98.950	3.39	101.17		98.027	97.570	3.14
																			11.51																												
Kilbimie Drive	710	720				0.07		0.20		0.47				0.74			6.62	0.00	11.80	1.0	1.29	12.69	70.51	894.54								894.54	750	0.61	908.60	1.99	115.19	14.1	101.17		98.102	97.340	3.07	100.59		97.397	96.635	3.19
																			12.77																												
Block 252	753	754				0.72								0.72			27.00	0.30	18.34	0.6	0.98	47.32	54.87	2596.56				0.96	126.63	121.45		2744.01	1800	0.11	3930.46	1.50	54.92	1186.5	98.80		95.008	93.179	3.79	97.52		94.949	93.120	2.57
BSUEA Pond 1	754	755															0.00	0.30	18.95	0.8	0.00	47.32	53.79	2545.28				0.96	124.08	119.00		2690.28	1800	0.13	4323.69	1.65	76.85	1633.4	95.00		94.939	93.110	0.06	95.00		94.839	93.010	0.16
BSUEA Pond 1	754	190															0.00	0.00	0.00	0.00														1800	0.15			15.00		97.75		94.95	93.12		97.75		94.93	93.10	2.57
	190	190A																																1200	0.06			30.00				94.32	93.10				94.30	93.08	
	190B	190B																																1200	0.10			52.70				94.30	93.08				94.25	93.03	
	190B	755																																600	0.11			15.00				93.64	93.03				93.62	93.01	
BSUEA Pond 1	755	822															0.00	0.30	19.73	0.80	0.00	47.32	52.47	2483.22				0.96	120.99	116.04		2625.27	1800	0.13	4323.7	1.65	79.46	1698.4	95.00		94.84	93.01	0.16	98.00		94.74	92.91	3.26
ICD																		20.03													2168.00	2168.00															3.79

BSUEA DRAINAGE AREA RUNOFF COEFFICIENTS

STREET	Maintenance Hole Number FROM	TO	0.20 5Yr	0.20 100Yr	0.40 5Yr	0.66 5 Yr	0.75 5 Yr	0.80 10Yr	0.85 5Yr	Total Area 5 Yr	Total Area 10 Yr	Total Area 100Yr	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Yr Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}-Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
BSUEA AREAS OUTLET TO POND 1 (NORTH)																																												
East-West Collector	152	154				0.82						0.82	0.00	0.00	0.82	0.82	10.00	1.98	1.50	1.50	104.19	156.76		0.00				0.00			156.76	525	0.35	265.4	1.19	141.10	108.7	106.15		101.47	100.94	4.68	105.60		100.98	100.44	4.62
																	11.98																												
Street 1	114	116				4.36						4.36	0.00	0.00	4.36	4.36	10.00	1.58	8.00	8.00	104.19	833.52		0.00				0.00			833.52	975	0.35	1383.2	1.79	170.20	549.6	105.60		102.21	101.22	3.39	105.40		101.61	100.62	3.79
Street 1	116	154	0.29		0.06	2.94						3.29	0.00	0.00	3.29	7.65	11.58	1.38	5.62	13.62	96.52	1314.86		0.00				0.00			1314.86	1200	0.35	2406.2	2.06	171.20	1091.4	105.40		101.61	100.39	3.79	105.20		101.01	99.79	4.19
																	12.96																												
East-West Collector	154	156				1.24	2.20					3.44	0.00	0.00	3.44	11.91	12.96	1.80	6.86	21.99	90.77	1995.82		0.00				0.00			1995.82	1200	0.69	3378.6	2.89	311.70	1382.7	105.20	0.23	100.75	99.53	4.45	103.55		98.60	97.38	4.95
																	14.76																												
River Mist Road	705(ex.)	164										0.00	0.00	0.00	0.00	0.00	10.00	1.14		0.00				0.00				0.00			0.00	375	0.35	108.2	0.95	65.20	375.0	103.80		99.49	99.11	4.31	103.65		99.26	98.88	4.39
River Mist Road	164	156				3.46						3.46	0.00	0.00	3.46	3.46	11.14	0.93	6.35	6.35	98.51	625.39		0.00				0.00			625.39	900	0.35	1117.3	1.70	95.37	375.0	103.65		99.26	98.35	4.39	103.55		98.93	98.01	4.62
																	12.08																												
East-West Collector	156	158				0.91						0.91	0.00	0.00	0.91	16.28	14.76	1.17	1.67	30.01	84.34	2530.78		0.00				0.00			2530.78	1800	0.40	7584.3	2.89	202.60	5053.5	103.55	0.34	98.26	96.43	5.29	99.90		97.45	95.62	2.45
																	15.93																												
Local Road adjacent to pond 1	160	158				3.00						3.00	0.00	0.00	3.00	3.00	10.00	1.57	5.50	5.50	104.19	573.52		0.00				0.00			573.52	1350	0.15	2156.5	1.46	137.50	1583.0	98.80		96.59	95.22	2.21	99.90		96.38	95.01	3.52
																	11.57																												
	158	P1-In										0.00	0.00	0.00	0.00	19.28	15.93			35.51	80.67	2864.67		0.00				0.00			2864.67	1800	0.15	4644.4	1.77	14.50	1779.7	99.90	-0.25	96.84	95.01	3.06	98.00		96.82	94.99	4.19

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
CONVENTIONAL STORM SYSTEM

Designed by: A.T.
Checked by: H.M.
Date: February 2018

Manning's Coefficient n = 0.013

Legend
- Proposed storm sewers within BSUEA
- Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
- Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

STREET	Maintenance Hole Number FROM	Maintenance Hole Number TO	BSUEA DRAINAGE AREA RUNOFF COEFFICIENTS 0.20 5Yr	0.20 100Yr	0.40 5Yr	0.66 5 Yr	0.75 5 Yr	0.80 10Yr	0.85 5Yr	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
BSUEA AREAS OUTLET TO POND 2 (SOUTH)													19.280	19.28				35.51				0.00				0.00																			
	Ditch Inlet	170		1.88						0.00	0.00	1.88	1.88	1.88	10.00	0.32		0.00				0.00				1.05	1.05	178.56	186.64		186.64	900	1.05	1935.2	2.95	55.91	1748.6			107.04	106.12		111.00		106.45	105.54	4.55
Kilbirnie	170	172				0.92			4.70	5.62	0.00	0.00	5.62	7.50	10.32	1.07	12.79	12.79	102.55	1312.06		0.00				1.05	175.72	183.68		1495.73	900	1.05	1935.2	2.95	188.50	439.5	111.00		106.45	105.54	4.55	107.63		104.47	103.56	3.16
Realigned Greenbank	172	174						1.08		0.00	1.08	0.00	1.08	8.58	11.38	1.49		12.79	97.42	1246.37	2.40	2.40	114.16	274.21		1.05	166.84	174.39		1694.98	1350	0.30	3049.8	2.06	184.40	1354.8	107.63		104.47	103.10	3.16	107.53		103.92	102.55	3.61
Realigned Greenbank	174	176						1.03	0.90	0.90	1.03	0.00	1.93	10.51	12.87	1.27	2.13	14.92	91.13	1359.76	2.29	4.69	106.76	501.00		1.05	155.97	163.04		2023.79	1350	0.30	3049.8	2.06	156.69	1026.0	107.53		103.92	102.55	3.61	107.15		103.45	102.08	3.70
Realigned Greenbank	176	179								0.00	0.00	0.00	0.00	10.51	14.14	1.30		14.92	86.46	1289.98		4.69	101.26	475.18		1.05	147.90	154.59		1919.75	1350	0.30	3049.8	2.06	161.41	1130.1	107.15		103.45	102.08	3.70	106.15		102.96	101.59	3.19
															15.44																													
East-West Collector	150	151				1.08				1.08	0.00	0.00	1.08	1.08	10.00	1.49	1.98	1.98	104.19	206.47		0.00				0.00			206.47	900	0.35	1122.9	1.71	152.84	916.4	106.00		102.60	101.69	3.40	105.90		102.06	101.15	3.84
															11.49																													
	Ditch Inlet 2	101		1.40						0.00	0.00	1.40	1.40	1.40	10.00	1.19		0.00				0.00				0.78	0.78	178.56	138.99		138.99	900	0.35	1117.3	1.70	121.05	978.3			104.82	103.91		107.90		104.40	103.49	3.50
Street 3	101	102				3.42				3.42	0.00	0.00	3.42	4.82	11.19	1.65	6.28	6.28	98.32	616.96		0.00				0.78	168.40	131.08		748.05	900	0.35	1117.3	1.70	168.09	369.3	108.20		104.40	103.49	3.80	107.90		103.81	102.90	4.09
Street 3	102	151	0.27		0.12	3.37				3.76	0.00	0.00	3.76	8.58	12.83	0.93	6.47	12.74	91.28	1163.13		0.00				0.78	156.24	121.62		1284.74	900	0.96	1851.7	2.82	156.90	566.9	107.90		103.81	102.90	4.09	105.85		102.30	101.39	3.55
															13.76																													
East-West Collector	151	179								0.00	0.00	0.00	0.00	9.66	13.76	0.90		14.72	87.79	1292.58		0.00				0.78	150.20	116.92		1409.50	1200	0.35	2406.2	2.06	111.76	996.8	106.00		102.06	100.84	3.94	106.15		101.67	100.45	4.48
															14.66																													
Adjacent to Barnsdale Rd	120	124				2.64				2.64	0.00	0.00	2.64	2.64	10.00	1.72	4.84	4.84	104.19	504.70		0.00				0.00			504.70	1200	0.15	1575.3	1.35	139.15	1070.6	102.80		99.10	97.88	3.70	103.50		98.89	97.67	4.61
															11.72																													
Street 3	121	122				1.97				1.97	0.00	0.00	1.97	1.97	10.00	1.08	3.61	3.61	104.19	376.61		0.00				0.00			376.61	750	0.15	449.8	0.99	63.99	73.2	105.85		101.56	100.80	4.29	104.50		101.46	100.70	3.04
	122	123								0.00	0.00	0.00	0.00	1.97	11.08	1.27		3.61	98.81	357.15		0.00				0.00			357.15	750	0.15	449.8	0.99	75.36	75.4	104.50	0.67	101.46	100.70	3.04	105.10		101.35	100.59	3.75
	123	124				1.71				1.71	0.00	0.00	1.71	3.68	12.35	2.53		3.61	93.21	336.91		0.00				0.00			336.91	750	0.15	449.8	0.99	149.81	112.9	105.10	1.62	100.68	99.92	4.42	103.50		100.51	99.75	2.99
															14.89																													
Adjacent to Barnsdale Rd	124	178								0.00	0.00	0.00	0.00	6.32	11.72	1.51		8.46	95.91	811.28		0.00				0.00			811.28	1200	0.15	1575.3	1.35	122.14	764.0	103.50		98.89	97.67	4.61	104.92		98.71	97.49	6.21
															13.23																													
Realigned Greenbank	179	178						1.06		0.00	1.06	0.00	1.06	21.23	15.44	2.32		29.64	82.16	2435.66	2.36	7.05	96.21	678.30		1.82	140.49	256.20		3370.16	1800	0.15	4644.4	1.77	245.72	1274.2	106.15	0.21	101.46	99.63	4.69	104.92		101.09	99.26	3.83
															17.76																													
Adjacent to Barnsdale Rd	178	132				2.51				2.51	0.00	0.00	2.51	30.06	17.76	1.66	4.61	42.71	75.60	3228.52		7.05	88.49	623.86		1.82	129.16	235.55		4087.93	1950	0.15	5749.5	1.87	185.60	1661.5	104.92		98.71	96.73	6.21	103.80		98.43	96.45	5.37
Adjacent to Barnsdale Rd	132	134				3.49				3.49	0.00	0.00	3.49	33.55	19.41	1.01	6.40	49.11	71.56	3514.55		7.05	83.75	590.46		1.82	122.21	222.87		4327.88	1950	0.20	6638.9	2.15	131.07	2311.0	103.80		98.43	96.45	5.37	103.00		98.17	96.19	4.83
Adjacent to Barnsdale Rd	134	136				3.24				3.24	0.00	0.00	3.24	36.79	20.43	1.34	5.94	55.06	69.32	3816.68		7.05	81.12	571.91		1.82	118.35	215.84		4604.43	1950	0.20	6638.9	2.15	173.27	2034.5	103.00		98.17	96.19	4.83	102.80		97.82	95.84	4.98
Adjacent to Barnsdale Rd	136	137			3.07					3.07	0.00	0.00	3.07	39.86	21.77	1.46	3.41	58.47	66.59	3893.59		7.05	77.91	549.28		1.82	113.65	207.26		4650.13	1950	0.16	5938.0	1.93	168.77	1287.9	102.80		97.82	95.84	4.98	99.73		97.55	95.57	2.18
	137	P2-IN								0.00	0.00	0.00	0.00	39.86	23.23	0.31		58.47	63.88	3734.79		7.05	74.72	526.79		1.82	108.97	198.73		4460.32	1950	0.16	5938.0	1.93	35.99	1477.7	99.73		97.55	95.57	2.18	97.60		97.49	95.51	0.11
															23.54																													
	P2-out	HDS825								0.00	0.00	0.00	0.00	0.00	0.00	0.84		0.00				0.00				0.00			340.00	340.00	750	0.15	449.8	0.99	50.00	109.8	98.00		96.35	95.59	1.65	99.55		96.28	95.51	3.28
	HDS825	EX. 822								0.00	0.00	0.00	0.00	0.00	0.84	1.38		0.00				0.00								340.00	1800	0.18	5087.7	1.94	160.81	4747.7	99.55		97.19	95.36	2.36	98.00		96.90	95.07	1.10
										0.00	0.00	0.00			2.23																													

EXISTING STORM SEWERS ON GREENBANK ROAD

STREET	FROM	TO	Runoff Coefficients 0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
Existing Greenbank Road	EX. 822	EX. 821	3.57						0.00	0.00	3.57	3.57	3.57	10.00	1.21		0.00				0.00	0.00			2.68	2.68	178.56	478.47		2986.47	1800	0.14	4457.1	1.70	123.06	1470.6	98.10		94.07	92.24	4.03	97.75		93.90	92.07	3.85
Existing Greenbank Road	EX. 821	EX. 820							0.00	0.00	0.00	0.00	3.57	11.21	1.16		0.00				0.00	0.00				2.68	168.22	450.76	321.00	2958.76	1800	0.15	4607.7	1.75	121.92	1648.9	97.75		93.89	92.06	3.86	97.84		93.71	91.88	4.13
														12.37																													
Lauraleaf Crescent	EX. 748	EX. 747						0.52	0.00	0.00	0.52	0.52	0.52	10.00	1.43		0.00				0.00	0.00			1.00	1.00	178.56	178.11		178.11	600	0.20	282.9	0.97	83.06	104.8	99.11		95.95	95.34	3.16	98.81		95.79	95.18	3.02
Lauraleaf Crescent	EX. 747	EX. 746							0.00	0.00	0.00	0.00	0.52	11.43	0.09		0.00				0.00	0.00				1.00	166.48	166.06		166.06	600	0.99	636.9	2.18	12.14	470.8	98.81		95.72	95.11	3.09	98.78		95.60	94.99	3.18
Lauraleaf Crescent	EX. 746	EX. 744						0.27	0.00	0.00	0.27	0.27	0.79	11.52	1.17		0.00				0.00	0.00			0.52	1.52	165.76	251.18		251.18	600	0.20	287.7	0.99	69.38	36.6	98.78		95.58	94.97	3.20	98.80		95.44	94.83	3.36
														12.69																													
Lauraleaf Crescent	EX. 743	EX. 744				0.66			0.00	0.00	0.66	0.66	0.66	10.00	0.65		0.00				0.00	0.00			1.19	1.19	178.56	212.56		212.56	450	1.31	340.9	2.08	81.44	128.4	99.02		95.59	95.13	3.43	98.80		94.52	94.06	4.28
														10.65																													
Easement	EX. 744	EX. 820			0.27				0.27	0.00	0.00	0.27	1.72	12.69	0.12	0.38	0.38	91.83	35.15	0.00	0.00				2.71	157.19	425.31		460.46	675	0.52	632.4	1.71	12.40	171.9	98.80		93.76	93.08	5.04	97.84		93.70	93.01	4.14
														12.81																													
Existing Greenbank Road	EX. 820	EX. 102							0.00	0.00	0.00	0.00	5.29	12.81	1.12		0.38	91.35	34.97	0.00	0.00				5.39	156.36	842.06	0.00	3706.03	1800	0.16	4738.2	1.80	121.70	1032.2	97.84		93.71	91.88	4.13	98.15		93.52	91.69	4.63
														13.94																													

BORRISOKANE DITCH

BRAZEAU AGGREGATE EXTRACTION AREA ~ OUTLET TO BRAZEAU SWM POND

STREET	FROM	TO	Runoff Coefficients 0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
	270	265					7.97		7.97	0.00	0.00	7.97	7.97	10.00	1.06	14.62	14.62	104.19	1523.01										1523.01	1500	0.15	2856.1	1.57	100.00	1333.1			99.45	97.93			1.30	99.30	97.78	
	265	260							0.00	0.00	0.00	0.00	7.97	11.06	3.80		14.62	98.89	1445.46									1445.46	1500	0.15	2856.1	1.57	357.27	1410.7			98.00	96.48				97.47	95.94	
	260	245					7.97		7.97	0.00	0.00	7.97	15.93	14.87	2.43	14.62	29.23	83.99	2455.34									2455.34	1500	0.15	2856.1	1.57	227.85	400.8			97.47	95.94				97.12	95.60	
														17.29																													
	250	245					7.97		7.97	0.00	0.00	7.97	7.97	10.00	3.67	14.62	14.62	104.19	1523.01									1523.01	1500	0.15	2856.1	1.57	344.99	1333.1			97.64	96.12				97.12	95.60	
														13.67																													
	245	240							0.00	0.00	0.00	0.00	23.90	17.29	0.72		43.85	76.81	3368.41									3368.41	2100	0.15	7005.7	1.96	84.88	3637.3			97.12	94.99				97.00	94.86	
	240	Brazeau SWM Pond							0.00	0.00	0.00	0.00	23.90	18.01	2.06		43.85	74.93	3285.93									3285.93	2100	0.15	7005.7	1.96	241.66	3719.8			97.00	94.86				96.63	94.50	
														20.07																													
	Brazeau SWM Pond	235																										310.00	310.00	675	0.17	365.8	0.99	37.00	55.8			95.19	94.50				95.12	94.44	

DRUMMOND AGGREGATE EXTRACTION AREA ~ OUTLET TO DRUMMOND SWM POND

STREET	FROM	TO	Runoff Coefficients 0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
	230	225					10.15		10.15	0.00	0.00	10.15	10.15	10.00	4.79	18.62	18.62	104.19	1940.41		0.00				0.00			1940.41	1500	0.15	2856.1	1.57	450.00	915.7			97.66	96.14				96.99	95.46	
	225	215							0.00	0.00	0.00	0.00	10.15	14.79	2.34		18.62	84.24	1568.85									1568.85	1500	0.15	2856.1	1.57	220.06	1287.3			96.99	95.46				96.66	95.13	
														17.13																													
	220	215					10.15		10.15	0.00	0.00	10.15	10.15	10.00	4.35	18.62	18.62	104.19	1940.41									1940.41	1500	0.15	2856.1	1.57	408.68	915.7			97.27	95.75				96.66	95.13	
														14.35																													
	215	Drummond SWM Pond							0.00	0.00	0.00	0.00	20.30	17.13	2.98		37.25	77.25	2877.13									2877.13	2100	0.15	7005.7	1.96	350.04	4128.6			96.66	94.52				96.13	94.00	
														20.11																													
	Drummond SWM Pond	210																										260.00	260.00	675	0.15	339.6	0.92	25.00	79.6			94.69	94.00				94.65	93.96	

BORRISOKANE DITCH ~ OUTLET TO JOCK RIVER 1:100 YEAR FLOOD PLAIN

STREET	FROM	TO	Runoff Coefficients 0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
	235	210																										310.00	675	0.17	365.8	0.99	272.00	55.8			95.12	94.44				94.65	93.96	
	210	205																										570.00	825	0.17	624.7	1.13	223.00	54.7			94.65	93.81				94.26	93.42	
	205	Flood Plain																										570.00	825	0.17	624.7	1.13	817.00	54.7			94.26	93.42				92.84	92.00	

CLARKE POND ~ MATTAMY LANDS WEST OUTLET TO NEW GREENBANK RD.

STREET	FROM	TO	Runoff Coefficients 0.27 100 Yr.	0.62 100 Yr.	0.51 5Yr	0.65 100 Yr.	0.66 5 Yr.	0.69 100 Yr.	Total Area 5 Yr (ha)	Total Area 10 Yr (ha)	Total Area 100 Yr (ha)	Total Area (ha)	Cum. Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min.)	5 YR PEAK FLOW 2.78AR	Cum. 2.78AR	5 Intensity (mm/hr)	Peak Flow (L/s)	10 YR PEAK FLOW 2.78AR	Cum. 2.78AR	10 Yr Intensity (mm/hr)	Peak Flow (L/s)	100 YR PEAK FLOW 2.78AR	Cum. 2.78AR	100 Yr Intensity (mm/hr)	Peak Flow (L/s)	ICD FLOW (L/s)	TOTAL Peak Flow (L/s)	SEWER DATA PIPE Dia (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)	Residual Capacity Q_{cap}, Q_d (L/s)	UPSTREAM Center Line	Drop	Obvert	Invert	Cover	DOWNSTREAM Center Line	Drop	Obvert	Invert	Cover
Future Collector	900	227 (ex.)					1.46		1.46	0.00	0.00	1.46	1.46	10.00		3.05	3.05	104.19	317.83	0.00	0.00			0.00	0.00		0.00		317.83	975	0.15	905.5	1.17	120.00	587.7			97.93	96.94				97.75	96.78	

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

STORM SEWER DESIGN SHEET
CONVENTIONAL STORM SYSTEM

Designed by: A.T.
Checked by: H.M
Date: February 2018

Manning's Coefficient n =	0.013

Legend	
	Proposed storm sewers within BSUEA
	Existing Storm Sewer Information Taken From Quinn's Pointe As-Constructed Storm Sewer design sheet (J.L.Richards, September 2015)
	Existing Storm Sewer Information Taken FromHalf Moon Bay South Subdivision (Stantec, September 2014)

TODD POND – MATTAMY LANDS EAST OUTLET TO ALEX POLOWIN AVE & FAMEFLOWER

STREET	Maintenance Hole Number		MATTAMY LANDS EAST AREA RUNOFF COEFFICIENTS																		Weighted	Total Area			Total	Cum.	Inlet	In Pipe	5 YR PEAK FLOW				TOTAL	SEWER DA	SEWER DATA				Residual
			0.55		0.57		0.62		0.68		0.69		0.70		0.71		0.77																						
	FROM	TO	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr	5 Yr	10 Yr				Average	5 Yr	10 Yr	100 Yr	Area (ha)	Area (ha)	Time (min.)	Flow Time (min.)	2.78AR	Cum. 2.78AR	5 Yr Intensity (mm/hr)	Peak Flow (L/s)	Peak Flow (L/s)	PIPE Dia (mm)	Actual Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Capacity $Q_{cap} - Q_d$ (L/s)
	s723	s722											0.11								0.70	0.11	0.00	0.00	0.11	0.11	10.00	0.54	0.21	0.21	104.19	22.30	22.30	300	304.8	0.65	81.3	1.11	59.0
	s722	s721													0.30						0.71	0.30	0.00	0.00	0.30	0.41	10.54	1.08	0.59	0.81	101.43	81.78	81.78	375	381.0	0.65	147.5	1.29	65.7
																											11.62												
	s725	s724													0.40						0.71	0.40	0.00	0.00	0.40	0.40	10.00	1.23	0.79	0.79	104.19	82.26	82.26	375	381.0	1.00	182.9	1.60	100.6
																											11.23												
	s728	s727															0.30				0.74	0.30	0.00	0.00	0.30	0.30	10.00	1.72	0.64	0.64	104.19	66.91	66.91	300	304.8	0.65	81.3	1.11	14.4
	s272	s726																				0.00	0.00	0.00	0.00	0.30	11.72	0.16		0.64	95.90	61.58	61.58	300	304.8	0.65	81.3	1.11	19.8
	s726	s724			0.54																0.57	0.54	0.00	0.00	0.54	0.84	11.88	0.73	0.86	1.50	95.21	142.61	142.61	450	457.2	0.65	239.8	1.46	97.2
																											12.61												
	s724	s721											0.54								0.70	0.54	0.00	0.00	0.54	1.78	12.61	0.41	1.05	3.34	92.16	307.65	307.65	450	457.2	2.50	470.3	2.86	162.6
																											13.02												
	s721	s720																				0.00	0.00	0.00	0.00	2.19	13.02	0.26		4.14	90.54	375.26	375.26	600	609.6	0.80	572.9	1.96	197.7
	s720	s719											0.08								0.70	0.08	0.00	0.00	0.08	2.27	13.29	0.29	0.16	4.30	89.54	385.02	385.02	600	609.6	0.80	572.9	1.96	187.9
	s719	s717	0.40																		0.55	0.40	0.00	0.00	0.40	2.67	13.58		0.61	4.91	88.45	434.43	434.43	600	609.6	0.80	572.9	1.96	138.5
	s673	s672					0.28														0.62	0.28	0.00	0.00	0.28	0.28	10.00	0.54	0.48	0.48	104.19	50.28	50.28	300	304.8	2.00	142.7	1.96	92.4
	s672	s671			0.44																0.57	0.44	0.00	0.00	0.44	0.72	10.54	0.52	0.70	1.18	101.44	119.68	119.68	375	381.0	2.00	258.7	2.27	139.0
	s671	s670																				0.00	0.00	0.00	0.00	0.72	11.05	0.54		1.18	98.94	116.73	116.73	375	381.0	2.00	258.7	2.27	141.9
	s670	s659																			0.69	0.76	0.00	0.00	0.76	1.48	11.60	0.46	1.46	2.64	96.46	254.43	254.43	450	457.2	2.00	420.6	2.56	166.2
																											12.05												
	s668	s667																				0.00	0.00	0.00	0.00	0.00	10.00	0.00		0.00			0.00	300	304.8	0.65	81.3	1.11	81.3
	s667	s666											0.24								0.70	0.24	0.00	0.00	0.24	0.24	10.00	0.16	0.47	0.47	104.19	48.66	48.66	300	304.8	0.65	81.3	1.11	32.7
	s666	s665																			0.68	0.41	0.00	0.00	0.41	0.65	10.16	1.27	0.78	1.24	103.33	128.35	128.35	450	457.2	0.30	162.9	0.99	34.6
																											11.44												
	s669	s665																			0.77	0.26	0.00	0.00	0.26	0.26	10.00	0.42	0.56	0.56	104.19	57.99	57.99	300	304.8	3.00	174.7	2.39	116.7
																											10.42												
	s665	s656																			0.77	0.26	0.00	0.00	0.26	1.17	10.42	0.63	0.56	2.36	102.02	240.29	240.29	450	457.2	1.00	297.4	1.81	57.1
																											11.06												

Appendix G

PCSWMM Model Inputs and Results

Appendix G – PCSWMM Model Parameters

The following sets out a description of each of the parameters used in the modelling. Any differences from the below at any of the specific elements are noted in the description in the model. Two types of modelling were used and are described below.

The event modelling is used to provide the analysis of the storm major and minor system design for HGL and capacity assessments. The continuous simulation modelling is used to determine the long term water budget of the BSUEA.

All surface and infrastructure elements should be present in the event simulation. Only those elements which impact the soil infiltration affect the continuous simulation model and to save run time the continuous simulation model has much of the sewer network and major system network removed. The EES system elements are maintained in the continuous simulation model as they will provide addition infiltration into the soils and groundwater table.

G1.0 Subcatchments

G1.1 General Parameters

Parameter	Units	Description / Values
Name	-	The name of the subcatchment is linked with the minor system section to which the runoff is directed.
Tag	-	No tags have been used for the subcatchments.
Rain Gauge	-	The storm type selected for the model run. In the event simulations the following storm files are used: Distribution — Return Periods 3 hour Chicago — 1:5, 1:10, 1:100 24 hour SCS — 1:5, 1:10, 1:100 Under the continuous simulation the 30 year data was used from Environment Canada weather stations at Ottawa Macdonald-Cartier International Airport and the Experimental Farm. The same long term rainfall was used in the Existing Conditions Report (Appendix B).
Outlet	-	The downstream major system node to which the subcatchment drains.
Area	ha	The area is calculated internally by PCSWMM and the value varies.

Parameter	Units	Description / Values
Width / Flow Length	m	For lumped catchment areas representing predominately residential land uses the width parameter is set at 225 m/ha as per the OSDG. Where the catchments are for non-residential land uses the width is the area of the catchment divided by the runoff flow path.
Slope	%	All slopes are a representative 2%.
Imperv	%	The following percent impervious values have been used: **Land Cover** — **Impervious (%)** Majority Residential Catchments — 67.143 Arterial / Collector Roads — 86 Schools — 79 Commercial — 93 Park and Ride — 93 The value for residential areas is based on an average for residential land cover catchments across the site.
N Imperv	-	A constant of 0.013 is selected as the Manning's N for impervious surfaces such as roads, sidewalk and parking areas. The value is representative of smooth impervious surface as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
N Perv	-	A constant of 0.25 is selected as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
DStore Imperv	mm	A constant of 1.57 mm is used as the impervious depression storage as per the OSDG Section 5.4.5.4.
DStore Perv	mm	A constant of 4.67 mm is used as the impervious depression storage as per the OSDG Section 5.4.5.4.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Zero Imperv</td><td>%</td><td>Across areas of water it is considered that there is no depression storage. For the catchment areas representing SWMFs the approximate coverage of the SWMF is used for the percent of zero impervious.</td></tr>
<tr><td>Subarea Routing</td><td>-</td><td>The constant ‘PERVIOUS’ is entered to simulate the subarea of impervious surface, such as the rear part of roofs, which may flow over pervious areas prior to discharging to the outlet of the subcatchment.</td></tr>
<tr><td>Percent Routed</td><td>%</td><td>The percentage of impervious area which is routed across the pervious area. The percentages are area weighted in PCSWMM based on the following impervious types:

Land Cover — Percent Routed
Residential catchments — 20
Arterial / Collector Roads — 0
Parks / SWM — 100
Schools — 0
Commercial — 70
Park and Ride — 0</td></tr>
<tr><td>Drying Time</td><td>days</td><td>The time for a fully saturated soil to completely dry is set at 7 days though this is not used in design event analysis.</td></tr>
</table>

Parameter	Units	Description / Values
Infiltration	-	The standard Horton infiltration coefficients as per the City's OSDG are used for the event modelling. For long term simulations the coefficients are as per the results of the Paterson field testing of Hydraulic Conductivity. See section B6.1.1 of the Existing Conditions Report (Appendix B) for a description of how the saturated field hydraulic conductivity was transferred into infiltration rates. For long term simulation the values have been reduced by a factor of 2.5 as per guidance from the Credit Valley Conservation Authority and Toronto and Region Conservation Authority Low Impact Development Stormwater Management Planning and Design Guide Appendix C. The Guide states that a safety correction factor of 2.5 should be applied where there is a ratio between the mean measured infiltration rates of 1 or less. The safety factor represents the potential loss of infiltration due to compaction during construction and gradual accumulation of fine sediments over the lifespan of the BMP.
Decay Constant	hr^{-1}	City of Ottawa standard value of 4.14 is used.

The parameters Curb Length, LID Controls and Erosion are not used in the model.

G1.2 Snowmelt

Used in the continuous simulation modelling only.

Parameter	Units	Description / Values
Dividing Temperature	°C	The temperature below which precipitation will fall as snow. Generally accepted as being 0°C. Value: 0
Snow Capture Factor	Fraction	It is assumed that the data from Environment Canada has captured all snowfall in the gauges. This factor can be used to increase snowfall where the gauges may not be accurate. Value: 1.0

Parameter	Units	Description / Values
ATI Weight	Fraction	Applied over the entire subwatershed, the ATI weighting factor is an indication of the thickness of the surface layer of snow. A low value will indicate a thicker surface layer with weighting to temperatures over the previous week while a value closer to 0.5 will indicate a normal surface layer. The lower the ATI Weight the snow will cool and warm more slowly. A value of 0.5 has been found to give reasonable results in watersheds and has been used here. Value: 0.5
Negative Melt Ratio	Fraction	The effect of the heat transfer during non-melt periods and the standard value is used. Value 0.6
Elevation above MS	m	The elevation will affect atmospheric pressure for the melt calculations. Value: 107
Latitude	°	The latitude will dictate the sunrise and sunset times in temperature calculations. Value: 45.0
Longitude Correction	minutes	Used to correct for in separation of the position of site versus the meridian of the standard time zone. This will have negligible effects. Value: 0
Melt Coefficients	mm/hr /°C	The Melt Coefficient has been taken from the AES snowmelt equations for southern Ontario (MNR Technical Guide Flooding Hazard Limit, 2002). The AES equations have a melt coefficient of 3.66 mm/day/°C for mean daily air temperatures. This equates to 0.1525 mm/hr/°C. Value: 0.153
Base Temperature	°C	The base temperature at which the snowpack will melt has been assumed as 0°C. A lower value could be used for rooftops where there will be heat transfer through the roof. Value: 0

Parameter	Units	Description / Values
Fraction Free Water Capacity	Fraction	Since snow is considered a porous medium some of the melt water may be contained within the snow pack. The fraction of the free water capacity is the fraction of the snow pack void space which will retain meltwater. This fraction is normally less than 0.1 and 0.05 has been used here to represent a deep snowpack. A value of 0.25 may represent a shallow slush layer. Value: 0.05
Initial Snow Depth	mm	The initial snow depth on the site is considered as zero. Value: 0
Initial Free Water	mm	Since there is no initial snow depth the initial free water has also been considered as zero. Value: 0
Depth at 100% Cover	mm	The snowmelt model assumes that there will always be a depth of snow above which there will be 100% coverage of the snow, even in areas which may be affected by shading, drifting of topography. Typical depths are 25 mm to 100 mm. Since the area is relatively open with limited shading then the lower end of the value range has been used. Value: 25
Fraction of impervious area that is plowable	fraction	It is assumed that for the developed areas where the 'future' snow pack is used that 20% of impervious areas will be plowed. Value: 0.2 For the area that is plowable the following parameters are applied: Depth at which snow removal begins (mm) 25.4 Fraction transferred out of the watershed 0.8 Fraction transferred to the impervious area 0.1 Fraction transferred to the pervious area 0.1 Fraction transferred into immediate melt 0.0 Faction moved to another subcatchment 0.0

Parameter	Units	Description / Values
Areal Depletion	Fraction	The areal depletion curve represents the area of snow cover for depths of the snow less than the depth at 100% coverage. Natural areal depletion curves are suggested by the software and are used here.

G1.3 Groundwater

Used in the continuous simulation modelling only.

Parameter	Units	Description / Values
Aquifer Name	-	Name of the aquifer representing soil conditions. Four Aquifers were created based on different soil conditions from OSG mapping. Only two of the aquifers are used within the study area, A and B. Aquifer / Description / Clay (%) / Sand (%) A / Sand / 5 / 92 B / Sandy Loam / 10 / 65 C / Sandy Clay Loam / 28 / 60 D / Clay Loam / 34 / 33
Receiving Node	-	Name of the receiving node for groundwater outflow to baseflow. This is based on the groundwater subwatershed delineation.
Surface Elevation	m	Elevation of the ground surface for the subcatchment was averaged from the Patterson report. Value: 107
Coefficients		The coefficients were set for the saturated groundwater zone to represent a storage reservoir where outflow is linear proportional to the water table depth without surface water interaction. It was considered that the nearest open water channels were sufficiently far to have negligible impact on groundwater levels. The groundwater equation used is: $f_G = A1\ (d_L - h_{sw})$ Where: f_G = groundwater flow d_L = depth of the lower saturated subsurface zone h_{sw} = height of surface water above the bottom of the groundwater zone A1 = Calibration factor (estimated at 0.05)

Parameter	Units	Description / Values
		Value: 0.05
Surface Water Depth	m	Set as 0.5 metres to allow flow from the water table to surrounding watercourses. Value: 0.5
Initial Elevation	m	Initial elevation of the water table Value: 95.5
		All other parameters used as per the receiving node or aquifer

G1.4 Aquifer

Used in the continuous simulation modelling only.

Parameter	Units	Description / Values
Porosity	Fraction	The following values were used for the volumetric water content of the soil at saturation (i.e. volume of water per total volume): **Soil Group** **A** **B** **C** **D** Porosity 0.436 0.450 0.432 0.472 *(Source: SPAW Calculator)*
Wilting Point	Fraction	This is soil moisture contact at which plants cannot obtain sufficient moisture from the soil to meet transpiration requirements and they will die. It is roughly equivalent to the moisture content of soil at 15 atmospheres. The following values were used: **Soil Group:** **A** **B** **C** **D** Wilting Point: 0.050 0.081 0.183 0.213 *(Source: SPAW Calculator)*
Field Capacity	Fraction	Considered to be the amount of water a well-drained soil holds after free water has drained off. The following values were used: **Soil Group:** **A** **B** **C** **D** Field Capacity: 0.094 0.179 0.283 0.350 *(Source: SPAW Calculator)*

Parameter	Units	Description / Values
Conductivity	mm/hr	Within the Aquifer Parameters, the soil saturated conductivity is a governing parameter of the percolation rate between the upper unsaturated soil layer and the lower saturated soil layer. This is not the same as any hydraulic conductivity used for the surface infiltration. The values have been selected from the SPAW calculator and are: **Soil Group:** **A** **B** **C** **D** Conductivity (mm/hr): 114 50.3 7.8 4.6 *(Source: SPAW Calculator)*
Conductivity Slope	-	Conductivity slope measures the rate at which a soil's hydraulic conductivity decreases with decreasing moisture content. Regression analysis has shown it can be estimated with the following relationship: Conductivity Slope = 0.48(% Sand) + 0.85(% Clay) Based on this relationship the following values were used: **Soil Group:** **A** **B** **C** **D** Conductivity Slope: 48 40 53 45
Tension Slope		Used for backward compatibility in the software and not used in this model
Upper Evaporation Factor	Fraction	This factor determines the fraction of available subsurface evaporation rate used in the upper subsurface zone (compared to the lower subsurface zone). A higher evaporation rate is associated with looser soils, lower water table elevations and shallow root zones. It was assumed that in all soils 80% of the available subsurface evaporation would be used in the upper zone due to the depth of the water table. **Value: 0.8**
Lower Evaporative Depth	m	The depth of the lower subsurface zone which can be used for evapotranspiration should be approximate to the expected average depth of root penetration. This does not impact this type of model but the following values were used: **Soil Group:** **A** **B** **C** **D** Evaporative Depth (m): 1.5 2.4 3.0 5.2 *(Source: Shah et al 2007 from EPA 2015)*

Parameter	Units	Description / Values
Lower Groundwater Loss Rate	mm/hr	This is the rate of percolation from the lower subsurface zone to a deep aquifer and is approximate to the rate at which the water table elevation will drop over a prolonged dry period. The saturated hydraulic conductivity of a compacted clay soil was used in all cases however it does not affect the model. **Value: 0.004**
Bottom Elevation	m	The elevation of the bedrock as averaged from the Patterson 2016 report. **Value: 85**
Unsaturated Zone Moisture		The moisture content of the unsaturated upper subsurface zone at the start of the simulation. Cannot be less than the wilting point and cannot be more that porosity. Assumed to be an approximate value between the wilting point and porosity fractions. **Soil Group:** **A** **B** **C** **D** Evaporative Depth (m): 0.25 0.22 0.32 0.35

G2.0 Link Elements

G2.1 Conduits

Parameter	Units	Description / Values
Name	-	The links are generally named as 'Upstream Manhole – Downstream Manhole'.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.

Parameter	Units	Description / Values
Tag	-	The following tags are used in the model to classify the links: **Tag** — **Classification** Storm Sewer — BSUEA minor system Street — BSUEA major system QP_Storm_Sewer — Quinn's Pointe minor system QPLow_Storm_Sewer — Quinn's Pointe minor system in the low lying area connected to Greenbank Road. GB_Storm_Sewer — Greenbank Road minor system
Length	m	Length is auto-calculated in PCSWMM
Roughness	-	The roughness coefficient of 0.013 is used for all minor system conduits. Where the conduit is part of the major system the roughness is contained within the transect and this value is not read by the model.
Inlet Elevation	m	Elevation of the upstream end of the link.
Outlet Elevation	m	Elevation of the downstream end of the link.
Initial Flow	m^3/s	No initial flows are set in the model
Flow Limit	m^3/s	No flow limits are set in the model
Entry Loss Coeff.	-	For minor system links in the BSUEA and Greenbank Road no entrance losses are applied. The minor system losses for the Quinn's Pointe links are as per the original XPSWMM model for the subdivision. For the connection between Pond 2 and the minor system the entry loss is representative of a concrete pipe with headwall inlet as per Table A.11 of the SWMM 5.0 User Manual. No losses are applied to the major system.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Exit Loss Coeff.</td><td>-</td><td>For the minor system the entry loss coefficient is based on the angle of change in flow direction at the downstream manhole as per the values below (read from City of Ottawa Sewer Design Guidelines Appendix 6-B).

<table>
<tr><th>Angle °</th><th>Loss Coeff.</th><th>Angle °</th><th>Loss Coeff.</th></tr>
<tr><td>0</td><td>0.02</td><td>50</td><td>0.46</td></tr>
<tr><td>10</td><td>0.05</td><td>60</td><td>0.64</td></tr>
<tr><td>20</td><td>0.12</td><td>70</td><td>0.84</td></tr>
<tr><td>30</td><td>0.21</td><td>80</td><td>1.07</td></tr>
<tr><td>40</td><td>0.32</td><td>90</td><td>1.32</td></tr>
</table>

The minor system losses for the Quinn’s Pointe links are as per the original XPSWMM model for the subdivision.

Exit losses from the minor system into open water, e.g. at Ponds, is 0.5 where the pond level is low compared to the sewer HGL and 1.0 where the sewer is low in the pond.

No losses are applied to the major system.</td></tr>
<tr><td>Average Loss Coeff.</td><td>-</td><td>The average loss coefficient is not used in this model.</td></tr>
<tr><td>Seepage Rate</td><td>mm/hr</td><td>There is no seepage applied to conduits in this model.</td></tr>
<tr><td>Flap Gate</td><td>-</td><td>No flap gates are used in the model.</td></tr>
<tr><td>Cross Section</td><td>-</td><td>Minor system links conduits are circular to represent pipes.

Major system conduits are Irregular and use the transect listed in the parameter below.</td></tr>
<tr><td>Geometry</td><td>M</td><td>The geometry of the conduit for cross sections other than irregular. The single value is the diameter of the conduit.</td></tr>
<tr><td>Barrels</td><td>-</td><td>No multiple barrel conduits are used in the model and the value is 1.</td></tr>
<tr><td>Transect</td><td>-</td><td>The cross section of the major system conduit, a typical road cross section based on the road classification.</td></tr>
<tr><td>Shape Curve</td><td>-</td><td>Not used in this model</td></tr>
</table>

Parameter	Units	Description / Values
Culvert Code	-	For the conduits collecting flows from Pond 1, the code is used to allow analysis for inlet control conditions using the FHWAA-HDS-5 method. The culvert codes are as per Table A.10 of the EPA SWMM User's Manual and represents a concrete circular culvert with headwall.

G2.2 Weirs

Weirs are generally used in the model to represent the overland flow paths in the major system network and transfer the flow from surcharging of street sag storage to a downstream node. In detailed design these will be replaced with conduits to simulate major system routing, however the weirs are used here at a high level to provide connectivity in the model.

Parameter	Units	Description / Values
Name	-	The links are generally named as 'Upstream Manhole – Downstream Manhole'.
Inlet Node	-	Upstream node of the weir element.
Outlet Node	-	Downstream node of the weir element.
Tag	-	Not tagged.
Type	-	All weirs in the model are traverse weirs.
Height	m	The height of the weir has been set to ensure that ponding at the upstream street sag storage node is no greater than 350 mm.
Length	m	The length of the weir is set at 8.5 metres to approximate the width of overland flow paths which will vary within each lumped drainage area.
Side Slope	m/m	No side slopes are applied.
Inlet Offset/Elevation	m	The inlet offset or elevation of the weir has been set to ensure that ponding at the upstream street sag storage node is no greater than 350 mm.
Discharge Coeff.	m^3/s	The discharge coefficient of 1.67 is used in the model to represent a broad crested weir.

Parameter	Units	Description / Values
Flap Gate	-	No flap gates are applied to weirs in the model.
End Contractions	-	No end contractions are applied to weirs in the model.
End Coeff.	m^3/s	No end coefficient losses are applied to weirs in the model.
Can Surcharge	-	Weirs are allowed to surcharge.

G2.3 Outlets

Outlets have been used to represent the combined inlet capture from the lumped drainage area.

Parameter	Units	Description / Values
Name	-	Outlet links are named the same as the subcatchment from which the flow is captured.
Inlet Node	-	Upstream node of the outlet link, the major system node.
Outlet Node	-	Downstream node of the outlet link, the minor system manhole at the upstream end of the receiving link.
Tag	-	No tags are used
Inlet Offset/Elevation	m	The outlet upstream offset or elevation is set at that of the upstream major system node invert.
Flap Gate	-	No flap gates are used on the outlets
Rating Curve	-	A three point rating curve is developed for each outlet link and the rating curve is named the same as the outlet link. The rating curve is set to control the outlet flow to the required inlet capture rate. The set inlet capture rates are summarized in the design criteria section of the report.

G2.4 Orifices

Orifices are used to represent the control device at the outlet of a pond or the ICD which will be placed at the downstream end of the Quinn's Pointe system to control flows from Pond 1.

Parameter	Units	Description / Values
Name	-	The links are generally named as 'Upstream Manhole – Downstream Manhole'.
Inlet Node	-	Upstream node of the weir element.
Outlet Node	-	Downstream node of the weir element.
Tag	-	Not tagged.
Type	-	All orifices in the model are side orifices.
Cross Section	-	All orifices in the model are circular orifices.
Height	m	The height of the orifice is the opening diameter.
Width	m	The width parameter is not used for circular orifices.
Inlet Offset/Elevation	m	The inlet offset or elevation of the orifice is set at the elevation of the upstream node.
Discharge Coeff.	m^3/s	The discharge coefficient of 0.65 is used.
Flap Gate	-	No flap gates are applied to orifices in the model.
Time to Open/Close	-	Time to open/close a gated orifice is not used in the model.

G3.0 Node elements

G3.1 Junctions

Junction node types are used for major system nodes along minor system conduits. Minor system manholes are represented using storage nodes (see section A1.1).

Parameter	Units	Description / Values
Name	-	Nodes are named after the subcatchment draining to the node.
Tag	-	Minor system junctions are tagged 'Street'.

Parameter	Units	Description / Values
Inflows	-	No junctions have additional inflows.
Treatment	-	No treatment is modelled.
Invert Elevation	m	The invert elevation is extracted from the proposed grading DEM in PCSWMM.
Rim Elevation	m	Set at 0.5 metres above the invert elevation to allow sufficient depth for potential ponding which should be limited to 0.35 m.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	No initial depths are set at junctions in the model.
Surcharge Depth	m	No surcharge depths are set at junctions in the model.
Ponded Area	m^2	No ponded areas are set in the model.

G3.2 Storage

Storage nodes are used to represent minor system manholes, street sag storage and pond storage.

Parameter	Units	Description / Values
Name	-	Minor system nodes are named as per the design sheets, major system nodes are named as per the catchment draining to the node or as per the pond name. Manholes identified as 3XX in the EES model are nodes on the EES sewer network.

Parameter	Units	Description / Values
Tag	-	The following tags are used: **Tag** — **Classification** Manhole — BSUEA minor system On-Site_Storage — BSUEA major system street sag storage QP_Manhole — Quinn's Pointe minor system QPLow_Manhole — Quinn's Pointe minor system in the low lying area not draining to the ponds GB_Manhole — Greenbank Road minor system Wet_Pond — Wet pond storage Dry_Pond — Dry pond storage
Inflows	-	Minor system nodes in Quinn's Pointe have additional inflows which are hydrographs from the Quinn's Pointe SWMHYMO model representing the captured minor system flow.
Treatment	-	No treatment is modelled
Invert Elevation	m	For minor system manholes in the BSUEA and on Greenbank Road the invert elevation is as per the design sheets. For the EES model the invert elevations are lower than the design sheet to accommodate the simulation of the EES subdrains. For minor system manholes in Quinn's Pointe the invert elevation is as per the Quinn's Pointe detailed design XPSWMM model. For major system nodes representing street sag storage the invert elevation is approximate to the lowest point in the associated drainage area as per the grading plan. For wet ponds the invert elevation is the designed permanent pool elevation. For dry ponds the invert elevation is the base of the pond as per the grading plan.

Parameter	Units	Description / Values
Rim Elevation	m	For minor system manholes in the BSUEA and on Greenbank Road the rim elevation is as per the surface elevation of the grading plan. For minor system manholes in Quinn's Pointe the rim elevation is set at the nearest underside of footing. The rim elevation is therefore not the ground elevation and freeboard to the rim elevation should be a minimum of 300 mm. For major system nodes representing street sag storage the rim elevation is 0.5 metres above invert. For wet and dry ponds the invert elevation is approximate to the minimum surrounding ground elevation from the grading plan.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	No initial depths are set in the model.
Ponded Area	m^2	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.
Storage Curve	-	For street sag storage Function storage curves are used. The storage is set at a constant area to provide 50 m^3/ha in 350mm depth unless otherwise noted. For manholes in the conventional system the Function storage curves are used. The storage is set at a constant representing the base area of a manhole for the entire depth. For EES manholes the Tabular curves are used. The lower point of the curve represents the storage in the EES subdrain and surrounding material for the lumped subcatchment draining to the manhole. The upper part of the curve represents the constant area manhole storage. For pond storage either Function or Tabular curves are used to represent the designed pond storage capacity.

Parameter	Units	Description / Values
Conductivity	mm/hr	In the EES storage nodes the seepage rate is set as per the results of the Paterson field testing of Hydraulic Conductivity. See section B6.1.1 of the Existing Conditions Report (Appendix B) for a description of how the saturated field hydraulic conductivity was transferred into infiltration rates. The values have been reduced by a factor of 2.5 as per guidance from the Credit Valley Conservation Authority and Toronto and Region Conservation Authority Low Impact Development Stormwater Management Planning and Design Guide Appendix C. The Guide states that a safety correction factor of 2.5 should be applied where there is a ratio between the mean measured infiltration rates of 1 or less. The safety factor represents the potential loss of infiltration due to compaction during construction and gradual accumulation of fine sediments over the lifespan of the BMP.

G3.3 Outfalls

Under the continuous simulation model two additional outfalls are placed to represent the outfalls to the groundwater receiving watercourses. These are not included below but are free outfalls with inverts to match the groundwater system.

Parameter	Units	Description / Values
Name	-	Outfalls are named either after the connection boundary condition manhole or as otherwise appropriate.
Tag	-	No outfalls are tagged
Inflows	-	No external inflows are applied at outfall nodes
Treatment	-	No treatment is modelled
Invert Elevation	m	For minor system outfalls the invert elevation is the elevation of the boundary condition storm sewer. For major system nodes the invert is taken from the grading plan.
Rim Elevation	m	For minor system outfalls the rim elevation is taken from the grading plan or existing surface. For major system nodes the rim elevation is either 0.5 m or 1 m above the invert depending on the connection conduit depth.

Parameter	Units	Description / Values
Tide Gate	-	No backflow is prevented in the model outfalls and therefore 'No' is selected.
Route To	-	If flow from the outfall is directed to another subcatchment but this is not done in the model and this parameter is left blank.
Type	-	Major system outfalls are free outfall nodes and minor system outfalls are fixed to the 1:100 year HGL in the minor system.

Conventional System 1:100 year 3 hour Chicago Output

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
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*************
Element Count
*************
Number of rain gages ...... 9
Number of subcatchments ... 42
Number of nodes ........... 144
Number of links ........... 178
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
----------------------------------------------------------------------
4hr_25mm             4hr_25mm                    INTENSITY   15 min.
CHI_3hr_10           CHI_3hr_10                  INTENSITY   10 min.
CHI_3hr_100          CHI_3hr_100                 INTENSITY   10 min.
CHI_3hr_100CC        CHI_3hr_100CC               INTENSITY   10 min.
CHI_3hr_5            CHI_3hr_5                   INTENSITY   10 min.
SCS_24h_10           SCS_24h_10                  INTENSITY   15 min.
SCS_24h_100          SCS_24h_100                 INTENSITY   15 min.
SCS_24h_100CC        SCS_24h_100CC               INTENSITY   15 min.
SCS_24h_5            SCS_24h_5                   INTENSITY   15 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage           Outlet
-----------------------------------------------------------------------------------------------------------
A13_1                       1.88    542.73      0.00    2.0000 CHI_3hr_100         MH_170
A13_2                       1.40    187.69      0.00    2.0000 CHI_3hr_100         MH_101
A5_part                    10.31    232.01      0.00    2.0000 CHI_3hr_100         OF_Drummond
A8_part                    15.25    304.82      0.00    2.0000 CHI_3hr_100         OF_Brazeau
AREA_1B                     3.57    364.48     10.00    2.0000 CHI_3hr_100         822
Brazeau                    23.90   5378.59     65.71    2.0000 CHI_3hr_100         S_Brazeau
Drummond                   20.17   4537.35     65.71    2.0000 CHI_3hr_100         S_Drummond
EXTERNAL-820_1              1.35    856.08     71.00    2.0000 CHI_3hr_100         S_External-820_1
EXTERNAL-820_2              1.66   1019.93     71.00    2.0000 CHI_3hr_100         S_External-820_2
Mattamy_West                3.60    810.41     65.71    2.0000 CHI_3hr_100         S_Mattamy_West
MH_101-102                  3.43    771.38     65.71    2.0000 CHI_3hr_100         S_101-102
MH_102-151                  3.76    846.32     65.71    2.0000 CHI_3hr_100         S_102-151
MH_110-111                  0.79    178.40     65.71    2.0000 CHI_3hr_100         S_110-111
MH_111-112                  0.72    161.28     65.71    2.0000 CHI_3hr_100         S_111-112
MH_111-112_SCH              2.42    198.27     80.00    2.0000 CHI_3hr_100         S_111-112_SCH
MH_113-112_1                0.86    193.28     65.71    2.0000 CHI_3hr_100         S_113-112
MH_113-112_2                0.45    101.32     65.71    2.0000 CHI_3hr_100         S_113
MH_114-116                  3.92    881.20     65.71    2.0000 CHI_3hr_100         S_114-116
MH_116-154                  3.29    739.22     65.71    2.0000 CHI_3hr_100         S_116-154
MH_120-124                  2.81    631.81     65.71    2.0000 CHI_3hr_100         S_120-124
MH_121-122                  1.93    434.39     65.71    2.0000 CHI_3hr_100         S_121-122
MH_123-124                  1.59    358.20     65.71    2.0000 CHI_3hr_100         S_123-124
MH_132-134                  3.49    784.76     65.71    2.0000 CHI_3hr_100         S_132-134
MH_134-136                  3.24    729.57     65.71    2.0000 CHI_3hr_100         S_134-136
MH_136-SWP                  2.86    210.32     30.00    2.0000 CHI_3hr_100         S_136-SWP
MH_150-151                  1.07    241.81     65.71    2.0000 CHI_3hr_100         S_150-151
MH_152-154                  0.82    184.95     65.71    2.0000 CHI_3hr_100         S_152-154
MH_154-156                  1.24    278.49     65.71    2.0000 CHI_3hr_100         S_154-156
MH_154-156_SCH              2.19    179.24     80.00    2.0000 CHI_3hr_100         S_154-156_SCH
MH_156-158                  1.12    251.10     65.71    2.0000 CHI_3hr_100         S_156-158
MH_160-158                  3.02    680.52     65.71    2.0000 CHI_3hr_100         S_160-158
MH_164-156                  3.47    780.15     65.71    2.0000 CHI_3hr_100         S_164-156
MH_170-172                  0.92    207.32     65.71    2.0000 CHI_3hr_100         S_170-172
MH_170-172_COM              2.13    104.50     93.00    2.0000 CHI_3hr_100         S_170-172_COM
MH_170-172_PR               2.57    161.36     93.00    2.0000 CHI_3hr_100         S_170-172_PR
MH_172-174                  1.08    604.06     86.00    2.0000 CHI_3hr_100         S_172-174
MH_174-176                  1.03    576.33     86.00    2.0000 CHI_3hr_100         S_174-176
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MH_174-176_MLT	0.90	100.71	93.00	2.0000	CHI_3hr_100	S_174-176_MLT
MH_178-132	2.51	563.68	65.71	2.0000	CHI_3hr_100	S_178-132
MH_179-178	1.06	627.39	86.00	2.0000	CHI_3hr_100	S_179-178
North_Pond	2.56	341.64	70.00	2.0000	CHI_3hr_100	NWP
South_Pond	2.95	325.29	70.00	2.0000	CHI_3hr_100	SWP

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
723E	JUNCTION	94.89	0.46	0.0	Yes
743E	JUNCTION	95.00	0.46	0.0	Yes
748E	JUNCTION	95.31	0.61	0.0	Yes
S_150-151	JUNCTION	106.00	0.65	0.0	
S_152	JUNCTION	106.15	0.50	0.0	
S_152-154	JUNCTION	106.00	0.50	0.0	
S_154-156	JUNCTION	105.20	0.50	0.0	
S_156-158	JUNCTION	103.55	0.50	0.0	
S_158-NWP	JUNCTION	99.91	0.50	0.0	
S_172	JUNCTION	107.72	0.50	0.0	
S_172-174	JUNCTION	107.63	0.50	0.0	
S_174-176	JUNCTION	107.53	0.50	0.0	
S_178	JUNCTION	105.00	0.50	0.0	
S_179-178	JUNCTION	106.00	0.50	0.0	
Clarke_224	OUTFALL	90.37	1.20	0.0	
D102	OUTFALL	91.66	1.83	0.0	
OF_Brazeau	OUTFALL	101.20	0.00	0.0	
OF_Drummond	OUTFALL	101.20	0.00	0.0	
OF2	OUTFALL	97.90	0.00	0.0	
700	STORAGE	96.62	1.09	0.0	Yes
701	STORAGE	95.65	2.56	0.0	Yes
702	STORAGE	98.73	1.85	0.0	Yes
703N	STORAGE	100.87	1.27	0.0	Yes
703S	STORAGE	99.91	2.05	0.0	Yes
704	STORAGE	98.28	3.63	0.0	Yes
705	STORAGE	98.51	3.46	0.0	Yes
710	STORAGE	97.34	1.82	0.0	Yes
711	STORAGE	98.95	1.67	0.0	Yes
712E	STORAGE	101.29	1.24	0.0	Yes
712N	STORAGE	101.65	0.88	0.0	Yes
713N	STORAGE	101.94	1.24	0.0	Yes
713S	STORAGE	102.02	1.16	0.0	Yes
714	STORAGE	101.15	1.83	0.0	Yes
720	STORAGE	96.06	2.75	0.0	Yes
721	STORAGE	95.18	2.85	0.0	Yes
722	STORAGE	94.49	3.22	0.0	Yes
723W	STORAGE	95.04	2.63	0.0	Yes
724	STORAGE	93.41	2.74	0.0	Yes
730	STORAGE	96.22	1.89	0.0	Yes
731	STORAGE	95.92	2.10	0.0	Yes
732	STORAGE	94.03	3.60	0.0	Yes
740	STORAGE	99.38	0.85	0.0	
741	STORAGE	96.96	1.49	0.0	Yes
742	STORAGE	93.89	3.59	0.0	Yes
743W	STORAGE	95.13	1.84	0.0	
744	STORAGE	93.08	3.56	0.0	Yes
746	STORAGE	94.97	1.67	0.0	Yes
747	STORAGE	95.07	2.80	0.0	
748W	STORAGE	95.34	1.58	0.0	
750E	STORAGE	96.04	1.46	0.0	Yes
750S	STORAGE	93.41	3.86	0.0	Yes
751	STORAGE	93.31	3.71	0.0	Yes
752	STORAGE	93.25	3.78	0.0	Yes
753	STORAGE	93.18	3.62	0.0	Yes
754	STORAGE	93.11	5.29	0.0	
754_2	STORAGE	93.08	5.92	0.0	
755	STORAGE	92.98	5.42	0.0	Yes
755_2	STORAGE	93.01	5.99	0.0	
760	STORAGE	95.59	1.51	0.0	Yes
761	STORAGE	94.51	2.23	0.0	Yes
770	STORAGE	94.47	2.66	0.0	Yes
771	STORAGE	95.85	3.24	0.0	
772	STORAGE	96.63	3.09	0.0	
773	STORAGE	98.32	1.70	0.0	Yes
774	STORAGE	98.20	1.32	0.0	Yes
776	STORAGE	97.25	2.53	0.0	

780	STORAGE	95.80	1.30	0.0	Yes
781	STORAGE	95.55	1.70	0.0	Yes
782	STORAGE	95.22	1.62	0.0	
783	STORAGE	95.03	1.81	0.0	Yes
790	STORAGE	99.83	2.36	0.0	Yes
800	STORAGE	100.32	1.66	0.0	Yes
801	STORAGE	101.24	1.19	0.0	Yes
810	STORAGE	100.72	2.01	0.0	Yes
820	STORAGE	91.67	6.18	0.0	
821	STORAGE	91.76	6.04	0.0	
822	STORAGE	92.07	6.53	0.0	
825	STORAGE	95.36	4.44	0.0	
Clarke_227	STORAGE	96.76	6.42	0.0	
Clarke_228	STORAGE	102.11	4.09	0.0	
Dry_Pond	STORAGE	100.00	1.50	0.0	
EX.102	STORAGE	91.38	6.60	0.0	
Mattamy_West_DryPond	STORAGE	101.18	2.00	0.0	
MH_101	STORAGE	103.49	4.71	0.0	
MH_102	STORAGE	102.90	5.00	0.0	
MH_110	STORAGE	102.44	4.56	0.0	
MH_111	STORAGE	99.80	3.70	0.0	
MH_112	STORAGE	98.87	4.53	0.0	
MH_113	STORAGE	100.06	4.09	0.0	
MH_114	STORAGE	101.22	2.93	0.0	
MH_116	STORAGE	100.39	5.01	0.0	
MH_120	STORAGE	97.88	4.92	0.0	
MH_121	STORAGE	100.82	5.04	0.0	
MH_122	STORAGE	100.72	3.78	0.0	
MH_123	STORAGE	99.91	5.19	0.0	
MH_124	STORAGE	97.66	5.84	0.0	
MH_132	STORAGE	96.45	7.35	0.0	
MH_134	STORAGE	96.19	6.81	0.0	
MH_136	STORAGE	95.84	6.96	0.0	
MH_150	STORAGE	101.69	4.31	0.0	
MH_151	STORAGE	100.85	5.16	0.0	
MH_152	STORAGE	100.94	5.21	0.0	
MH_154	STORAGE	99.53	5.67	0.0	
MH_156	STORAGE	96.43	7.12	0.0	
MH_158	STORAGE	95.02	4.88	0.0	
MH_160	STORAGE	95.22	3.58	0.0	
MH_164	STORAGE	98.35	5.30	0.0	
MH_170	STORAGE	105.54	5.46	0.0	
MH_172	STORAGE	103.10	4.53	0.0	
MH_174	STORAGE	102.55	5.75	0.0	
MH_176	STORAGE	102.08	4.92	0.0	
MH_178	STORAGE	96.73	8.19	0.0	
MH_179	STORAGE	99.63	6.52	0.0	
MH_360	STORAGE	93.10	5.78	0.0	
NWP	STORAGE	95.00	2.00	0.0	Yes
S_101-102	STORAGE	107.90	0.50	0.0	
S_102-151	STORAGE	107.90	0.50	0.0	
S_110-111	STORAGE	107.00	0.50	0.0	
S_111-112	STORAGE	103.40	0.50	0.0	
S_111-112_SCH	STORAGE	103.40	1.00	0.0	
S_113	STORAGE	104.15	0.50	0.0	
S_113-112	STORAGE	103.40	0.50	0.0	
S_114-116	STORAGE	105.60	0.50	0.0	
S_116-154	STORAGE	105.40	0.50	0.0	
S_120-124	STORAGE	102.80	0.50	0.0	
S_121-122	STORAGE	105.85	0.50	0.0	
S_123-124	STORAGE	105.10	0.50	0.0	
S_132-134	STORAGE	103.80	0.50	0.0	
S_134-136	STORAGE	103.00	0.50	0.0	
S_136-SWP	STORAGE	102.80	0.50	0.0	
S_154-156_SCH	STORAGE	105.20	0.50	0.0	
S_160-158	STORAGE	98.96	0.50	0.0	
S_164-156	STORAGE	103.65	0.50	0.0	
S_170-172	STORAGE	111.00	0.50	0.0	
S_170-172_COM	STORAGE	111.00	0.50	0.0	
S_170-172_PR	STORAGE	111.00	0.50	0.0	
S_174-176_MLT	STORAGE	107.53	0.50	0.0	
S_178-132	STORAGE	104.92	0.50	0.0	
S_Brazeau	STORAGE	101.20	1.50	0.0	
S_Drummond	STORAGE	101.20	1.50	0.0	
S_External-820_1	STORAGE	98.00	0.50	0.0	
S_External-820_2	STORAGE	98.00	0.50	0.0	
S_Mattamy_West	STORAGE	106.20	0.50	0.0	
SWP	STORAGE	95.10	4.40	0.0	

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
-100	776	772	CONDUIT	13.7	1.3919	0.0130
-101	772	771	CONDUIT	14.7	1.3621	0.0130
-102	771	770	CONDUIT	57.5	1.3923	0.0130
-103	770	753	CONDUIT	66.0	1.0001	0.0130
-104_1	748W	748E	CONDUIT	11.6	0.2404	0.0130
-104_2	748E	747	CONDUIT	56.3	0.2379	0.0130
-105	747	746	CONDUIT	12.2	0.9860	0.0130
-106	746	744	CONDUIT	68.8	0.2034	0.0130
-107	744	820	CONDUIT	14.3	0.4902	0.0130
-108_1	743W	743E	CONDUIT	9.4	1.4286	0.0130
-108_2	743E	744	CONDUIT	65.2	1.4347	0.0130
-109_1	723W	723E	CONDUIT	7.7	1.9207	0.0130
-109_2	723E	724	CONDUIT	73.0	1.9147	0.0130
-110	724	EX.102	CONDUIT	26.0	1.7233	0.0130
-160	700	701	CONDUIT	41.1	0.7374	0.0130
-27	820	EX.102	CONDUIT	119.6	0.1588	0.0130
-28	821	820	CONDUIT	124.1	0.1531	0.0130
-29	822	821	CONDUIT	124.1	0.1370	0.0130
-51	712N	711	CONDUIT	87.7	3.0448	0.0130
-52	711	710	CONDUIT	104.2	1.3248	0.0130
-53	710	720	CONDUIT	115.0	0.6128	0.0130
-54	720	701	CONDUIT	114.5	0.1921	0.0130
-55	703N	702	CONDUIT	76.2	2.6270	0.0130
-56	702	701	CONDUIT	112.5	1.5916	0.0130
-57	701	721	CONDUIT	75.5	0.5030	0.0130
-58	721	730	CONDUIT	35.4	0.7549	0.0130
-59	730	731	CONDUIT	11.2	0.6509	0.0130
-60	731	732	CONDUIT	97.0	0.2072	0.0130
-61	721	722	CONDUIT	104.9	0.1925	0.0130
-62	723W	722	CONDUIT	72.1	0.3411	0.0130
-63	722	732	CONDUIT	43.4	0.2466	0.0130
-64	748W	732	CONDUIT	78.0	0.5613	0.0130
-65	732	742	CONDUIT	78.6	0.1782	0.0130
-66	740	741	CONDUIT	78.5	3.0731	0.0130
-67	741	742	CONDUIT	73.3	0.9963	0.0130
-68	742	750S	CONDUIT	69.0	0.3190	0.0130
-69	743W	742	CONDUIT	73.8	0.7169	0.0130
-70	750E	760	CONDUIT	65.3	0.4594	0.0130
-71	760	761	CONDUIT	123.2	0.2874	0.0130
-72	761	753	CONDUIT	70.6	-0.3823	0.0130
-73	753	754	CONDUIT	51.7	0.1141	0.0130
-74	754	755	CONDUIT	78.9	0.1268	0.0130
754_2-755_2	754_2	755_2	CONDUIT	49.1	0.1221	0.0130
754-754_2	754	MH_360	CONDUIT	15.0	0.1333	0.0130
755_2-755	755_2	755	CONDUIT	15.0	0.0667	0.0130
-77	780	760	CONDUIT	65.2	0.2377	0.0130
-78	780	781	CONDUIT	16.1	0.5966	0.0130
-79	781	782	CONDUIT	103.7	0.2872	0.0130
-80	782	783	CONDUIT	14.3	0.3556	0.0130
-81	783	761	CONDUIT	67.2	0.2603	0.0130
-82	750S	751	CONDUIT	43.1	0.2321	0.0130
825-822	825	822	CONDUIT	168.1	0.1726	0.0130
-83	751	752	CONDUIT	42.8	0.1402	0.0130
-84	752	753	CONDUIT	35.7	0.1401	0.0130
-86	774	751	CONDUIT	119.9	2.6429	0.0130
-87	713S	714	CONDUIT	65.4	1.2541	0.0130
-88	714	790	CONDUIT	112.1	0.9632	0.0130
-89	790	705	CONDUIT	111.7	0.9489	0.0130
-90	705	704	CONDUIT	74.4	0.1856	0.0130
-91	704	776	CONDUIT	72.6	1.4053	0.0130
-92	801	800	CONDUIT	90.2	0.9646	0.0130
-93	800	704	CONDUIT	95.7	1.5355	0.0130
-94	713N	712E	CONDUIT	76.6	0.7053	0.0130
-95	712E	810	CONDUIT	110.0	0.4363	0.0130
-96	810	703S	CONDUIT	114.1	0.2718	0.0130
-97	703S	704	CONDUIT	75.8	1.4519	0.0130
-98	774	773	CONDUIT	13.6	0.6630	0.0130
-99	773	776	CONDUIT	45.7	1.1374	0.0130
C_152-151	S_152	S_150-151	CONDUIT	286.0	0.0524	0.0130
C_152-154	S_152	S_152-154	CONDUIT	23.4	0.6407	0.0130
C_154-156	S_152-154	S_154-156	CONDUIT	146.1	0.5476	0.0130
C_154-158	S_154-156	S_156-158	CONDUIT	294.0	0.5612	0.0130
C_156-NWP	S_156-158	S_158-NWP	CONDUIT	220.6	1.6510	0.0130

C_172-174_1	S_172	S_172-174	CONDUIT	77.7	0.1119	0.0130
C_172-174_2	S_172-174	S_174-176	CONDUIT	183.2	0.0546	0.0130
C_174-152	S_174-176	S_152	CONDUIT	239.0	0.5773	0.0130
C1_2	S_152	S_179-178	CONDUIT	10.7	1.4057	0.0130
C1_5	S_179-178	S_178	CONDUIT	231.2	0.4324	0.0130
Clarke_227-224	Clarke_227	Clarke_224	CONDUIT	361.2	1.7692	0.0130
Clarke_228-227	Clarke_228	Clarke_227	CONDUIT	239.3	2.0798	0.0130
Link247	EX.102	D102	CONDUIT	10.0	0.1600	0.0130
MH_101-102	MH_101	MH_102	CONDUIT	168.1	0.3504	0.0130
MH_102-151	MH_102	MH_151	CONDUIT	156.9	0.9610	0.0130
MH_110-111	MH_110	MH_111	CONDUIT	89.4	2.6958	0.0130
MH_111-112	MH_111	MH_112	CONDUIT	101.2	0.8996	0.0130
MH_112-710	MH_112	710	CONDUIT	84.3	1.1272	0.0130
MH_113-112	MH_113	MH_112	CONDUIT	140.0	0.7378	0.0130
MH_114-116	MH_114	MH_116	CONDUIT	170.2	0.3496	0.0130
MH_116-154	MH_116	MH_154	CONDUIT	171.2	0.3498	0.0130
MH_120-124	MH_120	MH_124	CONDUIT	139.2	0.1559	0.0130
MH_121-122	MH_121	MH_122	CONDUIT	64.0	0.1531	0.0130
MH_122-123	MH_122	MH_123	CONDUIT	75.4	0.1844	0.0130
MH_123-124	MH_123	MH_124	CONDUIT	149.8	0.1148	0.0130
MH_124-178	MH_124	MH_178	CONDUIT	122.1	0.1400	0.0130
MH_132-134	MH_132	MH_134	CONDUIT	131.1	0.1999	0.0130
MH_134-136	MH_134	MH_136	CONDUIT	173.3	0.2003	0.0130
MH_136-SWP	MH_136	SWP	CONDUIT	204.8	0.1597	0.0130
MH_150-151	MH_150	MH_151	CONDUIT	152.8	0.3507	0.0130
MH_151-152	MH_151	MH_179	CONDUIT	111.8	0.5449	0.0130
MH_152-154	MH_152	MH_154	CONDUIT	141.1	0.3508	0.0130
MH_154-156	MH_154	MH_156	CONDUIT	311.7	0.6897	0.0130
MH_156-158	MH_156	MH_158	CONDUIT	202.6	0.3999	0.0130
MH_158-NWP	MH_158	NWP	CONDUIT	14.5	0.1172	0.0130
MH_160-158	MH_160	MH_158	CONDUIT	135.8	0.1517	0.0130
MH_164-156	MH_164	MH_156	CONDUIT	95.4	0.3492	0.0130
MH_170-172	MH_170	MH_172	CONDUIT	188.5	1.0504	0.0130
MH_172-174	MH_172	MH_174	CONDUIT	184.4	0.3000	0.0130
MH_174-176	MH_174	MH_176	CONDUIT	156.7	0.2999	0.0130
MH_176-152	MH_176	MH_179	CONDUIT	161.4	0.2992	0.0130
MH_178-132	MH_178	MH_132	CONDUIT	185.6	0.1498	0.0130
MH_179-178	MH_179	MH_178	CONDUIT	245.7	0.1498	0.0130
MH_360-NWP	MH_360	754_2	CONDUIT	30.0	0.0667	0.0130
754-NWP	754_2	NWP	ORIFICE			
755-NWP	755_2	NWP	ORIFICE			
North_OR1	755	822	ORIFICE			
OR_Dry_Pond	Dry_Pond	MH_120	ORIFICE			
South_OR1	SWP	825	ORIFICE			
1	S_123-124	Dry_Pond	WEIR			
3	S_178	Dry_Pond	WEIR			
4	S_178	SWP	WEIR			
W_101-102	S_101-102	S_102-151	WEIR			
W_102-150	S_102-151	S_150-151	WEIR			
W_110-111	S_110-111	S_111-112	WEIR			
W_113	S_113	S_113-112	WEIR			
W_114-116	S_114-116	S_116-154	WEIR			
W_116-154	S_116-154	S_154-156	WEIR			
W_120-Dry_Pond	S_120-124	Dry_Pond	WEIR			
W_121-124	S_121-122	S_123-124	WEIR			
W_132-134	S_132-134	S_134-136	WEIR			
W_134-138	S_134-136	S_136-SWP	WEIR			
W_138-SWP	S_136-SWP	SWP	WEIR			
W_150-Dry_Pond	S_150-151	Dry_Pond	WEIR			
W_158-NWP	S_158-NWP	NWP	WEIR			
W_158-SWP	S_158-NWP	SWP	WEIR			
W_159-NWP	S_160-158	NWP	WEIR			
W_164-156	S_164-156	S_156-158	WEIR			
W_178-132	S_178-132	S_132-134	WEIR			
W_External-820_1_OF2	S_External-820_1 OF2		WEIR			
W_External-820_2_1	S_External-820_2	S_External-820_1	WEIR			
W2	S_Mattamy_West	Mattamy_West_DryPond	WEIR			
O_101-102	S_101-102	MH_101	OUTLET			
O_102-151	S_102-151	MH_102	OUTLET			
O_110-111	S_110-111	MH_110	OUTLET			
O_111-112	S_111-112	MH_111	OUTLET			
O_111-112_SCH	S_111-112_SCH	MH_112	OUTLET			
O_111-710	S_111-112	710	OUTLET			
O_113	S_113	MH_114	OUTLET			
O_113-112	S_113-112	MH_113	OUTLET			
O_113-710	S_113-112	710	OUTLET			
O_114-116	S_114-116	MH_114	OUTLET			
O_116-154	S_116-154	MH_116	OUTLET			
O_120-124	S_120-124	MH_120	OUTLET			

O_121-122	S_121-122	MH_121	OUTLET
O_123-124	S_123-124	MH_123	OUTLET
O_132-134	S_132-134	MH_132	OUTLET
O_134-136	S_134-136	MH_134	OUTLET
O_136-SWP	S_136-SWP	MH_136	OUTLET
O_150-151	S_150-151	MH_150	OUTLET
O_152-154	S_152-154	MH_152	OUTLET
O_154-156	S_154-156	MH_154	OUTLET
O_154-156_SCH	S_154-156_SCH	MH_154	OUTLET
O_156-158	S_156-158	MH_156	OUTLET
O_160-158	S_160-158	MH_160	OUTLET
O_164-156	S_164-156	MH_164	OUTLET
O_171-172	S_170-172	MH_170	OUTLET
O_171-172_COM	S_170-172_COM	MH_170	OUTLET
O__171-172_PR	S_170-172_PR	MH_170	OUTLET
O_172-174	S_172-174	MH_172	OUTLET
O_174-176	S_174-176	MH_174	OUTLET
O_174-176_MLT	S_174-176_MLT	MH_174	OUTLET
O_178-132	S_178-132	MH_178	OUTLET
O_179-178	S_179-178	MH_179	OUTLET
O_Brazeau	S_Brazeau	OF_Brazeau	OUTLET
O_Drummond	S_Drummond	OF_Drummond	OUTLET
O_External-820_1	S_External-820_1	821	OUTLET
O_External-820_2	S_External-820_2	SWP	OUTLET
O_Mattamy_West	S_Mattamy_West	Clarke_227	OUTLET
O_Mattamy_West_DryPond	Mattamy_West_DryPond	Clarke_227	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
-100	CIRCULAR	0.76	0.46	0.19	0.76	1	1.37
-101	CIRCULAR	0.76	0.46	0.19	0.76	1	1.36
-102	CIRCULAR	0.76	0.46	0.19	0.76	1	1.37
-103	CIRCULAR	0.91	0.66	0.23	0.91	1	1.89
-104_1	CIRCULAR	0.61	0.29	0.15	0.61	1	0.31
-104_2	CIRCULAR	0.61	0.29	0.15	0.61	1	0.31
-105	CIRCULAR	0.61	0.29	0.15	0.61	1	0.64
-106	CIRCULAR	0.61	0.29	0.15	0.61	1	0.29
-107	CIRCULAR	0.69	0.37	0.17	0.69	1	0.61
-108_1	CIRCULAR	0.46	0.16	0.11	0.46	1	0.36
-108_2	CIRCULAR	0.46	0.16	0.11	0.46	1	0.36
-109_1	CIRCULAR	0.46	0.16	0.11	0.46	1	0.41
-109_2	CIRCULAR	0.46	0.16	0.11	0.46	1	0.41
-110	CIRCULAR	0.46	0.16	0.11	0.46	1	0.39
-160	CIRCULAR	0.30	0.07	0.08	0.30	1	0.09
-27	CIRCULAR	1.83	2.63	0.46	1.83	1	4.78
-28	CIRCULAR	1.83	2.63	0.46	1.83	1	4.69
-29	CIRCULAR	1.83	2.63	0.46	1.83	1	4.44
-51	CIRCULAR	0.38	0.11	0.10	0.38	1	0.32
-52	CIRCULAR	0.46	0.16	0.11	0.46	1	0.34
-53	CIRCULAR	0.76	0.46	0.19	0.76	1	0.91
-54	CIRCULAR	1.22	1.17	0.30	1.22	1	1.78
-55	CIRCULAR	0.30	0.07	0.08	0.30	1	0.16
-56	CIRCULAR	0.38	0.11	0.10	0.38	1	0.23
-57	CIRCULAR	1.22	1.17	0.30	1.22	1	2.88
-58	CIRCULAR	0.30	0.07	0.08	0.30	1	0.09
-59	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-60	CIRCULAR	0.53	0.22	0.13	0.53	1	0.20
-61	CIRCULAR	1.37	1.48	0.34	1.37	1	2.45
-62	CIRCULAR	0.38	0.11	0.10	0.38	1	0.11
-63	CIRCULAR	1.52	1.82	0.38	1.52	1	3.66
-64	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-65	CIRCULAR	1.52	1.82	0.38	1.52	1	3.11
-66	CIRCULAR	0.30	0.07	0.08	0.30	1	0.18
-67	CIRCULAR	0.30	0.07	0.08	0.30	1	0.10
-68	CIRCULAR	1.52	1.82	0.38	1.52	1	4.17
-69	CIRCULAR	0.30	0.07	0.08	0.30	1	0.09
-70	CIRCULAR	0.46	0.16	0.11	0.46	1	0.20
-71	CIRCULAR	0.61	0.29	0.15	0.61	1	0.34
-72	CIRCULAR	0.91	0.66	0.23	0.91	1	1.17
-73	CIRCULAR	1.83	2.63	0.46	1.83	1	4.05
-74	CIRCULAR	1.83	2.63	0.46	1.83	1	4.27
754_2-755_2	CIRCULAR	1.20	1.13	0.30	1.20	1	1.36
754-754_2	CIRCULAR	1.80	2.54	0.45	1.80	1	4.20
755_2-755	CIRCULAR	0.60	0.28	0.15	0.60	1	0.16

-77	CIRCULAR	0.46	0.16	0.11	0.46	1	0.14
-78	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-79	CIRCULAR	0.38	0.11	0.10	0.38	1	0.10
-80	CIRCULAR	0.38	0.11	0.10	0.38	1	0.11
-81	CIRCULAR	0.53	0.22	0.13	0.53	1	0.23
-82	CIRCULAR	1.83	2.63	0.46	1.83	1	5.78
825-822	CIRCULAR	1.83	2.63	0.46	1.83	1	4.98
-83	CIRCULAR	1.83	2.63	0.46	1.83	1	4.49
-84	CIRCULAR	1.83	2.63	0.46	1.83	1	4.49
-86	CIRCULAR	0.30	0.07	0.08	0.30	1	0.16
-87	CIRCULAR	0.30	0.07	0.08	0.30	1	0.11
-88	CIRCULAR	0.30	0.07	0.08	0.30	1	0.10
-89	CIRCULAR	0.53	0.22	0.13	0.53	1	0.44
-90	CIRCULAR	0.76	0.46	0.19	0.76	1	0.50
-91	CIRCULAR	0.76	0.46	0.19	0.76	1	1.38
-92	CIRCULAR	0.38	0.11	0.10	0.38	1	0.18
-93	CIRCULAR	0.46	0.16	0.11	0.46	1	0.37
-94	CIRCULAR	0.38	0.11	0.10	0.38	1	0.15
-95	CIRCULAR	0.46	0.16	0.11	0.46	1	0.20
-96	CIRCULAR	0.53	0.22	0.13	0.53	1	0.23
-97	CIRCULAR	0.53	0.22	0.13	0.53	1	0.54
-98	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-99	CIRCULAR	0.30	0.07	0.08	0.30	1	0.11
C_152-151	SUB_STREET	0.28	2.79	0.14	22.00	1	1.32
C_152-154	SUB_STREET	0.28	2.79	0.14	22.00	1	4.61
C_154-156	SUB_STREET	0.28	2.79	0.14	22.00	1	4.26
C_154-158	SUB_STREET	0.28	2.79	0.14	22.00	1	4.31
C_156-NWP	SUB_STREET	0.28	2.79	0.14	22.00	1	7.40
C_172-174_1	GBR	0.26	6.41	0.17	41.50	1	5.03
C_172-174_2	GBR	0.26	6.41	0.17	41.50	1	3.51
C_174-152	GBR	0.26	6.41	0.17	41.50	1	11.41
C1_2	GBR	0.26	6.41	0.17	41.50	1	17.81
C1_5	GBR	0.26	6.41	0.17	41.50	1	9.88
Clarke_227-224	CIRCULAR	1.20	1.13	0.30	1.20	1	5.19
Clarke_228-227	CIRCULAR	0.82	0.53	0.21	0.82	1	2.07
Link247	CIRCULAR	1.83	2.63	0.46	1.83	1	4.80
MH_101-102	CIRCULAR	0.90	0.64	0.23	0.90	1	1.07
MH_102-151	CIRCULAR	0.90	0.64	0.23	0.90	1	1.77
MH_110-111	CIRCULAR	0.45	0.16	0.11	0.45	1	0.47
MH_111-112	CIRCULAR	0.68	0.36	0.17	0.68	1	0.80
MH_112-710	CIRCULAR	0.68	0.36	0.17	0.68	1	0.89
MH_113-112	CIRCULAR	0.53	0.22	0.13	0.53	1	0.37
MH_114-116	CIRCULAR	0.97	0.75	0.24	0.97	1	1.33
MH_116-154	CIRCULAR	1.20	1.13	0.30	1.20	1	2.31
MH_120-124	CIRCULAR	1.20	1.13	0.30	1.20	1	1.54
MH_121-122	CIRCULAR	0.75	0.44	0.19	0.75	1	0.44
MH_122-123	CIRCULAR	0.75	0.44	0.19	0.75	1	0.48
MH_123-124	CIRCULAR	0.75	0.44	0.19	0.75	1	0.38
MH_124-178	CIRCULAR	1.20	1.13	0.30	1.20	1	1.46
MH_132-134	CIRCULAR	1.95	2.99	0.49	1.95	1	6.36
MH_134-136	CIRCULAR	1.95	2.99	0.49	1.95	1	6.37
MH_136-SWP	CIRCULAR	1.95	2.99	0.49	1.95	1	5.69
MH_150-151	CIRCULAR	0.90	0.64	0.23	0.90	1	1.07
MH_151-152	CIRCULAR	1.20	1.13	0.30	1.20	1	2.88
MH_152-154	CIRCULAR	0.53	0.22	0.13	0.53	1	0.25
MH_154-156	CIRCULAR	1.20	1.13	0.30	1.20	1	3.24
MH_156-158	CIRCULAR	1.80	2.54	0.45	1.80	1	7.27
MH_158-NWP	CIRCULAR	1.80	2.54	0.45	1.80	1	3.94
MH_160-158	CIRCULAR	1.35	1.43	0.34	1.35	1	2.08
MH_164-156	CIRCULAR	0.90	0.64	0.23	0.90	1	1.07
MH_170-172	CIRCULAR	0.90	0.64	0.23	0.90	1	1.86
MH_172-174	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_174-176	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_176-152	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_178-132	CIRCULAR	1.95	2.99	0.49	1.95	1	5.51
MH_179-178	CIRCULAR	1.80	2.54	0.45	1.80	1	4.45
MH_360-NWP	CIRCULAR	1.20	1.13	0.30	1.20	1	1.01

```
****************
Transect Summary
****************

Transect GBR
Area:
           0.0002     0.0008     0.0018     0.0032     0.0051
           0.0073     0.0099     0.0130     0.0164     0.0203
           0.0245     0.0292     0.0343     0.0401     0.0532
```

```
            0.0756     0.1002     0.1249     0.1496     0.1742
            0.1989     0.2235     0.2482     0.2729     0.2975
            0.3222     0.3468     0.3715     0.3962     0.4209
            0.4460     0.4715     0.4974     0.5237     0.5505
            0.5776     0.6051     0.6331     0.6614     0.6902
            0.7193     0.7489     0.7789     0.8092     0.8400
            0.8712     0.9028     0.9348     0.9672     1.0000
  Hrad:
            0.0148     0.0296     0.0444     0.0592     0.0741
            0.0889     0.1037     0.1185     0.1333     0.1481
            0.1629     0.1777     0.1925     0.1451     0.0889
            0.0921     0.1222     0.1522     0.1821     0.2121
            0.2420     0.2720     0.3019     0.3318     0.3616
            0.3915     0.4213     0.4511     0.4809     0.5106
            0.5398     0.5684     0.5963     0.6237     0.6505
            0.6768     0.7026     0.7280     0.7529     0.7773
            0.8013     0.8249     0.8480     0.8708     0.8932
            0.9153     0.9369     0.9583     0.9793     1.0000
  Width:
            0.0123     0.0246     0.0369     0.0492     0.0614
            0.0737     0.0860     0.0983     0.1106     0.1229
            0.1352     0.1475     0.1598     0.2496     0.5446
            0.7470     0.7470     0.7470     0.7470     0.7470
            0.7470     0.7470     0.7470     0.7470     0.7470
            0.7470     0.7470     0.7470     0.7470     0.7542
            0.7665     0.7788     0.7911     0.8034     0.8157
            0.8280     0.8402     0.8525     0.8648     0.8771
            0.8894     0.9017     0.9140     0.9263     0.9386
            0.9508     0.9631     0.9754     0.9877     1.0000

  Transect SUB_STREET
  Area:
            0.0004     0.0016     0.0035     0.0062     0.0097
            0.0140     0.0190     0.0248     0.0314     0.0388
            0.0469     0.0559     0.0656     0.0760     0.0873
            0.0993     0.1121     0.1257     0.1400     0.1552
            0.1711     0.1877     0.2051     0.2224     0.2398
            0.2571     0.2747     0.2935     0.3134     0.3344
            0.3566     0.3800     0.4046     0.4303     0.4572
            0.4852     0.5144     0.5448     0.5763     0.6090
            0.6429     0.6779     0.7141     0.7515     0.7900
            0.8296     0.8705     0.9125     0.9557     1.0000
  Hrad:
            0.0198     0.0397     0.0595     0.0794     0.0992
            0.1190     0.1389     0.1587     0.1786     0.1984
            0.2183     0.2381     0.2579     0.2778     0.2976
            0.3175     0.3373     0.3571     0.3770     0.3968
            0.4167     0.4365     0.4685     0.5075     0.5464
            0.5852     0.6235     0.6587     0.6906     0.7196
            0.7460     0.7700     0.7919     0.8119     0.8303
            0.8472     0.8629     0.8774     0.8909     0.9035
            0.9154     0.9266     0.9372     0.9473     0.9569
            0.9662     0.9750     0.9836     0.9919     1.0000
  Width:
            0.0173     0.0345     0.0518     0.0691     0.0864
            0.1036     0.1209     0.1382     0.1555     0.1727
            0.1900     0.2073     0.2245     0.2418     0.2591
            0.2764     0.2936     0.3109     0.3282     0.3455
            0.3627     0.3800     0.3864     0.3864     0.3864
            0.3864     0.4041     0.4300     0.4559     0.4818
            0.5077     0.5336     0.5595     0.5855     0.6114
            0.6373     0.6632     0.6891     0.7150     0.7409
            0.7668     0.7927     0.8186     0.8445     0.8705
            0.8964     0.9223     0.9482     0.9741     1.0000


  ************************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ************************************************************

  ***************
  Analysis Options
  ***************
  Flow Units ..... CMS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
```

```
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Starting Date ............ 01/01/2000 00:00:00
Ending Date .............. 01/03/2000 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	10.705	71.708
Evaporation Loss	0.000	0.000
Infiltration Loss	3.708	24.834
Surface Runoff	6.963	46.643
Final Storage	0.120	0.803
Continuity Error (%)	-0.799	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	6.963	69.634
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	1.398	13.976
External Outflow	8.251	82.510
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.921	9.211
Final Stored Volume	1.026	10.261
Continuity Error (%)	0.055	

```
************************
Highest Continuity Errors
************************
Node S_152 (27.02%)
Node S_178 (3.70%)
Node S_158-NWP (3.54%)
Node S_156-158 (-1.50%)
Node S_152-154 (-1.47%)


*************************
Time-Step Critical Elements
*************************
None


*******************************
Highest Flow Instability Indexes
*******************************
Link North_OR1 (109)
Link O_171-172_COM (4)
Link O__171-172_PR (4)
Link O_172-174 (4)
Link O_154-156 (3)


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
```

```
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00
```

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A13_1	71.71	0.00	0.00	46.27	26.07	0.49	0.36	0.364
A13_2	71.71	0.00	0.00	48.92	23.11	0.32	0.15	0.322
A5_part	71.71	0.00	0.00	59.30	12.47	1.29	0.28	0.174
A8_part	71.71	0.00	0.00	60.07	11.69	1.78	0.37	0.163
AREA_1B	71.71	0.00	0.00	44.67	27.14	0.97	0.47	0.378
Brazeau	71.71	0.00	0.00	16.65	54.71	13.08	10.17	0.763
Drummond	71.71	0.00	0.00	16.65	54.71	11.03	8.58	0.763
EXTERNAL-820_1	71.71	0.00	0.00	12.65	58.82	0.79	0.64	0.820
EXTERNAL-820_2	71.71	0.00	0.00	12.65	58.80	0.98	0.78	0.820
Mattamy_West	71.71	0.00	0.00	16.65	54.71	1.97	1.53	0.763
MH_101-102	71.71	0.00	0.00	16.65	54.71	1.88	1.46	0.763
MH_102-151	71.71	0.00	0.00	16.65	54.71	2.06	1.60	0.763
MH_110-111	71.71	0.00	0.00	16.65	54.71	0.43	0.34	0.763
MH_111-112	71.71	0.00	0.00	16.65	54.71	0.39	0.31	0.763
MH_111-112_SCH	71.71	0.00	0.00	10.91	60.30	1.46	1.01	0.841
MH_113-112_1	71.71	0.00	0.00	16.65	54.71	0.47	0.37	0.763
MH_113-112_2	71.71	0.00	0.00	16.65	54.71	0.25	0.19	0.763
MH_114-116	71.71	0.00	0.00	16.65	54.71	2.14	1.67	0.763
MH_116-154	71.71	0.00	0.00	16.65	54.71	1.80	1.40	0.763
MH_120-124	71.71	0.00	0.00	16.65	54.71	1.54	1.20	0.763
MH_121-122	71.71	0.00	0.00	16.65	54.71	1.06	0.82	0.763
MH_123-124	71.71	0.00	0.00	16.65	54.71	0.87	0.68	0.763
MH_132-134	71.71	0.00	0.00	16.65	54.71	1.91	1.48	0.763
MH_134-136	71.71	0.00	0.00	16.65	54.71	1.77	1.38	0.763
MH_136-SWP	71.71	0.00	0.00	38.02	33.62	0.96	0.39	0.469
MH_150-151	71.71	0.00	0.00	16.65	54.71	0.59	0.46	0.763
MH_152-154	71.71	0.00	0.00	16.65	54.71	0.45	0.35	0.763
MH_154-156	71.71	0.00	0.00	16.65	54.71	0.68	0.53	0.763
MH_154-156_SCH	71.71	0.00	0.00	10.91	60.30	1.32	0.91	0.841
MH_156-158	71.71	0.00	0.00	16.65	54.71	0.61	0.48	0.763
MH_160-158	71.71	0.00	0.00	16.65	54.71	1.65	1.29	0.763
MH_164-156	71.71	0.00	0.00	16.65	54.71	1.90	1.48	0.763
MH_170-172	71.71	0.00	0.00	16.65	54.71	0.50	0.39	0.763
MH_170-172_COM	71.71	0.00	0.00	3.12	67.77	1.44	0.99	0.945
MH_170-172_PR	71.71	0.00	0.00	3.10	67.82	1.74	1.22	0.946
MH_172-174	71.71	0.00	0.00	6.08	64.93	0.70	0.52	0.905
MH_174-176	71.71	0.00	0.00	6.08	64.93	0.67	0.50	0.905
MH_174-176_MLT	71.71	0.00	0.00	3.06	67.88	0.61	0.44	0.947
MH_178-132	71.71	0.00	0.00	16.65	54.71	1.37	1.07	0.763
MH_179-178	71.71	0.00	0.00	6.07	64.93	0.69	0.51	0.906
North_Pond	71.71	0.00	0.00	17.57	54.79	1.40	0.99	0.764
South_Pond	71.71	0.00	0.00	17.74	54.67	1.62	1.10	0.762

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
723E	JUNCTION	0.01	0.20	95.09	0 01:08	0.20
743E	JUNCTION	0.01	0.25	95.24	0 01:24	0.25
748E	JUNCTION	0.01	0.29	95.61	0 01:25	0.29
S_150-151	JUNCTION	0.00	0.19	106.19	0 01:12	0.19
S_152	JUNCTION	0.00	0.04	106.19	0 01:15	0.04
S_152-154	JUNCTION	0.00	0.08	106.08	0 01:10	0.08
S_154-156	JUNCTION	0.00	0.19	105.39	0 01:12	0.19
S_156-158	JUNCTION	0.00	0.17	103.72	0 01:13	0.17
S_158-NWP	JUNCTION	0.00	0.28	100.18	0 01:15	0.28
S_172	JUNCTION	0.00	0.00	107.72	0 00:00	0.00
S_172-174	JUNCTION	0.00	0.08	107.71	0 01:11	0.08

S_174-176	JUNCTION	0.00	0.07	107.60	0	01:11	0.07
S_178	JUNCTION	0.00	0.02	105.02	0	01:12	0.02
S_179-178	JUNCTION	0.00	0.08	106.08	0	01:11	0.08
Clarke_224	OUTFALL	3.24	3.24	93.61	0	00:00	3.24
D102	OUTFALL	1.64	1.64	93.30	0	00:00	1.64
OF_Brazeau	OUTFALL	0.00	0.00	101.20	0	00:00	0.00
OF_Drummond	OUTFALL	0.00	0.00	101.20	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	97.90	0	00:00	0.00
700	STORAGE	0.00	0.08	96.70	0	01:06	0.08
701	STORAGE	0.02	1.03	96.68	0	01:23	1.03
702	STORAGE	0.01	0.15	98.88	0	01:16	0.15
703N	STORAGE	0.00	0.10	100.97	0	01:09	0.10
703S	STORAGE	0.01	0.20	100.11	0	01:08	0.20
704	STORAGE	0.01	0.34	98.62	0	01:05	0.34
705	STORAGE	0.01	0.37	98.87	0	01:04	0.37
710	STORAGE	0.02	1.40	98.74	0	01:19	1.40
711	STORAGE	0.01	0.18	99.13	0	01:03	0.18
712E	STORAGE	0.01	0.19	101.48	0	01:04	0.19
712N	STORAGE	0.00	0.11	101.76	0	01:03	0.11
713N	STORAGE	0.00	0.12	102.06	0	01:17	0.12
713S	STORAGE	0.00	0.11	102.13	0	01:02	0.11
714	STORAGE	0.00	0.14	101.29	0	01:03	0.14
720	STORAGE	0.03	0.95	97.01	0	01:23	0.95
721	STORAGE	0.04	1.37	96.55	0	01:23	1.37
722	STORAGE	0.10	1.83	96.32	0	01:24	1.83
723W	STORAGE	0.00	0.08	95.12	0	01:34	0.08
724	STORAGE	0.09	0.37	93.79	0	01:00	0.37
730	STORAGE	0.00	0.14	96.36	0	01:24	0.14
731	STORAGE	0.01	0.40	96.32	0	01:24	0.40
732	STORAGE	0.14	2.26	96.29	0	01:27	2.26
740	STORAGE	0.00	0.00	99.38	0	00:00	0.00
741	STORAGE	0.00	0.12	97.08	0	01:03	0.12
742	STORAGE	0.16	2.34	96.23	0	01:27	2.34
743W	STORAGE	0.00	0.14	95.27	0	01:27	0.14
744	STORAGE	0.23	0.54	93.61	0	01:24	0.54
746	STORAGE	0.01	0.33	95.30	0	01:27	0.33
747	STORAGE	0.05	0.28	95.35	0	01:25	0.28
748W	STORAGE	0.01	0.27	95.61	0	01:25	0.27
750E	STORAGE	0.00	0.13	96.17	0	01:28	0.13
750S	STORAGE	0.21	2.76	96.17	0	01:27	2.76
751	STORAGE	0.22	2.84	96.15	0	01:27	2.84
752	STORAGE	0.27	2.88	96.13	0	01:27	2.88
753	STORAGE	0.34	2.94	96.12	0	01:27	2.94
754	STORAGE	0.41	2.97	96.08	0	01:27	2.97
754_2	STORAGE	0.44	2.97	96.05	0	01:30	2.97
755	STORAGE	0.53	3.08	96.06	0	01:27	3.08
755_2	STORAGE	0.51	3.03	96.04	0	01:32	3.03
760	STORAGE	0.01	0.57	96.16	0	01:28	0.57
761	STORAGE	0.34	1.62	96.13	0	01:27	1.62
770	STORAGE	0.10	1.74	96.21	0	01:27	1.74
771	STORAGE	0.01	0.40	96.25	0	01:27	0.40
772	STORAGE	0.01	0.38	97.01	0	01:06	0.38
773	STORAGE	0.00	0.10	98.42	0	01:10	0.10
774	STORAGE	0.00	0.11	98.31	0	01:00	0.11
776	STORAGE	0.01	0.39	97.64	0	01:06	0.39
780	STORAGE	0.01	0.37	96.17	0	01:29	0.37
781	STORAGE	0.01	0.62	96.17	0	01:28	0.62
782	STORAGE	0.03	0.93	96.15	0	01:28	0.93
783	STORAGE	0.05	1.12	96.14	0	01:28	1.12
790	STORAGE	0.01	0.23	100.06	0	01:03	0.23
800	STORAGE	0.01	0.17	100.49	0	01:05	0.17
801	STORAGE	0.01	0.15	101.39	0	01:04	0.14
810	STORAGE	0.01	0.30	101.02	0	01:07	0.30
820	STORAGE	1.63	1.71	93.38	0	01:21	1.71
821	STORAGE	1.54	1.67	93.44	0	01:20	1.67
822	STORAGE	1.24	1.42	93.49	0	01:21	1.42
825	STORAGE	0.18	0.40	95.76	0	02:47	0.40
Clarke_227	STORAGE	0.01	0.33	97.09	0	01:24	0.33
Clarke_228	STORAGE	0.00	0.00	102.11	0	00:00	0.00
Dry_Pond	STORAGE	0.06	1.02	101.02	0	01:20	1.02
EX.102	STORAGE	1.92	1.94	93.31	0	01:21	1.94
Mattamy_West_DryPond	STORAGE	0.00	0.92	102.10	0	01:15	0.91
MH_101	STORAGE	0.01	0.60	104.08	0	01:11	0.60
MH_102	STORAGE	0.02	0.85	103.75	0	01:20	0.85
MH_110	STORAGE	0.00	0.21	102.65	0	01:05	0.21
MH_111	STORAGE	0.01	0.49	100.29	0	01:19	0.48
MH_112	STORAGE	0.02	1.27	100.14	0	01:19	1.27
MH_113	STORAGE	0.01	0.43	100.49	0	01:20	0.43
MH_114	STORAGE	0.01	0.60	101.81	0	01:05	0.60

MH_116	STORAGE	0.02	0.87	101.26	0	01:13	0.87
MH_120	STORAGE	0.04	1.65	99.53	0	01:20	1.65
MH_121	STORAGE	0.02	1.28	102.09	0	01:13	1.27
MH_122	STORAGE	0.02	1.10	101.82	0	01:13	1.09
MH_123	STORAGE	0.03	1.62	101.53	0	01:13	1.62
MH_124	STORAGE	0.05	1.83	99.49	0	01:19	1.83
MH_132	STORAGE	0.06	2.49	98.94	0	01:20	2.49
MH_134	STORAGE	0.08	2.28	98.47	0	01:20	2.28
MH_136	STORAGE	0.16	2.09	97.93	0	01:21	2.09
MH_150	STORAGE	0.01	0.28	101.96	0	01:20	0.28
MH_151	STORAGE	0.02	0.92	101.76	0	01:17	0.92
MH_152	STORAGE	0.01	0.32	101.26	0	01:20	0.32
MH_154	STORAGE	0.02	0.78	100.30	0	01:14	0.78
MH_156	STORAGE	0.02	0.91	97.33	0	01:15	0.91
MH_158	STORAGE	0.07	1.37	96.39	0	01:00	1.37
MH_160	STORAGE	0.05	1.23	96.45	0	01:01	1.22
MH_164	STORAGE	0.01	0.64	98.99	0	01:11	0.64
MH_170	STORAGE	0.02	1.33	106.87	0	01:12	1.33
MH_172	STORAGE	0.02	0.88	103.98	0	01:12	0.88
MH_174	STORAGE	0.03	1.04	103.58	0	01:14	1.04
MH_176	STORAGE	0.03	1.00	103.08	0	01:15	1.00
MH_178	STORAGE	0.06	2.61	99.33	0	01:19	2.61
MH_179	STORAGE	0.04	1.79	101.42	0	01:17	1.79
MH_360	STORAGE	0.42	2.97	96.07	0	01:30	2.97
NWP	STORAGE	0.06	0.98	95.98	0	01:56	0.98
S_101-102	STORAGE	0.00	0.33	108.23	0	01:11	0.33
S_102-151	STORAGE	0.00	0.32	108.21	0	01:11	0.32
S_110-111	STORAGE	0.00	0.35	107.35	0	01:11	0.35
S_111-112	STORAGE	0.00	0.25	103.65	0	01:13	0.25
S_111-112_SCH	STORAGE	0.18	0.41	103.81	0	01:17	0.41
S_113	STORAGE	0.00	0.03	104.18	0	01:10	0.03
S_113-112	STORAGE	0.00	0.33	103.73	0	01:13	0.33
S_114-116	STORAGE	0.00	0.32	105.92	0	01:10	0.32
S_116-154	STORAGE	0.00	0.21	105.61	0	01:11	0.21
S_120-124	STORAGE	0.00	0.27	103.07	0	01:10	0.26
S_121-122	STORAGE	0.00	0.04	105.89	0	01:10	0.04
S_123-124	STORAGE	0.00	0.34	105.44	0	01:10	0.33
S_132-134	STORAGE	0.00	0.35	104.15	0	01:11	0.35
S_134-136	STORAGE	0.00	0.34	103.34	0	01:11	0.33
S_136-SWP	STORAGE	0.00	0.32	103.12	0	01:12	0.32
S_154-156_SCH	STORAGE	0.00	0.41	105.61	0	01:17	0.41
S_160-158	STORAGE	0.00	0.35	99.31	0	01:10	0.35
S_164-156	STORAGE	0.00	0.35	104.00	0	01:10	0.35
S_170-172	STORAGE	0.00	0.01	111.01	0	01:10	0.01
S_170-172_COM	STORAGE	0.00	0.46	111.46	0	01:14	0.46
S_170-172_PR	STORAGE	0.00	0.46	111.46	0	01:14	0.46
S_174-176_MLT	STORAGE	0.00	0.17	107.70	0	01:13	0.17
S_178-132	STORAGE	0.00	0.35	105.27	0	01:10	0.35
S_Brazeau	STORAGE	0.14	1.04	102.24	0	02:18	1.04
S_Drummond	STORAGE	0.12	0.88	102.08	0	02:18	0.88
S_External-820_1	STORAGE	0.00	0.30	98.30	0	01:11	0.30
S_External-820_2	STORAGE	0.00	0.30	98.30	0	01:11	0.30
S_Mattamy_West	STORAGE	0.00	0.35	106.55	0	01:11	0.35
SWP	STORAGE	0.80	1.57	96.67	0	02:46	1.57

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent	
723E	JUNCTION	0.136	0.160	0 01:08	0.397	0.505	0.034	
743E	JUNCTION	0.162	0.199	0 01:24	0.402	0.541	-0.006	
748E	JUNCTION	0.077	0.138	0 01:24	0.291	0.419	-0.008	
S_150-151	JUNCTION	0.457	1.652	0 01:10	0.588	1.08	-0.687	
S_152	JUNCTION	0.000	0.105	0 01:14	0	0.0525	37.025	
S_152-154	JUNCTION	0.350	0.357	0 01:10	0.45	0.462	-1.447	
S_154-156	JUNCTION	0.527	1.961	0 01:10	0.677	1.31	-0.753	
S_156-158	JUNCTION	0.475	2.374	0 01:11	0.611	1.51	-1.474	
S_158-NWP	JUNCTION	0.000	1.964	0 01:13	0	0.971	3.673	
S_172	JUNCTION	0.000	0.000	0 00:00	0	0	0.000	ltr
S_172-174	JUNCTION	0.525	0.525	0 01:10	0.703	0.703	-0.614	
S_174-176	JUNCTION	0.498	0.539	0 01:09	0.667	0.693	-0.777	
S_178	JUNCTION	0.000	0.101	0 01:11	0	0.0501	3.839	

S_179-178	JUNCTION	0.514	0.530	0	01:10	0.688	0.712	-0.515	
Clarke_224	OUTFALL	0.000	0.880	0	01:24	0	1.97	0.000	
D102	OUTFALL	0.000	3.079	0	01:22	0	53.3	0.000	
OF_Brazeau	OUTFALL	0.373	0.683	0	01:30	1.78	14.9	0.000	
OF_Drummond	OUTFALL	0.278	0.538	0	01:20	1.29	12.3	0.000	
OF2	OUTFALL	0.000	0.257	0	01:11	0	0.0603	0.000	
700	STORAGE	0.012	0.012	0	00:52	0.0375	0.0375	0.347	
701	STORAGE	0.121	2.071	0	01:18	0.322	5.98	0.063	
702	STORAGE	0.034	0.074	0	01:09	0.124	0.288	-0.002	
703N	STORAGE	0.040	0.040	0	00:59	0.163	0.163	-0.001	
703S	STORAGE	0.032	0.145	0	01:07	0.138	0.6	-0.001	
704	STORAGE	0.036	0.472	0	01:05	0.109	1.87	-0.002	
705	STORAGE	0.034	0.182	0	01:03	0.16	0.736	-0.004	
710	STORAGE	0.055	1.299	0	01:19	0.229	3.22	-0.052	
711	STORAGE	0.045	0.102	0	01:03	0.168	0.374	0.460	
712E	STORAGE	0.040	0.072	0	01:04	0.157	0.293	0.026	
712N	STORAGE	0.057	0.057	0	00:57	0.206	0.206	0.031	
713N	STORAGE	0.032	0.032	0	00:58	0.135	0.135	-0.004	
713S	STORAGE	0.030	0.030	0	01:01	0.116	0.116	-0.002	
714	STORAGE	0.013	0.043	0	01:02	0.037	0.153	-0.003	
720	STORAGE	0.587	1.871	0	01:19	2.13	5.35	0.188	
721	STORAGE	0.139	2.150	0	01:14	0.373	6.35	0.790	
722	STORAGE	0.012	2.141	0	01:13	0.0691	6.37	-0.554	
723W	STORAGE	0.024	0.024	0	00:55	0.108	0.108	0.000	
724	STORAGE	0.040	0.197	0	01:00	0.0504	0.555	0.045	
730	STORAGE	0.022	0.029	0	01:23	0.112	0.113	0.001	
731	STORAGE	0.053	0.080	0	01:24	0.218	0.331	0.766	
732	STORAGE	0.144	2.321	0	01:10	0.42	7.15	-0.214	
740	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
741	STORAGE	0.031	0.031	0	00:58	0.13	0.13	-0.002	
742	STORAGE	0.097	2.370	0	01:11	0.269	7.44	0.245	
743W	STORAGE	0.000	0.063	0	01:27	0	0.139	0.019	
744	STORAGE	0.039	0.369	0	01:24	0.0888	1.2	0.006	
746	STORAGE	0.016	0.154	0	01:25	0.151	0.569	-0.007	
747	STORAGE	0.000	0.138	0	01:25	0	0.418	0.003	
748W	STORAGE	0.000	0.063	0	01:27	0	0.127	0.010	
750E	STORAGE	0.029	0.029	0	00:56	0.108	0.108	0.801	
750S	STORAGE	0.185	2.500	0	01:11	0.683	7.97	-0.216	
751	STORAGE	0.038	2.563	0	01:11	0.11	8.25	-0.078	
752	STORAGE	0.122	2.659	0	01:11	0.282	8.54	-0.072	
753	STORAGE	0.020	3.341	0	01:12	0.0585	11.7	-0.163	
754	STORAGE	0.000	3.306	0	01:12	0	25.6	-0.057	
754_2	STORAGE	0.000	1.500	0	01:12	0	16.6	0.039	
755	STORAGE	0.053	1.880	0	01:24	0.717	27	0.040	
755_2	STORAGE	0.000	0.782	0	01:12	0	9.59	0.049	
760	STORAGE	0.058	0.103	0	01:22	0.254	0.404	1.021	
761	STORAGE	0.021	0.208	0	01:42	0.106	0.848	0.987	
770	STORAGE	0.081	0.580	0	01:03	0.301	2.29	0.022	
771	STORAGE	0.000	0.498	0	01:06	0	1.99	0.229	
772	STORAGE	0.000	0.498	0	01:06	0	1.99	-0.000	
773	STORAGE	0.026	0.026	0	01:00	0.12	0.12	-0.002	
774	STORAGE	0.044	0.044	0	00:56	0.158	0.158	0.739	
776	STORAGE	0.000	0.498	0	01:05	0	1.99	0.021	
780	STORAGE	0.028	0.028	0	00:58	0.13	0.13	0.098	
781	STORAGE	0.020	0.047	0	01:14	0.0993	0.186	1.344	
782	STORAGE	0.000	0.049	0	01:04	0	0.184	-1.161	
783	STORAGE	0.033	0.083	0	01:05	0.157	0.343	0.252	
790	STORAGE	0.106	0.148	0	01:03	0.422	0.575	-0.002	
800	STORAGE	0.055	0.110	0	01:04	0.21	0.425	-0.002	
801	STORAGE	0.055	0.055	0	01:04	0.215	0.215	-0.003	
810	STORAGE	0.041	0.113	0	01:04	0.17	0.462	-0.027	
820	STORAGE	0.000	2.924	0	01:22	0	52.8	-0.000	
821	STORAGE	0.000	2.557	0	01:22	0	51.6	0.000	
822	STORAGE	0.471	2.304	0	01:30	0.968	50.8	-0.040	
825	STORAGE	0.000	0.511	0	02:46	0	23.3	0.017	
Clarke_227	STORAGE	0.000	0.880	0	01:08	0	1.97	0.016	
Clarke_228	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
Dry_Pond	STORAGE	0.000	2.161	0	01:11	0	0.979	0.000	
EX.102	STORAGE	0.000	3.078	0	01:22	0	53.3	-0.000	
Mattamy_West_DryPond	STORAGE	0.000	0.584	0	01:11	0	0.166	0.000	
MH_101	STORAGE	0.148	0.838	0	01:10	0.325	1.97	0.020	
MH_102	STORAGE	0.000	1.596	0	01:11	0	3.77	0.011	
MH_110	STORAGE	0.000	0.200	0	01:03	0	0.423	0.016	
MH_111	STORAGE	0.000	0.380	0	01:16	0	0.753	0.609	
MH_112	STORAGE	0.000	1.100	0	01:09	0	2.48	-0.241	
MH_113	STORAGE	0.000	0.220	0	01:04	0	0.448	0.884	
MH_114	STORAGE	0.000	0.900	0	01:04	0	2.1	0.063	
MH_116	STORAGE	0.000	1.568	0	01:05	0	3.6	-0.016	
MH_120	STORAGE	0.000	0.651	0	01:20	0	2.32	-0.043	

MH_121	STORAGE	0.000	0.570	0	01:04	0	0.971	0.065
MH_122	STORAGE	0.000	0.568	0	01:06	0	0.971	0.986
MH_123	STORAGE	0.000	0.877	0	01:13	0	1.75	-0.352
MH_124	STORAGE	0.000	1.470	0	01:14	0	4.08	0.342
MH_132	STORAGE	0.000	7.270	0	01:17	0	18	-0.014
MH_134	STORAGE	0.000	7.869	0	01:19	0	19.5	-0.027
MH_136	STORAGE	0.000	7.995	0	01:20	0	20.2	0.938
MH_150	STORAGE	0.000	0.220	0	01:03	0	0.497	0.562
MH_151	STORAGE	0.000	1.806	0	01:20	0	4.26	0.479
MH_152	STORAGE	0.000	0.170	0	01:02	0	0.39	0.012
MH_154	STORAGE	0.000	2.429	0	01:13	0	5.93	0.006
MH_156	STORAGE	0.000	3.349	0	01:14	0	8.19	-0.524
MH_158	STORAGE	0.000	3.994	0	01:11	0	9.72	0.300
MH_160	STORAGE	0.000	0.610	0	01:02	0	1.49	-0.098
MH_164	STORAGE	0.000	0.700	0	01:02	0	1.69	0.013
MH_170	STORAGE	0.357	1.957	0	01:10	0.489	4.18	0.050
MH_172	STORAGE	0.000	2.164	0	01:12	0	4.86	0.009
MH_174	STORAGE	0.000	2.744	0	01:13	0	6.12	-0.006
MH_176	STORAGE	0.000	2.738	0	01:14	0	6.12	0.007
MH_178	STORAGE	0.000	6.664	0	01:16	0	16.3	-0.023
MH_179	STORAGE	0.000	4.855	0	01:15	0	11	-0.147
MH_360	STORAGE	0.000	1.514	0	01:12	0	16.6	0.019
NWP	STORAGE	2.608	9.161	0	01:11	3.77	17	0.009
S_101-102	STORAGE	1.459	1.459	0	01:10	1.88	1.88	-0.015
S_102-151	STORAGE	1.601	2.121	0	01:10	2.06	2.29	-0.013
S_110-111	STORAGE	0.337	0.337	0	01:10	0.434	0.434	-0.017
S_111-112	STORAGE	0.305	0.333	0	01:11	0.392	0.403	-0.019
S_111-112_SCH	STORAGE	1.007	1.007	0	01:10	1.46	1.46	-0.028
S_113	STORAGE	0.192	0.192	0	01:10	0.246	0.246	-0.017
S_113-112	STORAGE	0.366	0.445	0	01:10	0.47	0.509	-0.017
S_114-116	STORAGE	1.667	1.667	0	01:10	2.14	2.14	-0.015
S_116-154	STORAGE	1.398	2.091	0	01:10	1.8	2.05	-0.013
S_120-124	STORAGE	1.195	1.195	0	01:10	1.54	1.54	-0.015
S_121-122	STORAGE	0.822	0.822	0	01:10	1.06	1.06	-0.019
S_123-124	STORAGE	0.678	0.907	0	01:10	0.871	0.956	-0.013
S_132-134	STORAGE	1.485	1.948	0	01:10	1.91	2.06	-0.014
S_134-136	STORAGE	1.380	2.377	0	01:10	1.77	2.15	-0.012
S_136-SWP	STORAGE	0.394	1.970	0	01:11	0.961	1.57	-0.000
S_154-156_SCH	STORAGE	0.911	0.911	0	01:10	1.32	1.32	-0.029
S_160-158	STORAGE	1.287	1.287	0	01:10	1.65	1.65	-0.015
S_164-156	STORAGE	1.476	1.476	0	01:10	1.9	1.9	-0.015
S_170-172	STORAGE	0.392	0.392	0	01:10	0.504	0.504	-0.023
S_170-172_COM	STORAGE	0.985	0.985	0	01:10	1.44	1.44	-0.053
S_170-172_PR	STORAGE	1.217	1.217	0	01:10	1.74	1.74	-0.046
S_174-176_MLT	STORAGE	0.438	0.438	0	01:10	0.611	0.611	-0.034
S_178-132	STORAGE	1.066	1.066	0	01:10	1.37	1.37	-0.015
S_Brazeau	STORAGE	10.175	10.175	0	01:10	13.1	13.1	-0.000
S_Drummond	STORAGE	8.583	8.583	0	01:10	11	11	-0.000
S_External-820_1	STORAGE	0.635	0.635	0	01:10	0.794	0.803	-0.010
S_External-820_2	STORAGE	0.782	0.932	0	01:09	0.978	0.998	-0.012
S_Mattamy_West	STORAGE	1.533	1.533	0	01:10	1.97	1.97	-0.016
SWP	STORAGE	1.095	10.945	0	01:13	1.62	32.2	-0.427

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
700	0.000	0	0	0	0.000	7	0 01:06	0.013
701	0.000	1	0	0	0.001	40	0 01:23	2.058

702	0.000	0	0	0	0.000	8	0	01:16	0.074
703N	0.000	0	0	0	0.000	8	0	01:09	0.040
703S	0.000	0	0	0	0.000	10	0	01:08	0.145
704	0.000	0	0	0	0.000	9	0	01:05	0.472
705	0.000	0	0	0	0.000	11	0	01:04	0.182
710	0.000	1	0	0	0.002	77	0	01:19	1.293
711	0.000	0	0	0	0.000	11	0	01:03	0.107
712E	0.000	1	0	0	0.000	15	0	01:04	0.072
712N	0.000	0	0	0	0.000	12	0	01:03	0.057
713N	0.000	0	0	0	0.000	10	0	01:17	0.032
713S	0.000	0	0	0	0.000	10	0	01:02	0.030
714	0.000	0	0	0	0.000	8	0	01:03	0.043
720	0.000	1	0	0	0.001	35	0	01:23	1.868
721	0.000	2	0	0	0.002	48	0	01:23	2.129
722	0.000	3	0	0	0.002	57	0	01:24	2.109
723W	0.000	0	0	0	0.000	3	0	01:34	0.024
724	0.000	3	0	0	0.000	14	0	01:00	0.197
730	0.000	0	0	0	0.000	7	0	01:24	0.028
731	0.000	0	0	0	0.000	19	0	01:24	0.080
732	0.000	4	0	0	0.003	63	0	01:27	2.273
740	0.000	0	0	0	0.000	0	0	00:00	0.000
741	0.000	0	0	0	0.000	8	0	01:03	0.031
742	0.000	4	0	0	0.003	65	0	01:27	2.338
743W	0.000	0	0	0	0.000	8	0	01:27	0.064
744	0.000	7	0	0	0.001	15	0	01:24	0.369
746	0.000	1	0	0	0.000	20	0	01:27	0.153
747	0.000	2	0	0	0.000	10	0	01:25	0.138
748W	0.000	0	0	0	0.000	17	0	01:25	0.063
750E	0.000	0	0	0	0.000	9	0	01:28	0.031
750S	0.000	5	0	0	0.003	71	0	01:27	2.481
751	0.000	6	0	0	0.003	77	0	01:27	2.538
752	0.000	7	0	0	0.003	76	0	01:27	2.641
753	0.000	9	0	0	0.003	81	0	01:27	3.306
754	0.004	8	0	0	0.028	56	0	01:27	3.268
754_2	0.004	7	0	0	0.030	50	0	01:30	1.481
755	0.004	10	0	0	0.022	57	0	01:27	1.869
755_2	0.005	8	0	0	0.031	51	0	01:32	0.767
760	0.000	1	0	0	0.001	38	0	01:28	0.115
761	0.000	15	0	0	0.002	73	0	01:27	0.223
770	0.000	4	0	0	0.002	66	0	01:27	0.586
771	0.000	0	0	0	0.000	12	0	01:27	0.499
772	0.000	0	0	0	0.000	12	0	01:06	0.498
773	0.000	0	0	0	0.000	6	0	01:10	0.026
774	0.000	0	0	0	0.000	8	0	01:00	0.046
776	0.000	0	0	0	0.000	15	0	01:06	0.498
780	0.000	1	0	0	0.000	29	0	01:29	0.034
781	0.000	1	0	0	0.001	36	0	01:28	0.049
782	0.000	2	0	0	0.001	57	0	01:28	0.051
783	0.000	3	0	0	0.001	62	0	01:28	0.080
790	0.000	0	0	0	0.000	10	0	01:03	0.148
800	0.000	0	0	0	0.000	10	0	01:05	0.110
801	0.000	0	0	0	0.000	12	0	01:04	0.055
810	0.000	1	0	0	0.000	15	0	01:07	0.113
820	0.002	26	0	0	0.002	28	0	01:21	2.929
821	0.002	26	0	0	0.002	28	0	01:20	2.557
822	0.001	19	0	0	0.002	22	0	01:21	2.322
825	0.000	4	0	0	0.000	9	0	02:47	0.511
Clarke_227	0.000	0	0	0	0.000	5	0	01:24	0.880
Clarke_228	0.000	0	0	0	0.000	0	0	00:00	0.000
Dry_Pond	0.049	3	0	0	0.925	60	0	01:20	0.081
EX.102	0.002	29	0	0	0.002	29	0	01:21	3.079
Mattamy_West_DryPond	0.001	0	0	0	0.119	46	0	01:15	0.100
MH_101	0.000	0	0	0	0.001	13	0	01:11	0.836
MH_102	0.000	0	0	0	0.001	17	0	01:20	1.586
MH_110	0.000	0	0	0	0.000	5	0	01:05	0.200
MH_111	0.000	0	0	0	0.001	13	0	01:19	0.380
MH_112	0.000	0	0	0	0.001	28	0	01:19	1.077
MH_113	0.000	0	0	0	0.000	11	0	01:20	0.234
MH_114	0.000	0	0	0	0.001	20	0	01:05	0.908
MH_116	0.000	0	0	0	0.001	17	0	01:13	1.559
MH_120	0.000	1	0	0	0.002	34	0	01:20	0.684
MH_121	0.000	0	0	0	0.001	25	0	01:13	0.568
MH_122	0.000	0	0	0	0.001	29	0	01:13	0.557
MH_123	0.000	1	0	0	0.002	31	0	01:13	0.857
MH_124	0.000	1	0	0	0.002	31	0	01:19	1.392
MH_132	0.000	1	0	0	0.003	34	0	01:20	7.219
MH_134	0.000	1	0	0	0.003	33	0	01:20	7.855
MH_136	0.000	2	0	0	0.002	30	0	01:21	7.988
MH_150	0.000	0	0	0	0.000	6	0	01:20	0.220

MH_151	0.000	0	0	0	0.001	18	0	01:17	1.830
MH_152	0.000	0	0	0	0.000	6	0	01:20	0.170
MH_154	0.000	0	0	0	0.001	14	0	01:14	2.429
MH_156	0.000	0	0	0	0.001	13	0	01:15	3.349
MH_158	0.000	1	0	0	0.002	28	0	01:00	4.049
MH_160	0.000	1	0	0	0.001	34	0	01:01	0.703
MH_164	0.000	0	0	0	0.001	12	0	01:11	0.700
MH_170	0.000	0	0	0	0.002	24	0	01:12	1.814
MH_172	0.000	0	0	0	0.001	19	0	01:12	2.164
MH_174	0.000	0	0	0	0.001	18	0	01:14	2.738
MH_176	0.000	1	0	0	0.001	20	0	01:15	2.732
MH_178	0.000	1	0	0	0.003	32	0	01:19	6.570
MH_179	0.000	1	0	0	0.002	28	0	01:17	4.837
MH_360	0.004	7	0	0	0.030	51	0	01:30	1.500
NWP	0.860	3	0	0	15.007	44	0	01:56	1.335
S_101-102	0.001	0	0	0	0.163	66	0	01:11	1.281
S_102-151	0.001	0	0	0	0.170	63	0	01:11	2.001
S_110-111	0.000	0	0	0	0.040	70	0	01:11	0.277
S_111-112	0.000	0	0	0	0.031	50	0	01:13	0.220
S_111-112_SCH	0.175	18	0	0	0.407	41	0	01:17	0.500
S_113	0.000	0	0	0	0.002	6	0	01:10	0.190
S_113-112	0.000	0	0	0	0.062	66	0	01:13	0.250
S_114-116	0.001	0	0	0	0.179	64	0	01:10	1.535
S_116-154	0.000	0	0	0	0.097	41	0	01:11	1.989
S_120-124	0.000	0	0	0	0.107	53	0	01:10	1.137
S_121-122	0.000	0	0	0	0.011	8	0	01:10	0.804
S_123-124	0.000	0	0	0	0.076	67	0	01:10	0.881
S_132-134	0.001	0	0	0	0.176	71	0	01:11	1.807
S_134-136	0.001	0	0	0	0.156	67	0	01:11	2.277
S_136-SWP	0.001	1	0	0	0.130	64	0	01:12	1.906
S_154-156_SCH	0.001	1	0	0	0.207	83	0	01:17	0.450
S_160-158	0.001	0	0	0	0.150	70	0	01:10	1.187
S_164-156	0.001	0	0	0	0.172	70	0	01:10	1.350
S_170-172	0.000	0	0	0	0.001	2	0	01:10	0.390
S_170-172_COM	0.001	0	0	0	0.183	91	0	01:14	0.540
S_170-172_PR	0.001	0	0	0	0.230	92	0	01:14	0.670
S_174-176_MLT	0.000	0	0	0	0.086	34	0	01:13	0.250
S_178-132	0.001	0	0	0	0.124	69	0	01:10	0.997
S_Brazeau	1.365	9	0	0	10.390	69	0	02:18	0.310
S_Drummond	1.162	8	0	0	8.786	59	0	02:18	0.260
S_External-820_1	0.000	0	0	0	0.082	61	0	01:11	0.627
S_External-820_2	0.000	0	0	0	0.101	61	0	01:11	0.616
S_Mattamy_West	0.001	0	0	0	0.180	70	0	01:11	1.364
SWP	13.415	14	0	0	27.837	29	0	02:46	0.511

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Clarke_224	13.50	0.085	0.880	1.971
D102	99.99	0.309	3.079	53.327
OF_Brazeau	25.98	0.331	0.683	14.861
OF_Drummond	26.31	0.271	0.538	12.318
OF2	0.24	0.144	0.257	0.060
System	33.21	1.140	5.176	82.537

****
Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
-100	CONDUIT	0.498	0	01:06	2.42	0.36	0.46
-101	CONDUIT	0.498	0	01:06	2.43	0.37	0.46
-102	CONDUIT	0.499	0	01:03	2.73	0.36	0.76
-103	CONDUIT	0.586	0	01:04	2.17	0.31	1.00
-104_1	CONDUIT	0.063	0	01:27	0.52	0.20	0.46
-104_2	CONDUIT	0.138	0	01:25	1.13	0.44	0.43

-105	CONDUIT	0.138	0	01:25	1.08	0.22	0.45
-106	CONDUIT	0.153	0	01:28	1.11	0.53	0.48
-107	CONDUIT	0.369	0	01:25	1.41	0.60	0.67
-108_1	CONDUIT	0.064	0	01:27	1.42	0.18	0.41
-108_2	CONDUIT	0.199	0	01:24	2.23	0.56	0.54
-109_1	CONDUIT	0.024	0	01:34	1.12	0.06	0.30
-109_2	CONDUIT	0.160	0	01:08	1.97	0.39	0.53
-110	CONDUIT	0.197	0	01:00	1.92	0.50	0.60
-160	CONDUIT	0.013	0	01:06	0.81	0.15	0.61
-27	CONDUIT	2.929	0	01:22	1.23	0.61	0.85
-28	CONDUIT	2.557	0	01:22	1.16	0.54	0.78
-29	CONDUIT	2.322	0	01:29	1.18	0.52	0.72
-51	CONDUIT	0.057	0	01:03	1.78	0.18	0.34
-52	CONDUIT	0.107	0	01:03	1.78	0.31	0.69
-53	CONDUIT	1.293	0	01:19	2.90	1.42	0.95
-54	CONDUIT	1.868	0	01:18	2.19	1.05	0.73
-55	CONDUIT	0.040	0	01:09	1.85	0.24	0.34
-56	CONDUIT	0.074	0	01:16	1.77	0.32	0.39
-57	CONDUIT	2.058	0	01:18	2.15	0.71	0.92
-58	CONDUIT	0.007	0	01:23	0.36	0.08	0.31
-59	CONDUIT	0.028	0	01:24	0.92	0.35	0.50
-60	CONDUIT	0.080	0	01:29	0.88	0.39	0.88
-61	CONDUIT	2.129	0	01:13	1.85	0.87	0.99
-62	CONDUIT	0.000	0	00:00	0.00	0.00	0.16
-63	CONDUIT	2.109	0	01:18	1.88	0.58	1.00
-64	CONDUIT	0.063	0	01:27	0.98	0.83	0.82
-65	CONDUIT	2.243	0	01:11	1.63	0.72	1.00
-66	CONDUIT	0.000	0	00:00	0.00	0.00	0.18
-67	CONDUIT	0.031	0	01:03	1.18	0.31	0.39
-68	CONDUIT	2.315	0	01:11	1.81	0.56	1.00
-69	CONDUIT	0.063	0	01:27	0.98	0.73	0.82
-70	CONDUIT	0.031	0	01:16	0.85	0.15	0.61
-71	CONDUIT	0.115	0	01:42	1.00	0.34	0.97
-72	CONDUIT	0.223	0	01:42	0.60	0.19	1.00
-73	CONDUIT	3.306	0	01:12	1.26	0.82	1.00
-74	CONDUIT	1.827	0	01:24	0.70	0.43	1.00
754_2-755_2	CONDUIT	0.533	0	01:12	0.52	0.39	1.00
754-754_2	CONDUIT	1.514	0	01:12	1.25	0.36	1.00
755_2-755	CONDUIT	0.251	0	01:11	0.99	1.58	1.00
-77	CONDUIT	0.026	0	01:41	0.35	0.18	0.76
-78	CONDUIT	0.027	0	01:14	0.93	0.35	1.00
-79	CONDUIT	0.049	0	01:04	0.91	0.50	1.00
-80	CONDUIT	0.051	0	01:05	0.97	0.47	1.00
-81	CONDUIT	0.080	0	01:05	0.83	0.35	1.00
-82	CONDUIT	2.481	0	01:11	1.01	0.43	1.00
825-822	CONDUIT	0.511	0	02:47	1.35	0.10	0.20
-83	CONDUIT	2.538	0	01:11	0.97	0.56	1.00
-84	CONDUIT	2.641	0	01:12	1.01	0.59	1.00
-86	CONDUIT	0.046	0	01:01	1.87	0.28	0.68
-87	CONDUIT	0.030	0	01:02	1.26	0.26	0.36
-88	CONDUIT	0.043	0	01:03	1.30	0.43	0.46
-89	CONDUIT	0.148	0	01:03	1.70	0.34	0.41
-90	CONDUIT	0.182	0	01:04	1.04	0.36	0.41
-91	CONDUIT	0.472	0	01:05	2.22	0.34	0.47
-92	CONDUIT	0.055	0	01:04	1.38	0.31	0.38
-93	CONDUIT	0.110	0	01:05	1.95	0.30	0.38
-94	CONDUIT	0.032	0	01:17	1.04	0.21	0.32
-95	CONDUIT	0.072	0	01:04	1.10	0.37	0.44
-96	CONDUIT	0.113	0	01:07	1.05	0.48	0.49
-97	CONDUIT	0.145	0	01:08	1.94	0.27	0.37
-98	CONDUIT	0.000	0	00:00	0.00	0.00	0.12
-99	CONDUIT	0.026	0	01:10	1.21	0.24	0.34
C_152-151	CHANNEL	0.006	0	01:13	0.09	0.00	0.39
C_152-154	CHANNEL	0.020	0	01:15	0.55	0.00	0.20
C_154-156	CHANNEL	0.156	0	01:10	0.37	0.04	0.48
C_154-158	CHANNEL	1.455	0	01:12	1.41	0.34	0.63
C_156-NWP	CHANNEL	1.964	0	01:13	1.95	0.27	0.76
C_172-174_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.16
C_172-174_2	CHANNEL	0.046	0	01:11	0.19	0.01	0.31
C_174-152	CHANNEL	0.102	0	01:14	0.91	0.01	0.21
C1_2	CHANNEL	0.046	0	01:15	1.19	0.00	0.23
C1_5	CHANNEL	0.101	0	01:11	0.86	0.01	0.21
Clarke_227-224	CONDUIT	0.880	0	01:24	1.15	0.17	0.64
Clarke_228-227	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
Link247	CONDUIT	3.079	0	01:22	1.24	0.64	0.90
MH_101-102	CONDUIT	0.836	0	01:11	1.63	0.78	0.80
MH_102-151	CONDUIT	1.586	0	01:20	2.89	0.89	0.84
MH_110-111	CONDUIT	0.200	0	01:16	2.87	0.43	0.52
MH_111-112	CONDUIT	0.380	0	01:10	1.80	0.48	0.86

MH_112-710	CONDUIT	1.077	0	01:20	3.01	1.21	1.00
MH_113-112	CONDUIT	0.234	0	01:23	1.46	0.63	0.91
MH_114-116	CONDUIT	0.908	0	01:05	2.00	0.69	0.63
MH_116-154	CONDUIT	1.559	0	01:13	2.02	0.68	0.65
MH_120-124	CONDUIT	0.684	0	01:23	1.13	0.44	1.00
MH_121-122	CONDUIT	0.568	0	01:06	1.30	1.30	1.00
MH_122-123	CONDUIT	0.557	0	01:13	1.38	1.17	1.00
MH_123-124	CONDUIT	0.857	0	01:14	2.08	2.27	0.88
MH_124-178	CONDUIT	1.392	0	01:22	1.75	0.95	1.00
MH_132-134	CONDUIT	7.219	0	01:19	2.42	1.13	1.00
MH_134-136	CONDUIT	7.855	0	01:20	2.63	1.23	1.00
MH_136-SWP	CONDUIT	7.988	0	01:21	2.94	1.40	0.85
MH_150-151	CONDUIT	0.220	0	01:20	1.18	0.21	0.49
MH_151-152	CONDUIT	1.830	0	01:18	2.25	0.64	0.87
MH_152-154	CONDUIT	0.170	0	01:20	1.35	0.67	0.57
MH_154-156	CONDUIT	2.429	0	01:14	3.13	0.75	0.65
MH_156-158	CONDUIT	3.349	0	01:15	2.70	0.46	0.49
MH_158-NWP	CONDUIT	4.049	0	01:10	4.15	1.03	0.54
MH_160-158	CONDUIT	0.703	0	01:03	0.59	0.34	0.95
MH_164-156	CONDUIT	0.700	0	01:12	1.69	0.65	0.63
MH_170-172	CONDUIT	1.814	0	01:12	3.03	0.98	0.90
MH_172-174	CONDUIT	2.164	0	01:13	2.00	0.74	0.71
MH_174-176	CONDUIT	2.738	0	01:14	2.40	0.94	0.76
MH_176-152	CONDUIT	2.732	0	01:15	2.56	0.94	0.70
MH_178-132	CONDUIT	6.570	0	01:17	2.20	1.19	1.00
MH_179-178	CONDUIT	4.837	0	01:17	2.21	1.09	0.80
MH_360-NWP	CONDUIT	1.500	0	01:12	1.59	1.49	1.00
754-NWP	ORIFICE	0.949	0	01:12			
755-NWP	ORIFICE	0.767	0	01:12			
North_OR1	ORIFICE	1.659	0	01:30			1.00
OR_Dry_Pond	ORIFICE	0.081	0	01:20			1.00
South_OR1	ORIFICE	0.511	0	02:46			1.00
1	WEIR	0.561	0	01:10			0.41
3	WEIR	0.048	0	01:12			0.04
4	WEIR	0.048	0	01:12			0.04
W_101-102	WEIR	0.591	0	01:11			0.55
W_102-150	WEIR	1.241	0	01:11			0.52
W_110-111	WEIR	0.077	0	01:11			0.17
W_113	WEIR	0.080	0	01:10			0.06
W_114-116	WEIR	0.745	0	01:10			0.44
W_116-154	WEIR	1.329	0	01:11			0.41
W_120-Dry_Pond	WEIR	0.567	0	01:10			0.33
W_121-124	WEIR	0.234	0	01:10			0.08
W_132-134	WEIR	1.107	0	01:11			0.55
W_134-138	WEIR	1.627	0	01:11			0.59
W_138-SWP	WEIR	1.766	0	01:12			0.58
W_150-Dry_Pond	WEIR	1.176	0	01:12			0.38
W_158-NWP	WEIR	0.723	0	01:15			0.79
W_158-SWP	WEIR	0.723	0	01:15			0.79
W_159-NWP	WEIR	0.577	0	01:10			0.44
W_164-156	WEIR	0.650	0	01:10			0.46
W_178-132	WEIR	0.497	0	01:10			0.41
W_External-820_1_OF2	WEIR	0.257	0	01:11			0.21
W_External-820_2_1	WEIR	0.153	0	01:09			0.22
W2	WEIR	0.584	0	01:11			0.44
O_101-102	DUMMY	0.690	0	01:02			
O_102-151	DUMMY	0.760	0	01:02			
O_110-111	DUMMY	0.200	0	01:03			
O_111-112	DUMMY	0.180	0	01:04			
O_111-112_SCH	DUMMY	0.500	0	01:03			
O_111-710	DUMMY	0.040	0	01:04			
O_113	DUMMY	0.110	0	01:04			
O_113-112	DUMMY	0.220	0	01:04			
O_113-710	DUMMY	0.030	0	01:04			
O_114-116	DUMMY	0.790	0	01:02			
O_116-154	DUMMY	0.660	0	01:02			
O_120-124	DUMMY	0.570	0	01:02			
O_121-122	DUMMY	0.570	0	01:04			
O_123-124	DUMMY	0.320	0	01:02			
O_132-134	DUMMY	0.700	0	01:02			
O_134-136	DUMMY	0.650	0	01:02			
O_136-SWP	DUMMY	0.140	0	01:06			
O_150-151	DUMMY	0.220	0	01:03			
O_152-154	DUMMY	0.170	0	01:02			
O_154-156	DUMMY	0.250	0	01:02			
O_154-156_SCH	DUMMY	0.450	0	01:03			
O_156-158	DUMMY	0.220	0	01:02			
O_160-158	DUMMY	0.610	0	01:02			
O_164-156	DUMMY	0.700	0	01:02			

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O_171-172            DUMMY       0.390     0  01:09
O_171-172_COM        DUMMY       0.540     0  01:02
O__171-172_PR        DUMMY       0.670     0  01:02
O_172-174            DUMMY       0.350     0  01:03
O_174-176            DUMMY       0.330     0  01:03
O_174-176_MLT        DUMMY       0.250     0  01:02
O_178-132            DUMMY       0.500     0  01:02
O_179-178            DUMMY       0.340     0  01:03
O_Brazeau            DUMMY       0.310     0  00:38
O_Drummond           DUMMY       0.260     0  00:39
O_External-820_1     DUMMY       0.321     0  01:02
O_External-820_2     DUMMY       0.540     0  01:03
O_Mattamy_West       DUMMY       0.780     0  01:03
O_Mattamy_West_DryPond DUMMY       0.100     0  01:08


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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
-100	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-101	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-102	1.00	0.01	0.00	0.00	0.08	0.00	0.00	0.91	0.07	0.00
-103	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.89	0.01	0.00
-104_1	1.00	0.00	0.93	0.00	0.07	0.00	0.00	0.00	0.94	0.00
-104_2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-105	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.04	0.00
-106	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-107	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00	0.00
-108_1	1.00	0.00	0.95	0.00	0.02	0.02	0.00	0.00	0.96	0.00
-108_2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-109_1	1.00	0.93	0.00	0.00	0.06	0.01	0.00	0.00	0.99	0.00
-109_2	1.00	0.92	0.01	0.00	0.01	0.06	0.00	0.00	0.99	0.00
-110	1.00	0.00	0.92	0.00	0.07	0.01	0.00	0.00	0.98	0.00
-160	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01	0.00
-27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-51	1.00	0.00	0.00	0.00	0.00	0.02	0.00	0.97	0.02	0.00
-52	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
-53	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-54	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-55	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-56	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-57	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.92	0.05	0.00
-58	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.97	0.00
-59	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-60	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
-61	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.02	0.00
-62	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-63	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.00	0.00
-64	1.00	0.93	0.04	0.00	0.00	0.00	0.03	0.00	0.00	0.00
-65	1.00	0.00	0.29	0.00	0.70	0.00	0.00	0.00	0.86	0.00
-66	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-67	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-68	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.89	0.00	0.00
-69	1.00	0.92	0.04	0.00	0.00	0.00	0.03	0.00	0.00	0.00
-70	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.01	0.00
-71	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.03	0.00
-72	1.00	0.00	0.00	0.00	0.09	0.00	0.90	0.00	0.00	0.00
-73	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-74	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
754_2-755_2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
754-754_2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
755_2-755	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-77	1.00	0.97	0.01	0.00	0.02	0.00	0.00	0.00	0.97	0.00
-78	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00
-79	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.03	0.00
-80	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00	0.00
-81	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.01	0.00
-82	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.00
825-822	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-83	1.00	0.00	0.28	0.00	0.72	0.00	0.00	0.00	0.87	0.00
-84	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

-86	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.91	0.98	0.00
-87	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-88	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-89	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-90	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-91	1.00	0.00	0.00	0.00	0.00	0.04	0.00	0.96	0.00	0.00
-92	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-93	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-94	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-95	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.02	0.00
-96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-97	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-98	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-99	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C_152-151	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C_152-154	1.00	0.01	0.01	0.00	0.81	0.18	0.00	0.00	0.01	0.00
C_154-156	1.00	0.91	0.02	0.00	0.05	0.02	0.00	0.00	0.99	0.00
C_154-158	1.00	0.90	0.02	0.00	0.06	0.03	0.00	0.00	0.98	0.00
C_156-NWP	1.00	0.91	0.00	0.00	0.06	0.02	0.00	0.00	0.01	0.00
C_172-174_1	1.00	0.92	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_172-174_2	1.00	0.92	0.00	0.00	0.08	0.00	0.00	0.00	0.99	0.00
C_174-152	1.00	0.01	0.93	0.00	0.06	0.01	0.00	0.00	0.97	0.00
C1_2	1.00	0.01	0.01	0.00	0.69	0.29	0.00	0.00	0.01	0.00
C1_5	1.00	0.92	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.00
Clarke_227-224	1.00	0.00	0.61	0.00	0.39	0.00	0.00	0.00	0.99	0.00
Clarke_228-227	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Link247	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MH_101-102	1.00	0.01	0.44	0.00	0.56	0.00	0.00	0.00	0.97	0.00
MH_102-151	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_110-111	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_111-112	1.00	0.01	0.00	0.00	0.05	0.01	0.00	0.94	0.05	0.00
MH_112-710	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
MH_113-112	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
MH_114-116	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
MH_116-154	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_120-124	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.98	0.00
MH_121-122	1.00	0.01	0.64	0.00	0.36	0.00	0.00	0.00	0.90	0.00
MH_122-123	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
MH_123-124	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_124-178	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
MH_132-134	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.76	0.00
MH_134-136	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.80	0.00
MH_136-SWP	1.00	0.00	0.01	0.00	0.97	0.00	0.00	0.02	0.62	0.00
MH_150-151	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.01	0.00
MH_151-152	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
MH_152-154	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_154-156	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_156-158	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.04	0.00
MH_158-NWP	1.00	0.01	0.11	0.00	0.87	0.01	0.00	0.00	0.60	0.00
MH_160-158	1.00	0.11	0.57	0.00	0.32	0.00	0.00	0.00	0.87	0.00
MH_164-156	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_170-172	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_172-174	1.00	0.04	0.03	0.00	0.93	0.00	0.00	0.00	0.73	0.00
MH_174-176	1.00	0.01	0.09	0.00	0.90	0.01	0.00	0.00	0.94	0.00
MH_176-152	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_178-132	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.04	0.00
MH_179-178	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_360-NWP	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
-102	0.01	0.01	0.81	0.01	0.01
-103	2.68	2.68	4.44	0.01	0.01
-160	0.01	0.01	0.08	0.01	0.01
-52	0.01	0.01	0.41	0.01	0.01
-53	0.01	0.39	0.01	0.42	0.01
-54	0.01	0.01	0.01	0.24	0.01
-57	0.01	0.01	0.13	0.01	0.01
-60	0.01	0.01	0.11	0.01	0.01
-63	0.51	0.51	0.65	0.01	0.01
-64	0.01	0.01	46.88	0.01	0.01

-65	2.01	2.01	2.56	0.01	0.01
-68	2.56	2.56	3.39	0.01	0.01
-69	0.01	0.01	46.87	0.01	0.01
-71	0.01	0.01	0.73	0.01	0.01
-72	1.29	1.29	2.48	0.01	0.01
-73	4.08	4.08	4.28	0.01	0.01
-74	4.29	4.29	4.37	0.01	0.01
754_2-755_2	4.68	4.68	4.71	0.01	0.01
754-754_2	4.31	4.31	4.34	0.01	0.30
755_2-755	5.10	5.10	5.10	3.79	4.42
-78	0.24	0.24	0.43	0.01	0.01
-79	0.62	0.62	1.63	0.01	0.01
-80	1.80	1.80	1.99	0.01	0.01
-81	1.96	1.96	2.67	0.01	0.01
-82	3.25	3.25	3.60	0.01	0.01
-83	3.60	3.60	3.82	0.01	0.01
-84	3.82	3.82	4.01	0.01	0.01
-86	0.01	0.01	2.87	0.01	0.01
Clarke_227-224	0.01	0.01	47.74	0.01	0.01
MH_111-112	0.01	0.01	0.33	0.01	0.01
MH_112-710	0.26	0.34	0.26	0.37	0.26
MH_113-112	0.01	0.01	0.34	0.01	0.01
MH_120-124	0.19	0.19	0.22	0.01	0.01
MH_121-122	0.18	0.21	0.18	0.18	0.18
MH_122-123	0.15	0.18	0.15	0.15	0.14
MH_123-124	0.01	0.38	0.01	0.41	0.01
MH_124-178	0.22	0.22	0.24	0.01	0.01
MH_132-134	0.20	0.23	0.20	0.25	0.20
MH_134-136	0.17	0.20	0.17	0.30	0.17
MH_136-SWP	0.01	0.17	0.01	0.37	0.01
MH_158-NWP	0.01	0.01	0.01	0.18	0.01
MH_160-158	0.01	0.01	0.04	0.01	0.01
MH_170-172	0.01	0.21	0.01	0.01	0.01
MH_178-132	0.23	0.24	0.23	0.29	0.22
MH_179-178	0.01	0.01	0.01	0.18	0.01
MH_360-NWP	4.67	4.67	4.68	3.12	0.46

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Analysis begun on:  Sat Feb 24 10:27:30 2018
Analysis ended on:  Sat Feb 24 10:27:54 2018
Total elapsed time: 00:00:24
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EES 1:100 year 3 hour Chicago Output

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
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*************
Element Count
*************
Number of rain gages ...... 9
Number of subcatchments ... 43
Number of nodes ........... 148
Number of links ........... 186
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
4hr_25mm             4hr_25mm                    INTENSITY   15 min.
CHI_3hr_10           CHI_3hr_10                  INTENSITY   10 min.
CHI_3hr_100          CHI_3hr_100                 INTENSITY   10 min.
CHI_3hr_100CC        CHI_3hr_100CC               INTENSITY   10 min.
CHI_3hr_5            CHI_3hr_5                   INTENSITY   10 min.
SCS_24h_10           SCS_24h_10                  INTENSITY   15 min.
SCS_24h_100          SCS_24h_100                 INTENSITY   15 min.
SCS_24h_100CC        SCS_24h_100CC               INTENSITY   15 min.
SCS_24h_5            SCS_24h_5                   INTENSITY   15 min.


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Subcatchment Summary
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Name                        Area     Width   %Imperv    %Slope Rain Gage           Outlet
------------------------------------------------------------------------------------------------------------
A13_1                       1.88    542.73      0.00    2.0000 CHI_3hr_100         MH_170
A13_2                       1.40    187.69      0.00    2.0000 CHI_3hr_100         MH_300
A5_part                    10.31    232.01      0.00    2.0000 CHI_3hr_100         OF_Drummond
A8_part                    15.25    304.82      0.00    2.0000 CHI_3hr_100         OF_Brazeau
AREA_1B                     3.57    364.48     10.00    2.0000 CHI_3hr_100         822
Brazeau                    23.90   5378.59     65.71    2.0000 CHI_3hr_100         S_Brazeau
Drummond                   20.03   4506.28     65.71    2.0000 CHI_3hr_100         S_Drummond
EXTERNAL-820_1              1.35    856.08     71.00    2.0000 CHI_3hr_100         S_External-820_1
EXTERNAL-820_2              1.66   1019.93     71.00    2.0000 CHI_3hr_100         S_External-820_2
Mattamy_West                3.60    809.67     65.71    2.0000 CHI_3hr_100         S_Mattamy_West
MH_110-111                  0.79    178.40     65.71    2.0000 CHI_3hr_100         S_110-111
MH_111-112                  0.72    161.28     65.71    2.0000 CHI_3hr_100         S_111-112
MH_111-112_SCH              2.42    198.27     80.00    2.0000 CHI_3hr_100         S_111-112_SCH
MH_150-152                  1.07    241.81     65.71    2.0000 CHI_3hr_100         S_150-152
MH_152-154                  0.82    184.95     65.71    2.0000 CHI_3hr_100         S_152-154
MH_154-156                  1.24    278.49     65.71    2.0000 CHI_3hr_100         S_154-156
MH_154-156_SCH              2.19    179.24     80.00    2.0000 CHI_3hr_100         S_154-156_SCH
MH_156-158                  1.12    251.10     65.71    2.0000 CHI_3hr_100         S_156-158
MH_163-156                  1.15    259.76     65.71    2.0000 CHI_3hr_100         S_163-156
MH_170-172                  0.92    207.32     65.71    2.0000 CHI_3hr_100         S_170-172
MH_171-172_COM              2.13    104.50     93.00    2.0000 CHI_3hr_100         S_171-172_COM
MH_171-172_PR               2.57    161.36     93.00    2.0000 CHI_3hr_100         S_171-172_PR
MH_172-174                  1.08    604.06     86.00    2.0000 CHI_3hr_100         S_172-174
MH_174-176                  1.03    576.33     86.00    2.0000 CHI_3hr_100         S_174-176
MH_174-176_MLT              0.90    100.71     93.00    2.0000 CHI_3hr_100         S_174-176_MLT
MH_177-152                  1.06    627.39     86.00    2.0000 CHI_3hr_100         S_177-152
MH_300-302                  3.43    771.38     65.71    2.0000 CHI_3hr_100         S_300-302
MH_302-304                  3.76    846.32     65.71    2.0000 CHI_3hr_100         S_302-304
MH_313-112                  0.86    193.28     65.71    2.0000 CHI_3hr_100         S_313-112
MH_314-316                  3.92    881.18     65.71    2.0000 CHI_3hr_100         S_314-316
MH_314-316_2                0.45    101.32     65.71    2.0000 CHI_3hr_100         S_314-316_2
MH_316-318                  3.29    739.22     65.71    2.0000 CHI_3hr_100         S_316-318
MH_318-364                  2.48    558.50     65.71    2.0000 CHI_3hr_100         S_318-364
MH_320-324                  2.65    595.69     65.71    2.0000 CHI_3hr_100         S_320-324
MH_322-323                  1.97    443.41     65.71    2.0000 CHI_3hr_100         S_322-323
MH_323-324                  1.71    385.36     65.71    2.0000 CHI_3hr_100         S_323-324
MH_330-332                  2.51    563.68     65.71    2.0000 CHI_3hr_100         S_330-332
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MH_332-334	3.49	784.76	65.71	2.0000 CHI_3hr_100	S_332-334
MH_334-338	3.24	729.57	65.71	2.0000 CHI_3hr_100	S_334-336
MH_336-SWP	2.86	210.32	30.00	2.0000 CHI_3hr_100	S_336-SWP
MH_362-360	2.83	636.28	65.71	2.0000 CHI_3hr_100	S_362-360
North_Pond	2.56	341.64	70.00	2.0000 CHI_3hr_100	NWP
South_Pond	2.95	325.29	70.00	2.0000 CHI_3hr_100	SWP

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
723E	JUNCTION	94.89	0.46	0.0	Yes
743E	JUNCTION	95.00	0.46	0.0	Yes
748E	JUNCTION	95.31	0.61	0.0	Yes
S_150-152	JUNCTION	106.00	0.50	0.0	
S_152	JUNCTION	106.15	0.50	0.0	
S_152-154	JUNCTION	106.00	0.50	0.0	
S_154-156	JUNCTION	105.20	0.50	0.0	
S_156-158	JUNCTION	103.55	0.50	0.0	
S_158-NWP	JUNCTION	99.90	0.50	0.0	
S_172	JUNCTION	107.63	0.50	0.0	
S_172-174	JUNCTION	107.33	0.50	0.0	
S_174-176	JUNCTION	106.89	0.50	0.0	
S_177	JUNCTION	105.00	0.50	0.0	
S_177-152	JUNCTION	106.00	0.50	0.0	
Clarke_224	OUTFALL	90.37	1.20	0.0	
D102	OUTFALL	91.66	1.83	0.0	
OF_Brazeau	OUTFALL	101.20	0.00	0.0	
OF_Drummond	OUTFALL	101.20	0.00	0.0	
OF2	OUTFALL	97.90	0.00	0.0	
700	STORAGE	96.62	1.09	0.0	Yes
701	STORAGE	95.65	2.56	0.0	Yes
702	STORAGE	98.73	1.85	0.0	Yes
703N	STORAGE	100.87	1.27	0.0	Yes
703S	STORAGE	99.91	2.05	0.0	Yes
704	STORAGE	98.28	3.63	0.0	Yes
705	STORAGE	98.51	3.46	0.0	Yes
710	STORAGE	97.34	1.82	0.0	Yes
711	STORAGE	98.95	1.67	0.0	Yes
712E	STORAGE	101.29	1.24	0.0	Yes
712N	STORAGE	101.65	0.88	0.0	Yes
713N	STORAGE	101.94	1.24	0.0	Yes
713S	STORAGE	102.02	1.16	0.0	Yes
714	STORAGE	101.15	1.83	0.0	Yes
720	STORAGE	96.06	2.75	0.0	Yes
721	STORAGE	95.18	2.85	0.0	Yes
722	STORAGE	94.49	3.22	0.0	Yes
723W	STORAGE	95.04	2.63	0.0	Yes
724	STORAGE	93.41	2.74	0.0	Yes
730	STORAGE	96.22	1.89	0.0	Yes
731	STORAGE	95.92	2.10	0.0	Yes
732	STORAGE	94.03	3.60	0.0	Yes
740	STORAGE	99.38	0.85	0.0	
741	STORAGE	96.96	1.49	0.0	Yes
742	STORAGE	93.89	3.59	0.0	Yes
743W	STORAGE	95.13	1.84	0.0	
744	STORAGE	93.08	3.56	0.0	Yes
746	STORAGE	94.97	1.67	0.0	Yes
747	STORAGE	95.07	2.80	0.0	
748W	STORAGE	95.34	1.58	0.0	
750E	STORAGE	96.04	1.46	0.0	Yes
750S	STORAGE	93.41	3.86	0.0	Yes
751	STORAGE	93.31	3.71	0.0	Yes
752	STORAGE	93.25	3.78	0.0	Yes
753	STORAGE	93.18	3.62	0.0	Yes
754	STORAGE	93.11	5.29	0.0	
754_2	STORAGE	93.08	5.92	0.0	
755	STORAGE	92.98	5.42	0.0	Yes
755_2	STORAGE	93.03	5.97	0.0	
760	STORAGE	95.59	1.51	0.0	Yes
761	STORAGE	94.51	2.23	0.0	Yes
770	STORAGE	94.47	2.66	0.0	Yes
771	STORAGE	95.85	3.24	0.0	
772	STORAGE	96.63	3.09	0.0	
773	STORAGE	98.32	1.70	0.0	Yes
774	STORAGE	98.20	1.32	0.0	Yes

776	STORAGE	97.25	2.53	0.0	
780	STORAGE	95.80	1.30	0.0	Yes
781	STORAGE	95.55	1.70	0.0	Yes
782	STORAGE	95.22	1.62	0.0	
783	STORAGE	95.03	1.81	0.0	Yes
790	STORAGE	99.83	2.36	0.0	Yes
800	STORAGE	100.32	1.66	0.0	Yes
801	STORAGE	101.24	1.19	0.0	Yes
810	STORAGE	100.72	2.01	0.0	Yes
820	STORAGE	91.67	6.18	0.0	
821	STORAGE	91.76	6.04	0.0	
822	STORAGE	92.07	6.35	0.0	
825	STORAGE	93.84	5.96	0.0	
Clarke_227	STORAGE	96.76	6.42	0.0	
Clarke_228	STORAGE	102.11	4.09	0.0	
Dry_Pond	STORAGE	100.00	1.50	0.0	
EX.102	STORAGE	91.38	6.60	0.0	
Mattamy_West_DryPond	STORAGE	101.18	2.00	0.0	
MH_110	STORAGE	102.44	4.56	0.0	
MH_111	STORAGE	99.80	3.70	0.0	
MH_112	STORAGE	98.87	4.53	0.0	
MH_150	STORAGE	101.61	4.39	0.0	
MH_152	STORAGE	99.93	6.22	0.0	
MH_154	STORAGE	99.01	6.19	0.0	
MH_156	STORAGE	96.33	7.22	0.0	
MH_158	STORAGE	94.67	5.23	0.0	
MH_163	STORAGE	99.89	3.76	0.0	
MH_170	STORAGE	105.54	5.46	0.0	
MH_172	STORAGE	103.10	4.53	0.0	
MH_174	STORAGE	102.55	5.48	0.0	
MH_176	STORAGE	102.08	4.92	0.0	
MH_177	STORAGE	101.32	3.68	0.0	
MH_300	STORAGE	102.39	5.81	0.0	
MH_302	STORAGE	100.01	7.89	0.0	
MH_304	STORAGE	98.17	7.83	0.0	
MH_313	STORAGE	98.96	5.19	0.0	
MH_314	STORAGE	99.59	4.61	0.0	
MH_316	STORAGE	99.19	6.21	0.0	
MH_318	STORAGE	99.04	6.26	0.0	
MH_320	STORAGE	97.89	4.91	0.0	
MH_321	STORAGE	98.07	7.78	0.0	
MH_322	STORAGE	97.94	6.56	0.0	
MH_323	STORAGE	97.83	7.27	0.0	
MH_324	STORAGE	97.00	6.50	0.0	
MH_330	STORAGE	96.75	8.35	0.0	
MH_332	STORAGE	96.39	7.42	0.0	
MH_334	STORAGE	96.19	6.81	0.0	
MH_336	STORAGE	94.81	7.99	0.0	
MH_360	STORAGE	93.10	5.70	0.0	
MH_362	STORAGE	95.55	5.71	0.0	
MH_364	STORAGE	96.86	6.79	0.0	
MH_559	STORAGE	94.08	6.02	0.0	
NWP	STORAGE	95.00	4.00	0.0	Yes
S_110-111	STORAGE	107.00	0.50	0.0	
S_111-112	STORAGE	103.40	0.50	0.0	
S_111-112_SCH	STORAGE	103.40	0.50	0.0	
S_154-156_SCH	STORAGE	105.20	0.50	0.0	
S_163-156	STORAGE	103.65	0.50	0.0	
S_170-172	STORAGE	111.00	0.50	0.0	
S_171-172_COM	STORAGE	111.00	0.50	0.0	
S_171-172_PR	STORAGE	111.00	0.50	0.0	
S_174-176_MLT	STORAGE	108.03	0.50	0.0	
S_300-302	STORAGE	108.10	0.50	0.0	
S_302-304	STORAGE	107.10	0.50	0.0	
S_313-112	STORAGE	103.40	0.50	0.0	
S_314-316	STORAGE	105.80	0.50	0.0	
S_314-316_2	STORAGE	104.15	0.50	0.0	
S_316-318	STORAGE	105.40	0.50	0.0	
S_318-364	STORAGE	105.30	0.50	0.0	
S_320-324	STORAGE	102.80	0.50	0.0	
S_322-323	STORAGE	104.50	0.50	0.0	
S_323-324	STORAGE	103.50	0.50	0.0	
S_330-332	STORAGE	105.10	0.50	0.0	
S_332-334	STORAGE	103.80	0.50	0.0	
S_334-336	STORAGE	103.00	0.50	0.0	
S_336-SWP	STORAGE	102.80	0.50	0.0	
S_362-360	STORAGE	101.25	0.50	0.0	
S_Brazeau	STORAGE	101.20	1.50	0.0	
S_Drummond	STORAGE	101.20	1.50	0.0	

S_External-820_1	STORAGE	98.00	0.50	0.0
S_External-820_2	STORAGE	98.00	0.50	0.0
S_Mattamy_West	STORAGE	106.20	0.50	0.0
SWP	STORAGE	95.60	4.20	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	MH_158	SWP	CONDUIT	40.0	-2.3206	0.0130
-100	776	772	CONDUIT	13.7	1.3919	0.0130
-101	772	771	CONDUIT	14.7	1.3621	0.0130
-102	771	770	CONDUIT	57.5	1.3923	0.0130
-103	770	753	CONDUIT	66.0	1.0001	0.0130
-104_1	748W	748E	CONDUIT	11.6	0.2404	0.0130
-104_2	748E	747	CONDUIT	56.3	0.2379	0.0130
-105	747	746	CONDUIT	12.2	0.9860	0.0130
-106	746	744	CONDUIT	68.8	0.2034	0.0130
-107	744	820	CONDUIT	14.3	0.4902	0.0130
-108_1	743W	743E	CONDUIT	9.4	1.4286	0.0130
-108_2	743E	744	CONDUIT	65.2	1.4347	0.0130
-109_1	723W	723E	CONDUIT	7.7	1.9207	0.0130
-109_2	723E	724	CONDUIT	73.0	1.9147	0.0130
-110	724	EX.102	CONDUIT	26.0	1.7233	0.0130
-160	700	701	CONDUIT	41.1	0.7374	0.0130
2	SWP	MH_158	CONDUIT	40.0	2.3206	0.0130
-27	820	EX.102	CONDUIT	119.6	0.1588	0.0130
-28	821	820	CONDUIT	124.1	0.1531	0.0130
-29	822	821	CONDUIT	124.1	0.1370	0.0130
5	MH_559	SWP	CONDUIT	43.0	-3.5418	0.0130
-51	712N	711	CONDUIT	87.7	3.0448	0.0130
-52	711	710	CONDUIT	104.2	1.3248	0.0130
-53	710	720	CONDUIT	115.0	0.6128	0.0130
-54	720	701	CONDUIT	114.5	0.1921	0.0130
-55	703N	702	CONDUIT	76.2	2.6270	0.0130
-56	702	701	CONDUIT	112.5	1.5916	0.0130
-57	701	721	CONDUIT	75.5	0.5030	0.0130
-58	721	730	CONDUIT	35.4	0.7549	0.0130
-59	730	731	CONDUIT	11.2	0.6509	0.0130
6	SWP	MH_559	CONDUIT	43.0	3.5418	0.0130
-60	731	732	CONDUIT	97.0	0.2072	0.0130
-61	721	722	CONDUIT	104.9	0.1925	0.0130
-62	723W	722	CONDUIT	72.1	0.3411	0.0130
-63	722	732	CONDUIT	43.4	0.2466	0.0130
-64	748W	732	CONDUIT	78.0	0.5613	0.0130
-65	732	742	CONDUIT	78.6	0.1782	0.0130
-66	740	741	CONDUIT	78.5	3.0731	0.0130
-67	741	742	CONDUIT	73.3	0.9963	0.0130
-68	742	750S	CONDUIT	69.0	0.3190	0.0130
-69	743W	742	CONDUIT	73.8	0.7169	0.0130
-70	750E	760	CONDUIT	65.3	0.4594	0.0130
-71	760	761	CONDUIT	123.2	0.2874	0.0130
-72	761	753	CONDUIT	70.6	-0.3823	0.0130
-73	753	754	CONDUIT	51.7	0.1141	0.0130
-74	754	755	CONDUIT	78.9	0.1268	0.0130
754_2-755_2	754_2	755_2	CONDUIT	52.7	0.0949	0.0130
754-754_2	754	MH_360	CONDUIT	15.3	0.1307	0.0130
755_2-755	755_2	755	CONDUIT	15.3	0.1305	0.0130
-77	780	760	CONDUIT	65.2	0.2377	0.0130
-78	780	781	CONDUIT	16.1	0.5966	0.0130
-79	781	782	CONDUIT	103.7	0.2872	0.0130
-80	782	783	CONDUIT	14.3	0.3556	0.0130
-81	783	761	CONDUIT	67.2	0.2603	0.0130
-82	750S	751	CONDUIT	43.1	0.2321	0.0130
825-822	825	822	CONDUIT	173.3	0.1154	0.0130
-83	751	752	CONDUIT	42.8	0.1402	0.0130
-84	752	753	CONDUIT	35.7	0.1401	0.0130
-86	774	751	CONDUIT	119.9	2.6429	0.0130
-87	713S	714	CONDUIT	65.4	1.2541	0.0130
-88	714	790	CONDUIT	112.1	0.9632	0.0130
-89	790	705	CONDUIT	111.7	0.9489	0.0130
-90	705	704	CONDUIT	74.4	0.1856	0.0130
-91	704	776	CONDUIT	72.6	1.4053	0.0130
-92	801	800	CONDUIT	90.2	0.9646	0.0130
-93	800	704	CONDUIT	95.7	1.5355	0.0130
-94	713N	712E	CONDUIT	76.6	0.7053	0.0130
-95	712E	810	CONDUIT	110.0	0.4363	0.0130

-96	810	703S	CONDUIT	114.1	0.2718	0.0130
-97	703S	704	CONDUIT	75.8	1.4519	0.0130
-98	774	773	CONDUIT	13.6	0.6630	0.0130
-99	773	776	CONDUIT	45.7	1.1374	0.0130
C_152-151	S_152	S_150-152	CONDUIT	272.4	0.0551	0.0130
C_152-154	S_152	S_152-154	CONDUIT	36.9	0.4068	0.0130
C_152-177	S_152	S_177-152	CONDUIT	9.1	1.6504	0.0130
C_154-156	S_152-154	S_154-156	CONDUIT	146.1	0.5476	0.0130
C_154-158	S_154-156	S_156-158	CONDUIT	294.0	0.5612	0.0130
C_156-NWP	S_156-158	S_158-NWP	CONDUIT	220.6	1.6510	0.0130
C_172-174	S_172	S_172-174	CONDUIT	79.6	0.3771	0.0130
C_172-176	S_172-174	S_174-176	CONDUIT	190.7	0.2307	0.0130
C_174-152	S_174-176	S_152	CONDUIT	234.8	0.3151	0.0130
C_177-152	S_177-152	S_177	CONDUIT	233.5	0.4283	0.0130
Clarke_227-224	Clarke_227	Clarke_224	CONDUIT	361.2	1.7692	0.0130
Clarke_228-227	Clarke_228	Clarke_227	CONDUIT	239.3	2.0798	0.0130
Link247	EX.102	D102	CONDUIT	10.0	0.1600	0.0130
MH_110-111	MH_110	MH_111	CONDUIT	89.4	2.6958	0.0130
MH_111-312	MH_111	MH_112	CONDUIT	101.2	0.8996	0.0130
MH_112-710	MH_112	710	CONDUIT	73.3	1.2954	0.0130
MH_150-152	MH_150	MH_152	CONDUIT	264.6	0.1500	0.0130
MH_152-154	MH_152	MH_154	CONDUIT	178.8	0.3508	0.0130
MH_154-156	MH_154	MH_156	CONDUIT	311.7	0.5495	0.0130
MH_156-158	MH_156	MH_158	CONDUIT	202.6	0.5499	0.0130
MH_158-559	MH_158	MH_559	CONDUIT	108.1	0.5495	0.0100
MH_163-156	MH_163	MH_156	CONDUIT	118.5	0.1502	0.0100
MH_170-172	MH_170	MH_172	CONDUIT	188.5	1.0504	0.0130
MH_172-174	MH_172	MH_174	CONDUIT	184.4	0.3000	0.0130
MH_174-176	MH_174	MH_176	CONDUIT	156.7	0.2999	0.0130
MH_176-152	MH_176	MH_152	CONDUIT	161.4	0.2992	0.0130
MH_177-152	MH_177	MH_152	CONDUIT	237.4	0.1516	0.0130
MH_300-302	MH_300	MH_302	CONDUIT	168.1	0.3498	0.0130
MH_302-304	MH_302	MH_304	CONDUIT	161.8	0.9447	0.0130
MH_304-321	MH_304	MH_321	CONDUIT	63.3	0.1485	0.0130
MH_313-112	MH_313	MH_112	CONDUIT	140.0	0.7400	0.0130
MH_314-316	MH_314	MH_316	CONDUIT	170.2	0.1504	0.0130
MH_316-318	MH_316	MH_318	CONDUIT	96.0	0.1500	0.0130
MH_318-364	MH_318	MH_364	CONDUIT	286.2	0.5800	0.0130
MH_320-324	MH_320	MH_324	CONDUIT	139.2	0.1502	0.0130
MH_321-322	MH_321	MH_322	CONDUIT	88.2	0.1496	0.0130
MH_322-323	MH_322	MH_323	CONDUIT	75.4	0.1499	0.0130
MH_323-324	MH_323	MH_324	CONDUIT	149.8	0.3504	0.0130
MH_324-330	MH_324	MH_330	CONDUIT	163.6	0.1504	0.0130
MH_330-332	MH_330	MH_332	CONDUIT	144.2	0.1498	0.0130
MH_332-334	MH_332	MH_334	CONDUIT	130.9	0.1505	0.0130
MH_334-336	MH_334	MH_336	CONDUIT	173.3	0.1500	0.0130
MH_336-SWP	MH_336	SWP	CONDUIT	95.6	0.3211	0.0130
MH_360-NWP	MH_360	754_2	CONDUIT	30.0	0.0666	0.0130
MH_362-360	MH_362	MH_360	CONDUIT	177.5	0.7009	0.0130
MH_364-362	MH_364	MH_362	CONDUIT	88.2	0.6992	0.0130
754-NWP	754_2	NWP	ORIFICE			
755-NWP	755_2	NWP	ORIFICE			
North_OR1	755	822	ORIFICE			
OR_Dry_Pond	Dry_Pond	MH_320	ORIFICE			
South_OR1	MH_559	825	ORIFICE			
3	S_177	Dry_Pond	WEIR			
4	S_177	SWP	WEIR			
W_102-150	S_302-304	S_150-152	WEIR			
W_110-111	S_110-111	S_111-112	WEIR			
W_132-134	S_332-334	S_334-336	WEIR			
W_150-Dry_Pond	S_150-152	Dry_Pond	WEIR			
W_158-NWP	S_158-NWP	NWP	WEIR			
W_158-SWP	S_158-NWP	SWP	WEIR			
W_163-158	S_163-156	S_156-158	WEIR			
W_178-132	S_330-332	S_332-334	WEIR			
W_300-302	S_300-302	S_302-304	WEIR			
W_314-313	S_314-316_2	S_313-112	WEIR			
W_314-316	S_314-316	S_316-318	WEIR			
W_316-154	S_316-318	S_154-156	WEIR			
W_318-163	S_318-364	S_163-156	WEIR			
W_321-Dry_Pond	S_320-324	Dry_Pond	WEIR			
W_322-323	S_322-323	S_323-324	WEIR			
W_323-Dry_Pond	S_323-324	Dry_Pond	WEIR			
W_334-336	S_334-336	S_336-SWP	WEIR			
W_338-SWP	S_336-SWP	SWP	WEIR			
W_362-NWP	S_362-360	NWP	WEIR			
W_External-820_1_OF2	S_External-820_1 OF2		WEIR			
W_External-820_2_1	S_External-820_2	S_External-820_1	WEIR			
W2	S_Mattamy_West	Mattamy_West_DryPond	WEIR			

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O_110-111         S_110-111         MH_110           OUTLET
O_111-112         S_111-112         MH_111           OUTLET
O_111-112_SCH     S_111-112_SCH     MH_112           OUTLET
O_111-710         S_111-112         710              OUTLET
O_150-152         S_150-152         MH_150           OUTLET
O_152-154         S_152-154         MH_152           OUTLET
O_154-156         S_154-156         MH_154           OUTLET
O_154-156_SCH     S_154-156_SCH     MH_154           OUTLET
O_156-158         S_156-158         MH_156           OUTLET
O_163-156         S_163-156         MH_163           OUTLET
O_170-172         S_170-172         MH_170           OUTLET
O_171-172_COM     S_171-172_COM     MH_170           OUTLET
O__171-172_PR     S_171-172_PR      MH_170           OUTLET
O_172-174         S_172-174         MH_172           OUTLET
O_174-176         S_174-176         MH_174           OUTLET
O_174-176_MLT     S_174-176_MLT     MH_174           OUTLET
O_177-152         S_177-152         MH_152           OUTLET
O_300-302         S_300-302         MH_300           OUTLET
O_302-304         S_302-304         MH_302           OUTLET
O_313-112         S_313-112         MH_313           OUTLET
O_313-710         S_313-112         710              OUTLET
O_314-316         S_314-316         MH_314           OUTLET
O_314-316_2       S_314-316_2       MH_314           OUTLET
O_316-318         S_316-318         MH_316           OUTLET
O_318-364         S_318-364         MH_318           OUTLET
O_320-324         S_320-324         MH_320           OUTLET
O_322-323         S_322-323         MH_322           OUTLET
O_323-324         S_323-324         MH_323           OUTLET
O_330-332         S_330-332         MH_330           OUTLET
O_332-334         S_332-334         MH_332           OUTLET
O_334-336         S_334-336         MH_334           OUTLET
O_336-SWP         S_336-SWP         MH_336           OUTLET
O_362-360         S_362-360         MH_362           OUTLET
O_Brazeau         S_Brazeau         OF_Brazeau       OUTLET
O_Drummond        S_Drummond        OF_Drummond      OUTLET
O_External-820_1  S_External-820_1  821              OUTLET
O_External-820_2  S_External-820_2  SWP              OUTLET
O_Mattamy_West    S_Mattamy_West    Clarke_227       OUTLET
O_Mattamy_West_DryPond Mattamy_West_DryPond Clarke_227       OUTLET


**********
Cross Section Summary
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                                    Full     Full     Hyd.     Max.   No. of     Full
Conduit           Shape            Depth     Area     Rad.    Width  Barrels     Flow
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1                 CIRCULAR          1.50     1.77     0.38     1.50        1    10.77
-100              CIRCULAR          0.76     0.46     0.19     0.76        1     1.37
-101              CIRCULAR          0.76     0.46     0.19     0.76        1     1.36
-102              CIRCULAR          0.76     0.46     0.19     0.76        1     1.37
-103              CIRCULAR          0.91     0.66     0.23     0.91        1     1.89
-104_1            CIRCULAR          0.61     0.29     0.15     0.61        1     0.31
-104_2            CIRCULAR          0.61     0.29     0.15     0.61        1     0.31
-105              CIRCULAR          0.61     0.29     0.15     0.61        1     0.64
-106              CIRCULAR          0.61     0.29     0.15     0.61        1     0.29
-107              CIRCULAR          0.69     0.37     0.17     0.69        1     0.61
-108_1            CIRCULAR          0.46     0.16     0.11     0.46        1     0.36
-108_2            CIRCULAR          0.46     0.16     0.11     0.46        1     0.36
-109_1            CIRCULAR          0.46     0.16     0.11     0.46        1     0.41
-109_2            CIRCULAR          0.46     0.16     0.11     0.46        1     0.41
-110              CIRCULAR          0.46     0.16     0.11     0.46        1     0.39
-160              CIRCULAR          0.30     0.07     0.08     0.30        1     0.09
2                 CIRCULAR          1.50     1.77     0.38     1.50        1    10.77
-27               CIRCULAR          1.83     2.63     0.46     1.83        1     4.78
-28               CIRCULAR          1.83     2.63     0.46     1.83        1     4.69
-29               CIRCULAR          1.83     2.63     0.46     1.83        1     4.44
5                 CIRCULAR          1.50     1.77     0.38     1.50        1    13.31
-51               CIRCULAR          0.38     0.11     0.10     0.38        1     0.32
-52               CIRCULAR          0.46     0.16     0.11     0.46        1     0.34
-53               CIRCULAR          0.76     0.46     0.19     0.76        1     0.91
-54               CIRCULAR          1.22     1.17     0.30     1.22        1     1.78
-55               CIRCULAR          0.30     0.07     0.08     0.30        1     0.16
-56               CIRCULAR          0.38     0.11     0.10     0.38        1     0.23
-57               CIRCULAR          1.22     1.17     0.30     1.22        1     2.88
-58               CIRCULAR          0.30     0.07     0.08     0.30        1     0.09
-59               CIRCULAR          0.30     0.07     0.08     0.30        1     0.08
6                 CIRCULAR          1.50     1.77     0.38     1.50        1    13.31
-60               CIRCULAR          0.53     0.22     0.13     0.53        1     0.20
```

-61	CIRCULAR	1.37	1.48	0.34	1.37	1	2.45
-62	CIRCULAR	0.38	0.11	0.10	0.38	1	0.11
-63	CIRCULAR	1.52	1.82	0.38	1.52	1	3.66
-64	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-65	CIRCULAR	1.52	1.82	0.38	1.52	1	3.11
-66	CIRCULAR	0.30	0.07	0.08	0.30	1	0.18
-67	CIRCULAR	0.30	0.07	0.08	0.30	1	0.10
-68	CIRCULAR	1.52	1.82	0.38	1.52	1	4.17
-69	CIRCULAR	0.30	0.07	0.08	0.30	1	0.09
-70	CIRCULAR	0.46	0.16	0.11	0.46	1	0.20
-71	CIRCULAR	0.61	0.29	0.15	0.61	1	0.34
-72	CIRCULAR	0.91	0.66	0.23	0.91	1	1.17
-73	CIRCULAR	1.83	2.63	0.46	1.83	1	4.05
-74	CIRCULAR	1.83	2.63	0.46	1.83	1	4.27
754_2-755_2	CIRCULAR	1.20	1.13	0.30	1.20	1	1.20
754-754_2	CIRCULAR	1.80	2.54	0.45	1.80	1	4.16
755_2-755	CIRCULAR	0.60	0.28	0.15	0.60	1	0.22
-77	CIRCULAR	0.46	0.16	0.11	0.46	1	0.14
-78	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-79	CIRCULAR	0.38	0.11	0.10	0.38	1	0.10
-80	CIRCULAR	0.38	0.11	0.10	0.38	1	0.11
-81	CIRCULAR	0.53	0.22	0.13	0.53	1	0.23
-82	CIRCULAR	1.83	2.63	0.46	1.83	1	5.78
825-822	CIRCULAR	1.83	2.63	0.46	1.83	1	4.08
-83	CIRCULAR	1.83	2.63	0.46	1.83	1	4.49
-84	CIRCULAR	1.83	2.63	0.46	1.83	1	4.49
-86	CIRCULAR	0.30	0.07	0.08	0.30	1	0.16
-87	CIRCULAR	0.30	0.07	0.08	0.30	1	0.11
-88	CIRCULAR	0.30	0.07	0.08	0.30	1	0.10
-89	CIRCULAR	0.53	0.22	0.13	0.53	1	0.44
-90	CIRCULAR	0.76	0.46	0.19	0.76	1	0.50
-91	CIRCULAR	0.76	0.46	0.19	0.76	1	1.38
-92	CIRCULAR	0.38	0.11	0.10	0.38	1	0.18
-93	CIRCULAR	0.46	0.16	0.11	0.46	1	0.37
-94	CIRCULAR	0.38	0.11	0.10	0.38	1	0.15
-95	CIRCULAR	0.46	0.16	0.11	0.46	1	0.20
-96	CIRCULAR	0.53	0.22	0.13	0.53	1	0.23
-97	CIRCULAR	0.53	0.22	0.13	0.53	1	0.54
-98	CIRCULAR	0.30	0.07	0.08	0.30	1	0.08
-99	CIRCULAR	0.30	0.07	0.08	0.30	1	0.11
C_152-151	SUB_STREET	0.28	2.79	0.14	22.00	1	1.35
C_152-154	SUB_STREET	0.28	2.79	0.14	22.00	1	3.67
C_152-177	GBR	0.26	6.41	0.17	41.50	1	19.30
C_154-156	SUB_STREET	0.28	2.79	0.14	22.00	1	4.26
C_154-158	SUB_STREET	0.28	2.79	0.14	22.00	1	4.31
C_156-NWP	SUB_STREET	0.28	2.79	0.14	22.00	1	7.40
C_172-174	GBR	0.26	6.41	0.17	41.50	1	9.23
C_172-176	GBR	0.26	6.41	0.17	41.50	1	7.22
C_174-152	GBR	0.26	6.41	0.17	41.50	1	8.43
C_177-152	GBR	0.26	6.41	0.17	41.50	1	9.83
Clarke_227-224	CIRCULAR	1.20	1.13	0.30	1.20	1	5.19
Clarke_228-227	CIRCULAR	0.82	0.53	0.21	0.82	1	2.07
Link247	CIRCULAR	1.83	2.63	0.46	1.83	1	4.80
MH_110-111	CIRCULAR	0.45	0.16	0.11	0.45	1	0.47
MH_111-312	CIRCULAR	0.68	0.36	0.17	0.68	1	0.80
MH_112-710	CIRCULAR	0.68	0.36	0.17	0.68	1	0.96
MH_150-152	CIRCULAR	0.68	0.36	0.17	0.68	1	0.33
MH_152-154	CIRCULAR	1.50	1.77	0.38	1.50	1	4.19
MH_154-156	CIRCULAR	1.50	1.77	0.38	1.50	1	5.24
MH_156-158	CIRCULAR	1.50	1.77	0.38	1.50	1	5.24
MH_158-559	CIRCULAR	1.50	1.77	0.38	1.50	1	6.81
MH_163-156	CIRCULAR	0.75	0.44	0.19	0.75	1	0.56
MH_170-172	CIRCULAR	0.90	0.64	0.23	0.90	1	1.86
MH_172-174	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_174-176	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_176-152	CIRCULAR	1.35	1.43	0.34	1.35	1	2.92
MH_177-152	CIRCULAR	0.68	0.36	0.17	0.68	1	0.33
MH_300-302	CIRCULAR	0.90	0.64	0.23	0.90	1	1.07
MH_302-304	CIRCULAR	0.90	0.64	0.23	0.90	1	1.76
MH_304-321	CIRCULAR	1.20	1.13	0.30	1.20	1	1.50
MH_313-112	CIRCULAR	0.53	0.22	0.13	0.53	1	0.37
MH_314-316	CIRCULAR	1.05	0.87	0.26	1.05	1	1.06
MH_316-318	CIRCULAR	1.20	1.13	0.30	1.20	1	1.51
MH_318-364	CIRCULAR	1.20	1.13	0.30	1.20	1	2.97
MH_320-324	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
MH_321-322	CIRCULAR	1.20	1.13	0.30	1.20	1	1.51
MH_322-323	CIRCULAR	1.20	1.13	0.30	1.20	1	1.51
MH_323-324	CIRCULAR	1.20	1.13	0.30	1.20	1	2.31
MH_324-330	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74

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MH_330-332       CIRCULAR            1.50     1.77     0.38     1.50        1     2.74
MH_332-334       CIRCULAR            1.65     2.14     0.41     1.65        1     3.54
MH_334-336       CIRCULAR            1.65     2.14     0.41     1.65        1     3.53
MH_336-SWP       CIRCULAR            1.65     2.14     0.41     1.65        1     5.17
MH_360-NWP       CIRCULAR            1.20     1.13     0.30     1.20        1     1.01
MH_362-360       CIRCULAR            1.20     1.13     0.30     1.20        1     3.26
MH_364-362       CIRCULAR            1.20     1.13     0.30     1.20        1     3.26


***************
Transect Summary
***************

Transect GBR
Area:
            0.0002     0.0008     0.0018     0.0032     0.0051
            0.0073     0.0099     0.0130     0.0164     0.0203
            0.0245     0.0292     0.0343     0.0401     0.0532
            0.0756     0.1002     0.1249     0.1496     0.1742
            0.1989     0.2235     0.2482     0.2729     0.2975
            0.3222     0.3468     0.3715     0.3962     0.4209
            0.4460     0.4715     0.4974     0.5237     0.5505
            0.5776     0.6051     0.6331     0.6614     0.6902
            0.7193     0.7489     0.7789     0.8092     0.8400
            0.8712     0.9028     0.9348     0.9672     1.0000
Hrad:
            0.0148     0.0296     0.0444     0.0592     0.0741
            0.0889     0.1037     0.1185     0.1333     0.1481
            0.1629     0.1777     0.1925     0.1451     0.0889
            0.0921     0.1222     0.1522     0.1821     0.2121
            0.2420     0.2720     0.3019     0.3318     0.3616
            0.3915     0.4213     0.4511     0.4809     0.5106
            0.5398     0.5684     0.5963     0.6237     0.6505
            0.6768     0.7026     0.7280     0.7529     0.7773
            0.8013     0.8249     0.8480     0.8708     0.8932
            0.9153     0.9369     0.9583     0.9793     1.0000
Width:
            0.0123     0.0246     0.0369     0.0492     0.0614
            0.0737     0.0860     0.0983     0.1106     0.1229
            0.1352     0.1475     0.1598     0.2496     0.5446
            0.7470     0.7470     0.7470     0.7470     0.7470
            0.7470     0.7470     0.7470     0.7470     0.7470
            0.7470     0.7470     0.7470     0.7470     0.7542
            0.7665     0.7788     0.7911     0.8034     0.8157
            0.8280     0.8402     0.8525     0.8648     0.8771
            0.8894     0.9017     0.9140     0.9263     0.9386
            0.9508     0.9631     0.9754     0.9877     1.0000

Transect SUB_STREET
Area:
            0.0004     0.0016     0.0035     0.0062     0.0097
            0.0140     0.0190     0.0248     0.0314     0.0388
            0.0469     0.0559     0.0656     0.0760     0.0873
            0.0993     0.1121     0.1257     0.1400     0.1552
            0.1711     0.1877     0.2051     0.2224     0.2398
            0.2571     0.2747     0.2935     0.3134     0.3344
            0.3566     0.3800     0.4046     0.4303     0.4572
            0.4852     0.5144     0.5448     0.5763     0.6090
            0.6429     0.6779     0.7141     0.7515     0.7900
            0.8296     0.8705     0.9125     0.9557     1.0000
Hrad:
            0.0198     0.0397     0.0595     0.0794     0.0992
            0.1190     0.1389     0.1587     0.1786     0.1984
            0.2183     0.2381     0.2579     0.2778     0.2976
            0.3175     0.3373     0.3571     0.3770     0.3968
            0.4167     0.4365     0.4685     0.5075     0.5464
            0.5852     0.6235     0.6587     0.6906     0.7196
            0.7460     0.7700     0.7919     0.8119     0.8303
            0.8472     0.8629     0.8774     0.8909     0.9035
            0.9154     0.9266     0.9372     0.9473     0.9569
            0.9662     0.9750     0.9836     0.9919     1.0000
Width:
            0.0173     0.0345     0.0518     0.0691     0.0864
            0.1036     0.1209     0.1382     0.1555     0.1727
            0.1900     0.2073     0.2245     0.2418     0.2591
            0.2764     0.2936     0.3109     0.3282     0.3455
            0.3627     0.3800     0.3864     0.3864     0.3864
            0.3864     0.4041     0.4300     0.4559     0.4818
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            0.5077     0.5336     0.5595     0.5855     0.6114
            0.6373     0.6632     0.6891     0.7150     0.7409
            0.7668     0.7927     0.8186     0.8445     0.8705
            0.8964     0.9223     0.9482     0.9741     1.0000


  ***********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ***********************************************************

  ***************
  Analysis Options
  ***************
  Flow Units ............... CMS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ 01/01/2000 00:00:00
  Ending Date .............. 01/03/2000 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 1.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.001500 m


  *************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  *************************     ---------       -------
  Total Precipitation ......        10.693        71.708
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         3.646        24.447
  Surface Runoff ...........         7.011        47.014
  Final Storage ............         0.120         0.802
  Continuity Error (%) .....        -0.774


  *************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  *************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         7.011        70.108
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         1.398        13.976
  External Outflow .........         7.854        78.545
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.523         5.229
  Initial Stored Volume ....         0.106         1.060
  Final Stored Volume ......         0.150         1.502
  Continuity Error (%) .....        -0.154


  ************************
  Highest Continuity Errors
  ************************
  Node S_152 (36.13%)
  Node S_158-NWP (-6.80%)
  Node S_177 (3.75%)
  Node MH_321 (-2.17%)
  Node S_172-174 (-2.01%)


  **************************
  Time-Step Critical Elements
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****
None

****
Highest Flow Instability Indexes
****
Link North_OR1 (103)
Link O_171-172_COM (4)
Link O__171-172_PR (4)
Link O_172-174 (4)
Link O_154-156 (3)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.01

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A13_1	71.71	0.00	0.00	46.27	26.07	0.49	0.36	0.364
A13_2	71.71	0.00	0.00	48.92	23.11	0.32	0.15	0.322
A5_part	71.71	0.00	0.00	59.30	12.47	1.29	0.28	0.174
A8_part	71.71	0.00	0.00	60.07	11.69	1.78	0.37	0.163
AREA_1B	71.71	0.00	0.00	44.67	27.14	0.97	0.47	0.378
Brazeau	71.71	0.00	0.00	15.30	56.00	13.39	10.26	0.781
Drummond	71.71	0.00	0.00	15.30	56.00	11.22	8.59	0.781
EXTERNAL-820_1	71.71	0.00	0.00	12.65	58.82	0.79	0.64	0.820
EXTERNAL-820_2	71.71	0.00	0.00	12.65	58.80	0.98	0.78	0.820
Mattamy_West	71.71	0.00	0.00	16.65	54.71	1.97	1.53	0.763
MH_110-111	71.71	0.00	0.00	16.65	54.71	0.43	0.34	0.763
MH_111-112	71.71	0.00	0.00	16.65	54.71	0.39	0.31	0.763
MH_111-112_SCH	71.71	0.00	0.00	10.91	60.30	1.46	1.01	0.841
MH_150-152	71.71	0.00	0.00	16.65	54.71	0.59	0.46	0.763
MH_152-154	71.71	0.00	0.00	16.65	54.71	0.45	0.35	0.763
MH_154-156	71.71	0.00	0.00	16.65	54.71	0.68	0.53	0.763
MH_154-156_SCH	71.71	0.00	0.00	10.91	60.30	1.32	0.91	0.841
MH_156-158	71.71	0.00	0.00	16.65	54.71	0.61	0.48	0.763
MH_163-156	71.71	0.00	0.00	16.65	54.71	0.63	0.49	0.763
MH_170-172	71.71	0.00	0.00	16.65	54.71	0.50	0.39	0.763
MH_171-172_COM	71.71	0.00	0.00	3.12	67.77	1.44	0.99	0.945
MH_171-172_PR	71.71	0.00	0.00	3.10	67.82	1.74	1.22	0.946
MH_172-174	71.71	0.00	0.00	6.08	64.93	0.70	0.52	0.905
MH_174-176	71.71	0.00	0.00	6.08	64.93	0.67	0.50	0.905
MH_174-176_MLT	71.71	0.00	0.00	3.06	67.88	0.61	0.44	0.947
MH_177-152	71.71	0.00	0.00	6.07	64.93	0.69	0.51	0.906
MH_300-302	71.71	0.00	0.00	16.65	54.71	1.88	1.46	0.763
MH_302-304	71.71	0.00	0.00	16.65	54.71	2.06	1.60	0.763
MH_313-112	71.71	0.00	0.00	16.65	54.71	0.47	0.37	0.763
MH_314-316	71.71	0.00	0.00	16.65	54.71	2.14	1.67	0.763
MH_314-316_2	71.71	0.00	0.00	16.65	54.71	0.25	0.19	0.763
MH_316-318	71.71	0.00	0.00	16.65	54.71	1.80	1.40	0.763
MH_318-364	71.71	0.00	0.00	16.65	54.71	1.36	1.06	0.763
MH_320-324	71.71	0.00	0.00	16.65	54.71	1.45	1.13	0.763
MH_322-323	71.71	0.00	0.00	16.65	54.71	1.08	0.84	0.763
MH_323-324	71.71	0.00	0.00	16.65	54.71	0.94	0.73	0.763
MH_330-332	71.71	0.00	0.00	16.65	54.71	1.37	1.07	0.763
MH_332-334	71.71	0.00	0.00	16.65	54.71	1.91	1.48	0.763
MH_334-338	71.71	0.00	0.00	16.65	54.71	1.77	1.38	0.763
MH_336-SWP	71.71	0.00	0.00	38.02	33.62	0.96	0.39	0.469
MH_362-360	71.71	0.00	0.00	16.65	54.71	1.55	1.20	0.763
North_Pond	71.71	0.00	0.00	17.59	54.82	1.40	0.99	0.765
South_Pond	71.71	0.00	0.00	17.74	54.67	1.62	1.10	0.762

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
723E	JUNCTION	0.01	0.21	95.10	0 01:23	0.21
743E	JUNCTION	0.01	0.27	95.27	0 01:22	0.27
748E	JUNCTION	0.01	0.33	95.64	0 01:24	0.33
S_150-152	JUNCTION	0.00	0.21	106.21	0 01:12	0.21
S_152	JUNCTION	0.00	0.04	106.19	0 01:16	0.04
S_152-154	JUNCTION	0.00	0.08	106.08	0 01:10	0.08
S_154-156	JUNCTION	0.00	0.20	105.40	0 01:11	0.20
S_156-158	JUNCTION	0.00	0.18	103.73	0 01:12	0.18
S_158-NWP	JUNCTION	0.00	0.31	100.21	0 01:15	0.31
S_172	JUNCTION	0.00	0.00	107.63	0 00:00	0.00
S_172-174	JUNCTION	0.00	0.08	107.41	0 01:11	0.08
S_174-176	JUNCTION	0.00	0.08	106.97	0 01:12	0.08
S_177	JUNCTION	0.00	0.02	105.02	0 01:12	0.02
S_177-152	JUNCTION	0.00	0.08	106.08	0 01:11	0.08
Clarke_224	OUTFALL	3.24	3.24	93.61	0 00:00	3.24
D102	OUTFALL	1.64	1.64	93.30	0 00:00	1.64
OF_Brazeau	OUTFALL	0.00	0.00	101.20	0 00:00	0.00
OF_Drummond	OUTFALL	0.00	0.00	101.20	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	97.90	0 00:00	0.00
700	STORAGE	0.00	0.49	97.11	0 01:23	0.48
701	STORAGE	0.02	1.45	97.10	0 01:23	1.45
702	STORAGE	0.01	0.15	98.88	0 01:16	0.15
703N	STORAGE	0.00	0.10	100.97	0 01:09	0.10
703S	STORAGE	0.01	0.20	100.11	0 01:08	0.20
704	STORAGE	0.01	0.34	98.62	0 01:05	0.34
705	STORAGE	0.01	0.37	98.87	0 01:04	0.37
710	STORAGE	0.02	1.40	98.74	0 01:19	1.39
711	STORAGE	0.01	0.18	99.13	0 01:01	0.18
712E	STORAGE	0.01	0.19	101.48	0 01:04	0.19
712N	STORAGE	0.00	0.11	101.76	0 01:03	0.11
713N	STORAGE	0.00	0.12	102.06	0 01:17	0.12
713S	STORAGE	0.00	0.11	102.13	0 01:02	0.11
714	STORAGE	0.00	0.14	101.29	0 01:03	0.14
720	STORAGE	0.03	1.28	97.34	0 01:23	1.28
721	STORAGE	0.04	1.72	96.90	0 01:23	1.72
722	STORAGE	0.08	2.17	96.66	0 01:23	2.17
723W	STORAGE	0.00	0.13	95.17	0 01:24	0.13
724	STORAGE	0.09	0.37	93.79	0 01:00	0.37
730	STORAGE	0.01	0.58	96.80	0 01:23	0.58
731	STORAGE	0.01	0.80	96.72	0 01:23	0.80
732	STORAGE	0.11	2.59	96.62	0 01:23	2.59
740	STORAGE	0.00	0.00	99.38	0 00:00	0.00
741	STORAGE	0.00	0.12	97.08	0 01:03	0.12
742	STORAGE	0.12	2.65	96.54	0 01:23	2.65
743W	STORAGE	0.00	0.17	95.30	0 01:24	0.17
744	STORAGE	0.23	0.60	93.67	0 01:23	0.60
746	STORAGE	0.01	0.37	95.34	0 01:25	0.37
747	STORAGE	0.05	0.31	95.38	0 01:24	0.31
748W	STORAGE	0.01	0.30	95.64	0 01:24	0.30
750E	STORAGE	0.01	0.45	96.49	0 01:24	0.44
750S	STORAGE	0.16	3.07	96.48	0 01:23	3.06
751	STORAGE	0.17	3.14	96.45	0 01:23	3.14
752	STORAGE	0.22	3.18	96.43	0 01:23	3.18
753	STORAGE	0.29	3.23	96.41	0 01:23	3.23
754	STORAGE	0.36	3.25	96.36	0 01:23	3.25
754_2	STORAGE	0.39	2.84	95.92	0 01:32	2.84
755	STORAGE	0.49	3.34	96.32	0 01:23	3.34
755_2	STORAGE	0.44	2.86	95.89	0 01:34	2.86
760	STORAGE	0.01	0.88	96.47	0 01:23	0.88
761	STORAGE	0.32	1.91	96.42	0 01:23	1.91
770	STORAGE	0.07	2.04	96.51	0 01:23	2.04
771	STORAGE	0.01	0.77	96.62	0 01:23	0.77
772	STORAGE	0.01	0.38	97.01	0 01:06	0.38
773	STORAGE	0.00	0.10	98.42	0 01:10	0.10
774	STORAGE	0.00	0.11	98.31	0 01:01	0.11
776	STORAGE	0.01	0.39	97.64	0 01:06	0.39
780	STORAGE	0.01	0.68	96.48	0 01:23	0.68
781	STORAGE	0.01	0.93	96.48	0 01:23	0.93
782	STORAGE	0.02	1.23	96.45	0 01:23	1.23
783	STORAGE	0.03	1.42	96.44	0 01:23	1.42

790	STORAGE	0.01	0.23	100.06	0	01:03	0.23
800	STORAGE	0.01	0.17	100.49	0	01:05	0.17
801	STORAGE	0.01	0.15	101.39	0	01:04	0.14
810	STORAGE	0.01	0.30	101.02	0	01:07	0.30
820	STORAGE	1.63	1.73	93.40	0	01:20	1.73
821	STORAGE	1.54	1.71	93.47	0	01:20	1.71
822	STORAGE	1.24	1.47	93.54	0	01:19	1.47
825	STORAGE	0.17	0.46	94.30	0	01:12	0.46
Clarke_227	STORAGE	0.01	0.33	97.09	0	01:24	0.33
Clarke_228	STORAGE	0.00	0.00	102.11	0	00:00	0.00
Dry_Pond	STORAGE	0.03	1.18	101.18	0	01:18	1.18
EX.102	STORAGE	1.92	1.94	93.32	0	01:21	1.94
Mattamy_West_DryPond	STORAGE	0.00	0.91	102.09	0	01:15	0.91
MH_110	STORAGE	0.00	0.21	102.65	0	01:05	0.21
MH_111	STORAGE	0.01	0.34	100.14	0	01:19	0.33
MH_112	STORAGE	0.02	1.09	99.96	0	01:19	1.09
MH_150	STORAGE	0.01	0.44	102.05	0	01:20	0.44
MH_152	STORAGE	0.03	1.02	100.95	0	01:17	1.02
MH_154	STORAGE	0.03	1.00	100.01	0	01:17	1.00
MH_156	STORAGE	0.06	2.43	98.76	0	01:13	2.43
MH_158	STORAGE	0.49	2.98	97.65	0	01:11	2.98
MH_163	STORAGE	0.01	0.39	100.28	0	01:19	0.39
MH_170	STORAGE	0.02	1.33	106.87	0	01:12	1.33
MH_172	STORAGE	0.02	0.88	103.98	0	01:13	0.88
MH_174	STORAGE	0.03	1.16	103.70	0	01:16	1.16
MH_176	STORAGE	0.03	1.30	103.38	0	01:16	1.30
MH_177	STORAGE	0.00	0.00	101.32	0	00:00	0.00
MH_300	STORAGE	0.44	1.69	104.08	0	01:12	1.69
MH_302	STORAGE	0.45	2.45	102.45	0	01:18	2.44
MH_304	STORAGE	0.54	2.76	100.92	0	01:19	2.75
MH_313	STORAGE	0.59	1.41	100.37	0	01:20	1.41
MH_314	STORAGE	0.60	1.92	101.51	0	01:17	1.92
MH_316	STORAGE	0.59	2.17	101.36	0	01:17	2.17
MH_318	STORAGE	0.59	1.82	100.86	0	01:16	1.82
MH_320	STORAGE	1.06	2.02	99.92	0	01:17	2.02
MH_321	STORAGE	0.45	2.64	100.72	0	01:19	2.64
MH_322	STORAGE	0.46	2.53	100.47	0	01:19	2.53
MH_323	STORAGE	0.46	2.32	100.15	0	01:20	2.32
MH_324	STORAGE	0.95	2.50	99.50	0	01:19	2.50
MH_330	STORAGE	0.68	2.52	99.27	0	01:18	2.52
MH_332	STORAGE	0.64	2.61	99.00	0	01:18	2.60
MH_334	STORAGE	0.63	2.49	98.67	0	01:19	2.49
MH_336	STORAGE	0.85	2.32	97.13	0	01:19	2.32
MH_360	STORAGE	0.37	3.25	96.35	0	01:23	3.25
MH_362	STORAGE	0.45	1.90	97.45	0	01:17	1.90
MH_364	STORAGE	0.54	1.97	98.83	0	01:17	1.97
MH_559	STORAGE	0.69	3.50	97.58	0	01:10	3.50
NWP	STORAGE	0.04	0.75	95.75	0	01:58	0.75
S_110-111	STORAGE	0.00	0.35	107.35	0	01:11	0.35
S_111-112	STORAGE	0.00	0.25	103.65	0	01:13	0.25
S_111-112_SCH	STORAGE	0.00	0.23	103.63	0	01:17	0.23
S_154-156_SCH	STORAGE	0.00	0.41	105.61	0	01:17	0.41
S_163-156	STORAGE	0.00	0.15	103.80	0	01:10	0.15
S_170-172	STORAGE	0.00	0.01	111.01	0	01:10	0.01
S_171-172_COM	STORAGE	0.00	0.46	111.46	0	01:14	0.46
S_171-172_PR	STORAGE	0.00	0.46	111.46	0	01:14	0.46
S_174-176_MLT	STORAGE	0.00	0.17	108.20	0	01:13	0.17
S_300-302	STORAGE	0.00	0.14	108.24	0	01:10	0.13
S_302-304	STORAGE	0.00	0.22	107.32	0	01:10	0.22
S_313-112	STORAGE	0.00	0.33	103.73	0	01:13	0.33
S_314-316	STORAGE	0.00	0.15	105.95	0	01:10	0.14
S_314-316_2	STORAGE	0.00	0.03	104.18	0	01:10	0.03
S_316-318	STORAGE	0.00	0.22	105.62	0	01:10	0.22
S_318-364	STORAGE	0.00	0.11	105.41	0	01:10	0.11
S_320-324	STORAGE	0.00	0.12	102.92	0	01:10	0.11
S_322-323	STORAGE	0.00	0.09	104.59	0	01:10	0.09
S_323-324	STORAGE	0.00	0.26	103.76	0	01:10	0.26
S_330-332	STORAGE	0.00	0.11	105.21	0	01:10	0.11
S_332-334	STORAGE	0.00	0.19	103.99	0	01:10	0.19
S_334-336	STORAGE	0.00	0.26	103.26	0	01:10	0.26
S_336-SWP	STORAGE	0.00	0.27	103.07	0	01:11	0.27
S_362-360	STORAGE	0.00	0.12	101.37	0	01:10	0.12
S_Brazeau	STORAGE	0.14	1.05	102.25	0	02:25	1.05
S_Drummond	STORAGE	0.12	0.88	102.08	0	02:25	0.88
S_External-820_1	STORAGE	0.00	0.32	98.32	0	01:11	0.32
S_External-820_2	STORAGE	0.00	0.32	98.32	0	01:11	0.32
S_Mattamy_West	STORAGE	0.00	0.35	106.55	0	01:11	0.35
SWP	STORAGE	0.21	1.18	96.78	0	02:53	1.18

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Node Inflow Summary
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-------------------------------------------------------------------------------------------------
                                 Maximum  Maximum                  Lateral       Total        Flow
                                 Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                  Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           CMS      CMS  days hr:min    10^6 ltr    10^6 ltr     Percent
-------------------------------------------------------------------------------------------------
723E                 JUNCTION     0.136    0.178     0  01:23       0.397        0.52       0.033
743E                 JUNCTION     0.162    0.230     0  01:21       0.402       0.536      -0.006
748E                 JUNCTION     0.077    0.165     0  01:23       0.291       0.421      -0.007
S_150-152            JUNCTION     0.457    1.880     0  01:10       0.588        1.26      -1.020
S_152                JUNCTION     0.000    0.127     0  01:12           0       0.058      56.570
S_152-154            JUNCTION     0.350    0.352     0  01:10        0.45       0.459      -1.341
S_154-156            JUNCTION     0.527    2.084     0  01:10       0.677        1.41      -0.764
S_156-158            JUNCTION     0.475    2.633     0  01:11       0.611        1.75       0.771
S_158-NWP            JUNCTION     0.000    2.182     0  01:12           0        1.16      -6.369
S_172                JUNCTION     0.000    0.000     0  00:00           0           0       0.000 ltr
S_172-174            JUNCTION     0.525    0.525     0  01:10       0.703       0.703      -1.975
S_174-176            JUNCTION     0.498    0.577     0  01:08       0.667       0.712       0.486
S_177                JUNCTION     0.000    0.097     0  01:11           0      0.0486       3.899
S_177-152            JUNCTION     0.514    0.521     0  01:10       0.688       0.713      -0.535
Clarke_224           OUTFALL      0.000    0.880     0  01:24           0        1.97       0.000
D102                 OUTFALL      0.000    3.477     0  01:21           0        48.8       0.000
OF_Brazeau           OUTFALL      0.373    0.683     0  01:30        1.78        15.2       0.000
OF_Drummond          OUTFALL      0.278    0.538     0  01:20        1.29        12.5       0.000
OF2                  OUTFALL      0.000    0.359     0  01:11           0      0.0814       0.000
700                  STORAGE      0.012    0.024     0  01:18      0.0375      0.0381       0.387
701                  STORAGE      0.121    2.044     0  01:21       0.322        6.02      -0.186
702                  STORAGE      0.034    0.074     0  01:09       0.124       0.288       0.052
703N                 STORAGE      0.040    0.040     0  00:59       0.163       0.163      -0.001
703S                 STORAGE      0.032    0.145     0  01:07       0.138         0.6      -0.001
704                  STORAGE      0.036    0.472     0  01:05       0.109        1.87      -0.002
705                  STORAGE      0.034    0.182     0  01:03        0.16       0.736      -0.004
710                  STORAGE      0.055    1.301     0  01:19       0.229        3.26      -0.062
711                  STORAGE      0.045    0.102     0  01:03       0.168       0.374       0.459
712E                 STORAGE      0.040    0.072     0  01:04       0.157       0.293       0.026
712N                 STORAGE      0.057    0.057     0  00:57       0.206       0.206       0.031
713N                 STORAGE      0.032    0.032     0  00:58       0.135       0.135      -0.004
713S                 STORAGE      0.030    0.030     0  01:01       0.116       0.116      -0.002
714                  STORAGE      0.013    0.043     0  01:02       0.037       0.153      -0.003
720                  STORAGE      0.587    1.869     0  01:19        2.13        5.39       0.293
721                  STORAGE      0.139    2.106     0  01:14       0.373         6.4       0.861
722                  STORAGE      0.012    2.063     0  01:13      0.0691        6.38      -0.544
723W                 STORAGE      0.024    0.061     0  01:23       0.108       0.123      -0.000
724                  STORAGE      0.040    0.197     0  01:00      0.0504        0.57       0.045
730                  STORAGE      0.022    0.077     0  01:19       0.112       0.148      -0.032
731                  STORAGE      0.053    0.127     0  01:19       0.218       0.367       0.193
732                  STORAGE      0.144    2.255     0  01:23        0.42        7.18      -0.214
740                  STORAGE      0.000    0.000     0  00:00           0           0       0.000 ltr
741                  STORAGE      0.031    0.031     0  00:58        0.13        0.13       0.031
742                  STORAGE      0.097    2.291     0  01:24       0.269        7.47       0.253
743W                 STORAGE      0.000    0.089     0  01:24           0       0.134       0.017
744                  STORAGE      0.039    0.430     0  01:23      0.0888         1.2      -0.015
746                  STORAGE      0.016    0.181     0  01:24       0.151       0.571      -0.007
747                  STORAGE      0.000    0.165     0  01:24           0        0.42       0.003
748W                 STORAGE      0.000    0.090     0  01:24           0       0.129       0.007
750E                 STORAGE      0.029    0.043     0  01:17       0.108       0.109       0.747
750S                 STORAGE      0.185    2.392     0  01:24       0.683           8      -0.223
751                  STORAGE      0.038    2.472     0  01:24        0.11        8.29      -0.079
752                  STORAGE      0.122    2.600     0  01:25       0.282        8.58      -0.072
753                  STORAGE      0.020    3.394     0  01:25      0.0585        11.8      -0.164
754                  STORAGE      0.000    3.410     0  01:25           0        20.7      -0.072
754_2                STORAGE      0.000    2.931     0  01:21           0        13.1       0.052
755                  STORAGE      0.053    2.394     0  01:20       0.717        22.1       0.037
755_2                STORAGE      0.000    1.496     0  01:21           0        7.89       0.070
760                  STORAGE      0.058    0.182     0  01:15       0.254       0.411       1.116
761                  STORAGE      0.021    0.232     0  01:29       0.106       0.872       1.013
770                  STORAGE      0.081    0.581     0  01:04       0.301        2.29       0.015
771                  STORAGE      0.000    0.498     0  01:06           0        1.99       0.240
772                  STORAGE      0.000    0.498     0  01:06           0        1.99      -0.000
773                  STORAGE      0.026    0.026     0  01:00        0.12        0.12      -0.002
774                  STORAGE      0.044    0.044     0  00:56       0.158       0.158       0.747
776                  STORAGE      0.000    0.498     0  01:05           0        1.99       0.021
780                  STORAGE      0.028    0.076     0  01:16        0.13       0.134       0.090
781                  STORAGE      0.020    0.052     0  01:16      0.0993       0.192       1.391
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782	STORAGE	0.000	0.049	0	01:05	0	0.192	-1.001	
783	STORAGE	0.033	0.081	0	01:51	0.157	0.351	0.247	
790	STORAGE	0.106	0.148	0	01:03	0.422	0.575	-0.002	
800	STORAGE	0.055	0.110	0	01:04	0.21	0.425	-0.002	
801	STORAGE	0.055	0.055	0	01:04	0.215	0.215	-0.003	
810	STORAGE	0.041	0.113	0	01:04	0.17	0.462	-0.028	
820	STORAGE	0.000	3.299	0	01:20	0	48.3	0.000	
821	STORAGE	0.000	2.876	0	01:19	0	47.1	0.000	
822	STORAGE	0.471	2.553	0	01:20	0.968	46.3	-0.037	
825	STORAGE	0.000	0.576	0	01:10	0	24.3	0.005	
Clarke_227	STORAGE	0.000	0.880	0	01:08	0	1.97	0.015	
Clarke_228	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
Dry_Pond	STORAGE	0.000	2.645	0	01:10	0	1.33	0.004	
EX.102	STORAGE	0.000	3.477	0	01:21	0	48.8	-0.000	
Mattamy_West_DryPond	STORAGE	0.000	0.582	0	01:11	0	0.165	-0.001	
MH_110	STORAGE	0.000	0.200	0	01:03	0	0.423	0.015	
MH_111	STORAGE	0.000	0.380	0	01:05	0	0.753	0.102	
MH_112	STORAGE	0.000	1.099	0	01:16	0	2.53	0.212	
MH_150	STORAGE	0.000	0.220	0	01:02	0	0.505	0.004	
MH_152	STORAGE	0.000	3.409	0	01:16	0	7.69	0.002	
MH_154	STORAGE	0.000	4.109	0	01:17	0	9.63	-0.166	
MH_156	STORAGE	0.000	4.564	0	01:17	0	10.8	0.506	
MH_158	STORAGE	0.000	4.916	0	01:18	0	18.4	-0.138	
MH_163	STORAGE	0.000	0.230	0	01:02	0	0.53	0.003	
MH_170	STORAGE	0.357	1.957	0	01:10	0.489	4.18	0.049	
MH_172	STORAGE	0.000	2.164	0	01:12	0	4.85	0.014	
MH_174	STORAGE	0.000	2.739	0	01:13	0	6.12	0.003	
MH_176	STORAGE	0.000	2.694	0	01:14	0	6.12	-0.003	
MH_177	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
MH_300	STORAGE	0.148	0.838	0	01:10	0.325	1.88	-0.086	
MH_302	STORAGE	0.000	1.573	0	01:13	0	3.05	-0.104	
MH_304	STORAGE	0.000	1.599	0	01:12	0	2.45	0.257	
MH_313	STORAGE	0.000	0.220	0	01:04	0	0.448	-0.437	
MH_314	STORAGE	0.000	0.900	0	01:04	0	1.99	-0.177	
MH_316	STORAGE	0.000	1.594	0	01:11	0	2.8	1.083	
MH_318	STORAGE	0.000	2.007	0	01:16	0	3.38	-1.197	
MH_320	STORAGE	0.000	0.866	0	01:17	0	2.53	0.484	
MH_321	STORAGE	0.000	1.754	0	01:12	0	2.46	-2.124	
MH_322	STORAGE	0.000	1.944	0	01:13	0	3.23	-0.037	
MH_323	STORAGE	0.000	2.136	0	01:17	0	3.73	-0.198	
MH_324	STORAGE	0.000	2.972	0	01:17	0	5.97	0.423	
MH_330	STORAGE	0.000	3.234	0	01:18	0	7.08	-0.462	
MH_332	STORAGE	0.000	3.882	0	01:18	0	8.28	0.870	
MH_334	STORAGE	0.000	4.465	0	01:18	0	9.14	-0.609	
MH_336	STORAGE	0.000	4.543	0	01:19	0	9.17	-0.089	
MH_360	STORAGE	0.000	2.990	0	01:19	0	14	-0.380	
MH_362	STORAGE	0.000	2.557	0	01:17	0	4.31	0.796	
MH_364	STORAGE	0.000	1.994	0	01:17	0	3.03	-0.016	
MH_559	STORAGE	0.000	2.664	0	01:17	0	31.2	0.010	
NWP	STORAGE	2.608	6.264	0	01:14	3.77	10.5	-0.001	
S_110-111	STORAGE	0.337	0.337	0	01:10	0.434	0.434	-0.017	
S_111-112	STORAGE	0.305	0.333	0	01:11	0.392	0.403	-0.019	
S_111-112_SCH	STORAGE	1.007	1.007	0	01:10	1.46	1.46	-0.029	
S_154-156_SCH	STORAGE	0.911	0.911	0	01:10	1.32	1.32	-0.029	
S_163-156	STORAGE	0.491	1.003	0	01:10	0.632	0.87	-0.011	
S_170-172	STORAGE	0.392	0.392	0	01:10	0.504	0.504	-0.023	
S_171-172_COM	STORAGE	0.985	0.985	0	01:10	1.44	1.44	-0.053	
S_171-172_PR	STORAGE	1.217	1.217	0	01:10	1.74	1.74	-0.046	
S_174-176_MLT	STORAGE	0.438	0.438	0	01:10	0.611	0.611	-0.034	
S_300-302	STORAGE	1.459	1.459	0	01:10	1.88	1.88	-0.015	
S_302-304	STORAGE	1.601	2.290	0	01:10	2.06	2.38	-0.012	
S_313-112	STORAGE	0.366	0.445	0	01:10	0.47	0.509	-0.017	
S_314-316	STORAGE	1.667	1.667	0	01:10	2.14	2.14	-0.015	
S_314-316_2	STORAGE	0.192	0.192	0	01:10	0.246	0.246	-0.017	
S_316-318	STORAGE	1.398	2.173	0	01:10	1.8	2.16	-0.012	
S_318-364	STORAGE	1.057	1.057	0	01:10	1.36	1.36	-0.015	
S_320-324	STORAGE	1.127	1.127	0	01:10	1.45	1.45	-0.015	
S_322-323	STORAGE	0.839	0.839	0	01:10	1.08	1.08	-0.015	
S_323-324	STORAGE	0.729	1.138	0	01:10	0.937	1.13	-0.012	
S_330-332	STORAGE	1.066	1.066	0	01:10	1.37	1.37	-0.015	
S_332-334	STORAGE	1.485	1.995	0	01:10	1.91	2.14	-0.013	
S_334-336	STORAGE	1.380	2.553	0	01:10	1.77	2.32	-0.011	
S_336-SWP	STORAGE	0.394	2.132	0	01:10	0.961	1.79	0.001	
S_362-360	STORAGE	1.204	1.204	0	01:10	1.55	1.55	-0.015	
S_Brazeau	STORAGE	10.258	10.258	0	01:10	13.4	13.4	-0.000	
S_Drummond	STORAGE	8.594	8.594	0	01:10	11.2	11.2	-0.000	
S_External-820_1	STORAGE	0.635	0.712	0	01:10	0.794	0.819	-0.008	
S_External-820_2	STORAGE	0.782	0.916	0	01:09	0.978	0.991	-0.012	
S_Mattamy_West	STORAGE	1.532	1.532	0	01:10	1.97	1.97	-0.015	

SWP STORAGE 1.095 11.560 0 01:18 1.62 24.3 0.049

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
700	0.000	0	0	0	0.001	45	0 01:23	0.019
701	0.000	1	0	0	0.002	57	0 01:23	2.018
702	0.000	0	0	0	0.000	8	0 01:16	0.074
703N	0.000	0	0	0	0.000	8	0 01:09	0.040
703S	0.000	0	0	0	0.000	10	0 01:08	0.145
704	0.000	0	0	0	0.000	9	0 01:05	0.472
705	0.000	0	0	0	0.000	11	0 01:04	0.182
710	0.000	1	0	0	0.002	77	0 01:19	1.292
711	0.000	0	0	0	0.000	11	0 01:01	0.106
712E	0.000	1	0	0	0.000	15	0 01:04	0.072
712N	0.000	0	0	0	0.000	12	0 01:03	0.057
713N	0.000	0	0	0	0.000	10	0 01:17	0.032
713S	0.000	0	0	0	0.000	10	0 01:02	0.030
714	0.000	0	0	0	0.000	8	0 01:03	0.043
720	0.000	1	0	0	0.001	47	0 01:23	1.846
721	0.000	1	0	0	0.002	60	0 01:23	2.086
722	0.000	2	0	0	0.002	67	0 01:23	2.047
723W	0.000	0	0	0	0.000	5	0 01:24	0.061
724	0.000	3	0	0	0.000	14	0 01:00	0.197
730	0.000	0	0	0	0.001	31	0 01:23	0.074
731	0.000	1	0	0	0.001	38	0 01:23	0.127
732	0.000	3	0	0	0.003	72	0 01:23	2.256
740	0.000	0	0	0	0.000	0	0 00:00	0.000
741	0.000	0	0	0	0.000	8	0 01:03	0.032
742	0.000	3	0	0	0.003	74	0 01:23	2.300
743W	0.000	0	0	0	0.000	9	0 01:24	0.089
744	0.000	7	0	0	0.001	17	0 01:23	0.430
746	0.000	1	0	0	0.000	22	0 01:25	0.181
747	0.000	2	0	0	0.000	11	0 01:24	0.165
748W	0.000	0	0	0	0.000	19	0 01:24	0.090
750E	0.000	0	0	0	0.001	30	0 01:24	0.043
750S	0.000	4	0	0	0.003	79	0 01:23	2.399
751	0.000	5	0	0	0.004	85	0 01:23	2.481
752	0.000	6	0	0	0.004	84	0 01:23	2.605
753	0.000	8	0	0	0.004	89	0 01:23	3.410
754	0.003	7	0	0	0.030	61	0 01:23	3.427
754_2	0.004	7	0	0	0.029	48	0 01:32	2.919
755	0.003	9	0	0	0.024	62	0 01:23	2.375
755_2	0.004	7	0	0	0.029	48	0 01:34	1.487
760	0.000	1	0	0	0.001	59	0 01:23	0.131
761	0.000	14	0	0	0.002	86	0 01:23	0.255
770	0.000	3	0	0	0.002	77	0 01:23	0.579
771	0.000	0	0	0	0.001	24	0 01:23	0.500
772	0.000	0	0	0	0.000	12	0 01:06	0.498
773	0.000	0	0	0	0.000	6	0 01:10	0.026
774	0.000	0	0	0	0.000	8	0 01:01	0.046
776	0.000	0	0	0	0.000	15	0 01:06	0.498
780	0.000	1	0	0	0.001	52	0 01:23	0.043
781	0.000	1	0	0	0.001	55	0 01:23	0.049
782	0.000	1	0	0	0.001	76	0 01:23	0.050
783	0.000	2	0	0	0.002	78	0 01:23	0.082
790	0.000	0	0	0	0.000	10	0 01:03	0.148
800	0.000	0	0	0	0.000	10	0 01:05	0.110

801	0.000	0	0	0	0.000	12	0	01:04	0.055
810	0.000	1	0	0	0.000	15	0	01:07	0.113
820	0.002	26	0	0	0.002	28	0	01:20	3.301
821	0.002	26	0	0	0.002	28	0	01:20	2.876
822	0.001	20	0	0	0.002	23	0	01:19	2.580
825	0.000	3	0	0	0.001	8	0	01:12	0.571
Clarke_227	0.000	0	0	0	0.000	5	0	01:24	0.880
Clarke_228	0.000	0	0	0	0.000	0	0	00:00	0.000
Dry_Pond	0.022	1	0	0	1.123	73	0	01:18	0.337
EX.102	0.002	29	0	0	0.002	29	0	01:21	3.477
Mattamy_West_DryPond	0.001	0	0	0	0.119	46	0	01:15	0.100
MH_110	0.000	0	0	0	0.000	5	0	01:05	0.200
MH_111	0.000	0	0	0	0.000	9	0	01:19	0.380
MH_112	0.000	0	0	0	0.001	24	0	01:19	1.079
MH_150	0.000	0	0	0	0.000	10	0	01:20	0.219
MH_152	0.000	0	0	0	0.001	16	0	01:17	3.409
MH_154	0.000	0	0	0	0.001	16	0	01:17	4.104
MH_156	0.000	1	0	0	0.003	34	0	01:13	4.916
MH_158	0.001	9	0	0	0.003	57	0	01:11	5.114
MH_163	0.000	0	0	0	0.000	10	0	01:19	0.230
MH_170	0.000	0	0	0	0.002	24	0	01:12	1.814
MH_172	0.000	0	0	0	0.001	20	0	01:13	2.159
MH_174	0.000	0	0	0	0.001	21	0	01:16	2.694
MH_176	0.000	1	0	0	0.001	27	0	01:16	2.681
MH_177	0.000	0	0	0	0.000	0	0	00:00	0.000
MH_300	0.213	42	0	29	0.503	99	0	01:12	0.837
MH_302	0.234	42	0	20	0.553	99	0	01:18	1.603
MH_304	0.001	7	0	0	0.003	35	0	01:19	1.702
MH_313	0.073	55	0	27	0.127	97	0	01:20	0.228
MH_314	0.372	57	0	30	0.647	100	0	01:17	0.947
MH_316	0.270	56	0	17	0.482	99	0	01:17	1.510
MH_318	0.206	56	0	10	0.365	99	0	01:16	1.996
MH_320	0.001	22	0	0	0.002	41	0	01:17	0.866
MH_321	0.066	40	0	7	0.159	96	0	01:19	1.546
MH_322	0.123	42	0	10	0.291	98	0	01:19	1.788
MH_323	0.108	42	0	7	0.253	98	0	01:20	2.121
MH_324	0.001	15	0	0	0.003	38	0	01:19	2.869
MH_330	0.234	62	0	5	0.369	98	0	01:18	3.234
MH_332	0.303	59	0	6	0.512	99	0	01:18	3.818
MH_334	0.278	58	0	5	0.477	99	0	01:19	4.445
MH_336	0.001	11	0	0	0.003	29	0	01:19	4.568
MH_360	0.000	6	0	0	0.004	57	0	01:23	2.931
MH_362	0.178	42	0	11	0.415	99	0	01:17	2.543
MH_364	0.001	8	0	0	0.002	29	0	01:17	1.992
MH_559	0.005	11	0	0	0.025	58	0	01:10	2.818
NWP	0.476	1	0	0	10.212	16	0	01:58	1.211
S_110-111	0.000	0	0	0	0.040	70	0	01:11	0.277
S_111-112	0.000	0	0	0	0.032	50	0	01:13	0.220
S_111-112_SCH	0.002	0	0	0	0.231	46	0	01:17	0.500
S_154-156_SCH	0.001	1	0	0	0.207	83	0	01:17	0.450
S_163-156	0.000	0	0	0	0.025	31	0	01:10	0.979
S_170-172	0.000	0	0	0	0.001	2	0	01:10	0.390
S_171-172_COM	0.001	0	0	0	0.183	91	0	01:14	0.540
S_171-172_PR	0.001	0	0	0	0.230	92	0	01:14	0.670
S_174-176_MLT	0.000	0	0	0	0.086	34	0	01:13	0.250
S_300-302	0.000	0	0	0	0.066	27	0	01:10	1.395
S_302-304	0.000	0	0	0	0.117	44	0	01:10	2.190
S_313-112	0.000	0	0	0	0.062	66	0	01:13	0.250
S_314-316	0.000	0	0	0	0.082	29	0	01:10	1.584
S_314-316_2	0.000	0	0	0	0.002	6	0	01:10	0.190
S_316-318	0.000	0	0	0	0.102	44	0	01:10	2.092
S_318-364	0.000	0	0	0	0.039	22	0	01:10	1.020
S_320-324	0.000	0	0	0	0.044	23	0	01:10	1.086
S_322-323	0.000	0	0	0	0.027	19	0	01:10	0.815
S_323-324	0.000	0	0	0	0.064	52	0	01:10	1.113
S_330-332	0.000	0	0	0	0.039	22	0	01:10	1.029
S_332-334	0.000	0	0	0	0.097	39	0	01:10	1.911
S_334-336	0.000	0	0	0	0.121	52	0	01:10	2.444
S_336-SWP	0.001	0	0	0	0.110	54	0	01:11	2.090
S_362-360	0.000	0	0	0	0.048	24	0	01:10	1.158
S_Brazeau	1.429	10	0	0	10.524	70	0	02:25	0.310
S_Drummond	1.198	8	0	0	8.826	59	0	02:25	0.260
S_External-820_1	0.000	0	0	0	0.085	63	0	01:11	0.680
S_External-820_2	0.000	0	0	0	0.107	64	0	01:11	0.650
S_Mattamy_West	0.001	0	0	0	0.179	70	0	01:11	1.362
SWP	3.242	4	0	0	18.966	24	0	02:53	0.840

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Clarke_224	13.50	0.085	0.880	1.969
D102	99.99	0.283	3.477	48.845
OF_Brazeau	26.53	0.331	0.683	15.169
OF_Drummond	26.70	0.271	0.538	12.500
OF2	0.25	0.190	0.359	0.081
System	33.39	1.160	5.638	78.564

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	2.451	0	01:16	2.16	0.23	0.89
-100	CONDUIT	0.498	0	01:06	2.42	0.36	0.46
-101	CONDUIT	0.498	0	01:06	2.43	0.37	0.46
-102	CONDUIT	0.500	0	01:04	2.74	0.36	1.00
-103	CONDUIT	0.579	0	01:04	2.16	0.31	1.00
-104_1	CONDUIT	0.090	0	01:24	0.59	0.29	0.52
-104_2	CONDUIT	0.165	0	01:24	1.19	0.53	0.48
-105	CONDUIT	0.165	0	01:24	1.12	0.26	0.51
-106	CONDUIT	0.181	0	01:25	1.16	0.62	0.53
-107	CONDUIT	0.430	0	01:23	1.48	0.70	0.73
-108_1	CONDUIT	0.089	0	01:24	1.57	0.25	0.48
-108_2	CONDUIT	0.230	0	01:22	2.30	0.65	0.59
-109_1	CONDUIT	0.061	0	01:24	1.12	0.15	0.37
-109_2	CONDUIT	0.178	0	01:23	2.03	0.43	0.53
-110	CONDUIT	0.197	0	01:00	1.91	0.50	0.60
-160	CONDUIT	0.019	0	01:29	0.81	0.22	1.00
2	CONDUIT	0.212	0	04:18	1.37	0.02	0.89
-27	CONDUIT	3.301	0	01:21	1.37	0.69	0.86
-28	CONDUIT	2.876	0	01:20	1.28	0.61	0.80
-29	CONDUIT	2.580	0	01:23	1.27	0.58	0.74
5	CONDUIT	2.286	0	01:16	2.04	0.17	0.89
-51	CONDUIT	0.057	0	01:03	1.78	0.18	0.34
-52	CONDUIT	0.106	0	01:02	1.78	0.31	0.69
-53	CONDUIT	1.292	0	01:19	2.89	1.42	0.96
-54	CONDUIT	1.846	0	01:21	2.17	1.04	1.00
-55	CONDUIT	0.040	0	01:09	1.85	0.24	0.34
-56	CONDUIT	0.074	0	01:16	1.77	0.32	0.41
-57	CONDUIT	2.018	0	01:22	2.09	0.70	1.00
-58	CONDUIT	0.055	0	01:19	0.86	0.63	1.00
-59	CONDUIT	0.074	0	01:19	1.01	0.91	1.00
6	CONDUIT	0.840	0	11:52	0.74	0.06	0.89
-60	CONDUIT	0.127	0	01:25	0.88	0.62	1.00
-61	CONDUIT	2.051	0	01:13	1.87	0.84	1.00
-62	CONDUIT	0.037	0	01:23	0.45	0.35	0.68
-63	CONDUIT	2.010	0	01:23	1.93	0.55	1.00
-64	CONDUIT	0.090	0	01:24	1.32	1.19	0.88
-65	CONDUIT	2.166	0	01:24	1.66	0.70	1.00
-66	CONDUIT	0.000	0	00:00	0.00	0.00	0.18
-67	CONDUIT	0.032	0	01:18	1.18	0.32	0.69
-68	CONDUIT	2.211	0	01:24	1.84	0.53	1.00
-69	CONDUIT	0.089	0	01:24	1.31	1.05	0.88
-70	CONDUIT	0.043	0	01:19	0.85	0.21	0.99
-71	CONDUIT	0.131	0	01:30	1.00	0.38	1.00
-72	CONDUIT	0.255	0	01:29	0.60	0.22	1.00
-73	CONDUIT	3.410	0	01:25	1.30	0.84	1.00
-74	CONDUIT	2.341	0	01:20	0.89	0.55	1.00
754_2-755_2	CONDUIT	0.836	0	01:21	0.74	0.70	1.00
754-754_2	CONDUIT	1.384	0	01:08	1.07	0.33	1.00
755_2-755	CONDUIT	0.660	0	01:21	2.33	2.98	1.00
-77	CONDUIT	0.048	0	01:16	0.36	0.33	1.00
-78	CONDUIT	0.028	0	01:13	0.93	0.36	1.00
-79	CONDUIT	0.049	0	01:05	0.91	0.50	1.00
-80	CONDUIT	0.050	0	01:51	0.97	0.45	1.00

-81	CONDUIT	0.082	0	01:51	0.83	0.36	1.00
-82	CONDUIT	2.399	0	01:24	1.03	0.41	1.00
825-822	CONDUIT	0.571	0	01:12	1.30	0.14	0.22
-83	CONDUIT	2.481	0	01:25	0.94	0.55	1.00
-84	CONDUIT	2.605	0	01:25	0.99	0.58	1.00
-86	CONDUIT	0.046	0	01:01	1.87	0.28	0.68
-87	CONDUIT	0.030	0	01:02	1.26	0.26	0.36
-88	CONDUIT	0.043	0	01:03	1.30	0.43	0.46
-89	CONDUIT	0.148	0	01:03	1.70	0.34	0.41
-90	CONDUIT	0.182	0	01:04	1.04	0.36	0.41
-91	CONDUIT	0.472	0	01:05	2.22	0.34	0.47
-92	CONDUIT	0.055	0	01:04	1.38	0.31	0.38
-93	CONDUIT	0.110	0	01:05	1.95	0.30	0.38
-94	CONDUIT	0.032	0	01:17	1.04	0.21	0.32
-95	CONDUIT	0.072	0	01:04	1.10	0.37	0.44
-96	CONDUIT	0.113	0	01:07	1.05	0.48	0.49
-97	CONDUIT	0.145	0	01:08	1.94	0.27	0.37
-98	CONDUIT	0.000	0	00:00	0.00	0.00	0.12
-99	CONDUIT	0.026	0	01:10	1.21	0.24	0.34
C_152-151	CHANNEL	0.054	0	01:12	0.11	0.04	0.42
C_152-154	CHANNEL	0.016	0	01:16	0.48	0.00	0.19
C_152-177	CHANNEL	0.049	0	01:16	1.34	0.00	0.22
C_154-156	CHANNEL	0.149	0	01:10	0.32	0.03	0.49
C_154-158	CHANNEL	1.603	0	01:12	1.44	0.37	0.65
C_156-NWP	CHANNEL	2.182	0	01:12	1.77	0.29	0.81
C_172-174	CHANNEL	0.000	0	00:00	0.00	0.00	0.15
C_172-176	CHANNEL	0.083	0	01:07	0.37	0.01	0.31
C_174-152	CHANNEL	0.076	0	01:16	0.76	0.01	0.22
C_177-152	CHANNEL	0.097	0	01:11	0.86	0.01	0.21
Clarke_227-224	CONDUIT	0.880	0	01:24	1.15	0.17	0.64
Clarke_228-227	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
Link247	CONDUIT	3.477	0	01:21	1.40	0.72	0.90
MH_110-111	CONDUIT	0.200	0	01:05	2.87	0.43	0.46
MH_111-312	CONDUIT	0.380	0	01:13	1.70	0.48	0.75
MH_112-710	CONDUIT	1.079	0	01:19	3.02	1.13	1.00
MH_150-152	CONDUIT	0.219	0	01:20	1.11	0.67	0.54
MH_152-154	CONDUIT	3.409	0	01:17	2.76	0.81	0.66
MH_154-156	CONDUIT	4.104	0	01:17	3.25	0.78	0.82
MH_156-158	CONDUIT	4.916	0	01:18	2.78	0.94	1.00
MH_158-559	CONDUIT	2.664	0	01:17	1.51	0.39	1.00
MH_163-156	CONDUIT	0.230	0	01:19	1.19	0.41	0.45
MH_170-172	CONDUIT	1.814	0	01:12	3.03	0.98	0.90
MH_172-174	CONDUIT	2.159	0	01:13	1.95	0.74	0.75
MH_174-176	CONDUIT	2.694	0	01:14	2.24	0.92	0.91
MH_176-152	CONDUIT	2.681	0	01:16	2.17	0.92	0.81
MH_177-152	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
MH_300-302	CONDUIT	0.833	0	01:13	1.98	0.78	0.63
MH_302-304	CONDUIT	1.599	0	01:12	2.73	0.91	1.00
MH_304-321	CONDUIT	1.702	0	01:13	1.66	1.13	1.00
MH_313-112	CONDUIT	0.228	0	01:21	1.29	0.62	0.79
MH_314-316	CONDUIT	0.944	0	01:11	1.49	0.89	0.83
MH_316-318	CONDUIT	1.507	0	01:16	1.68	1.00	0.75
MH_318-364	CONDUIT	1.994	0	01:17	2.82	0.67	0.60
MH_320-324	CONDUIT	0.866	0	01:17	1.78	1.56	0.93
MH_321-322	CONDUIT	1.544	0	01:13	1.57	1.02	1.00
MH_322-323	CONDUIT	1.786	0	01:17	1.74	1.18	1.00
MH_323-324	CONDUIT	2.119	0	01:20	2.02	0.92	0.96
MH_324-330	CONDUIT	2.869	0	01:20	1.77	1.05	0.94
MH_330-332	CONDUIT	3.232	0	01:21	1.93	1.18	0.92
MH_332-334	CONDUIT	3.815	0	01:18	1.95	1.08	0.88
MH_334-336	CONDUIT	4.443	0	01:19	2.61	1.26	0.74
MH_336-SWP	CONDUIT	4.568	0	01:19	4.07	0.88	0.63
MH_360-NWP	CONDUIT	2.931	0	01:21	2.59	2.91	1.00
MH_362-360	CONDUIT	2.540	0	01:17	3.18	0.78	0.69
MH_364-362	CONDUIT	1.992	0	01:17	2.59	0.61	0.64
754-NWP	ORIFICE	2.083	0	01:21			
755-NWP	ORIFICE	1.487	0	01:21			
North_OR1	ORIFICE	1.733	0	01:24			1.00
OR_Dry_Pond	ORIFICE	0.337	0	01:18			1.00
South_OR1	ORIFICE	0.576	0	01:10			1.00
3	WEIR	0.045	0	01:12			0.04
4	WEIR	0.045	0	01:12			0.04
W_102-150	WEIR	1.450	0	01:10			0.57
W_110-111	WEIR	0.077	0	01:11			0.17
W_132-134	WEIR	1.211	0	01:10			0.59
W_150-Dry_Pond	WEIR	1.384	0	01:12			0.42
W_158-NWP	WEIR	0.874	0	01:15			0.89
W_158-SWP	WEIR	0.874	0	01:15			0.89
W_163-158	WEIR	0.749	0	01:10			0.59

W_178-132	WEIR	0.519	0	01:10	0.42
W_300-302	WEIR	0.705	0	01:10	0.37
W_314-313	WEIR	0.080	0	01:10	0.06
W_314-316	WEIR	0.794	0	01:10	0.29
W_316-154	WEIR	1.442	0	01:10	0.44
W_318-163	WEIR	0.520	0	01:10	0.38
W_321-Dry_Pond	WEIR	0.556	0	01:10	0.33
W_322-323	WEIR	0.415	0	01:10	0.19
W_323-Dry_Pond	WEIR	0.763	0	01:10	0.37
W_334-336	WEIR	1.794	0	01:10	0.69
W_338-SWP	WEIR	1.990	0	01:11	0.63
W_362-NWP	WEIR	0.588	0	01:10	0.44
W_External-820_1_OF2	WEIR	0.359	0	01:11	0.27
W_External-820_2_1	WEIR	0.150	0	01:11	0.28
W2	WEIR	0.582	0	01:11	0.44
O_110-111	DUMMY	0.200	0	01:03	
O_111-112	DUMMY	0.180	0	01:04	
O_111-112_SCH	DUMMY	0.500	0	01:03	
O_111-710	DUMMY	0.040	0	01:04	
O_150-152	DUMMY	0.220	0	01:02	
O_152-154	DUMMY	0.170	0	01:02	
O_154-156	DUMMY	0.250	0	01:02	
O_154-156_SCH	DUMMY	0.450	0	01:03	
O_156-158	DUMMY	0.230	0	01:02	
O_163-156	DUMMY	0.230	0	01:02	
O_170-172	DUMMY	0.390	0	01:09	
O_171-172_COM	DUMMY	0.540	0	01:02	
O__171-172_PR	DUMMY	0.670	0	01:02	
O_172-174	DUMMY	0.350	0	01:03	
O_174-176	DUMMY	0.330	0	01:03	
O_174-176_MLT	DUMMY	0.250	0	01:02	
O_177-152	DUMMY	0.340	0	01:03	
O_300-302	DUMMY	0.690	0	01:02	
O_302-304	DUMMY	0.740	0	01:02	
O_313-112	DUMMY	0.220	0	01:04	
O_313-710	DUMMY	0.030	0	01:04	
O_314-316	DUMMY	0.790	0	01:02	
O_314-316_2	DUMMY	0.110	0	01:04	
O_316-318	DUMMY	0.650	0	01:02	
O_318-364	DUMMY	0.500	0	01:02	
O_320-324	DUMMY	0.530	0	01:02	
O_322-323	DUMMY	0.400	0	01:02	
O_323-324	DUMMY	0.350	0	01:02	
O_330-332	DUMMY	0.510	0	01:02	
O_332-334	DUMMY	0.700	0	01:02	
O_334-336	DUMMY	0.650	0	01:02	
O_336-SWP	DUMMY	0.100	0	01:04	
O_362-360	DUMMY	0.570	0	01:02	
O_Brazeau	DUMMY	0.310	0	00:33	
O_Drummond	DUMMY	0.260	0	00:34	
O_External-820_1	DUMMY	0.321	0	01:02	
O_External-820_2	DUMMY	0.500	0	01:03	
O_Mattamy_West	DUMMY	0.780	0	01:03	
O_Mattamy_West_DryPond	DUMMY	0.100	0	01:08	

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class								
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.00
-100	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-101	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-102	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.94	0.05	0.00
-103	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.91	0.01	0.00
-104_1	1.00	0.00	0.93	0.00	0.07	0.00	0.00	0.00	0.94	0.00
-104_2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-105	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.93	0.04	0.00
-106	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-107	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-108_1	1.00	0.00	0.96	0.00	0.02	0.01	0.00	0.00	0.96	0.00
-108_2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-109_1	1.00	0.93	0.00	0.00	0.06	0.01	0.00	0.00	0.99	0.00
-109_2	1.00	0.92	0.01	0.00	0.01	0.06	0.00	0.00	0.99	0.00

-110	1.00	0.00	0.92	0.00	0.07	0.01	0.00	0.00	0.98	0.00
-160	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
2	1.00	0.01	0.00	0.00	0.31	0.69	0.00	0.00	0.71	0.00
-27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
5	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.43	0.00
-51	1.00	0.00	0.00	0.00	0.00	0.02	0.00	0.97	0.02	0.00
-52	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
-53	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-54	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
-55	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-56	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-57	1.00	0.00	0.00	0.00	0.03	0.01	0.00	0.95	0.02	0.00
-58	1.00	0.94	0.06	0.00	0.01	0.00	0.00	0.00	0.97	0.00
-59	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
6	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.74	0.00
-60	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
-61	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.93	0.02	0.00
-62	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-63	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.92	0.00	0.00
-64	1.00	0.96	0.03	0.00	0.00	0.00	0.02	0.00	0.00	0.00
-65	1.00	0.00	0.30	0.00	0.69	0.00	0.00	0.00	0.83	0.00
-66	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-67	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-68	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.91	0.00	0.00
-69	1.00	0.95	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00
-70	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
-71	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.95	0.03	0.00
-72	1.00	0.00	0.00	0.00	0.07	0.00	0.92	0.00	0.00	0.00
-73	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-74	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
754_2-755_2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
754-754_2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
755_2-755	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-77	1.00	0.98	0.00	0.00	0.02	0.00	0.00	0.00	0.97	0.00
-78	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
-79	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.95	0.02	0.00
-80	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
-81	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.92	0.01	0.00
-82	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.44	0.00
825-822	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-83	1.00	0.00	0.29	0.00	0.71	0.00	0.00	0.00	0.89	0.00
-84	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
-86	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.93	0.06	0.00
-87	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-88	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
-89	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-90	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-91	1.00	0.00	0.00	0.00	0.00	0.04	0.00	0.96	0.00	0.00
-92	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-93	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-94	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-95	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.02	0.00
-96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-97	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
-98	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-99	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C_152-151	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C_152-154	1.00	0.01	0.01	0.00	0.81	0.17	0.00	0.00	0.01	0.00
C_152-177	1.00	0.01	0.01	0.00	0.70	0.28	0.00	0.00	0.01	0.00
C_154-156	1.00	0.91	0.02	0.00	0.05	0.02	0.00	0.00	0.99	0.00
C_154-158	1.00	0.89	0.02	0.00	0.06	0.03	0.00	0.00	0.00	0.00
C_156-NWP	1.00	0.91	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.00
C_172-174	1.00	0.92	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_172-176	1.00	0.92	0.00	0.00	0.08	0.00	0.00	0.00	0.99	0.00
C_174-152	1.00	0.01	0.93	0.00	0.06	0.01	0.00	0.00	0.97	0.00
C_177-152	1.00	0.92	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.00
Clarke_227-224	1.00	0.00	0.61	0.00	0.39	0.00	0.00	0.00	0.99	0.00
Clarke_228-227	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Link247	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MH_110-111	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_111-312	1.00	0.01	0.00	0.00	0.05	0.02	0.00	0.93	0.06	0.00
MH_112-710	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_150-152	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_152-154	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_154-156	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_156-158	1.00	0.01	0.00	0.00	0.29	0.00	0.00	0.71	0.16	0.00
MH_158-559	1.00	0.01	0.00	0.00	0.99	0.01	0.00	0.00	0.69	0.00

MH_163-156	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_170-172	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_172-174	1.00	0.04	0.03	0.00	0.93	0.00	0.00	0.00	0.74	0.00
MH_174-176	1.00	0.01	0.09	0.00	0.90	0.01	0.00	0.00	0.94	0.00
MH_176-152	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
MH_177-152	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH_300-302	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
MH_302-304	1.00	0.95	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00
MH_304-321	1.00	0.95	0.00	0.00	0.05	0.00	0.00	0.01	0.01	0.00
MH_313-112	1.00	0.95	0.01	0.00	0.01	0.00	0.00	0.04	0.01	0.00
MH_314-316	1.00	0.95	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00
MH_316-318	1.00	0.95	0.00	0.00	0.05	0.00	0.00	0.00	0.93	0.00
MH_318-364	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
MH_320-324	1.00	0.46	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00
MH_321-322	1.00	0.95	0.00	0.00	0.05	0.00	0.00	0.00	0.95	0.00
MH_322-323	1.00	0.95	0.00	0.00	0.05	0.00	0.00	0.00	0.93	0.00
MH_323-324	1.00	0.95	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00
MH_324-330	1.00	0.56	0.00	0.00	0.10	0.00	0.00	0.34	0.08	0.00
MH_330-332	1.00	0.90	0.00	0.00	0.02	0.00	0.00	0.09	0.00	0.00
MH_332-334	1.00	0.92	0.00	0.00	0.08	0.00	0.00	0.01	0.04	0.00
MH_334-336	1.00	0.92	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
MH_336-SWP	1.00	0.01	0.74	0.00	0.24	0.01	0.00	0.00	0.75	0.00
MH_360-NWP	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MH_362-360	1.00	0.95	0.00	0.00	0.01	0.00	0.00	0.04	0.01	0.00
MH_364-362	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full (Both Ends)	Hours Full (Upstream)	Hours Full (Dnstream)	Hours Above Full Normal Flow	Hours Capacity Limited
1	0.01	0.01	8.41	0.01	0.01
-102	0.03	0.03	0.65	0.01	0.01
-103	1.72	1.72	3.45	0.01	0.01
-160	0.14	0.14	0.24	0.01	0.01
2	0.01	0.01	8.41	0.01	0.01
5	0.01	0.01	13.51	0.01	0.01
-52	0.01	0.01	0.39	0.01	0.01
-53	0.01	0.36	0.01	0.41	0.01
-54	0.05	0.05	0.05	0.19	0.04
-57	0.15	0.15	0.26	0.01	0.01
-58	0.11	0.11	0.20	0.01	0.01
-59	0.20	0.20	0.21	0.01	0.10
6	0.01	0.01	13.51	0.01	0.01
-60	0.21	0.21	0.28	0.01	0.01
-61	0.23	0.23	0.24	0.01	0.16
-62	0.01	0.01	0.11	0.01	0.01
-63	0.44	0.44	0.52	0.01	0.01
-64	0.01	0.01	46.87	0.18	0.01
-65	1.10	1.10	1.60	0.01	0.01
-67	0.01	0.01	0.04	0.01	0.01
-68	1.60	1.60	2.35	0.01	0.01
-69	0.01	0.01	46.85	0.10	0.01
-70	0.01	0.01	0.29	0.01	0.01
-71	0.29	0.29	0.57	0.01	0.01
-72	0.79	0.79	1.52	0.01	0.01
-73	3.03	3.03	3.26	0.01	0.01
-74	3.27	3.27	3.38	0.01	0.01
754_2-755_2	3.69	3.69	3.72	0.01	0.20
754-754_2	3.31	3.31	3.33	0.01	0.02
755_2-755	4.12	4.12	4.13	2.35	2.65
-77	0.18	0.18	0.29	0.01	0.01
-78	0.34	0.34	0.44	0.01	0.01
-79	0.58	0.58	0.86	0.01	0.01
-80	0.91	0.91	1.06	0.01	0.01
-81	1.03	1.03	1.70	0.01	0.01
-82	2.20	2.20	2.54	0.01	0.01
-83	2.54	2.54	2.76	0.01	0.01
-84	2.76	2.76	2.95	0.01	0.01
-86	0.01	0.01	1.91	0.01	0.01
C_156-NWP	0.01	0.01	0.07	0.01	0.01
Clarke_227-224	0.01	0.01	47.74	0.01	0.01
MH_111-312	0.01	0.01	0.22	0.01	0.01
MH_112-710	0.19	0.23	0.19	0.26	0.19

MH_156-158	0.22	0.23	2.14	0.01	0.15
MH_158-559	8.41	8.41	13.51	0.01	0.01
MH_170-172	0.01	0.21	0.01	0.01	0.01
MH_302-304	0.10	0.10	0.18	0.01	0.03
MH_304-321	0.17	0.18	0.17	0.03	0.16
MH_313-112	0.01	0.01	0.23	0.01	0.01
MH_320-324	0.01	0.11	0.01	0.32	0.01
MH_321-322	0.14	0.17	0.14	0.01	0.14
MH_322-323	0.04	0.14	0.04	0.17	0.04
MH_323-324	0.01	0.04	0.01	0.01	0.01
MH_324-330	0.01	0.01	0.01	0.10	0.01
MH_330-332	0.01	0.01	0.01	0.17	0.01
MH_332-334	0.01	0.01	0.01	0.11	0.01
MH_334-336	0.01	0.01	0.01	0.16	0.01
MH_360-NWP	3.68	3.68	3.69	0.59	0.68

```
Analysis begun on:  Sat Feb 24 10:30:32 2018
Analysis ended on:  Sat Feb 24 10:30:56 2018
Total elapsed time: 00:00:24
```

Calculation Sheet for Permanent Pool Sizing - North Pond (Pond 1)

Removal Efficiency:	Enhanced 80% long-term S.S. removal	
SWMP Type:	Wet Pond	
Total Drainage Area:	29.0	ha
Average Imperviousness:	70%	
Storage Volume (m³/ha)	225	*(See Table 3.2 from MOECC SWMPDG, copied below)*
Extended Detention Volume (m³/ha)	40	
Permanent Pool Volume Required:	**5,360**	**m³**
Extended Detention Volume Required:	**1,160**	**m³**

Protection Level	**SWMP Type**	**Storage Volume (m³/ha) for Impervious Level**			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

Calculation Sheet for Permanent Pool Sizing - South Pond (Pond 2)

Removal Efficiency:	Enhanced 80% long-term S.S. removal	
SWMP Type:	Wet Pond	
Total Drainage Area:	58.1	ha
Average Imperviousness:	64%	
Storage Volume (m³/ha)	212	*(See Table 3.2 from MOECC SWMPDG, copied below)*
Extended Detention Volume (m³/ha)	40	
Permanent Pool Volume Required:	**9,990**	**m³**
Extended Detention Volume Required:	**2,330**	**m³**

Protection Level	**SWMP Type**	**Storage Volume (m³/ha) for Impervious Level**			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

Calculation Sheet for Sediment Storage

	North	South
Imperviousness	70%	64%
Drainage Area	29	58
Annual Loading / ha	2.84	2.49
Annual Loading	82	145
10 year sediment	823	1449
Slope _:1	5	5
Height	1.5	1.5
Square Length	31	39
Base Area	961	1482
Top Area	256	552
Volume	857	1470

Appendix H

Todd Pond Model Tables and Extracts

Appendix H: Half Moon Bay South Model Results

Table H-1: Mattamy Lands East Major System Ponding Depths

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	ST665A	0.442	9.00	64.0	0.5	0.0	9.0
School	ST666A	0.411	10.39	64.0	0.5	-	-
Park	ST666B	0.061	15.27	32.0	0.0	-	-
Road	ST667A	0.370	9.96	54.0	1.0	0.0	10.0
Road	ST669A	0.151	6.01	67.0	0.0	5.0	6.0
Road	ST670A	0.394	8.57	84.0	0.7	0.0	8.6
RY	ST670B	0.094	17.74	32.0	0.0	0.0	17.7
Road	ST672A	0.169	6.24	55.0	0.0	18.0	6.2
Road	ST672B	0.073	16.14	32.0	0.0	0.0	16.1
Road	ST673A	0.124	5.51	55.0	0.0	0.0	5.5
Road	ST720A	0.039	3.51	22.0	2.3	15.0	3.5
Road	ST722A	0.206	7.67	74.0	1.0	15.0	7.7
Road	ST723A	0.055	4.01	32.0	1.0	0.0	4.0
Road	ST724A	0.385	9.02	84.0	0.7	15.0	9.0
Road	ST724B	0.111	19.03	42.0	0.0	14.0	19.0
Road	ST725A	0.195	6.92	96.0	0.5	0.0	6.9
Road	ST726A	0.237	7.07	55.0	0.0	0.0	7.1
Road	ST726B	0.109	18.81	42.0	0.0	5.0	18.8
Road	ST728A	0.147	7.69	67.0	0.0	5.0	7.7

Table H-2: Half Moon Bay South Major System Ponding Depths (including Mattamy Lands East)

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	EXT-1	0.067	15.72	0.0	0.0	0.0	15.7
Road	EXT-6	1.737	12.88	699.6	500.6	0.0	12.9
Road	ST509AA	1.221	15.68	44.0	113.3	28.0	43.7
RY	ST509AB	0.105	18.58	22.0	0.0	0.0	18.6
Park	ST510A	0.062	1.90	33.0	0.0	-	-
Road	ST521D	0.311	10.20	22.0	111.9	30.0	40.2
RY	ST521E	0.117	19.42	22.0	0.0	0.0	19.4
Road	ST524A	0.116	6.18	44.0	37.6	30.0	6.2
RY	ST602A	0.087	17.17	22.0	0.0	0.0	N/A
Road	ST604A	0.375	10.01	64.0	11.5	15.0	25.0
Road	ST605A	0.479	12.03	86.0	72.7	24.0	36.0
Road	ST606A	0.148	7.72	64.0	14.2	15.0	22.7
RY	ST606B	0.130	20.26	22.0	0.0	0.0	N/A
Road	ST608A	0.228	8.28	76.0	35.3	19.0	27.3
RY	ST608B	0.114	19.25	22.0	0.0	0.0	19.3
RY	ST608C	0.082	16.83	32.0	0.0	0.0	N/A
RY	ST608D	0.063	5.56	32.0	1.0	5.0	10.6
Road	ST609A	0.129	7.32	54.0	14.6	15.0	22.3
RY	ST609B	0.093	17.67	22.0	0.0	0.0	17.7
RY	ST611A	0.095	17.79	42.0	0.0	0.0	17.8
Road	ST612A	0.134	7.46	64.0	0.5	5.0	12.5
Road	ST613A	0.642	12.27	638.6	5.6	30.0	12.3
RY	ST613B	0.169	22.21	32.0	0.0	0.0	N/A
Road	ST614A	0.293	8.75	22.0	2.3	12.0	20.8
Road	ST614B	0.365	10.83	32.0	9.9	12.0	22.8
Road	ST614C	0.387	11.06	32.0	0.0	5.0	11.1
Road	ST615A	0.127	7.28	44.0	12.0	15.0	22.3
Road	ST616A	0.405	9.87	64.0	48.1	19.0	28.9

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	ST619A	0.209	24.20	32.0	0.0	0.0	N/A
Road	ST619B	0.090	6.38	22.0	0.0	0.0	6.4
Road	ST620A	0.057	4.88	22.0	0.0	4.0	4.9
Road	ST620B	0.143	7.62	44.0	13.3	15.0	22.6
Road	ST621A	0.185	8.36	64.0	11.5	15.0	8.4
Road	ST623A	0.573	11.76	140.0	81.3	22.0	33.8
RY	ST623B	0.135	20.52	32.0	0.0	0.0	N/A
Road	ST624A	0.135	6.77	112.0	14.6	30.0	6.8
School	ST624AA	0.907	13.41	242.4	407.5	0.0	13.4
Road	ST627A	0.390	11.10	387.9	4.9	20.0	11.1
Road	ST628A	0.529	12.45	150.0	26.7	16.0	28.5
Road	ST629A	0.457	11.80	70.9	1.8	13.0	11.8
Road	ST630A	0.486	12.08	32.0	1.0	19.0	31.1
RY	ST630AA	0.167	22.12	32.0	0.0	0.0	22.1
Road	ST630AB	0.434	9.79	134.0	32.5	19.0	28.8
RY	ST631A	0.188	23.16	22.0	0.0	0.0	23.2
Park	ST631B	0.246	5.58	22.0	0.0	-	-
RY	ST631C	0.199	23.69	100.5	0.0	0.0	23.7
RY	ST631D	0.225	24.99	67.0	0.0	0.0	25.0
Road	ST632A	0.467	11.90	84.0	0.0	0.0	11.9
Road	ST637A	0.683	12.06	682.5	3.0	30.0	12.1
RY	ST637B	0.267	26.47	42.0	0.0	0.0	26.5
RY	ST637C	0.162	21.86	22.0	0.0	0.0	21.9
Road	ST638A	0.100	6.61	22.0	0.0	9.0	6.6
Road	ST638B	0.198	8.60	74.0	15.1	15.0	23.6
Road	ST640A	0.446	10.70	128.0	4.6	10.0	20.7
Road	ST641A	0.127	7.27	54.0	12.0	15.0	22.3
Road	ST643A	0.162	7.30	32.0	0.0	0.0	7.3

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST646A	0.150	7.75	54.0	1.0	5.0	12.8
Road	ST647A	0.472	9.68	55.0	0.0	9.0	9.7
RY	ST648A	0.114	19.22	22.0	0.0	0.0	19.2
Road	ST649A	0.567	10.42	109.0	0.7	5.0	15.4
Road	ST650A	0.171	7.13	84.0	0.0	0.0	7.1
RY	ST650B	0.125	20.02	42.0	0.0	0.0	20.0
Road	ST652A	0.223	7.64	96.0	0.5	3.0	10.6
School	ST652AA	0.851	9.84	339.0	274.5	-	-
RY	ST652B	0.049	13.80	22.0	0.0	0.0	13.8
RY	ST654A	0.074	16.19	32.0	0.0	0.0	16.2
Road	ST655A	0.621	12.13	54.0	13.5	15.0	27.1
RY	ST655B	0.166	22.07	67.0	0.0	0.0	22.1
Road	ST656A	0.744	14.17	54.0	16.8	15.0	29.2
Road	ST657A	0.152	7.78	64.0	14.7	15.0	22.8
Road	ST659A	0.472	11.96	64.0	0.5	5.0	17.0
Road	ST660A	0.226	9.07	109.0	10.8	14.0	23.1
RY	ST660B	0.056	14.78	22.0	0.0	0.0	14.8
Road	ST662A	0.127	6.18	64.0	0.0	0.0	6.2
Park	ST662AA	0.101	3.09	55.2	0.0	-	-
Road	ST663A	0.118	6.03	64.0	2.0	5.0	11.0
Road	ST664A	0.159	6.11	84.0	0.7	0.0	6.1
RY	ST665A	0.442	9.00	64.0	0.5	0.0	9.0
School	ST666A	0.411	10.39	64.0	0.5	-	-
Park	ST666B	0.061	15.27	32.0	0.0	-	-
Road	ST667A	0.370	9.96	54.0	1.0	0.0	10.0
Road	ST669A	0.151	6.01	67.0	0.0	5.0	6.0
Road	ST670A	0.394	8.57	84.0	0.7	0.0	8.6
RY	ST670B	0.094	17.74	32.0	0.0	0.0	17.7

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST672A	0.169	6.24	55.0	0.0	18.0	6.2
Road	ST672B	0.073	16.14	32.0	0.0	0.0	16.1
Road	ST673A	0.124	5.51	55.0	0.0	0.0	5.5
Road	ST703A	0.532	10.61	116.0	21.3	0.0	10.6
Road	ST703B	0.354	9.79	32.0	0.0	0.0	9.8
Road	ST704A	0.107	5.78	55.0	0.0	0.0	5.8
Road	ST705A	0.594	10.60	178.0	1.6	0.0	10.6
Road	ST707AA	0.345	6.28	186.0	14.0	0.0	6.3
Road	ST709A	0.109	5.24	64.0	0.0	0.0	5.2
Road	ST710A	0.170	8.09	84.0	13.0	0.0	8.1
Road	ST710B	0.172	22.38	67.0	0.0	0.0	22.4
Road	ST711A	0.164	7.99	64.0	14.7	0.0	8.0
Road	ST713A	0.187	8.40	84.0	13.0	0.0	8.4
Road	ST714A	0.141	20.84	42.0	0.0	0.0	20.8
Road	ST715A	0.227	9.08	109.0	10.8	0.0	9.1
Road	ST715B	0.091	17.53	42.0	0.0	0.0	17.5
Road	ST717A	0.210	6.74	84.0	0.0	0.0	6.7
Road	ST719A	0.126	5.54	44.0	1.6	0.0	5.5
Road	ST719B	0.098	18.04	42.0	0.0	0.0	18.0
Road	ST720A	0.039	3.51	22.0	2.3	15.0	3.5
Road	ST722A	0.206	7.67	74.0	1.0	15.0	7.7
Road	ST723A	0.055	4.01	32.0	1.0	0.0	4.0
Road	ST724A	0.385	9.02	84.0	0.7	15.0	9.0
Road	ST724B	0.111	19.03	42.0	0.0	14.0	19.0
Road	ST725A	0.195	6.92	96.0	0.5	0.0	6.9
Road	ST726A	0.237	7.07	55.0	0.0	0.0	7.1
Road	ST726B	0.109	18.81	42.0	0.0	5.0	18.8
Road	ST728A	0.147	7.69	67.0	0.0	5.0	7.7

Table H-3: Critical HGL at Nodes within Mattamy Lands East

Node (CB / MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF-HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF-HGL) (m)
665	101.66	99.66	99.066	0.594	99.067	0.593
666	101.66	99.66	99.328	0.332	99.331	0.329
667	101.76	99.76	99.372	0.388	99.375	0.385
668	101.96	99.96	99.372	0.588	99.375	0.585
669	102.86	100.86	100.317	0.543	100.317	0.543
670	102.5	100.5	99.614	0.886	99.614	0.886
671	104.15	102.15	101.061	1.089	101.06	1.09
672	105.63	103.63	102.529	1.101	102.529	1.101
673	106.76	104.76	103.793	0.967	103.793	0.967
720	102.06	100.06	99.606	0.454	99.606	0.454
721	102.54	100.54	100.109	0.431	100.11	0.43
722	103.19	101.19	100.502	0.688	100.502	0.688
723	103.68	101.68	100.665	1.015	100.665	1.015
724	104.29	102.29	101.69	0.6	101.69	0.6
725	105.56	103.56	102.821	0.739	102.822	0.738
726	106.02	104.02	102.903	1.117	102.903	1.117
727	106.2	104.2	103.231	0.969	103.231	0.969
728	106.77	104.77	104.068	0.702	104.068	0.702

Table H-4: Critical HGL at Nodes within Half Moon Bay South (including Mattamy Lands East)

Node (CB / MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF-HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF-HGL) (m)
649	98.73	96.71	96.06	0.65	96.08	0.63
650	99.51	97.01	97.13	0.61**	97.13	0.60**
651	99.63	97.82	97.24	0.58	97.24	0.58
652	97.93	N/A	94.72	N/A	95.36	N/A
653	100.29	98.01	97.78	0.59**	97.78	0.59**
654	100.31	96.89	96.68	1.14**	96.68	0.72**
655	100.50	98.27	97.56	0.71	97.56	0.71
656	100.61	N/A	97.96	N/A	97.96	N/A
657	100.64	98.67	98.45	0.31**	98.39	0.37**
658	100.68	98.75	98.45	0.30	98.39	0.36
659	101.29	N/A	98.11	N/A	98.11	N/A
660	100.66	98.83	98.37	0.46	98.37	0.46
661	100.71	98.95	98.38	0.57	98.37	0.58
662	98.57	N/A	95.39	N/A	95.51	N/A
663	99.55	N/A	96.39	N/A	96.39	N/A
664	101.43	98.35	99.15	0.66**	99.15	0.66**
665	101.66	99.66	99.066	0.594	99.067	0.593
666	101.66	99.66	99.328	0.332	99.331	0.329
667	101.76	99.76	99.372	0.388	99.375	0.385
668	101.96	99.96	99.372	0.588	99.375	0.585
669	102.86	100.86	100.317	0.543	100.317	0.543
670	102.5	100.5	99.614	0.886	99.614	0.886
671	104.15	102.15	101.061	1.089	101.06	1.09
672	105.63	103.63	102.529	1.101	102.529	1.101
673	106.76	104.76	103.793	0.967	103.793	0.967
703	98.44	96.21	95.25	0.96	95.28	0.93
704	100.10	96.68	97.48	0.74**	97.48	0.74**
705	98.58	N/A	95.95	N/A	95.96	N/A
706	99.03	97.00	96.62	0.38	96.62	0.38
707	99.20	97.00	96.79	0.36**	96.79	0.35**
708	100.32	98.03	97.88	0.92**	97.88	0.91**
709	101.47	98.96	99.10	0.78**	99.10	0.78**
710	98.73	96.60	96.12	0.48	96.15	0.45
711	98.65	96.74	96.19	0.55	96.22	0.52
712	98.70	96.74	96.23	0.52	96.26	0.48
713	98.72	96.74	96.35	0.39	96.40	0.34
714	98.81	96.82	96.42	0.40	96.48	0.34
715	99.54	96.83	97.26	0.34**	97.28	0.28**
716	100.05	97.38	96.10	1.28	96.12	1.27
717	101.49	98.37	97.58	0.79	97.58	0.79
718	101.54	99.93	98.48	1.45	98.48	1.45
719	102.11	N/A	99.23	N/A	99.23	N/A
720	102.06	100.06	99.606	0.454	99.606	0.454
721	102.54	100.54	100.109	0.431	100.11	0.43
722	103.19	101.19	100.502	0.688	100.502	0.688
723	103.68	101.68	100.665	1.015	100.665	1.015
724	104.29	102.29	101.69	0.6	101.69	0.6
725	105.56	103.56	102.821	0.739	102.822	0.738
726	106.02	104.02	102.903	1.117	102.903	1.117
727	106.2	104.2	103.231	0.969	103.231	0.969
728	106.77	104.77	104.068	0.702	104.068	0.702
EX509A	95.06	N/A	92.80	N/A	93.07	N/A
EX510	95.23	93.49	92.92	0.57	93.10	0.39
EX521	96.24	94.04	93.74	0.45**	94.25	0.01**
EX524	96.48	94.25	93.70	0.55	94.20	0.05

Node (CB / MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF-HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF-HGL) (m)
EX601	95.61	N/A	92.62	N/A	0.00	N/A
EX602	95.58	N/A	92.77	N/A	93.04	N/A
EX603	95.16	93.36	92.79	0.57	93.07	0.29
EX604	95.81	93.89	93.01	0.89	93.25	0.64
EX605	96.00	94.13	93.09	1.04	93.34	0.79
EX606	96.10	94.36	93.17	1.19	93.40	0.96
EX607	96.13	94.55	93.22	1.33	93.42	1.13
EX608	96.39	94.57	93.49	1.08	93.55	1.02
EX609	96.28	94.70	93.57	1.13	93.59	1.11
EX610	96.33	94.76	93.57	1.19	93.60	1.16
EX611	96.11	94.63	93.69	0.94	93.70	0.93
EX612	96.10	94.98	94.18	0.80	94.18	0.80
EX613	96.09	N/A	93.03	N/A	93.37	N/A
EX614	96.15	94.33	93.13	1.20	93.49	0.84
EX615	96.30	94.33	93.23	1.11	93.54	0.79
EX616	96.04	94.50	93.30	1.20	93.56	0.94
EX617	96.11	94.45	93.12	1.33	93.59	0.86
EX619	96.25	94.51	93.22	1.30	93.57	0.94
EX620	96.23	94.93	93.71	1.22	93.76	1.17
EX621	96.19	94.51	93.25	1.26	93.60	0.91
EX622	96.23	94.61	93.28	1.33	93.63	0.98
EX623	96.10	94.61	93.65	0.96	93.81	0.80
EX624	96.29	94.48	93.42	1.06	93.85	0.63
EX624A	96.50	N/A	93.83	N/A	93.92	N/A
EX627	96.68	94.58	93.65	0.93	94.15	0.43
EX628	96.51	94.65	94.03	0.62	94.54	0.11
EX629	96.85	94.75	94.12	0.63	94.64	0.11
EX629A	96.91	N/A	94.15	N/A	94.68	N/A

Node (CB / MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF-HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF-HGL) (m)
EX630	96.68	94.86	94.32	0.52**	94.87	0.08**
EX630A	96.49	94.92	94.52	0.49**	95.10	0.04**
EX631	97.32	94.88	94.31	0.57	94.80	0.08
EX632	98.59	95.58	95.15	0.43	95.20	0.38
EX637	96.56	95.51	93.77	1.74	94.30	1.21
EX638	96.46	94.62	93.91	0.72	94.46	0.16
EX639	96.51	94.76	93.91	0.85	94.47	0.29
EX640	96.76	94.65	93.87	0.78	94.42	0.23
EX641	96.59	95.08	94.03	1.05	94.50	0.58
EX642	96.63	94.88	94.02	0.86	94.50	0.38
EX643	97.37	94.97	94.44	0.53	95.02	0.05
EX646	97.50	95.42	94.75	0.67	95.37	0.05
EX647	97.88	95.31	95.11	0.55**	95.81	-0.07**
EX648	98.41	N/A	95.34	N/A	95.97	N/A

**NOTE: Worst case HGL for these locations has been interpolated based on proposed building service lateral location

5.0 Storm Drainage

5.1 OVERVIEW

A Stormwater Management Report is being submitted concurrently with this report, under separate cover. For more details on the SWM design, please refer to the report entitled "*Half Moon Bay South Phase 4, Barrhaven South, City of Ottawa, Stormwater Management Report*", Stantec Consulting Ltd., dated May 27, 2015.

In order to allow the Meadows in Half Moon Bay (Tamarack lands north of the site) and the Half Moon Bay South (Mattamy lands) development to proceed prior to the update to the Barrhaven South MSS, J. F. Sabourin and Associates (JFSA) undertook an analysis in August 2014 to evaluate the performance of the existing Todd pond and proposed Clarke pond systems by combining several separate models developed by JFSA (Half Moon Bay subdivision), IBI (Meadows in Half Moon Bay) and Stantec (Half Moon Bay South). The analysis has been subsequently revised every time there are changes to the Meadows in Half Moon Bay and/or the Half Moon Bay South developments to assess impacts on the Todd and Clarke Pond storm systems. The results of the latest analyses are summarized in **Appendix A.5**.

In April 2015, J.F. Sabourin & Associates (JFSA) presented a revised Todd pond model as part of their Model Keeper Analysis for Todd Pond making use of the dual routing procedure for DDSWMM outlined in Technical Bulletin ISDTB-2014-01. The resultant increase in storage provided in existing roadways permitted expanded Todd pond drainage boundaries also outlined in the JFSA Model Keeper Analysis. It is the intent of the proposed servicing scheme to make use of all available drainage area allocated to the Todd pond to limit requirements for a minor system sewer to the Clarke Pond to service Half Moon Bay South.

5.2 CRITERIA AND CONSTRAINTS

The following section discusses the criteria and constraints influencing the design of Phase 4 (P4) of the Half Moon Bay South (HMBS) development.

5.2.1 Criteria

Criteria were established through review of the background documentation, supplemented with current design practices outlined by the City of Ottawa Sewer Design Guidelines (City of Ottawa, October 2012) and the City of Ottawa's Technical Memo (City of Ottawa, January 2012).

- Use of the dual drainage principle
- Maximum 100 year flow depth of 0.30 m in road sags
- Standing water depths at road sags not to cause surface flooding on any building or structure

- Rear-yard storage not to be included in stormwater management (SWM) calculations
- Use of standard self-cleansing inlet-control devices where possible
- Ensure that 100 year overland flows from the proposed HMBS development tributary to River Mist Road are captured into the minor system prior to entering the adjacent Meadows in Half Moon Bay development to the north
- Maximum peak release rate from the HMBS development to the Corrigan pond at MH501 (existing manhole in phase 1A) to be 2,152 L/s as obtained from the 100 year XP-SWMM model included in the SWM Report of Phase 1A of the HMBS development (Stantec, July 2011)
- 100 year major flows exiting Phase 1A at Regatta/Pennant Avenue to be less than 2.7 m^3/s as obtained from the 100 year DDSWMM model included in the SWM Report of Phase 1A of the HMBS development (Stantec, July 2011)
- Proposed schools in Phase 4 of the HMBS development to store post development 100 year peak flows on site while restricting minor system flows to 120 L/s/ha
- Proposed park areas in Phase 4 of the HMBS development to restrict minor system peak flows to 60 L/s/ha.
- 100 year hydraulic grade line (HGL) to be a minimum of 0.30 m below building foundation footings (3hr Chicago Storm) for existing and proposed phases.
- Size storm sewers to convey the 5 year storm event under free-flow conditions using 2004 City of Ottawa I-D-F parameters with the exception of the trunk sewer along River Mist Road to the Todd pond which has been sized in XP-SWMM to capture and convey the 100 year post development flows, while meeting the Under Side of Footing (USF) - HGL clearance criteria across the site
- Subdrains required in swales where longitudinal gradient is less than 1.5%
- Account for tributary external drainage through the system
- Provide adequate emergency overflow conveyance off-site
- Quality control is provided in the downstream Barrhaven South Todd and Corrigan Ponds

5.2.2 Site Constraints

As shown in the background documents, the HMBS development is within an area of Barrhaven South that has three separate outlets for both minor and major systems.

The proposed P4 of the HMBS development has several storm sewer outlets. One storm outlet is proposed to the Corrigan Pond via an existing 525mm dia. storm sewer within the Damselfly Way ROW that directs runoff to the trunk sewer along Andre Audet Avenue through phase 2 towards the storm system in phase 1A of the HMBS development, which in turn ultimately discharges into

an existing 1950 mm dia. trunk sewer on the existing Greenbank Road. The minor system allowable release rate to the existing MH501 at the Phase 1A boundary towards the Corrigan Pond is 2,152 L/s.

Three storm outlets in Phase 4 (a 675mm dia. storm sewer on River Mist Road south of Soldats Riendeau Street, a 900mm dia. storm sewer on Soldats Riendeau Street west of Lamprey Street, and a 1200mm dia. storm sewer on Dundonald Street just west of Grand Canal Street) will direct runoff from the proposed phase to the Todd Pond storm system running north along River Mist Road towards the storm system across the Meadows in Half Moon Bay development (see **Drawing SD-1**). The three outlets converge to a single minor system outlet at the northern boundary of the site at River Mist Road. Discharge curves for this outlet as well as detailed drainage area information have been provided to J.F. Sabourin and Associates (JFSA) for their Todd pond model keeper analysis for verification of freeboard to existing units in Half Moon Bay subdivision from Todd pond operating levels, as well as to ensure the pond maintains a sufficient permanent pool volume to satisfy MOE objectives (see **Appendix A.5** for JFSA memo). Additionally, the SWM strategy for the initial draft plan of HMBS indicates a major system target release rate to the Todd pond of 2.7 m^3/s at Regatta/Pennant Avenue and of 0L/s (full capture to minor system) at the northern connection point of River Mist Road in Phase 1, which will be respected in the proposed design (see Table below).

SWM Pond / Outlet	Background Studies		HMBS Phase 4 (100yr 3hr Chicago Event)	
	Minor System Release Rate (L/s)	Major System Release Rate (L/s)	Minor System Release Rate (L/s)	Major System Release Rate (L/s)
Clarke – Realigned Greenbank[1]	700	0	700	0
Todd – River Mist	No Negative Impact to Downstream USFs[3]	0	6,973	0
Todd - Regatta	0	2,700	0	1,124
Corrigan – Greenbank[2]	2,152	0	2,148	0

1. Based on Mattamy-owned portion of school block, controlled to 5-year peak release rate with flows from larger events stored on-site.
2. Background information for the Corrigan pond was obtained from the Corrigan Design Brief (IBI, July 2010) and the HMBS – Phase 1A SWM Report (Stantec, July 2011).
3. Confirmed as part of Todd Pond Model Keeper Analysis by JFSA under separate cover.

5.3 STORMWATER MANAGEMENT PLAN

The following sections describe the stormwater management (SWM) plan for Phase 4 of the HMBS development in the context of the background documents and available governing criteria.

5.3.1 Phase 4 Buildout Conditions

The proposed P4 of the HMBS development (the site) will comprise a combination of townhouse units, terrace homes and single-family residential lots, two schools, park land and associated transportation and servicing infrastructure.

The proposed site is designed using the "dual drainage" principle, whereby the minor (pipe) system is designed to convey the peak rate of runoff from the 5 year design storm (or equivalent flow rate), and runoff from larger events is conveyed by both minor (pipe) and major (overland) channels such as roadways and walkways safely off site. A combination of vertical orifices and IPEX inlet control devices (ICDs) are specified for most street and rear yard catchbasins to limit the inflow to the minor system and thus control the hydraulic grade line from surcharging storm sewers into basements during major storms and to meet the target release rates from the site. Solid covers are proposed for all manholes located in ponding areas to limit inflows to the minor system to that of the ICD. As recommended by the Ottawa Sewer Design Guidelines, no storage will be accounted for in the rear yards. **Drawing SD-1** outlines the proposed drainage areas.

Major system runoff from the proposed P4 development will be directed to two separate outlets. A major system outlet will be provided overland through Andre Audet Avenue which will direct major flows to Regatta Avenue at the Meadows in Half Moon Bay development while a second major system outlet will be provided through the storm trunk sewer along River Mist Road which conveys minor and major system flows to the Todd Pond.

Several unrestricted curb inlets have been installed along the section of River Mist Road within Phase 1A in order to capture the 100 year major flows from the portion of the HMBS development tributary to the River Mist Road outlet, while meeting the USF clearance criteria across the site.

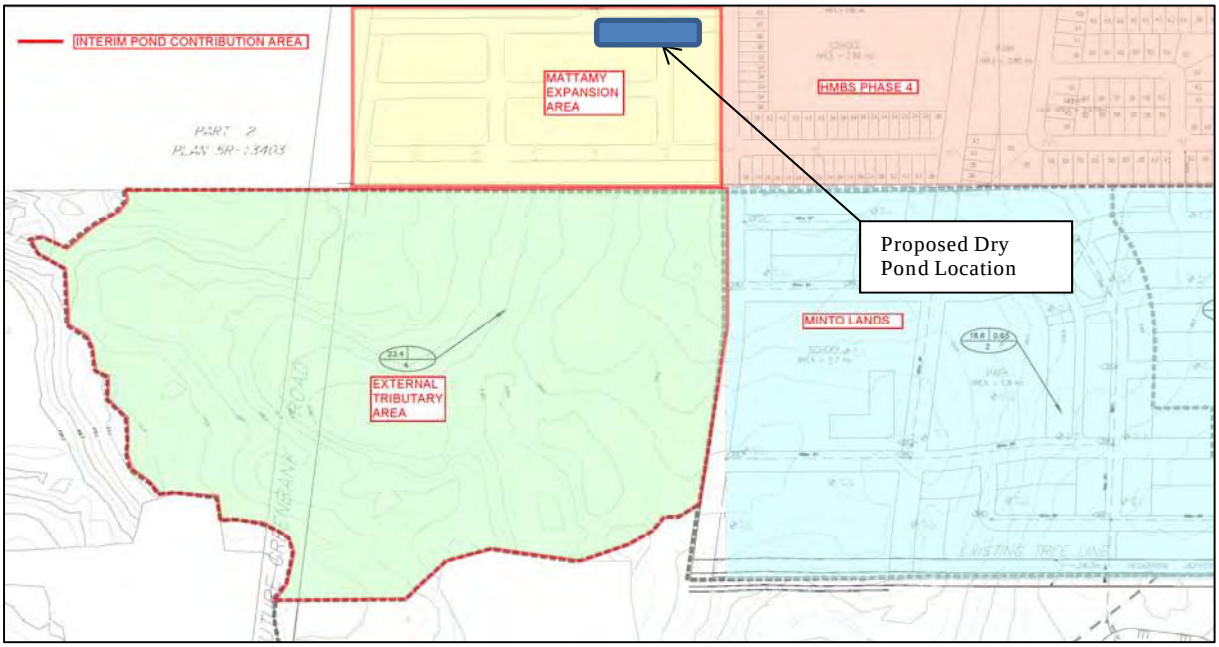
5.3.1.1 Interim Dry Pond

A temporary dry pond is proposed to attenuate flows from external rural tributary areas within the urban boundary but outside of the current CDP owned by Minto (approx. 23.4ha) and Mattamy Homes (approx. 5.64ha) per the results of the Todd Pond Model Keeper Analysis submitted under separate cover (see **Appendix A.5**) and approved by City staff. A PCSWMM model was created for the temporary dry pond and 29.04ha total external drainage area based on the parameters as follows and in accordance with Section 8.3.11.5 of the City of Ottawa Sewer Design Guidelines:

- Pond catchment area: 29.04ha
- Catchment area length parameter: 880m
- Catchment area CN: 74
- Average slope of catchment area: 1.5%
- Catchment imperviousness: 0%
- Bottom of pond elevation: 99.40
- Top of pond elevation: 100.80

- Available pond storage volume: 1305m³
- Outlet orifice size: 375mm circular
- Pond active depth: 1.4m (City of Ottawa requires depth < 2.5m)
- Pond side slopes: max. 4:1

Figure 10: Interim Dry Pond Contributing Lands



The orifice and pond storage volume have been sized to attenuate interim flows to a maximum of 350L/s in the 100yr SCS storm event scenario. The 350L/s figure has been confirmed through correspondence with JFSA as to not negatively impact downstream USFs in the pre-weir expansion scenario (see **Appendix A.6** for model input/output details). Inclusion of the Mattamy owned 5.64ha to the Todd pond drainage boundary has been confirmed by the JFSA Todd pond model keeper analysis and approved by City staff. Per the MSS, overland flows from Minto owned lands will ultimately be diverted to a future SWM facility elsewhere.

5.3.2 Hydrologic Analysis

A comprehensive hydrologic modeling exercise was completed with DDSWMM, accounting for the estimated major and minor flows to evaluate the response of the storm sewer infrastructure and the site's major systems. Two DDSWMM models were created; one for the minor system to the Corrigan pond and major system to Regatta Avenue at the boundary of Phase 1A and a second model for the minor system to the Todd Pond and major system to River Mist Road. The DDSWMM models incorporate subcatchments within the proposed P4 area, the approved Phases 2, 3 and part of the existing Phase 1A, and lumped drainage areas for future development lands southwest of the HMBS development tributary to the Todd Pond. Catchments within the approved phases of the development have been included in order to

assess any impacts to the existing major and minor systems. **Drawing SD-1** shows the drainage catchments in the HMBS development along with the preliminary storm servicing infrastructure.

5.3.2.1 Hydrologic Parameters and Assumptions

Surface storage estimates for the subcatchments within the proposed P4 and the approved and existing phases of the HMBS development were based on the detailed grading plan designs (see **Drawings GP1-4**), while the approximate surface storage available in the lumped catchments within future areas of the HMBS development was assumed based on the proposed road grade slope and type of road. The following assumptions were applied to the DDSWMM models:

- Hydrologic parameters as per Barrhaven South MSS (Stantec, 2007), including Horton infiltration, Manning's 'n' and depression storage values (see Appendix A1)
- 3hr Chicago Storm distribution as outlined in the Barrhaven South MSS (Stantec, 2007)
- 100 year 3hr Chicago and 24hr SCS events, and during the 100 year 3hr Chicago design storm increased by 20%
- Impervious areas were measured in several representative catchments based on the type of units in the catchment (single, townhouse, etc.) and whether they were road or rear yard catchments. Impervious areas for these catchments were based on a maximum unit size based on lot setbacks and as such the impervious areas measured are considered conservative. The imperviousness values calculated were used in similar catchments across the site. Imperviousness values were converted to runoff coefficients for storm sewer sizing purposes using the relationship C = (Imp. x 0.7) + 0.2
- Imperviousness values for rear yard catchments within the proposed P4 were assumed to be 80% effective
- DDSWMM segment lengths defined from high-point to low-point where sags occur
- Subcatchment width equal to two times the average segment length for two-sided catchments, equal to one time the segment length for one-sided catchments, and equal to 225 times the area of the catchment for any other catchments
- Draft Plan #2 catchments were included in the model and the parameters used for these catchments (areas, length, width and inlet information) were obtained from the DDSWMM model included in the HMBS – Draft Plan #2 SWM Report (Stantec, April 2015)
- Phase 2 & 3 catchments were included in the model and the parameters used for these catchments (areas, length, width and inlet information) were obtained from the DDSWMM model included in the HMBS – Phases 2 & 3 SWM Report (Stantec, February 2014)
- Phase 1A catchments tributary to the minor and major system outlet at River Mist Road were included in the model and the parameters used for these catchments (areas,

length, width and inlet information) were obtained from the DDSWMM model included in the HMBS – Phase 1A SWM Report (Stantec, July 2011)

- Existing catchment lengths and road segments were modified to permit double routing per City Technical Bulletin ISDTB-2014-01
- Several segment cross-section types were defined to represent 8.5 m wide roads at different longitudinal slopes, 11.0 m wide roads at different longitudinal slopes, rear yard swales at 1.0% longitudinal slope, and parks
- Minor flows from park areas in the proposed DP3 of the HMBS development to be controlled to 60 L/s/ha (approx. 5 year peak flows from pervious areas)
- School areas to store 100 year peak flows on-site and to restrict minor system inflows to 120 L/s/ha

In general, ICDs have been sized in areas tributary to the Todd pond to convey the 5-year event without surface ponding. Due to inlet restrictions to sewers tributary to the Corrigan pond, surface ponding could not be eliminated in all areas tributary to the Corrigan system. Also, it is of note that the time step used within the DDSWMM model for Phase 4 areas has been revised to be consistent with that used by JFSA in their pond model keeper analysis. As such, existing areas tributary to the Todd pond show surface ponding based on their existing ICD configuration. The following table summarizes the ICD schedule across the proposed Phase 4 of the HMBS development:

Table 10: Schedule of Inlet Control Devices

Catchment ID	ICD Type / Size (mm)	Max. Release Rate (L/s)	# of CBs and Interconnection
Proposed Draft Plan 3 Areas with Minor System to the Corrigan Pond			
ST546B	1 x IPEX B	32	One rear yard CB
ST560A	1 x IPEX C	42	Two CBs Interconnected
ST560B	1 x IPEX B	32	One rear yard CB
ST561A	1 x IPEX B	32	Two CBs Interconnected
ST563A	1 x IPEX C	42	Two CBs Interconnected
ST564A	1 x IPEX C	42	Two CBs Interconnected
ST564B	1 x IPEX B	32	One rear yard CB
ST566A	1 x IPEX B	32	Two CBs Interconnected
Proposed Draft Plan 3 Areas with Minor System to the Todd Pond			
ST648A	1 x IPEX A	22	One rear yard CB
ST649A	1 x IPEX C, 1 x IPEX D	109	Three CBs - One Interconnected
ST650A	2 x IPEX C	84	Two CBs
ST650B	1 x IPEX C	42	One rear yard CB
ST652A	3 x IPEX B	96	Three CBs
ST652AA	120 L/s/ha	339	School CB
ST654A	1 x IPEX B	32	One rear yard CB

Catchment ID	ICD Type / Size (mm)	Max. Release Rate (L/s)	# of CBs and Interconnection
ST655A	1 x IPEX A, 1 x IPEX B	54	Two CBs
ST655B	1 x IPEX D	67	One rear yard CB
ST656A	1 x IPEX A, 1 x IPEX B	54	Two CBs
ST657A	2 x IPEX B	64	Two CBs
ST659A	2 x IPEX B	64	Two CBs
ST660A	1 x IPEX C, 1 x IPEX D	109	Two CBs
ST660B	1 x IPEX A	22	One rear yard CB
ST662AA	60 L/s/ha	55.2	Park CB
ST662A	2 x IPEX B	64	Two CBs
ST663A	2 x IPEX B	64	Three CBs - One Interconnected
ST664A	2 x IPEX C	84	Two CBs
ST703A	1 x IPEX B, 2 x IPEX C	116	Three CBs
ST703B	1 x IPEX B	32	Two CBs Interconnected
EXT-6	120 L/s/ha	699.6	School CB
ST704A	1 x IPEX A, 1 x IPEX B	55	Two CBs
ST705A	2 x IPEX A, 2 x IPEX D	178	Four CBs
ST707AA	60 L/s/ha	186	Park CB
ST709A	2 x IPEX B	64	Two CBs
ST710A	2 x IPEX C	84	Two CBs
ST710B	1 x IPEX D	67	One rear yard CB
ST711A	2 x IPEX B	64	Two CBs
ST713A	2 x IPEX C	84	Two CBs
ST714A	1 x IPEX C	42	One rear yard CB
ST715A	1 x IPEX C, 1 x IPEX D	109	Two CBs
ST715B	1 x IPEX C	42	One rear yard CB
ST717A	2 x IPEX C	84	Two CBs
ST719A	2 x IPEX A	44	Two CBs
ST719B	1 x IPEX C	42	One rear yard CB

5.3.2.2 Interim Condition Hydrologic Analysis Results

Two development events have been analyzed for the purposes of this report: the interim scenario considers a full build-out of Phase 4 lands including an interim dry pond to attenuate flows from external rural tributary areas owned by Minto (approx. 23.4ha) and Mattamy Homes (approx. 5.64ha) and prior to the weir expansion to occur within the Todd pond, whereas the ultimate scenario considers removal of the interim pond, build-out of the Mattamy owned lands ultimately tributary to the Todd pond, as well as a weir expansion within the downstream Todd pond to occur for the purposes of development of the expanded Todd pond drainage area. Weir expansion within the downstream Todd pond is required to attenuate the increased peak discharge expected from the future lands beyond the 350L/s peak discharge rate of the interim dry pond without subjecting existing areas of Half Moon Bay to additional overland flow depth or deleterious surcharge of downstream sewers.

Interim Dry Pond Results

Storm Event	Major System Inflow (L/s)	Minor System Outflow (L/s)	Required Storage (m3)	Drawdown Time After Event (h)
5yr Chicago	53.6	49.2	88	8
100yr Chicago	270.1	237.0	529	12
100yr 24hr SCS	437.8	346.3	1363	24
100yr Chicago +20%	426.8	330.4	1198	13

Table 11 and **Table 12** summarize the minor system inflow and major system sag storage and overflow results for the proposed P4 areas of the HMBS development as well as the existing phase areas that serve as major system outlet for the phase and future development land areas during the 5 and 100 year, 3hr Chicago storms respectively in the interim condition. **Appendix A2** summarizes the DDSWMM modeling results for the various storm events included in this analysis. The total flow depth shown in the tables below is equal to the depth on the segment obtained from DDSWMM plus the maximum ponding depth on street sags, when the storage used obtained from DDSWMM equals the maximum storage available on the street sag.

Table 11: HMBS- Phase 4 – Major and Minor System 5 Year Storm Results

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Minor System To Corrigan Pond							
Road	ST525A	0.150	7.74	66.0	22.6	15.0	22.7
Road	ST526A	0.079	6.10	44.0	12.8	15.0	6.1
RY	ST526B	0.046	13.40	32.0	0.0	0.0	N/A
Road	ST528A	0.053	5.10	32.0	8.7	20.0	5.1
RY	ST529A	0.040	12.73	32.0	0.0	0.0	N/A
Road	ST530A	0.092	6.39	44.0	12.7	15.0	21.4
Road	ST532A	0.074	5.98	44.0	10.9	15.0	6.0
Road	ST534A	0.062	5.49	32.0	12.0	17.0	5.5
Road	ST535A	0.198	8.55	118.0	39.6	15.0	23.6
Road	ST537A	0.064	5.58	32.0	12.5	15.0	5.6
Road	ST538A	0.220	8.89	64.0	12.9	14.0	22.9
RY	ST536A	0.049	13.82	32.0	0.0	0.0	N/A
RY	ST534B	0.063	15.38	32.0	0.0	0.0	N/A
Road	ST540A	0.045	4.53	44.0	0.0	10.0	14.5
Road	ST551A	0.243	8.50	22.0	11.3	13.0	21.5

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	ST532B	0.060	15.16	22.0	0.0	0.0	N/A
Road	ST552A	0.062	5.48	32.0	11.6	15.0	5.5
Road	ST555A	0.029	3.70	22.0	2.9	0.0	3.7
Road	ST554A	0.257	9.46	22.0	0.0	13.0	22.5
RY	ST554B	0.021	10.14	20.5	0.0	0.0	N/A
RY	ST554C	0.119	19.58	32.0	0.0	0.0	N/A
RY	ST555B	0.011	7.53	11.4	0.0	0.0	N/A
Road	ST556A	0.293	9.14	64.0	23.4	16.0	25.1
Road	ST557A	0.101	5.37	22.0	0.0	0.0	5.4
RY	ST557B	0.011	7.52	11.3	0.0	0.0	N/A
RY	ST559B	0.020	10.06	20.0	0.0	0.0	N/A
Road	ST559A	0.046	3.96	22.0	0.0	0.0	4.0
Road	ST559C	0.016	3.08	15.4	0.0	5.0	8.1
Road	ST560A	0.050	4.99	42.0	1.8	15.0	5.0
Road	ST561A	0.032	4.27	31.7	0.2	5.0	4.3
Road	ST563A	0.085	6.24	42.0	14.2	15.0	21.2
Road	ST564A	0.076	5.43	42.0	10.7	15.0	20.4
RY	ST564B	0.041	12.79	32.0	0.0	0.0	N/A
RY	ST560B	0.019	9.86	19.0	0.0	0.0	N/A
Road	ST566A	0.072	5.89	32.0	1.4	5.0	5.9
Road	ST541A	0.060	5.40	32.0	14.3	15.0	5.4
Road	ST542A	0.057	5.29	32.0	0.0	15.0	20.3
Road	ST544B	0.112	5.62	32.0	10.5	16.0	21.6
RY	ST546B	0.069	15.85	32.0	0.0	0.0	N/A
Road	ST546A	0.042	3.82	22.0	0.0	0.0	3.8
Road	ST544A	0.126	7.18	64.0	12.7	15.0	22.2
-	EXT-5	0.115	3.51	0.0	0.0	0.0	N/A
Park	ST662AA	0.015	0.47	8.8	0.0	0.0	0.5
RY	ST521E	0.048	13.74	22.0	0.0	0.0	N/A
Road	ST521D	0.140	7.57	22.0	81.6	30.0	7.6
RY	EXT-2	0.041	12.75	0.0	0.0	0.0	N/A
Road	ST506A	0.072	5.88	44.0	10.2	17.0	5.9
Road	ST502A	0.070	5.79	44.0	9.1	17.0	5.8
Road	ST504A	0.137	7.43	44.0	50.9	24.0	31.4
Road	ST503A	0.085	6.23	44.0	1.9	13.0	19.2
RY	ST516A	0.062	15.33	22.0	0.0	0.0	N/A
Road	ST513A	0.085	6.24	44.0	14.9	16.0	22.2
Road	ST518A	0.095	6.46	22.0	15.0	16.0	22.5

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	EXT-3	0.010	7.22	0.0	0.0	0.0	N/A
Road	ST512A	0.140	7.50	44.0	10.0	15.0	22.5
RY	ST521C	0.063	15.42	22.0	0.0	0.0	N/A
Road	ST522A	0.130	7.35	44.0	47.4	30.0	7.4
RY	ST522B	0.054	14.48	22.0	0.0	0.0	N/A
RY	EXT-4	0.012	7.72	0.0	0.0	0.0	N/A
RY	ST521B	0.047	13.54	22.0	0.0	0.0	N/A
Road	ST520A	0.163	8.03	44.0	38.2	20.0	28.0
Road	ST521A	0.067	5.69	44.0	8.1	17.0	5.7
Road	ST517A	0.058	5.33	22.0	9.5	15.0	20.3
Road	ST509A	0.167	7.39	66.0	72.5	30.0	7.4
Road	ST523A	0.067	4.96	44.0	0.0	0.0	5.0
Road	ST514A	0.064	5.10	44.0	14.9	30.0	5.1
Road	PH1A	0.029	4.12	0.0	0.0	0.0	4.1
Minor System To Todd Pond							
Road	ST604A	0.111	6.31	64.0	11.5	15.0	21.3
RY	ST602A	0.033	11.82	22.0	0.0	0.0	N/A
RY	ST613B	0.065	15.58	32.0	0.0	0.0	N/A
Road	ST614A	0.018	3.08	18.4	0.2	12.0	3.1
Road	ST616A	0.144	6.66	64.0	33.1	19.0	6.7
Road	ST606A	0.075	6.00	64.0	1.2	15.0	6.0
Road	ST605A	0.134	7.45	86.0	19.5	24.0	7.5
RY	ST606B	0.019	9.78	18.7	0.0	0.0	N/A
RY	ST608C	0.033	11.80	32.0	0.0	0.0	N/A
Road	ST620A	0.030	3.75	22.0	0.0	4.0	3.8
Road	ST623A	0.190	7.74	140.0	18.2	22.0	7.7
Road	ST614B	0.053	5.18	32.0	9.6	12.0	5.2
Road	ST615A	0.066	5.66	44.0	7.1	15.0	5.7
Road	ST614C	0.066	5.67	32.0	0.0	5.0	5.7
Road	ST619B	0.032	4.33	22.0	0.0	0.0	4.3
Road	ST620B	0.074	5.97	44.0	10.7	15.0	6.0
Road	ST621A	0.095	6.50	64.0	9.5	15.0	6.5
RY	ST619A	0.060	15.16	32.0	0.0	0.0	N/A
RY	ST623B	0.053	14.32	32.0	0.0	0.0	N/A
Road	ST628A	0.158	7.90	150.0	3.0	16.0	7.9
Road	ST637A	0.086	5.48	85.9	0.4	30.0	5.5
Road	ST640A	0.106	6.22	105.5	0.4	10.0	6.2
Road	ST612A	0.070	5.82	64.0	0.3	5.0	5.8

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST643A	0.054	4.80	32.0	0.0	0.0	4.8
Park	ST662AA	0.015	0.46	8.7	0.0	-	-
Road	ST662A	0.052	4.42	52.0	0.0	0.0	4.4
Road	ST663A	0.058	4.59	57.3	0.2	5.0	4.6
RY	ST637B	0.053	14.34	42.0	0.0	0.0	14.3
Road	ST609A	0.065	5.63	54.0	2.0	15.0	5.6
RY	ST652B	0.017	9.26	17.0	0.0	0.0	9.3
Road	ST652A	0.084	5.22	83.6	0.1	3.0	5.2
Road	ST638A	0.024	3.82	22.0	0.0	9.0	3.8
Road	ST608A	0.098	6.06	76.0	4.8	19.0	6.1
RY	ST608D	0.033	4.41	32.0	0.1	5.0	4.4
RY	ST608B	0.020	10.06	19.9	0.0	0.0	10.1
RY	ST609B	0.017	9.34	17.3	0.0	0.0	9.3
Road	ST647A	0.024	3.14	24.1	0.0	9.0	3.1
School	ST652AA	0.397	6.64	318.7	32.9	-	-
Road	ST630A	0.052	5.13	32.0	1.0	19.0	24.1
Park	ST631B	0.042	1.29	22.0	0.0	-	-
Road	ST630AB	0.159	6.68	134.0	2.9	19.0	6.7
RY	ST630AA	0.071	15.97	32.0	0.0	0.0	16.0
Road	ST629A	0.089	6.36	70.9	1.8	13.0	6.4
RY	ST631C	0.049	13.88	48.9	0.0	0.0	13.9
RY	ST631D	0.097	17.92	67.0	0.0	0.0	17.9
Road	ST632A	0.103	6.68	84.0	0.0	0.0	6.7
Road	ST638B	0.096	6.51	74.0	5.1	15.0	6.5
Road	ST641A	0.063	5.57	54.0	1.8	15.0	5.6
Road	ST646A	0.076	6.03	54.0	1.0	5.0	11.0
RY	ST611A	0.044	13.18	42.0	0.0	0.0	13.2
RY	ST631A	0.040	12.73	22.0	0.0	0.0	12.7
RY	EXT-1	0.028	11.09	0.0	0.0	0.0	11.1
Road	ST509AA	0.213	8.07	44.0	113.3	28.0	36.1
RY	ST509AB	0.048	13.77	22.0	0.0	0.0	13.8
RY	ST521E	0.048	13.74	22.0	0.0	0.0	13.7
Road	ST521D	0.140	7.57	22.0	81.6	30.0	7.6
Park	ST510A	0.009	0.28	2.7	0.0	-	-
Road	ST613A	0.153	7.12	149.8	1.3	30.0	7.1
School	ST624AA	0.468	10.47	232.9	117.3	0.0	10.5
Road	ST624A	0.068	5.21	57.5	7.5	30.0	5.2
Road	ST627A	0.057	5.34	55.9	0.7	20.0	5.3

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST524A	0.060	4.78	44.0	8.0	30.0	4.8
RY	ST637C	0.053	14.37	22.0	0.0	0.0	14.4
RY	ST648A	0.019	9.93	19.2	0.0	0.0	9.9
RY	ST660B	0.024	10.63	22.0	0.0	0.0	10.6
Road	ST660A	0.113	6.95	109.0	1.4	14.0	7.0
Road	ST657A	0.065	5.63	62.9	1.5	15.0	5.6
Road	ST659A	0.069	5.77	64.0	0.4	5.0	5.8
Road	ST656A	0.049	5.02	46.6	1.5	15.0	5.0
Road	ST655A	0.059	4.95	54.0	1.6	15.0	5.0
RY	ST655B	0.067	15.67	66.2	0.0	0.0	15.7
RY	ST650B	0.049	13.83	42.0	0.0	0.0	13.8
Road	ST650A	0.084	5.43	84.0	0.0	0.0	5.4
Road	ST649A	0.110	5.57	109.0	0.1	5.0	5.6
RY	ST654A	0.031	11.53	31.0	0.0	0.0	11.5
Road	ST664A	0.081	4.72	81.2	0.1	5.0	4.7
RY	ST715B	0.039	12.58	39.0	0.0	0.0	12.6
Road	ST714A	0.041	12.79	40.6	0.0	0.0	12.8
RY	ST719B	0.041	12.81	40.8	0.0	0.0	12.8
Road	ST719A	0.047	3.75	44.0	0.3	5.0	3.8
Road	ST717A	0.083	4.76	83.4	0.0	0.0	4.8
Road	ST705A	0.181	6.73	178.0	0.4	5.0	6.7
Road	ST709A	0.057	4.09	56.9	0.0	0.0	4.1
Road	ST715A	0.112	6.90	109.0	1.2	15.0	6.9
Road	ST713A	0.079	6.09	76.6	1.2	14.0	6.1
Road	ST711A	0.069	5.78	64.0	1.7	15.0	5.8
Road	ST710A	0.081	6.16	79.4	1.2	15.0	6.2
RY	ST710B	0.074	16.20	67.0	0.0	0.0	16.2
Park	ST707AA	0.052	1.58	46.0	2.5	-	-
School	EXT-6	0.836	9.74	699.6	26.8	-	-
Road	ST703B	0.032	3.90	32.0	0.0	0.0	3.9
Road	ST703A	0.118	6.02	115.1	2.1	18.0	6.0
Road	ST704A	0.051	4.38	51.1	0.0	0.0	4.4

Table 12: HMBS – Phase 4 – Major and Minor System 100 Year Storm Results

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Minor System To Corrigan Pond							
Road	ST525A	1.049	16.22	66.0	22.6	15.0	31.2
Road	ST526A	0.156	7.88	44.0	13.4	15.0	22.9
RY	ST526B	0.114	19.22	32.0	0.0	0.0	N/A
Road	ST528A	0.106	6.71	32.0	33.4	20.0	26.7
RY	ST529A	0.101	18.22	32.0	0.0	0.0	N/A
Road	ST530A	0.209	8.72	44.0	12.7	15.0	23.7
Road	ST532A	0.147	7.66	44.0	14.2	15.0	7.7
Road	ST534A	0.123	7.11	32.0	17.5	17.0	24.1
Road	ST535A	0.974	15.74	118.0	39.6	15.0	30.7
Road	ST537A	0.127	7.20	32.0	13.0	15.0	22.2
Road	ST538A	0.841	14.84	64.0	12.9	14.0	28.8
RY	ST536A	0.125	20.04	32.0	0.0	0.0	N/A
RY	ST534B	0.161	21.83	32.0	0.0	0.0	N/A
Road	ST540A	0.089	5.82	44.0	0.0	10.0	15.8
Road	ST551A	0.891	13.88	22.0	11.3	13.0	26.9
RY	ST532B	0.151	21.34	22.0	0.0	0.0	N/A
Road	ST552A	0.124	7.13	32.0	15.5	15.0	22.1
Road	ST555A	0.057	4.87	22.0	16.3	0.0	4.9
Road	ST554A	0.850	14.91	22.0	0.0	13.0	27.9
RY	ST554B	0.054	14.47	22.0	0.0	0.0	N/A
RY	ST554C	0.302	27.73	32.0	0.0	0.0	N/A
RY	ST555B	0.029	11.23	22.0	0.0	0.0	N/A
Road	ST556A	0.718	12.78	64.0	23.4	16.0	28.8
Road	ST557A	0.306	8.21	22.0	0.0	0.0	8.2
RY	ST557B	0.027	11.00	22.0	0.0	0.0	N/A
RY	ST559B	0.096	17.91	22.0	0.0	0.0	N/A
Road	ST559A	0.182	6.74	22.0	0.0	0.0	6.7
Road	ST559C	0.030	4.20	22.0	0.0	5.0	9.2
Road	ST560A	0.229	9.03	42.0	13.5	15.0	24.0
Road	ST561A	0.108	6.77	32.0	1.9	5.0	6.8
Road	ST563A	0.176	8.22	42.0	14.2	15.0	23.2
Road	ST564A	0.194	7.81	42.0	10.7	15.0	22.8
RY	ST564B	0.095	17.83	32.0	0.0	0.0	N/A
RY	ST560B	0.090	17.41	32.0	0.0	0.0	N/A
Road	ST566A	0.145	7.62	32.0	1.4	5.0	7.6
Road	ST541A	0.275	9.73	32.0	24.4	15.0	24.7

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST542A	0.302	10.10	32.0	0.0	15.0	25.1
Road	ST544B	0.240	7.55	32.0	10.5	16.0	23.6
RY	ST546B	0.168	22.16	32.0	0.0	0.0	N/A
Road	ST546A	0.082	4.97	22.0	0.0	0.0	5.0
Road	ST544A	0.390	11.06	64.0	12.7	15.0	26.1
-	EXT-5	0.229	5.46	0.0	0.0	0.0	N/A
Park	ST662AA	0.102	3.11	55.0	0.0	0.0	3.1
RY	ST521E	0.117	19.42	22.0	0.0	0.0	N/A
Road	ST521D	0.311	10.20	22.0	111.9	30.0	40.2
RY	EXT-2	0.092	17.56	0.0	0.0	0.0	N/A
Road	ST506A	0.140	7.50	44.0	18.4	17.0	24.5
Road	ST502A	0.135	7.38	44.0	16.6	17.0	24.4
Road	ST504A	0.301	10.09	44.0	50.9	24.0	34.1
Road	ST503A	0.188	8.41	44.0	1.9	13.0	21.4
RY	ST516A	0.152	21.35	22.0	0.0	0.0	N/A
Road	ST513A	0.162	8.01	44.0	14.9	16.0	24.0
Road	ST518A	0.184	8.34	22.0	15.0	16.0	24.3
RY	EXT-3	0.023	10.43	0.0	0.0	0.0	N/A
Road	ST512A	0.341	10.53	44.0	10.0	15.0	25.5
RY	ST521C	0.153	21.39	22.0	0.0	0.0	N/A
Road	ST522A	0.289	9.91	44.0	118.3	30.0	39.9
RY	ST522B	0.123	19.91	22.0	0.0	0.0	N/A
RY	EXT-4	0.027	11.00	0.0	0.0	0.0	N/A
RY	ST521B	0.105	18.53	22.0	0.0	0.0	N/A
Road	ST520A	1.006	15.97	44.0	38.2	20.0	36.0
Road	ST521A	1.066	16.32	44.0	32.5	17.0	33.3
Road	ST517A	0.113	6.88	22.0	9.5	15.0	21.9
Road	ST509A	0.682	12.54	66.0	80.9	30.0	42.5
Road	ST523A	0.132	6.46	44.0	0.0	0.0	6.5
Road	ST514A	0.149	7.05	44.0	61.0	30.0	37.1
Road	PH1A	1.124	16.65	0.0	0.0	0.0	16.7
Minor System to Todd Pond							
Road	ST604A	0.375	10.01	64.0	11.5	15.0	25.0
RY	ST602A	0.087	17.17	22.0	0.0	0.0	N/A
RY	ST613B	0.169	22.21	32.0	0.0	0.0	N/A
Road	ST614A	0.293	8.75	22.0	2.3	12.0	20.8
Road	ST616A	0.405	9.87	64.0	48.1	19.0	28.9
Road	ST606A	0.148	7.72	64.0	14.2	15.0	22.7
Road	ST605A	0.479	12.03	86.0	72.7	24.0	36.0

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	ST606B	0.130	20.26	22.0	0.0	0.0	N/A
RY	ST608C	0.082	16.83	32.0	0.0	0.0	N/A
Road	ST620A	0.057	4.88	22.0	0.0	4.0	4.9
Road	ST623A	0.573	11.76	140.0	81.3	22.0	33.8
Road	ST614B	0.365	10.83	32.0	9.9	12.0	22.8
Road	ST615A	0.127	7.28	44.0	12.0	15.0	22.3
Road	ST614C	0.387	11.06	32.0	0.0	5.0	11.1
Road	ST619B	0.090	6.38	22.0	0.0	0.0	6.4
Road	ST620B	0.143	7.62	44.0	13.3	15.0	22.6
Road	ST621A	0.185	8.36	64.0	11.5	15.0	8.4
RY	ST619A	0.209	24.20	32.0	0.0	0.0	N/A
RY	ST623B	0.135	20.52	32.0	0.0	0.0	N/A
Road	ST628A	0.510	12.29	150.0	26.7	16.0	28.3
Road	ST637A	0.683	12.06	682.5	3.0	30.0	12.1
Road	ST640A	0.446	10.70	128.0	4.6	10.0	20.7
Road	ST612A	0.134	7.46	64.0	0.5	5.0	12.5
Road	ST643A	0.162	7.30	32.0	0.0	0.0	7.3
Park	ST662AA	0.101	3.09	55.2	0.0	-	-
Road	ST662A	0.127	6.18	64.0	0.0	0.0	6.2
Road	ST663A	0.118	6.03	64.0	2.0	5.0	11.0
RY	ST637B	0.267	26.47	42.0	0.0	0.0	26.5
Road	ST609A	0.129	7.32	54.0	14.6	15.0	22.3
RY	ST652B	0.049	13.80	22.0	0.0	0.0	13.8
Road	ST652A	0.223	7.64	96.0	0.5	3.0	10.6
Road	ST638A	0.100	6.61	22.0	0.0	9.0	6.6
Road	ST608A	0.228	8.28	76.0	35.3	19.0	27.3
RY	ST608D	0.063	5.56	32.0	1.0	5.0	10.6
RY	ST608B	0.114	19.25	22.0	0.0	0.0	19.3
RY	ST609B	0.093	17.67	22.0	0.0	0.0	17.7
Road	ST647A	0.405	9.17	55.0	0.0	9.0	9.2
School	ST652AA	0.851	9.84	339.0	274.5	-	-
Road	ST630A	0.486	12.08	32.0	1.0	19.0	31.1
Park	ST631B	0.246	5.58	22.0	0.0	-	-
Road	ST630AB	0.434	9.79	134.0	32.5	19.0	28.8
RY	ST630AA	0.167	22.12	32.0	0.0	0.0	22.1
Road	ST629A	0.433	11.54	70.9	1.8	13.0	11.5
RY	ST631C	0.199	23.69	100.5	0.0	0.0	23.7
RY	ST631D	0.225	24.99	67.0	0.0	0.0	25.0
Road	ST632A	0.439	11.61	84.0	0.0	0.0	11.6

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST638B	0.198	8.60	74.0	15.1	15.0	23.6
Road	ST641A	0.127	7.27	54.0	12.0	15.0	22.3
Road	ST646A	0.150	7.75	54.0	1.0	5.0	12.8
RY	ST611A	0.095	17.79	42.0	0.0	0.0	17.8
RY	ST631A	0.188	23.16	22.0	0.0	0.0	23.2
RY	EXT-1	0.067	15.72	0.0	0.0	0.0	15.7
Road	ST509AA	1.221	15.68	44.0	113.3	28.0	43.7
RY	ST509AB	0.105	18.58	22.0	0.0	0.0	18.6
RY	ST521E	0.117	19.42	22.0	0.0	0.0	19.4
Road	ST521D	0.311	10.20	22.0	111.9	30.0	40.2
Park	ST510A	0.062	1.90	33.0	0.0	-	-
Road	ST613A	0.642	12.27	638.6	5.6	30.0	12.3
School	ST624AA	0.907	13.41	242.4	407.5	0.0	13.4
Road	ST624A	0.135	6.77	112.0	14.6	30.0	6.8
Road	ST627A	0.361	10.78	357.2	4.5	20.0	10.8
Road	ST524A	0.116	6.18	44.0	37.6	30.0	6.2
RY	ST637C	0.162	21.86	22.0	0.0	0.0	21.9
RY	ST648A	0.114	19.22	22.0	0.0	0.0	19.2
RY	ST660B	0.056	14.78	22.0	0.0	0.0	14.8
Road	ST660A	0.226	9.07	109.0	10.8	14.0	23.1
Road	ST657A	0.152	7.78	64.0	14.7	15.0	22.8
Road	ST659A	0.150	7.75	64.0	0.5	5.0	12.8
Road	ST656A	0.126	7.25	54.0	16.8	15.0	22.3
Road	ST655A	0.194	7.80	54.0	13.5	15.0	22.8
RY	ST655B	0.166	22.07	67.0	0.0	0.0	22.1
RY	ST650B	0.125	20.02	42.0	0.0	0.0	20.0
Road	ST650A	0.171	7.13	84.0	0.0	0.0	7.1
Road	ST649A	0.425	9.32	109.0	0.7	5.0	14.3
RY	ST654A	0.074	16.19	32.0	0.0	0.0	16.2
Road	ST664A	0.159	6.11	84.0	0.7	5.0	11.1
RY	ST715B	0.091	17.53	42.0	0.0	0.0	17.5
Road	ST714A	0.141	20.84	42.0	0.0	0.0	20.8
RY	ST719B	0.098	18.04	42.0	0.0	0.0	18.0
Road	ST719A	0.126	5.54	44.0	1.6	5.0	10.5
Road	ST717A	0.210	6.74	84.0	0.0	0.0	6.7
Road	ST705A	0.594	10.60	178.0	1.6	5.0	15.6
Road	ST709A	0.109	5.24	64.0	0.0	0.0	5.2
Road	ST715A	0.227	9.08	109.0	10.8	15.0	24.1
Road	ST713A	0.187	8.40	84.0	13.0	14.0	22.4

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST711A	0.164	7.99	64.0	14.7	15.0	23.0
Road	ST710A	0.170	8.09	84.0	13.0	15.0	23.1
RY	ST710B	0.172	22.38	67.0	0.0	0.0	22.4
Park	ST707AA	0.345	6.28	186.0	14.0	-	-
School	EXT-6	1.737	12.88	699.6	500.6	-	-
Road	ST703B	0.354	9.79	32.0	0.0	0.0	9.8
Road	ST703A	0.532	10.61	116.0	21.3	18.0	28.6
Road	ST704A	0.107	5.78	55.0	0.0	0.0	5.8

It is of note that segments ST509AA, ST521D, ST522A, and ST509A form part of Phase 1A of the Half Moon Bay South development, which was designed and constructed prior to City of Ottawa requirements to maintain flow depths on street below 0.30m in depth. As segments 509AA and 509A form part of the major overland flow route to Regatta Avenue and maintain a static ponding depth of 0.30m, it is not possible to alleviate flow depth issues in these areas without significant re-grading of the right-of-ways in the existing phase. Effort has been made to size ICDs within Phase 4 to reduce overland flow contribution to these areas without also exceeding the 2,152L/s peak capture rate specified for the Corrigan minor system.

The 100 year, 3 hr Chicago major system overflow to Regatta within Phase 1A of the HMBS development is 1.12 m3/s, which is less than the 2.70 m3/s target. The overall 100 year (3 hr Chicago storm) minor system inflow from the proposed P4 and approved phase areas from the outlet within Phase 1A towards the Corrigan pond is 2,148 L/s as obtained from the XP-SWMM model (see details in **Section 5.3**), which is less than the allowable 2,152 L/s minor system release rate to the Phase 1A outlet.

The DDSWMM results also show no 100 year overland spill flows onto the adjacent Meadows in Half Moon Bay development at River Mist Road (segment ST613A). The actual 100 year peak outflow from the HMBS development to the storm outlet at River Mist Road will be obtained from the XP-SWMM model, which takes into account routing and the differences in time to peak of the inflow hydrographs. The overall peak flow from the HMBS development to the trunk sewer along River Mist Road directed to the Todd Pond does not negatively impact the hydraulic grade line (HGL) elevation and underside of footing (USF) clearance downstream, as confirmed through correspondence with JFSA.

5.3.2.3 Ultimate Condition Hydrologic Analysis Results

Table 13 and Table 14 summarize the ultimate condition DDSWMM modeling results for the proposed areas in P4 and approved and existing phase areas along the Todd major system outlet for the 5 year, and 100 year 3 hr Chicago storms respectively. Ultimate scenario flow

depths and capture rates for areas tributary to the Corrigan system remain unchanged from that of the interim scenario.

Table 13: HMBS - Phase 4 - Major and Minor System 5 Year Storm Results

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Minor System To Todd Pond							
Road	ST604A	0.111	6.31	64.0	11.5	15.0	21.3
RY	ST602A	0.033	11.82	22.0	0.0	0.0	N/A
RY	ST613B	0.065	15.58	32.0	0.0	0.0	N/A
Road	ST614A	0.018	3.08	18.4	0.2	12.0	3.1
Road	ST616A	0.144	6.66	64.0	33.1	19.0	6.7
Road	ST606A	0.075	6.00	64.0	1.2	15.0	6.0
Road	ST605A	0.134	7.45	86.0	19.5	24.0	7.5
RY	ST606B	0.019	9.78	18.7	0.0	0.0	N/A
RY	ST608C	0.033	11.80	32.0	0.0	0.0	N/A
Road	ST620A	0.030	3.75	22.0	0.0	4.0	3.8
Road	ST623A	0.190	7.74	140.0	18.2	22.0	7.7
Road	ST614B	0.053	5.18	32.0	9.6	12.0	5.2
Road	ST615A	0.066	5.66	44.0	7.1	15.0	5.7
Road	ST614C	0.066	5.67	32.0	0.0	5.0	5.7
Road	ST619B	0.032	4.33	22.0	0.0	0.0	4.3
Road	ST620B	0.074	5.97	44.0	10.7	15.0	6.0
Road	ST621A	0.095	6.50	64.0	9.5	15.0	6.5
RY	ST619A	0.060	15.16	32.0	0.0	0.0	N/A
RY	ST623B	0.053	14.32	32.0	0.0	0.0	N/A
Road	ST628A	0.158	7.90	150.0	3.0	16.0	7.9
Road	ST637A	0.086	5.48	85.9	0.4	30.0	5.5
Road	ST640A	0.106	6.22	105.5	0.4	10.0	6.2
Road	ST612A	0.070	5.82	64.0	0.3	5.0	5.8
Road	ST643A	0.054	4.80	32.0	0.0	0.0	4.8
Park	ST662AA	0.015	0.46	8.7	0.0	-	-
Road	ST662A	0.052	4.42	52.0	0.0	0.0	4.4
Road	ST663A	0.058	4.59	57.3	0.2	5.0	4.6
RY	ST637B	0.053	14.34	42.0	0.0	0.0	14.3
Road	ST609A	0.065	5.63	54.0	2.0	15.0	5.6
RY	ST652B	0.017	9.26	17.0	0.0	0.0	9.3
Road	ST652A	0.084	5.22	83.6	0.1	3.0	5.2
Road	ST638A	0.024	3.82	22.0	0.0	9.0	3.8

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST608A	0.098	6.06	76.0	4.8	19.0	6.1
RY	ST608D	0.033	4.41	32.0	0.1	5.0	4.4
RY	ST608B	0.020	10.06	19.9	0.0	0.0	10.1
RY	ST609B	0.017	9.34	17.3	0.0	0.0	9.3
Road	ST647A	0.024	3.14	24.1	0.0	9.0	3.1
School	ST652AA	0.397	6.64	318.7	32.9	-	-
Road	ST630A	0.052	5.13	32.0	1.0	19.0	24.1
Park	ST631B	0.042	1.29	22.0	0.0	-	-
Road	ST630AB	0.159	6.68	134.0	2.9	19.0	6.7
RY	ST630AA	0.071	15.97	32.0	0.0	0.0	16.0
Road	ST629A	0.089	6.36	70.9	1.8	13.0	6.4
RY	ST631C	0.049	13.88	48.9	0.0	0.0	13.9
RY	ST631D	0.097	17.92	67.0	0.0	0.0	17.9
Road	ST632A	0.103	6.68	84.0	0.0	0.0	6.7
Road	ST638B	0.096	6.51	74.0	5.1	15.0	6.5
Road	ST641A	0.063	5.57	54.0	1.8	15.0	5.6
Road	ST646A	0.076	6.03	54.0	1.0	5.0	11.0
RY	ST611A	0.044	13.18	42.0	0.0	0.0	13.2
RY	ST631A	0.040	12.73	22.0	0.0	0.0	12.7
RY	EXT-1	0.028	11.09	0.0	0.0	0.0	11.1
Road	ST509AA	0.213	8.07	44.0	113.3	28.0	36.1
RY	ST509AB	0.048	13.77	22.0	0.0	0.0	13.8
RY	ST521E	0.048	13.74	22.0	0.0	0.0	13.7
Road	ST521D	0.140	7.57	22.0	81.6	30.0	7.6
Park	ST510A	0.009	0.28	2.7	0.0	-	-
Road	ST613A	0.153	7.12	149.8	1.3	30.0	7.1
School	ST624AA	0.468	10.47	232.9	117.3	0.0	10.5
Road	ST624A	0.068	5.21	57.5	7.5	30.0	5.2
Road	ST627A	0.057	5.34	55.9	0.7	20.0	5.3
Road	ST524A	0.060	4.78	44.0	8.0	30.0	4.8
RY	ST637C	0.053	14.37	22.0	0.0	0.0	14.4
RY	ST648A	0.019	9.93	19.2	0.0	0.0	9.9
RY	ST660B	0.024	10.63	22.0	0.0	0.0	10.6
Road	ST660A	0.113	6.95	109.0	1.4	14.0	7.0
Road	ST657A	0.065	5.63	62.9	1.5	15.0	5.6
Road	ST659A	0.113	6.94	64.0	0.5	5.0	11.9
Road	ST656A	0.057	5.32	54.0	2.2	15.0	5.3
Road	ST655A	0.059	4.95	54.0	1.6	15.0	5.0

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
RY	ST655B	0.067	15.67	66.2	0.0	0.0	15.7
RY	ST650B	0.049	13.83	42.0	0.0	0.0	13.8
Road	ST650A	0.084	5.43	84.0	0.0	0.0	5.4
Road	ST649A	0.110	5.57	109.0	0.1	5.0	5.6
RY	ST654A	0.031	11.53	31.0	0.0	0.0	11.5
Road	ST669A	0.070	4.52	67.0	0.0	5.0	4.5
RY	ST665A	0.070	4.51	64.0	0.5	0.0	4.5
Road	ST670A	0.151	6.02	84.0	0.7	0.0	6.0
RY	ST670B	0.027	10.98	26.9	0.0	0.0	11.0
Road	ST728A	0.076	6.02	67.0	0.0	5.0	6.0
Road	ST726A	0.057	4.10	55.0	0.0	0.0	4.1
Road	ST726B	0.044	13.15	42.0	0.0	5.0	13.2
Road	ST725A	0.098	5.32	96.0	0.2	0.0	5.3
Road	ST724A	0.078	4.88	77.8	0.1	15.0	4.9
Road	ST724B	0.052	14.26	42.0	0.0	14.0	14.3
Road	ST722A	0.079	5.29	74.0	0.3	15.0	5.3
Road	ST720A	0.019	2.68	19.1	0.2	15.0	2.7
Road	ST667A	0.058	4.91	54.0	0.3	0.0	4.9
Park	ST666B	0.029	11.23	28.8	0.0	-	-
School	ST666A	0.069	5.24	64.0	0.3	-	-
Road	ST673A	0.058	4.13	55.0	0.0	0.0	4.1
Road	ST672A	0.051	3.90	51.1	0.0	18.0	3.9
Road	ST672B	0.030	11.39	30.0	0.0	0.0	11.4
Road	ST723A	0.027	3.11	26.7	0.1	0.0	3.1
Road	ST664A	0.081	4.72	81.2	0.1	0.0	4.7
Road	ST715B	0.039	12.58	39.0	0.0	0.0	12.6
Road	ST714A	0.041	12.79	40.6	0.0	0.0	12.8
Road	ST719B	0.041	12.81	40.8	0.0	0.0	12.8
Road	ST719A	0.047	3.75	44.0	0.3	0.0	3.8
Road	ST717A	0.083	4.76	83.4	0.0	0.0	4.8
Road	ST705A	0.181	6.73	178.0	0.4	0.0	6.7
Road	ST709A	0.057	4.09	56.9	0.0	0.0	4.1
Road	ST715A	0.112	6.90	109.0	1.2	0.0	6.9
Road	ST713A	0.079	6.09	76.6	1.2	0.0	6.1
Road	ST711A	0.069	5.78	64.0	1.7	0.0	5.8
Road	ST710A	0.081	6.16	79.4	1.2	0.0	6.2
Road	ST710B	0.074	16.20	67.0	0.0	0.0	16.2
Road	ST707AA	0.052	1.58	46.0	2.5	0.0	1.6

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	EXT-6	0.836	9.74	699.6	26.8	0.0	9.7
Road	ST703B	0.032	3.90	32.0	0.0	0.0	3.9
Road	ST703A	0.118	6.02	115.1	2.1	0.0	6.0
Road	ST704A	0.051	4.38	51.1	0.0	0.0	4.4

Table 14: HMBS - Phase 4 - Major and Minor System 100 Year Storm Results

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Minor System To Todd Pond							
Road	ST604A	0.375	10.01	64.0	11.5	15.0	25.0
RY	ST602A	0.087	17.17	22.0	0.0	0.0	N/A
RY	ST613B	0.169	22.21	32.0	0.0	0.0	N/A
Road	ST614A	0.293	8.75	22.0	2.3	12.0	20.8
Road	ST616A	0.405	9.87	64.0	48.1	19.0	28.9
Road	ST606A	0.148	7.72	64.0	14.2	15.0	22.7
Road	ST605A	0.479	12.03	86.0	72.7	24.0	36.0
RY	ST606B	0.130	20.26	22.0	0.0	0.0	N/A
RY	ST608C	0.082	16.83	32.0	0.0	0.0	N/A
Road	ST620A	0.057	4.88	22.0	0.0	4.0	4.9
Road	ST623A	0.573	11.76	140.0	81.3	22.0	33.8
Road	ST614B	0.365	10.83	32.0	9.9	12.0	22.8
Road	ST615A	0.127	7.28	44.0	12.0	15.0	22.3
Road	ST614C	0.387	11.06	32.0	0.0	5.0	11.1
Road	ST619B	0.090	6.38	22.0	0.0	0.0	6.4
Road	ST620B	0.143	7.62	44.0	13.3	15.0	22.6
Road	ST621A	0.185	8.36	64.0	11.5	15.0	8.4
RY	ST619A	0.209	24.20	32.0	0.0	0.0	N/A
RY	ST623B	0.135	20.52	32.0	0.0	0.0	N/A
Road	ST628A	0.529	12.45	150.0	26.7	16.0	28.5
Road	ST637A	0.683	12.06	682.5	3.0	30.0	12.1
Road	ST640A	0.446	10.70	128.0	4.6	10.0	20.7
Road	ST612A	0.134	7.46	64.0	0.5	5.0	12.5
Road	ST643A	0.162	7.30	32.0	0.0	0.0	7.3
Park	ST662AA	0.101	3.09	55.2	0.0	-	-
Road	ST662A	0.127	6.18	64.0	0.0	0.0	6.2

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST663A	0.118	6.03	64.0	2.0	5.0	11.0
RY	ST637B	0.267	26.47	42.0	0.0	0.0	26.5
Road	ST609A	0.129	7.32	54.0	14.6	15.0	22.3
RY	ST652B	0.049	13.80	22.0	0.0	0.0	13.8
Road	ST652A	0.223	7.64	96.0	0.5	3.0	10.6
Road	ST638A	0.100	6.61	22.0	0.0	9.0	6.6
Road	ST608A	0.228	8.28	76.0	35.3	19.0	27.3
RY	ST608D	0.063	5.56	32.0	1.0	5.0	10.6
RY	ST608B	0.114	19.25	22.0	0.0	0.0	19.3
RY	ST609B	0.093	17.67	22.0	0.0	0.0	17.7
Road	ST647A	0.472	9.68	55.0	0.0	9.0	9.7
School	ST652AA	0.851	9.84	339.0	274.5	-	-
Road	ST630A	0.486	12.08	32.0	1.0	19.0	31.1
Park	ST631B	0.246	5.58	22.0	0.0	-	-
Road	ST630AB	0.434	9.79	134.0	32.5	19.0	28.8
RY	ST630AA	0.167	22.12	32.0	0.0	0.0	22.1
Road	ST629A	0.457	11.80	70.9	1.8	13.0	11.8
RY	ST631C	0.199	23.69	100.5	0.0	0.0	23.7
RY	ST631D	0.225	24.99	67.0	0.0	0.0	25.0
Road	ST632A	0.467	11.90	84.0	0.0	0.0	11.9
Road	ST638B	0.198	8.60	74.0	15.1	15.0	23.6
Road	ST641A	0.127	7.27	54.0	12.0	15.0	22.3
Road	ST646A	0.150	7.75	54.0	1.0	5.0	12.8
RY	ST611A	0.095	17.79	42.0	0.0	0.0	17.8
RY	ST631A	0.188	23.16	22.0	0.0	0.0	23.2
RY	EXT-1	0.067	15.72	0.0	0.0	0.0	15.7
Road	ST509AA	1.221	15.68	44.0	113.3	28.0	43.7
RY	ST509AB	0.105	18.58	22.0	0.0	0.0	18.6
RY	ST521E	0.117	19.42	22.0	0.0	0.0	19.4
Road	ST521D	0.311	10.20	22.0	111.9	30.0	40.2
Park	ST510A	0.062	1.90	33.0	0.0	-	-
Road	ST613A	0.642	12.27	638.6	5.6	30.0	12.3
School	ST624AA	0.907	13.41	242.4	407.5	0.0	13.4
Road	ST624A	0.135	6.77	112.0	14.6	30.0	6.8
Road	ST627A	0.390	11.10	387.9	4.9	20.0	11.1
Road	ST524A	0.116	6.18	44.0	37.6	30.0	6.2
RY	ST637C	0.162	21.86	22.0	0.0	0.0	21.9
RY	ST648A	0.114	19.22	22.0	0.0	0.0	19.2
RY	ST660B	0.056	14.78	22.0	0.0	0.0	14.8

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST660A	0.226	9.07	109.0	10.8	14.0	23.1
Road	ST657A	0.152	7.78	64.0	14.7	15.0	22.8
Road	ST659A	0.472	11.96	64.0	0.5	5.0	17.0
Road	ST656A	0.744	14.17	54.0	16.8	15.0	29.2
Road	ST655A	0.621	12.13	54.0	13.5	15.0	27.1
RY	ST655B	0.166	22.07	67.0	0.0	0.0	22.1
RY	ST650B	0.125	20.02	42.0	0.0	0.0	20.0
Road	ST650A	0.171	7.13	84.0	0.0	0.0	7.1
Road	ST649A	0.567	10.42	109.0	0.7	5.0	15.4
RY	ST654A	0.074	16.19	32.0	0.0	0.0	16.2
Road	ST669A	0.151	6.01	67.0	0.0	5.0	6.0
RY	ST665A	0.442	9.00	64.0	0.5	0.0	9.0
Road	ST670A	0.394	8.57	84.0	0.7	0.0	8.6
RY	ST670B	0.094	17.74	32.0	0.0	0.0	17.7
Road	ST728A	0.147	7.69	67.0	0.0	5.0	7.7
Road	ST726A	0.237	7.07	55.0	0.0	0.0	7.1
Road	ST726B	0.109	18.81	42.0	0.0	5.0	18.8
Road	ST725A	0.195	6.92	96.0	0.5	0.0	6.9
Road	ST724A	0.385	9.02	84.0	0.7	15.0	9.0
Road	ST724B	0.111	19.03	42.0	0.0	14.0	19.0
Road	ST722A	0.206	7.67	74.0	1.0	15.0	7.7
Road	ST720A	0.039	3.51	22.0	2.3	15.0	3.5
Road	ST667A	0.370	9.96	54.0	1.0	0.0	10.0
Park	ST666B	0.061	15.27	32.0	0.0	-	-
School	ST666A	0.411	10.39	64.0	0.5	-	-
Road	ST673A	0.124	5.51	55.0	0.0	0.0	5.5
Road	ST672A	0.169	6.24	55.0	0.0	18.0	6.2
Road	ST672B	0.073	16.14	32.0	0.0	0.0	16.1
Road	ST723A	0.055	4.01	32.0	1.0	0.0	4.0
Road	ST664A	0.159	6.11	84.0	0.7	0.0	6.1
Road	ST715B	0.091	17.53	42.0	0.0	0.0	17.5
Road	ST714A	0.141	20.84	42.0	0.0	0.0	20.8
Road	ST719B	0.098	18.04	42.0	0.0	0.0	18.0
Road	ST719A	0.126	5.54	44.0	1.6	0.0	5.5
Road	ST717A	0.210	6.74	84.0	0.0	0.0	6.7
Road	ST705A	0.594	10.60	178.0	1.6	0.0	10.6
Road	ST709A	0.109	5.24	64.0	0.0	0.0	5.2
Road	ST715A	0.227	9.08	109.0	10.8	0.0	9.1
Road	ST713A	0.187	8.40	84.0	13.0	0.0	8.4

Segment Type	Segment ID	Peak Flow (m^3/s)	Depth on Segment (cm)	Max. Capture (L/s)	Storage Used (m^3)	Static Ponding Depth (cm)	Total Flow Depth (cm)
Road	ST711A	0.164	7.99	64.0	14.7	0.0	8.0
Road	ST710A	0.170	8.09	84.0	13.0	0.0	8.1
Road	ST710B	0.172	22.38	67.0	0.0	0.0	22.4
Road	ST707AA	0.345	6.28	186.0	14.0	0.0	6.3
Road	EXT-6	1.737	12.88	699.6	500.6	0.0	12.9
Road	ST703B	0.354	9.79	32.0	0.0	0.0	9.8
Road	ST703A	0.532	10.61	116.0	21.3	0.0	10.6
Road	ST704A	0.107	5.78	55.0	0.0	0.0	5.8

The results of the hydrologic analyses (DDSWMM input and output files) for the different storm events are summarized in **Appendix A2.**

The following table shows the segments with 100 year total flow depth greater than 30 cm as shown in the above **Table 12 and Table 14**, along with a comparison to the 100 year total flow depth on those segments as per the approved SWM Report for Draft Plan #2 (Stantec, August 2014).

Table 15: 100 Year Total Flow Depth Comparison

Catchment ID	Approved SWM Plan (August 2014) Total Flow Depth (cm)	Interim Phase 4 SWM Plan (July 2015) Total Flow Depth (cm)	Ultimate Phase 4 SWM Plan (July 2015) Total Flow Depth (cm)
Minor System to Corrigan Pond			
'1-1' / ST525A	34.4	31.2	31.2
'1-9' / ST535A	39.3	30.7	30.7
'1-20' / ST551A	34.3	26.9	26.9
Minor System to Todd Pond			
'2-5' / ST616A	33.4	28.9	28.9
'2-7' / ST605A	38.7	36.0	36.0
'2-11' / ST623A	33.7	33.8	33.8
ST630A	<30	31.1	31.1

The above table shows that total flow depths have been reduced in the majority of areas with the exception of area ST630A, which shows a negligible flow depth increase. These areas were previously designed and approved prior to the flow depth requirement and/or are within Draft Plan #2 and were approved with flow depths in excess of the required 30cm. It should be noted that several efforts were made during detailed design of the approved phases in order to reduce the 100 year flow depths on streets as much as possible. The total 100 year flow depth over the proposed Phase 4 segments remains below 30cm.

5.3.3 Hydraulic Grade Line Analysis

In order to assess the hydraulic grade line (HGL) elevation across the Phase #4 areas of the HMBS development, the storm sewers tributary to the Todd Pond outlet at River Mist (EXMH601), to the Corrigan Pond at Sweet Grass Circle (EXMH501), as well as the detailed DDSWMM hydrology for the 100 year, 3 hr Chicago storm were incorporated into two XP-SWMM models. One model represents the minor system to the Corrigan Pond at the boundary with Phase 1A of the HMBS development (EXMH501) and the results of this analysis have been included in **Appendix A.3**. The second model represents the minor system to the Todd Pond including the storm sewer infrastructure across the existing phases (outlet at River Mist Road) and the results of this analysis have also been included in **Appendix A.3**. Given that the storm sewer systems to the Todd Pond have been designed to capture and convey major flows along River Mist Road, the minor system inflows during the 100 year, 3 hr Chicago storm increased by 20% increase considerably and as such, the storm systems were also stress tested during this storm event. The PCSWMM modeled dry pond outflow hydrograph has been added to node 719 to simulate inflows from the temporary dry pond attenuating peak flows from the upstream rural area noted in the Barrhaven South MSS and reassessed by JL Richards & Associates for the future Minto lands to the south (see **Appendix A.5)**. **Appendix A.4** presents the proposed storm sewer design sheet.

The 100 year, 3hr Chicago HGL boundary condition (fixed water level) at EXMH501 to the Corrigan Pond was obtained from the HMBS – Phase 1A SWM Report (Stantec, July 2011) as 92.70 m. The fixed HGL boundary condition at EXMH601 was determined from the overall XPSWMM model inclusive of Todd Pond's outlet and water elevations within the downstream Jock River as created by JFSA (see correspondence included in **Appendix A.5**).

5.3.3.1 Interim Hydraulic Grade Line Results

The DDSWMM hydrology was interfaced with the XP-SWMM models to determine the resulting HGL across the approved Draft Plans #1 and #2, and the proposed Phase 4 of the HMBS development. **Table 16** summarizes the HGL modeling results across the HMBS development and shows the lowest USF elevations and proposed road grades. HGL clearance from lowest USF has been calculated across approved phases, while HGL clearance across the Phase 4 development areas has been estimated based on proposed road elevations. Proposed USF elevations are to be updated in the forthcoming revised grading plans for the region, and will satisfy the 0.30m minimum freeboard requirement from maximum 100yr HGL elevations.

It is of note that as inflow rates to the Corrigan minor system are at their maximum rates during the 100yr Chicago event as defined by the DDSWMM model hydrology, no HGL increases have been observed for the 100yr +20% event for sewers tributary to the Corrigan minor system. The maximum 100yr HGL column for areas tributary to the Todd pond minor system incorporates worst case results from both the 100yr 24hr SCS and 100yr 3hr Chicago events.

Table 16: 3hr Chicago Hydraulic Grade Line Results

Node (CB/MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF – HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF – HGL) (m)
Proposed and Approved Phases - Minor System to Corrigan Pond (Outlet at Greenbank Road)						
566	99.44	97.30	96.91	0.39	96.91	0.39
565	99.30	97.26	96.78	0.48	96.78	0.48
564	99.29	97.07	96.31	0.76	96.31	0.76
563	99.20	96.94	96.51	0.43	96.51	0.43
562	98.99	97.09	96.22	0.88	96.22	0.88
561	99.05	97.05	96.20	0.85	96.20	0.85
560	99.08	97.01	95.65	1.36	95.65	1.36
EX521	96.24	95.79	93.15	2.64	93.15	2.64
EX525	96.17	94.24	93.25	0.99	93.25	0.99
EX526	96.25	94.41	93.46	0.95	93.46	0.95
EX527	96.32	94.48	93.66	0.82	93.66	0.82
EX528	96.28	94.54	93.75	0.79	93.75	0.79
EX529	96.20	94.34	93.28	1.06	93.28	1.06
EX530	96.41	94.34	93.29	1.05	93.29	1.05
EX531	96.40	94.59	93.30	1.29	93.30	1.29
EX532	96.47	94.59	93.34	1.25	93.34	1.25
EX533	96.48	94.48	93.35	1.13	93.35	1.13
EX534	96.31	94.48	93.69	0.79	93.69	0.79
EX535	96.26	94.54	93.30	1.24	93.30	1.24
EX536	96.38	94.56	93.36	1.20	93.36	1.20
EX537	96.46	94.56	93.87	0.69	93.87	0.69
EX538	96.51	94.54	93.34	1.20	93.34	1.20
EX539	96.87	94.73	93.38	1.35	93.38	1.35
EX540	97.34	95.02	93.47	1.55	93.47	1.55
EX541	97.31	95.41	94.73	0.68	94.73	0.68
EX542	97.51	95.86	93.77	2.09	93.77	2.09
EX543	97.56	95.61	94.02	1.59	94.02	1.59
EX544	97.55	95.68	94.85	0.83	94.85	0.83
EX545	97.86	95.73	95.02	0.71	95.02	0.71
EX546	98.96	96.84	96.37	0.47	96.37	0.47
EX551	96.44	94.56	93.41	1.15	93.41	1.15
EX552	96.49	94.56	93.86	0.70	93.86	0.70
EX553	96.55	94.63	93.72	0.91	93.72	0.91
EX554	96.55	94.66	93.71	0.95	93.71	0.95
EX555	96.54	94.82	94.09	0.73	94.09	0.73
EX556	97.03	95.13	93.96	1.17	93.96	1.17

EX557	97.91	95.79	94.45	1.34	94.45	1.34
EX558	98.10	96.22	94.60	1.63	94.60	1.63
EX559	98.95	96.72	95.07	1.65	95.07	1.65
Proposed and Approved Phases - Minor to Todd Pond						
649	98.73	96.71	95.88	0.83	95.88	0.83
650	99.51	97.01	97.13	0.61**	97.13	0.60**
651	99.63	97.82	97.24	0.58	97.24	0.58
652	97.93	N/A	94.59	N/A	94.69	N/A
653	100.29	98.01	97.78	0.59**	97.78	0.59**
654	100.31	96.89	96.48	0.41	96.48	0.41
655	100.50	98.27	97.26	1.01	97.26	1.01
656	100.61	N/A	97.72	N/A	97.72	N/A
657	100.64	98.67	98.46	0.31	98.46	0.31
658	100.68	98.75	98.46	0.30	98.46	0.30
659	101.29	N/A	97.92	N/A	97.92	N/A
660	100.66	98.83	98.37	0.46	98.37	0.46
661	100.71	98.95	98.38	0.57	98.38	0.57
662	98.57	N/A	95.39	N/A	95.40	N/A
663	99.55	N/A	96.39	N/A	96.39	N/A
664	101.43	98.35	99.15	0.66**	99.15	0.66**
703	98.44	96.21	95.15	1.07	95.12	1.09
704	100.10	96.68	97.48	0.74**	97.48	0.74**
705	98.58	N/A	95.72	N/A	95.68	N/A
706	99.03	97.00	96.62	0.38	96.62	0.38
707	99.20	97.00	96.79	0.36**	96.79	0.35**
708	100.32	98.03	97.88	0.92**	97.88	0.91**
709	101.47	98.96	99.10	0.78**	99.10	0.78**
710	98.73	96.60	95.94	0.66	96.05	0.55
711	98.65	96.74	96.04	0.70	96.11	0.63
712	98.70	96.74	96.10	0.64	96.16	0.58
713	98.72	96.74	96.28	0.46	96.31	0.43
714	98.81	96.82	96.38	0.44	96.40	0.42
715	99.54	96.83	97.25	0.34**	97.26	0.28**
716	100.05	97.38	95.76	1.62	95.70	1.68
717	101.49	98.37	97.38	0.99	97.37	1.00
718	101.54	99.93	98.48	1.45	98.48	1.45
719	102.11	N/A	99.12	N/A	99.11	N/A
EX509A	95.06	N/A	92.64	N/A	92.98	N/A
EX510	95.23	93.49	92.92	0.57	92.99	0.50
EX521	96.24	94.04	93.55	0.49	93.87	0.17
EX524	96.48	94.25	93.32	0.93	93.84	0.42
EX601	95.61	N/A	92.50	N/A	92.80	N/A

EX602	95.58	N/A	92.61	N/A	92.96	N/A
EX603	95.16	93.36	92.64	0.72	92.97	0.39
EX604	95.81	93.89	92.90	1.00	93.18	0.71
EX605	96.00	94.13	93.01	1.12	93.27	0.86
EX606	96.10	94.36	93.12	1.24	93.33	1.03
EX607	96.13	94.55	93.21	1.35	93.36	1.19
EX608	96.39	94.57	93.49	1.08	93.52	1.05
EX609	96.28	94.70	93.57	1.13	93.58	1.12
EX610	96.33	94.76	93.57	1.19	93.58	1.18
EX611	96.11	94.63	93.69	0.94	93.69	0.94
EX612	96.10	94.98	94.18	0.80	94.18	0.80
EX613	96.09	N/A	92.78	N/A	93.23	N/A
EX614	96.15	94.33	92.96	1.37	93.34	1.00
EX615	96.30	94.33	93.18	1.15	93.39	0.94
EX616	96.04	94.50	93.29	1.21	93.41	1.10
EX617	96.11	94.45	93.12	1.33	93.12	1.33
EX619	96.25	94.51	93.10	1.41	93.42	1.10
EX620	96.23	94.93	93.71	1.22	93.71	1.22
EX621	96.19	94.51	93.15	1.36	93.45	1.06
EX622	96.23	94.61	93.22	1.39	93.47	1.14
EX623	96.10	94.61	93.65	0.96	93.69	0.92
EX624	96.29	94.48	93.05	1.43	93.57	0.91
EX624A	96.50	N/A	93.83	N/A	93.84	N/A
EX627	96.68	94.58	93.22	1.36	93.79	0.80
EX628	96.51	94.65	93.50	1.15	94.05	0.60
EX629	96.85	94.75	93.61	1.14	94.11	0.64
EX629A	96.91	N/A	93.78	N/A	94.15	N/A
EX630	96.68	94.86	93.84	1.02	94.24	0.62
EX630A	96.49	94.92	94.03	0.89	94.37	0.55
EX631	97.32	94.88	94.20	0.69	94.34	0.54
EX632	98.59	95.58	95.15	0.43	95.15	0.43
EX637	96.56	95.51	93.31	2.20	93.90	1.61
EX638	96.46	94.62	93.65	0.97	94.04	0.58
EX639	96.51	94.76	93.67	1.09	94.05	0.71
EX640	96.76	94.65	93.38	1.27	93.97	0.68
EX641	96.59	95.08	94.01	1.07	94.09	0.99
EX642	96.63	94.88	94.00	0.88	94.08	0.80
EX643	97.37	94.97	93.81	1.16	94.31	0.66
EX646	97.50	95.42	94.21	1.21	94.45	0.97
EX647	97.88	95.31	94.82	0.49	94.83	0.48
EX648	98.41	N/A	95.14	N/A	95.14	N/A

NOTE: Worst case HGL for these locations has been interpolated based on proposed building service lateral location – See **Appendix A.3 for calculations.

As can be seen in **Table 16**, the 100 year storm (worst case between 3 hr Chicago and 24 hr SCS) results in HGL elevations that remain at least 0.30 m below the underside of footings (USFs) across the proposed and existing phases of the HMBS development.

The XP-SWMM results also show that the actual 100 year peak outflow to the trunk sewer on River Mist Road is 6,973 L/s. Similarly, the XP-SWMM results show that the actual 100 year peak outflow to EXMH501 in Phase 1A towards the Corrigan Pond is 2,148 L/s.

5.3.3.2 Ultimate Hydraulic Grade Line Analysis Results

Table 17 summarizes the ultimate scenario HGL modeling results for areas tributary to the Todd pond minor system (Corrigan minor system remains unchanged for Interim/Ultimate scenarios) across the HMBS development and shows the lowest USF elevations and proposed road grades. HGL clearance from lowest USF has been calculated across approved phases, while HGL clearance across the Phase 4 development areas has been estimated based on proposed road elevations. Proposed USF elevations are to be updated in the forthcoming revised grading plans for the region, and will satisfy the 0.30m minimum freeboard requirement from maximum 100yr HGL elevations.

Areas of unrestricted minor system capture to the Todd system exist along River Mist within drainage areas ST637A, ST627A, and ST613A and were constructed as part of Phase 1A of the development prior to City of Ottawa requirements to analyze the effects of a climate change event on the system. As a result, during the 100yr + 20% event, a considerable sewer surcharge is experienced in these areas. To reduce the surcharge to manageable levels, it is recommended to install ICDs on each unrestricted catchbasin lead within area ST627A (6 IPEX Type C ICDs restricted to 67L/s each) and area ST637A (8 ICDs restricted to 86L/s each) prior to development of future Mattamy lands to the south beyond Phase 4 to permit major system routing for additional flows over that experienced during a regular 100 year event. Additional routing delays peak inflows from these areas, with the net effect of managing HGL levels across problem areas during the ultimate scenario. No major system discharge through area ST613A to neighboring properties to the north has been noted in the DDSWMM analysis for this scenario.

Table 17: 100 Year, 3hr Chicago Ultimate Hydraulic Grade Line Results

Node (CB/MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF – HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF – HGL) (m)
Proposed and Approved Phases - Minor to Todd Pond						
649	98.73	96.71	96.06	0.65	96.08	0.63
650	99.51	97.01	97.13	0.61**	97.13	0.60**
651	99.63	97.82	97.24	0.58	97.24	0.58
652	97.93	N/A	94.72	N/A	95.36	N/A
653	100.29	98.01	97.78	0.59**	97.78	0.59**
654	100.31	96.89	96.68	1.14**	96.68	0.72**
655	100.50	98.27	97.56	0.71	97.56	0.71
656	100.61	N/A	97.96	N/A	97.96	N/A
657	100.64	98.67	98.45	0.31**	98.39	0.37**
658	100.68	98.75	98.45	0.30	98.39	0.36
659	101.29	N/A	98.11	N/A	98.11	N/A
660	100.66	98.83	98.37	0.46	98.37	0.46
661	100.71	98.95	98.38	0.57	98.37	0.58
662	98.57	N/A	95.39	N/A	95.51	N/A
663	99.55	N/A	96.39	N/A	96.39	N/A
664	101.43	98.35	99.15	0.66**	99.15	0.66**
703	98.44	96.21	95.25	0.96	95.28	0.93
704	100.10	96.68	97.48	0.74**	97.48	0.74**
705	98.58	N/A	95.95	N/A	95.96	N/A
706	99.03	97.00	96.62	0.38	96.62	0.38
707	99.20	97.00	96.79	0.36**	96.79	0.35**
708	100.32	98.03	97.88	0.92**	97.88	0.91**
709	101.47	98.96	99.10	0.78**	99.10	0.78**
710	98.73	96.60	96.12	0.48	96.15	0.45
711	98.65	96.74	96.19	0.55	96.22	0.52
712	98.70	96.74	96.23	0.52	96.26	0.48
713	98.72	96.74	96.35	0.39	96.40	0.34
714	98.81	96.82	96.42	0.40	96.48	0.34
715	99.54	96.83	97.26	0.34**	97.28	0.28**
716	100.05	97.38	96.10	1.28	96.12	1.27
717	101.49	98.37	97.58	0.79	97.58	0.79
718	101.54	99.93	98.48	1.45	98.48	1.45
719	102.11	N/A	99.23	N/A	99.23	N/A
EX509A	95.06	N/A	92.80	N/A	93.07	N/A
EX510	95.23	93.49	92.92	0.57	93.10	0.39

Node (CB/MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF – HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF – HGL) (m)
EX521	96.24	94.04	93.74	0.45**	94.25	0.01**
EX524	96.48	94.25	93.70	0.55	94.20	0.05
EX601	95.61	N/A	92.62	N/A	0.00	N/A
EX602	95.58	N/A	92.77	N/A	93.04	N/A
EX603	95.16	93.36	92.79	0.57	93.07	0.29
EX604	95.81	93.89	93.01	0.89	93.25	0.64
EX605	96.00	94.13	93.09	1.04	93.34	0.79
EX606	96.10	94.36	93.17	1.19	93.40	0.96
EX607	96.13	94.55	93.22	1.33	93.42	1.13
EX608	96.39	94.57	93.49	1.08	93.55	1.02
EX609	96.28	94.70	93.57	1.13	93.59	1.11
EX610	96.33	94.76	93.57	1.19	93.60	1.16
EX611	96.11	94.63	93.69	0.94	93.70	0.93
EX612	96.10	94.98	94.18	0.80	94.18	0.80
EX613	96.09	N/A	93.03	N/A	93.37	N/A
EX614	96.15	94.33	93.13	1.20	93.49	0.84
EX615	96.30	94.33	93.23	1.11	93.54	0.79
EX616	96.04	94.50	93.30	1.20	93.56	0.94
EX617	96.11	94.45	93.12	1.33	93.59	0.86
EX619	96.25	94.51	93.22	1.30	93.57	0.94
EX620	96.23	94.93	93.71	1.22	93.76	1.17
EX621	96.19	94.51	93.25	1.26	93.60	0.91
EX622	96.23	94.61	93.28	1.33	93.63	0.98
EX623	96.10	94.61	93.65	0.96	93.81	0.80
EX624	96.29	94.48	93.42	1.06	93.85	0.63
EX624A	96.50	N/A	93.83	N/A	93.92	N/A
EX627	96.68	94.58	93.65	0.93	94.15	0.43
EX628	96.51	94.65	94.03	0.62	94.54	0.11
EX629	96.85	94.75	94.12	0.63	94.64	0.11
EX629A	96.91	N/A	94.15	N/A	94.68	N/A
EX630	96.68	94.86	94.32	0.52**	94.87	0.08**
EX630A	96.49	94.92	94.52	0.49**	95.10	0.04**
EX631	97.32	94.88	94.31	0.57	94.80	0.08
EX632	98.59	95.58	95.15	0.43	95.20	0.38
EX637	96.56	95.51	93.77	1.74	94.30	1.21
EX638	96.46	94.62	93.91	0.72	94.46	0.16
EX639	96.51	94.76	93.91	0.85	94.47	0.29
EX640	96.76	94.65	93.87	0.78	94.42	0.23

Node (CB/MH)	Exist./Prop. Road Elevation (m)	Underside of Footing (m)	Maximum 100yr HGL (m)	Difference (USF – HGL) (m)	Maximum 100yr +20% HGL (m)	Difference (USF – HGL) (m)
EX641	96.59	95.08	94.03	1.05	94.50	0.58
EX642	96.63	94.88	94.02	0.86	94.50	0.38
EX643	97.37	94.97	94.44	0.53	95.02	-0.05
EX646	97.50	95.42	94.75	0.67	95.37	0.05
EX647	97.88	95.31	95.11	0.55**	95.81	-0.07**
EX648	98.41	N/A	95.34	N/A	95.97	N/A

NOTE: Worst case HGL for these locations has been interpolated based on proposed building service lateral location – See **Appendix A.3 for calculations.

As can be seen in **Table 17**, the worst case results between the 100 year 3 hr Chicago)and 24hr SCS events results in HGL elevations that remain at least 0.30 m below the underside of footings (USFs) across the approved and existing phases of the HMBS development. Maximum elevations for the 100yr +20% climate change event do not exceed basement floor elevations (USF + 0.23m) for existing properties in the region.

Appendix I

Draft BSMSSA – Revised Potable Water and Sanitary Servicing Analysis Memo, Stantec, October 19, 2016

Memo

To:	Jeff Shillington City of Ottawa	From:	Kevin Alemany Stantec Consulting Ltd.
File:	1634-00999	Date:	October 19, 2016

Reference: **Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area**

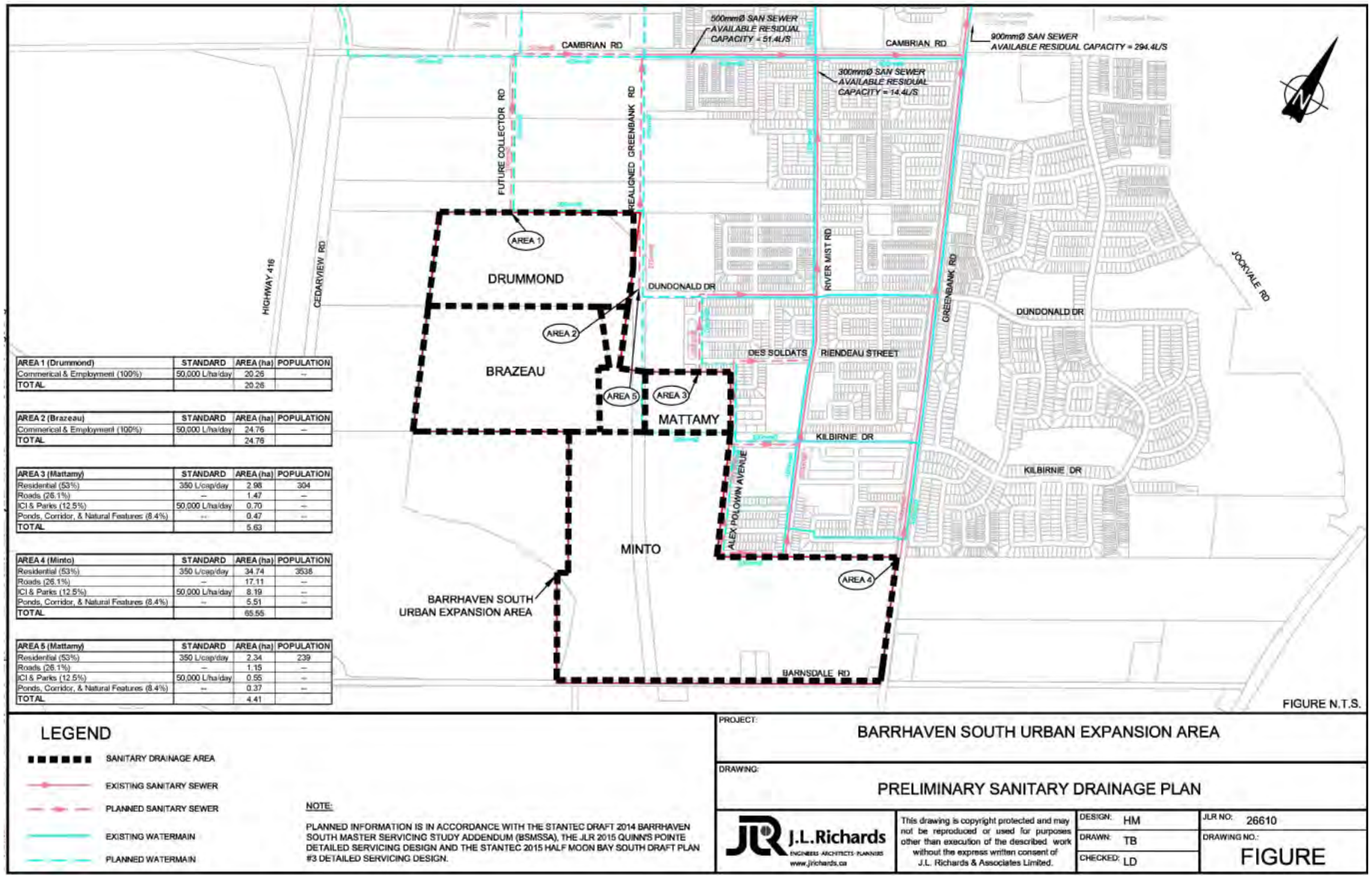
OVERVIEW

This technical memorandum provides an update to the potable water and sanitary servicing plan for the Barrhaven South Study Area. This update includes revisions to the Barrhaven South Urban Expansion Area. The analysis was completed as part of an addendum to the Barrhaven Master Servicing Study (MSS).

The preliminary sanitary drainage plan and population projections for the Barrhaven South Urban Expansion Area were completed by J.L. Richards & Associates Limited (JLR). The document provided to Stantec from JLR is provided in **Figure 1** below. This document splits the proposed expansion areas into five regions based on the developer and provides preferred sanitary and potable water layouts and connection points for each of these areas.

There have been realignments of the Barrhaven South Master Servicing Study Area since the previous iteration of the sanitary drainage plan (Nov 28th 2014). Using the new sanitary drainage plan provided by J.L. Richards below in **Figure 1**, it has been understood that area 3 was included in previous sanitary design flow projections. All other areas (Area 1, 2, 4 and 5), have been assumed to be new areas which will contribute additional flow to that already accounted for in previous iterations of the sanitary design sheets.

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area



AREA 1 (Drummond)	STANDARD	AREA (ha)	POPULATION
Commerical & Employment (100%)	50,000 L/ha/day	20.26	--
TOTAL		20.26	

AREA 2 (Brazeau)	STANDARD	AREA (ha)	POPULATION
Commerical & Employment (100%)	50,000 L/ha/day	24.76	--
TOTAL		24.76	

AREA 3 (Mattamy)	STANDARD	AREA (ha)	POPULATION
Residential (53%)	350 L/cap/day	2.98	304
Roads (26.1%)	--	1.47	--
ICI & Parks (12.5%)	50,000 L/ha/day	0.70	--
Ponds, Corridor, & Natural Features (8.4%)	--	0.47	--
TOTAL		5.63	

AREA 4 (Minto)	STANDARD	AREA (ha)	POPULATION
Residential (53%)	350 L/cap/day	34.74	3538
Roads (26.1%)	--	17.11	--
ICI & Parks (12.5%)	50,000 L/ha/day	8.19	--
Ponds, Corridor, & Natural Features (8.4%)	--	5.51	--
TOTAL		65.55	

AREA 5 (Mattamy)	STANDARD	AREA (ha)	POPULATION
Residential (53%)	350 L/cap/day	2.34	239
Roads (26.1%)	--	1.15	--
ICI & Parks (12.5%)	50,000 L/ha/day	0.55	--
Ponds, Corridor, & Natural Features (8.4%)	--	0.37	--
TOTAL		4.41	

Figure 1: Preliminary Sanitary Drainage Plan for the Barrhaven South Urban Expansion Area

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

SANITARY ANALYSIS

An analysis was completed to determine the preferred sanitary servicing alternatives for the updated urban expansion areas. These areas will generate additional flow that must be conveyed by the existing sanitary trunk sewers.

METHODOLOGY

The sanitary servicing analysis was completed using previous iterations of Stantec's sanitary sewer design sheets for the Barrhaven South Study Area as part of revisions to the Master Servicing Study (MSS). These sheets included estimations of flow generation for all approved development areas proposed to discharge to the Barrhaven South Trunk Sanitary Sewers. As-built sanitary sewer information was used in these sheets where available, to ensure the analysis would represent current conditions.

The analysis required use of the sanitary sewer design sheet for the Barrhaven South Master Servicing Study (MSS) last updated by Stantec on July 29th 2016, as well as the sanitary sewer design sheet for the Half Moon Bay South Subdivision last updated by Stantec on September 24th 2014.

The Half Moon Bay South Subdivision design sheet included area 3 as part of its original drainage area, and thus this area is not included as a separate line in the above mentioned sewer design sheets. No analysis to confirm the serviceability elevations within the development sites was completed.

FLOW GENERATION

The Preliminary Sanitary Drainage Plan, completed by J.L. Richards August 24th 2016, was used to determine the flow generation anticipated from each proposed development area. This plan separated each proposed development area into the following four landuse categories:

- Residential
- Roads
- ICI & Parks
- Ponds, Corridors, and Natural Features

Dry Weather Flow (DWF)

A flow generation of 50,000 L/ha/day was proposed for the ICI & Park areas per JLR's Preliminary Sanitary Design Plan. An approximate population projection was provided in this plan for all residential areas with an estimated flow generation of 350 L/cap/day.

The rates, populations, and areas prescribed by JLR were used in updating Stantec's sanitary sewer design sheets. It was assumed, per the provided information from JLR, that all area identified as belonging to the ICI & Parks land use designation would generate 50,000 L/ha/day. Harmons peaking factor was used for residential areas, with an acceptable value range between 2 and 4. A peak factor of 2.4 was used for industrial type land uses and a peak factor of 1.5 was used for commercial and institutional areas.

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

Wet Weather Flow (WWF)

All roadway area and pond, corridor and natural feature area was used in the approximation of inflow and infiltration, per the previous iterations of the sanitary design using a rate of 0.28L/s/ha. **Table 1** below provides a summary of the flow anticipated to be produced from each sanitary drainage area.

Table 1: Anticipated Flow Generation from Proposed Urban Expansion Areas

Drainage Area	Drainage Area Developer	Flow Generated (L/s)					Infiltration and Inflow (L/s)	Total WWF (L/s)
		Res.	ICI	Peak Res.	Peak ICI	Total DWF		
1	Drummond	0	11.7	0	17.6	17.6	5.7	23.3
2	Brazeau	0	14.4	0	21.5	21.5	6.9	28.4
3	Mattamy	1.2	0.4	4.9	0.6	5.5	1.5	7.0
4	Minto	14.3	4.7	48.4	7.1	55.8	16.8	72.3
5	Mattamy	1.0	0.32	3.9	0.5	4.4	1.1	5.5

SERVICING ALTERNATIVES

The Preliminary Sanitary Drainage Plan provided by JLR included preferred connection points into existing infrastructure for each of the proposed development areas. **Table 2** below summarizes these proposed connection locations, while **Figure 2** provides mapping of these. **Figure 2** also includes locations of other potential connection points and manholes for reference.

Table 2: Proposed Connection Points for Urban Expansion Areas into Existing Sanitary Infrastructure

Drainage Area	Drainage Area Developer	Proposed Connection Location	Proposed Connection Manhole
1	Drummond	Future Collector Road	MA11
2	Brazeau	Re-aligned Greenbank Road & Dundonald Drive	MA14
3	Mattamy	Des Soldats Reindeau Street & Street B (future)	SAN 217
4	Minto	Greenbank Road	205A
5	Mattamy	Re-aligned Greenbank Road & Dundonald Drive	MA14

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

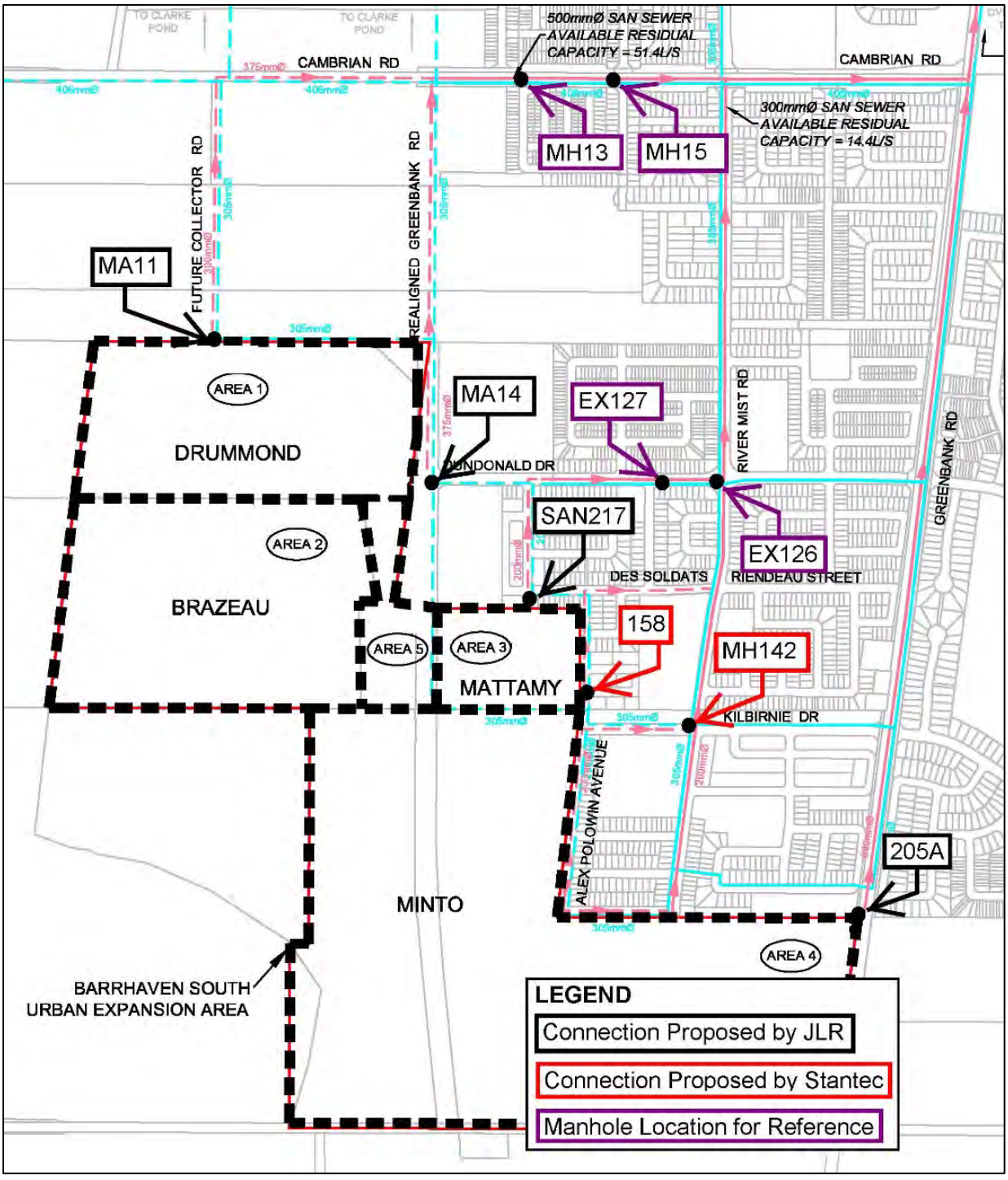


Figure 2: Proposed Connection Points for Connections into Existing Sanitary Infrastructure

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

ASSESSMENT RESULTS

Catchment allocations per JLR's preliminary sanitary drainage plan were analyzed as a primary solution to servicing the Barrhaven South Urban Expansion Area. Where potential capacity limitations were identified, alternatives have been developed by Stantec. The sanitary sewer design sheets and corresponding sewer shed area diagrams that confirm the conclusions below are provided as attachments to this memo. Additional site development information including grading, road layouts and phasing will provide a means of determining a preferred alternative. No hydraulic grade line analysis has been completed as part of this exercise. It is recommended that this be completed where increasing the flow in an existing sewer has been recommended. A figure providing a summary of the servicing alternatives is provided in **Figure 3** below:

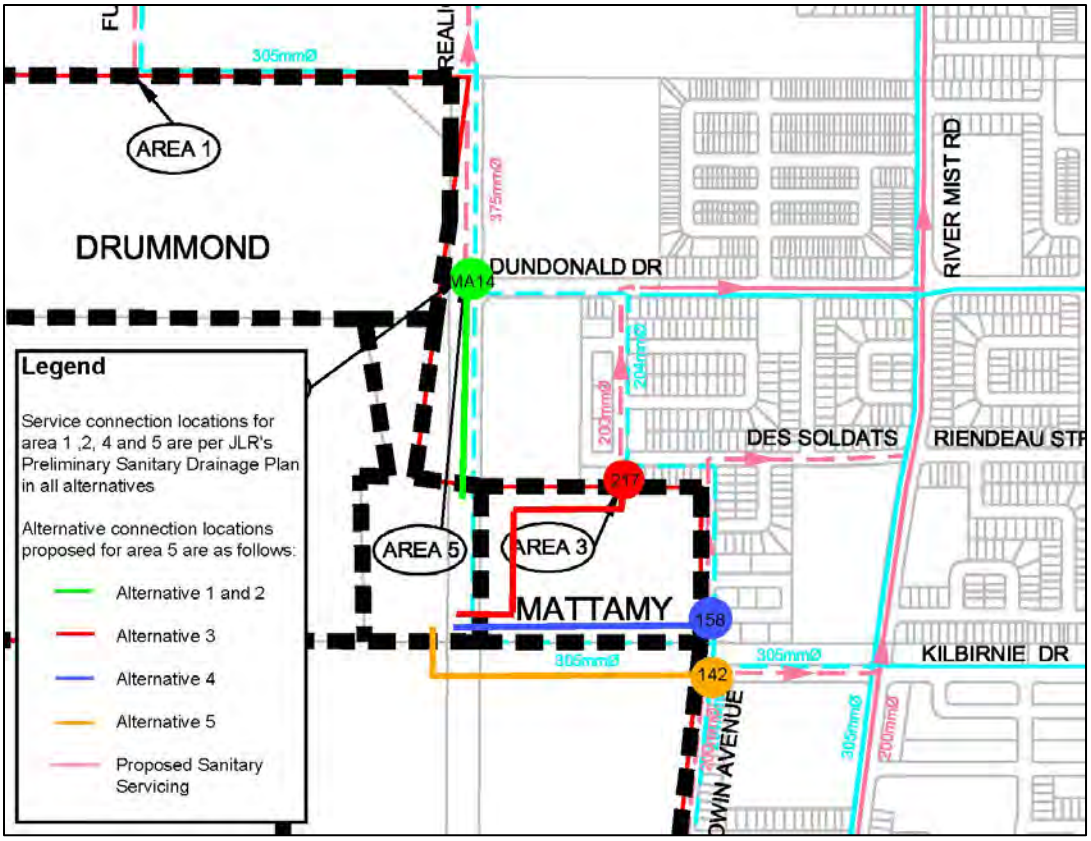


Figure 3: Sanitary Servicing Alternatives

Alternative 1

The proposed allocations provided by JLR were adopted and applied to the Barrhaven South MSS sanitary sewer design sheet. Per this plan, area 4 was allocated to manhole 205A along the Greenbank Road trunk sewer. The Greenbank Road sewer was found to have sufficient residual capacity to accommodate the additional flow from area 4. Area 3 was allocated to sanitary manhole 217, which is a part of the Half Moon Bay South development. Area 3 was accounted for in previous

iterations of the sanitary sewer design sheets for the Half Moon Bay South development and the receiving sewers were found to have adequate residual capacity to accommodate area 3.

Area 1 was proposed by JLR to be allocated to manhole MA11, located at the end of a future collector road, south of Cambrian Road (see **Figure 2**). Area 2 and area 5 were proposed to be allocated to MA14 located at the intersection of Realigned Greenbank Road and Dundonald Drive. The increase in flow allocated to sewer MH13A-MH15A on Cambrian Road from development area 1, 2 and 5 resulted in this existing sewer segment exceeding its capacity by approximately 3%.

A hydraulic grade line (HGL) analysis could be completed to determine if the proposed flow and 3% capacity constraint would result in HGL concerns. The sensitivity of this result could be assessed as the use of design ICI generation rate of 50,000L/ha/d is conservative. A review of the contributing area could also be completed. Sewer flow monitoring could be completed to confirm existing flows and available residual capacity as well.

Alternative 2

An analysis with reduced estimations for flow generation was also considered by Stantec. In alternative 1, the capacity of sewer MH13A-MH15A was exceeded by approximately 4.9 L/s. To maintain flows within the capacity of sewer MH13A-MH15A, while keeping the development area manhole allocations presented by JLR, flow from the development areas would need to be reduced. This reduction could be achieved by decreasing the assumed flow generation rate or by decreasing the sewer shed area proposed to discharge to this sewer. This alternative focuses on the percentage of development area that would need to be removed to meet this flow reduction. Sewer MH13A-MH15A was found to have adequate residual capacity (within 0.25%) for areas 1, 2 and 5, when the development in areas 1 and 2 was limited to 90% of the total developable area.

Alternative 3

It was determined sewer MH13A-MH15A would operate at 100% of its capacity (within 0.25%) if flow from area 5 was reallocated to a different sewer. Stantec opted to examine the alternative of area 5 discharging through area 3, connecting to existing infrastructure at Des Soldats Reindeau Street and future Street B (manhole SAN 217) as part of the Half Moon Bay South subdivision. This alternative proposes area 5 discharge to the River Mist Street trunk sewer through Dundonald Drive. This servicing method was determined not to be feasible as the capacity of constructed sewer EX127-EX126 on Dundonald Drive was exceeded by approximately 16% when the additional flow was added. All other drainage area allocations and characteristics were maintained per alternative 1.

Alternative 4

Alternative 4 proposes the removal of Area 5 from sewer MH13A-MH15A such that the sewer will operate at 100% of its capacity (within 0.25%). Stantec has proposed Area 5 discharge through area 3, and connect to existing infrastructure at Buffalograss Crescent and Aex Polowin Avenue (manhole 158) as part of the Half Moon Bay South development. This alternative proposes area 5 discharge into the River Mist Street trunk sewer through Des Soldats Reindeau Street. All other sewer shed area allocations and characteristics were maintained per alternative 1.

Alternative 4 was found to be serviceable in terms of sewer capacity, however this alternative requires connection into constructed local sewers. It is expected these constructed sewers will have higher invert elevations then what would be required to service area 5 with gravity. There is an area of elevated groundwater within area 3 that necessitated sewers in that area be raised. The requirement for pumping to service area 5 is anticipated, but facility requirements will be dependent on the final grading and road layout selected within the area 5 site. This alternative also requires the sewer to cross realigned Greenbank Road.

Alternative 5

Alternative 5 also proposes the removal of Area 5 from MH13A-MH15A such that the sewer will operate at 100% of its capacity (within 0.25%). In this alternative Stantec has proposed sewers conveying flow from Area 5 connect at River Mist Road and Kilbirnie Drive (manhole MH142) and discharge into the River Mist Road Trunk. All other drainage area allocations and characteristics were maintained per alternative 1.

Adequate capacity exists in the River Mist Road trunk sewer to accommodate flow from area 5. A preliminary sanitary drainage plan for the Kilbirnie sewer area was completed by JLR, including a sanitary design sheet which is provided as an attachment to this memo. The sewer on Kilbirnie Drive is shown to be operating at approximately 20% of its capacity with approximately 13 L/s of residual capacity. Area 5 is anticipated to generate approximately 5.5 L/s of flow. The allocation of flow from Area 5 to the Kilbirnie Drive sewer would need to be confirmed by JLR to ensure this works per their design. It is likely that an area with elevated groundwater in area 4 will necessitate higher sewer elevations. Given the topography and proposed grading of these sites it is anticipated that pumping would be required to service area 5 in this alternative as well.

This alternative requires that area to be developed by Mattamy discharge through area to be developed by Minto. Elements such as phasing and cost-sharing would need to be discussed between the two developers.

SUMMARY

The sanitary servicing analysis showed the preferred servicing as provided by JLR to result in the existing sewer MH13A-MH15A on Cambrian Road exceeding capacity due to the allocation of Areas 1, 2 and 5. The additional flow generated by Area 3 and Area 4 do not result in any sewers exceeded capacity.

The design ICI flow generation rates and attributed contributing areas proposed for development areas 1 and 2 are considered conservative. Flow monitoring may show additional residual capacity to exist in sewer MH13A-MH15A such that Areas 1, 2 and 5 are serviceable with sewer MH13A-MH15A. A hydraulic grade line analysis also may show the slight exceedance above sewer capacity in segment MH13A-MH15A to be negligible. Alternatively, if Area 1 and Area 2 are restricted to produce a maximum flow of 169L/s, which is a reduction of 4.9L/s from what was proposed by JLR, the capacity of sewer MH13A-MH15A will not be exceeded. This is anticipated to be equivalent to developing approximately 90% of the land in areas 1 and 2.

The removal of Area 5 from sewer MH13A-MH15A also results in this sewer operating within its capacity (within 0.25%). Two alternative service connection points were found to be feasible in the servicing of

area 5: alternative 4 at manhole 158 and alternative 5 at MH142. These alternatives propose the connection of Area 5 into the River Mist Road trunk sewer. Alternative 4 requires Area 5 to discharge through constructed internal sanitary sewers. Given the proposed elevations of these sewers, and topography of the area 5 site, it is anticipated pumping of flow generated from area 5 will be required. Alternative 5 requires Area 5 to be serviced through Area 4, which is proposed to be developed by a separate developer. Communication between the two developers will therefore be critical. Pumping of flow generated from area 5 is also anticipated in this alternative, given the proposed elevations of these sewers, and topography of the area 5 site.

POTABLE WATER ANALYSIS

A hydraulic analysis for the potable water portion of the study area was performed to determine whether the previously proposed watermain alignment and sizing would be sufficient in providing the level of service. This analysis herein mainly focuses on urban expansion area.

LEVEL OF SERVICE

Based on the City of Ottawa Water Design Guidelines, the desired range of pressure under basic day (BSDY), maximum day (MXDY) and peak hour (PKHR) demands is 50 to 70 psi and no *less than 40 psi* at ground elevation (i.e. at hydrant level). Furthermore, the maximum pressure at any point in the water distribution should not exceed 100 psi and as such, pressure reducing measures are required to service areas where pressures *greater than 80 psi*.

Under fire flow conditions, the system must be able to supply the MXDY demands and the appropriate fire flow while maintaining a residual pressure of 138kPa (20 psi). A fire flow of 13,000 L/min is used for this analysis following the recommendations presented in the 2013 Water Master Plan (WMP) for system level analysis in the core area.

PROPOSED BACKBONE PIPING

The proposed backbone piping of the Barrhaven South Study Area is shown in **Figure 4**. Changes to the pipe layout since the last issued Barrhaven MSS (Stantec, 2014) include the following:

- The proposed 610mm diameter watermain crossing the river is to extend further west before splitting into two 406mm diameter watermains;
- The 406mm diameter watermain following the 610 river crossing that extends east and along Greenbank Road is to be realigned.

Estimated water demands for the urban expansion area were distributed in model nodes along the backbone watermains feeding into the area as shown in **Figure 4**.

GROUND ELEVATIONS

The topography of the urban expansion area is shown in **Figure 5**. Modeling shows that the HGL in the urban expansion area can reach a minimum of 136m due to headlosses across the distribution system from the South Urban Community (SUC) pump stations. Therefore, areas with a ground elevation greater than 108m can experience pressures below 40 psi at this minimum HGL.

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

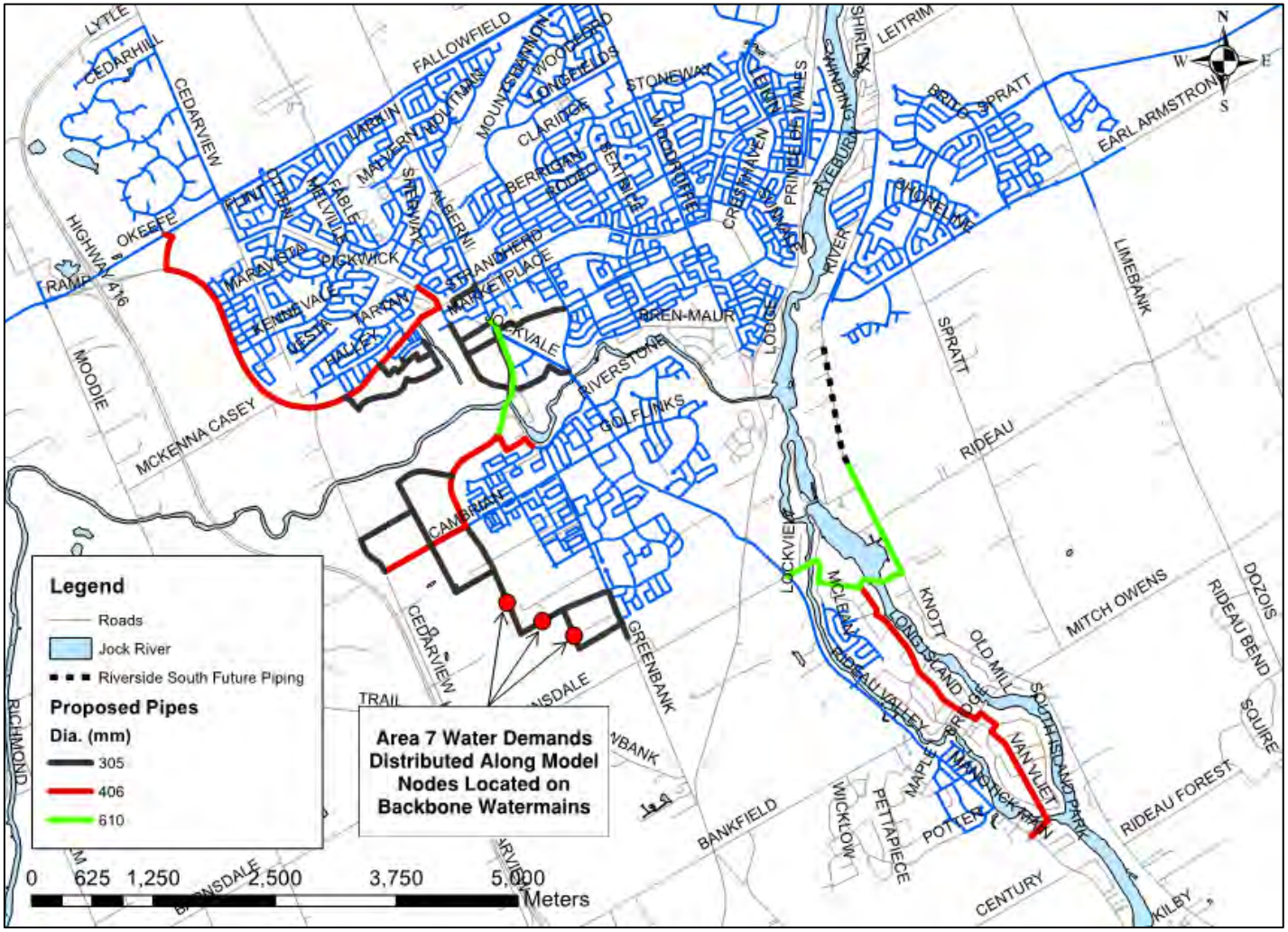


Figure 4: Updated Proposed Backbone Piping

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

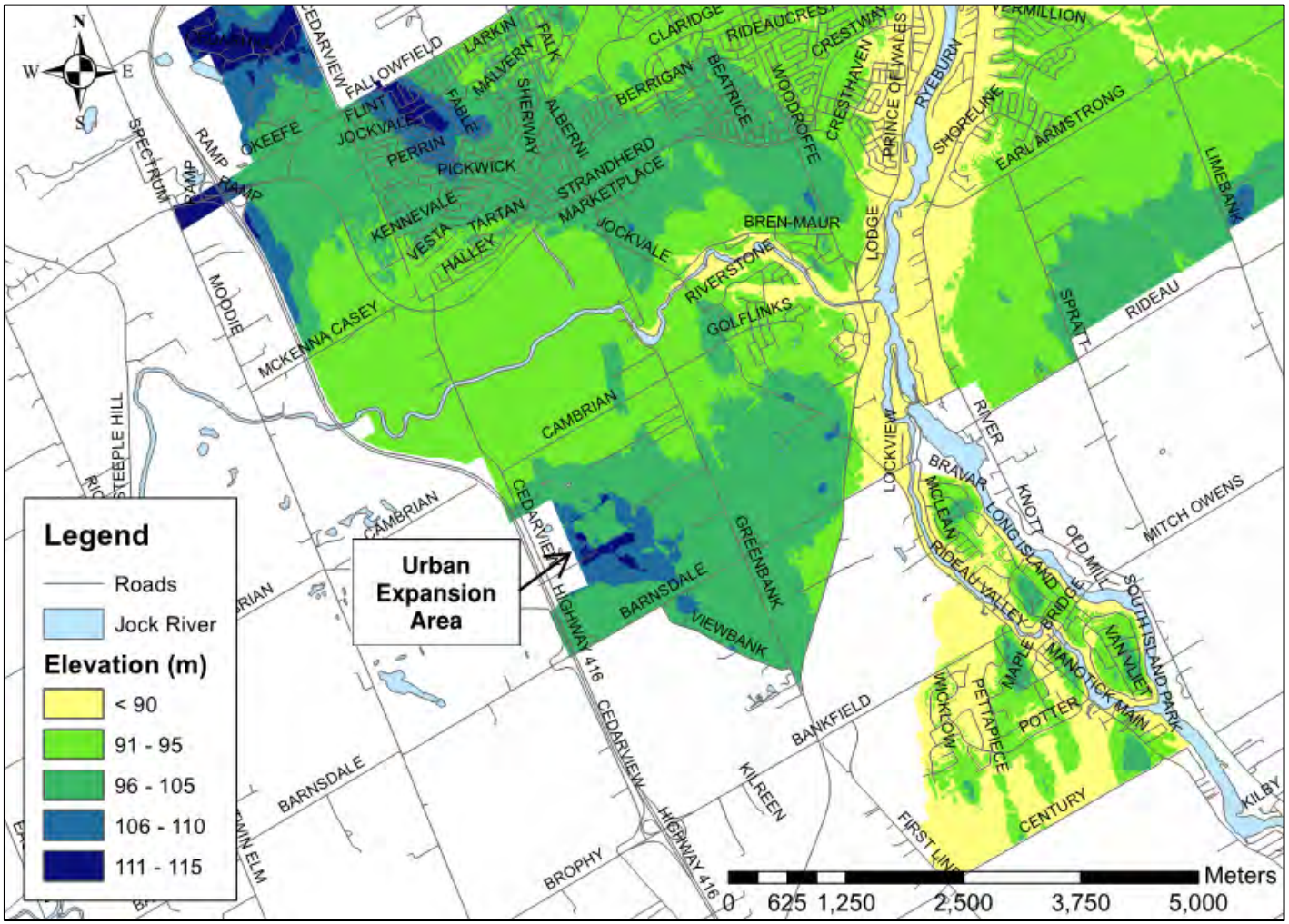


Figure 5: Topography Map (in meters)

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

MODEL SET-UP

2013 WMP Criteria

Following the 2013 WMP, the zone/system level criteria for water demands are used for population that exceeds 3,000 persons. Zone level demands are generally used to assess larger service areas and are not generally used to size smaller internal piping.

For residential land-uses, single family and semi-detached homes were considered to have similar demand patterns, and categorized under "single family home" or SFH. Similarly, all free-hold townhomes and stacked townhomes were categorized under "multi-level townhomes" or MLT. All apartments were categorized under APT. Lastly, for any land-use that had a designated number of jobs (mixed-use, retail, and employment land-uses), an employment (EMP) water demand was applied. **Table 3** shows the consumption rate for each unit type used to calculate BSDY demands.

Table 3: Consumption Rate Based on Unit Types

Consumption Rate (L/cap/d)			L/SHF/d
SFH	MLT	EMP	OWD
180	198	137	1049

MXDY demands were estimated by calculating an outdoor water demand (OWD) which uses a consumption rate of 1,049 L/SFH/d for all SFH units in the development and added to the BSDY demands. PKHR demands were determined by applying the City developed diurnal patterns to the maximum day demands. The diurnal patterns are different for each unit type and all vary with time. The overall maximum observed demand when patterns are applied is the PKHR demand.

Updated Water Demands

Based on the estimated population and land use of the urban expansion area provided by J.L. Richards, the water demands were calculated. The persons per unit (PPU) densities used were in accordance to the City of Ottawa's Water Design Guidelines (July, 2010).

It was assumed that the residential lands will be comprised of 50% single family homes and 50% town homes. The PPU densities for single family homes and town homes are 3.4 and 2.7, respectively. Residential demands were calculated using the consumptions rates shown in **Table 3** and presented in **Table 4.**

Table 4: Estimated Residential Demands

Land	Population	SFH	MLT	SFH Units	MLT Units	SFH (L/s)	MLT (L/s)	OWD (L/s)
Mattamy	304	50%	50%	45	56	0.32	0.35	0.54
Minto	3538	50%	50%	520	655	3.69	4.05	6.32
Mattamy	239	50%	50%	35	44	0.25	0.27	0.43

Since information on employment numbers was limited, a consumption rate of 50,000 L/ha/d was used as per the City of Ottawa's Water Design Guidelines (July, 2010) to calculate the commercial water demands. **Table 5** shows the calculated demands for the Drummond and Brazeau lands. It can be see that the water consumption will predominately be commercial use.

Table 5: Estimated Commercial Demands

Land	Area (ha)	Consumption Rate (L/ha/d)	Demand (L/s)
Drummond	20.26	50,000	11.72
Brazeau	24.76	50,000	14.33

Table 6 shows the updated BSDY and MXDY demands for Barrhaven South including the addition of Area 7. The Barrhaven South demand represents 2031 conditions and build-out.

Table 6: Updated BSDY and MXDY Demands Barrhaven South

	BSDY (MLD)	MXDY (MLD)
Barrhaven South (2014 MSS)	16.3	33.2
Area 7	3.0	3.7
Total	***19.3***	***36.9***

HYDRAULIC ANALYSIS

Stantec used the previous Barrhaven MSS hydraulic model and revised it based on the additional water demands of the urban expansion area and the updated watermain sizing and alignment. The hydraulic model was performed under 2031 demand conditions to verify how the proposed network would respond with the complete build-out of the revised configuration.

Since the urban expansion area will be serviced by Zone 3C pressure, only 3C model nodes in the Barrhaven South area is examined during this hydraulic analysis.

Basic Day & Peak Hour Conditions

Similar to the hydraulic modeling results in the previous Barrhaven MSS (Stantec, 2014) some low lying lands with elevations less than 90m will experience pressures above the objective limit of 80 psi and will require pressure reducing measures. **Figure 6** presents the maximum pressure range. Modeling shows maximum pressures ranging between 55 psi and 88 psi during basic day conditions.

During peak hour demands, modeling shows minimum pressures ranging between 40 psi and 73 psi. As shown in **Figure 7**, the model nodes on the backbone watermains that are to feed into the urban expansion area can experience pressures in the range of 40 - 50 psi during peak hours.

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

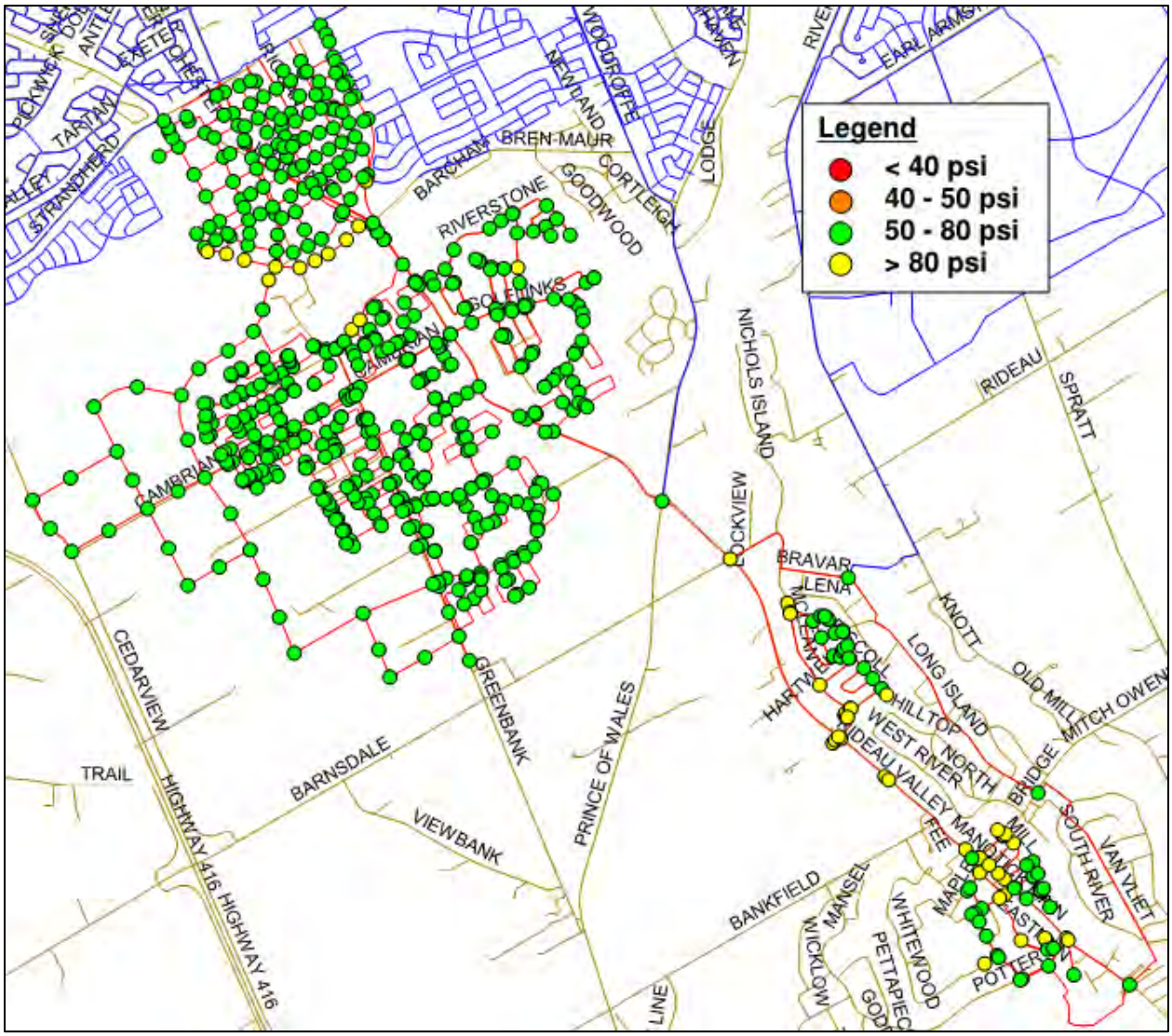


Figure 6: Maximum Pressures during BSDY Conditions

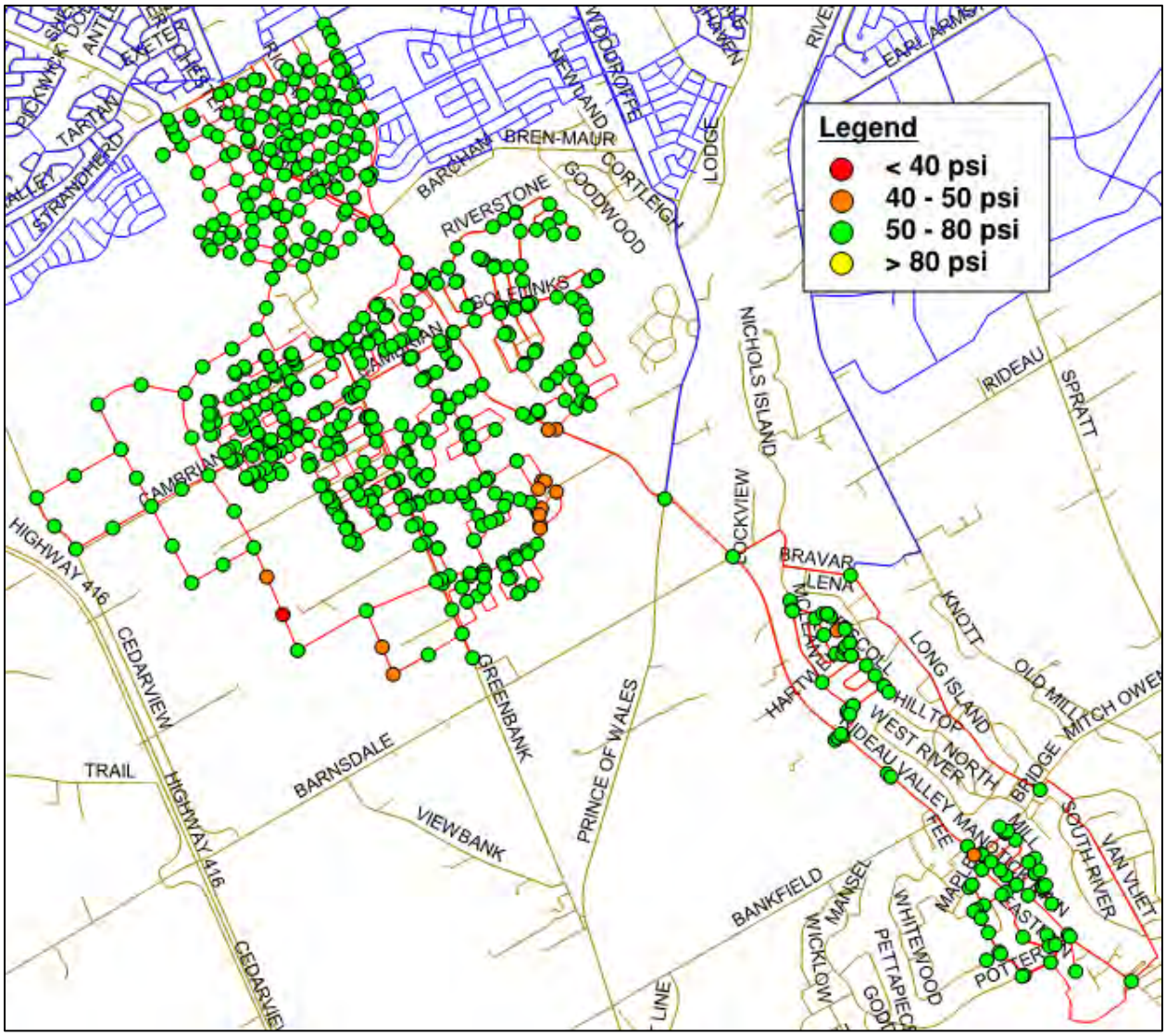


Figure 7: Minimum Pressures during PKHR Conditions

Maximum Day + Fire Flow

The purpose of such an analysis is to ensure the distribution system is able to provide the appropriate fire flow under MXDY demand conditions. The minimum allowable pressure under emergency fire flow conditions is 20 psi.

Figure 8 shows the available flow in study area. It is observed that available flows along the proposed backbone watermains are anticipated to be greater than 13,000 L/min. It is noted that there are existing areas with lower available flows present in Barrhaven South.

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

Upon the subdivision approval phase, local watermains are checked for their ability to provide the objective Fire Underwriter Survey (FUS) fire flows and they are typical less than 10,000 L/min for town home rows or single family units.

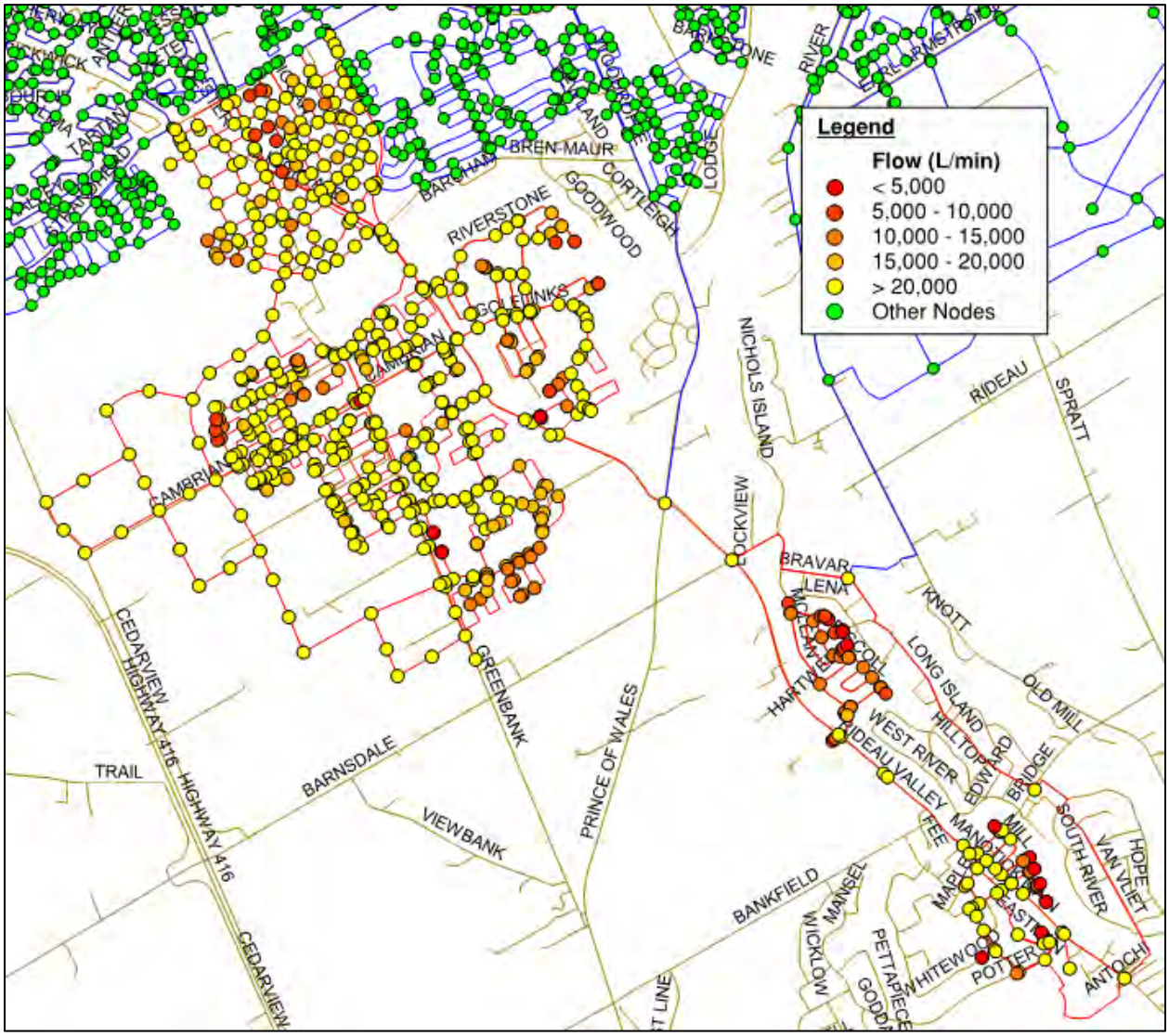


Figure 8: Available Flow in 3C Portion of Barrhaven South

Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

SUMMARY

Hydraulic modeling was performed to examine whether the proposed backbone alignment and sizing is capable of supporting the additional demands of Area 7. Modeling showed some low laying lands experiencing pressures greater than 80 psi as noted in the previous Barrhaven MSS (Stantec, 2014). These areas will require pressure reducing measures to operate within the City's objective.

During peak demand conditions, modeling showed that nodes along the backbone watermains which are to feed into the urban expansion area can experience minimum pressures in the range of 40 - 50 psi. Additional headlosses through internal piping may result in pressures below 40 psi during peak demands. This should be noted and confirmed upon detailed design.

In regards to the available fire flows in the 3C portion of Barrhaven South, flows greater than 13,000 L/min were observed in proposed backbone watermains. FUS fire flows will need to be determined and confirmed upon detailed design.

Should you have any questions, please do not hesitate to contact the undersigned.

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Reference: Barrhaven MSS Addendum - Revised Potable Water and Sanitary Servicing Analysis for the Barrhaven South Urban Expansion Area

Attachments:

1. Barrhaven South MSS Sanitary Sewer Design Sheet and Catchment Diagram (revised July 29, 2016)
2. Half Moon Bay South Subdivision Sanitary Sewer Design Sheet and Catchment Diagram Draft Plan #3 (revised September 24, 2014)
3. Barrhaven South MSS Sanitary Sewer Design Sheet – Alternative 1 (per JLR) (revised September 19, 2016)
4. Barrhaven South MSS Sanitary Sewer Design Sheet – Alternative 2 (revised September 19, 2016)
5. Half Moon Bay South Sanitary Sewer Design Sheet – Alternative 3 (revised September 19, 2016)
6. Half Moon Bay South Sanitary Sewer Design Sheet – Alternative 4 (revised September 19, 2016)
7. Barrhaven South MSS Sanitary Sewer Design Sheet – Alternative 5 (revised September 19, 2016)
8. Kilbirnie Drive Sanitary Sewer Design Sheet and Catchment Diagram – JLR (revised June 2015)

1 - Barrhaven South MSS Sanitary Sewer Design Sheet and Catchment Diagram (revised July 29th 2016)

Area: **BARRHAVEN SOUTH MASTER SERVICING STUDY**

DATE: 7/29/2016
REVISION: 2
DESIGNED BY: LP
CHECKED BY: /

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 163400999

Colour code:
- HMB values
- Hard coded values
- Most US MH
- Caculated value
- Estimated value
- updated value
- Value from subdivision design
- MH receiving flow from 2 or more sewers

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 L/p/day	MINIMUM VELOCITY	0.60 m/s	As per CDP (units/ha)	
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 L/ha/day	MAXIMUM VELOCITY	3.00 m/s	LOW DENSITY RESIDENTIAL	26
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 L/ha/day	MANNINGS n	0.013	SEMI-DETACHED	52
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 L/ha/day	BEDDING CLASS	B	TOWN HOUSES	82
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 L/ha/day	MINIMUM COVER	2.50 m	APARTMENTS	120
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 L/s/ha			COMMUNITY CORE	60
PERSONS / APARTMENT	1.8					AVERAGE PERSONS/ha	107

LOCATION				RESIDENTIAL AREA AND POPULATION										COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	Source	FROM M.H.	TO M.H.	DEV AREA (ha)	DEV POP	ADD'N RES AREA (ha)	ADD'N POP	TOTAL AREA (ha)	TOTAL POP	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	SLOPE (%)	CAP. (FULL) (L/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
MSS-A-23		MA11	MA10	0.00	0	14.2	1,523	14.2	1,523	14.20	1,523	3.67	22.6	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	2.5	2.5	2	19.5	19.5	5.5	30.1	482.1	300	PVC	0.75	87.6	34%	1.20	1.08
MSS-A-22		MA10	MH57A	0.00	0	12.8	1,371	12.8	1,371	27.00	2,894	3.46	40.6	0.0	0.0	0.0	0.0	0.0	0.0	7.2	10.0	14.5	17.0	8.7	34.5	54.0	15.1	64.4	449.7	375	PVC	0.40	115.1	56%	1.01	1.04
Realigned Greenbank Road																																				
MSS-A-21		MA14	MA13	0.0	0	4.8	513	4.8	513	4.8	513	3.97	8.3	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5	0.0	0.0	6.5	12.3	12.3	3.4	18.2	295.0	250	PVC	1.30	71.4	25%	1.40	1.12
N-4		MA13	MH57A	0.0	0	11.0	1,176	11.0	1,176	15.8	1,689	3.64	24.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.5	0.5	6.5	11.5	23.8	6.7	38.1	413.1	375	PVC	0.30	100.3	38%	0.88	0.81
Cambrian Road																																				
N-5		MH57A	MH13A	0.0	0	4.3	458	4.3	458	47.1	5,041	3.24	66.2	3.4	3.4	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	18.1	7.7	85.5	23.9	108.2	216.5	500	CPP	0.25	188.2	57%	0.96	0.99
N-2		MH13A	MH15A	6.2	631	0.0	3	6.2	634	53.3	5,675	3.19	73.3	0.0	3.4	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	18.1	6.2	91.7	25.7	117.1	165.2	500	CPP	0.20	168.6	69%	0.86	0.93
N-6		MH15A	MH17A	5.6	868	0.0	2	5.6	870	58.9	6,545	3.13	83.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	18.1	5.6	97.3	27.2	128.3	202.0	600	CPP	0.13	230.7	56%	0.79	0.81
River Mist Road																																				
MSS-A-18	Stantec	MH163	162	6.5	543	0.0	0	6.5	543	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	0.9	0.9	2.4	10.2	10.2	2.9	14.0	36.3	200	PVC	1.15	35.8	39%	1.12	1.04
	Stantec	162	161	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	87.2	250	PVC	1.15	67.3	21%	1.32	1.00
	Stantec	161	EX151	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	75.6	250	PVC	1.15	67.3	21%	1.32	1.00
	Stantec	EX151	MH142	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	44.4	300	PVC	1.40	119.0	12%	1.63	1.08
N-14	Stantec	MH142	EX139	8.2	825	1.0	102	9.2	927	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	9.2	19.4	5.4	29.8	74.8	300	PVC	0.40	63.5	47%	0.87	0.85
	Stantec	EX139	EX136	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	64.7	300	PVC	0.40	63.5	47%	0.87	0.85
	Stantec	EX136	MH126	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	78.9	300	PVC	0.41	64.2	46%	0.88	0.86
N-15	Stantec	MH126	EX123	16.5	954	0.0	0	16.5	954	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.9	0.0	0.9	4.3	18.6	38.0	10.6	49.5	71.3	375	PVC	0.45	122.0	41%	1.07	1.01
	Stantec	EX123	MH112	0.0	0	0.0	0	0.0	0	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	38.0	10.6	49.5	90.3	375	PVC	0.42	118.6	42%	1.04	0.99
N-16	Stantec	MH112	EX102	8.3	689	0.0	0	8.3	689	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	8.3	46.3	13.0	60.6	68.0	375	PVC	0.31	101.5	60%	0.89	0.93
	Stantec	EX102	EX101	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	34.0	375	PVC	0.29	98.0	62%	0.86	0.91
	IBI	EX101	MH43A	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	38.0	375	PVC	0.30	100.3	60%	0.88	0.92
N-12	IBI	MH43A	MH44A	6.6	352	0.0	0	6.6	352	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	6.6	52.9	14.8	66.7	81.0	375	PVC	0.30	100.3	67%	0.88	0.95
	IBI	MH44A	MH45A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	64.0	375	PVC	0.30	100.3	67%	0.88	0.95
	IBI	MH45A	MH46A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	85.0	375	PVC	0.30	100.3	67%	0.88	0.95
N-10	IBI	MH46A	MH47A	8.4	562	0.0	0	8.4	562	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	1.6	2.5	4.3	10.0	62.9	17.6	76.2	41.0	375	PVC	0.30	100.3	76%	0.88	0.98
	DSEL	MH47A	MH101A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	100.3	76%	0.88	0.98
	DSEL	MH101A	MH102A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	100.3	76%	0.88	0.98
N-7	DSEL	MH102A	MH17A	4.0	291	1.2	129	5.2	420	60.7	4,447	3.29	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	5.2	68.1	19.1	82.7	81.0	375	PVC	0.30	100.3	82%	0.88	0.99
Cambrian Road																																				
N-3		MH17A	MH21A	26.0	1,956	0.0	0	26.0	1,956	145.6	12,948	2.84	149.0	0.0	3.4	0.0	0.0	0.0	0.0	3.0	25.4	5.1	25.1	25.0	34.1	199.5	55.9	229.9	204.3	750	CPP	0.13	419.5	55%	0.92	0.94
N-8		MH21A	MH45	7.0	408	0.0	0	7.0	408	152.6	13,356	2.83	153.1	0.0	3.4	0.0	0.0	0.0	0.0	0.0	25.4	2.9	28.0	25.0	9.9	209.4	58.6	236.7	277.8	750	CPP	0.13	419.5	56%	0.92	0.95
Greenbank Road																																				
MSS-A-14	IBI	MH205A	MH98A	0.0	0	21.0	2,246	21.0	2,246	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	21.0	5.9	38.2	126.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH98A	MH99A	0.0	0	0.0	0	0.0	0	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	5.9	38.2	125.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH99A	MH100A	0.0	0	0.0	0	0.0	0	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	5.9	38.2	108.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH100A	MH204A	0.0	0	0.0	0	0.0	0	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	5.9	38.2	105.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH204A	MH206A	0.0	0	0.0	0	0.0	0	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	5.9	38.2	103.0	600	CPP	0.25	321.2	12%	1.10	0.73
	IBI	MH206A	MH97A	0.0	0	0.0	0	0.0	0	21.0	2,246	3.55	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	5.9	38.2	125.0	600	CPP	0.25	321.2	12%	1.10	0.73
N-13, N-13-R	IBI	MH97A	MH96A	19.9	1,625	0.1	6	20.0	1,631	41.0	3,877	3.35	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	20.8	41.8	11.7	64.3	98.0	600	CPP	0.30	350.4	18%	1.20	0.89
	IBI	MH96A	MH95A	0.0	0	0.0	0	0.0	0	41.0	3,877	3.35	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	0.0	41.8	11.7	64.3	129.0	600	CPP	0.30	350.4	18%	1.20	0.89
	IBI	MH95A	MH201A	0.0	0	0.0	0	0.0	0	41.0	3,877	3.35	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	0.0	41.8	11.7	64.3	123.0	600	CPP	0.30	350.4	18%	1.20	0.89
N-11, N-11-R	IBI	MH201A	MH201B	12.1	787	0.0	0	12.1	787	53.1	4,664	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	12.1	53.9	15.1	76.9	124.0	600	CPP	0.30	350.4	22%	1.20	0.94
	IBI	MH201B	MH200A	0.0	0	0.0	0	0.0	0	53.1	4,664	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	0.0	53.9	15.1	76.9	68.0	600	CPP	0.30	350.4	22%	1.20	0.94
	IBI	MH200A	MH200C	0.0	0	0.0	0	0.0	0	53.1	4,664	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	0.0	53.9	15.1	76.9	48.0	600	CPP	0.50	452.6	17%	1.55	1.12
	IBI	MH200C	MH45	0.0	0	0.0	0	0.0	0	53.1	4,664	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0	0.0	53.9	15.1	76.9	26.0	600	CPP	0.12	221.9	35%	0.76	0.68
MSS-A-15		MH45	MH435A	0.0	0	5.1	548	5.1	548	210.8	18,568	2.68	201.6	0.0	3.4	0.0	0.0	0.0	0.0	0.0	25.4	0.0	28.8	25.0	5.1	268.4	75.2	301.8	296.6	900	CPP	0.10	597.0	51%	0.91	0.91
North																																				
MSS-A-9		MA9	MA8	0.0	0	22.2	2,378	22.2	2,378	22.2	2,378	3.53	34.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	9.5	9.5	2.2	34.2	34.2	9.6	45.8	507.5	450	CPP	0.11	98.4	47%	0.60	0.59
MSS-A-8		MA8	MA7	0.0	0	2.9	308	2.9	308	25.1	2,686	3.48	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.8	10.3	2.2	3.7	37.9	10.6	50.7	317.1	450	CPP	0.11	98.4	52%	0.60	0.61
MSS-A-7		MA7	MA6	0.0	0	18.5	1,979	18.5	1,979	43.6	4,665	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	18.5	56.4	15.8	79.8	573.1	450	CPP	0.11	98.4	81%	0.60	0.67
MSS-A-6		MA6	MA5	0.0	0	21.7	2,320	21.7	2,320	65.3	6,985	3.11	88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	21.7	78.1	21.9	112.1	473.9	600	CPP	0.10	201.5	56%	0.69	0.71
MSS-A-5		MA5	M27A	0.0	0	9.5	1,020	9.5	1,020	74.8	8,005	3.05	98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	9.5	87.6	24.5	125.6	220.0	600	CPP	0.10	201.5	62%	0.69	0.73
MSS-A-4		M27A	MH5200A	0.0	0	8.1	863	8.1	863	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	8.1	95.7	26.8	137.1	501.5	600	CPP	0.15	248.2	55%	0.85	0.87
		MH5200A	MH520A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	46.0	600	CPP	0.08	181.0	76%	0.62	0.69
		MH520A	MH521A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	44.4	600	CPP	0.10	201.5	68%	0.69	0.75
N-1		MH521A	MH522A	3.3	177	0.5	54	3.8	231	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	3.8	99.5	27.9	140.7	50.1	600	CPP	0.09	192.7	73%	0.66	0.73
		MH522A	MH435A	0.0	0	0.0	0	0.0	0	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	99.5	27.9	140.7	10.8	600	CPP	0.21	292.0	48%	1.00	0.99
		MH435A	MH501A	0.0	0	0.0	0	0.0	0	297.5	27,667	2.51	281.3	0.0	3.4	0.0	0.0	0.0	0.0	0.0	27.9	0.0	39.1	27.2	0.0	367.9	103.0	411.5	13.3	900	CPP	0.11	623.2	66%	0.95	1.02

N

MA7
MSS-A-7
18.5 ha
MA7
MSS-A-8
3.7 ha
MA8
MSS-A-9
34.2 ha
MA9
MA9
MA8
MSS-A-22
34.5 ha
MA10
MA10
MSS-A-23
19.5 ha
MA11
MA11
MA13
MSS-A-21
12.2 ha
MA14
MA14
MSS-A-6
21.7 ha
MA6
MSS-A-5
9.5 ha
MA5
MA5
MA6
MA4
MSS-A-4
10.5 ha
MA4
MSS-EX
37.9 ha
MH501A
MSS-A-15
5.1 ha
MH45
MSS-A-18
10.2 ha
MH63
MSS-A-14
21.0 ha
MH205A

450mm @ 0.11%
450mm @ 0.11%
525mm @ 0.10%
375mm @ 0.40%
300mm @ 0.75%
250mm @ 1.30%
375mm @ 0.30%
375mm @ 0.30%
375mm @ 0.30%
600mm @ 0.30%
375mm @ 0.30%
600mm @ 0.13%
750mm @ 0.13%
600mm @ 0.25%
300mm @ 0.70%
375mm @ 0.25%
200mm @ 1.15%
600mm @ 0.25%

Cambrian Road
Realigned Greenbank Road
River Mist Road
Existing Greenbank Road

N-1
3.8 ha
MH521A
N-2
6.2 ha
MH13A
N-3
34.1 ha
MH17A
N-4
11.5 ha
MA13
N-5
7.7 ha
MH57A
N-6
5.6 ha
MH15A
N-7
5.2 ha
MH102A
N-8
9.9 ha
MH21A
N-10
10.0 ha
MH46A
N-11
12.1 ha
MH201A
N-11-R
1.4 ha
MH201A
N-12
6.6 ha
MH43A
N-13
20.8 ha
MH97A
N-13-R
2.3 ha
MH97A
N-14
9.2 ha
MH142
N-15
18.5 ha
MH126
N-16
8.3 ha
MH112

MH435A
MH501A
MH522A
MH521A
MH45A
MH13A
MH15A
MH17A
MH21A
MH102A
MH46A
MH201A
MH43A
MH112
MH126
MH142
MH163
MH97A
MH205A
MH57A

W:\active\1634_00999_Barrhaven_SUC_MSS_Update\planning\drawing\Sanitary\163400999-SAN-Figure3-5.mxd

Stantec

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Legend

- BARRHAVEN SOUTH COMMUNITY BOUNDARY
- EXISTING NODES
- PROPOSED NODES
- EXISTING SEWERS
- PROPOSED SEWERS
- EXISTING SEWERS (FROM 2007 MSS)
- RIVER
- 100 YEAR FLOOD PLAIN
- SANITARY CATCHMENTS
- Area Name / Area (ha) / Manhole — SANITARY CATCHMENT INFORMATION

Revision	By	Appd.	
1 ISSUED FOR MSS ADDENDUM	LP	AP	14.11.28

File Name: 163400999-SAN-Figure3-5.MXD	Dwn.	Chkd.	Dsgn.	
	LP	AP	LP	14.11.28

Permit-Seal

Client/Project
CITY OF OTTAWA

BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM
Ottawa, ON

Title
SANITARY SEWER SYSTEM

Project No. 163400999
Scale 0 35 70 140 210 280 Meters
Drawing No. FIG 3-5
Sheet 5 of 5
Revision 1

2 - Half Moon Bay South Subdivision Sanitary Sewer Design Sheet and Catchment Diagram Draft Plan #3 (revised September 24th 2014)

Stantec

SUBDIVISION: **HALF MOON BAY SOUTH SUBDIVISION - PHASE 4**

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX103A	EX103	EX102	0.80	18	0	0	61	0.80	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.2	120.0	200	PVC	SDR 35	2.02	47.5	**2.56%**	1.49	0.54
EX123AA	EX123A	EX123	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.06	2.06	0.00	0.00	1.8	2.06	2.06	0.6	2.4	15.8	250	PVC	SDR 35	0.89	57.1	**4.14%**	1.15	0.47
EX23AA	EX23A	EX23	0.67	15	0	0	51	0.67	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.0	105.0	200	PVC	SDR 35	0.37	20.4	**4.97%**	0.64	0.28
EX23A	EX23	EX126	0.40	6	0	0	20	1.06	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.40	1.06	0.3	1.5	89.3	200	PVC	SDR 35	1.47	40.5	**3.59%**	1.27	0.50
EX131A	EX131	EX130	0.80	19	0	0	65	0.80	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.3	112.3	200	PVC	SDR 35	1.00	33.4	**3.80%**	1.05	0.42
EX130B, EX130A	EX130	EX128	0.36	6	0	0	20	1.16	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.0	0.76	1.56	0.4	1.8	96.5	200	PVC	SDR 35	0.50	23.6	**7.68%**	0.74	0.37
SA202A	202	201	0.53	4	0	0	14	0.53	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.53	0.53	0.1	0.4	50.0	200	PVC	SDR 35	3.25	60.3	**0.61%**	1.90	0.46
SA213A	213	212	0.93	21	0	0	71	0.93	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.93	0.93	0.3	1.4	120.0	200	PVC	SDR 35	0.65	27.0	**5.26%**	0.85	0.37
SA212A	212	211	0.20	3	0	0	10	1.13	82	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	1.13	0.3	1.6	12.8	200	PVC	SDR 35	0.40	21.1	**7.75%**	0.67	0.33
SA211A	211	210	0.27	5	0	0	17	1.40	99	4.00	1.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	1.40	0.4	2.0	59.5	200	PVC	SDR 35	0.40	21.1	**9.41%**	0.67	0.35
SA210A	210	209	0.06	1	0	0	3	1.46	102	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.46	0.4	2.1	11.0	200	PVC	SDR 35	0.40	21.1	**9.75%**	0.67	0.35
SA209A	209	208	0.29	7	0	0	24	1.75	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.29	1.75	0.5	2.5	40.6	200	PVC	SDR 35	0.40	21.1	**11.95%**	0.67	0.37
SA208A	208	203	0.75	18	0	0	61	2.50	187	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.75	2.50	0.7	3.7	120.0	200	PVC	SDR 35	0.40	21.1	**17.63%**	0.67	0.42
SA207A	207	206	0.18	0	9	0	24	0.18	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.18	0.0	0.4	63.7	200	PVC	SDR 35	1.75	44.2	**1.00%**	1.39	0.37
SA206A	206	205	0.17	0	9	0	24	0.35	49	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.35	0.1	0.9	63.7	200	PVC	SDR 35	1.75	44.2	**2.00%**	1.39	0.46
SA205AA	205A	205	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	3.10	0.0	3.10	3.10	0.9	0.9	7.7	150	PVC	DR 28	1.00	15.3	**5.66%**	0.86	0.39
SA205A	205	204	0.04	0	1	0	3	0.40	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.04	3.50	1.0	1.8	11.0	200	PVC	SDR 35	1.50	41.0	**4.42%**	1.29	0.55
SA204A	204	203	0.14	0	4	0	11	0.54	62	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.14	3.64	1.0	2.0	36.5	200	PVC	SDR 35	1.50	41.0	**4.94%**	1.29	0.55
SA216A	216	215	0.19	0	5	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	45.2	200	PVC	SDR 35	0.65	27.0	**1.01%**	0.85	0.23
SA217A, External	217	215	2.72	61	0	0	207	2.72	207	4.00	3.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	2.72	2.72	0.8	4.1	34.5	200	PVC	SDR 35	2.00	47.3	**8.72%**	1.49	0.76
SA215A	215	214	0.34	0	15	0	41	3.25	261	4.00	4.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.34	3.25	0.9	5.1	72.0	200	PVC	SDR 35	2.00	47.3	**10.88%**	1.49	0.81
SA214A	214	203	0.35	0	15	0	41	3.60	302	4.00	4.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.35	3.60	1.0	5.9	73.5	200	PVC	SDR 35	2.00	47.3	**12.48%**	1.49	0.85
SA203A	203	201	0.12	0	0	0	0	6.75	551	3.95	8.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.12	9.85	2.8	11.6	73.7	200	PVC	SDR 35	0.40	21.1	**54.76%**	0.67	0.58
SA201A	201	EX129A	0.21	3	0	0	10	7.49	575	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.21	10.59	3.0	12.1	47.8	200	PVC	SDR 35	0.40	21.1	**57.43%**	0.67	0.59
EX129AA	EX129A	EX129	0.75	18	0	0	61	8.24	636	3.92	10.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.75	11.34	3.2	13.3	100.9	200	PVC	SDR 35	0.40	21.1	**62.76%**	0.67	0.61
EX129A	EX129	EX128	0.58	11	0	0	37	8.82	673	3.90	10.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.58	11.92	3.3	14.0	91.7	200	PVC	SDR 35	0.40	21.1	**66.15%**	0.67	0.62
EX128A	EX128	EX127	0.37	9	0	0	31	10.35	789	3.86	12.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.0	0.37	13.85	3.9	16.2	49.8	200	PVC	SDR 35	0.50	23.6	**68.64%**	0.74	0.70
EX127A	EX127	EX126	0.66	13	0	0	44	11.01	833	3.85	13.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.0	0.66	14.51	4.1	17.1	97.8	200	PVC	SDR 35	0.32	19.0	**89.70%**	0.60	0.61
SA163A	163	162	7.96	118	43	0	517	7.96	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	2.83	2.83	0.00	0.00	2.5	10.79	10.79	3.0	13.8	36.3	250	PVC	SDR 35	0.85	55.9	**24.67%**	1.13	0.78
SA162A	162	161	0.20	0	0	0	0	8.16	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.00	2.5	0.20	10.99	3.1	13.8	87.2	250	PVC	SDR 35	1.15	65.0	**21.29%**	1.31	0.86
SA161AA	161A	161	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.0	0.91	0.91	0.3	0.3	14.0	150	PVC	DR 28	1.00	15.3	**1.66%**	0.86	0.27
SA161A	161	151	0.19	0	0	0	0	8.35	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.91	2.5	0.19	12.09	3.4	14.2	57.7	250	PVC	SDR 35	1.15	65.0	**21.77%**	1.31	0.88
SA151AA	151A	151	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.77	2.77	0.00	0.00	2.4	2.77	2.77	0.8	3.2	12.7	150	PVC	DR 28	1.00	15.3	**20.77%**	0.86	0.57
EX151A	151	EX151	0.09	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.09	14.95	4.2	17.4	17.9	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
	EX151	EX142	0.00	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.00	14.95	4.2	17.4	44.4	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
SA165A	165	150	0.67	17	0	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	101.2	200	PVC	SDR 35	1.50	41.0	**2.75%**	1.29	0.47
SA155A	155	154	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.43%**	0.85	0.18
SA154A	154	153	0.48	0	22	0	59	0.59	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.59	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.74%**	0.67	0.30
SA160A	160	159	0.04	0	1	0	3	0.04	3	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.04	0.04	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.21%**	0.85	0.13
SA159A	159	158	0.51	0	23	0	62	0.56	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.56	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.70%**	0.67	0.30
SA158A, External	158	153	1.50	14	50	0	118	2.06	183	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.50	2.06	0.6	3.5	45.0	200	PVC	SDR 35	0.40	21.1	**16.73%**	0.67	0.41
SA153A, External	153	152	1.46	12	21	0	98	4.10	345	4.00	5.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.46	4.10	1.1	6.7	70.0	200	PVC	SDR 35	0.80	29.9	**22.53%**	0.94	0.63
SA152A, External	152	150	0.56	14	0	0	48	4.66	393	4.00	6.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.56	4.66	1.3	7.7	85.7	200	PVC	SDR 35	0.80	29.9	**25.64%**	0.94	0.66
SA150A	150	146	0.30	6	0	0	20	5.63	471	3.99	7.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.30	5.63	1.6	9.2	72.0	200	PVC	SDR 35	0.80	29.9	**30.71%**	0.94	0.70
SA149A	149	148	0.27	5	0	0	17	0.27	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	0.27	0.1	0.4	51.2	200	PVC	SDR 35	1.00	33.4	**1.05%**	1.05	0.28
SA148A	148	147	0.15	2	0	0	7	0.42	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.42	0.1	0.5	10.5	200	PVC	SDR 35	1.00	33.4	**1.51%**	1.05	0.32
SA147A	147	146	0.52	13	0	0	44	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.52	0.95	0.3	1.4	78.2	200	PVC	SDR 35	1.00	33.4	**4.09%**	1.05	0.43
SA146A	146	EX145	0.08	2	0	0	7	6.66	546	3.95	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.08	6.66	1.9	10.6	19.3	200	PVC	SDR 35	0.50	23.6	**44.87%**	0.74	0.62

Stantec

SUBDIVISION:
HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX145A	EX145	EX144	0.07	0	0	0	0	6.73	546	3.95	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	6.73	1.9	10.6	35.9	200	PVC	SDR 35	0.50	23.6	**44.94%**	0.74	0.62
EX144A	EX144	EX143	0.54	9	0	0	31	7.27	576	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.54	7.27	2.0	11.2	114.9	200	PVC	SDR 35	0.50	23.6	**47.53%**	0.74	0.62
	EX143	EX142	0.00	0	0	0	0	7.27	576	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	7.27	2.0	11.2	21.5	200	PVC	SDR 35	0.40	21.1	**53.14%**	0.67	0.58
EX142A	EX142	EX139	0.26	3	0	0	10	15.97	1104	3.77	16.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.26	22.48	6.3	28.0	74.8	300	PVC	SDR 35	0.40	60.7	**46.15%**	0.86	0.72
EX141B	EX141	EX140	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	10.6	200	PVC	SDR 35	0.65	27.0	**0.58%**	0.85	0.18
EX140A	EX140	EX139	0.24	5	0	0	17	0.40	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.40	0.1	0.5	67.7	200	PVC	SDR 35	0.65	27.0	**1.85%**	0.85	0.28
EX139A	EX139	EX136	0.47	10	0	0	34	16.84	1162	3.76	17.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.47	23.35	6.5	29.1	64.7	300	PVC	SDR 35	0.40	60.7	**47.89%**	0.86	0.73
EX141A	EX141	EX138	0.38	8	0	0	27	0.38	27	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	0.5	49.7	200	PVC	SDR 35	0.65	27.0	**2.03%**	0.85	0.28
EX138A	EX138	EX137	0.18	2	0	0	7	0.56	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.56	0.2	0.7	10.6	200	PVC	SDR 35	0.65	27.0	**2.62%**	0.85	0.31
EX137A	EX137	EX136	0.28	5	0	0	17	0.84	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.28	0.84	0.2	1.1	67.8	200	PVC	SDR 35	0.65	27.0	**3.94%**	0.85	0.35
EX136A	EX136	EX126	0.29	4	0	0	14	17.96	1226	3.74	18.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.29	24.48	6.9	30.3	78.9	300	PVC	SDR 35	0.41	61.7	**49.10%**	0.88	0.74
EX126A	EX126	EX123	0.29	0	5	0	14	30.32	2144	3.56	30.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	4.41	4.9	0.29	40.34	11.3	47.1	71.3	375	PVC	SDR 35	0.45	117.4	**40.10%**	1.06	0.85
EX123A	EX123	EX112	0.34	0	7	0	19	30.66	2163	3.56	31.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.66	0.00	4.41	6.7	0.34	42.73	12.0	49.8	90.3	375	PVC	SDR 35	0.42	113.8	**43.78%**	1.03	0.85
EX117A	EX117	EX113	0.15	0	0	0	0	0.15	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.0	90.0	200	PVC	SDR 35	0.65	27.0	**0.15%**	0.85	0.13
EX116A	EX116	EX113	0.50	0	21	0	57	0.50	57	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	1.1	90.6	200	PVC	SDR 35	0.50	23.6	**4.48%**	0.74	0.32
EX113A	EX113	EX112B	0.25	0	10	0	27	0.90	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.25	0.90	0.3	1.6	47.0	200	PVC	SDR 35	0.65	27.0	**5.96%**	0.85	0.39
EX112BA	EX112B	EX111	0.46	0	22	0	59	1.36	143	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.36	0.4	2.7	81.5	200	PVC	SDR 35	0.65	27.0	**10.01%**	0.85	0.45
EX119A	EX119	EX118	0.51	0	30	0	81	0.51	81	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.5	116.9	200	PVC	SDR 35	0.50	23.6	**6.15%**	0.74	0.34
EX122A	EX122	EX121	0.69	0	31	0	84	0.69	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.69	0.69	0.2	1.5	112.0	200	PVC	SDR 35	0.40	21.1	**7.33%**	0.67	0.32
EX121A	EX121	EX120	0.16	0	4	0	11	0.85	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.85	0.2	1.8	8.5	200	PVC	SDR 35	0.40	21.1	**8.37%**	0.67	0.34
EX120A	EX120	EX118	0.17	0	6	0	16	1.02	111	4.00	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	1.02	0.3	2.1	39.0	200	PVC	SDR 35	0.40	21.1	**9.84%**	0.67	0.35
EX118A	EX118	EX111	0.09	0	1	0	3	1.62	194	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.09	1.62	0.5	3.6	46.5	200	PVC	SDR 35	0.40	21.1	**17.04%**	0.67	0.41
EX111A	EX111	EX112	0.42	0	15	0	41	3.39	378	4.00	6.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.42	3.39	0.9	7.1	74.8	200	PVC	SDR 35	0.32	18.9	**37.43%**	0.59	0.47
EX112A	EX112	EX102	0.14	0	0	0	0	34.19	2541	3.50	36.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.66	0.00	4.41	6.7	0.14	46.26	13.0	55.7	68.0	375	PVC	SDR 35	0.31	97.4	**57.13%**	0.88	0.79
EX115A	EX115	EX114	0.51	0	22	0	59	0.51	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.1	81.6	200	PVC	SDR 35	0.40	21.1	**5.22%**	0.67	0.29
EX114A	EX114	EX110	0.16	0	3	0	8	0.67	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.67	0.2	1.3	10.6	200	PVC	SDR 35	0.40	21.1	**6.05%**	0.67	0.30
EX110A	EX110	EX108	0.17	0	6	0	16	0.83	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.83	0.2	1.6	37.5	200	PVC	SDR 35	0.40	21.1	**7.51%**	0.67	0.32
EX109A	EX109	EX108	0.38	0	22	0	59	0.38	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	1.1	85.6	200	PVC	SDR 35	0.65	27.0	**3.96%**	0.85	0.35
EX108A	EX108	EX107	0.48	0	15	0	41	1.69	184	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	1.69	0.5	3.4	106.8	200	PVC	SDR 35	0.40	21.1	**16.30%**	0.67	0.41
EX107A	EX107	EX106	0.15	0	3	0	8	1.84	192	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.84	0.5	3.6	10.4	200	PVC	SDR 35	0.40	21.1	**17.13%**	0.67	0.41
EX106A	EX106	EX105	0.65	0	22	0	59	2.49	251	4.00	4.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.65	2.49	0.7	4.8	92.1	200	PVC	SDR 35	0.40	21.1	**22.54%**	0.67	0.45
EX105A	EX105	EX104	0.61	0	22	0	59	3.11	311	4.00	5.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.61	3.11	0.9	5.9	88.7	200	PVC	SDR 35	0.40	21.1	**27.90%**	0.67	0.48
EX104A	EX104	EX102	0.73	0	28	0	76	3.83	386	4.00	6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.73	3.83	1.1	7.3	114.6	200	PVC	SDR 35	0.44	22.2	**33.05%**	0.70	0.52
EX102A	EX102	EX101	0.07	0	0	0	0	38.89	2989	3.44	41.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.66	0.00	4.41	6.7	0.07	50.96	14.3	62.6	34.0	375	PVC	SDR 35	0.29	95.1	**65.84%**	0.86	0.80
																												375							
EX7A	EX7	EX6	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	11.1	200	PVC	SDR 35	0.63	26.5	**0.44%**	0.83	0.18
EX6A	EX6	EX5	0.66	0	31	0	84	0.76	89	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.66	0.76	0.2	1.7	117.0	200	PVC	SDR 35	0.65	26.9	**6.15%**	0.85	0.39
EX5A	EX5	EX4	0.07	0	2	0	5	0.83	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	0.83	0.2	1.8	8.5	200	PVC	SDR 35	1.18	36.3	**4.86%**	1.14	0.49
EX4A	EX4	EX3	0.05	0	0	0	0	0.88	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.05	0.88	0.2	1.8	39.0	200	PVC	SDR 35	1.08	34.7	**5.12%**	1.09	0.48
EX10A, EX10B	EX10	EX9	0.33	5	0	0	17	0.33	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.0	0.89	0.89	0.2	0.5	75.3	200	PVC	SDR 35	0.92	32.0	**1.64%**	1.01	0.31
EX18A	EX18	EX19	0.14	2	0	0	7	0.14	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.14	0.14	0.0	0.1	8.5	200	PVC	SDR 35	0.83	30.4	**0.49%**	0.96	0.21
EX19A	EX19	EX9	0.62	11	12	0	70	0.76	77	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.62	0.76	0.2	1.5	107.0	200	PVC	SDR 35	0.63	26.5	**5.50%**	0.83	0.37
EX9A	EX9	EX8	0.07	0	0	0	0	1.16	94	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.07	1.72	0.5	2.0	48.0	200	PVC	SDR 35	0.96	32.7	**6.11%**	1.03	0.47
EX14A	EX14	EX13	0.13	0	2	0	5	0.13	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.13	0.13	0.0	0.1	9.5	200	PVC	SDR 35	0.74	28.7	**0.43%**	0.90	0.20
EX13A	EX13	EX12	0.43	0	20	0	54	0.57	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.57	0.2	1.1	82.1	200	PVC	SDR 35	0.65	26.9	**4.17%**	0.85	0.35
EX12A	EX12	EX11	0.44	0	21	0	57	1.01	116	4.00	1.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.01	0.3	2.2	82.1	200	PVC	SDR 35	0.41	21.5	**10.06%**	0.68	0.36
EX18B	EX18	EX15	0.15	3	0	0	10	0.15	10	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.2	42.0	200	PVC	SDR 35	2.38	51.6	**0.40%**	1.62	0.31
EX17A	EX17	EX16	0.67	9	10	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	84.1	200	PVC	SDR 35	0.44	22.2	**5.05%**	0.70	0.31
EX16A	EX16	EX15	0.49	7	9	0	48	1.16	106	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.49	1.16	0.3	2.0	79.0	200	PVC	SDR 35	0.34	19.5	**10.42%**	0.62	0.33

Stantec

SUBDIVISION:
HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

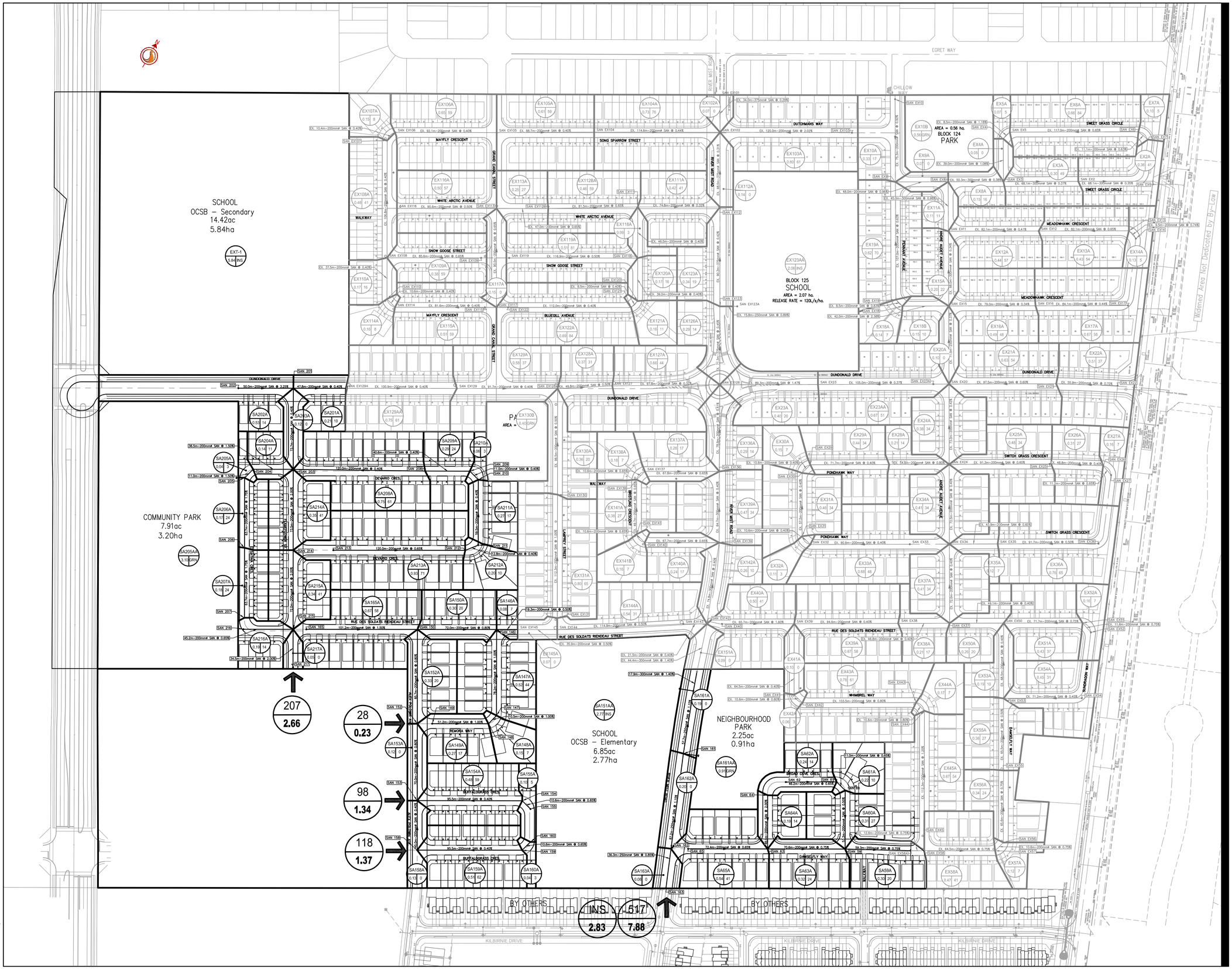
SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	**FLOW** (l/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
EX22A	EX22	EX21	0.51	11	0	0	37	0.51	37	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	0.8	55.9	200	PVC	SDR 35	0.72	28.3	**2.65%**	0.89	0.32
EX21A	EX21	EX20	0.63	16	0	0	54	1.14	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.63	1.14	0.3	1.8	97.5	200	PVC	SDR 35	0.60	26.0	**6.95%**	0.82	0.39
EX33A	EX33	EX32	0.68	14	0	0	48	0.68	48	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.68	0.68	0.2	1.0	90.6	200	PVC	SDR 35	0.40	21.1	**4.54%**	0.67	0.28
EX32A	EX32	EX31	0.11	1	0	0	3	0.78	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	0.78	0.2	1.0	10.6	200	PVC	SDR 35	0.40	21.1	**4.94%**	0.67	0.28
EX31A	EX31	EX30	0.46	10	0	0	34	1.25	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.25	0.3	1.7	57.5	200	PVC	SDR 35	0.40	21.1	**8.16%**	0.67	0.33
EX30A	EX30	EX29	0.15	2	0	0	7	1.40	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.40	0.4	1.9	10.6	200	PVC	SDR 35	0.40	21.1	**8.89%**	0.67	0.34
EX29A	EX29	EX28	0.44	10	0	0	34	1.84	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.84	0.5	2.6	71.7	200	PVC	SDR 35	0.40	21.1	**12.08%**	0.67	0.37
EX28A	EX28	EX24	0.21	4	0	0	14	2.05	139	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	2.05	0.6	2.8	54.6	200	PVC	SDR 35	0.80	29.9	**9.47%**	0.94	0.49
EX27A	EX27	EX26	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.2	200	PVC	SDR 35	0.65	27.0	**0.57%**	0.85	0.18
EX26A	EX26	EX25	0.31	8	0	0	27	0.47	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.47	0.1	0.7	48.8	200	PVC	SDR 35	0.40	21.1	**3.22%**	0.67	0.25
EX25A	EX25	EX24	0.48	10	0	0	34	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.95	0.3	1.4	91.3	200	PVC	SDR 35	0.60	25.9	**5.28%**	0.81	0.36
EX36A	EX36	EX35	0.76	19	0	0	65	0.76	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.76	0.76	0.2	1.3	91.7	200	PVC	SDR 35	0.50	23.6	**5.32%**	0.74	0.33
EX35A	EX35	EX34	0.12	2	0	0	7	0.88	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	0.88	0.2	1.4	43.9	200	PVC	SDR 35	0.60	25.9	**5.42%**	0.81	0.36
EX40A	EX40	EX39	0.50	12	0	0	41	0.50	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	0.8	65.7	200	PVC	SDR 35	1.60	42.3	**1.90%**	1.33	0.44
EX45A	EX45	EX44	0.67	16	0	0	54	0.67	54	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	112.3	200	PVC	SDR 35	1.20	36.6	**2.92%**	1.15	0.44
EX44A	EX44	EX43	0.17	2	0	0	7	0.84	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.84	0.2	1.2	10.6	200	PVC	SDR 35	0.80	29.9	**4.10%**	0.94	0.39
EX43A	EX43	EX42	0.78	18	0	0	61	1.63	122	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.78	1.63	0.5	2.4	103.5	200	PVC	SDR 35	0.80	29.9	**8.15%**	0.94	0.47
EX42A	EX42	EX41	0.06	1	0	0	3	1.68	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.68	0.5	2.5	10.6	200	PVC	SDR 35	0.80	29.9	**8.39%**	0.94	0.48
EX41A	EX41	EX39	0.10	0	0	0	0	1.79	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	1.79	0.5	2.5	64.5	200	PVC	SDR 35	0.40	21.1	**12.02%**	0.66	0.37
EX39A	EX39	EX38	0.67	17	0	0	58	2.96	224	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	2.96	0.8	4.5	94.6	200	PVC	SDR 35	0.40	21.1	**21.11%**	0.67	0.44
EX38A	EX38	EX37	0.21	5	0	0	17	3.16	241	4.00	3.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	3.16	0.9	4.8	46.8	200	PVC	SDR 35	0.40	21.1	**22.69%**	0.67	0.45
EX52A	EX52	EX51	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.6	200	PVC	SDR 35	0.75	29.0	**0.54%**	0.91	0.20
EX51A	EX51	EX50	0.43	11	0	0	37	0.59	44	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.59	0.2	0.9	71.7	200	PVC	SDR 35	0.75	29.0	**3.05%**	0.91	0.35
EX54A	EX54	EX53	0.45	9	0	0	31	0.45	31	4.00	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.45	0.45	0.1	0.6	71.2	200	PVC	SDR 35	0.45	22.4	**2.77%**	0.71	0.26
SA62A	62	61	0.24	4	0	0	14	0.24	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.24	0.1	0.3	46.2	200	PVC	SDR 35	0.65	27.0	**1.07%**	0.85	0.23
SA61A	61	60	0.22	3	0	0	10	0.46	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.46	0.1	0.5	11.0	200	PVC	SDR 35	0.65	27.0	**1.91%**	0.85	0.28
SA60A	60	59	0.31	8	0	0	27	0.77	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.77	0.2	1.0	53.3	200	PVC	SDR 35	0.50	23.6	**4.40%**	0.74	0.32
SA64A	64	63	0.19	4	0	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	48.9	200	PVC	SDR 35	2.00	47.3	**0.58%**	1.49	0.32
SA65A	65	63	0.54	12	0	0	41	0.54	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.54	0.54	0.2	0.8	72.4	200	PVC	SDR 35	0.65	27.0	**3.01%**	0.85	0.32
SA63A	63	59	0.32	7	0	0	24	1.05	78	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.32	1.05	0.3	1.6	70.6	200	PVC	SDR 35	0.75	29.0	**5.39%**	0.91	0.40
SA59A	59	EX58A	0.30	6	0	0	20	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.30	2.12	0.6	3.0	59.3	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
	EX58A	EX58	0.00	0	0	0	0	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.12	0.6	3.0	12.6	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
EX58A	EX58	EX57	0.47	12	0	0	41	2.59	190	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.47	2.59	0.7	3.8	64.5	200	PVC	SDR 35	0.75	29.0	**13.16%**	0.91	0.52
EX57A	EX57	EX56	0.12	2	0	0	7	2.70	197	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	2.70	0.8	4.0	10.6	200	PVC	SDR 35	0.75	29.0	**13.65%**	0.91	0.53
EX56A	EX56	EX55	0.34	7	0	0	24	3.05	221	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.34	3.05	0.9	4.4	65.6	200	PVC	SDR 35	0.75	29.0	**15.31%**	0.91	0.55
EX55A	EX55	EX53	0.38	8	0	0	27	3.43	248	4.00	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	3.43	1.0	5.0	65.5	200	PVC	SDR 35	0.50	23.6	**21.07%**	0.74	0.49
EX53A	EX53	EX50	0.19	3	0	0	10	4.07	289	4.00	4.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	4.07	1.1	5.8	68.5	200	PVC	SDR 35	0.40	21.1	**27.53%**	0.67	0.47
EX50A	EX50	EX37	0.26	6	0	0	20	4.92	354	4.00	5.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.26	4.92	1.4	7.1	49.1	200	PVC	SDR 35	0.40	21.0	**33.77%**	0.66	0.50
EX37A	EX37	EX34	0.41	10	0	0	34	8.49	629	3.92	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	8.49	2.4	12.4	72.0	200	PVC	SDR 35	0.40	21.1	**58.49%**	0.67	0.59
EX34A	EX34	EX24	0.41	10	0	0	34	9.79	734	3.88	11.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	9.79	2.7	14.3	72.5	200	PVC	SDR 35	0.40	21.1	**67.57%**	0.67	0.62
EX24A	EX24	EX20	0.38	10	0	0	34	13.16	976	3.81	15.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	13.16	3.7	18.7	73.0	200	PVC	SDR 35	0.42	21.7	**86.43%**	0.68	0.69
EX20A	EX20	EX15	0.10	0	0	0	0	14.40	1068	3.78	16.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	14.40	4.0	20.4	71.0	250	PVC	SDR 35	0.37	36.7	**55.56%**	0.74	0.65
EX15A	EX15	EX11	0.20	0	8	0	22	15.92	1205	3.75	18.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	15.92	4.5	22.7	68.0	300	PVC	SDR 35	0.34	55.8	**40.73%**	0.79	0.64
EX11A	EX11	EX8	0.11	0	4	0	11	17.05	1332	3.72	20.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	17.05	4.8	24.8	45.0	300	PVC	SDR 35	0.98	94.9	**26.15%**	1.35	0.95
EX8A	EX8	EX3	0.15	0	6	0	16	18.35	1442	3.69	21.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.15	18.91	5.3	26.9	50.3	300	PVC	SDR 35	0.38	59.0	**45.49%**	0.84	0.70
EX3A	EX3	EX2	0.30	0	18	0	49	19.53	1585	3.66	23.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.30	20.09	5.6	29.1	68.1	300	PVC	SDR 35	0.37	58.2	**50.08%**	0.83	0.71
EX2A	EX2	EX1	0.36	0	15	0	41	19.89	1625	3.65	24.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.36	20.45	5.7	29.8	68.1	300	PVC	SDR 35	0.35	57.0	**52.25%**	0.81	0.70
																												300							



Stantec

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Legend

- SA101A / 0.50 / 12 — SANITARY DRAINAGE AREA ID# / POPULATION / SANITARY DRAINAGE AREA ha.
- SANITARY DRAINAGE AREA
- PROPOSED SANITARY SEWER
- EXISTING PHASE
- FUTURE STUB
- EX101A / 0.50 / 12 — FUTURE SANITARY DRAINAGE AREA
- 891 / 12.72 — OFF-SITE OVERALL CONTRIBUTING POPULATION / OFF-SITE OVERALL CONTRIBUTING AREA (ha.)

Notes

5	ISSUED FOR CONSTRUCTION	DT	DT	15.10.20
4	REVISED INTERIM DRAINAGE	DT	DT	15.09.02
3	REVISED PER CITY COMMENTS	DT	DT	15.08.26
2	REVISED PER CITY COMMENTS	WJ	DT	15.07.30
1	ISSUED FOR REVIEW	MS	DT	15.05.27
Revision		By	Appd.	YY.MM.DD

File Name: 160400743-D8		DT	PM	15.05.19
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
MATTAMY HOMES LTD.

HALF MOON BAY SOUTH
PHASE 4
Ottawa, ON

Title
SANITARY DRAINAGE PLAN

Project No. 160400743	Scale 1:1500 (0, 15, 45, 75m)	
Drawing No. SA-1	Sheet 28 of 28	Revision 5

W:\active\160400743_Half_Moon_Bay_South_Draft_Plan\design\drawing\DRAFT PLAN 3\160400743A.dwg
2015/10/20 2:31 PM By: Hilbolt, Justin

ORIGINAL SHEET - ARCH D

3 - Barrhaven South MSS Sanitary Sewer Design Sheet - Alternative 1 (per JLR) (revised September 19th 2016)

Barrhaven South MSS Sanitary Sewer Design Sheet - Preferred Servicing Strategy per J.L. Richards Alternative 1

Area: **BARRHAVEN SOUTH MASTER SERVICING STUDY**

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: MY
CHECKED BY: MF

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 163400999

updated location

Colour code:
HMB values
Hard coded values — Most US MH
Caculated value — Estimated value
Value from subdivision design — MH receiving flow from 2 or more sewers

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 L/p/day	MINIMUM VELOCITY	0.60 m/s	As per CDP (units/ha)	
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 L/ha/day	MAXIMUM VELOCITY	3.00 m/s	LOW DENSITY RESIDENTIAL	26
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 L/ha/day	MANNINGS n	0.013	SEMI-DETACHED	52
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 L/ha/day	BEDDING CLASS	B	TOWN HOUSES	82
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 L/ha/day	MINIMUM COVER	2.50 m	APARTMENTS	120
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 L/s/ha			COMMUNITY CORE	60
PERSONS / APARTMENT	1.8					AVERAGE PERSONS/ha	107

LOCATION				RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE						
AREA ID NUMBER	Source	FROM M.H.	TO M.H.	DEV AREA (ha)	DEV POP	ADD'N RES AREA (ha)	ADD'N POP	TOTAL AREA (ha)	TOTAL POP	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	SLOPE (%)	CAP. (FULL) (L/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Future Collector Road																																			
Area 1 (Drummond)			MA11	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	20.3	20.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	20.3	20.3	5.7	23.3	-	-	-	-	-	-	-	-
MSS-A-23		MA11	MA10	0.0	0	14.2	1523	14.2	1,523	14.2	1,523	3.67	22.6	0.0	20.3	0.0	0.0	0.0	0.0	2.8	2.8	2.5	2.5	20.1	19.5	39.8	11.1	53.8	482.1	300	PVC	0.75	82.6	65%	1.18	1.26
MSS-A-22		MA10	MH57A	0.0	0	12.8	1371	12.8	1,371	27.0	2,894	3.46	40.6	0.0	20.3	0.0	0.0	0.0	0.0	7.2	10.0	14.5	17.0	26.3	34.5	74.3	20.8	87.7	449.7	375	PVC	0.40	110.0	80%	1.00	1.12
Realigned Greenbank Road																																			
Area 2 (Brazeau)			MA14	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	24.8	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.5	24.8	24.8	6.9	28.4	-	-	-	-	-	-	-	-
Area 5 (Mattamy)			MA14	2.3	239	0.0	0	2.3	239	2.3	239	4.00	3.9	0.00	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.2	1.2	0.5	4.1	4.1	1.1	5.5	-	-	-	-	-	-	-	-
MSS-A-21		MA14	MA13	0.0	0	4.8	513	4.8	513	7.1	752	3.88	11.8	0.0	24.8	0.0	0.0	0.0	0.0	7.5	8.1	0.0	1.2	28.6	12.3	41.2	11.5	51.9	295.0	250	PVC	1.30	67.1	77%	1.37	1.52
N-4		MA13	MH57A	0.0	0	11.0	1176	11.0	1,176	18.1	1,928	3.60	28.1	0.0	24.8	0.0	0.0	0.0	0.0	0.0	8.1	0.5	1.7	28.6	11.5	52.7	14.8	71.5	413.1	375	PVC	0.30	94.6	76%	0.86	0.95
Cambrian Road																																			
N-5		MH57A	MH13A	0.0	0	4.3	458	4.3	458	49.4	5,280	3.22	68.9	3.4	48.5	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	57.8	7.7	134.7	37.7	164.4	216.5	500	CPP	0.25	188.2	87%	0.96	1.09
N-2		MH13A	MH15A	6.2	631	0.0	3	6.2	634	55.6	5,914	3.18	76.2	0.0	48.5	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	57.8	6.2	140.9	39.5	173.5	165.2	500	CPP	0.20	168.6	103%	0.86	1.00
N-6		MH15A	MH17A	5.6	868	0.0	2	5.6	870	61.2	6,784	3.12	85.7	0.0	48.5	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	57.8	5.6	146.5	41.0	184.5	202.0	600	CPP	0.13	230.7	80%	0.79	0.88
River Mist Road																																			
Area 3 (Mattamy)			MH126	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-
MSS-A-18	Stantec	MH163	162	6.5	543	0.0	0	6.5	543	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	0.9	0.9	2.4	10.2	10.2	2.9	14.0	36.3	200	PVC	1.15	36.2	39%	1.13	1.05
	Stantec	162	161	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	87.2	250	PVC	1.15	63.2	22%	1.29	1.01
	Stantec	161	EX151	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	75.6	250	PVC	1.15	63.2	22%	1.29	1.01
	Stantec	EX151	MH142	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	44.4	300	PVC	1.40	113.4	12%	1.62	1.07
N-14	Stantec	MH142	EX139	8.2	825	1.0	102	9.2	927	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	9.2	19.4	5.4	29.8	74.8	300	PVC	0.40	60.9	49%	0.87	0.86
	Stantec	EX139	EX136	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	64.7	300	PVC	0.40	60.9	49%	0.87	0.86
	Stantec	EX136	MH126	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	78.9	300	PVC	0.41	61.6	48%	0.88	0.87
N-15	Stantec	MH126	EX123	16.5	954	0.0	0	16.5	954	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.9	0.0	0.9	4.3	18.6	38.0	10.6	49.5	71.3	375	PVC	0.45	116.6	42%	1.06	1.01
	Stantec	EX123	MH112	0.0	0	0.0	0	0.0	0	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	38.0	10.6	49.5	90.3	375	PVC	0.42	112.2	44%	1.02	0.98
N-16	Stantec	MH112	EX102	8.3	689	0.0	0	8.3	689	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	8.3	46.3	13.0	60.6	68.0	375	PVC	0.31	96.8	63%	0.88	0.93
	Stantec	EX102	EX101	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	34.0	375	PVC	0.29	93.5	65%	0.85	0.91
	IBI	EX101	MH43A	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	38.0	375	PVC	0.30	94.6	64%	0.86	0.92
N-12	IBI	MH43A	MH44A	6.6	352	0.0	0	6.6	352	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	6.6	52.9	14.8	66.7	81.0	375	PVC	0.30	94.6	71%	0.86	0.94
	IBI	MH44A	MH45A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	64.0	375	PVC	0.30	94.6	71%	0.86	0.94
	IBI	MH45A	MH46A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	85.0	375	PVC	0.30	94.6	71%	0.86	0.94
N-10	IBI	MH46A	MH47A	8.4	562	0.0	0	8.4	562	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	1.6	2.5	4.3	10.0	62.9	17.6	76.2	41.0	375	PVC	0.30	94.6	81%	0.86	0.96
	DSEL	MH47A	MH101A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	94.6	81%	0.86	0.96
	DSEL	MH101A	MH102A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	94.6	81%	0.86	0.96
N-7	DSEL	MH102A	MH17A	4.0	291	1.2	129	5.2	420	60.7	4,447	3.29	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	5.2	68.1	19.1	82.7	81.0	375	PVC	0.30	94.6	87%	0.86	0.98
Cambrian Road																																			
N-3		MH17A	MH21A	26.0	1956	0.0	0	26.0	1,956	147.9	13,187	2.83	151.2	0.0	48.5	0	0	0	0	3.0	26.0	5.1	26.3	64.7	34.1	248.7	69.6	285.5	204.3	750	CPP	0.13	419.5	68%	0.92	1.00
N-8		MH21A	MH45	7.0	408	0.0	0	7.0	408	154.9	13,595	2.82	155.3	0.0	48.5	0	0	0	0	0.0	26.0	2.9	29.2	64.7	9.9	258.6	72.4	292.4	277.8	750	CPP	0.13	419.5	70%	0.92	1.00
Greenbank Road																																			
Area 4 (Minto)			MH205A	34.7	3538	0.0	0	34.7	3,538	34.70	3,538	3.38	48.4	0.0	0.0	0.0	0.0	0.0	0.0	8.2	8.2	17.1	17.1	7.1	60.0	60.0	16.8	72.3	-	-	-	-	-	-	-	-
MSS-A-14	IBI	MH205A	MH98A	0.0	0	21.0	2246	21.0	2,246	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	21.0	81.0	22.7	104.5	126.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH98A	MH99A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH99A	MH100A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	108.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH100A	MH204A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	105.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH204A	MH206A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	103.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH206A	MH97A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
N-13, N-13-R	IBI	MH97A	MH96A	19.9	1625	0.1	6	20.0	1,631	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.8	17.9	7.1	20.8	101.8	28.5	128.1	98.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH96A	MH95A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	129.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH95A	MH201A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	123.0	600	CPP	0.30	350.4	37%	1.20	1.09
N-11, N-11-R	IBI	MH201A	MH201B	12.1	787	0.0	0	12.1	787	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	12.1	113.9	31.9	140.0	124.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH201B	MH200A	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	68.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH200A	MH200C	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	48.0	600	CPP	0.50	452.6	31%	1.55	1.35
	IBI	MH200C	MH45	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	26.0	600	CPP	0.12	221.9	63%	0.76	0.81
MSS-A-15		MH45	MH435A	0.0	0	5.1	548	5.1	548	247.8	22,345	2.60	235.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	34.2	0.0	47.1	71.8	5.1	377.6	105.7	412.8	296.6	900	CPP	0.10	597.0	69%	0.91	0.99
North																																			
MSS-A-9		MA9	MA8	0.0	0	22.2	2378	22.2	2,378	22.2	2,378	3.53	34.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	9.5	9.5	2.2	34.2	34.2	9.6	45.8	507.5	450	CPP	0.11	98.4	47%	0.60	0.59
MSS-A-8		MA8	MA7	0.0	0	2.9	308	2.9	308	25.1	2,686	3.48	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.8	10.3	2.2	3.7	37.9	10.6	50.7	317.1	450	CPP	0.11	98.4	52%	0.60	0.61
MSS-A-7		MA7	MA6	0.0	0	18.5	1979	18.5	1,979	43.6	4,665	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	18.5	56.4	15.8	79.8	573.1	450	CPP	0.11	98.4	81%	0.60	0.67
MSS-A-6		MA6	MA5	0.0	0	21.7	2320	21.7	2,320	65.3	6,985	3.11	88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	21.7	78.1	21.9	112.1	473.9	600	CPP	0.10	201.5	56%	0.69	0.71
MSS-A-5		MA5	M27A	0.0	0	9.5	1020	9.5	1,020	74.8	8,005	3.05	98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	9.5	87.6	24.5	125.6	220.0	600	CPP	0.10	201.5	62%	0.69	0.73
MSS-A-4		M27A	MH5200A	0.0	0	8.1	863	8.1	863	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	8.1	95.7	26.8	137.1	501.5	600	CPP	0.15	248.2	55%	0.85	0.87
		MH5200A	MH520A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	46.0	600	CPP	0.08	181.0	76%	0.62	0.69
		MH520A	MH521A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	44.4	600	CPP	0.10	201.5	68%	0.69	0.75
N-1		MH521A	MH522A	3.3	177	0.5	54	3.8	231	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	3.8	99.5	27.9	140.7	50.1	600	CPP	0.09	192.7	73%	0.66	0.73
		MH522A	MH435A	0.0	0	0.0	0	0.0	0	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	99.5	27.9	140.7	10.8	600	CPP	0.21	292.0	48%	1.00	0.99
		MH435A	MH501A	0.0	0	0.0	0	0.0	0	334.5	31,444	2.46	313.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	36.7	0.0	57.4	74.0	0.0	477.1	133.6	520.9	13.3	900	CPP	0.11	623.2	84%	0.95	1.07

Note: Area 3 (Mattamy) was acocunted for in this spreadsheet orginally as part of catchment N-14 and N-15 and thus values for this catchment have been set to zero.

4 - Barrhaven South MSS Sanitary Sewer Design Sheet - Alternative 2 (revised September 19th 2016)

Barrhaven South MSS Sanitary Sewer Design Sheet - Preferred Servicing Strategy per J.L. Richards with Reduced Assumptions for Flow Generation (Alternative 2)

Area: **BARRHAVEN SOUTH MASTER SERVICING STUDY**

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: MY
CHECKED BY: MF

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 163400999

Colour code:
- HMB values
- Hard coded values — Most US MH
- Caculated value — Estimated value
- updated segment — Value from subdivision design — MH receiving flow from 2 or more sewers

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 L/p/day	MINIMUM VELOCITY	0.60 m/s	As per CDP (units/ha)	
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 L/ha/day	MAXIMUM VELOCITY	3.00 m/s	LOW DENSITY RESIDENTIAL	26
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 L/ha/day	MANNINGS n	0.013	SEMI-DETACHED	52
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 L/ha/day	BEDDING CLASS	B	TOWN HOUSES	82
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 L/ha/day	MINIMUM COVER	2.50 m	APARTMENTS	120
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 L/s/ha			COMMUNITY CORE	60
PERSONS / APARTMENT	1.8					AVERAGE PERSONS/ha	107

LOCATION				RESIDENTIAL AREA AND POPULATION										COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	Source	FROM M.H.	TO M.H.	DEV AREA (ha)	DEV POP	ADD'N RES AREA (ha)	ADD'N POP	TOTAL AREA (ha)	TOTAL POP	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	SLOPE (%)	CAP. (FULL) (L/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Future Collector Road																																				
Area 1 (Drummond)			MA11	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	18.2	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.8	18.2	18.2	5.1	20.9	-	-	-	-	-	-	-	-
MSS-A-23		MA11	MA10	0.0	0	14.2	1523	14.2	1,523	14.2	1,523	3.67	22.6	0.0	18.2	0.0	0.0	0.0	0.0	2.8	2.8	2.5	2.5	18	19.5	37.7	10.6	51.2	482.1	300	PVC	0.75	82.6	62%	1.18	1.25
MSS-A-22		MA10	MH57A	0.0	0	12.8	1371	12.8	1,371	27.0	2,894	3.46	40.6	0.0	18.2	0.0	0.0	0.0	0.0	7.2	10.0	14.5	17.0	24.5	34.5	72.2	20.2	85.3	449.7	375	PVC	0.40	110.0	78%	1.00	1.12
Realigned Greenbank Road																																				
Area 2 (Brazeau)			MA14	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	22.3	22.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.4	22.3	22.3	6.2	25.6	-	-	-	-	-	-	-	-
Area 5 (Mattamy)			MA14	2.3	239	0.0	0	2.3	239	2.3	239	4.00	3.9	0.00	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.2	1.2	0.5	4.1	4.1	1.1	5.5	-	-	-	-	-	-	-	-
MSS-A-21		MA14	MA13	0.0	0	4.8	513	4.8	513	7.1	752	3.88	11.8	0.0	22.3	0.0	0.0	0.0	0.0	7.5	8.1	0.0	1.2	26.4	12.3	38.7	10.8	49.0	295.0	250	PVC	1.30	67.1	73%	1.37	1.51
N-4		MA13	MH57A	0.0	0	11.0	1176	11.0	1,176	18.1	1,928	3.60	28.1	0.0	22.3	0.0	0.0	0.0	0.0	0.0	8.1	0.5	1.7	26.4	11.5	50.2	14.1	68.6	413.1	375	PVC	0.30	94.6	73%	0.86	0.95
Cambrian Road																																				
N-5		MH57A	MH13A	0.0	0	4.3	458	4.3	458	49.4	5,280	3.22	68.9	3.4	43.9	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	53.8	7.7	130.1	36.4	159.1	216.5	500	CPP	0.25	188.2	85%	0.96	1.08
N-2		MH13A	MH15A	6.2	631	0.0	3	6.2	634	55.6	5,914	3.18	76.2	0.0	43.9	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	53.8	6.2	136.3	38.2	168.2	165.2	500	CPP	0.20	168.6	100%	0.86	1.00
N-6		MH15A	MH17A	5.6	868	0.0	2	5.6	870	61.2	6,784	3.12	85.7	0.0	43.9	0.0	0.0	0.0	0.0	0.0	18.1	0.0	18.7	53.8	5.6	141.9	39.7	179.2	202.0	600	CPP	0.13	230.7	78%	0.79	0.88
River Mist Road																																				
Area 3 (Mattamy)			MH126	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-
MSS-A-18	Stantec	MH163	162	6.5	543	0.0	0	6.5	543	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	0.9	0.9	2.4	10.2	10.2	2.9	14.0	36.3	200	PVC	1.15	36.2	39%	1.13	1.05
	Stantec	162	161	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	87.2	250	PVC	1.15	63.2	22%	1.29	1.01
	Stantec	161	EX151	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	75.6	250	PVC	1.15	63.2	22%	1.29	1.01
	Stantec	EX151	MH142	0.0	0	0.0	0	0.0	0	6.5	543	3.96	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	10.2	2.9	14.0	44.4	300	PVC	1.40	113.4	12%	1.62	1.07
N-14	Stantec	MH142	EX139	8.2	825	1.0	102	9.2	927	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	9.2	19.4	5.4	29.8	74.8	300	PVC	0.40	60.9	49%	0.87	0.86
	Stantec	EX139	EX136	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	64.7	300	PVC	0.40	60.9	49%	0.87	0.86
	Stantec	EX136	MH126	0.0	0	0.0	0	0.0	0	15.7	1,470	3.69	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	2.4	0.0	19.4	5.4	29.8	78.9	300	PVC	0.41	61.6	48%	0.88	0.87
N-15	Stantec	MH126	EX123	16.5	954	0.0	0	16.5	954	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.9	0.0	0.9	4.3	18.6	38.0	10.6	49.5	71.3	375	PVC	0.45	116.6	42%	1.06	1.01
	Stantec	EX123	MH112	0.0	0	0.0	0	0.0	0	32.2	2,424	3.52	34.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	38.0	10.6	49.5	90.3	375	PVC	0.42	112.2	44%	1.02	0.98
N-16	Stantec	MH112	EX102	8.3	689	0.0	0	8.3	689	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	8.3	46.3	13.0	60.6	68.0	375	PVC	0.31	96.8	63%	0.88	0.93
	Stantec	EX102	EX101	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	34.0	375	PVC	0.29	93.5	65%	0.85	0.91
	IBI	EX101	MH43A	0.0	0	0.0	0	0.0	0	40.5	3,113	3.43	43.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	46.3	13.0	60.6	38.0	375	PVC	0.30	94.6	64%	0.86	0.92
N-12	IBI	MH43A	MH44A	6.6	352	0.0	0	6.6	352	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	6.6	52.9	14.8	66.7	81.0	375	PVC	0.30	94.6	71%	0.86	0.94
	IBI	MH44A	MH45A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	64.0	375	PVC	0.30	94.6	71%	0.86	0.94
	IBI	MH45A	MH46A	0.0	0	0.0	0	0.0	0	47.1	3,465	3.39	47.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.9	4.3	0.0	52.9	14.8	66.7	85.0	375	PVC	0.30	94.6	71%	0.86	0.94
N-10	IBI	MH46A	MH47A	8.4	562	0.0	0	8.4	562	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	1.6	2.5	4.3	10.0	62.9	17.6	76.2	41.0	375	PVC	0.30	94.6	81%	0.86	0.96
	DSEL	MH47A	MH101A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	94.6	81%	0.86	0.96
	DSEL	MH101A	MH102A	0.0	0	0.0	0	0.0	0	55.5	4,027	3.33	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	0.0	62.9	17.6	76.2	64.0	375	PVC	0.30	94.6	81%	0.86	0.96
N-7	DSEL	MH102A	MH17A	4.0	291	1.2	129	5.2	420	60.7	4,447	3.29	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	2.5	4.3	5.2	68.1	19.1	82.7	81.0	375	PVC	0.30	94.6	87%	0.86	0.98
Cambrian Road																																				
N-3		MH17A	MH21A	26.0	1956	0.0	0	26.0	1,956	147.9	13,187	2.83	151.2	0.0	43.9	0.0	0.0	0.0	0.0	3.0	26.0	5.1	26.3	60.7	34.1	244.1	68.3	280.2	204.3	750	CPP	0.13	419.5	67%	0.92	0.99
N-8		MH21A	MH45	7.0	408	0.0	0	7.0	408	154.9	13,595	2.82	155.3	0.0	43.9	0.0	0.0	0.0	0.0	0.0	26.0	2.9	29.2	60.7	9.9	254.0	71.1	287.1	277.8	750	CPP	0.13	419.5	68%	0.92	1.00
Greenbank Road																																				
Area 4 (Minto)			MH205A	34.7	3538	0.0	0	34.7	3,538	34.70	3,538	3.38	48.4	0.0	0.0	0.0	0.0	0.0	0.0	8.2	8.2	17.1	17.1	7.1	60.0	60.0	16.8	72.3	-	-	-	-	-	-	-	-
MSS-A-14	IBI	MH205A	MH98A	0.0	0	21.0	2246	21.0	2,246	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	21.0	81.0	22.7	104.5	126.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH98A	MH99A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH99A	MH100A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	108.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH100A	MH204A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	105.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH204A	MH206A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	103.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH206A	MH97A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
N-13, N-13-R	IBI	MH97A	MH96A	19.9	1625	0.1	6	20.0	1,631	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.8	17.9	7.1	20.8	101.8	28.5	128.1	98.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH96A	MH95A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	129.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH95A	MH201A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	123.0	600	CPP	0.30	350.4	37%	1.20	1.09
N-11, N-11-R	IBI	MH201A	MH201B	12.1	787	0.0	0	12.1	787	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	12.1	113.9	31.9	140.0	124.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH201B	MH200A	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	68.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH200A	MH200C	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	48.0	600	CPP	0.50	452.6	31%	1.55	1.35
	IBI	MH200C	MH45	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	26.0	600	CPP	0.12	221.9	63%	0.76	0.81
MSS-A-15		MH45	MH435A	0.0	0	5.1	548	5.1	548	247.8	22,345	2.60	235.3	0.0	43.9	0.0	0.0	0.0	0.0	0.0	34.2	0.0	47.1	67.8	5.1	373.0	104.4	407.5	296.6	900	CPP	0.10	597.0	68%	0.91	0.99
North																																				
MSS-A-9		MA9	MA8	0.0	0	22.2	2378	22.2	2,378	22.2	2,378	3.53	34.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	9.5	9.5	2.2	34.2	34.2	9.6	45.8	507.5	450	CPP	0.11	98.4	47%	0.60	0.59
MSS-A-8		MA8	MA7	0.0	0	2.9	308	2.9	308	25.1	2,686	3.48	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.8	10.3	2.2	3.7	37.9	10.6	50.7	317.1	450	CPP	0.11	98.4	52%	0.60	0.61
MSS-A-7		MA7	MA6	0.0	0	18.5	1979	18.5	1,979	43.6	4,665	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	18.5	56.4	15.8	79.8	573.1	450	CPP	0.11	98.4	81%	0.60	0.67
MSS-A-6		MA6	MA5	0.0	0	21.7	2320	21.7	2,320	65.3	6,985	3.11	88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	21.7	78.1	21.9	112.1	473.9	600	CPP	0.10	201.5	56%	0.69	0.71
MSS-A-5		MA5	M27A	0.0	0	9.5	1020	9.5	1,020	74.8	8,005	3.05	98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	9.5	87.6	24.5	125.6	220.0	600	CPP	0.10	201.5	62%	0.69	0.73
MSS-A-4		M27A	MH5200A	0.0	0	8.1	863	8.1	863	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	8.1	95.7	26.8	137.1	501.5	600	CPP	0.15	248.2	55%	0.85	0.87
		MH5200A	MH520A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	46.0	600	CPP	0.08	181.0	76%	0.62	0.69
		MH520A	MH521A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	44.4	600	CPP	0.10	201.5	68%	0.69	0.75
N-1		MH521A	MH522A	3.3	177	0.5	54	3.8	231	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	3.8	99.5	27.9	140.7	50.1	600	CPP	0.09	192.7	73%	0.66	0.73
		MH522A	MH435A	0.0	0	0.0	0	0.0	0	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	99.5	27.9	140.7	10.8	600	CPP	0.21	292.0	48%	1.00	0.99
		MH435A	MH501A	0.0	0	0.0	0	0.0	0	334.5	31,444	2.46	313.3	0.0	43.9	0.0	0.0	0.0	0.0	0.0	36.7	0.0	57.4	70.0	0.0	472.5	132.3	515.6	13.3	900	CPP	0.11	623.2	83%	0.95	1.07

Note: Area 3 (Mattamy) was acocunted for in this spreadsheet orginally as part of catchment N-14 and N-15 and thus values for this catchment have been set to zero.

5 - Half Moon Bay South Sanitary Sewer Design Sheet - Alternative 3 (revised September 19th 2016)

Stantec

SUBDIVISION: HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX103A	EX103	EX102	0.80	18	0	0	61	0.80	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.2	120.0	200	PVC	SDR 35	2.02	47.5	**2.56%**	1.49	0.54
EX123AA	EX123A	EX123	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.06	2.06	0.00	0.00	1.8	2.06	2.06	0.6	2.4	15.8	250	PVC	SDR 35	0.89	57.1	**4.14%**	1.15	0.47
EX23AA	EX23A	EX23	0.67	15	0	0	51	0.67	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.0	105.0	200	PVC	SDR 35	0.37	20.4	**4.97%**	0.64	0.28
EX23A	EX23	EX126	0.40	6	0	0	20	1.06	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.40	1.06	0.3	1.5	89.3	200	PVC	SDR 35	1.47	40.5	**3.59%**	1.27	0.50
EX131A	EX131	EX130	0.80	19	0	0	65	0.80	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.3	112.3	200	PVC	SDR 35	1.00	33.4	**3.80%**	1.05	0.42
EX130B, EX130A	EX130	EX128	0.36	6	0	0	20	1.16	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.0	0.76	1.56	0.4	1.8	96.5	200	PVC	SDR 35	0.50	23.6	**7.68%**	0.74	0.37
SA202A	202	201	0.53	4	0	0	14	0.53	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.53	0.53	0.1	0.4	50.0	200	PVC	SDR 35	3.25	60.3	**0.61%**	1.90	0.46
SA213A	213	212	0.93	21	0	0	71	0.93	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.93	0.93	0.3	1.4	120.0	200	PVC	SDR 35	0.65	27.0	**5.26%**	0.85	0.37
SA212A	212	211	0.20	3	0	0	10	1.13	82	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	1.13	0.3	1.6	12.8	200	PVC	SDR 35	0.40	21.1	**7.75%**	0.67	0.33
SA211A	211	210	0.27	5	0	0	17	1.40	99	4.00	1.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	1.40	0.4	2.0	59.5	200	PVC	SDR 35	0.40	21.1	**9.41%**	0.67	0.35
SA210A	210	209	0.06	1	0	0	3	1.46	102	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.46	0.4	2.1	11.0	200	PVC	SDR 35	0.40	21.1	**9.75%**	0.67	0.35
SA209A	209	208	0.29	7	0	0	24	1.75	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.29	1.75	0.5	2.5	40.6	200	PVC	SDR 35	0.40	21.1	**11.95%**	0.67	0.37
SA208A	208	203	0.75	18	0	0	61	2.50	187	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.75	2.50	0.7	3.7	120.0	200	PVC	SDR 35	0.40	21.1	**17.63%**	0.67	0.42
SA207A	207	206	0.18	0	9	0	24	0.18	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.18	0.0	0.4	63.7	200	PVC	SDR 35	1.75	44.2	**1.00%**	1.39	0.37
SA206A	206	205	0.17	0	9	0	24	0.35	49	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.35	0.1	0.9	63.7	200	PVC	SDR 35	1.75	44.2	**2.00%**	1.39	0.46
SA205AA	205A	205	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	3.10	0.0	3.10	3.10	0.9	0.9	7.7	150	PVC	DR 28	1.00	15.3	**5.66%**	0.86	0.39
SA205A	205	204	0.04	0	1	0	3	0.40	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.04	3.50	1.0	1.8	11.0	200	PVC	SDR 35	1.50	41.0	**4.42%**	1.29	0.55
SA204A	204	203	0.14	0	4	0	11	0.54	62	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.14	3.64	1.0	2.0	36.5	200	PVC	SDR 35	1.50	41.0	**4.94%**	1.29	0.55
SA216A	216	215	0.19	0	5	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	45.2	200	PVC	SDR 35	0.65	27.0	**1.01%**	0.85	0.23
Area 5 (Mattamy)		217	2.34				239	2.34	239	4.00	3.9	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.55	1.15	1.15	0.5	4.04	4.04	1.1	5.5									
SA217A, External	217	215	2.72	61	0	0	207	5.06	446	4.00	7.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	2.72	6.76	1.9	9.6	34.5	200	PVC	SDR 35	2.00	47.3	**20.31%**	1.49	0.97
SA215A	215	214	0.34	0	15	0	41	5.59	500	3.97	8.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.34	7.29	2.0	10.6	72.0	200	PVC	SDR 35	2.00	47.3	**22.36%**	1.49	1.00
SA214A	214	203	0.35	0	15	0	41	5.94	541	3.96	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.35	7.64	2.1	11.3	73.5	200	PVC	SDR 35	2.00	47.3	**23.87%**	1.49	1.01
SA203A	203	201	0.12	0	0	0	0	9.09	790	3.86	12.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.25	0.5	0.12	13.89	3.9	16.7	73.7	200	PVC	SDR 35	0.40	21.1	**79.12%**	0.67	0.65
SA201A	201	EX129A	0.21	3	0	0	10	9.83	814	3.86	12.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.25	0.5	0.21	14.63	4.1	17.3	47.8	200	PVC	SDR 35	0.40	21.1	**81.74%**	0.67	0.66
EX129AA	EX129A	EX129	0.75	18	0	0	61	10.58	875	3.84	13.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.25	0.5	0.75	15.38	4.3	18.4	100.9	200	PVC	SDR 35	0.40	21.1	**86.94%**	0.67	0.67
EX129A	EX129	EX128	0.58	11	0	0	37	11.16	912	3.83	14.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.25	0.5	0.58	15.96	4.5	19.1	91.7	200	PVC	SDR 35	0.40	21.1	**90.25%**	0.67	0.68
EX128A	EX128	EX127	0.37	9	0	0	31	12.69	1028	3.79	15.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.65	0.5	0.37	17.89	5.0	21.3	49.8	200	PVC	SDR 35	0.50	23.6	**90.00%**	0.74	0.76
EX127A	EX127	EX126	0.66	13	0	0	44	13.35	1072	3.78	16.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	4.65	0.5	0.66	18.55	5.2	22.1	97.8	200	PVC	SDR 35	0.32	19.0	**116.18%**	0.60	0.60
SA163A	163	162	7.96	118	43	0	517	7.96	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	2.83	2.83	0.00	0.00	2.5	10.79	10.79	3.0	13.8	36.3	250	PVC	SDR 35	0.85	55.9	**24.67%**	1.13	0.78
SA162A	162	161	0.20	0	0	0	0	8.16	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.00	2.5	0.20	10.99	3.1	13.8	87.2	250	PVC	SDR 35	1.15	65.0	**21.29%**	1.31	0.86
SA161AA	161A	161	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.0	0.91	0.91	0.3	0.3	14.0	150	PVC	DR 28	1.00	15.3	**1.66%**	0.86	0.27
SA161A	161	151	0.19	0	0	0	0	8.35	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.91	2.5	0.19	12.09	3.4	14.2	57.7	250	PVC	SDR 35	1.15	65.0	**21.77%**	1.31	0.88
SA151AA	151A	151	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.77	2.77	0.00	0.00	2.4	2.77	2.77	0.8	3.2	12.7	150	PVC	DR 28	1.00	15.3	**20.77%**	0.86	0.57
EX151A	151	EX151	0.09	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.09	14.95	4.2	17.4	17.9	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
	EX151	EX142	0.00	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.00	14.95	4.2	17.4	44.4	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
SA165A	165	150	0.67	17	0	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	101.2	200	PVC	SDR 35	1.50	41.0	**2.75%**	1.29	0.47
SA155A	155	154	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.43%**	0.85	0.18
SA154A	154	153	0.48	0	22	0	59	0.59	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.59	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.74%**	0.67	0.30
SA160A	160	159	0.04	0	1	0	3	0.04	3	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.04	0.04	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.21%**	0.85	0.13
SA159A	159	158	0.51	0	23	0	62	0.56	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.56	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.70%**	0.67	0.30
SA158A, External	158	153	1.50	14	50	0	118	2.06	183	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.50	2.06	0.6	3.5	45.0	200	PVC	SDR 35	0.40	21.1	**16.73%**	0.67	0.41
SA153A, External	153	152	1.46	12	21	0	98	4.10	345	4.00	5.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.46	4.10	1.1	6.7	70.0	200	PVC	SDR 35	0.80	29.9	**22.53%**	0.94	0.63
SA152A, External	152	150	0.56	14	0	0	48	4.66	393	4.00	6.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.56	4.66	1.3	7.7	85.7	200	PVC	SDR 35	0.80	29.9	**25.64%**	0.94	0.66
SA150A	150	146	0.30	6	0	0	20	5.63	471	3.99	7.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.30	5.63	1.6	9.2	72.0	200	PVC	SDR 35	0.80	29.9	**30.71%**	0.94	0.70
SA149A	149	148	0.27	5	0	0	17	0.27	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	0.27	0.1	0.4	51.2	200	PVC	SDR 35	1.00	33.4	**1.05%**	1.05	0.28
SA148A	148	147	0.15	2	0	0	7	0.42	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.42	0.1	0.5	10.5	200	PVC	SDR 35	1.00	33.4	**1.51%**	1.05	0.32
SA147A	147	146	0.52	13	0	0	44	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.52	0.95	0.3	1.4	78.2	200	PVC	SDR 35	1.00	33.4	**4.09%**	1.05	0.43

Stantec

SUBDIVISION:
HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
SA146A	146	EX145	0.08	2	0	0	7	6.66	546	3.95	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.08	6.66	1.9	10.6	19.3	200	PVC	SDR 35	0.50	23.6	**44.87%**	0.74	0.62
EX145A	EX145	EX144	0.07	0	0	0	0	6.73	546	3.95	8.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	6.73	1.9	10.6	35.9	200	PVC	SDR 35	0.50	23.6	**44.94%**	0.74	0.62
EX144A	EX144	EX143	0.54	9	0	0	31	7.27	576	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.54	7.27	2.0	11.2	114.9	200	PVC	SDR 35	0.50	23.6	**47.53%**	0.74	0.62
	EX143	EX142	0.00	0	0	0	0	7.27	576	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	7.27	2.0	11.2	21.5	200	PVC	SDR 35	0.40	21.1	**53.14%**	0.67	0.58
EX142A	EX142	EX139	0.26	3	0	0	10	15.97	1104	3.77	16.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.26	22.48	6.3	28.0	74.8	300	PVC	SDR 35	0.40	60.7	**46.15%**	0.86	0.72
EX141B	EX141	EX140	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	10.6	200	PVC	SDR 35	0.65	27.0	**0.58%**	0.85	0.18
EX140A	EX140	EX139	0.24	5	0	0	17	0.40	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.40	0.1	0.5	67.7	200	PVC	SDR 35	0.65	27.0	**1.85%**	0.85	0.28
EX139A	EX139	EX136	0.47	10	0	0	34	16.84	1162	3.76	17.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.47	23.35	6.5	29.1	64.7	300	PVC	SDR 35	0.40	60.7	**47.89%**	0.86	0.73
EX141A	EX141	EX138	0.38	8	0	0	27	0.38	27	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	0.5	49.7	200	PVC	SDR 35	0.65	27.0	**2.03%**	0.85	0.28
EX138A	EX138	EX137	0.18	2	0	0	7	0.56	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.56	0.2	0.7	10.6	200	PVC	SDR 35	0.65	27.0	**2.62%**	0.85	0.31
EX137A	EX137	EX136	0.28	5	0	0	17	0.84	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.28	0.84	0.2	1.1	67.8	200	PVC	SDR 35	0.65	27.0	**3.94%**	0.85	0.35
EX136A	EX136	EX126	0.29	4	0	0	14	17.96	1226	3.74	18.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.29	24.48	6.9	30.3	78.9	300	PVC	SDR 35	0.41	61.7	**49.10%**	0.88	0.74
EX126A	EX126	EX123	0.29	0	5	0	14	32.66	2383	3.53	34.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	0.00	5.56	5.3	0.29	44.38	12.4	51.8	71.3	375	PVC	SDR 35	0.45	117.4	**44.11%**	1.06	0.87
EX123A	EX123	EX112	0.34	0	7	0	19	33.00	2402	3.52	34.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.34	46.77	13.1	54.5	90.3	375	PVC	SDR 35	0.42	113.8	**47.91%**	1.03	0.87
EX117A	EX117	EX113	0.15	0	0	0	0	0.15	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.0	90.0	200	PVC	SDR 35	0.65	27.0	**0.15%**	0.85	0.13
EX116A	EX116	EX113	0.50	0	21	0	57	0.50	57	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	1.1	90.6	200	PVC	SDR 35	0.50	23.6	**4.48%**	0.74	0.32
EX113A	EX113	EX112B	0.25	0	10	0	27	0.90	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.25	0.90	0.3	1.6	47.0	200	PVC	SDR 35	0.65	27.0	**5.96%**	0.85	0.39
EX112BA	EX112B	EX111	0.46	0	22	0	59	1.36	143	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.36	0.4	2.7	81.5	200	PVC	SDR 35	0.65	27.0	**10.01%**	0.85	0.45
EX119A	EX119	EX118	0.51	0	30	0	81	0.51	81	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.5	116.9	200	PVC	SDR 35	0.50	23.6	**6.15%**	0.74	0.34
EX122A	EX122	EX121	0.69	0	31	0	84	0.69	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.69	0.69	0.2	1.5	112.0	200	PVC	SDR 35	0.40	21.1	**7.33%**	0.67	0.32
EX121A	EX121	EX120	0.16	0	4	0	11	0.85	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.85	0.2	1.8	8.5	200	PVC	SDR 35	0.40	21.1	**8.37%**	0.67	0.34
EX120A	EX120	EX118	0.17	0	6	0	16	1.02	111	4.00	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	1.02	0.3	2.1	39.0	200	PVC	SDR 35	0.40	21.1	**9.84%**	0.67	0.35
EX118A	EX118	EX111	0.09	0	1	0	3	1.62	194	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.09	1.62	0.5	3.6	46.5	200	PVC	SDR 35	0.40	21.1	**17.04%**	0.67	0.41
EX111A	EX111	EX112	0.42	0	15	0	41	3.39	378	4.00	6.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.42	3.39	0.9	7.1	74.8	200	PVC	SDR 35	0.32	18.9	**37.43%**	0.59	0.47
EX112A	EX112	EX102	0.14	0	0	0	0	36.53	2780	3.47	39.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.14	50.30	14.1	60.3	68.0	375	PVC	SDR 35	0.31	97.4	**61.89%**	0.88	0.81
EX115A	EX115	EX114	0.51	0	22	0	59	0.51	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.1	81.6	200	PVC	SDR 35	0.40	21.1	**5.22%**	0.67	0.29
EX114A	EX114	EX110	0.16	0	3	0	8	0.67	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.67	0.2	1.3	10.6	200	PVC	SDR 35	0.40	21.1	**6.05%**	0.67	0.30
EX110A	EX110	EX108	0.17	0	6	0	16	0.83	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.83	0.2	1.6	37.5	200	PVC	SDR 35	0.40	21.1	**7.51%**	0.67	0.32
EX109A	EX109	EX108	0.38	0	22	0	59	0.38	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	1.1	85.6	200	PVC	SDR 35	0.65	27.0	**3.96%**	0.85	0.35
EX108A	EX108	EX107	0.48	0	15	0	41	1.69	184	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	1.69	0.5	3.4	106.8	200	PVC	SDR 35	0.40	21.1	**16.30%**	0.67	0.41
EX107A	EX107	EX106	0.15	0	3	0	8	1.84	192	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.84	0.5	3.6	10.4	200	PVC	SDR 35	0.40	21.1	**17.13%**	0.67	0.41
EX106A	EX106	EX105	0.65	0	22	0	59	2.49	251	4.00	4.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.65	2.49	0.7	4.8	92.1	200	PVC	SDR 35	0.40	21.1	**22.54%**	0.67	0.45
EX105A	EX105	EX104	0.61	0	22	0	59	3.11	311	4.00	5.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.61	3.11	0.9	5.9	88.7	200	PVC	SDR 35	0.40	21.1	**27.90%**	0.67	0.48
EX104A	EX104	EX102	0.73	0	28	0	76	3.83	386	4.00	6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.73	3.83	1.1	7.3	114.6	200	PVC	SDR 35	0.44	22.2	**33.05%**	0.70	0.52
EX102A	EX102	EX101	0.07	0	0	0	0	41.23	3228	3.42	44.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.07	55.00	15.4	67.2	34.0	375	PVC	SDR 35	0.29	95.1	**70.65%**	0.86	0.82
																												375							
EX7A	EX7	EX6	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	11.1	200	PVC	SDR 35	0.63	26.5	**0.44%**	0.83	0.18
EX6A	EX6	EX5	0.66	0	31	0	84	0.76	89	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.66	0.76	0.2	1.7	117.0	200	PVC	SDR 35	0.65	26.9	**6.15%**	0.85	0.39
EX5A	EX5	EX4	0.07	0	2	0	5	0.83	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	0.83	0.2	1.8	8.5	200	PVC	SDR 35	1.18	36.3	**4.86%**	1.14	0.49
EX4A	EX4	EX3	0.05	0	0	0	0	0.88	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.05	0.88	0.2	1.8	39.0	200	PVC	SDR 35	1.08	34.7	**5.12%**	1.09	0.48
EX10A, EX10B	EX10	EX9	0.33	5	0	0	17	0.33	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.0	0.89	0.89	0.2	0.5	75.3	200	PVC	SDR 35	0.92	32.0	**1.64%**	1.01	0.31
EX18A	EX18	EX19	0.14	2	0	0	7	0.14	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.14	0.14	0.0	0.1	8.5	200	PVC	SDR 35	0.83	30.4	**0.49%**	0.96	0.21
EX19A	EX19	EX9	0.62	11	12	0	70	0.76	77	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.62	0.76	0.2	1.5	107.0	200	PVC	SDR 35	0.63	26.5	**5.50%**	0.83	0.37
EX9A	EX9	EX8	0.07	0	0	0	0	1.16	94	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.07	1.72	0.5	2.0	48.0	200	PVC	SDR 35	0.96	32.7	**6.11%**	1.03	0.47
EX14A	EX14	EX13	0.13	0	2	0	5	0.13	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.13	0.13	0.0	0.1	9.5	200	PVC	SDR 35	0.74	28.7	**0.43%**	0.90	0.20
EX13A	EX13	EX12	0.43	0	20	0	54	0.57	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.57	0.2	1.1	82.1	200	PVC	SDR 35	0.65	26.9	**4.17%**	0.85	0.35
EX12A	EX12	EX11	0.44	0	21	0	57	1.01	116	4.00	1.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.01	0.3	2.2	82.1	200	PVC	SDR 35	0.41	21.5	**10.06%**	0.68	0.36
EX18B	EX18	EX15	0.15	3	0	0	10	0.15	10	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.2	42.0	200	PVC	SDR 35	2.38	51.6	**0.40%**	1.62	0.31
EX17A	EX17	EX16	0.67	9	10	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	84.1	200	PVC	SDR 35	0.44	22.2	**5.05%**	0.70	0.31

Stantec

SUBDIVISION:
HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX16A	EX16	EX15	0.49	7	9	0	48	1.16	106	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.49	1.16	0.3	2.0	79.0	200	PVC	SDR 35	0.34	19.5	**10.42%**	0.62	0.33
EX22A	EX22	EX21	0.51	11	0	0	37	0.51	37	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	0.8	55.9	200	PVC	SDR 35	0.72	28.3	**2.65%**	0.89	0.32
EX21A	EX21	EX20	0.63	16	0	0	54	1.14	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.63	1.14	0.3	1.8	97.5	200	PVC	SDR 35	0.60	26.0	**6.95%**	0.82	0.39
EX33A	EX33	EX32	0.68	14	0	0	48	0.68	48	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.68	0.68	0.2	1.0	90.6	200	PVC	SDR 35	0.40	21.1	**4.54%**	0.67	0.28
EX32A	EX32	EX31	0.11	1	0	0	3	0.78	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	0.78	0.2	1.0	10.6	200	PVC	SDR 35	0.40	21.1	**4.94%**	0.67	0.28
EX31A	EX31	EX30	0.46	10	0	0	34	1.25	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.25	0.3	1.7	57.5	200	PVC	SDR 35	0.40	21.1	**8.16%**	0.67	0.33
EX30A	EX30	EX29	0.15	2	0	0	7	1.40	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.40	0.4	1.9	10.6	200	PVC	SDR 35	0.40	21.1	**8.89%**	0.67	0.34
EX29A	EX29	EX28	0.44	10	0	0	34	1.84	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.84	0.5	2.6	71.7	200	PVC	SDR 35	0.40	21.1	**12.08%**	0.67	0.37
EX28A	EX28	EX24	0.21	4	0	0	14	2.05	139	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	2.05	0.6	2.8	54.6	200	PVC	SDR 35	0.80	29.9	**9.47%**	0.94	0.49
EX27A	EX27	EX26	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.2	200	PVC	SDR 35	0.65	27.0	**0.57%**	0.85	0.18
EX26A	EX26	EX25	0.31	8	0	0	27	0.47	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.47	0.1	0.7	48.8	200	PVC	SDR 35	0.40	21.1	**3.22%**	0.67	0.25
EX25A	EX25	EX24	0.48	10	0	0	34	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.95	0.3	1.4	91.3	200	PVC	SDR 35	0.60	25.9	**5.28%**	0.81	0.36
EX36A	EX36	EX35	0.76	19	0	0	65	0.76	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.76	0.76	0.2	1.3	91.7	200	PVC	SDR 35	0.50	23.6	**5.32%**	0.74	0.33
EX35A	EX35	EX34	0.12	2	0	0	7	0.88	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	0.88	0.2	1.4	43.9	200	PVC	SDR 35	0.60	25.9	**5.42%**	0.81	0.36
EX40A	EX40	EX39	0.50	12	0	0	41	0.50	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	0.8	65.7	200	PVC	SDR 35	1.60	42.3	**1.90%**	1.33	0.44
EX45A	EX45	EX44	0.67	16	0	0	54	0.67	54	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	112.3	200	PVC	SDR 35	1.20	36.6	**2.92%**	1.15	0.44
EX44A	EX44	EX43	0.17	2	0	0	7	0.84	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.84	0.2	1.2	10.6	200	PVC	SDR 35	0.80	29.9	**4.10%**	0.94	0.39
EX43A	EX43	EX42	0.78	18	0	0	61	1.63	122	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.78	1.63	0.5	2.4	103.5	200	PVC	SDR 35	0.80	29.9	**8.15%**	0.94	0.47
EX42A	EX42	EX41	0.06	1	0	0	3	1.68	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.68	0.5	2.5	10.6	200	PVC	SDR 35	0.80	29.9	**8.39%**	0.94	0.48
EX41A	EX41	EX39	0.10	0	0	0	0	1.79	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	1.79	0.5	2.5	64.5	200	PVC	SDR 35	0.40	21.1	**12.02%**	0.66	0.37
EX39A	EX39	EX38	0.67	17	0	0	58	2.96	224	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	2.96	0.8	4.5	94.6	200	PVC	SDR 35	0.40	21.1	**21.11%**	0.67	0.44
EX38A	EX38	EX37	0.21	5	0	0	17	3.16	241	4.00	3.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	3.16	0.9	4.8	46.8	200	PVC	SDR 35	0.40	21.1	**22.69%**	0.67	0.45
EX52A	EX52	EX51	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.6	200	PVC	SDR 35	0.75	29.0	**0.54%**	0.91	0.20
EX51A	EX51	EX50	0.43	11	0	0	37	0.59	44	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.59	0.2	0.9	71.7	200	PVC	SDR 35	0.75	29.0	**3.05%**	0.91	0.35
EX54A	EX54	EX53	0.45	9	0	0	31	0.45	31	4.00	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.45	0.45	0.1	0.6	71.2	200	PVC	SDR 35	0.45	22.4	**2.77%**	0.71	0.26
SA62A	62	61	0.24	4	0	0	14	0.24	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.24	0.1	0.3	46.2	200	PVC	SDR 35	0.65	27.0	**1.07%**	0.85	0.23
SA61A	61	60	0.22	3	0	0	10	0.46	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.46	0.1	0.5	11.0	200	PVC	SDR 35	0.65	27.0	**1.91%**	0.85	0.28
SA60A	60	59	0.31	8	0	0	27	0.77	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.77	0.2	1.0	53.3	200	PVC	SDR 35	0.50	23.6	**4.40%**	0.74	0.32
SA64A	64	63	0.19	4	0	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	48.9	200	PVC	SDR 35	2.00	47.3	**0.58%**	1.49	0.32
SA65A	65	63	0.54	12	0	0	41	0.54	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.54	0.54	0.2	0.8	72.4	200	PVC	SDR 35	0.65	27.0	**3.01%**	0.85	0.32
SA63A	63	59	0.32	7	0	0	24	1.05	78	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.32	1.05	0.3	1.6	70.6	200	PVC	SDR 35	0.75	29.0	**5.39%**	0.91	0.40
SA59A	59	EX58A	0.30	6	0	0	20	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.30	2.12	0.6	3.0	59.3	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
	EX58A	EX58	0.00	0	0	0	0	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.12	0.6	3.0	12.6	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
EX58A	EX58	EX57	0.47	12	0	0	41	2.59	190	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.47	2.59	0.7	3.8	64.5	200	PVC	SDR 35	0.75	29.0	**13.16%**	0.91	0.52
EX57A	EX57	EX56	0.12	2	0	0	7	2.70	197	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	2.70	0.8	4.0	10.6	200	PVC	SDR 35	0.75	29.0	**13.65%**	0.91	0.53
EX56A	EX56	EX55	0.34	7	0	0	24	3.05	221	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.34	3.05	0.9	4.4	65.6	200	PVC	SDR 35	0.75	29.0	**15.31%**	0.91	0.55
EX55A	EX55	EX53	0.38	8	0	0	27	3.43	248	4.00	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	3.43	1.0	5.0	65.5	200	PVC	SDR 35	0.50	23.6	**21.07%**	0.74	0.49
EX53A	EX53	EX50	0.19	3	0	0	10	4.07	289	4.00	4.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	4.07	1.1	5.8	68.5	200	PVC	SDR 35	0.40	21.1	**27.53%**	0.67	0.47
EX50A	EX50	EX37	0.26	6	0	0	20	4.92	354	4.00	5.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.26	4.92	1.4	7.1	49.1	200	PVC	SDR 35	0.40	21.0	**33.77%**	0.66	0.50
EX37A	EX37	EX34	0.41	10	0	0	34	8.49	629	3.92	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	8.49	2.4	12.4	72.0	200	PVC	SDR 35	0.40	21.1	**58.49%**	0.67	0.59
EX34A	EX34	EX24	0.41	10	0	0	34	9.79	734	3.88	11.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	9.79	2.7	14.3	72.5	200	PVC	SDR 35	0.40	21.1	**67.57%**	0.67	0.62
EX24A	EX24	EX20	0.38	10	0	0	34	13.16	976	3.81	15.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	13.16	3.7	18.7	73.0	200	PVC	SDR 35	0.42	21.7	**86.43%**	0.68	0.69
EX20A	EX20	EX15	0.10	0	0	0	0	14.40	1068	3.78	16.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	14.40	4.0	20.4	71.0	250	PVC	SDR 35	0.37	36.7	**55.56%**	0.74	0.65
EX15A	EX15	EX11	0.20	0	8	0	22	15.92	1205	3.75	18.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	15.92	4.5	22.7	68.0	300	PVC	SDR 35	0.34	55.8	**40.73%**	0.79	0.64
EX11A	EX11	EX8	0.11	0	4	0	11	17.05	1332	3.72	20.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	17.05	4.8	24.8	45.0	300	PVC	SDR 35	0.98	94.9	**26.15%**	1.35	0.95
EX8A	EX8	EX3	0.15	0	6	0	16	18.35	1442	3.69	21.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.15	18.91	5.3	26.9	50.3	300	PVC	SDR 35	0.38	59.0	**45.49%**	0.84	0.70
EX3A	EX3	EX2	0.30	0	18	0	49	19.53	1585	3.66	23.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.30	20.09	5.6	29.1	68.1	300	PVC	SDR 35	0.37	58.2	**50.08%**	0.83	0.71
EX2A	EX2	EX1	0.36	0	15	0	41	19.89	1625	3.65	24.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.36	20.45	5.7	29.8	68.1	300	PVC	SDR 35	0.35	57.0	**52.25%**	0.81	0.70
																												300							

6 - Half Moon Bay South Sanitary Sewer Design Sheet - Alternative 4 (revised September 19th 2016)

Stantec

SUBDIVISION:
HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX103A	EX103	EX102	0.80	18	0	0	61	0.80	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.2	120.0	200	PVC	SDR 35	2.02	47.5	**2.56%**	1.49	0.54
EX123AA	EX123A	EX123	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.06	2.06	0.00	0.00	1.8	2.06	2.06	0.6	2.4	15.8	250	PVC	SDR 35	0.89	57.1	**4.14%**	1.15	0.47
EX23AA	EX23A	EX23	0.67	15	0	0	51	0.67	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.0	105.0	200	PVC	SDR 35	0.37	20.4	**4.97%**	0.64	0.28
EX23A	EX23	EX126	0.40	6	0	0	20	1.06	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.40	1.06	0.3	1.5	89.3	200	PVC	SDR 35	1.47	40.5	**3.59%**	1.27	0.50
EX131A	EX131	EX130	0.80	19	0	0	65	0.80	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.80	0.80	0.2	1.3	112.3	200	PVC	SDR 35	1.00	33.4	**3.80%**	1.05	0.42
EX130B, EX130A	EX130	EX128	0.36	6	0	0	20	1.16	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.0	0.76	1.56	0.4	1.8	96.5	200	PVC	SDR 35	0.50	23.6	**7.68%**	0.74	0.37
SA202A	202	201	0.53	4	0	0	14	0.53	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.53	0.53	0.1	0.4	50.0	200	PVC	SDR 35	3.25	60.3	**0.61%**	1.90	0.46
SA213A	213	212	0.93	21	0	0	71	0.93	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.93	0.93	0.3	1.4	120.0	200	PVC	SDR 35	0.65	27.0	**5.26%**	0.85	0.37
SA212A	212	211	0.20	3	0	0	10	1.13	82	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	1.13	0.3	1.6	12.8	200	PVC	SDR 35	0.40	21.1	**7.75%**	0.67	0.33
SA211A	211	210	0.27	5	0	0	17	1.40	99	4.00	1.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	1.40	0.4	2.0	59.5	200	PVC	SDR 35	0.40	21.1	**9.41%**	0.67	0.35
SA210A	210	209	0.06	1	0	0	3	1.46	102	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.46	0.4	2.1	11.0	200	PVC	SDR 35	0.40	21.1	**9.75%**	0.67	0.35
SA209A	209	208	0.29	7	0	0	24	1.75	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.29	1.75	0.5	2.5	40.6	200	PVC	SDR 35	0.40	21.1	**11.95%**	0.67	0.37
SA208A	208	203	0.75	18	0	0	61	2.50	187	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.75	2.50	0.7	3.7	120.0	200	PVC	SDR 35	0.40	21.1	**17.63%**	0.67	0.42
SA207A	207	206	0.18	0	9	0	24	0.18	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.18	0.0	0.4	63.7	200	PVC	SDR 35	1.75	44.2	**1.00%**	1.39	0.37
SA206A	206	205	0.17	0	9	0	24	0.35	49	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.35	0.1	0.9	63.7	200	PVC	SDR 35	1.75	44.2	**2.00%**	1.39	0.46
SA205AA	205A	205	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	3.10	0.0	3.10	3.10	0.9	0.9	7.7	150	PVC	DR 28	1.00	15.3	**5.66%**	0.86	0.39
SA205A	205	204	0.04	0	1	0	3	0.40	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.04	3.50	1.0	1.8	11.0	200	PVC	SDR 35	1.50	41.0	**4.42%**	1.29	0.55
SA204A	204	203	0.14	0	4	0	11	0.54	62	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.14	3.64	1.0	2.0	36.5	200	PVC	SDR 35	1.50	41.0	**4.94%**	1.29	0.55
SA216A	216	215	0.19	0	5	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	45.2	200	PVC	SDR 35	0.65	27.0	**1.01%**	0.85	0.23
SA217A, External	217	215	2.72	61	0	0	207	2.72	207	4.00	3.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	2.72	2.72	0.8	4.1	34.5	200	PVC	SDR 35	2.00	47.3	**8.72%**	1.49	0.76
SA215A	215	214	0.34	0	15	0	41	3.25	261	4.00	4.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.34	3.25	0.9	5.1	72.0	200	PVC	SDR 35	2.00	47.3	**10.88%**	1.49	0.81
SA214A	214	203	0.35	0	15	0	41	3.60	302	4.00	4.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.35	3.60	1.0	5.9	73.5	200	PVC	SDR 35	2.00	47.3	**12.48%**	1.49	0.85
SA203A	203	201	0.12	0	0	0	0	6.75	551	3.95	8.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.12	9.85	2.8	11.6	73.7	200	PVC	SDR 35	0.40	21.1	**54.76%**	0.67	0.58
SA201A	201	EX129A	0.21	3	0	0	10	7.49	575	3.94	9.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.21	10.59	3.0	12.1	47.8	200	PVC	SDR 35	0.40	21.1	**57.43%**	0.67	0.59
EX129AA	EX129A	EX129	0.75	18	0	0	61	8.24	636	3.92	10.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.75	11.34	3.2	13.3	100.9	200	PVC	SDR 35	0.40	21.1	**62.76%**	0.67	0.61
EX129A	EX129	EX128	0.58	11	0	0	37	8.82	673	3.90	10.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.0	0.58	11.92	3.3	14.0	91.7	200	PVC	SDR 35	0.40	21.1	**66.15%**	0.67	0.62
EX128A	EX128	EX127	0.37	9	0	0	31	10.35	789	3.86	12.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.0	0.37	13.85	3.9	16.2	49.8	200	PVC	SDR 35	0.50	23.6	**68.64%**	0.74	0.70
EX127A	EX127	EX126	0.66	13	0	0	44	11.01	833	3.85	13.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	0.0	0.66	14.51	4.1	17.1	97.8	200	PVC	SDR 35	0.32	19.0	**89.70%**	0.60	0.61
SA163A	163	162	7.96	118	43	0	517	7.96	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	2.83	2.83	0.00	0.00	2.5	10.79	10.79	3.0	13.8	36.3	250	PVC	SDR 35	0.85	55.9	**24.67%**	1.13	0.78
SA162A	162	161	0.20	0	0	0	0	8.16	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.00	2.5	0.20	10.99	3.1	13.8	87.2	250	PVC	SDR 35	1.15	65.0	**21.29%**	1.31	0.86
SA161AA	161A	161	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.0	0.91	0.91	0.3	0.3	14.0	150	PVC	DR 28	1.00	15.3	**1.66%**	0.86	0.27
SA161A	161	151	0.19	0	0	0	0	8.35	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.91	2.5	0.19	12.09	3.4	14.2	57.7	250	PVC	SDR 35	1.15	65.0	**21.77%**	1.31	0.88
SA151AA	151A	151	0.00	0	0	0	0	0.00	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.77	2.77	0.00	0.00	2.4	2.77	2.77	0.8	3.2	12.7	150	PVC	DR 28	1.00	15.3	**20.77%**	0.86	0.57
EX151A	151	EX151	0.09	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.09	14.95	4.2	17.4	17.9	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
	EX151	EX142	0.00	0	0	0	0	8.44	517	3.97	8.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.91	4.9	0.00	14.95	4.2	17.4	44.4	300	PVC	SDR 35	1.40	113.6	**15.28%**	1.61	0.98
SA165A	165	150	0.67	17	0	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	101.2	200	PVC	SDR 35	1.50	41.0	**2.75%**	1.29	0.47
SA155A	155	154	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.43%**	0.85	0.18
SA154A	154	153	0.48	0	22	0	59	0.59	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.59	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.74%**	0.67	0.30
SA160A	160	159	0.04	0	1	0	3	0.04	3	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.04	0.04	0.0	0.1	10.6	200	PVC	SDR 35	0.65	27.0	**0.21%**	0.85	0.13
SA159A	159	158	0.51	0	23	0	62	0.56	65	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.56	0.2	1.2	95.5	200	PVC	SDR 35	0.40	21.1	**5.70%**	0.67	0.30
Area 5 (Mattamy)		158	2.34				239	2.34	239	4.00	3.9	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.55	1.15	1.15	0.5	4.04	4.04	1.1	5.5									
SA158A, External	158	153	1.50	14	50	0	118	4.40	422	4.00	6.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	1.50	6.10	1.7	9.0	45.0	200	PVC	SDR 35	0.40	21.1	**42.65%**	0.67	0.54
SA153A, External	153	152	1.46	12	21	0	98	6.44	584	3.94	9.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	1.46	8.14	2.3	12.1	70.0	200	PVC	SDR 35	0.80	29.9	**40.38%**	0.94	0.76
SA152A, External	152	150	0.56	14	0	0	48	7.00	632	3.92	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.56	8.70	2.4	12.9	85.7	200	PVC	SDR 35	0.80	29.9	**43.28%**	0.94	0.77
SA150A	150	146	0.30	6	0	0	20	7.97	710	3.89	11.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.30	9.67	2.7	14.4	72.0	200	PVC	SDR 35	0.80	29.9	**48.07%**	0.94	0.80
SA149A	149	148	0.27	5	0	0	17	0.27	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.27	0.27	0.1	0.4	51.2	200	PVC	SDR 35	1.00	33.4	**1.05%**	1.05	0.28
SA148A	148	147	0.15	2	0	0	7	0.42	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.42	0.1	0.5	10.5	200	PVC	SDR 35	1.00	33.4	**1.51%**	1.05	0.32

Stantec

SUBDIVISION:

HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
SA147A	147	146	0.52	13	0	0	44	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.52	0.95	0.3	1.4	78.2	200	PVC	SDR 35	1.00	33.4	**4.09%**	1.05	0.43
SA146A	146	EX145	0.08	2	0	0	7	9.00	785	3.87	12.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.08	10.70	3.0	15.8	19.3	200	PVC	SDR 35	0.50	23.6	**66.67%**	0.74	0.69
EX145A	EX145	EX144	0.07	0	0	0	0	9.07	785	3.87	12.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.07	10.77	3.0	15.8	35.9	200	PVC	SDR 35	0.50	23.6	**66.74%**	0.74	0.70
EX144A	EX144	EX143	0.54	9	0	0	31	9.61	815	3.86	12.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.54	11.31	3.2	16.4	114.9	200	PVC	SDR 35	0.50	23.6	**69.27%**	0.74	0.70
	EX143	EX142	0.00	0	0	0	0	9.61	815	3.86	12.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	1.15	0.5	0.00	11.31	3.2	16.4	21.5	200	PVC	SDR 35	0.40	21.1	**77.44%**	0.67	0.65
EX142A	EX142	EX139	0.26	3	0	0	10	18.31	1343	3.71	20.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	0.00	2.06	5.3	0.26	26.52	7.4	33.0	74.8	300	PVC	SDR 35	0.40	60.7	**54.29%**	0.86	0.76
EX141B	EX141	EX140	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	10.6	200	PVC	SDR 35	0.65	27.0	**0.58%**	0.85	0.18
EX140A	EX140	EX139	0.24	5	0	0	17	0.40	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.40	0.1	0.5	67.7	200	PVC	SDR 35	0.65	27.0	**1.85%**	0.85	0.28
EX139A	EX139	EX136	0.47	10	0	0	34	19.18	1401	3.70	21.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	0.00	2.06	5.3	0.47	27.39	7.7	34.0	64.7	300	PVC	SDR 35	0.40	60.7	**56.00%**	0.86	0.76
EX141A	EX141	EX138	0.38	8	0	0	27	0.38	27	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	0.5	49.7	200	PVC	SDR 35	0.65	27.0	**2.03%**	0.85	0.28
EX138A	EX138	EX137	0.18	2	0	0	7	0.56	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.56	0.2	0.7	10.6	200	PVC	SDR 35	0.65	27.0	**2.62%**	0.85	0.31
EX137A	EX137	EX136	0.28	5	0	0	17	0.84	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.28	0.84	0.2	1.1	67.8	200	PVC	SDR 35	0.65	27.0	**3.94%**	0.85	0.35
EX136A	EX136	EX126	0.29	4	0	0	14	20.30	1465	3.69	21.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	0.00	2.06	5.3	0.29	28.52	8.0	35.2	78.9	300	PVC	SDR 35	0.41	61.7	**57.05%**	0.88	0.78
EX126A	EX126	EX123	0.29	0	5	0	14	32.66	2383	3.53	34.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	0.00	5.56	5.3	0.29	44.38	12.4	51.8	71.3	375	PVC	SDR 35	0.45	117.4	**44.11%**	1.06	0.87
EX123A	EX123	EX112	0.34	0	7	0	19	33.00	2402	3.52	34.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.34	46.77	13.1	54.5	90.3	375	PVC	SDR 35	0.42	113.8	**47.91%**	1.03	0.87
EX117A	EX117	EX113	0.15	0	0	0	0	0.15	0	4.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.0	90.0	200	PVC	SDR 35	0.65	27.0	**0.15%**	0.85	0.13
EX116A	EX116	EX113	0.50	0	21	0	57	0.50	57	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	1.1	90.6	200	PVC	SDR 35	0.50	23.6	**4.48%**	0.74	0.32
EX113A	EX113	EX112B	0.25	0	10	0	27	0.90	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.25	0.90	0.3	1.6	47.0	200	PVC	SDR 35	0.65	27.0	**5.96%**	0.85	0.39
EX112BA	EX112B	EX111	0.46	0	22	0	59	1.36	143	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.36	0.4	2.7	81.5	200	PVC	SDR 35	0.65	27.0	**10.01%**	0.85	0.45
EX119A	EX119	EX118	0.51	0	30	0	81	0.51	81	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.5	116.9	200	PVC	SDR 35	0.50	23.6	**6.15%**	0.74	0.34
EX122A	EX122	EX121	0.69	0	31	0	84	0.69	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.69	0.69	0.2	1.5	112.0	200	PVC	SDR 35	0.40	21.1	**7.33%**	0.67	0.32
EX121A	EX121	EX120	0.16	0	4	0	11	0.85	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.85	0.2	1.8	8.5	200	PVC	SDR 35	0.40	21.1	**8.37%**	0.67	0.34
EX120A	EX120	EX118	0.17	0	6	0	16	1.02	111	4.00	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	1.02	0.3	2.1	39.0	200	PVC	SDR 35	0.40	21.1	**9.84%**	0.67	0.35
EX118A	EX118	EX111	0.09	0	1	0	3	1.62	194	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.09	1.62	0.5	3.6	46.5	200	PVC	SDR 35	0.40	21.1	**17.04%**	0.67	0.41
EX111A	EX111	EX112	0.42	0	15	0	41	3.39	378	4.00	6.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.42	3.39	0.9	7.1	74.8	200	PVC	SDR 35	0.32	18.9	**37.43%**	0.59	0.47
EX112A	EX112	EX102	0.14	0	0	0	0	36.53	2780	3.47	39.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.14	50.30	14.1	60.3	68.0	375	PVC	SDR 35	0.31	97.4	**61.89%**	0.88	0.81
EX115A	EX115	EX114	0.51	0	22	0	59	0.51	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	1.1	81.6	200	PVC	SDR 35	0.40	21.1	**5.22%**	0.67	0.29
EX114A	EX114	EX110	0.16	0	3	0	8	0.67	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.67	0.2	1.3	10.6	200	PVC	SDR 35	0.40	21.1	**6.05%**	0.67	0.30
EX110A	EX110	EX108	0.17	0	6	0	16	0.83	84	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.83	0.2	1.6	37.5	200	PVC	SDR 35	0.40	21.1	**7.51%**	0.67	0.32
EX109A	EX109	EX108	0.38	0	22	0	59	0.38	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	0.38	0.1	1.1	85.6	200	PVC	SDR 35	0.65	27.0	**3.96%**	0.85	0.35
EX108A	EX108	EX107	0.48	0	15	0	41	1.69	184	4.00	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	1.69	0.5	3.4	106.8	200	PVC	SDR 35	0.40	21.1	**16.30%**	0.67	0.41
EX107A	EX107	EX106	0.15	0	3	0	8	1.84	192	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.84	0.5	3.6	10.4	200	PVC	SDR 35	0.40	21.1	**17.13%**	0.67	0.41
EX106A	EX106	EX105	0.65	0	22	0	59	2.49	251	4.00	4.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.65	2.49	0.7	4.8	92.1	200	PVC	SDR 35	0.40	21.1	**22.54%**	0.67	0.45
EX105A	EX105	EX104	0.61	0	22	0	59	3.11	311	4.00	5.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.61	3.11	0.9	5.9	88.7	200	PVC	SDR 35	0.40	21.1	**27.90%**	0.67	0.48
EX104A	EX104	EX102	0.73	0	28	0	76	3.83	386	4.00	6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.73	3.83	1.1	7.3	114.6	200	PVC	SDR 35	0.44	22.2	**33.05%**	0.70	0.52
EX102A	EX102	EX101	0.07	0	0	0	0	41.23	3228	3.42	44.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21	0.00	5.56	7.1	0.07	55.00	15.4	67.2	34.0	375 375	PVC	SDR 35	0.29	95.1	**70.65%**	0.86	0.82
EX7A	EX7	EX6	0.10	0	2	0	5	0.10	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	0.10	0.0	0.1	11.1	200	PVC	SDR 35	0.63	26.5	**0.44%**	0.83	0.18
EX6A	EX6	EX5	0.66	0	31	0	84	0.76	89	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.66	0.76	0.2	1.7	117.0	200	PVC	SDR 35	0.65	26.9	**6.15%**	0.85	0.39
EX5A	EX5	EX4	0.07	0	2	0	5	0.83	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.07	0.83	0.2	1.8	8.5	200	PVC	SDR 35	1.18	36.3	**4.86%**	1.14	0.49
EX4A	EX4	EX3	0.05	0	0	0	0	0.88	95	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.05	0.88	0.2	1.8	39.0	200	PVC	SDR 35	1.08	34.7	**5.12%**	1.09	0.48
EX10A, EX10B	EX10	EX9	0.33	5	0	0	17	0.33	17	4.00	0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.0	0.89	0.89	0.2	0.5	75.3	200	PVC	SDR 35	0.92	32.0	**1.64%**	1.01	0.31
EX18A	EX18	EX19	0.14	2	0	0	7	0.14	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.14	0.14	0.0	0.1	8.5	200	PVC	SDR 35	0.83	30.4	**0.49%**	0.96	0.21
EX19A	EX19	EX9	0.62	11	12	0	70	0.76	77	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.62	0.76	0.2	1.5	107.0	200	PVC	SDR 35	0.63	26.5	**5.50%**	0.83	0.37
EX9A	EX9	EX8	0.07	0	0	0	0	1.16	94	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.07	1.72	0.5	2.0	48.0	200	PVC	SDR 35	0.96	32.7	**6.11%**	1.03	0.47
EX14A	EX14	EX13	0.13	0	2	0	5	0.13	5	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.13	0.13	0.0	0.1	9.5	200	PVC	SDR 35	0.74	28.7	**0.43%**	0.90	0.20
EX13A	EX13	EX12	0.43	0	20	0	54	0.57	59	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.57	0.2	1.1	82.1	200	PVC	SDR 35	0.65	26.9	**4.17%**	0.85	0.35
EX12A	EX12	EX11	0.44	0	21	0	57	1.01	116	4.00	1.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.01	0.3	2.2	82.1	200	PVC	SDR 35	0.41	21.5	**10.06%**	0.68	0.36
EX18B	EX18	EX15	0.15	3	0	0	10	0.15	10	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	0.15	0.0	0.2	42.0	200	PVC	SDR 35	2.38	51.6	**0.40%**	1.62	0.31

Stantec

SUBDIVISION:

HALF MOON BAY SOUTH SUBDIVISION - PHASE 4

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: DT
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160400743

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 l/s/Ha		
PERSONS / APARTMENT	2.3				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT.	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
EX17A	EX17	EX16	0.67	9	10	0	58	0.67	58	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	84.1	200	PVC	SDR 35	0.44	22.2	**5.05%**	0.70	0.31
EX16A	EX16	EX15	0.49	7	9	0	48	1.16	106	4.00	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.49	1.16	0.3	2.0	79.0	200	PVC	SDR 35	0.34	19.5	**10.42%**	0.62	0.33
EX22A	EX22	EX21	0.51	11	0	0	37	0.51	37	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.51	0.51	0.1	0.8	55.9	200	PVC	SDR 35	0.72	28.3	**2.65%**	0.89	0.32
EX21A	EX21	EX20	0.63	16	0	0	54	1.14	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.63	1.14	0.3	1.8	97.5	200	PVC	SDR 35	0.60	26.0	**6.95%**	0.82	0.39
EX33A	EX33	EX32	0.68	14	0	0	48	0.68	48	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.68	0.68	0.2	1.0	90.6	200	PVC	SDR 35	0.40	21.1	**4.54%**	0.67	0.28
EX32A	EX32	EX31	0.11	1	0	0	3	0.78	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	0.78	0.2	1.0	10.6	200	PVC	SDR 35	0.40	21.1	**4.94%**	0.67	0.28
EX31A	EX31	EX30	0.46	10	0	0	34	1.25	85	4.00	1.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	1.25	0.3	1.7	57.5	200	PVC	SDR 35	0.40	21.1	**8.16%**	0.67	0.33
EX30A	EX30	EX29	0.15	2	0	0	7	1.40	92	4.00	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.15	1.40	0.4	1.9	10.6	200	PVC	SDR 35	0.40	21.1	**8.89%**	0.67	0.34
EX29A	EX29	EX28	0.44	10	0	0	34	1.84	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.44	1.84	0.5	2.6	71.7	200	PVC	SDR 35	0.40	21.1	**12.08%**	0.67	0.37
EX28A	EX28	EX24	0.21	4	0	0	14	2.05	139	4.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	2.05	0.6	2.8	54.6	200	PVC	SDR 35	0.80	29.9	**9.47%**	0.94	0.49
EX27A	EX27	EX26	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.2	200	PVC	SDR 35	0.65	27.0	**0.57%**	0.85	0.18
EX26A	EX26	EX25	0.31	8	0	0	27	0.47	34	4.00	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.47	0.1	0.7	48.8	200	PVC	SDR 35	0.40	21.1	**3.22%**	0.67	0.25
EX25A	EX25	EX24	0.48	10	0	0	34	0.95	68	4.00	1.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.48	0.95	0.3	1.4	91.3	200	PVC	SDR 35	0.60	25.9	**5.28%**	0.81	0.36
EX36A	EX36	EX35	0.76	19	0	0	65	0.76	65	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.76	0.76	0.2	1.3	91.7	200	PVC	SDR 35	0.50	23.6	**5.32%**	0.74	0.33
EX35A	EX35	EX34	0.12	2	0	0	7	0.88	71	4.00	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	0.88	0.2	1.4	43.9	200	PVC	SDR 35	0.60	25.9	**5.42%**	0.81	0.36
EX40A	EX40	EX39	0.50	12	0	0	41	0.50	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.50	0.50	0.1	0.8	65.7	200	PVC	SDR 35	1.60	42.3	**1.90%**	1.33	0.44
EX45A	EX45	EX44	0.67	16	0	0	54	0.67	54	4.00	0.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	0.67	0.2	1.1	112.3	200	PVC	SDR 35	1.20	36.6	**2.92%**	1.15	0.44
EX44A	EX44	EX43	0.17	2	0	0	7	0.84	61	4.00	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.84	0.2	1.2	10.6	200	PVC	SDR 35	0.80	29.9	**4.10%**	0.94	0.39
EX43A	EX43	EX42	0.78	18	0	0	61	1.63	122	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.78	1.63	0.5	2.4	103.5	200	PVC	SDR 35	0.80	29.9	**8.15%**	0.94	0.47
EX42A	EX42	EX41	0.06	1	0	0	3	1.68	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.06	1.68	0.5	2.5	10.6	200	PVC	SDR 35	0.80	29.9	**8.39%**	0.94	0.48
EX41A	EX41	EX39	0.10	0	0	0	0	1.79	126	4.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	1.79	0.5	2.5	64.5	200	PVC	SDR 35	0.40	21.1	**12.02%**	0.66	0.37
EX39A	EX39	EX38	0.67	17	0	0	58	2.96	224	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.67	2.96	0.8	4.5	94.6	200	PVC	SDR 35	0.40	21.1	**21.11%**	0.67	0.44
EX38A	EX38	EX37	0.21	5	0	0	17	3.16	241	4.00	3.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	3.16	0.9	4.8	46.8	200	PVC	SDR 35	0.40	21.1	**22.69%**	0.67	0.45
EX52A	EX52	EX51	0.16	2	0	0	7	0.16	7	4.00	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.16	0.16	0.0	0.2	11.6	200	PVC	SDR 35	0.75	29.0	**0.54%**	0.91	0.20
EX51A	EX51	EX50	0.43	11	0	0	37	0.59	44	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.59	0.2	0.9	71.7	200	PVC	SDR 35	0.75	29.0	**3.05%**	0.91	0.35
EX54A	EX54	EX53	0.45	9	0	0	31	0.45	31	4.00	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.45	0.45	0.1	0.6	71.2	200	PVC	SDR 35	0.45	22.4	**2.77%**	0.71	0.26
SA62A	62	61	0.24	4	0	0	14	0.24	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.24	0.24	0.1	0.3	46.2	200	PVC	SDR 35	0.65	27.0	**1.07%**	0.85	0.23
SA61A	61	60	0.22	3	0	0	10	0.46	24	4.00	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.22	0.46	0.1	0.5	11.0	200	PVC	SDR 35	0.65	27.0	**1.91%**	0.85	0.28
SA60A	60	59	0.31	8	0	0	27	0.77	51	4.00	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.31	0.77	0.2	1.0	53.3	200	PVC	SDR 35	0.50	23.6	**4.40%**	0.74	0.32
SA64A	64	63	0.19	4	0	0	14	0.19	14	4.00	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.3	48.9	200	PVC	SDR 35	2.00	47.3	**0.58%**	1.49	0.32
SA65A	65	63	0.54	12	0	0	41	0.54	41	4.00	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.54	0.54	0.2	0.8	72.4	200	PVC	SDR 35	0.65	27.0	**3.01%**	0.85	0.32
SA63A	63	59	0.32	7	0	0	24	1.05	78	4.00	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.32	1.05	0.3	1.6	70.6	200	PVC	SDR 35	0.75	29.0	**5.39%**	0.91	0.40
SA59A	59	EX58A	0.30	6	0	0	20	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.30	2.12	0.6	3.0	59.3	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
	EX58A	EX58	0.00	0	0	0	0	2.12	150	4.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.12	0.6	3.0	12.6	200	PVC	SDR 35	0.75	29.0	**10.42%**	0.91	0.49
EX58A	EX58	EX57	0.47	12	0	0	41	2.59	190	4.00	3.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.47	2.59	0.7	3.8	64.5	200	PVC	SDR 35	0.75	29.0	**13.16%**	0.91	0.52
EX57A	EX57	EX56	0.12	2	0	0	7	2.70	197	4.00	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.12	2.70	0.8	4.0	10.6	200	PVC	SDR 35	0.75	29.0	**13.65%**	0.91	0.53
EX56A	EX56	EX55	0.34	7	0	0	24	3.05	221	4.00	3.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.34	3.05	0.9	4.4	65.6	200	PVC	SDR 35	0.75	29.0	**15.31%**	0.91	0.55
EX55A	EX55	EX53	0.38	8	0	0	27	3.43	248	4.00	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	3.43	1.0	5.0	65.5	200	PVC	SDR 35	0.50	23.6	**21.07%**	0.74	0.49
EX53A	EX53	EX50	0.19	3	0	0	10	4.07	289	4.00	4.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	4.07	1.1	5.8	68.5	200	PVC	SDR 35	0.40	21.1	**27.53%**	0.67	0.47
EX50A	EX50	EX37	0.26	6	0	0	20	4.92	354	4.00	5.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.26	4.92	1.4	7.1	49.1	200	PVC	SDR 35	0.40	21.0	**33.77%**	0.66	0.50
EX37A	EX37	EX34	0.41	10	0	0	34	8.49	629	3.92	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	8.49	2.4	12.4	72.0	200	PVC	SDR 35	0.40	21.1	**58.49%**	0.67	0.59
EX34A	EX34	EX24	0.41	10	0	0	34	9.79	734	3.88	11.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.41	9.79	2.7	14.3	72.5	200	PVC	SDR 35	0.40	21.1	**67.57%**	0.67	0.62
EX24A	EX24	EX20	0.38	10	0	0	34	13.16	976	3.81	15.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.38	13.16	3.7	18.7	73.0	200	PVC	SDR 35	0.42	21.7	**86.43%**	0.68	0.69
EX20A	EX20	EX15	0.10	0	0	0	0	14.40	1068	3.78	16.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.10	14.40	4.0	20.4	71.0	250	PVC	SDR 35	0.37	36.7	**55.56%**	0.74	0.65
EX15A	EX15	EX11	0.20	0	8	0	22	15.92	1205	3.75	18.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	15.92	4.5	22.7	68.0	300	PVC	SDR 35	0.34	55.8	**40.73%**	0.79	0.64
EX11A	EX11	EX8	0.11	0	4	0	11	17.05	1332	3.72	20.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	17.05	4.8	24.8	45.0	300	PVC	SDR 35	0.98	94.9	**26.15%**	1.35	0.95
EX8A	EX8	EX3	0.15	0	6	0	16	18.35	1442	3.69	21.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.15	18.91	5.3	26.9	50.3	300	PVC	SDR 35	0.38	59.0	**45.49%**	0.84	0.70
EX3A	EX3	EX2	0.30	0	18	0	49	19.53	1585	3.66	23.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.30	20.09	5.6	29.1	68.1	300	PVC	SDR 35	0.37	58.2	**50.08%**	0.83	0.71
EX2A	EX2	EX1	0.36	0	15	0	41	19.89	1625	3.65	24.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.0	0.36	20.45	5.7	29.8	68.1	300	PVC	SDR 35	0.35	57.0	**52.25%**	0.81	0.70
																												300							

7 - Barrhaven South MSS Sanitary Sewer Design Sheet - Alternative 5 (revised September 19th 2016)

Alternative 5 Sanitary Sewer Design Sheets

Area: **BARRHAVEN SOUTH MASTER SERVICING STUDY**

DATE: 10/18/2016
REVISION: 1
DESIGNED BY: MY
CHECKED BY: MF

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 163400999

Colour code:
- HMB values
- Hard coded values — Most US MH
- Caculated value — Estimated value
- updated location — Value from subdivision design — MH receiving flow from 2 or more sewers

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	350 L/p/day	MINIMUM VELOCITY	0.60 m/s	As per CDP (units/ha)	
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	50,000 L/ha/day	MAXIMUM VELOCITY	3.00 m/s	LOW DENSITY RESIDENTIAL	26
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 L/ha/day	MANNINGS n	0.013	SEMI-DETACHED	52
PEAKING FACTOR (COMM., INST.):	1.5	INDUSTRIAL (LIGHT)	35,000 L/ha/day	BEDDING CLASS	B	TOWN HOUSES	82
PERSONS / SINGLE UNIT	3.4	INSTITUTIONAL	50,000 L/ha/day	MINIMUM COVER	2.50 m	APARTMENTS	120
PERSONS / TOWNHOME	2.7	INFILTRATION	0.28 L/s/ha			COMMUNITY CORE	60
PERSONS / APARTMENT	1.8					AVERAGE PERSONS/ha	107

LOCATION				RESIDENTIAL AREA AND POPULATION										COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	Source	FROM M.H.	TO M.H.	DEV AREA (ha)	DEV POP	ADD'N RES AREA (ha)	ADD'N POP	TOTAL AREA (ha)	TOTAL POP	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (L/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (L/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (L/s)	FLOW (L/s)	LENGTH (m)	DIA (mm)	MATERIAL	SLOPE (%)	CAP. (FULL) (L/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Future Collector Road																																				
Area 1 (Drummond)			MA11	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	20.3	20.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	20.3	20.3	5.7	23.3	-	-	-	-	-	-	-	-
MSS-A-23		MA11	MA10	0.0	0	14.2	1523	14.2	1,523	14.2	1,523	3.67	22.6	0.0	20.3	0.0	0.0	0.0	0.0	2.8	2.8	2.5	2.5	20	19.5	39.8	11.1	53.7	482.1	300	PVC	0.75	82.6	65%	1.18	1.26
MSS-A-22		**MA10**	MH57A	0.0	0	12.8	1371	12.8	1,371	27.0	2,894	3.46	40.6	0.0	20.3	0.0	0.0	0.0	0.0	7.2	10.0	14.5	17.0	26.3	34.5	74.3	20.8	87.7	449.7	375	PVC	0.40	110.0	80%	1.00	1.12
Realigned Greenbank Road																																				
Area 2 (Brazeau)			MA14	0.0	0	0.0	0	0.0	0	0.00	0	4.00	0.0	24.8	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.5	24.8	24.8	6.9	28.4	-	-	-	-	-	-	-	-
MSS-A-21		MA14	MA13	0.0	0	4.8	513	4.8	513	4.8	513	3.97	8.3	0.0	24.8	0.0	0.0	0.0	0.0	7.5	7.5	0.0	0.0	28.0	12.3	37.1	10.4	46.7	295.0	250	PVC	1.30	67.1	70%	1.37	1.49
N-4		**MA13**	MH57A	0.0	0	11.0	1176	11.0	1,176	15.8	1,689	3.64	24.9	0.0	24.8	0.0	0.0	0.0	0.0	0.0	7.5	0.5	0.5	28.0	11.5	48.6	13.6	66.5	413.1	375	PVC	0.30	94.6	70%	0.86	0.94
Cambrian Road																																				
N-5		**MH57A**	MH13A	0.0	0	4.3	458	4.3	458	47.1	5,041	3.24	66.2	3.4	48.5	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	57.3	7.7	130.6	36.6	160.1	216.5	500	CPP	0.25	188.2	85%	0.96	1.08
N-2		**MH13A**	MH15A	6.2	631	0.0	3	6.2	634	53.3	5,675	3.19	73.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	57.3	6.2	136.8	38.3	168.9	165.2	500	CPP	0.20	168.6	100%	0.86	1.00
N-6		**MH15A**	MH17A	5.6	868	0.0	2	5.6	870	58.9	6,545	3.13	83.0	0.0	48.5	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	57.3	5.6	142.4	39.9	180.2	202.0	600	CPP	0.13	230.7	78%	0.79	0.88
River Mist Road																																				
Area 5 (Mattamy)			MA163	2.3	239	0.0	0	2.3	239	2.3	239	4.00	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.2	1.2	0.5	4.1	4.1	1.1	5.5	-	-	-	-	-	-	-	-
Area 3 (Mattamy)			MH126	0.0	0	0.0	0	0.0	0	0.0	0	4.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-
MSS-A-18	Stantec	MH163	162	6.5	543	0.0	0	6.5	543	8.8	782	3.87	12.3	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.4	0.9	2.1	3.0	10.2	14.3	4.0	19.3	36.3	200	PVC	1.15	36.2	53%	1.13	1.14
	Stantec	162	161	0.0	0	0.0	0	0.0	0	8.8	782	3.87	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	0.0	14.3	4.0	19.3	87.2	250	PVC	1.15	63.2	31%	1.29	1.12
	Stantec	161	EX151	0.0	0	0.0	0	0.0	0	8.8	782	3.87	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	0.0	14.3	4.0	19.3	75.6	250	PVC	1.15	63.2	31%	1.29	1.12
	Stantec	EX151	MH142	0.0	0	0.0	0	0.0	0	8.8	782	3.87	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	0.0	14.3	4.0	19.3	44.4	300	PVC	1.40	113.4	17%	1.62	1.17
N-14	Stantec	**MH142**	EX139	8.2	825	1.0	102	9.2	927	18.0	1,709	3.64	25.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	9.2	23.5	6.6	34.8	74.8	300	PVC	0.40	60.9	57%	0.87	0.90
	Stantec	EX139	EX136	0.0	0	0.0	0	0.0	0	18.0	1,709	3.64	25.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	0.0	23.5	6.6	34.8	64.7	300	PVC	0.40	60.9	57%	0.87	0.90
	Stantec	EX136	MH126	0.0	0	0.0	0	0.0	0	18.0	1,709	3.64	25.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.1	3.0	0.0	23.5	6.6	34.8	78.9	300	PVC	0.41	61.6	56%	0.88	0.91
N-15	Stantec	**MH126**	EX123	16.5	954	0.0	0	16.5	954	34.5	2,663	3.49	37.6	0.0	0.0	0.0	0.0	0.0	0.0	2.1	5.5	0.0	2.1	4.8	18.6	42.1	11.8	54.2	71.3	375	PVC	0.45	116.6	46%	1.06	1.04
	Stantec	EX123	MH112	0.0	0	0.0	0	0.0	0	34.5	2,663	3.49	37.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	0.0	42.1	11.8	54.2	90.3	375	PVC	0.42	112.2	48%	1.02	1.01
N-16	Stantec	**MH112**	EX102	8.3	689	0.0	0	8.3	689	42.8	3,352	3.40	46.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	8.3	50.4	14.1	65.1	68.0	375	PVC	0.31	96.8	67%	0.88	0.95
	Stantec	EX102	EX101	0.0	0	0.0	0	0.0	0	42.8	3,352	3.40	46.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	0.0	50.4	14.1	65.1	34.0	375	PVC	0.29	93.5	70%	0.85	0.93
	IBI	EX101	MH43A	0.0	0	0.0	0	0.0	0	42.8	3,352	3.40	46.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	0.0	50.4	14.1	65.1	38.0	375	PVC	0.30	94.6	69%	0.86	0.93
N-12	IBI	**MH43A**	MH44A	6.6	352	0.0	0	6.6	352	49.4	3,704	3.36	50.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	6.6	57.0	16.0	71.2	81.0	375	PVC	0.30	94.6	75%	0.86	0.95
	IBI	MH44A	MH45A	0.0	0	0.0	0	0.0	0	49.4	3,704	3.36	50.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	0.0	57.0	16.0	71.2	64.0	375	PVC	0.30	94.6	75%	0.86	0.95
	IBI	MH45A	MH46A	0.0	0	0.0	0	0.0	0	49.4	3,704	3.36	50.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	2.1	4.8	0.0	57.0	16.0	71.2	85.0	375	PVC	0.30	94.6	75%	0.86	0.95
N-10	IBI	**MH46A**	MH47A	8.4	562	0.0	0	8.4	562	57.8	4,266	3.31	57.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	1.6	3.7	4.8	10.0	67.0	18.8	80.8	41.0	375	PVC	0.30	94.6	85%	0.86	0.97
	DSEL	MH47A	MH101A	0.0	0	0.0	0	0.0	0	57.8	4,266	3.31	57.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	3.7	4.8	0.0	67.0	18.8	80.8	64.0	375	PVC	0.30	94.6	85%	0.86	0.97
	DSEL	MH101A	MH102A	0.0	0	0.0	0	0.0	0	57.8	4,266	3.31	57.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	3.7	4.8	0.0	67.0	18.8	80.8	64.0	375	PVC	0.30	94.6	85%	0.86	0.97
N-7	DSEL	**MH102A**	MH17A	4.0	291	1.2	129	5.2	420	63.0	4,686	3.27	62.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	3.7	4.8	5.2	72.2	20.2	87.1	81.0	375	PVC	0.30	94.6	92%	0.86	0.99
Cambrian Road																																				
N-3		**MH17A**	MH21A	26.0	1956	0.0	0	26.0	1,956	147.9	13,187	2.83	151.2	0.0	48.5	0.0	0.0	0.0	0.0	3.0	26.0	5.1	26.3	64.7	34.1	248.7	69.6	285.5	204.3	750	CPP	0.13	419.5	68%	0.92	1.00
N-8		**MH21A**	MH45	7.0	408	0.0	0	7.0	408	154.9	13,595	2.82	155.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	26.0	2.9	29.2	64.7	9.9	258.6	72.4	292.4	277.8	750	CPP	0.13	419.5	70%	0.92	1.00
Greenbank Road																																				
Area 4 (Minto)			MH205A	34.7	3538	0.0	0	34.7	3,538	34.7	3,538	3.38	48.4	0.0	0.0	0.0	0.0	0.0	0.0	8.2	8.2	17.1	17.1	7.1	60.0	60.0	16.8	72.3	-	-	-	-	-	-	-	-
MSS-A-14	IBI	MH205A	MH98A	0.0	0	21.0	2246	21.0	2,246	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	21.0	81.0	22.7	104.5	126.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH98A	MH99A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH99A	MH100A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	108.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH100A	MH204A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	105.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH204A	MH206A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	103.0	600	CPP	0.25	321.2	33%	1.10	0.97
	IBI	MH206A	MH97A	0.0	0	0.0	0	0.0	0	55.7	5,784	3.19	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.1	7.1	0.0	81.0	22.7	104.5	125.0	600	CPP	0.25	321.2	33%	1.10	0.97
N-13, N-13-R	IBI	**MH97A**	MH96A	19.9	1625	0.1	6	20.0	1,631	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.8	17.9	7.1	20.8	101.8	28.5	128.1	98.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH96A	MH95A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	129.0	600	CPP	0.30	350.4	37%	1.20	1.09
	IBI	MH95A	MH201A	0.0	0	0.0	0	0.0	0	75.7	7,415	3.08	92.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	101.8	28.5	128.1	123.0	600	CPP	0.30	350.4	37%	1.20	1.09
N-11, N-11-R	IBI	**MH201A**	MH201B	12.1	787	0.0	0	12.1	787	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	12.1	113.9	31.9	140.0	124.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH201B	MH200A	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	68.0	600	CPP	0.30	350.4	40%	1.20	1.13
	IBI	MH200A	MH200C	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	48.0	600	CPP	0.50	452.6	31%	1.55	1.35
	IBI	MH200C	MH45	0.0	0	0.0	0	0.0	0	87.8	8,202	3.04	101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	17.9	7.1	0.0	113.9	31.9	140.0	26.0	600	CPP	0.12	221.9	63%	0.76	0.81
MSS-A-15		**MH45**	MH435A	0.0	0	5.1	548	5.1	548	247.8	22,345	2.60	235.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	34.2	0.0	47.1	71.8	5.1	377.6	105.7	412.8	296.6	900	CPP	0.10	597.0	69%	0.91	0.99
North																																				
MSS-A-9		MA9	MA8	0.0	0	22.2	2378	22.2	2,378	22.2	2,378	3.53	34.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	9.5	9.5	2.2	34.2	34.2	9.6	45.8	507.5	450	CPP	0.11	98.4	47%	0.60	0.59
MSS-A-8		**MA8**	MA7	0.0	0	2.9	308	2.9	308	25.1	2,686	3.48	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.8	10.3	2.2	3.7	37.9	10.6	50.7	317.1	450	CPP	0.11	98.4	52%	0.60	0.61
MSS-A-7		**MA7**	MA6	0.0	0	18.5	1979	18.5	1,979	43.6	4,665	3.27	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	18.5	56.4	15.8	79.8	573.1	450	CPP	0.11	98.4	81%	0.60	0.67
MSS-A-6		**MA6**	MA5	0.0	0	21.7	2320	21.7	2,320	65.3	6,985	3.11	88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	21.7	78.1	21.9	112.1	473.9	600	CPP	0.10	201.5	56%	0.69	0.71
MSS-A-5		**MA5**	M27A	0.0	0	9.5	1020	9.5	1,020	74.8	8,005	3.05	98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	9.5	87.6	24.5	125.6	220.0	600	CPP	0.10	201.5	62%	0.69	0.73
MSS-A-4		**M27A**	MH5200A	0.0	0	8.1	863	8.1	863	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	8.1	95.7	26.8	137.1	501.5	600	CPP	0.15	248.2	55%	0.85	0.87
		MH5200A	MH520A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	46.0	600	CPP	0.08	181.0	76%	0.62	0.69
		MH520A	MH521A	0.0	0	0.0	0	0.0	0	82.9	8,868	3.01	108.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	95.7	26.8	137.1	44.4	600	CPP	0.10	201.5	68%	0.69	0.75
N-1		**MH521A**	MH522A	3.3	177	0.5	54	3.8	231	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	3.8	99.5	27.9	140.7	50.1	600	CPP	0.09	192.7	73%	0.66	0.73
		MH522A	MH435A	0.0	0	0.0	0	0.0	0	86.7	9,099	3.00	110.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	10.3	2.2	0.0	99.5	27.9	140.7	10.8	600	CPP	0.21	292.0	48%	1.00	0.99
		MH435A	MH501A	0.0	0	0.0	0	0.0	0	334.5	31,444	2.46	313.3	0.0	48.5	0.0	0.0	0.0	0.0	0.0	36.7	0.0	57.4	74.0	0.0	477.1	133.6	520.9	13.3	900	CPP	0.11	623.2	84%	0.95	1.07

8- Kilbirnie Drive Sanitary Sewer Design Sheet and Catchment Diagram - JLR (revised June 2015)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

QUINN'S POINTE
3872 GREENBANK ROAD
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 24748

SANITARY SEWER DESIGN SHEET

Designed by: H.M./J.W.
Checked by: L.D.
Date : June 2015

Single Family	3.4	pers/unit	q =	350	L/cap/day
Semi-Detached/Townhouse (row)	2.7	pers/unit	I =	0.280	L/s/ha
			Inst. =	50000	L/ha/day
Manning's Coeff. N =	0.013				

STREET	M.H. #		RESIDENTIAL							INSTITUTIONAL						SEWER DATA					RESIDUAL	UPSTREAM					DOWNSTREAM				
			NUMBER OF UNITS			CUMULATIVE		PEAKING	POPUL.		CUMM.	INST.	PEAK EXTR.	PLUG	PEAK DES.															
	FROM	TO	SING.	MULT.	AREA ha	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	AREA ha	AREA ha	FLOW l/s	FLOW l/s	FLOW l/s	FLOW l/s	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	CAP. l/s	Center Line	Obvert	Invert	Cover	Center Line	Obvert Drop	Obvert	Invert	Cover
Alex Polowin Avenue	13	14	5	0	0.29	17	0.29	4.00	0.28	0.00	0.00	0.00	0.08		0.36	200	0.65	27.6	0.85	74.41	27.23	105.00	102.549	102.346	2.45	105.52	0.06	102.065	101.862	3.45
Russet Terrace	14	90	7	0	0.42	41	0.71	4.00	0.66	0.00	0.00	0.00	0.20		0.86	200	0.92	32.8	1.01	112.14	31.96	105.00	102.005	101.802	2.99	103.93		100.973	100.770	2.96
Russet Terrace	90	5	6	0	0.35	61	1.06	4.00	0.99	0.00	0.00	0.00	0.30		1.29	200	0.40	21.6	0.67	107.70	20.35	103.93	100.973	100.770	2.96	103.80	0.06	100.543	100.339	3.26
River Mist Road	Stub	5	1	0	0.06	3	0.06	4.00	0.06	0.00	0.00	0.00	0.02		0.07	200	1.00	34.2	1.06	9.41	34.14	103.80	100.577	100.374	3.22	103.80		100.483	100.280	3.32
River Mist Road	5	4	12	0	0.55	105	1.67	4.00	1.71	0.00	0.00	0.00	0.47		2.18	200	0.32	19.4	0.60	74.35	17.18	103.80	100.483	100.280	3.32	103.70		100.245	100.042	3.45
Boddington Street	101	100	14	0	0.72	48	0.72	4.00	0.77	0.00	0.00	0.00	0.20		0.97	200	1.00	34.2	1.06	90.20	33.24	105.07	102.188	101.985	2.88	104.55		101.286	101.083	3.26
Boddington Street	100	4	8	0	0.44	75	1.16	4.00	1.21	0.00	0.00	0.00	0.32		1.54	200	0.90	32.5	1.00	91.54	30.92	104.55	101.286	101.083	3.26	103.70	0.22	100.462	100.259	3.24
River Mist Road	4	3	12	0	0.53	221	3.36	4.00	3.58	0.00	0.00	0.00	0.94		4.52	200	0.32	19.4	0.60	74.59	14.83	103.70	100.245	100.042	3.45	104.30		100.007	99.803	4.29
Clonfadda Terrace	111	110	13	0	0.62	44	0.62	4.00	0.72	0.00	0.00	0.00	0.17		0.89	200	1.00	34.2	1.06	75.22	33.33	104.97	101.803	101.600	3.17	104.74		101.051	100.848	3.69
Clonfadda Terrace	110	3	15	0	0.64	95	1.26	4.00	1.54	0.00	0.00	0.00	0.35		1.90	200	0.91	32.6	1.01	108.21	30.75	104.74	101.051	100.848	3.69	104.30	0.06	100.067	99.863	4.23
River Mist Road	3	2	3	0	0.32	326	4.94	4.00	5.29	0.00	0.00	0.00	1.38		6.67	200	0.32	19.4	0.60	100.24	12.68	104.30	100.007	99.803	4.29	103.30		99.686	99.483	3.61
River Mist Road	2	1	0	14	0.55	364	5.49	4.00	5.90	0.00	0.00	0.00	1.54		7.44	200	1.81	46.0	1.42	112.24	38.60	103.30	99.686	99.483	3.61	100.42	1.53	97.654	97.451	2.77
Alex Polowin Avenue	13	12	5	0	0.29	17	0.29	4.00	0.28	0.00	0.00	0.00	0.08		0.36	200	1.00	34.2	1.06	74.41	33.86	105.52	101.748	101.544	3.77	104.98		101.004	100.800	3.98
Alex Polowin Avenue	12	11	8	0	0.46	44	0.75	4.00	0.72	0.00	0.00	0.00	0.21		0.93	200	2.10	49.6	1.53	107.69	48.66	104.98	101.004	100.800	3.98	102.80		98.742	98.539	4.06
Alex Polowin Avenue	11	10	9	0	0.45	75	1.20	4.00	1.21	0.00	0.00	0.00	0.34		1.55	200	1.70	44.6	1.38	104.17	43.06	102.80	98.742	98.539	4.06	101.20	0.06	96.971	96.768	4.23
Kilbirnie Drive	10	20	0	14	0.57	113	1.77	4.00	1.82	0.00	0.00	0.00	0.50		2.32	200	0.32	19.4	0.60	116.10	17.04	101.20	96.911	96.708	4.29	100.60		96.540	96.336	4.06
Block 251 (School)	Stub	20	0	0	0.00	0	0.00	4.00	0.00	2.83	2.83	2.46	0.79		3.25	200	0.32	19.4	0.60	11.00	16.11	100.60	97.856	97.653	2.74	100.60	1.28	97.822	97.618	2.78
Kilbirnie Drive	20	1	0	15	0.54	153	2.31	4.00	2.48	0.00	2.83	2.46	1.44		6.38	200	0.32	19.4	0.60	109.51	12.98	100.60	96.540	96.336	4.06	100.42	0.06	96.189	95.986	4.23
River Mist Road	1	EX. MH163	0	0	0.08	517	7.88	3.97	8.31	0.00	2.83	2.46	3.00		**13.77**	200	0.32	19.4	0.60	39.39	5.59	100.42	96.129	95.926	4.29	99.99		96.003	95.800	3.99
Ramsgrange Street	40	41	0	11	0.42	30	0.42	4.00	0.48	0.00	0.00	0.00	0.12		0.60	200	3.16	60.8	1.88	77.96	60.23	102.63	99.290	99.087	3.34	100.34		96.826	96.623	3.51
Block 250 (Park)	Stub	41	0	0	0.00	0	0.00	4.00	0.00	1.57	1.57	1.36	0.44	5.00	6.80	150	1.00	15.9	0.87	11.00	9.09	100.34	96.945	96.793	3.39	100.34	0.01	96.835	96.683	3.50
Ramsgrange Street	41	42	0	10	0.36	57	0.78	4.00	0.92	0.00	1.57	1.36	0.66		7.94	200	1.00	34.2	1.06	77.96	26.28	100.34	96.826	96.623	3.51	99.60	0.23	96.047	95.844	3.55
Lauraleaf Crescent	43	42	0	15	0.45	41	0.45	4.00	0.66	0.00	0.00	0.00	0.13		0.78	200	0.65	27.6	0.85	76.72	26.80	99.02	96.375	96.172	2.65	99.60	0.06	95.876	95.673	3.72
Quinn's Pointe Road	42	50	5	0	0.28	114	1.51	4.00	1.85	0.00	1.57	1.36	0.86		9.08	200	0.32	19.4	0.60	74.01	10.28	99.60	95.816	95.613	3.78	99.00	0.06	95.579	95.376	3.42
Guinness Crescent	74	75	5	0	0.28	17	0.28	4.00	0.28	0.00	0.00	0.00	0.08		0.35	200	2.65	55.7	1.72	52.68	55.35	102.03	98.900	98.697	3.13	100.17		97.504	97.301	2.67
Guinness Crescent	75	51	5	0	0.29	34	0.57	4.00	0.55	0.00	0.00	0.00	0.16		0.71	200	2.45	53.6	1.65	70.23	52.85	100.17	97.504	97.301	2.67	98.80	0.06	95.783	95.580	3.02
Quinn's Pointe Road	52	51	3	0	0.21	10	0.21	4.00	0.17	0.00	0.00	0.00	0.06		0.22	200	0.65	27.6	0.85	36.72	27.36	98.45	96.064	95.861	2.39	98.80	0.10	95.825	95.622	2.97
Quinn's Pointe Road	51	50	4	0	0.19	58	0.97	4.00	0.94	0.00	0.00	0.00	0.27		1.21	200	0.32	19.4	0.60	44.99	18.15	98.80	95.723	95.520	3.08	99.00	0.06	95.579	95.376	3.42
Knockaderry Crescent	50	60	3	0	0.21	182	2.69	4.00	2.95	0.00	1.57	1.36	1.19		10.51	200	0.32	19.4	0.60	73.66	8.85	99.00	95.519	95.316	3.48	98.67	0.08	95.284	95.080	3.39
Knockaderry Crescent	81	60	6	0	0.29	20	0.29	4.00	0.33	0.00	0.00	0.00	0.08		0.41	200	1.00	34.2	1.06	63.51	33.80	98.67	95.900	95.697	2.77	98.85	0.06	95.265	95.062	3.58
Kilbride Lane	60	61	12	0	0.61	243	3.59	4.00	3.94	0.00	1.57	1.36	1.44		11.75	200	0.32	19.4	0.60	119.54	7.62	98.85	95.205	95.002	3.64	98.50	0.18	94.822	94.619	3.68
Guinness Crescent	74	73	1	0	0.08	3	0.08	4.00	0.06	0.00	0.00	0.00	0.02		0.08	200	1.00	34.2	1.06	10.63	34.14	102.03	99.150	98.947	2.88	102.11	0.03	99.044	98.841	3.07
Guinness Crescent	73	72	7	0	0.47	27	0.55	4.00	0.44	0.00	0.00	0.00	0.15		0.59	200	1.15	36.7	1.13	58.28	36.11	102.11	99.014	98.811	3.10	101.93	0.03	98.343	98.140	3.59
Guinness Crescent	72	71	0	0	0.00	27	0.55	4.00	0.44	0.00	0.00	0.00	0.15		0.59	200	1.00	34.2	1.06	13.16	33.62	101.93	98.313	98.110	3.62	101.77	0.03	98.182	97.979	3.59
Guinness Crescent	71	70	10	0	0.54	61	1.09	4.00	0.99	0.00	0.00	0.00	0.31		1.30	200	3.00	59.3	1.83	57.60	57.97	101.77	98.152	97.949	3.62	99.64	0.26	96.424	96.221	3.22
Guinness Crescent	70	53	5	0	0.46	78	1.55	4.00	1.27	0.00	0.00	0.00	0.43		1.70	200	1.00	34.2	1.06	67.46	32.52	99.64	96.160	95.957	3.48	98.40		95.485	95.282	2.91
Knockaderry Crescent	53	61	5	0	0.46	95	2.01	4.00	1.54	0.00	0.00	0.00	0.56		2.11	200	1.00	34.2	1.06	69.41	32.11	98.40	95.485	95.282	2.91	98.50	0.15	94.791	94.588	3.71
Knockaderry Crescent	61	83	5	0	0.51	356	6.11	4.00	5.76	0.00	1.57	1.36	2.15		14.28	200	0.35	20.2	0.62	73.95	5.97	98.50	94.641	94.438	3.86	98.52	0.08	94.382	94.179	4.14

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

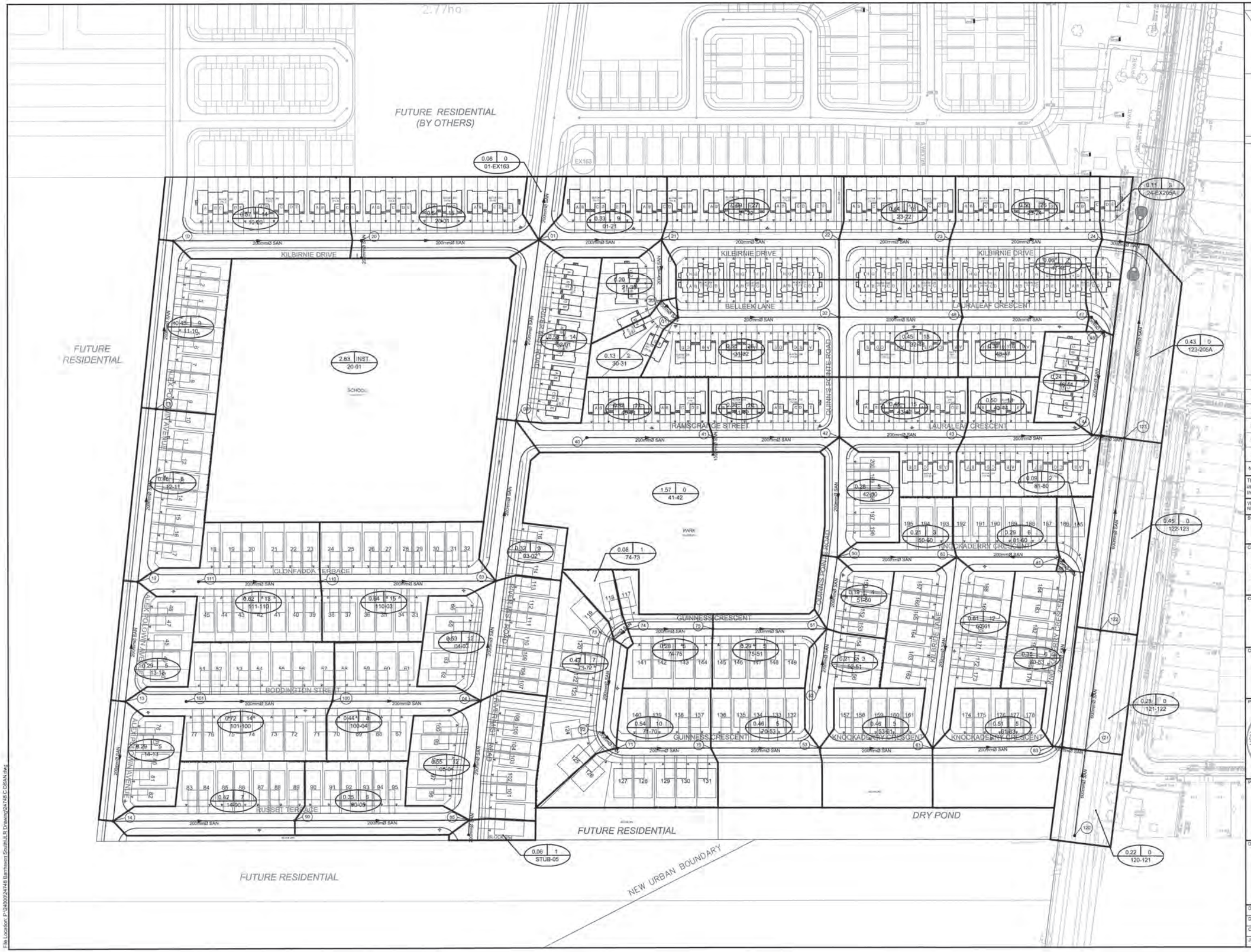
QUINN'S POINTE
3872 GREENBANK ROAD
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 24748

SANITARY SEWER DESIGN SHEET

Designed by: H.M./J.W.
Checked by: L.D.
Date : June 2015

Single Family	3.4	pers/unit	q =	350	L/cap/day
Semi-Detached/Townhouse (row)	2.7	pers/unit	I =	0.280	L/s/ha
			Inst. =	50000	L/ha/day
Manning's Coeff. N =	0.013				

			RESIDENTIAL							INSTITUTIONAL																					
STREET	M.H. #		NUMBER OF UNITS			CUMULATIVE		PEAKING	POPUL.		CUMM.	INST.	PEAK EXTR.	PLUG	PEAK DES.	SEWER DATA					RESIDUAL	UPSTREAM					DOWNSTREAM				
	FROM	TO	SING.	MULT.	AREA ha	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	AREA ha	AREA ha	FLOW l/s	FLOW l/s	FLOW l/s	FLOW l/s	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	CAP. l/s	Center Line	Obvert	Invert	Cover	Center Line	Obvert Drop	Obvert	Invert	Cover
Knockaderry Crescent	81	80	2	0	0.09	7	0.09	4.00	0.11	0.00	0.00	0.00	0.03		0.14	200	0.65	27.6	0.85	12.86	27.45	98.67	95.505	95.302	3.16	98.72	0.03	95.422	95.218	3.30
Knockaderry Crescent	80	83	6	0	0.35	27	0.44	4.00	0.44	0.00	0.00	0.00	0.12		0.56	200	0.65	27.6	0.85	109.13	27.02	98.72	95.392	95.188	3.33	98.52	0.38	94.682	94.479	3.84
Easement	83	121	0	0	0.00	383	6.55	4.00	6.20	0.00	1.57	1.36	2.27		14.84	300	0.32	57.1	0.78	20.44	42.23	98.52	94.303	93.998	4.22	98.12	2.62	94.238	93.933	3.88
Greenbank Road	120	121	0	0	0.22	0	0.22	4.00	0.00	0.00	0.00	0.00	0.06		0.06	600	0.25	320.3	1.10	53.42	320.22	98.30	91.750	91.141	6.55	98.12		91.617	91.007	6.50
Greenbank Road	121	122	0	0	0.28	383	7.05	4.00	6.20	0.00	1.57	1.36	2.41		14.98	600	0.25	320.3	1.10	74.92	305.30	98.12	91.617	91.007	6.50	97.80		91.430	90.820	6.37
Greenbank Road	122	123	0	0	0.45	383	7.50	4.00	6.20	0.00	1.57	1.36	2.54		15.11	600	0.25	320.3	1.10	120.00	305.17	97.80	91.430	90.820	6.37	97.84		91.130	90.520	6.71
Belleek Lane	21	30	0	5	0.20	14	0.20	4.00	0.22	0.00	0.00	0.00	0.06		0.27	200	0.65	27.6	0.85	37.79	27.31	100.00	97.189	96.986	2.81	99.75	0.03	96.944	96.740	2.81
Belleek Lane	30	31	0	2	0.13	19	0.33	4.00	0.31	0.00	0.00	0.00	0.09		0.40	200	0.65	27.6	0.85	14.44	27.19	99.75	96.914	96.710	2.84	99.82	0.03	96.820	96.616	3.00
Belleek Lane	31	32	0	26	0.65	89	0.98	4.00	1.44	0.00	0.00	0.00	0.27		1.72	200	0.65	27.6	0.85	99.41	25.87	99.82	96.790	96.586	3.03	99.70	0.23	96.144	95.940	3.56
Lauraleaf Crescent	32	48	0	18	0.45	138	1.43	4.00	2.23	0.00	0.00	0.00	0.40		2.63	200	1.00	34.2	1.06	76.14	31.58	99.11	95.915	95.711	3.20	99.11		95.153	94.950	3.96
Lauraleaf Crescent	48	47	0	18	0.39	186	1.82	4.00	3.02	0.00	0.00	0.00	0.51		3.53	200	0.50	24.2	0.75	79.62	20.67	99.11	95.153	94.950	3.96	98.81	0.03	94.755	94.552	4.05
Lauraleaf Crescent	47	46	0	2	0.06	192	1.88	4.00	3.11	0.00	0.00	0.00	0.53		3.63	200	0.32	19.4	0.60	12.05	15.72	98.81	94.725	94.522	4.08	98.65	0.03	94.686	94.483	3.96
Lauraleaf Crescent	46	44	0	7	0.24	211	2.12	4.00	3.41	0.00	0.00	0.00	0.59		4.01	200	0.32	19.4	0.60	63.96	15.35	98.65	94.656	94.453	3.99	98.73	0.10	94.452	94.249	4.28
Lauraleaf Crescent	43	44	0	18	0.50	49	0.50	4.00	0.79	0.00	0.00	0.00	0.14		0.93	200	1.27	38.6	1.19	78.93	37.63	99.02	96.103	95.900	2.92	98.73	0.75	95.101	94.898	3.63
Easement	44	123	0	0	0.00	259	2.62	4.00	4.20	0.00	0.00	0.00	0.73		4.93	300	0.50	71.3	0.98	20.45	66.40	98.73	94.352	94.047	4.38	99.40	3.12	94.250	93.945	5.15
Greenbank Road	123	EX. 205A	0	0	0.43	642	10.55	3.92	10.18	0.00	1.57	1.36	3.39		19.94	600	0.25	320.3	1.10	119.97	300.34	97.84	91.130	90.520	6.71	97.90		90.830	90.220	7.07
Kilbirnie Drive	1	21	0	9	0.33	24	0.33	4.00	0.39	0.00	0.00	0.00	0.09		0.49	200	1.00	34.2	1.06	75.61	33.73	100.42	97.315	97.112	3.10	100.00		96.559	96.356	3.44
Kilbirnie Drive	21	22	0	27	0.69	97	1.02	4.00	1.58	0.00	0.00	0.00	0.29		1.86	200	0.65	27.6	0.85	109.62	25.73	100.00	96.559	96.356	3.44	100.00		95.847	95.644	4.15
Kilbirnie Drive	22	23	0	18	0.44	146	1.46	4.00	2.36	0.00	0.00	0.00	0.41		2.77	200	0.32	19.4	0.60	68.39	16.58	99.40	95.847	95.644	3.55	100.00		95.628	95.425	4.37
Kilbirnie Drive	23	24	0	26	0.58	216	2.04	4.00	3.50	0.00	0.00	0.00	0.57		4.07	200	1.25	38.3	1.18	93.99	34.18	99.40	95.628	95.425	3.77	98.20	3.27	94.453	94.250	3.75
Kilbirnie Drive	24	EX. 205A	0	3	0.11	224	2.15	4.00	3.63	0.00	0.00	0.00	0.60		4.23	300	0.60	78.1	1.07	28.92	73.91	98.20	91.183	90.878	7.02	97.90	0.18	91.010	90.705	6.89
Greenbank Road	EX. 205A	EX. 98A	0	0	0.00	866	12.70	3.84	13.47	0.00	1.57	1.36	4.00		**23.83**	600	0.25	320.3	1.10	126.00	296.45	97.90	90.830	90.220	7.07			90.515	89.905	



CAMBRIAN
GREENBANK ROAD
BARNDALE
BARNDALE
BARNDALE
MONARCH AVE
SEE ANWORTH
ANWORTH
WOODWARD
WOODWARD
PRIVATE
PRIVATE

LEGEND:

DRAINAGE BOUNDARY
AREA IN HECTARES
NUMBER OF UNITS
PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED TO CITY FOR REVIEW - 3RD SUBMISSION	03/07/15
2	ISSUED TO CITY FOR REVIEW - 2ND SUBMISSION	12/06/15
1	ISSUED TO CITY FOR REVIEW - 1ST SUBMISSION	29/04/15

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SCALE: 1:1000

CLIENT:
MINTO COMMUNITIES INC.
200-180 KENT STREET
OTTAWA, ON
K1P 0B6

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PROVINCE OF ONTARIO

PROJECT NORTH:

PROJECT:
MINTO COMMUNITIES INC.
QUINN'S POINTE
3872 GREENBANK ROAD

DRAWING:
SANITARY
DRAINAGE PLAN

DESIGN:	HM
DRAWN:	BR
CHECKED:	LD
JLR #:	24748

DRAWING #:
DSAN

PLOT DATE: July 3, 2015 4:15:39 PM

File Location: P:\24000\24748 Barrhaven South\JLR Drawing\24748 C DSAN.dwg

Appendix J

Sanitary Sewer Design

Alexandre Tourigny

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: December 6, 2017 11:40 AM
To: Guy Forget
Cc: Hugo Lalonde; Lucie Dalrymple
Subject: RE: BSUEA - Comments
Attachments: Draft_WastewaterParameterReview_Feb14.pdf

Hi Guy

I have attached the PDF (my apologies). Let me know if you any questions on my questions.

In addition, a discussion on the Brazeau/Drummons lands may be required.

Thanks

John
x14990

From: Guy Forget [mailto:gforget@jlrichards.ca]
Sent: Wednesday, December 06, 2017 7:53 AM
To: Bougadis, John <John.Bougadis@ottawa.ca>
Cc: Hugo Lalonde <HLalonde@minto.com>; Lucie Dalrymple <ldalrymple@jlrichards.ca>
Subject: BSUEA - Comments

Hi John,

We got the comments last week from the City. As per Comment 19(upcoming revisions to the sanitary design criteria), we did not receive the PDF as noted in that comment. Any chance that you can forward this attachment.

On another note, we may want to meet and discuss a few of the comments received. We will go through Robin and discuss further.

Thanks

Guy

Guy Forget, P.Eng., LEED AP
Associate
Senior Water Resources Engineer

J.L. Richards & Associates Limited
864 Lady Ellen Place, Ottawa, ON K1Z 5M2
Tel: 613-728-3571 Fax: 613-728-6012

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Table 1

Parameters	Current			Proposed		
	Design	Annual	Rare	Design	Annual	Rare
Res. Per Capita	350	300	300	280 [1]	200 [2]	200 [2]
Commercial	50000	17000	17000	28000	17000 [4]	17000 [4]
Institutional	50000	17000	17000	28000	17000 [4]	17000 [4]
Industrial	35000	10000	10000	35000 [4]	10000 [4]	10000 [4]
I/I dry	n/a	n/a	n/a	0.05	0.02*	0.02*
I/I wet	0.28	0.28*	0.5*	0.28	0.28*	0.53*
Total I/I	0.28	0.28*	0.5*	0.33	0.3	0.55 [3]
Harmon - Correction Factor	1	0.4-0.6	0.4-0.6	0.8	0.6	0.6
ICI Peak Factor	1.5	1	1	1.5/1 [5]	1	1

* or higher with the support of monitoring data

[1] 280 L/cap/day = 90th percentile based on statistical analysis of new development

[2] 200 L/cap/day = 70th percentile for new development, 60th percentile for old development

[3] 0.53 L/ha/day = interim value to be reviewed in 2017

[4] Values to be reviewed in 2017

[5] ICI Peak Factor = 1.5 if ICI in contributing area is >20%, 1.0 if ICI in contributing area is <20%

Notes:

1) Sewers in new subdivisions shall be designed to operate under free flow conditions during peak flow periods.

2) During a catastrophic failure at a wastewater pump station, the HGL in the sanitary sewer system shall be below the underside of footing for the "Annual Event" flow condition.

3) A minimum freeboard of 0.3 m is required under a "Rare Event" flow condition. For areas serviced by a pump station, assume the station is operating at its rated capacity (rated capacity to be confirmed by ESD staff).

4) Preferably, the elevation of the sanitary overflow conduit should be above the 100 yr stormwater elevation. The overflow elevation can be lowered to the 25 year storm event on a case-by-case basis.

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

BARRHAVEN SOUTH URBAN EXPANSION (BSUEA)

BSUEA SANITARY SEWER DESIGN SHEET

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

Designed by: A.T
Checked by: H.M
Date : May 2018

DESIGN PARAMETERS			
Residential Population Density	63.9 pers/ha**	q =	280 L/cap/day
		I =	0.330 L/s/ha
		Inst. =	28000 L/ha/day
Manning's Coeff. N =	0.013	ICI Peaking Factor* =	1.0/1.5

*ICI Peaking Factor = 1.5 if ICI in contributing area is >20%, 1.0 if ICI in contributing area is <20%

Portion of Contributing Flows from Existing Quinn's Pointe Stage 1 Subdivision

STREET	M.H. #		RESIDENTIAL										COMMERCIAL			INSTITUTIONAL			(Infiltration)			SEWER DATA					RESIDUAL	UPSTREAM				DOWNSTREAM				ICI Peaking Factor	
			NUMBER OF UNITS						CUMULATIVE		PEAKING	POPUL.		CUMM.			CUMM.		PEAK EXTR.	PLUG	PEAK DES.																
	FROM	TO	SING.	MULT.	APT.	Infiltration Area (ha)	Residential Area ha	Total Area ha	POPUL. peop.	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	AREA ha	AREA ha	INST. FLOW l/s	AREA ha	AREA ha	INST. FLOW l/s	FLOW l/s	FLOW l/s	FLOW l/s	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	CAP. l/s	Center Line	Obvert	Invert	Cover	Center Line	Obvert	Invert	Cover	ICI TOTAL	P.F
MINTO LANDS WITHIN BSUEA (OUTLETS TO RIVER MIST.)																																				
Kilbirnie Dr.	572	511					0.64	0.64	41	41	0.64	3.67	0.49		0.00	0.00	2.43	2.43	1.18	1.01		2.68	200	2.87	57.9	1.79	136.50	55.23	107.40	102.79	102.59	4.61	103.50	98.88	98.68	4.62	0.79	1.50
Kilbirnie Dr.	511	512					0.82	0.82	52	93	1.46	3.60	1.09	0.00	0.00	0.00	0.00	2.43	1.18	1.28		3.55	200	0.80	30.6	0.94	97.52	27.05	103.50	98.88	98.68	4.62	103.40	98.10	97.90	5.30	0.62	1.50
Street 1	514	512					1.07	1.07	68	68	1.07	3.63	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.35		1.15	200	0.74	29.4	0.91	212.06	28.28	105.60	99.67	99.47	5.93	103.40	98.10	97.90	5.30	0.00	1.00
Kilbirnie Dr.	512	10 (ex.)							0	161	2.53	3.54	1.85	0.00	0.00	0.00	0.00	2.43	1.18	1.64		4.67	200	1.60	43.3	1.33	74.41	38.61	103.40	98.10	97.90	5.30	101.18	96.91	96.71	4.27	0.49	1.50
Alex Polowin Ave.	13(ex.)	12(ex.)	5				0.46	0.46	29	29	0.46	3.69	0.35		0.00	0.00		0.00	0.00	0.15		0.50	200	1.01	34.4	1.06	74.36	33.89	105.52	101.76	101.56	3.76	104.96	101.01	100.81	3.97	0.00	1.00
Alex Polowin Ave.	12(ex.)	11(ex.)	8				0.74	0.74	45	74	1.20	3.62	0.87		0.00	0.00		0.00	0.00	0.40		1.26	200	2.14	50.1	1.54	107.77	48.79	104.98	101.00.	100.80	3.98	102.80	98.69	98.49	4.11	0.00	1.00
Alex Polowin Ave.	11(ex.)	10(ex).	9				0.71	0.71	47	121	1.910	3.58	1.40		0.00	0.00		0.00	0.00	0.63		2.03	200	1.65	44.0	1.36	103.97	41.92	102.80	96.67	98.47	4.13	101.20	96.95	96.75	4.25	0.00	1.00
MINTO LANDS WITHIN BSUEA (OUTLETS TO EXISTING GREENBANK)																																				
Street 1	514	516					3.49	3.49	223	223	3.49	3.50	2.53		0.00	0.00		0.00	0.00	1.15		3.68	200	0.35	20.2	0.62	127.86	16.56	105.60	102.70	102.50	2.90	105.40	102.25	102.05	3.15	0.00	1.00
Street 1	516	554				0.35	2.83	3.18	181	404	6.67	3.42	4.47		0.00	0.00		0.00	0.00	2.20		6.67	200	0.35	20.2	0.62	170.90	13.57	105.40	102.25	102.05	3.15	105.20	101.65	101.45	3.55	0.00	1.00
Street 3	500	502			120	2.57	5.11	7.68	485	485	7.68	3.38	5.32		0.00	0.00		0.00	0.00	2.53	0.10	7.95	200	0.35	20.2	0.62	174.02	12.29	108.10	105.03	104.827	3.07	107.90	104.42	104.218	3.48	0.00	1.00
Street 3	502	551					1.55	1.55	99	584	9.23	3.35	6.34		0.00	0.00		0.00	0.00	3.05		9.49	200	0.89	32.3	1.00	168.60	22.79	107.90	104.42	104.218	3.48	105.90	102.92	102.717	2.98	0.00	1.00
East-West Collector	550	551				0.94	1.04	1.98	67	67	1.98	3.63	0.79		0.00	0.00		0.00	0.00	0.65		1.44	200	0.35	20.2	0.62	161.54	18.80	105.50	103.20	103.00	2.30	105.90	102.63	102.43	3.27	0.00	1.00
East-West Collector	551	552					1.49	1.49	95	746	12.70	3.30	7.98		0.00	0.00		0.00	0.00	4.19		12.28	200	0.35	20.2	0.62	113.56	7.97	105.90	102.63	102.43	3.27	106.15	102.24	102.03	3.91	0.00	1.00
East-West Collector	552	554				2.12	1.24	3.36	79	825	16.06	3.28	8.77		0.00	0.00		0.00	0.00	5.30		14.17	200	0.35	20.2	0.62	178.26	6.07	106.15	102.24	102.03	3.91	105.20	101.61	101.41	3.59	0.00	1.00
East-West Collector	554	556					1.81	1.81	116	1345	24.54	3.17	13.82		0.00	0.00		0.00	0.00	8.10		22.02	250	0.33	35.6	0.70	295.67	13.62	105.20	101.61	101.36	3.59	103.55	100.64	100.38	2.91	0.00	1.00
Street 4	517	564					2.07	2.07	132	132	2.07	3.57	1.53		0.00	0.00		0.00	0.00	0.68		2.21	200	0.58	26.2	0.81	282.43	23.94	105.30	102.10	101.90	3.20	103.65	100.45	100.25	3.20	0.00	1.00
Alex Polowin Ave.	13 (ex.)	14 (ex.)	5				0.54	0.54	32	32	0.54	3.68	0.38		0.00	0.00		0.00	0.00	0.18		0.56	200	0.67	28.0	0.86	74.56	27.45	105.00	102.55	102.35	2.45	105.52	102.05	101.85	3.47	0.00	1.00
Alex Polowin Ave.	14 (ex.)	90 (ex.)	7				0.65	0.65	36	68	1.19	3.63	0.80		0.00	0.00		0.00	0.00	0.39		1.19	200	0.94	33.2	1.02	112.06	31.98	105.00	102.00	101.80	3.00	103.96	101.95	101.75	2.01	0.00	1.00
Russet Terrace	90 (ex.)	5 (ex.)	6				0.54	0.54	30	98	1.73	3.60	1.14		0.00	0.00		0.00	0.00	0.57		1.71	200	0.35	20.2	0.62	108.16	18.53	103.93	100.95	100.75	2.98	103.80	100.57	100.37	3.23	0.00	1.00
River Mist Rd.	5 (ex.)	564					0.47	0.47	30	128	2.20	3.57	1.48		0.00	0.00		0.00	0.00	0.73		2.21	200	0.35	20.2	0.62	74.22	18.04	103.90	100.30	100.10	3.60	103.80	100.04	99.84	3.76	0.00	1.00
River Mist Rd.	564	556					0.62	0.62	0 40	300	4.89	3.46	3.37		0.00	0.00		0.00	0.00	1.61		4.98	200	0.35	20.2	0.62	94.59	15.26	103.65	100.04	99.84	3.61	103.55	99.71	99.51	3.84	0.00	1.00
East-West Collector	556	557							0	1645	29.43	3.12	16.63		0.00	0.00	2.12	2.12	0.69	10.41		27.83	250	1.39	73.1	1.44	44.25	45.31	103.55	99.71	99.46	3.84	102.78	99.09	98.84	3.69	0.07	1.00
East-West Collector	557	558					0.68	0.68	43	1688	30.11	3.11	17.03		0.00	0.00	3.12	5.24	1.70	11.67	4.00	34.50	250	1.39	73.1	1.44	158.35	38.65	102.78	99.09	98.84	3.69	99.90	96.89	96.64	3.01	0.15	1.00
Street 5	560	558					2.73	2.73	175	175	2.73	3.53	2.00		0.00	0.00		0.00	0.00	0.90		2.91	200	0.35	20.2	0.62	142.27	17.34	98.80	95.32	95.12	3.48	99.90	94.82	94.62	5.08	0.00	1.00
East-West Collector	558	119				5.43	0.31	5.74	20	1883	38.58	3.08	18.82		0.00	0.00		5.24	1.70	14.46		39.08	375	0.18	77.6	0.68	150.71	38.52	99.90	93.71	93.32	6.20	99.55	93.43	93.05	6.12	0.12	1.00
Street 6	521	522					2.17	2.17	139	139	2.17	3.56	1.60		0.00	0.00		0.00	0.00	0.72		2.32	200	1.50	41.9	1.29	37.09	39.59	105.18	102.18	101.98	3.00	104.50	101.62	101.42	2.88	0.00	1.00
	522	523								139	2.17	3.56	1.60		0.00	0.00		0.00	0.00	0.72		2.32	200	0.80	30.6	0.94	73.27	28.28	104.50	101.62	101.42	2.88	105.11	101.04	100.83	4.07	0.00	1.00
	523	524					1.95	1.95	125	264	4.12	3.48	2.98		0.00	0.00		0.00	0.00	1.36		4.34	200	0.35	20.2	0.62	164.00	15.90	105.11	101.04	100.83	4.07	103.50	100.46	100.26	3.04	0.00	1.00
Adjacent to Barnsdale Rd	520	524					2.06	2.06	132	132	2.06	3.57	1.53		0.00	0.00		0.00	0.00	0.68		2.21	300	0.20	45.1	0.62	146.25	42.91	102.80	98.40	98.10	4.40	103.50	98.11	97.80	5.39	0.00	1.00
Adjacent to Barnsdale Rd	524	578							0	396	6.18	3.42	4.39		0.00	0.00		0.00	0.00	2.04		6.43	300	0.20	45.1	0.62	126.92	38.69	103.50	98.11	97.80	5.39	104.92	97.85	97.55	7.07	0.00	1.00
Adjacent to Barnsdale Rd	578	532				1.06	2.57	3.63	164	560	9.81	3.36	6.10		0.00	0.00		0.00	0.00	3.24		9.33	300	0.20	45.1	0.62	173.72	35.78	104.92	97.85	97.55	7.07	103.80	97.51	97.20	6.29	0.00	1.00
Adjacent to Barnsdale Rd	532	534					3.29	3.29	210	770	13.10	3.30	8.23		0.00	0.00		0.00	0.00	4.32		12.55	300	0.20	45.1	0.62	127.45	32.57	103.80	97.51	97.20	6.29	103.00	97.25	96.95	5.75	0.00	1.00
Adjacent to Barnsdale Rd	534	536					2.95	2.95	189	959	16.05	3.25	10.10		0.00	0.00		0.00	0.00	5.30		15.39	450	0.20	133.0	0.81	173.27	117.62	103.00	95.50	95.04	7.50	101.56	95.15	94.70	6.41	0.00	1.00
Easement (Barnsdale to E-W Collector)	536	538							0	959	16.05	3.25	10.10		0.00	0.00		0.00	0.00	5.30		15.39	450	0.20	133.0	0.81	309.73	117.62	101.56	95.15	94.70	6.41	99.75	94.53	94.08	5.22	0.00	1.00
	538	119							0	959	16.05	3.25	10.10		0.00	0.00		0.00	0.00	5.30		15.39	525	0.15	173.8	0.78	245.34	158.37	99.75	93.80	93.26	5.95	99.55	93.43	92.89	6.12	0.00	1.00
Ex. Greenbank Rd.	119	120 (ex.)							0	2842	54.630	2.97	27.35		0.00	0.00		5.24	1.70	19.76		52.91	600 600	0.15 0.25	248.1	0.85	168.66	195.18	99.55	93.43	92.82	6.12		93.17	92.57		0.09	1.00
MATTAMY LANDS EAST OUTLETS TO DUNDONALD DR. & DES SOLDATS									54.63	**2842**																										
	900	158 (ex.)				0.8	3.10	3.90	198	198	3.90	3.52	2.26	0.00	0.00	0.00		0.00	0.00	1.29		3.55	200	0.35	20.2	0.62	280.00	16.70	106.62	97.23	97.02	9.39	101.03	97.13	97.13	3.90	0.00	1.00
	910	153 (ex.)					0.70	0.70	45	45	0.70	3.66	0.53	0.00	0.00	0.00		0.00	0.00	0.23		0.76	200	0.35	20.2	0.62	130.00	19.48	104.00	96.70	96.49	7.30	100.35	96.65	96.65	3.70	0.00	1.00
	920	930					1.78	1.78	114	114	1.78	3.58	1.32	2.13	2.13	1.04		0.00	0.00	1.29		3.65	200	0.35	20.2	0.62	165.00	16.59	106.07	97.42	97.21	8.65	101.70	97.36	97.16	4.34	0.54	1.50
	930	217 (ex.)								114	1.78	3.58	1.32	0.00	2.13	1.04		0.00	0.00	1.29		3.65	200	0.35	20.2	0.62	40.00	16.59	101.70	97.36	97.16	4.34	101.70	97.24	97.04	4.46	0.54	1.50
BRAZEAU AGGREGATE EXTRACTION AREA OUTLETS TO NEW GREENBANK ROAD*																																				
	585	575			38			21.75	1194	1194	21.75	3.20	12.38	0.67	0.67	0.22	1.47	1.47	0.48	7.88		20.96	250	0.24	30.4	0.60	431.00	9.44		98.56	98.30			97.52	97.27		0.09	1.00
	575	555							0	1194	21.75	3.20	12.38		0.67	0.22		1.47	0.48	7.88		20.96	250	0.24	30.4	0.60	228.00	9.44		97.52	97.27			96.98	96.72		0.09	1.00
	565	555							0	0	0.00	3.80	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	250	0.24	30.4	0.60	431.00	30.39		98.01	97.76			96.98	96.72		0.00	1.00
	555	545							0	1194	21.75	3.20	12.38		0.67	0.22		1.47	0.48	7.88		20.96	250	0.24	30.4	0.60	133.00	9.44		96.98	96.72			96.66	96.40		0.09	1.00
	545	900							0	1194	21.75	3.20	12.38		0.67	0.22		1.47	0.48	7.88		20.96	250	0.24	30.4	0.60	72.00	9.44	104.31	96.66	96.40	7.65	103.00	96.48	96.23	6.52	0.09	1.00
	900	MA 14																					250	0.24	30.4	0.60	160.00	30.39		96.48	96.23			96.10	95.85			
MATTAMY LANDS WEST OUTLETS TO NEW GREENBANK RD																																				
Realigned Greenbank Rd.	900	MA 14					3.89	3.89	249	249	3.89	3.49	2.82	0.00	0.67	0.33	0.00	1.47	0.71	1.99		5.85	250	1.30	70.7	1.40	60.00	64.89	104.31	96.88	96.63	7.43	103.00	96.10	95.85	6.90	0.35	1.50
	MA 14	MA13						0.00	0	249	3.89	3.49	2.82	0.00	0.67	0.33	0.00	1.47	0.71	1.99		5.85	250	1.30	70.7	1.40	295.00	64.84	103.00	96.10	95.85	6.90	95.20	92.27	92.02	2.93	0.35	1.50
	MA13	MH57A								249	3.89	3.49	2.82		0.67	0.33		1.47	0.71	1.99		5.85	375	0.30	100.2	0.88	413.10	94.34	92.27	90.77	90.39	1.50	93.60	89.53	89.15	4.07	0.35	1.50
DRUMMOND AGGREGATE EXTRACTION AREA OUTLETS TO PROPOSED COLLECTOR RD.*																																				
	593	592																					200	0.35	20.2	0.62	300.00	20.24		99.19	98.99			98.14	97.94			1.00
	592	590																					200	0.35	20.2	0.62	220.00	20.24		98.14	97.94			97.37	97.17			1.00
	591	590																					200	0.35	20.2	0.62	300.00	20.24		98.42	98.22			97.37	97.17			1.00
	590	MA 11			32			18.48	958	958	18.48	3.25	10.09	0.57	0.57	0.18	1.25	1.25	0.41	6.70		17.38	300	0.35	59.7	0.82	80.00	42.31		97.37	97.07		100.00	97.09	96.79	2.91	0.09	1.00
	MA 11	MA 10							0	958	18.48	3.25	10.09		0.57	0.18		1.25	0.41	6.70		17.38	300	0.75	87.4	1.20	482.10	69.99	100.00	95.00	94.69	5.00	93.50	91.38	91.08	2.12	0.09	1.00
	MA 10	MH57A							0	958	18.48	3.25	10.09		0.57	0.18		1.25	0.41	6.70		17.38	375	0.41	117.3	1.03	449.70	99.94	93.50	91.38	91.00	2.12	93.60	89.53	89.15	4.07		1.00

*ONLY FLOW CONTRIBUTIONS FROM BSUEA ARE SHOWN, FOR SANITARY FLOWS FROM OTHER CONTRIBUTING AREAS TRIBUTARY TO CAMBRIAN ROAD, SEE OVERALL SANITARY SPREADSHEET
**RESIDENTIAL POPULATION DENSITY IS MULTIPLIED BY RESIDENTIAL AREA TO OBTAIN POPULATION,SINGLE FAMILY HOMES SHOWN ARE FROM EXISTING QUINN'S POINTE STAGE 1 SUBDIVISION

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

BARRHAVEN SOUTH SANITARY SEWER DESIGN SHEET

Designed by: AT
Checked by:HM

PROPOSED AND BSUEA DESIGN PARAMETERS					
Single Family	3.4	pers/unit	q =	280	L/cap/day
Semi-Detached/Townhouse (row)	2.7	pers/unit	I =	0.330	L/s/ha
Apt Units	1.8	pers/unit	Inst./Comm. =	28000	L/ha/day
Manning's Coeff. N =	0.013		Commerial PF*=	1.0/1.5	

*1.5 if ICI in contributing area is >20%, 1.0 if ICI in contributing area is <20%

Sources:	
	Half Moon Bay South Subdivision - Phase 4 - Excluding Arterials- Sanitary sewer design sheet prepared by Stantec (2015)
	Quinn's Pointe - Excluding Arterials-Sanitary sewer design sheet prepared by J.L Richards (2015)
	Barrhaven South Master Servicing Study Addendum - Sanitary sewer design sheet prepared Stantec (2014)

Legend	
	Proposed
	Proposed by Others
	Existing

Date: May 2018

STREET	SOURCE	M.H. #		RESIDENTIAL								COMMERCIAL			INSTITUTIONAL			GREEN/UNUSED		PEAK EXTR.	PLUG	PEAK DES.	SEWER DATA					RESIDUAL		ICI*
				NUMBER OF UNITS			AREA	POPULATION	CUMULATIVE		PEAKING	POPUL.	AREA	CUMM.	INST.	AREA	CUMM.	INST.	AREA	CUMM.										
		FROM	TO	SING.	MULT.	APT.	TOTAL ha	TOTAL peop.	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	ha	AREA ha	FLOW l/s	ha	AREA ha	FLOW l/s	AREA ha	AREA ha	FLOW l/s	FLOW l/s	FLOW l/s	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	CAP. l/s	ICI/ TOTAL	Peaking Factor
CAMBRIAN ROAD OUTLET VIA FUTURE REALIGNED GREENBANK AND FUTURE COLLECTOR																														
Drummond Aggregate Extraction Area		545	MA11			32.00	18.48	958	958	18.48	3.25	10.09	0.57	0.57	0.18	1.25	1.25	0.41		0.00	6.70		17.38	300	0.75	87.4	1.20	300.00	69.99	0.09	1.00
Future Collector Road	Stantec (2014)	MA11	MA10				14.23	1523	2481	32.71	3.01	24.19		0.57	0.18	2.80	4.05	1.31	2.50	2.50	13.14		38.83	300	0.75	87.4	1.20	482.10	48.53	0.12	1.00
Cambrian Rd.	Stantec (2014)	MA10	MH57A				12.81	1371	3852	45.52	2.88	35.93		0.57	0.18	7.22	11.27	3.65	14.49	16.99	24.54		64.30	375	0.40	115.7	1.01	449.70	51.38	0.16	1.00
Brazeau Aggregate Extraction Area + Mattamy Lands		900	MA14			38.00	25.65	1443	1443	25.65	3.15	14.75	0.67	0.67	0.22	1.47	1.47	0.48		0.00	9.17		24.6	250	1.30	70.7	1.40	350.00	46.12	0.08	1.00
New Greenbank Road	Stantec (2014)	MA14	MA13				4.79	513	1956	30.44	3.07	19.49		0.67	0.33	7.45	8.92	4.34		0.00	13.21		37.36	250	1.30	70.7	1.40	295.00	33.37	0.24	1.50
New Greenbank Road	Stantec (2014)	MA13	MH57A				10.99	1176	3132	41.43	2.94	29.85		0.67	0.22		8.92	2.89	0.53	0.53	17.01		49.97	375	0.30	100.2	0.88	413.10	50.21	0.19	1.00
Cambrian Road	Stantec	MH57A	MH13A				4.29	458	7442	91.24	2.66	64.27	3.44	4.68	1.52	0.00	20.19	6.54		17.52	44.10		116.42	500	0.25	197.0	0.97	216.50	80.54	0.19	1.00
Cambrian Road	Stantec	MH13A	MH15A				6.21	634	8076	97.45	2.64	69.02		4.68	1.52	0.00	20.19	6.54		17.52	46.15		123.22	500	0.20	176.2	0.87	165.20	52.94	0.18	1.00
Cambrian Road	Stantec	MH15A	MH17A				5.61	870	8946	103.06	2.60	75.44		4.68	1.52	0.00	20.19	6.54		17.52	48.00		131.50	600	0.13	231.0	0.79	202.00	99.46	0.17	1.00
QUINN'S POINTE OUTLET TO MH163 RIVER MIST RD.							103.06	8946					4.68						17.52											
Kilbirnie Drive		572	511				0.64	41	41	0.64	3.67	0.49		0.00	0.00	2.43	2.43	1.18		0.00	1.01		2.68	200	2.87	57.9	1.79	136.50	55.22	0.79	1.50
Kilbirnie Drive		511	512				0.82	52	93	1.46	3.60	1.09		0.00	0.00		2.43	1.18		0.00	1.28		3.55	200	0.80	30.6	0.94	97.50	27.05	0.62	1.50
Future Collector Road		514	512				1.07	68	68	1.07	3.63	0.80		0.00	0.00		0.00	0.00		0.00	0.35		1.15	200	0.74	29.4	0.91	212.10	28.28	0.00	1.00
Kilbirnie Drive		512	EX10				0.00	0	161	2.53	3.54	1.85		0.00	0.00		2.43	1.18		0.00	1.64		4.67	200	1.60	43.3	1.33	74.00	38.61	0.49	1.50
River Mist Road		EX5	EX4	12			0.55	41	41	0.55	3.67	0.49		0.00	0.00		0.00	0.00		0.00	0.18		0.67	200	0.33	19.8	0.61	74.90	19.10	0.00	1.00
Boddington Street		EX101	EX100	14			0.72	48	48	0.72	3.65	0.57		0.00	0.00		0.00	0.00		0.00	0.24		0.81	200	0.98	33.8	1.04	90.13	33.00	0.00	1.00
Boddington Street		EX100	EX4	8			0.44	27	75	1.16	3.62	0.88		0.00	0.00		0.00	0.00		0.00	0.38		1.26	200	0.91	32.6	1.01	91.40	31.34	0.00	1.00
River Mist Road		EX4	EX3	12			0.53	41	157	2.24	3.55	1.81		0.00	0.00		0.00	0.00		0.00	0.74		2.54	200	0.32	19.4	0.60	74.95	16.82	0.00	1.00
Clonfadda Terrace		EX111	EX110	13			0.62	44	44	0.62	3.66	0.52		0.00	0.00		0.00	0.00		0.00	0.20		0.73	200	1.04	34.8	1.07	76.25	34.10	0.00	1.00
Clonfadda Terrace		EX110	EX3	15			0.64	51	95	1.26	3.60	1.11		0.00	0.00		0.00	0.00		0.00	0.42		1.52	200	0.83	31.2	0.96	108.32	29.67	0.00	1.00
River Mist Road		EX3	EX2	3			0.32	10	262	3.82	3.48	2.96		0.00	0.00		0.00	0.00		0.00	1.26		4.22	200	0.35	20.2	0.62	100.22	16.00	0.00	1.00
River Mist Road		EX2	EX1		14		0.55	38	300	4.37	3.46	3.37		0.00	0.00		0.00	0.00		0.00	1.44		4.81	200	1.77	45.5	1.40	112.11	40.65	0.00	1.00
Alex Polowin Avenue		EX13	EX12	5			0.46	29	29	0.46	3.69	0.35		0.00	0.00		0.00	0.00		0.00	0.15		0.50	200	1.01	34.4	1.06	74.36	33.87	0.00	1.00
Alex Polowin Avenue		EX12	EX11	8			0.74	45	74	1.20	3.62	0.87		0.00	0.00		0.00	0.00		0.00	0.40		1.26	200	2.14	50.1	1.54	107.77	48.83	0.00	1.00
Alex Polowin Avenue		EX11	EX10	9			0.71	47	121	1.91	3.58	1.40		0.00	0.00		0.00	0.00		0.00	0.63		2.03	200	1.65	44.0	1.36	103.97	41.98	0.00	1.00
Kilbirnie Drive		EX10	EX20		14		0.57	38	320	5.01	3.45	3.58		0.00	0.00		2.43	1.18		0.00	2.46		7.22	200	0.32	19.3	0.60	118.98	12.12	0.33	1.50
Block 251 (School)		Stub	EX20				0.00	0	0	0.00	3.80	0.00		0.00	0.00	2.83	2.83	1.38		0.00	0.93		2.31	200	0.32	19.3	0.60	11.00	16.99	1.00	1.50
Kilbirnie Drive		EX20	EX1		15		0.54	41	361	5.55	3.43	4.02		0.00	0.00		5.26	2.56		0.00	3.57		10.14	200	0.32	19.4	0.60	106.01	9.21	0.49	1.50
River Mist Road		EX1	MH163				0.08	0	661	10.00	3.33	7.13		0.00	0.00		5.26	2.56		0.00	5.04		14.72	200	0.32	19.3	0.60	39.41	4.63	0.34	1.50
MH163 TO MH17A RIVERMIST ROAD OUTLETS VIA CAMBRIAN ROAD							10.00	661																						
River Mist Road	Stantec (2015)	MH163	EX162				0.08	0	661	10.08	3.33	7.13		0.00	0.00		5.26	2.56		0.00	5.06		14.75	250	0.85	57.2	1.13	36.30	42.45	0.34	1.50
River Mist Road		EX162	EX161				0.20	0	661	10.28	3.33	7.13		0.00	0.00		5.26	2.56		0.00	5.13		14.81	250	1.15	66.5	1.31	44.40	51.72	0.34	1.50
River Mist Road		EX161A	EX161				0.00	0	0	0.00	3.80	0.00		0.00	0.00		0.00	0.00	0.91	0.91	0.30		0.30	150	1.00	15.9	0.87	14.00	15.59	0.00	1.00
River Mist Road		EX161	151				0.19	0	661	10.47	3.33	7.13		0.00	0.00		5.26	2.56		0.91	5.49		15.18	250	1.15	66.5	1.31	57.70	51.35	0.32	1.50
River Mist Road		EX151A	151				0.00	0	0	0.00	3.80	0.00		0.00	0.00	2.77	2.77	1.35		0.00	0.91		2.26	150	1.00	15.9	0.87	12.70	13.63	1.00	1.50
River Mist Road		151	EX151				0.09	0	661	10.56	3.33	7.13		0.00	0.00		8.03	3.90		0.91	6.44		17.47	300	1.40	119.4	1.64	17.90	101.90	0.41	1.50
River Mist Road		EX151	MH142				0.00	0	661	10.56	3.33	7.13		0.00	0.00		8.03	3.90		0.91	6.44		17.47	300	1.40	119.4	1.64	44.40	101.90	0.41	1.50
Buffalograss Cres.	Stantec (2015)	EX159	EX158		24		0.56	65	65	0.56	3.63	0.77		0.00	0.00		0.00	0.00		0.00	0.18		0.95	200	0.40	21.6	0.67	95.50	20.69	0.00	1.00
Mattamy Lands East		900	EX158				3.90	198	198	3.90	3.52	2.26		0.00	0.00		0.00	0.00		0.00	1.29		3.55	200	0.35	20.2	0.62	280.00	16.46	0.00	1.00
Alex Polowin ave.		EX158	EX153	0	0		0.13	0	263	4.59	3.48	2.97		0.00	0.00		0.00	0.00		0.00	1.51		4.48	200	0.40	21.6	0.67	45.00	17.16	0.00	1.00
Mattamy Lands East		910	EX153				0.70	45	45	0.70	3.66	0.53		0.00	0.00		0.00	0.00		0.00	0.23		0.76	200	0.35	20.2	0.62	130.00	19.48	0.00	1.00
Alex Polowin ave.		EX153	EX152				0.12	0	308	5.41	3.46	3.45		0.00	0.00		0.00	0.00		0.00	1.79		5.24	200	0.80	30.6	0.94	70.00	25.37	0.00	1.00
Alex Polowin ave.		EX152	EX150				0.00	0	308	5.41	3.46	3.45		0.00	0.00		0.00	0.00		0.00	1.79		5.24	200	0.80	30.6	0.94	85.70	25.37	0.00	1.00
Rue Des Soldats Riendeau St.		EX165	EX150	17			0.67	58	58	0.67	3.64	0.68		0.00	0.00		0.00	0.00		0.00	0.22		0.91	200	1.50	41.9	1.29	101.20	41.00	0.00	1.00
Rue Des Soldats Riendeau St.	Stantec (2015)	EX150	EX146	6			0.30	20	386	6.38	3.42	4.28		0.00	0.00		0.00	0.00		0.00	2.11		6.39	200	0.80	30.6	0.94	72.00	24.22	0.00	1.00

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

BARRHAVEN SOUTH SANITARY SEWER DESIGN SHEET

Designed by: AT
Checked by:HM

PROPOSED AND BSUEA DESIGN PARAMETERS					
Single Family	3.4	pers/unit	q =	280	L/cap/day
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Manning's Coeff. N =	0.013		Commerial PF*=	1.0/1.5	

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Sources:	
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Legend	
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	Existing

Date: May 2018

STREET	SOURCE	M.H. #		RESIDENTIAL								COMMERCIAL			INSTITUTIONAL			GREEN/UNUSED		PEAK EXTR.	PLUG	PEAK DES.	SEWER DATA					RESIDUAL		ICI*
				NUMBER OF UNITS			AREA	POPULATION	CUMULATIVE		PEAKING	POPUL.	AREA	CUMM.	INST.	AREA	CUMM.	INST.	AREA	CUMM.										
				SING.	MULT.	APT.	TOTAL	TOTAL	POPUL.	AREA	FACTOR	FLOW		AREA	FLOW		AREA	FLOW		AREA	FLOW	FLOW	FLOW	DIA.	SLOPE	CAPAC.	VEL.	LENGTH	CAP.	ICI/	Peaking
		FROM	TO				ha	peop.	peop.	ha		l/s	ha	ha	l/s	ha	ha	l/s	ha	ha	l/s	l/s	l/s	mm	%	l/s	m/s	m	l/s	TOTAL	Factor
Remora Way		EX147	EX146	20			0.94	68	68	0.94	3.63	0.80		0.00	0.00		0.00	0.00		0.00	0.31		1.11	200	1.00	34.2	1.06	78.20	33.11	0.00	1.00
Rue Des Soldats Riendeau St.		EX146	EX145	2			0.08	7	461	7.40	3.39	5.07		0.00	0.00		0.00	0.00		0.00	2.44		7.51	200	0.50	24.2	0.75	19.30	16.68	0.00	1.00
Rue Des Soldats Riendeau St.		EX145	EX144				0.07	0	461	7.47	3.39	5.07		0.00	0.00		0.00	0.00		0.00	2.47		7.54	200	0.50	24.2	0.75	35.90	16.66	0.00	1.00
Rue Des Soldats Riendeau St.		EX144	EX143	9			0.54	31	492	8.01	3.38	5.39		0.00	0.00		0.00	0.00		0.00	2.64		8.04	200	0.50	24.2	0.75	114.90	16.16	0.00	1.00
Rue Des Soldats Riendeau St.		EX143	MH142				0.00	0	492	8.01	3.38	5.39		0.00	0.00		0.00	0.00		0.00	2.64		8.04	200	0.40	21.6	0.67	21.50	13.60	0.00	1.00
River Mist Road		MH142	EX139	3			0.26	10	1163	18.83	3.21	12.08		0.00	0.00		8.03	3.90		0.91	9.16		25.15	300	0.40	63.8	0.87	74.80	38.65	0.29	1.50
		EX140	EX139	7			0.40	24	24	0.40	3.70	0.29		0.00	0.00		0.00	0.00		0.00	0.13		0.42	200	0.65	27.6	0.85	67.70	27.17	0.00	1.00
River Mist Road		EX139	EX136	10			0.47	34	1221	19.70	3.19	12.64		0.00	0.00		8.03	3.90		0.91	9.45		25.99	300	0.41	64.6	0.89	64.70	38.60	0.28	1.50
		EX137	EX136	15			0.84	51	51	0.84	3.65	0.60		0.00	0.00		0.00	0.00		0.00	0.28		0.88	200	0.65	27.6	0.85	67.80	26.71	0.00	1.00
River Mist Road		EX136	MH126	4			0.29	14	1286	20.83	3.18	13.26		0.00	0.00		8.03	3.90		0.91	9.82		26.99	300	0.41	64.6	0.89	78.90	37.61	0.27	1.50
Mattamy Lands East		920	930				1.78	114	114	1.78	3.58	1.32	2.13	2.13	1.04		0.00	0.00		0.00	1.29		3.65	200	0.35	20.2	0.62	165.00	15.50	0.54	1.50
Mattamy Lands East		930	EX217					0	114	1.78	3.58	1.32		2.13	1.04		0.00	0.00		0.00	1.29		3.65	200	0.36	20.5	0.63	40.00	15.50	0.54	1.50
Flameflower St.		EX217	EX215				0.05	0	114	1.83	3.58	1.32		2.13	1.04		0.00	0.00		0.00	1.31		3.67	200	2.00	48.4	1.49	34.50	44.72	0.54	1.50
Flameflower St.	Stantec (2015)	EX216	EX215		5		0.19	14	14	0.19	3.72	0.17		0.00	0.00		0.00	0.00		0.00	0.06		0.23	200	0.65	27.6	0.85	45.20	27.35	0.00	1.00
Flameflower St.		EX215	EX214		15		0.34	41	169	2.36	3.54	1.94		2.13	1.04		0.00	0.00		0.00	1.48		4.46	200	2.00	48.4	1.49	72.00	43.93	0.47	1.50
Flameflower St.		EX214	EX203		15		0.35	41	210	2.71	3.51	2.39		2.13	1.04		0.00	0.00		0.00	1.60		5.02	200	2.00	48.4	1.49	73.50	43.37	0.44	1.50
Devario Cres.		EX204	EX203				0.54	62	62	0.54	3.64	0.73		0.00	0.00		0.00	0.00	3.10	3.10	1.20		1.93	200	1.50	41.9	1.29	36.50	39.97	0.00	1.00
Devario Cres.		EX208	EX203				2.50	187	187	2.50	3.53	2.14		0.00	0.00		0.00	0.00		0.00	0.83		2.96	200	0.40	21.6	0.67	120.00	18.68	0.00	1.00
Flameflower St.		EX203	EX201				0.12	0	459	5.87	3.39	5.05		2.13	0.69		0.00	0.00		3.10	3.66		9.40	200	0.40	21.6	0.67	73.70	12.24	0.19	1.00
Dundonald Dr.		EX202	EX201	4			0.53	14	14	0.53	3.72	0.17		0.00	0.00		0.00	0.00		0.00	0.17		0.34	200	3.25	61.7	1.90	50.00	61.34	0.00	1.00
Dundonald Dr.		EX201	EX129A	3			0.21	10	483	6.61	3.39	5.30		2.13	0.69		0.00	0.00		3.10	3.91		9.90	200	0.40	21.6	0.67	47.80	11.74	0.18	1.00
Dundonald Dr.		EX129A	EX129	18			0.75	61	544	7.36	3.36	5.93		2.13	0.69		0.00	0.00		3.10	4.15		10.78	200	0.40	21.6	0.67	100.90	10.86	0.17	1.00
Dundonald Dr.		EX129	EX128	11			0.58	37	581	7.94	3.35	6.31		2.13	0.69		0.00	0.00		3.10	4.35		11.35	200	0.40	21.6	0.67	91.70	10.29	0.16	1.00
Lamprey St.		EX130	EX128				1.16	85	85	1.16	3.61	0.99		0.00	0.00		0.00	0.00	0.40	0.40	0.51		1.51	200	0.50	24.2	0.75	96.50	22.69	0.00	1.00
Dundonald Dr.		EX128	EX127	9			0.37	31	697	9.47	3.32	7.49		2.13	0.69		0.00	0.00		3.50	4.98		13.16	200	0.50	24.2	0.75	49.80	11.03	0.14	1.00
Dundonald Dr.		EX127	MH126	13			0.66	44	741	10.13	3.30	7.93		2.13	0.69		0.00	0.00		3.50	5.20		13.83	200	0.32	19.4	0.60	97.80	5.53	0.14	1.00
Dundonald Dr.		EX23	MH126				1.06	71	71	1.06	3.63	0.83		0.00	0.00		0.00	0.00		0.00	0.35		1.18	200	1.47	41.5	1.28	89.30	40.30	0.00	1.00
School		EX123A	EX123				0.00	0	0	0.00	3.80	0.00		0.00	0.00	2.06	2.06	1.00		0.00	0.68		1.68	250	0.89	58.5	1.16	15.80	56.85	1.00	1.50
River Mist. Dr.		MH126	EX123		5		0.29	14	2112	32.31	3.05	20.90		2.13	1.04		8.03	3.90		4.41	15.47		41.31	375	0.45	122.7	1.08	122.00	81.39	0.22	1.50
River Mist. Rd.		EX123	MH112		7		0.34	19	2131	32.65	3.05	21.07		2.13	1.04		10.09	4.90		4.41	16.26		43.28	375	0.42	118.5	1.04	90.30	75.26	0.25	1.50
White Arctic Ave.		EX111	MH112				3.39	378	378	3.39	3.43	4.20		0.00	0.00		0.00	0.00		0.00	1.12		5.32	200	0.32	19.4	0.60	74.80	14.04	0.00	1.00

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

BARRHAVEN SOUTH SANITARY SEWER DESIGN SHEET

Designed by: AT
Checked by:HM

Date: May 2018

PROPOSED AND BSUEA DESIGN PARAMETERS					
Single Family	3.4	pers/unit	q =	280	L/cap/day
Semi-Detached/Townhouse (row)	2.7	pers/unit	I =	0.330	L/s/ha
Apt Units	1.8	pers/unit	Inst./Comm. =	28000	L/ha/day
Manning's Coeff. N =	0.013		Commerial PF*=	1.0/1.5	

*1.5 if ICI in contributing area is >20%, 1.0 if ICI in contributing area is <20%

Sources:	
	Half Moon Bay South Subdivision - Phase 4 - Excluding Arterials- Sanitary sewer design sheet prepared by Stantec (2015)
	Quinn's Pointe - Excluding Arterials-Sanitary sewer design sheet prepared by J.L Richards (2015)
	Barrhaven South Master Servicing Study Addendum - Sanitary sewer design sheet prepared Stantec (2014)

Legend: Proposed; Proposed by Others; Existing

STREET	SOURCE	M.H. #		RESIDENTIAL								COMMERCIAL			INSTITUTIONAL			GREEN/UNUSED						SEWER DATA					RESIDUAL		ICI*
				NUMBER OF UNITS			AREA	POPULATION	CUMULATIVE		PEAKING	POPUL.	AREA	CUMM.	INST.	AREA	CUMM.	INST.	AREA	CUMM.	PEAK EXTR.	PLUG	PEAK DES.	DIA.	SLOPE	CAPAC.	VEL.	LENGTH	CAP.	ICI/	Peaking
		FROM	TO	SING.	MULT.	APT.	TOTAL ha	TOTAL peop.	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	ha	ha	FLOW l/s	ha	ha	FLOW l/s	AREA ha	AREA ha	FLOW l/s	FLOW l/s	FLOW l/s	mm	%	l/s	m/s	m	l/s	TOTAL	Factor
River Mist. Rd.		MH112	EX102				0.14	0	2509	36.18	3.01	24.44		2.13	1.04		10.09	4.90		4.41	17.43		47.81	375	0.31	101.8	0.89	68.00	54.03	0.23	1.50
Dutchmans Way		EX103	EX102	18			0.80	61	61	0.80	3.64	0.72		0.00	0.00		0.00	0.00		0.00	0.26		0.98	200	2.02	48.6	1.50	120.00	47.65	0.00	1.00
Song Sparrow St.		EX104	EX102				3.83	386	386	3.83	3.42	4.28		0.00	0.00		0.00	0.00		0.00	1.26		5.55	200	0.44	22.7	0.70	114.60	17.15	0.00	1.00
River Mist Road	Stantec (2015)	EX102	EX101				0.07	0	2956	40.88	2.96	28.34		2.13	1.04		10.09	4.90		4.41	18.98		53.26	375	0.29	98.5	0.86	34.00	45.24	0.21	1.50
	Stantec (2014)	EX101	MH43A				0.00	0	2956	40.88	2.96	28.34		2.13	1.04		10.09	4.90		4.41	18.98		53.26	375	0.30	100.2	0.88	38.00	46.93	0.21	1.50
		MH43A	MH44A				6.56	352	3308	47.44	2.92	31.35		2.13	0.69		10.09	3.27		4.41	21.14		56.46	375	0.30	100.2	0.88	81.00	43.73	0.19	1.00
		MH44A	MH45A				0.00	0	3308	47.44	2.92	31.35		2.13	0.69		10.09	3.27		4.41	21.14		56.46	375	0.30	100.2	0.88	64.00	43.73	0.19	1.00
		MH45A	MH46A				0.00	0	3308	47.44	2.92	31.35		2.13	0.69		10.09	3.27		4.41	21.14		56.46	375	0.30	100.2	0.88	85.00	43.73	0.19	1.00
		MH46A	MH47A				8.40	562	3870	55.84	2.88	36.08		2.13	0.69		10.09	3.27	1.60	6.01	24.44		64.48	375	0.30	100.2	0.88	41.00	35.70	0.16	1.00
		MH47A	MH101A				0.00	0	3870	55.84	2.88	36.08		2.13	0.69		10.09	3.27		6.01	24.44		64.48	375	0.30	100.2	0.88	64.00	35.70	0.16	1.00
		MH101A	MH102A				0.00	0	3870	55.84	2.88	36.08		2.13	0.69		10.09	3.27		6.01	24.44		64.48	375	0.30	100.2	0.88	64.00	35.70	0.16	1.00
River Mist Road	Stantec (2014)	MH102A	MH17A				5.24	420	4290	61.08	2.84	39.55		2.13	0.69		10.09	3.27		6.01	26.17		69.68	375	0.30	100.2	0.88	81.00	30.50	0.15	1.00
CAMBRIAN RD. FROM MH17A TO MH45A							61.08	4290																						
Cambrian Rd.	Stantec (2014)	MH17A	MH21A				26.01	1956	15192	190.15	2.77	136.51		6.81	2.21	2.96	33.24	10.77	5.10	28.63	75.97		225.45	750	0.13	419.5	0.92	204.30	194.05	0.15	1.00
Cambrian Rd.	Stantec (2014)	MH21A	MH45				7.04	408	15600	197.19	2.76	139.59		6.81	2.21		33.24	10.77	0.00	28.63	78.29		230.86	750	0.13	419.5	0.92	277.80	188.64	0.15	1.00
MINTO LANDS WITHIN BSUEA OUTLETS TO 120 (QUINN'S POINTE) EXISTING GREENBANK RD.							197.19																							
Future Collector		514	516				3.49	223	223	3.49	3.50	2.53		0.00	0.00	0.00	0.00	0.00		0.00	1.15		3.68	200	0.35	20.2	0.62	127.90	16.56	0.00	1.00
Future Collector		516	554				3.18	181	404	6.67	3.42	4.47		0.00	0.00	0.00	0.00	0.00		0.00	2.20		6.67	200	0.35	20.2	0.62	170.90	13.57	0.00	1.00
Future Collector																0.00														
Future Collector		500	502			120	7.68	485	485	7.68	3.38	5.32		0.00	0.00	0.00	0.00	0.00		0.00	2.53	0.10	7.95	200	0.35	20.2	0.62	174.00	11.41	0.00	1.00
Future Collector		502	551				1.55	99	584	9.23	3.35	6.34		0.00	0.00	0.00	0.00	0.00		0.00	3.05	0.10	9.49	200	0.88	32.1	0.99	171.30	20.22	0.00	1.00
East-West Collector		550	551				1.98	67	67	1.98	3.63	0.79		0.00	0.00	0.00	0.00	0.00		0.00	0.65		1.44	200	0.35	20.2	0.62	99.90	18.73	0.00	1.00
East-West Collector		551	552				1.49	95	746	12.70	3.30	7.98		0.00	0.00	0.00	0.00	0.00		0.00	4.19	0.10	12.28	200	0.35	20.2	0.62	175.00	7.97	0.00	1.00
East-West Collector		552	554				3.36	79	825	16.06	3.28	8.77		0.00	0.00	0.00	0.00	0.00		0.00	5.30	0.10	14.17	200	0.35	20.2	0.62	178.30	3.37	0.00	1.00
East-West Collector		554	556				1.81	116	1345	24.54	3.17	13.82		0.00	0.00	0.00	0.00	0.00		0.00	8.10	0.10	22.02	250	0.33	35.6	0.70	295.60	9.15	0.00	1.00
Future Collector		517	564				2.07	132	132	2.07	3.57	1.53		0.00	0.00	0.00	0.00	0.00		0.00	0.68		2.21	200	0.59	26.3	0.81	280.00	24.06	0.00	1.00
Alex Polowin Ave.		13	14	5	0		0.54	32	32	0.54	3.68	0.38		0.00	0.00	0.00	0.00	0.00		0.00	0.18		0.56	200	0.67	28.0	0.86	74.56	27.46	0.00	1.00
Alex Polowin Ave.		14	90	7	0		0.65	36	68	1.19	3.63	0.80		0.00	0.00	0.00	0.00	0.00		0.00	0.39		1.19	200	0.94	33.1	1.02	112.06	31.93	0.00	1.00
Alex Polowin Ave.		90	5	6	0		0.54	30	98	1.73	3.60	1.14		0.00	0.00	0.00	0.00	0.00		0.00	0.57		1.71	200	0.35	20.3	0.63	108.16	18.57	0.00	1.00
River Mist Road		5	563	0			0.00	0	98	1.73	3.60	1.14		0.00	0.00	0.00	0.00	0.00		0.00	0.57		1.71	200	0.42	22.2	0.68	80.00	20.46	0.00	1.00
River Mist Road		563	564	0			0.47	30	128	2.20	3.57	1.48		0.00	0.00	0.00	0.00	0.00		0.00	0.73		2.21	200	0.42	22.2	0.68	50.00	19.97	0.00	1.00
River Mist Road		564	556				0.62	40	300	4.89	3.46	3.37		0.00	0.00		0.00	0.00		0.00	1.61		4.98	200	0.35	20.2	0.62	95.00	15.26	0.00	1.00
East-West Collector		556	557						1645	29.43	3.12	16.63		0.00	0.00	2.12	2.12	0.69		0.00	10.41	0.10	27.83	300	1.39	118.9	1.63	44.30	84.53	0.07	1.00
East-West Collector		557	558				0.68	43	1688	30.11	3.11	17.03		0.00	0.00	3.12	5.24	1.70		0.00	11.67	4.00	34.50	300	1.39	118.9	1.63	158.40	80.38	0.15	1.00
Future Collector		560	558				2.73	175	175	2.73	3.53	2.00		0.00	0.00		0.00	0.00		0.00	0.90		2.91	200	0.35	20.2	0.62	150.00	17.34	0.00	1.00
East-West Collector		558	119				5.74	20	1883	38.58	3.08	18.82		0.00	0.00		5.24	1.70		0.00	14.46	4.10	39.08	450	0.13	107.2	0.65	150.00	63.75	0.12	1.00
Future Collector		521	522				2.17	139	139	2.17	3.56	1.60		0.00	0.00		0.00	0.00		0.00	0.72		2.32	200	1.26	38.4	1.18	230.00	36.10	0.00	1.00
		522	523						139	2.17	3.56	1.60		0.00	0.00		0.00	0.00		0.00	0.72		2.32								
		523	524				1.95	125	264	4.12	3.48	2.98		0.00	0.00		0.00	0.00		0.00	1.36		4.34							0.00	1.00
Future Collector		520	524				2.06	132	132	2.06	3.57	1.53		0.00	0.00		0.00	0.00		0.00	0.68		2.21	200	0.26	17.4	0.54	72.20	15.24	0.00	1.00
Future Collector		524	578				0.00	0	396	6.18	3.42	4.39		0.00	0.00		0.00	0.00		0.00	2.04		6.43	300	0.20	45.1	0.62	200.90	38.69	0.00	1.00
Future Collector		578	532				3.63	164	560	9.81	3.36	6.10		0.00	0.00		0.00	0.00		0.00	3.24		9.33	300	0.20	45.1	0.62	173.70	35.78	0.00	1.00
Future Collector		532	534				3.29	210	770	13.10	3.30	8.23		0.00	0.00		0.00	0.00		0.00	4.32		12.55	300	0.20	45.1	0.62	127.45	32.57	0.00	1.00
Future Collector		534	536				2.95	189	959	16.05	3.25	10.10		0.00	0.00		0.00	0.00		0.00	5.30		15.39	450	0.20	133.0	0.81	173.27	117.62	0.00	1.00
Future Collector		536	538				0.00	0	959	16.05	3.25	10.10		0.00	0.00	0.00	0.00	0.00		0.00	5.30		15.39	450	0.20	133.0	0.81	309.73	117.62	0.00	1.00
		538	119	0			0.00	0	959	16.05	3.25	10.10		0.00	0.00		0.00	0.00		0.00	5.30		15.39	525	0.15	173.8	0.78	245.34	158.37	0.00	1.00
Greenbank Rd.		119	EX120					0	2842	54.63	2.97	27.35		0.00	0.00		5.24	1.70		0.00	19.76		52.91	600	0.15	248.1	0.85	168.66	187.53	0.09	1.00
QUINN'S POINTE OUTLETS TO MH205A EXISTING GREENBANK RD.							54.63	2842																						
Greenbank Road		EX120	EX121				0.22	0	2842	54.85	2.97	27.35		0.00	0.00	0.00	5.24	1.70		0.00	19.83		52.98	600	0.16	259.0	0.89	58.09	206.06	0.09	1.00
Greenbank Road		EX121	EX122				0.28	0	3225	61.68	2.93	30.65		0.00	0.00	0.00	6.81	2.21		0.00	22.60		59.55	600	0.33	369.2	1.27	75.27	309.66	0.10	1.00

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR NO. 26610

BARRHAVEN SOUTH SANITARY SEWER DESIGN SHEET

Designed by: AT
Checked by:HM

Date: May 2018

PROPOSED AND BSUEA DESIGN PARAMETERS					
Single Family	3.4	pers/unit	q =	280	L/cap/day
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Legend
- Proposed
- Proposed by Others
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STREET	SOURCE	M.H. #		RESIDENTIAL								COMMERCIAL			INSTITUTIONAL			GREEN/UNUSED						SEWER DATA					RESIDUAL		ICI*
				NUMBER OF UNITS			AREA	POPULATION	CUMULATIVE		PEAKING	POPUL.	AREA	CUMM.	INST.	AREA	CUMM.	INST.	AREA	CUMM.	PEAK EXTR.	PLUG	PEAK DES.	DIA.	SLOPE	CAPAC.	VEL.	LENGTH	CAP.	ICI/	Peaking
		FROM	TO	SING.	MULT.	APT.	TOTAL ha	TOTAL peop.	POPUL. peop.	AREA ha	FACTOR	FLOW l/s	ha	ha	FLOW l/s	ha	ha	FLOW l/s	ha	AREA ha	FLOW l/s	FLOW l/s	FLOW l/s	mm	%	l/s	m/s	m	l/s	TOTAL	Factor
Greenbank Road		EX122	EX123R				0.45	0	3225	62.13	2.93	30.65		0.00	0.00	0.00	6.81	2.21		0.00	22.75		59.70	600	0.21	291.1	1.00	121.02	231.39	0.10	1.00
Easement		EX44	EX123R				0.00	0	259	2.62	3.48	2.93		0.00	0.00	0.00	0.00	0.00		0.00	0.86		3.79	300	0.35	59.9	0.82	19.00	56.12	0.00	1.00
Greenbank Road		EX123R	MH205A				0.43	0	3484	65.18	2.91	32.85		0.00	0.00	0.00	6.81	2.21		0.00	23.76		62.91	600	0.25	319.2	1.09	120.80	256.31	0.09	1.00
Kilbirnie Drive	JLR (2016)	EX24	MH205A		3		0.11	8	224	2.15	3.50	2.54		0.00	0.00	0.00	0.00	0.00		0.00	0.71		3.25	200	0.71	28.8	0.89	28.70	25.59	0.00	1.00
Existing Greenbank Road		MH205A	EX98A					0	3708	67.33	2.89	34.73		0.00	0.00	0.00	6.81	2.21		0.00	24.47		70.50	600	0.25	320.3	1.10	126.00	249.78	0.09	1.00
EXISTING GREENBANK RD. FROM MH 98A TO MH45A							6.15	484																						
Existing Greenbank Road	IBI	EX98A	MH99A				0.00	0	3708	67.33	2.89	34.73		0.00	0.00		6.81	2.21		0.00	24.47		70.50	600	0.25	320.3		125.00	249.78	0.09	1.00
Existing Greenbank Road	IBI	MH99A	MH100A				0.00	0	3708	67.33	2.89	34.73		0.00	0.00		6.81	2.21		0.00	24.47		70.50	600	0.25	320.3		108.00	249.78	0.09	1.00
Existing Greenbank Road	IBI	MH100A	MH204A				0.00	0	3708	67.33	2.89	34.73		0.00	0.00		6.81	2.21		0.00	24.47		70.50	600	0.25	320.3		105.00	249.78	0.09	1.00
Existing Greenbank Road	IBI	MH204A	MH206A				0.00	0	3708	67.33	2.89	34.73		0.00	0.00		6.81	2.21		0.00	24.47		70.50	600	0.25	320.3		103.00	249.78	0.09	1.00
Existing Greenbank Road	IBI	MH206A	MH97A				0.00	0	3708	67.33	2.89	34.73		0.00	0.00		6.81	2.21		0.00	24.47		70.50	600	0.25	320.3		125.00	249.78	0.09	1.00
Existing Greenbank Road	IBI	MH97A	MH96A				19.95	1631	5339	87.28	2.77	48.01		0.00	0.00		6.81	2.21	0.81	0.81	31.32		90.63	600	0.30	350.8		98.00	260.21	0.07	1.00
Existing Greenbank Road	IBI	MH96A	MH95A				0.00	0	5339	87.28	2.77	48.01		0.00	0.00		6.81	2.21		0.81	31.32		90.63	600	0.30	350.8		129.00	260.21	0.07	1.00
Existing Greenbank Road	IBI	MH95A	MH201A				0.00	0	5339	87.28	2.77	48.01		0.00	0.00		6.81	2.21		0.81	31.32		90.63	600	0.30	350.8		123.00	260.21	0.07	1.00
Existing Greenbank Road	IBI	MH201A	MH201B				12.13	787	6126	99.41	2.73	54.19		0.00	0.00		6.81	2.21		0.81	35.32		100.82	600	0.30	350.8		124.00	250.03	0.06	1.00
Existing Greenbank Road	IBI	MH201B	MH200A				0.00	0	6126	99.41	2.73	54.19		0.00	0.00		6.81	2.21		0.81	35.32		100.82	600	0.30	350.8		68.00	250.03	0.06	1.00
Existing Greenbank Road	IBI	MH200A	MH200C				0.00	0	6126	99.41	2.73	54.19		0.00	0.00		6.81	2.21		0.81	35.32		100.82	600	0.50	452.9		48.00	352.12	0.06	1.00
Existing Greenbank Road	IBI	MH200C	MH45				0.00	0	6126	99.41	2.73	54.19		0.00	0.00		6.81	2.21		0.81	35.32		100.82	600	0.12	221.9		26.00	121.08	0.06	1.00
Existing Greenbank Road	Stantec (2014)	MH45	MH435A				5.12	548	22274	301.72	2.28	164.90		6.81	2.21		40.05	12.98	0.00	29.44	124.75		313.94	900	0.10	597.2		296.00	283.29	0.12	1.00
North																															
		MA9	MA8				22.23	2378	2378	22.23	3.02	23.28	0.00	0.00	0.00	2.45	2.45	0.79	9.54	9.54	11.29		35.37	450	0.11	98.4		507.50	63.03	0.07	1.00
		MA8	MA7				2.88	308	2686	25.11	2.99	25.99	0.00	0.00	0.00	0.00	2.45	0.79	0.78	10.32	12.50		39.29	450	0.11	98.4		317.10	59.11	0.06	1.00
		MA7	MA6				18.50	1979	4665	43.61	2.82	42.61	0.00	0.00	0.00	0.00	2.45	0.79	0.00	10.32	18.61		62.01	450	0.11	98.4		573.10	36.39	0.04	1.00
Realigned Greenbank Road		MA6	MA5				21.68	2320	6985	65.29	2.69	60.80	0.00	0.00	0.00	0.00	2.45	0.79	0.00	10.32	25.76		87.36	525	0.10	140.5		473.90	53.14	0.03	1.00
Realigned Greenbank Road		MA5	MA4				9.53	1020	8005	74.82	2.64	68.49	0.00	0.00	0.00	0.00	2.45	0.79	0.00	10.32	28.90		98.19	525	0.10	140.5		439.40	42.31	0.03	1.00
Realigned Greenbank Road		MA4	MH521A				8.07	863	8868	82.89	2.61	74.87	0.00	0.00	0.00	0.00	2.45	0.79	2.42	12.74	32.37		108.03	525	0.10	140.5		530.70	32.47	0.02	1.00
		MH521A	MH522A				3.80	231	9099	86.69	2.60	76.56	0.00	0.00	0.00	0.00	2.45	0.79	0.02	12.76	33.63		110.98	600	0.10	201.5		49.90	90.52	0.02	1.00
		MH522A	MH435A				0.00	0	9099	86.69	2.60	76.56	0.00	0.00	0.00	0.00	2.45	0.79	0.00	12.76	33.63		110.98	600	0.10	201.5		11.10	90.52	0.02	1.00
		MH435A	MH501A				0.00	0	31373	388.41	2.17	220.28	0.00	6.81	2.21	0.00	42.50	13.77	0.00	42.20	158.37		403.73	900	0.10	597.0		13.30	193.27	0.10	1.00

Appendix K

Cost Estimate Calculations

BSUEA MSS - OPC for Cost Sharing
Trunk Storm Sewers with and without New Greenbank Road and Park & Ride
Conventional Storm Sewer System (Drawing MST-1)

JLR No. 26610

BSUEA Conventional Storm Sewer System - INCLUDING of New Greenbank Road and Park & Ride

Maintenance Hole Number		LENGTH (m)	PIPE DIA. (mm)	PIPE Cost/m	TOTAL PIPE COST	UPSTREAM MH DIA. (mm)	TOTAL MH COST	TOTAL OPC COST (2018$)
FROM	TO							
170	172	188.50	900	$650	$123,000	1800	$8,000	$131,000
172	174	184.40	1350	$900	$166,000	3000	$20,000	$186,000
174	176	156.69	1350	$900	$141,000	2400	$15,000	$156,000
176	179	161.41	1350	$900	$145,000	2400	$15,000	$160,000
179	178	245.72	1800	$1,500	$369,000	3000x2400	$25,000	$394,000
178	132	185.60	1950	$1,700	$316,000	3000x2400	$25,000	$341,000
132	134	131.07	1950	$1,700	$223,000	3000	$20,000	$243,000
134	136	173.27	1950	$1,700	$295,000	3000	$20,000	$315,000
136	137	168.77	1950	$1,700	$287,000	3000	$20,000	$307,000
137	P2-IN	35.99	1950	$1,700	$61,000	3000	$20,000	$81,000
							SUBTOTAL:	**$2,314,000.00**
							CONTINGENCY (40%):	**$926,000.00**
							TOTAL OPC COST:	**$3,240,000.00**

BSUEA Conventional Storm Sewer System - EXCLUDING of New Greenbank Road and Park & Ride

Maintenance Hole Number		LENGTH (m)	PIPE DIA. (mm)	PIPE Cost/m	TOTAL PIPE COST	UPSTREAM MH DIA. (mm)	TOTAL MH COST	TOTAL OPC COST (2018$)
FROM	TO							
170	172	188.50	900	$650	$123,000	1800	$8,000	$131,000
172	174	184.40	975	$750	$138,000	2400	$15,000	$153,000
174	176	156.69	975	$750	$118,000	1800	$8,000	$126,000
176	179	161.41	975	$750	$121,000	1800	$8,000	$129,000
179	178	245.72	1500	$1,000	$246,000	3000	$20,000	$266,000
178	132	185.60	1650	$1,200	$223,000	3000x1800	$25,000	$248,000
132	134	131.07	1800	$1,500	$197,000	3000	$20,000	$217,000
134	136	173.27	1800	$1,500	$260,000	3000	$20,000	$280,000
136	137	168.77	1800	$1,500	$253,000	3000	$20,000	$273,000
137	P2-IN	35.99	1800	$1,500	$54,000	3000	$20,000	$74,000
							SUBTOTAL:	**$1,897,000.00**
							CONTINGENCY (40%):	**$759,000.00**
							TOTAL OPC COST:	**$2,656,000.00**

OPC COST OF OVERSIZING PIPES FOR NEW GREENBANK AND PARK AND RIDE:	**$584,000.00**

BSUEA MSS - Cost Sharing
Trunk Storm Sewers with and without New Greenbank Road and Park & Ride
EES (Drawing MST-2)
JLR No. 26610

BSUEA EES - INCLUDING New Greenbank Road and Park & Ride

Maintenance Hole Number		LENGTH (m)	PIPE DIA. (mm)	PIPE Cost/m	TOTAL PIPE COST	UPSTREAM MH DIA. (mm)	TOTAL MH COST	TOTAL COST (2018$)
FROM	TO							
170	172	188.50	900	$650	$123,000	1800	$8,000	$131,000
172	174	184.40	1350	$900	$166,000	3000	$20,000	$186,000
174	176	156.69	1350	$900	$141,000	2400	$15,000	$156,000
176	152	161.41	1350	$900	$145,000	2400	$15,000	$160,000
177	152	237.41	675	$450	$107,000	1500	$6,500	$114,000
152	154	178.75	1500	$1,000	$179,000	3000	$20,000	$199,000
154	156	311.71	1500	$1,000	$312,000	2400	$15,000	$327,000
156	158	202.56	1500	$1,000	$203,000	3000	$20,000	$223,000
158	158A	40.00	1500	$1,000	$40,000	3000	$20,000	$60,000
							SUBTOTAL:	**$1,556,000.00**
							CONTINGENCY (40%):	**$622,000.00**
							TOTAL COST:	**$2,178,000.00**

BSUEA EES - EXCLUDING New Greenbank Road and Park & Ride

Maintenance Hole Number		LENGTH (m)	PIPE DIA. (mm)	PIPE Cost/m	TOTAL PIPE COST	UPSTREAM MH DIA. (mm)	TOTAL MH COST	TOTAL COST (2018$)
FROM	TO							
170	172	188.50	900	$650	$123,000	1800	$8,000	$131,000
172	174	184.40	975	$750	$138,000	2400	$15,000	$153,000
174	176	156.69	975	$750	$118,000	1800	$8,000	$126,000
176	152	161.41	975	$750	$121,000	1800	$8,000	$129,000
177	152	0.00	N/A	#N/A	$0	N/A	$0	$0
152	154	178.75	1050	$800	$143,000	2400	$15,000	$158,000
154	156	311.71	1050	$800	$249,000	1800	$8,000	$257,000
156	158	202.56	1200	$850	$172,000	3000	$20,000	$192,000
158	158A	40.00	1200	$850	$34,000	3000	$20,000	$54,000
							SUBTOTAL:	**$1,200,000.00**
							CONTINGENCY (40%):	**$480,000.00**
							TOTAL COST:	**$1,680,000.00**

COST OF OVERSIZING PIPES FOR NEW GREENBANK AND PARK AND RIDE:	**$498,000.00**

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Storm Sewer Cost Comparison
Conventional vs EES
BSUEA MSS
Opinion of Probable Cost (Level D)

CONSTRUCTION

Dated: Feb. 2018

ITEM	CONSTRUCTION	PRICE / UNIT	CONVENTIONAL		EES	
			Quantity	Cost	Quantity	Cost
1	Water Quality Unit @ East-West Collector	$250,000.00 / ea.			1	$250,000.00
2	Water Quality Unit @ Kilbirnie Drive	$100,000.00 / ea.	1	$100,000.00	1	$100,000.00
3	Excavation for permanenent pool (Pond 1) incl. hauling and spreading onsite	$12.00 / m3	11166	$133,992.00		
4	Excavation for permanenent pool (Pond 2) incl. hauling and spreading onsite	$12.00 / m3	11960	$143,520.00		
5	Additional Trench Excavation for sewers and MHs (2.5 m3/m)	$15.00 / m			9250	$138,750.00
6	2 x 200 mm diameter perforated pipe c/w filter sock, clear stone and geotextile	$250.00 / m			9250	$2,312,500.00
	SUBTOTAL			$377,512.00		$2,801,250.00
	+40% Contigency			$94,378.00		$1,120,500.00
	TOTAL			$471,890.00		$3,921,750.00

OPC DIFFERENCE to have EES : $3,449,860.00

Local Roads	9000	m
New Greenbank	1000	m
Collector	1780	m
Total length of roads in BSUEA	11780	m
Total Area of BSUEA	121	ha

OPC per Total meter to road for EES : $292.86 / m

OPC per BSUEA TotaL Area : $28,511.24 / ha

OPERATION & MAINTENANCE

ITEM	OPERATION & MAINTENANCE	PRICE / UNIT	CONVENTIONAL	EES
	End-of-Pipe Facilities		**Wet Ponds**	**Dry Ponds**
1	Litter removal	$2,000.00 / ha	$10,000.00	$2,000.00
2	Inspection of rip-rap, inlet/outlet structures	$100.00 / unit	$500.00	$300.00
3	Grass cutting	$350.00 / ha	$875.00	$1,750.00
4	Weed control	$3,000.00 / ha	$15,000.00	N/A
5	Vegetation maintenance (shoreline) - 5 year, avg over 1 year	$2,000.00 / ha	$1,000.00	N/A
6	Vegatation maintenance (Upland) - 5 year, avg over 1 year	$5,000.00 / ha	$1,000.00	$5,000.00
7	Sediment removal - 20 year, avg over 1 year	$25.00 / m3	$2,250.00	N/A
8	Sediment testing - 20 year, avg over 1 year	$500.00 / unit	$250.00	N/A
9	Sediment disposal - 20 year, avg over 1 year	$400.00 / m3	$36,000.00	N/A
	Water Quality Unit (HDS)			
1	Removal of suspended solids	$5,000.00 / year	N/A	$5,000.00
	OPERATION and Maintenance of EES			
1	Inspection	$2,240.00 / year	N/A	$2,240.00
2	Flushing, sediment removal - 20 year, avg over 1 year	$870.00 / year	N/A	$870.00
	SUBTOTAL		$66,875.00	$17,160.00
	+40% Contigency		$16,718.75	$6,864.00
	TOTAL		$83,593.75	$24,024.00

$59,569.75 / Year O&M DIFFERENCE for Conventional

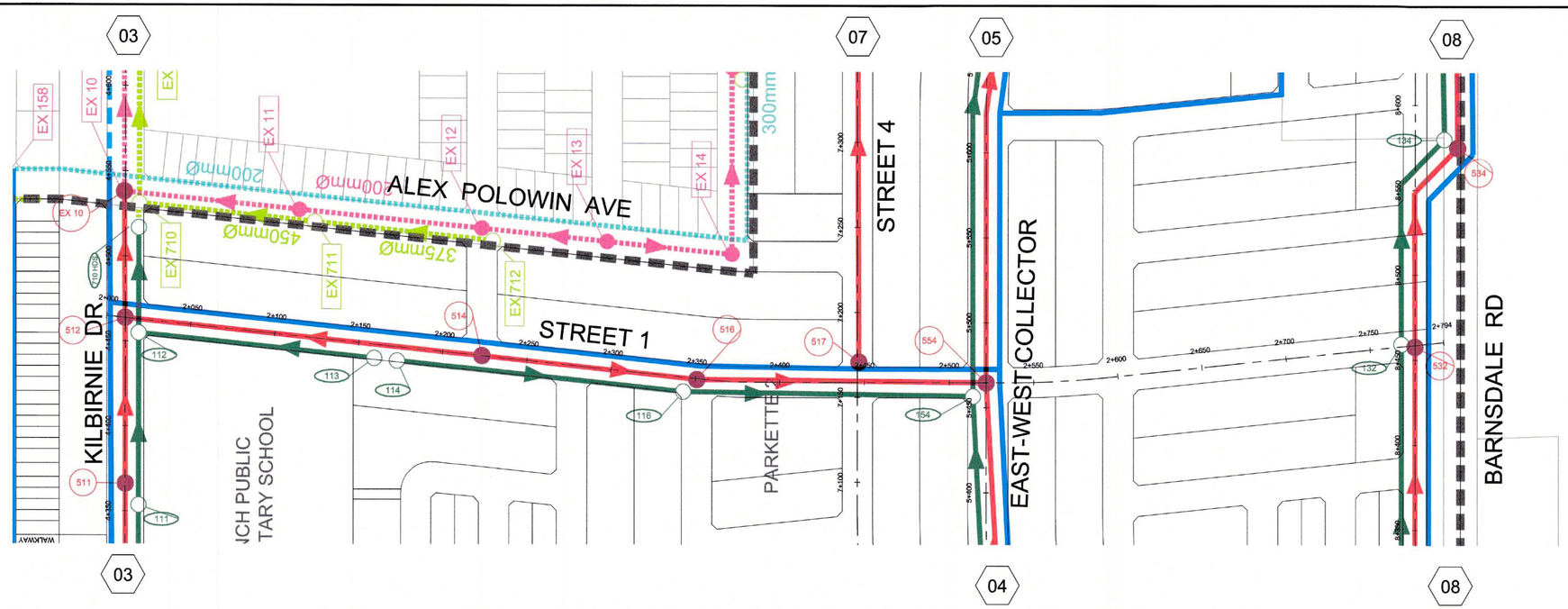
Local Roads	9000	m
New Greenbank	1000	m
Collector	1780	m
Total length of roads in BSUEA	11780	m
Total Area of BSUEA	121	ha

$5.06 / m O&M for Conventional per Total meter to road

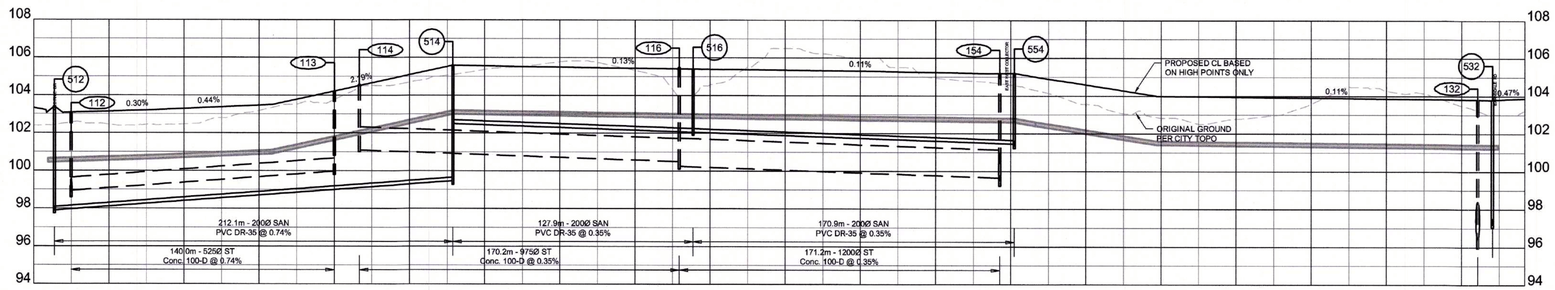
$492.31 / ha O&M for Conventional per BSUEA Total Area

Appendix L

Plan and Profile Drawings


03
07
05
08
EX 158
EX 10
EX
EX 11
EX 12
EX 13
EX 14
300mm
200mmø
200mmø
ALEX POLOWIN AVE
450mmø
375mmø
EX 10
EX 710
EX 711
EX 712
STREET 4
STREET 1
KILBIRNIE DR
EAST-WEST COLLECTOR
BARNSDALE RD
PARKETTE
WALKWAY
512
112
113
114
514
516
517
554
511
111
132
134
532
03
04
08

STREET 1


108
106
104
102
100
98
96
94
512
112
113
114
514
116
516
154
554
532
132
0.30%
0.44%
2.19%
0.13%
0.11%
0.11%
0.47%
PROPOSED CL BASED ON HIGH POINTS ONLY
ORIGINAL GROUND PER CITY TOPO
212.1m - 200Ø SAN PVC DR-35 @ 0.74%
140.0m - 525Ø ST Conc. 100-D @ 0.74%
127.9m - 200Ø SAN PVC DR-35 @ 0.35%
170.2m - 975Ø ST Conc. 100-D @ 0.35%
170.9m - 200Ø SAN PVC DR-35 @ 0.35%
171.2m - 1200Ø ST Conc. 100-D @ 0.35%

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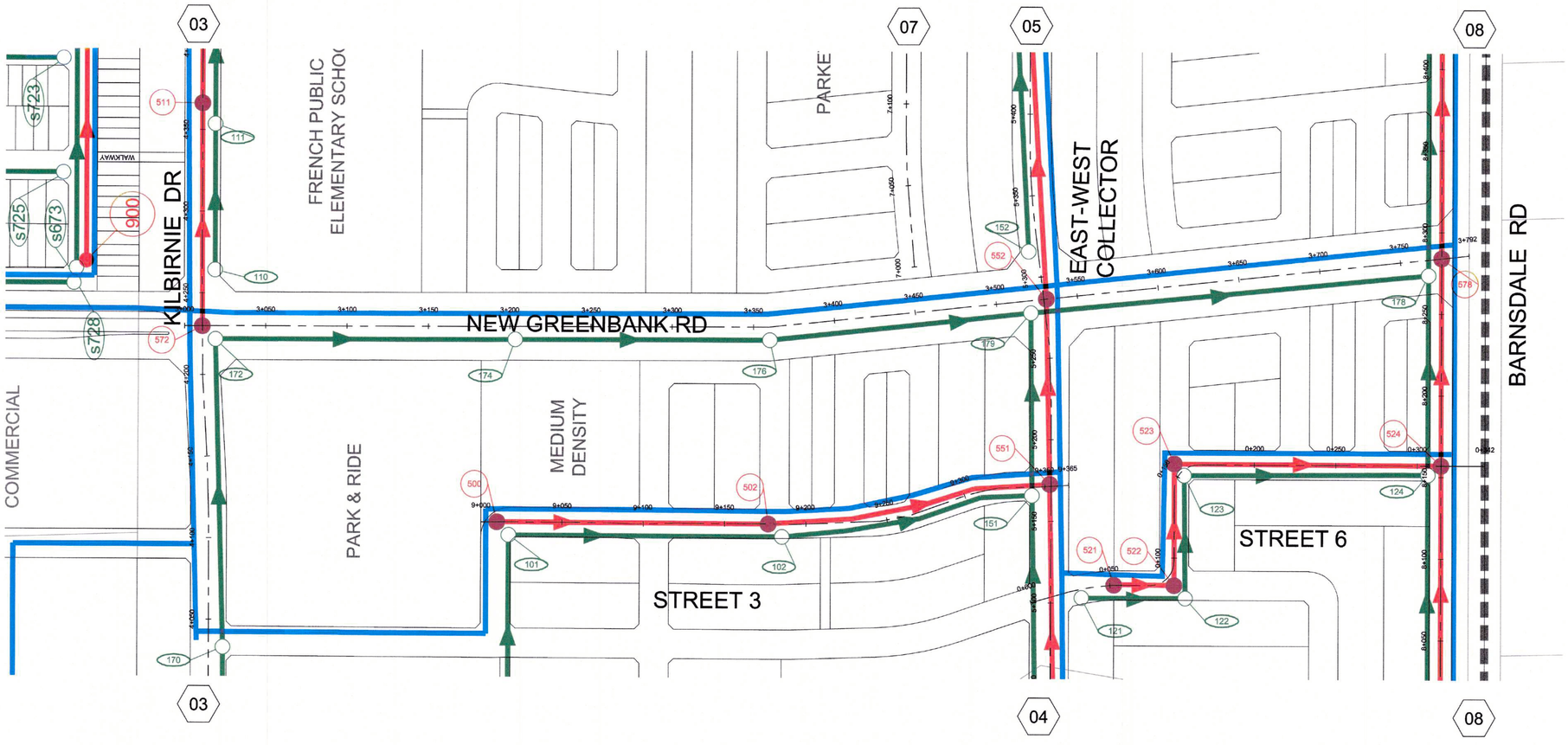
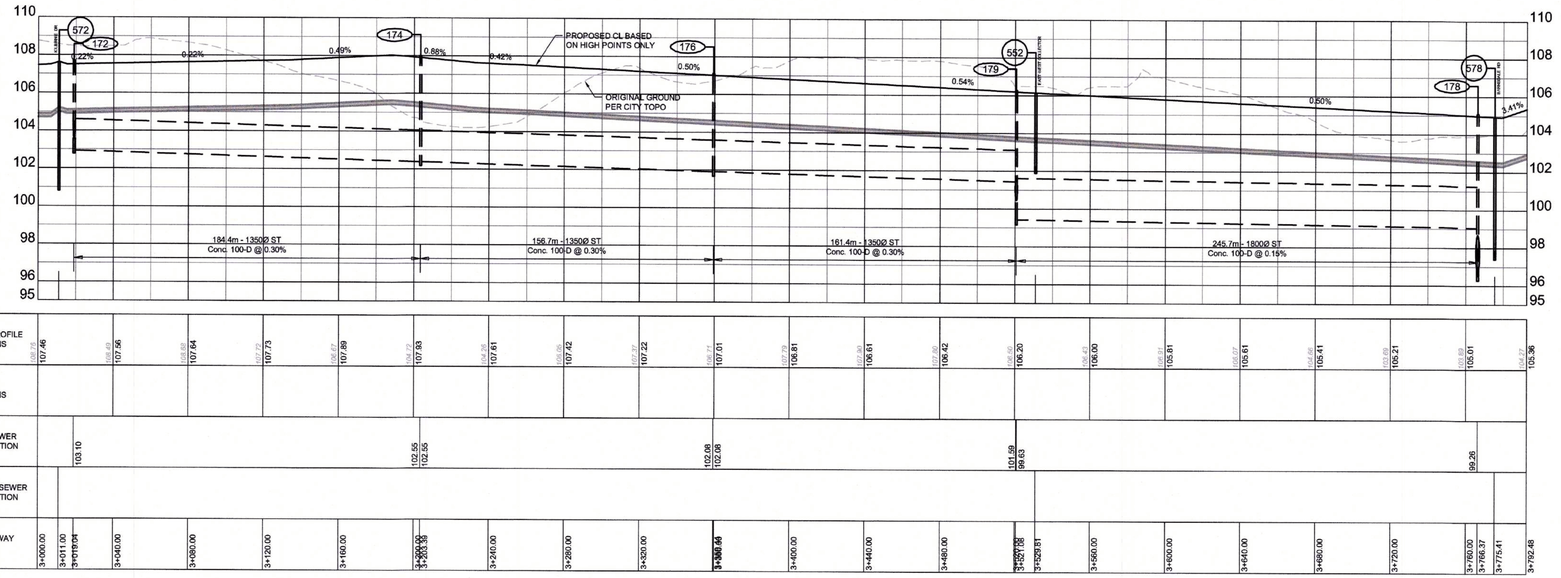
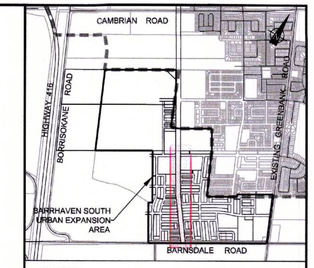


NEW GREENBANK RD





KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED FOR PLANNING COMMITTEE APPROVAL	03/05/18
2	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
1	ISSUED AS PART OF DRAFT MSS	20/09/17

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VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER, M. N. L. DALRYMPLE, May 4/18, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

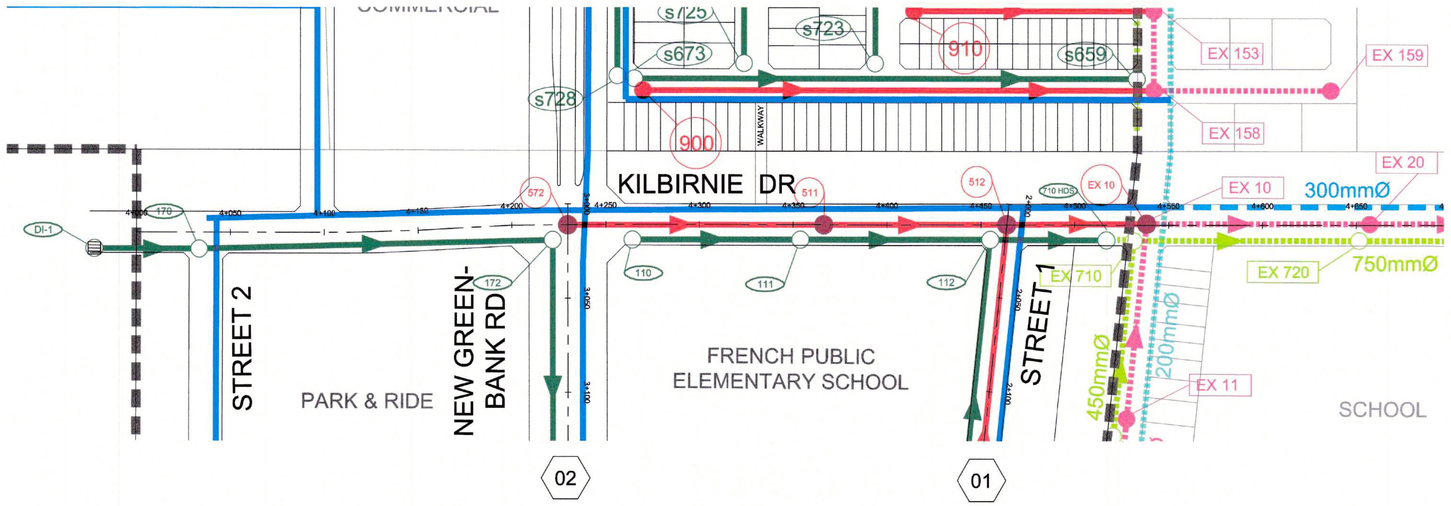
PLAN AND PROFILE NEW GREENBANK RD CONVENTIONAL STORM SEWER SYSTEM

DESIGN:
DRAWN:
CHECKED:
JLR #:

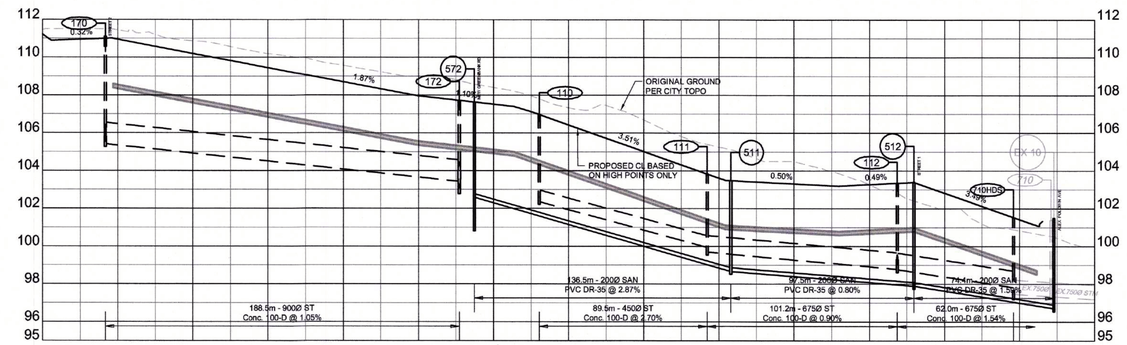
DRAWING #: 02

PLOT DATE: May 3, 2018 4:42:27 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C Profiles.dwg



KILBIRNIE DR



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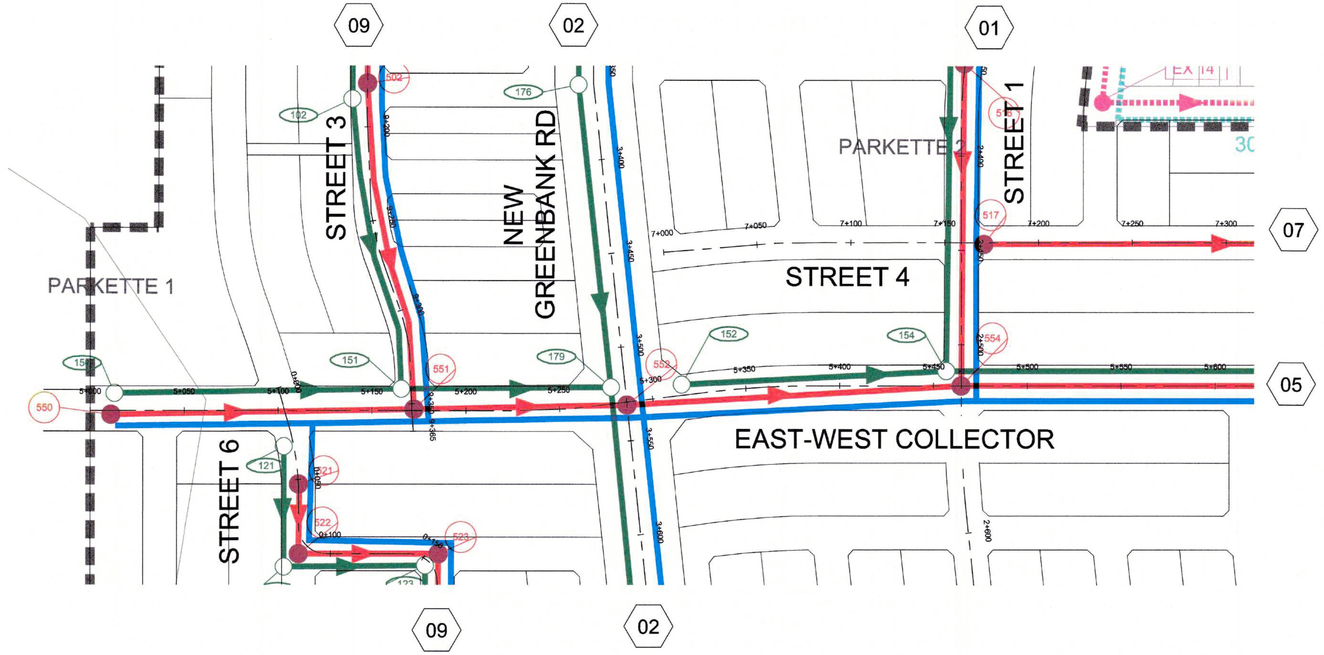
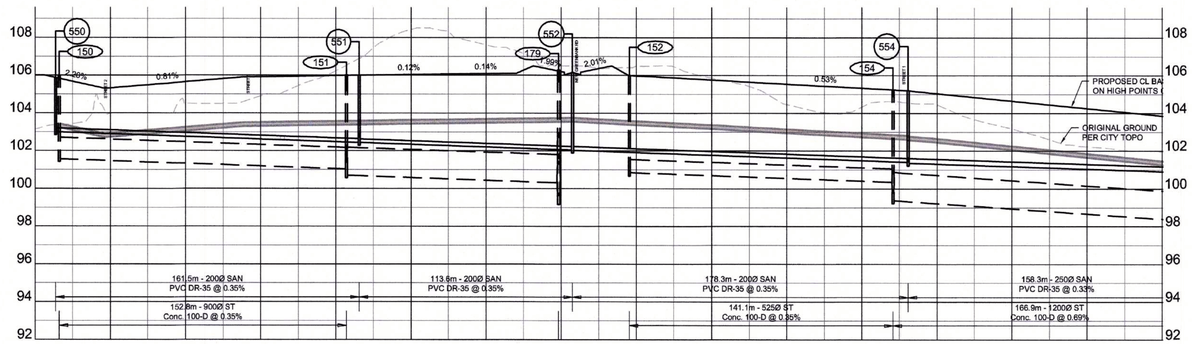


EAST-WEST COLLECTOR



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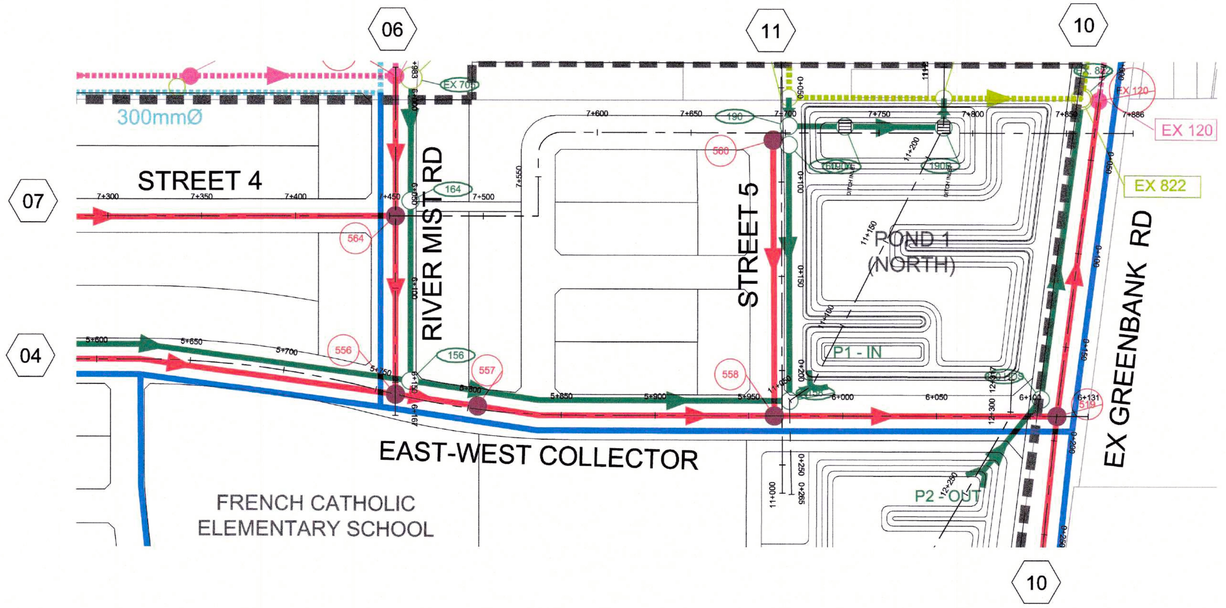
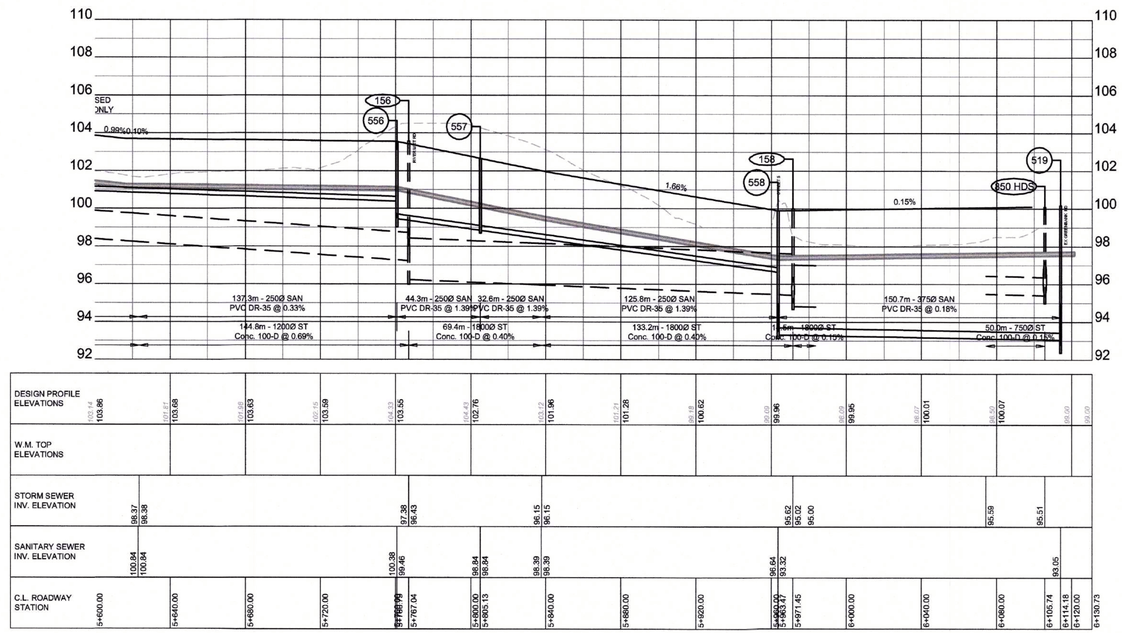


EAST-WEST COLLECTOR



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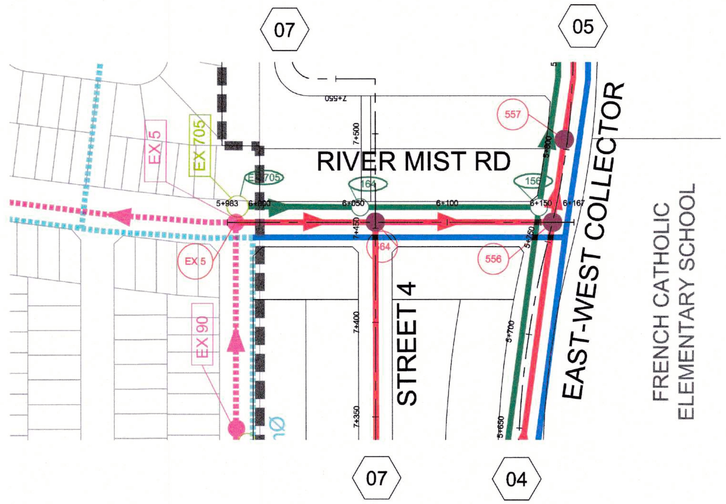
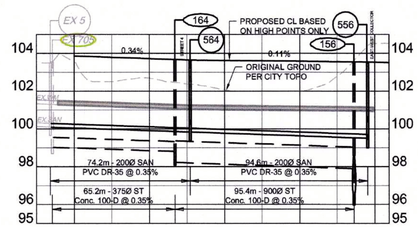


RIVER MIST RD



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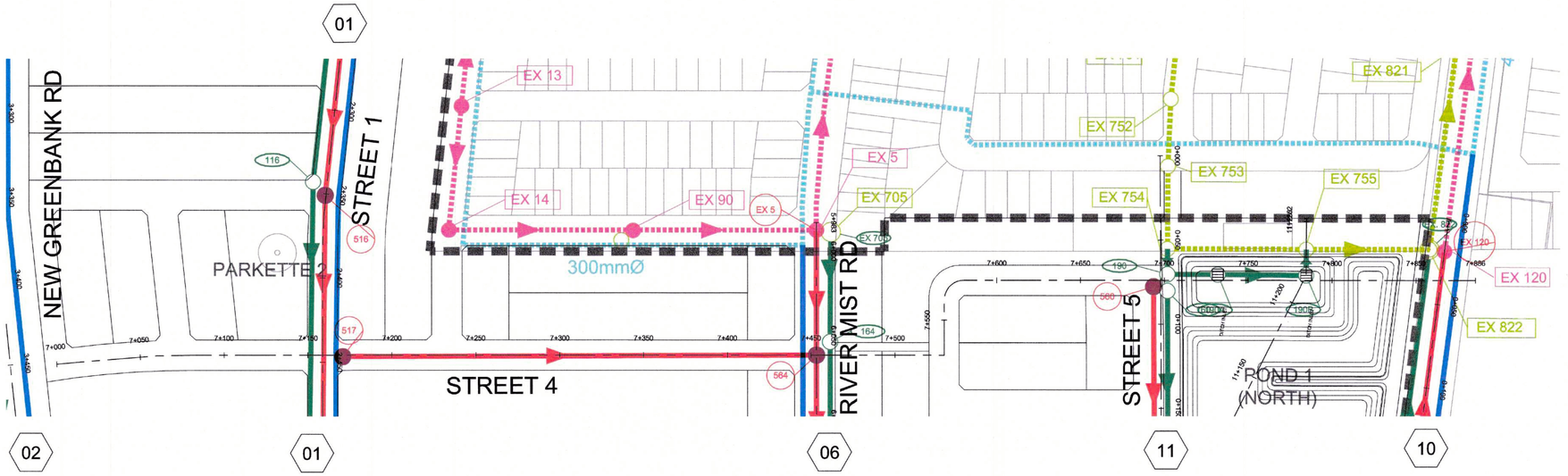
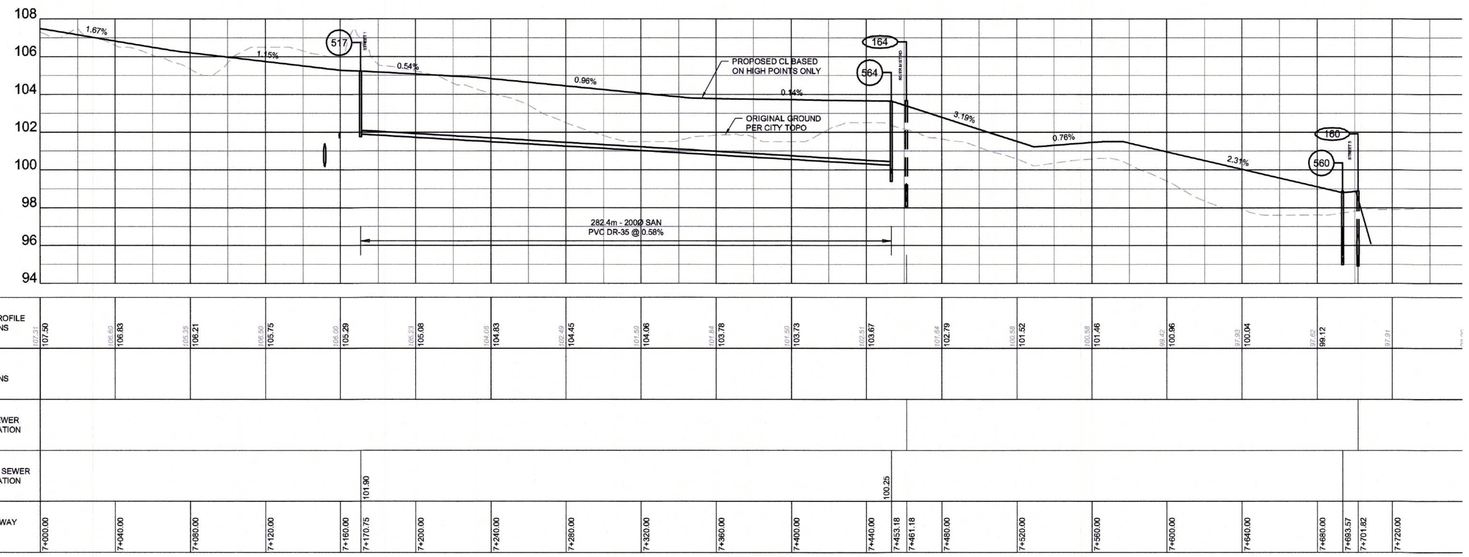
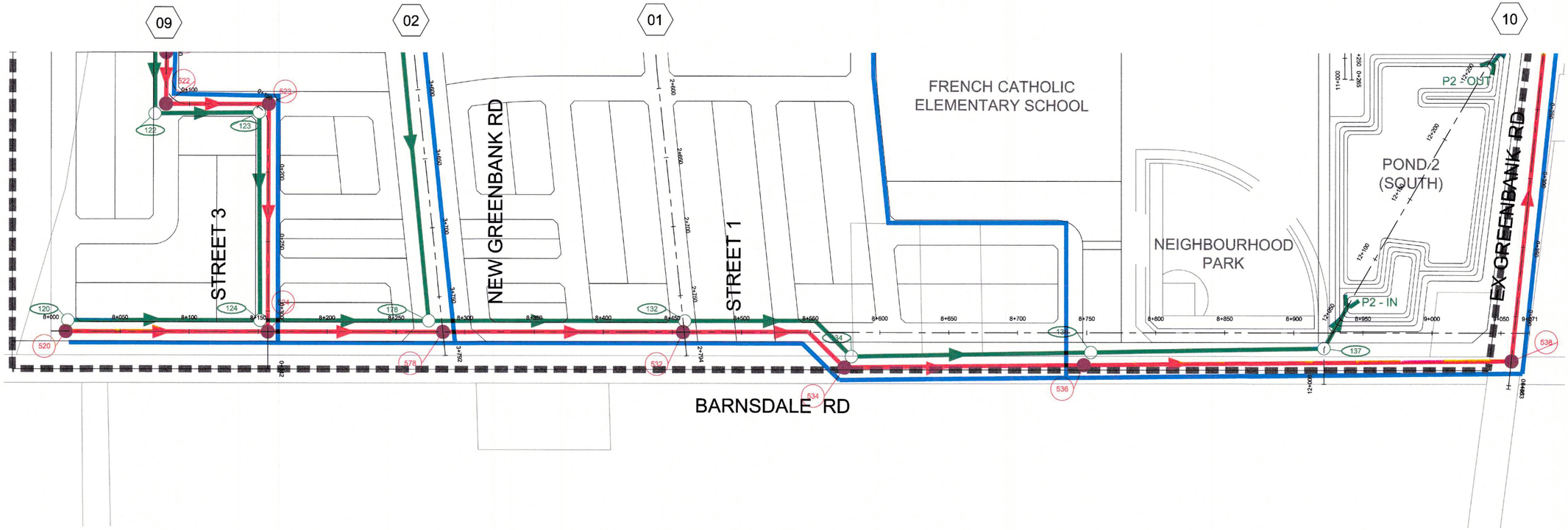
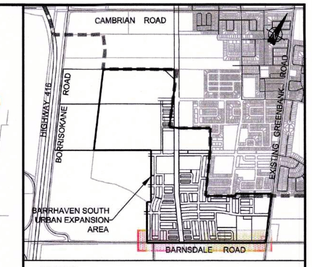

01
NEW GREENBANK RD
STREET 1
PARKETTE 2
STREET 4
RIVER MIST RD
STREET 5
POND 1 (NORTH)
EX 13
EX 14
EX 90
EX 5
EX 705
EX 752
EX 753
EX 754
EX 755
EX 821
EX 120
EX 822
300mmØ
116
516
517
564
164
560
190
02
01
06
11
10

STREET 4


108
106
104
102
100
98
96
94
1.67%
1.15%
0.54%
0.96%
0.14%
9.19%
0.76%
2.31%
517
564
164
560
160
PROPOSED CL BASED ON HIGH POINTS ONLY
ORIGINAL GROUND PER CITY TOPO
282.4m - 200Ø SAN PVC DR-35 @ 0.58%

| | | |



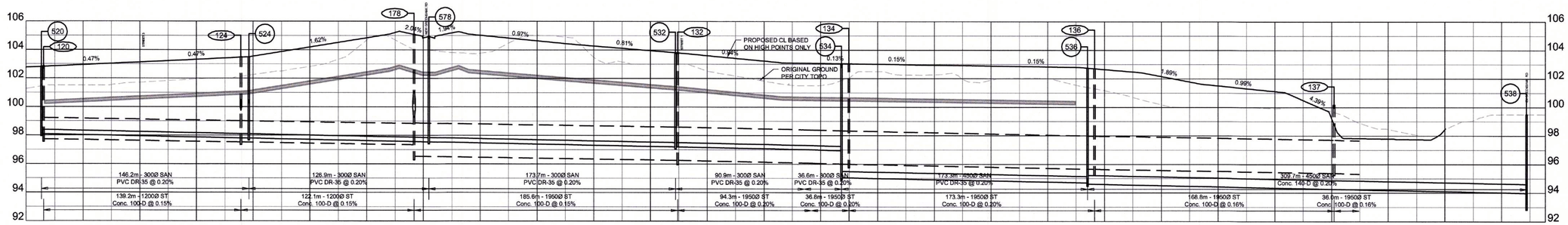


KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

BARNSDALE RD



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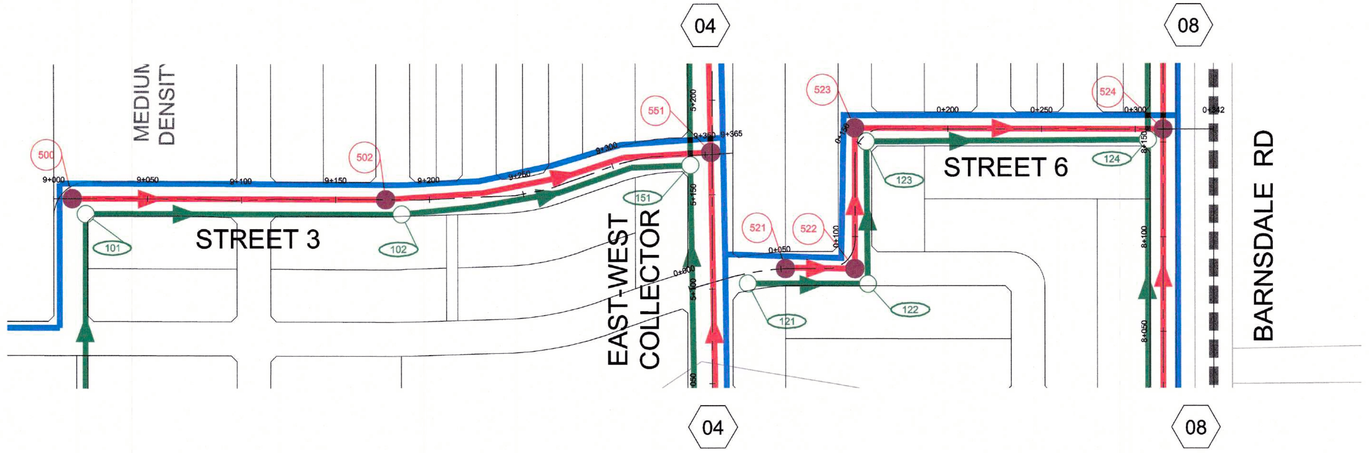
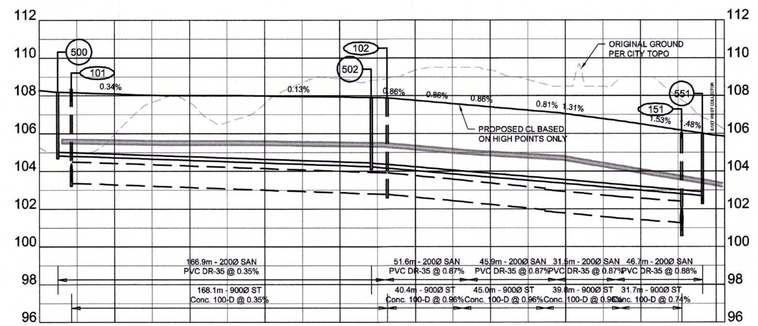
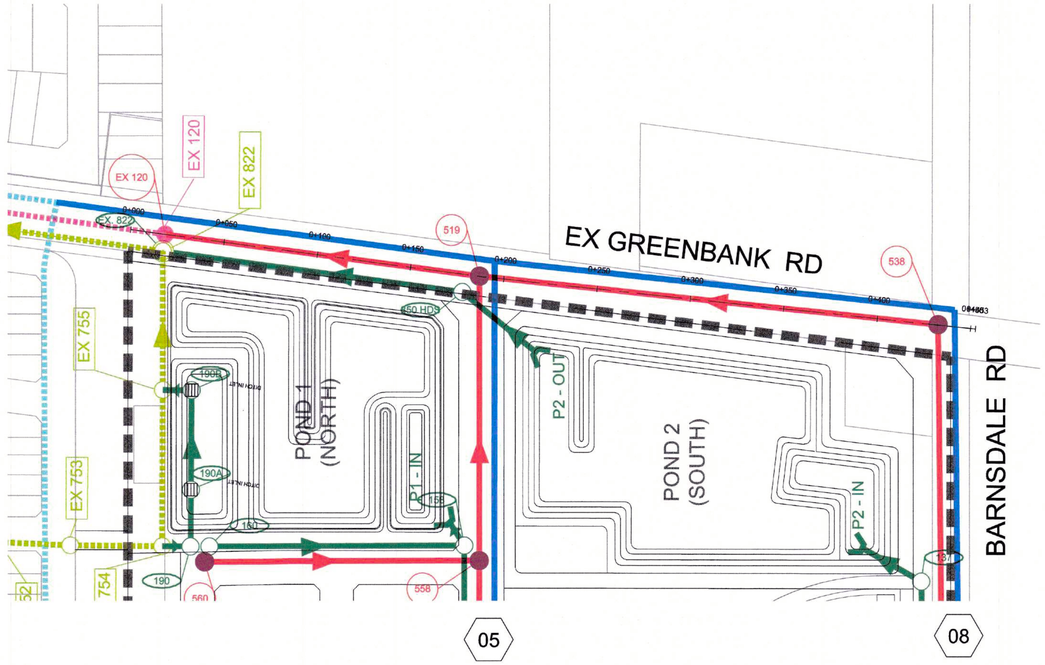

04
08
MEDIUM DENSITY
STREET 3
STREET 6
EAST-WEST COLLECTOR
BARNSDALE RD
500
501
502
551
151
101
102
121
122
123
124
521
522
523
524

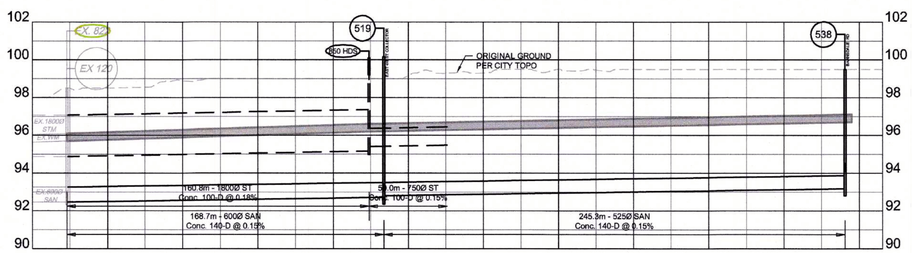
STREET 3


ORIGINAL GROUND PER CITY TOPO
PROPOSED CL BASED ON HIGH POINTS ONLY
0.34%
0.13%
0.86%
0.88%
0.88%
0.81%
1.31%
1.53%
1.48%
166.9m - 200Ø SAN PVC DR-35 @ 0.35%
168.1m - 900Ø ST Conc. 100-D @ 0.35%
51.6m - 200Ø SAN PVC DR-35 @ 0.67%
45.9m - 200Ø SAN PVC DR-35 @ 0.67%
31.1m - 200Ø SAN PVC DR-35 @ 0.67%
46.7m - 200Ø SAN PVC DR-35 @ 0.86%
40.4m - 900Ø ST Conc. 100-D @ 0.86%
45.0m - 900Ø ST Conc. 100-D @ 0.96%
39.8m - 900Ø ST Conc. 100-D @ 0.96%
31.7m - 900Ø ST Conc. 100-D @ 0.74%

| | | |



EXISTING GREENBANK RD



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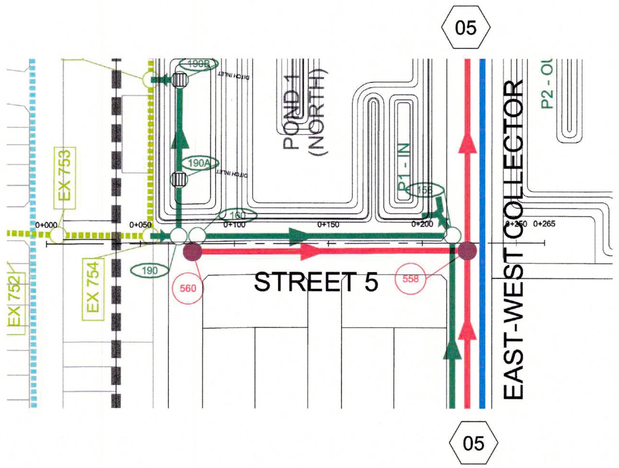
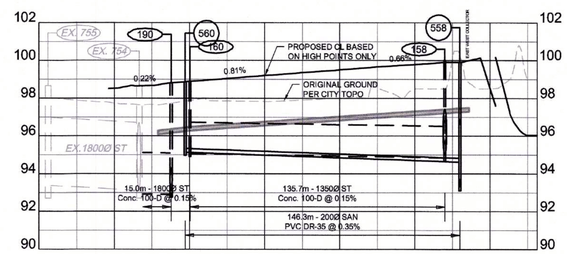
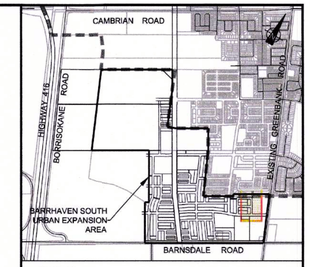


STREET 5



DESIGN PROFILE ELEVATIONS	98.00	97.74	98.52	97.88	98.88	97.83	99.20	98.00	99.50	98.48	99.79	98.51	98.53	99.00
W.M. TOP ELEVATIONS			98.522		98.885		99.201		99.503		99.785		98.531	
STORM SEWER INV. ELEVATION				93.12	93.10	95.22				95.01				
SANITARY SEWER INV. ELEVATION						95.13					94.62			
C.L. ROADWAY STATION	0+000.00		0+040.00		0+070.30	0+080.00	0+120.00		0+160.00		0+200.00	0+215.99	0+223.93	0+240.00	0+265.06



KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED FOR PLANNING COMMITTEE APPROVAL	03/05/18
2	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
1	ISSUED AS PART OF DRAFT MSS	20/09/17

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SCALE: 1:1500

CLIENT:

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ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
M. N. L. DALRYMPLE
May 4/18
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

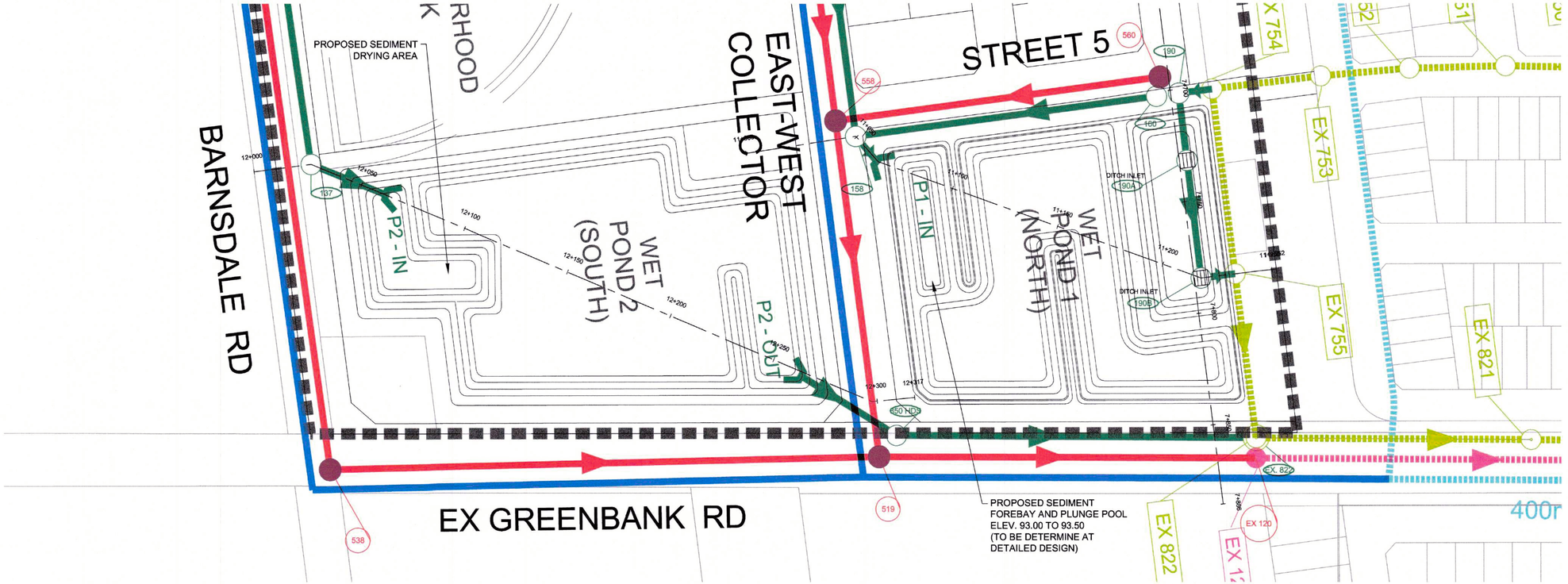
PLAN AND PROFILE
STEET 5
CONVENTIONAL
STORM SEWER SYSTEM

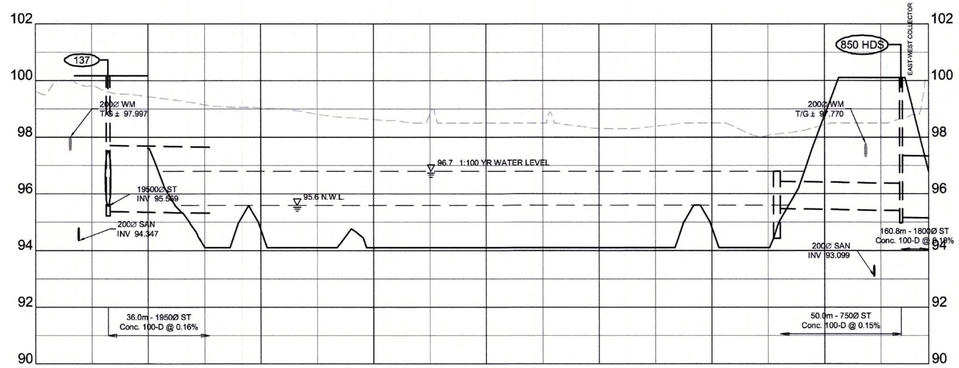
DESIGN:
DRAWN:
CHECKED:
JLR #:

DRAWING #: 11

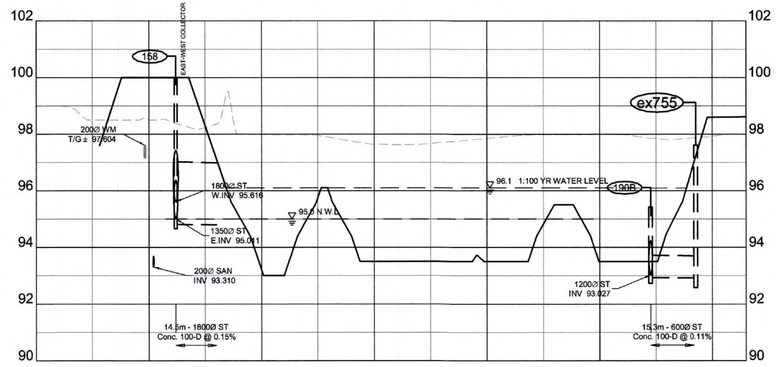
PLOT DATE: May 3, 2018 4:44:51 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C Profiles.dwg





DESIGN PROFILE ELEVATIONS	99.60	99.43	99.03	98.62	98.50	98.31	98.50	98.44	98.75	98.98	98.80	
W.M. TOP ELEVATIONS												
STORM SEWER INV. ELEVATION		95.57	95.51					95.59	95.51	95.36	95.07	
SANITARY SEWER INV. ELEVATION												
C.L. ROADWAY STATION	12+000.00	12+025.73	12+040.00	12+080.00	12+120.00	12+160.00	12+200.00	12+240.00	12+280.00	12+307.22	12+316.89	



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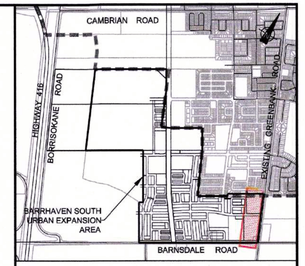
W.M. TOP ELEVATIONS												
STORM SEWER INV. ELEVATION			95.02	95.00				93.03	93.01			
SANITARY SEWER INV. ELEVATION												
C.L. ROADWAY STATION	11+000.00	11+040.00	11+049.61	11+080.00	11+120.00	11+160.00	11+200.00	11+218.09	11+240.00	11+251.98		



KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED FOR PLANNING COMMITTEE APPROVAL	03/05/18
2	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
1	ISSUED AS PART OF DRAFT MSS	20/09/17

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SCALE: 1:1000

CLIENT:

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
M. N. L. DALRYMPLE
May 4/18
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

KEY SERVICING PLAN WITH CONVENTIONAL STORM SEWER SYSTEM

DESIGN:
DRAWN:
CHECKED:
JLR #:

DRAWING #: SWM-CONV

PLOT DATE: May 3, 2018 4:48:10 PM

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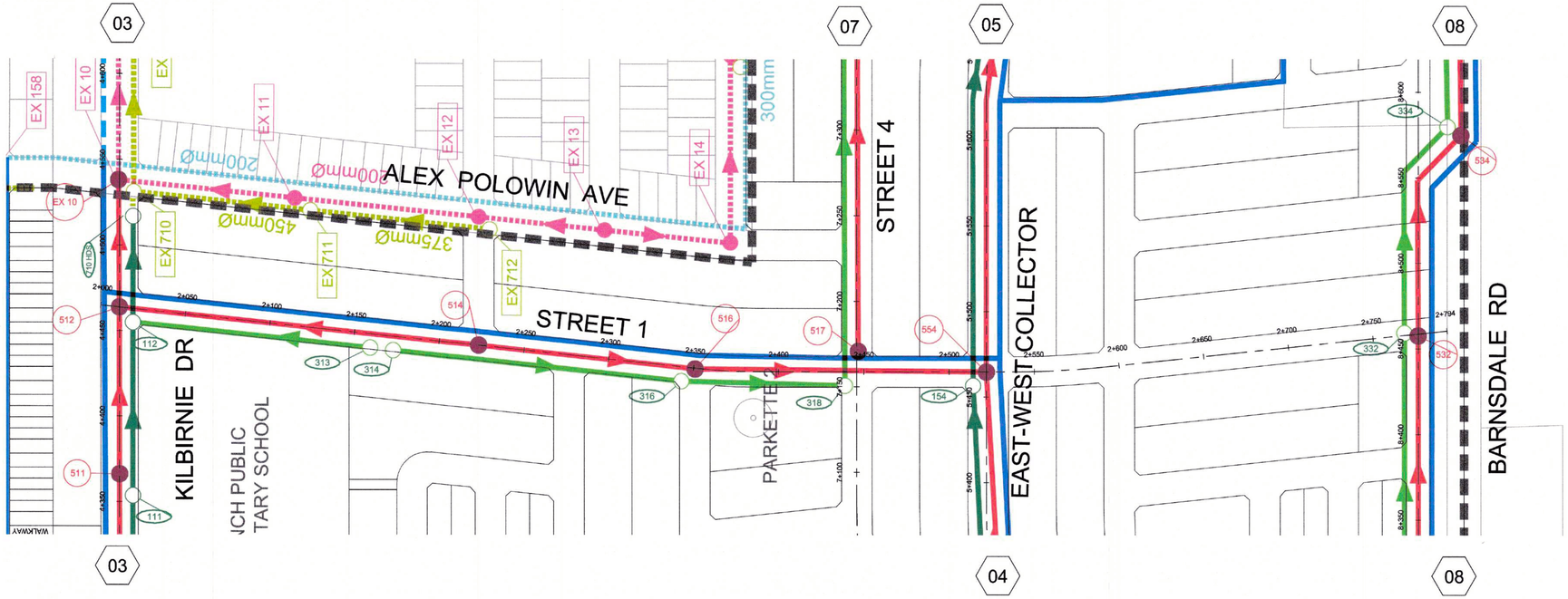
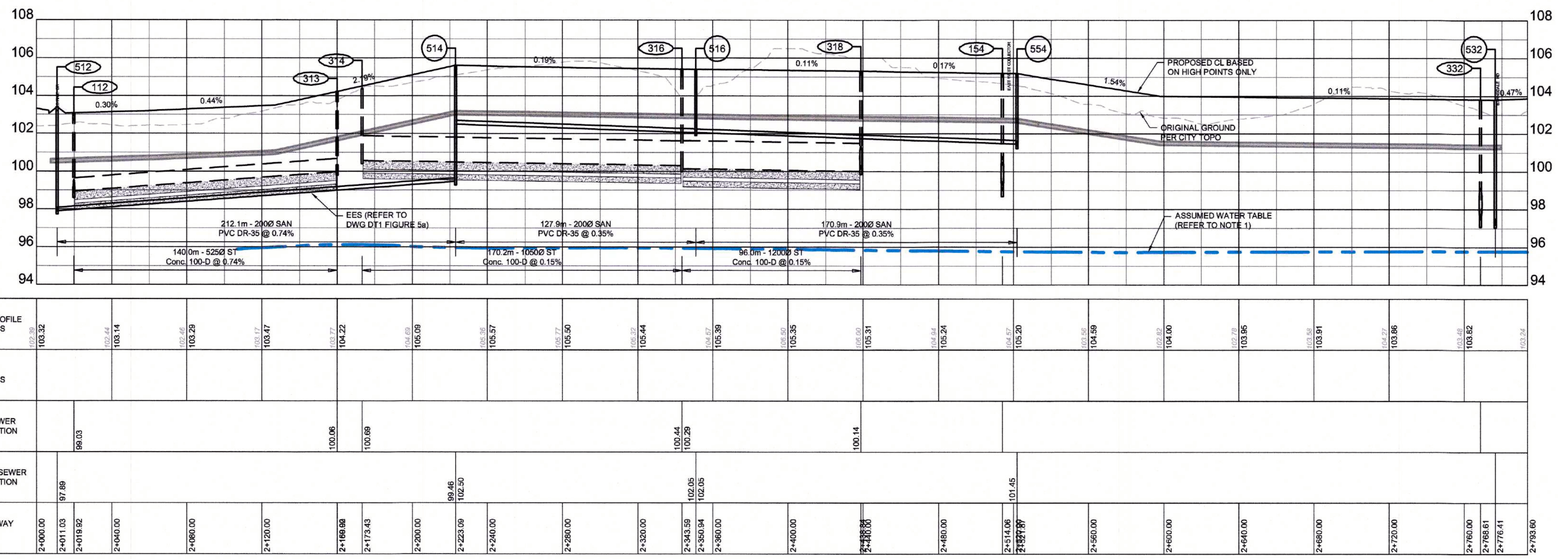
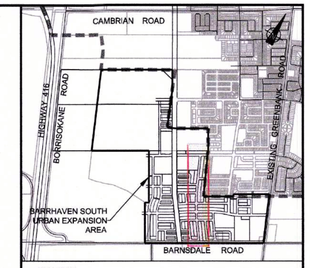


STREET 1





KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

NOTE:

1. ASSUMED WATER TABLE DERIVED FROM THE PATERSON GROUP "GROUND WATER CONTOURS AND FLOW DIRECTION" DRAWING PG-3757-1 REV.3 - HYDROGEOLOGICAL EXISTING CONDITIONS REPORT - PROPOSED BARRHAVEN SOUTH URBAN EXPANSION AREA COMMUNITY DESIGN PLAN DATED JULY 5, 2017 (NOT FOR CONSTRUCTION)

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED FOR PLANNING COMMITTEE APPROVAL	03/05/18
2	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
1	ISSUED AS PART OF DRAFT MSS	20/09/17

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SCALE: 1:1500

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENCED PROFESSIONAL ENGINEER, W. N. L. DALRYMPLE, May 4/18, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

PLAN AND PROFILE
STREET 1
EES
STORM SEWER SYSTEM

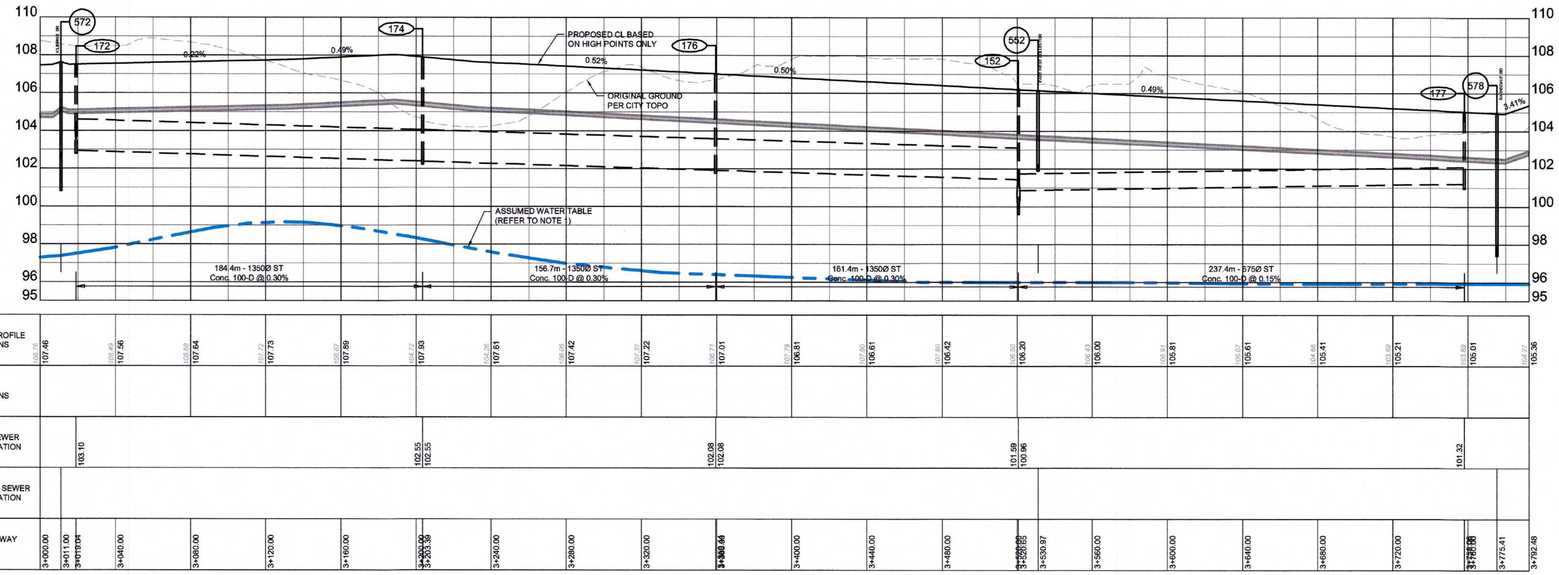
DESIGN:
DRAWN:
CHECKED:
JLR #:

DRAWING #: 01

PLOT DATE: May 7, 2018 4:45:06 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C Profiles.dwg

NEW GREENBANK RD



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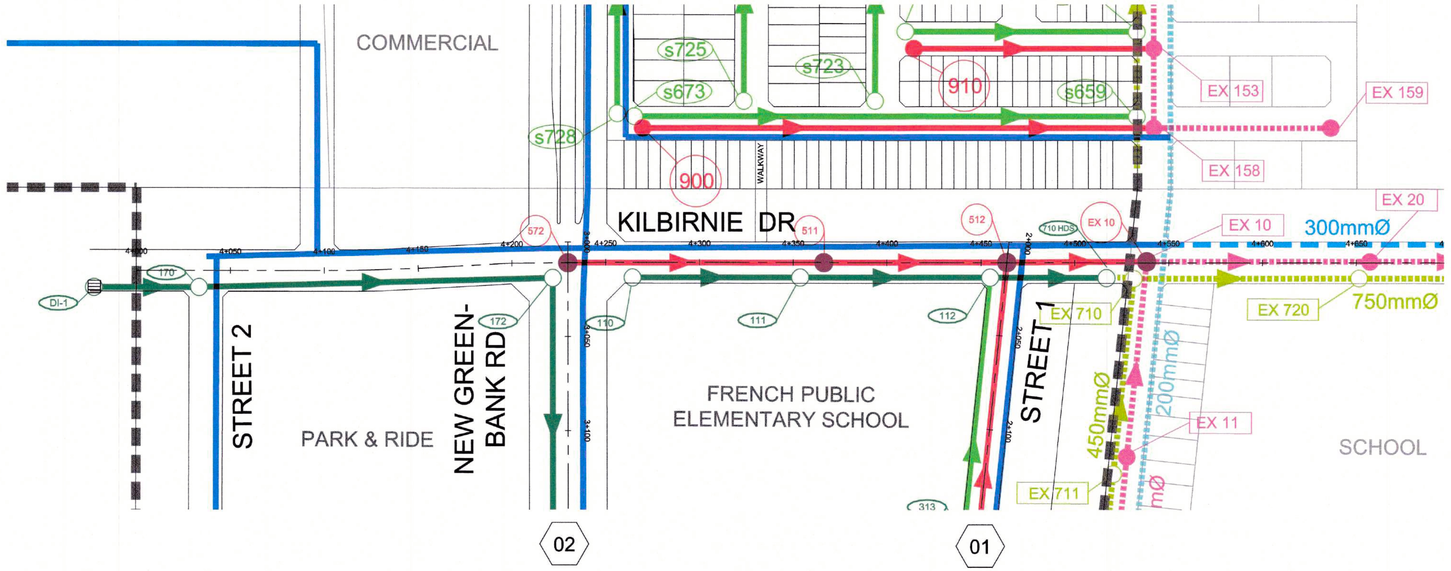

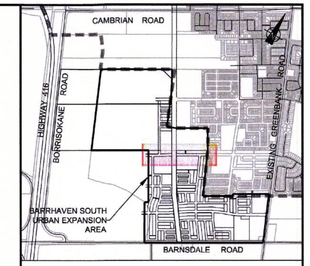

KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

NOTE:

1. ASSUMED WATER TABLE DERIVED FROM THE PATERSON GROUP "GROUND WATER CONTOURS AND FLOW DIRECTION" DRAWING PG-3757-1 REV.3 - HYDROGEOLOGICAL EXISTING CONDITIONS REPORT - PROPOSED BARRHAVEN SOUTH URBAN EXPANSION AREA COMMUNITY DESIGN PLAN DATED JULY 5, 2017 (NOT FOR CONSTRUCTION)

No.	ISSUE / REVISION	DD/MM/YY
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1	ISSUED AS PART OF DRAFT MSS	20/09/17

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SCALE: 1:1500

CLIENT:

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

PROJECT:

DRAWING:

PLAN AND PROFILE
KILBIRNIE DR
EES
STORM SEWER SYSTEM

DESIGN:

DRAWN:

CHECKED:

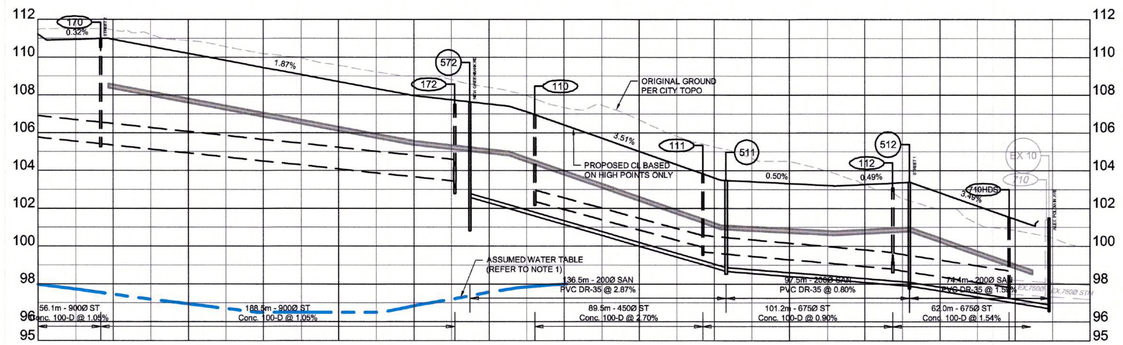
JLR #:

DRAWING #: 03

PLOT DATE: May 7, 2018 4:45:36 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26610 C Profiles.dwg

KILBIRNIE DR



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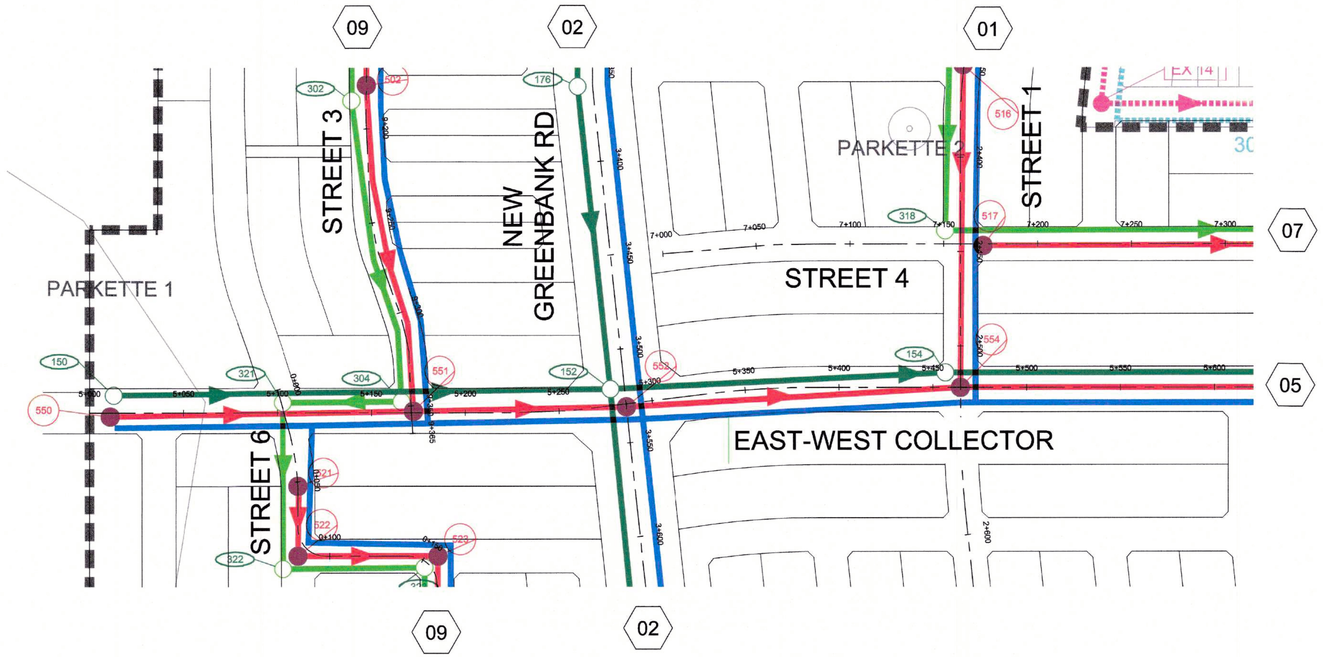
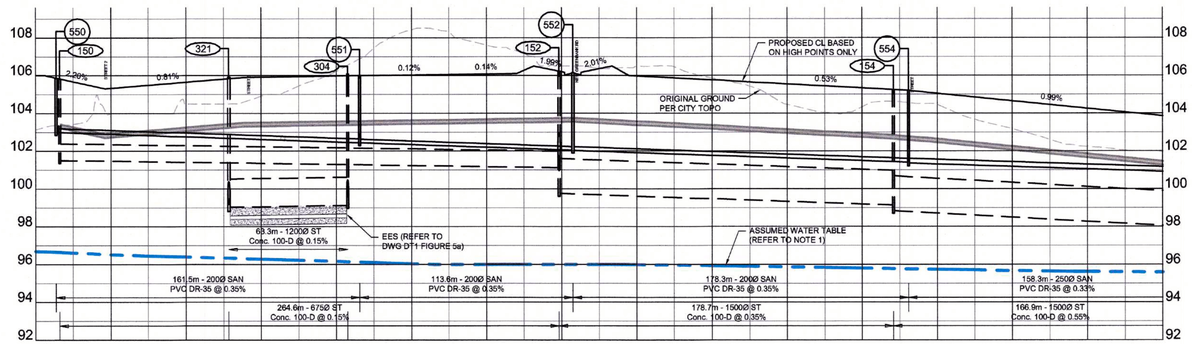


EAST-WEST COLLECTOR



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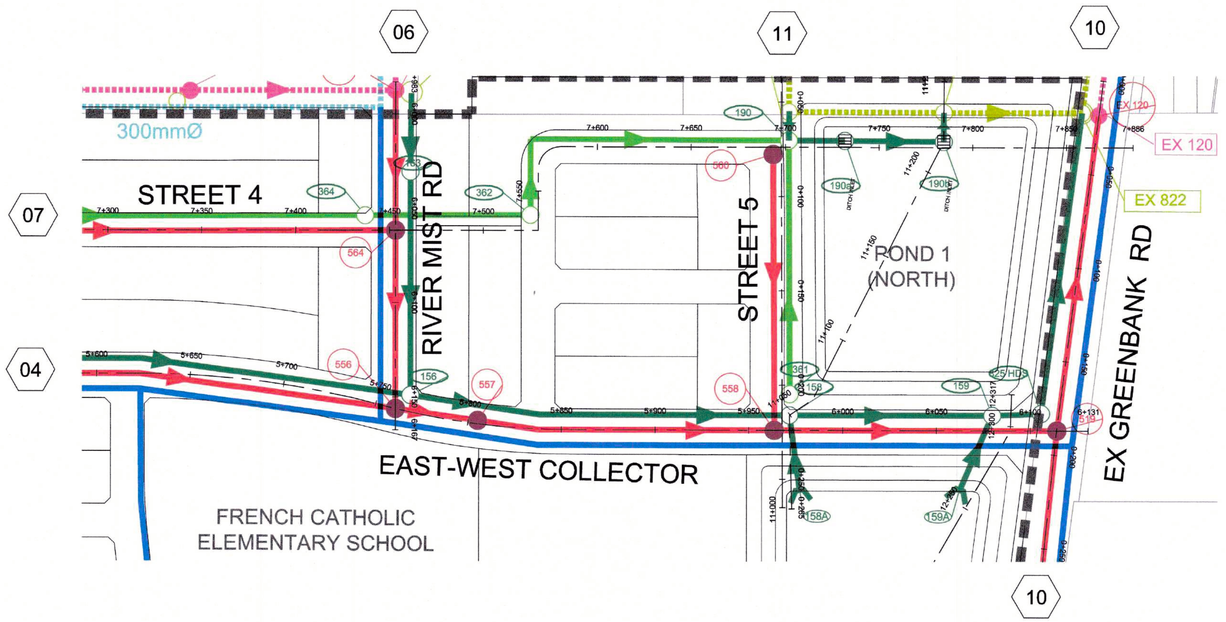
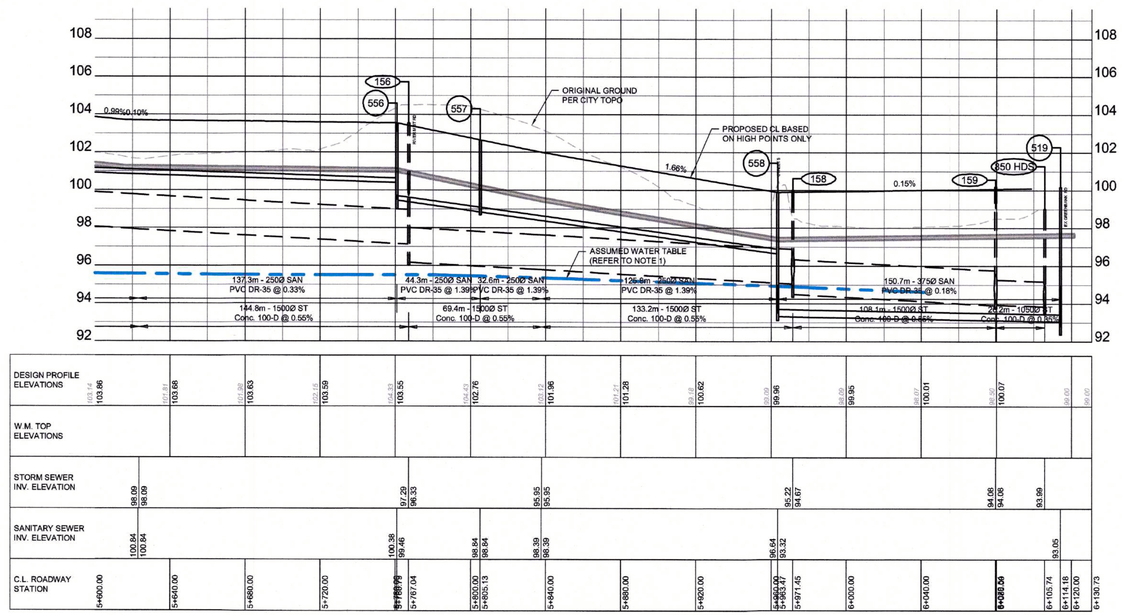
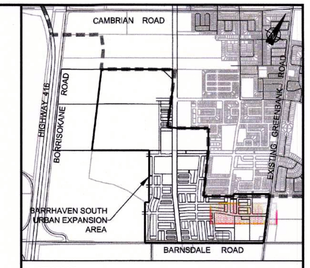


EAST-WEST COLLECTOR





KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

NOTE:

1. ASSUMED WATER TABLE DERIVED FROM THE PATERSON GROUP "GROUND WATER CONTOURS AND FLOW DIRECTION" DRAWING PG-3757-1 REV.3 - HYDROGEOLOGICAL EXISTING CONDITIONS REPORT - PROPOSED BARRHAVEN SOUTH URBAN EXPANSION AREA COMMUNITY DESIGN PLAN DATED JULY 5, 2017 (NOT FOR CONSTRUCTION)

No.	ISSUE / REVISION	DD/MM/YY
3	ISSUED FOR PLANNING COMMITTEE APPROVAL	03/05/18
2	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
1	ISSUED AS PART OF DRAFT MSS	20/09/17

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CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
M. N. L. DALRYMPLE
May 4/18
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

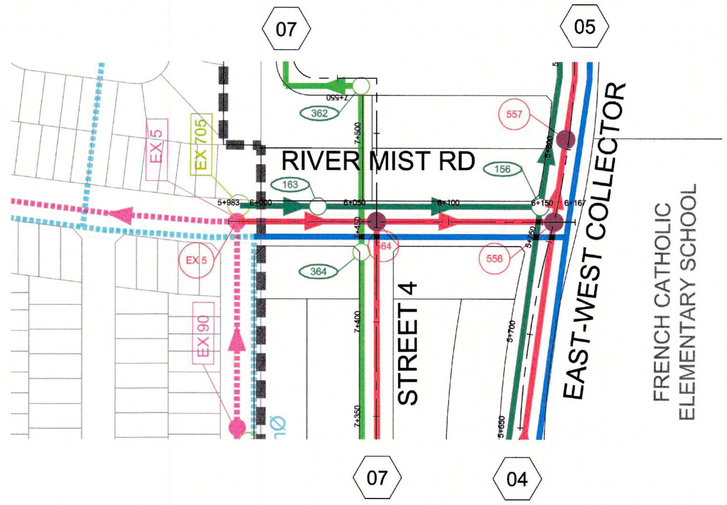
PLAN AND PROFILE
EAST-WEST COLLECTOR
(STA.5+600 TO STA.6+130.73)
EES
STORM SEWER SYSTEM

DESIGN:
DRAWN:
CHECKED:
JLR #:

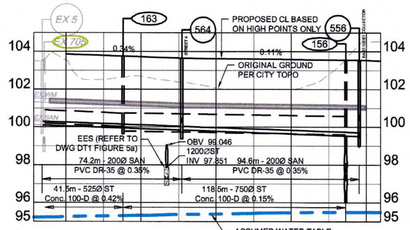
DRAWING #: 05

PLOT DATE: May 3, 2018 4:48:15 PM

File Location: R:\26000\26810 - Barrhaven Expansion - Minto Brazeau Mattamy\JLR DWG\Civil\26810 C Profiles.dwg



RIVER MIST RD



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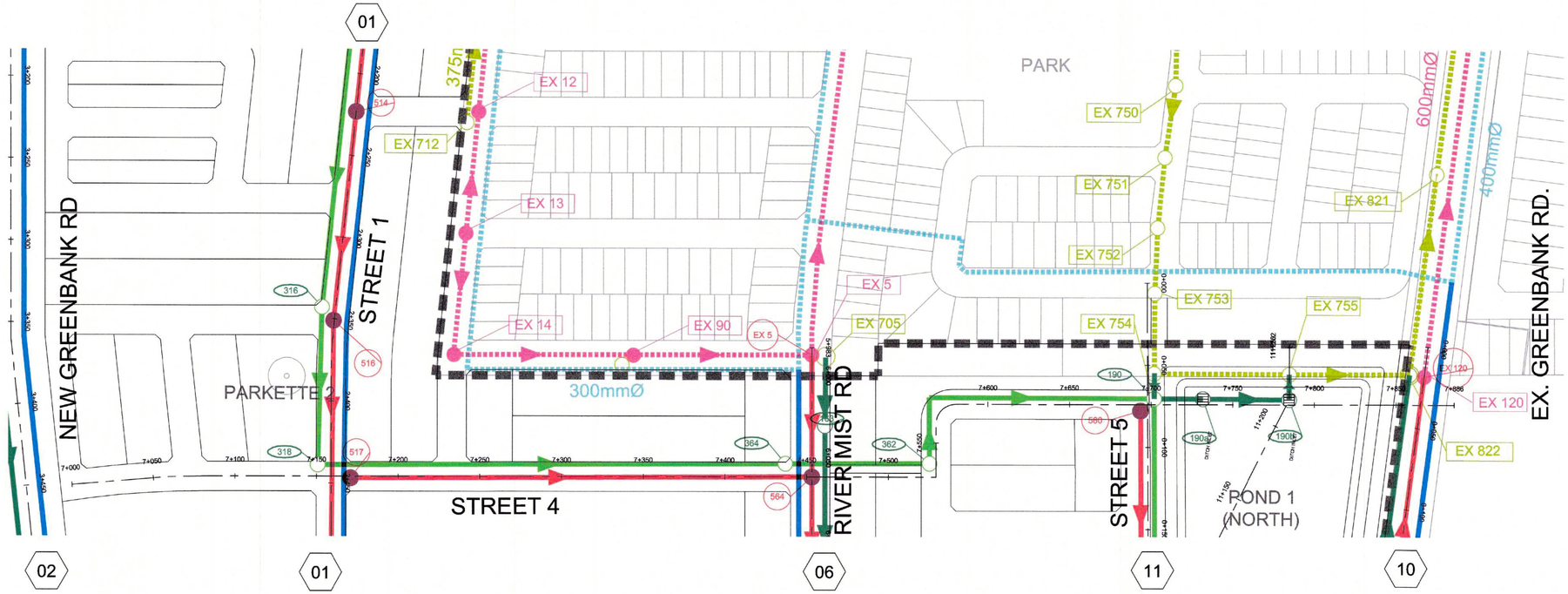

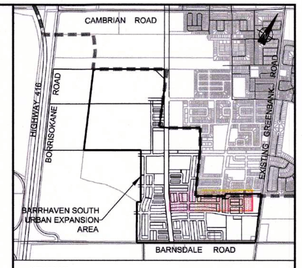

KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

NOTE:

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CLIENT:

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CONSULTANT:

PROFESSIONAL STAMP

LICENCED PROFESSIONAL ENGINEER K. N. L. DALRYMPLE 11 May 4/18 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

PLAN AND PROFILE
STREET 4
EES
STORM SEWER SYSTEM

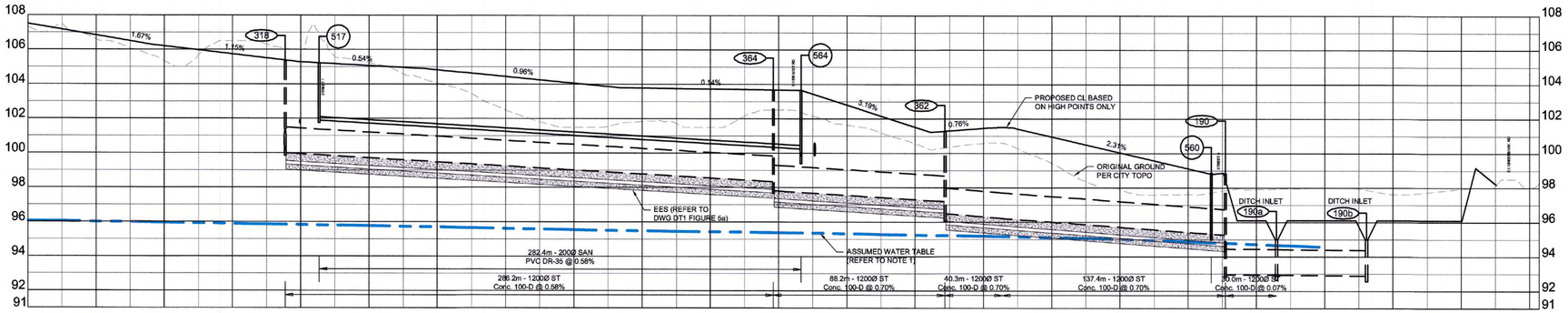
DESIGN:
DRAWN:
CHECKED:
JLR #:

DRAWING #: 07

PLOT DATE: May 3, 2018 4:48:47 PM

File Location: R:\26609\26610 - Barrhaven Expansion - Minto Brazeau Maltamy\JLR DWG\Civil\26610 C Profiles.dwg

STREET 4



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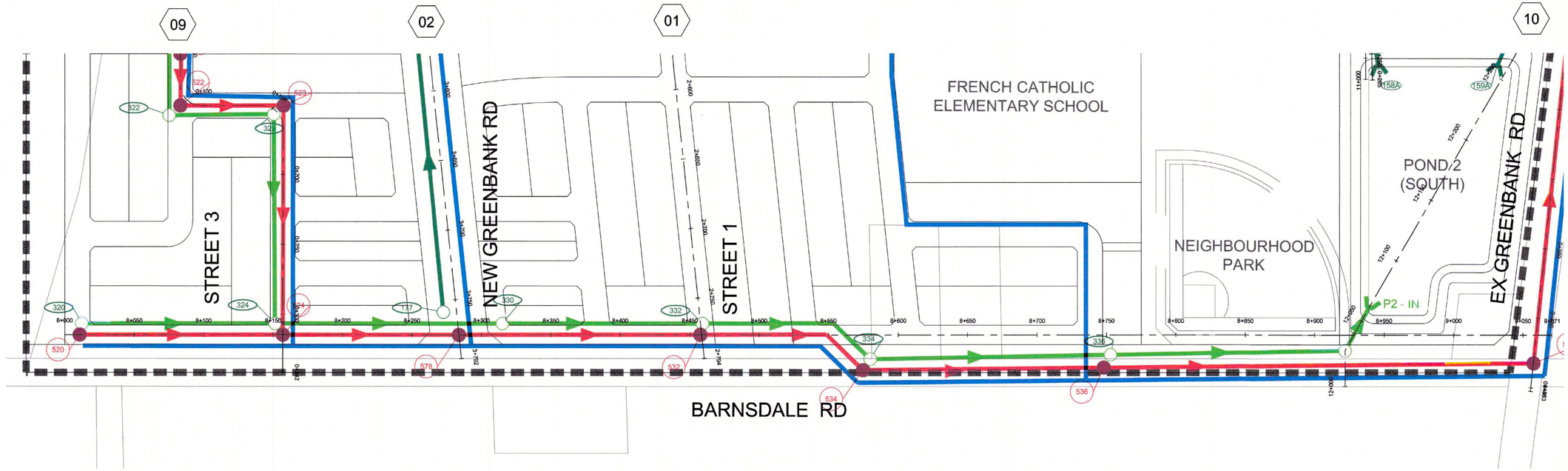

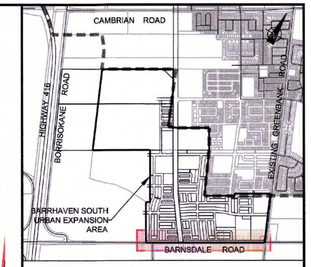

KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN

NOTE:

1. ASSUMED WATER TABLE DERIVED FROM THE PATERSON GROUP "GROUND WATER CONTOURS AND FLOW DIRECTION" DRAWING PG-3757-1 REV.3 - HYDROGEOLOGICAL EXISTING CONDITIONS REPORT - PROPOSED BARRHAVEN SOUTH URBAN EXPANSION AREA COMMUNITY DESIGN PLAN DATED JULY 5, 2017 (NOT FOR CONSTRUCTION)

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CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
M. N. L. DALRYMPLE
May 4/18
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

PLAN AND PROFILE
BARNSDALE RD
EES
STORM SEWER SYSTEM

DESIGN:

DRAWN:

CHECKED:

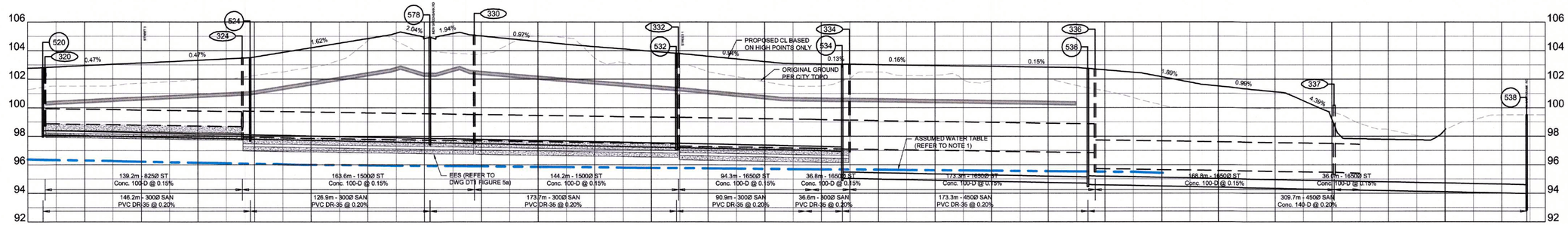
JLR #:

DRAWING #: 08

PLOT DATE: May 3, 2018 4:47:02 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau, Mattamy\JLR DWG\Civil\26610 C Profiles.dwg

BARNSDALE RD



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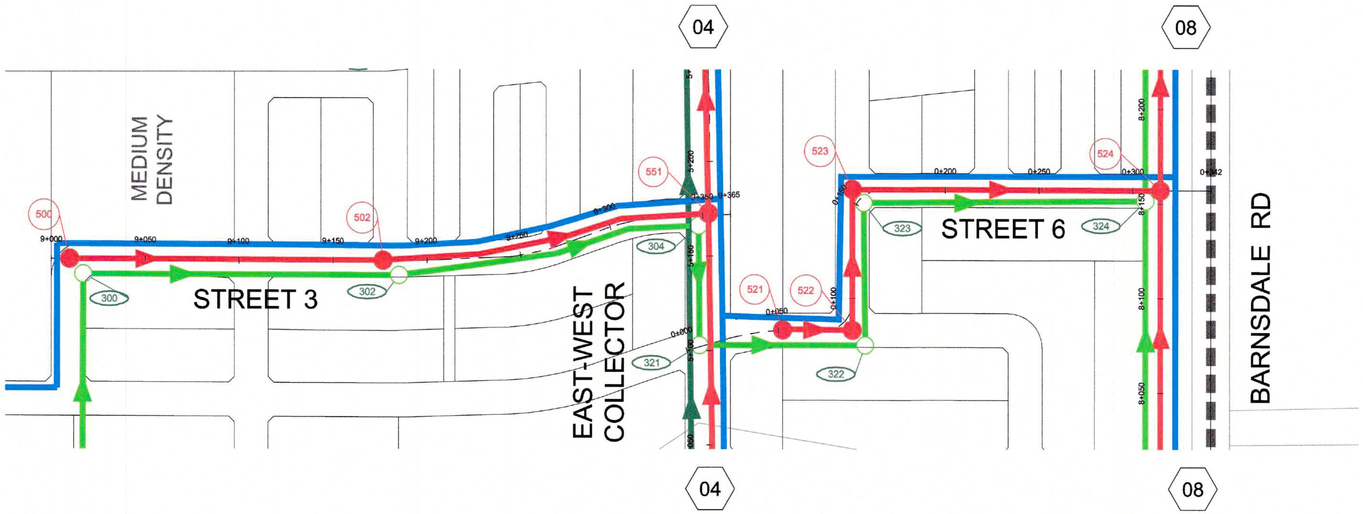
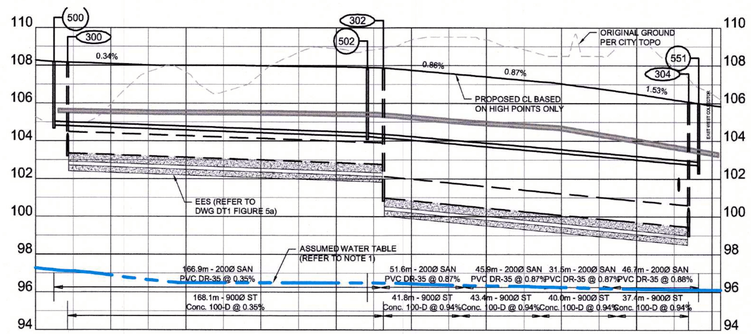
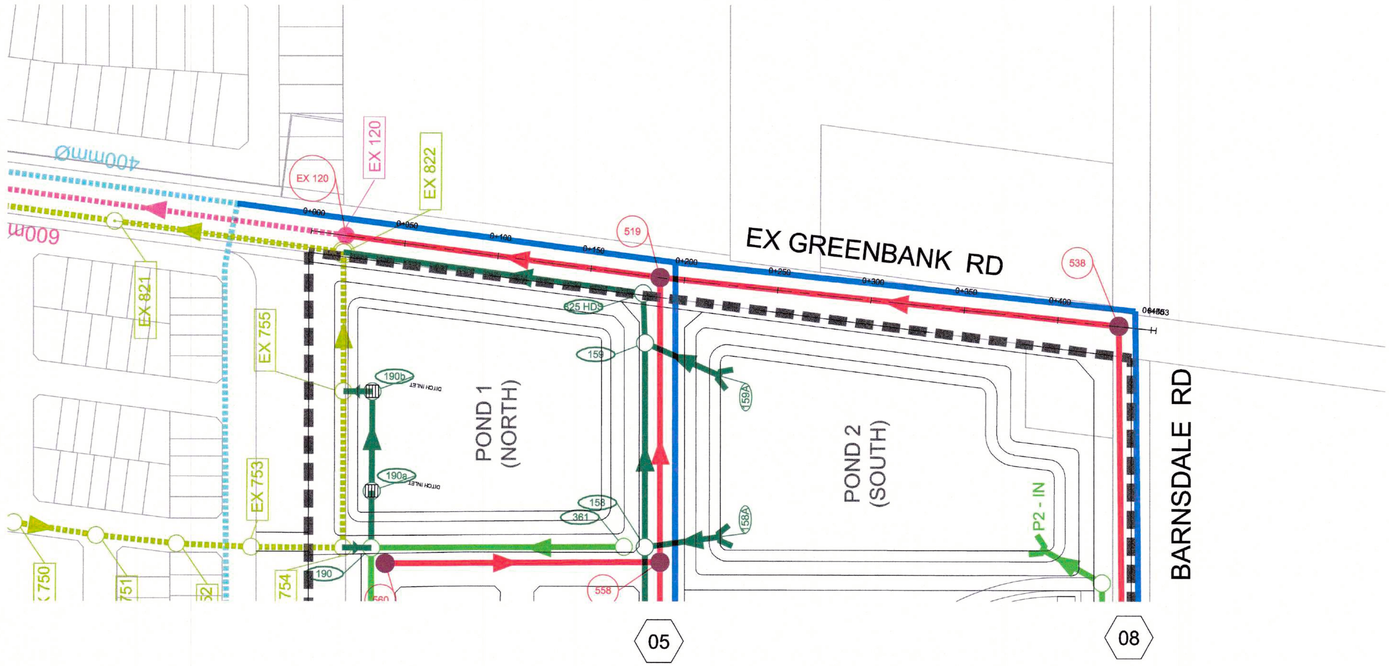

04
08
MEDIUM DENSITY
STREET 3
EAST-WEST COLLECTOR
STREET 6
BARNSDALE RD
500
300
302
502
551
304
321
521
522
322
523
323
524
324
9+000
9+050
9+100
9+150
9+200
9+250
9+300
9+365
0+050
0+100
0+150
0+200
0+250
0+300
0+342
0+800
0+850
0+900

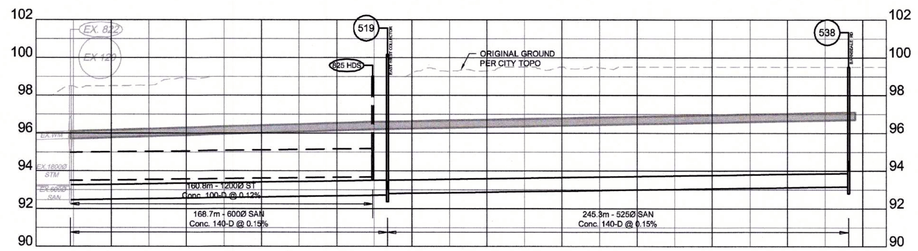
STREET 3


500
300
302
502
551
304
0.34%
0.86%
0.87%
7.53%
ORIGINAL GROUND PER CITY TOPO
PROPOSED CL BASED ON HIGH POINTS ONLY
EES (REFER TO DWG DT1 FIGURE 5a)
ASSUMED WATER TABLE (REFER TO NOTE 1)
166.9m - 200Ø SAN PVC DR-35 @ 0.32%
168.1m - 900Ø ST Conc. 100-D @ 0.35%
51.6m - 200Ø SAN PVC DR-35 @ 0.87%
41.8m - 900Ø ST Conc. 100-D @ 0.94%
45.9m - 200Ø SAN PVC DR-35 @ 0.87%
43.4m - 900Ø ST Conc. 100-D @ 0.94%
31.5m - 200Ø SAN PVC DR-35 @ 0.87%
40.0m - 900Ø ST Conc. 100-D @ 0.94%
46.1m - 200Ø SAN PVC DR-35 @ 0.88%
37.4m - 900Ø ST Conc. 100-D @ 0.94%
110
108
106
104
102
100
98
96
94

| | | |



EXISTING GREENBANK RD



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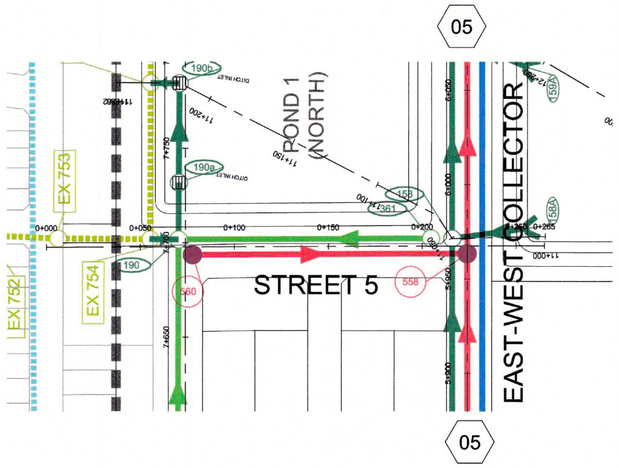
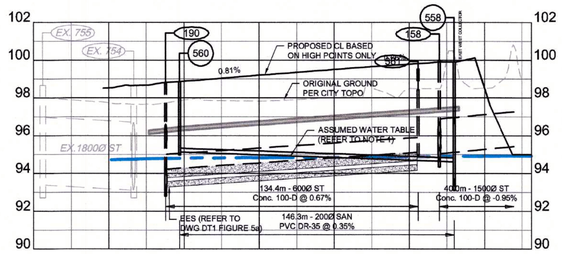
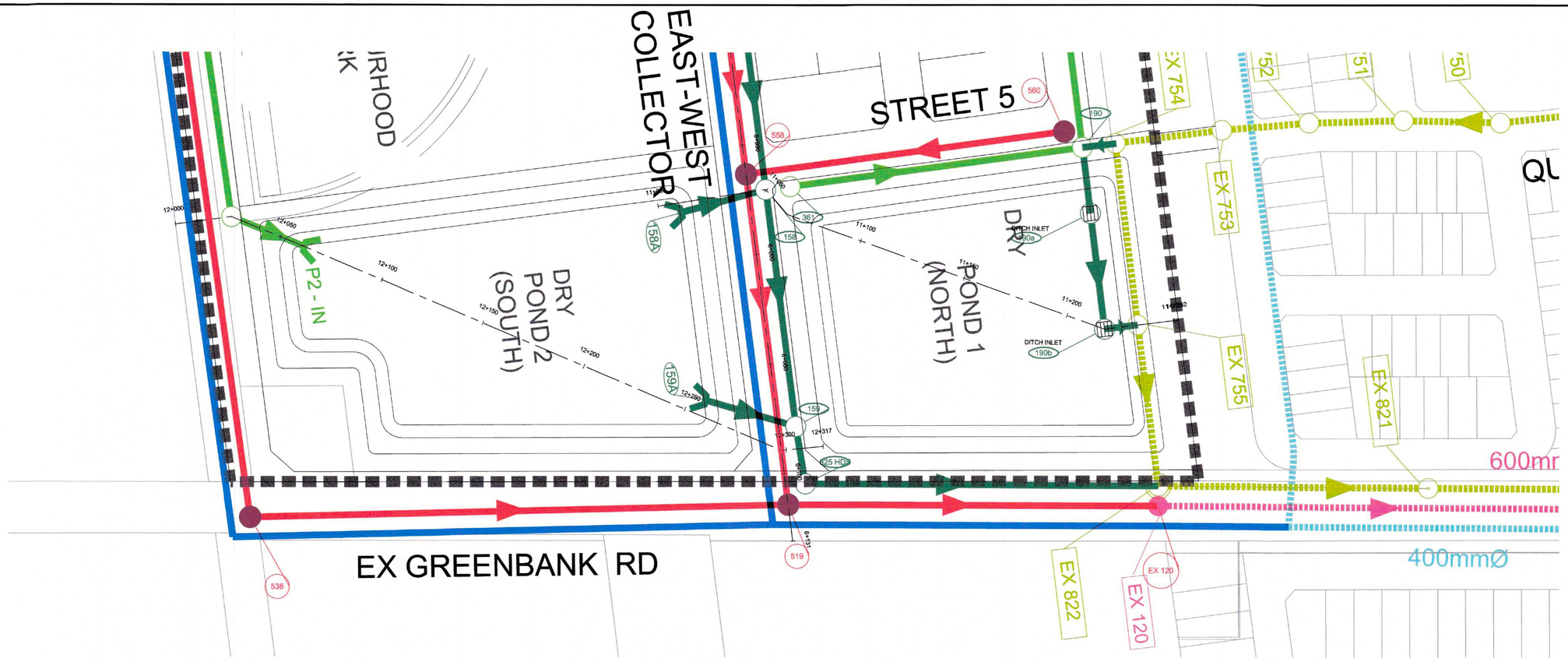

05
POND 1 (NORTH)
EAST-WEST COLLECTOR
STREET 5
EX 753
EX 754
EX 752
190b
190a
190
560
558
158
158A
158B
0+000
0+050
0+100
0+150
0+200
0+265
11+000
05

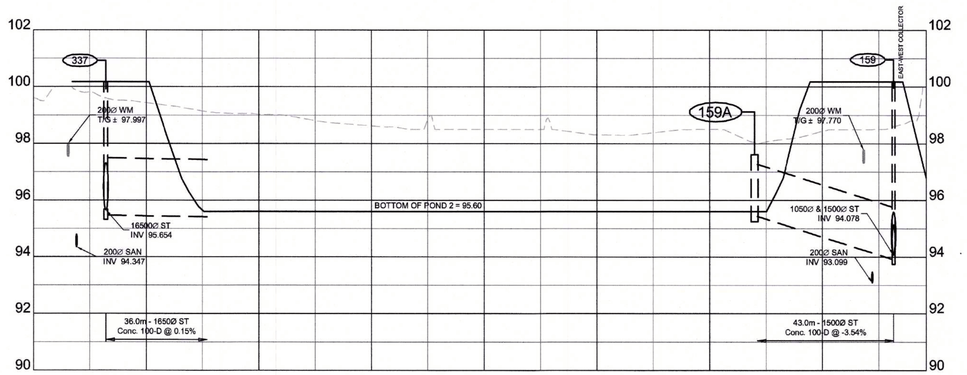
STREET 5


102
100
98
96
94
92
90
(EX. 755)
(EX. 754)
EX.1800Ø ST
190
560
558
158
158A
PROPOSED CL BASED ON HIGH POINTS ONLY
0.81%
ORIGINAL GROUND PER CITY TOPO
ASSUMED WATER TABLE (REFER TO NOTE 1)
134.4m - 600Ø ST Conc. 100-D @ 0.67%
400m - 1500Ø ST Conc. 100-D @ -0.95%
EES (REFER TO DWG DT1 FIGURE 5a)
146.3m - 200Ø SAN PVC DR-35 @ 0.35%

| | | |



POND 2 - EES



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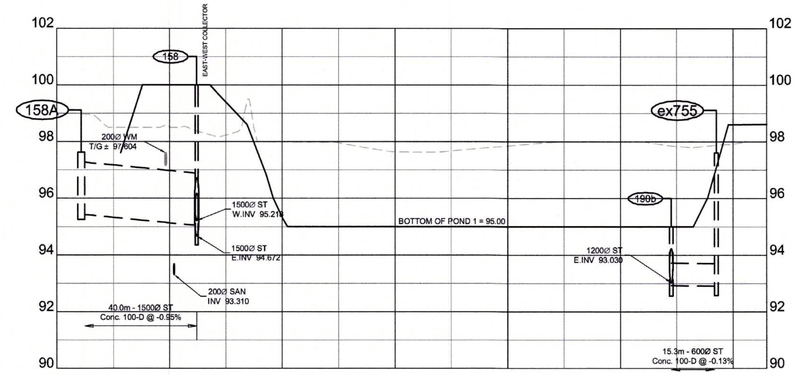
W.M. TOP ELEVATIONS											
STORM SEWER INV. ELEVATION		95.65		95.60				95.60		94.06	
SANITARY SEWER INV. ELEVATION											
C.L. ROADWAY STATION	12+000.00	12+025.73	12+040.00	12+080.00	12+120.00	12+160.00	12+200.00	12+240.00	12+280.00	12+305.33	12+316.89

POND 1 - EES



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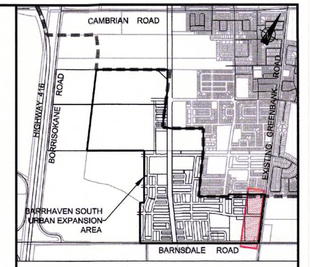
W.M. TOP ELEVATIONS			99.913					97.195	98.619		
STORM SEWER INV. ELEVATION		95.60		95.22				93.03	93.01		
SANITARY SEWER INV. ELEVATION											
C.L. ROADWAY STATION	11+020.00	11+040.00	11+049.61	11+060.00	11+120.00	11+160.00	11+200.00	11+240.00	11+251.98		



KEY PLAN
N.T.S.

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
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- EXISTING STORM
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CLIENT:

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CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER, W. K. L. DALRYMPLE, May 4/18, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

DRAWING:

KEY SERVICING PLAN WITH EES STORM SEWER SYSTEM

DESIGN:

DRAWN:

CHECKED:

JLR #:

DRAWING #: SWM-EES

PLOT DATE: May 3, 2018 4:48:30 PM

File Location: R:\26000\26610 - Barrhaven Expansion - Minto Brazeau, Mattamy,JLR DWG\Civil\26610 C Profiles.dwg

Appendix M

Drawings

OUTLET TRUNK STORM SEWER TO JOCK RIVER
DISTANCE FROM MH205 TO JOCK RIVER 1:100 YR FLOOD PLAIN LIMIT IS APPROXIMATELY 815 M
INVERT AT MH205 = 93.42 M
INVERT AT JOCK RIVER 100 YR FLOOD PLAIN = APPROXIMATELY 92.0 M
OUTLET SEWER = 825 MM DIA. @ 0.17 %

TO CLARK POND

CAMBRIAN RD

BORRISOKANE RD

FUTURE COLLECTOR RD

HIGHWAY 416

DRUMMOND SWM POND

DRUMMOND AGGREGATE EXTRACTION AREA

BRAZEAU SWM POND

BRAZEAU AGGREGATE EXTRACTION AREA

COMMERCIAL

SWM DRY POND

DRY SWM POND

TRAIL RD

BARNSDALE RD

RIVER MIST RD

EX GREENBANK RD

DUNDONALD DR

TODD POND OUTLET

SCHOOL

PARK

DES SOLDATS RIENDEAU ST

FAMEFLOWER ST

KILBIRNIE DR

LAURALEAF CR

BREAKSTONE RD

KNOCKADERRY CR

ALEX POLOVIN AVE

NEW GREENBANK RD

STREET 1

STREET 2

STREET 3

STREET 4

STREET 5

STREET 6

PARK & RIDE

MEDIUM DENSITY

FRENCH PUBLIC ELEMENTARY SCHOOL

FRENCH CATHOLIC ELEMENTARY SCHOOL

NEIGHBOURHOOD PARK

PARKETTE 1

PARKETTE 2

EAST-WEST COLLECTOR

POND 1 (NORTH)

POND 2 (SOUTH)

710 HDS

NOTE:
REFER TO DWG SWM-CONV FOR DETAILS

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN
- LIMIT OF STUDY AREA FOR BSUEA
- 710 HDS — HYDROLOGY DYNAMIC SEPARATOR

SANITARY SEWERS

M.H. # FROM	M.H. # TO	SEWER DATA DIA. mm	SLOPE %	LENGTH m	Upstream Obvert	Downstream Obvert
572	511	200	2.67	136.5	102.79	98.88
511	512	200	0.80	97.5	98.88	98.10
514	512	200	0.74	212.1	99.67	98.10
512	10 (ex.)	200	1.60	74.4	98.10	96.91
514	516	200	0.35	127.9	102.70	102.26
516	554	200	0.35	170.9	102.25	101.65
500	502	200	0.35	174.0	105.03	104.42
502	551	200	0.89	168.6	104.42	102.92
550	551	200	0.35	161.5	103.20	102.63
551	552	200	0.35	113.6	102.63	102.24
552	554	200	0.35	173.3	102.24	101.61
554	556	250	0.33	295.7	101.61	100.64
517	554	200	0.58	282.4	102.10	100.45
13 (ex.)	14 (ex.)	200	0.67	74.6	102.55	102.05
14 (ex.)	90 (ex.)	200	0.94	112.1	102.00	101.95
90 (ex.)	5 (ex.)	200	0.35	109.2	103.95	100.51
5 (ex.)	564	200	0.35	74.2	100.30	100.04
564	556	200	0.35	94.6	100.04	99.71
556	557	250	1.39	44.3	99.71	99.09
557	558	250	1.39	158.4	99.09	96.89
560	558	200	0.35	162.3	99.32	94.82
558	119	375	0.18	150.7	93.71	93.43
521	522	200	1.50	37.1	102.18	101.62
522	523	200	0.80	73.3	101.62	101.04
523	524	200	0.35	164.0	101.04	100.46
520	524	300	0.20	145.3	98.40	98.11
524	578	300	0.20	129.9	98.11	97.85
578	532	300	0.20	173.7	97.85	97.51
532	534	300	0.20	127.5	97.51	97.25
534	536	450	0.20	173.3	95.55	95.15
536	538	450	0.20	309.7	95.15	94.53
538	119	525	0.15	245.3	93.80	93.43
119	120 (ex.)	600	0.15	168.7	93.43	93.17
900	158 (ex.)	200	0.35	280.0	97.23	97.13
310	153 (ex.)	200	0.35	130.0	97.70	96.65
920	930	200	0.35	165.0	97.42	97.36
930	217 (ex.)	200	0.35	40.0	97.58	97.24
585	575	250	0.24	431.0	98.56	97.52
575	555	250	0.24	228.2	97.52	96.98
555	555	250	0.24	431.0	98.01	96.98
555	545	250	0.24	133.0	98.98	96.66
545	900	250	0.24	72.0	96.65	96.48
900	MA 14	250	0.24	160.0	96.48	96.10
903	MA 14	250	1.30	60.0	96.88	96.10
MA 14	MA13	250	1.30	295.0	96.10	92.27
MA13	MH57A	375	0.30	413.1	92.77	89.53
563	562	250	0.35	300.0	99.19	98.14
562	560	200	0.35	220.0	98.14	97.37
561	560	200	0.35	300.0	98.42	97.37
560	MA 11	300	0.35	80.0	97.37	97.09
MA 11	MA 10	300	0.75	482.1	95.00	91.39
MA 10	MH57A	375	0.41	449.7	91.38	89.53

CONVENTIONAL STORM SEWERS

Maintenance Hole Number FROM	TO	SEWER DATA PIPE Dia (mm)	Slope (%)	Length (m)	Upstream Obvert	Downstream Obvert
110	111	450	2.70	89.4	102.90	100.49
111	112	675	0.90	101.2	100.49	99.58
113	112	525	0.74	140.0	100.80	99.56
112	710 (ex.)	675	1.30	73.3	99.56	98.61
112	710	675	1.30	73.3	99.56	98.61
712	711	375	2.56	104.3	102.03	99.36
711	710	450	1.32	104.4	99.41	98.03
710	720	750	0.61	115.2	98.10	97.40
753	754	1800	0.11	54.9	95.01	94.95
754	755	1800	0.13	76.9	94.94	94.84
754	190	1800	0.15	15.0	94.95	94.93
190	190A	1200	0.06	30.0	94.32	94.30
190A	190B	1200	0.10	52.7	94.30	94.25
190B	755	600	0.11	15.0	93.64	93.62
755	822	1800	0.13	79.5	94.84	94.74
152	154	525	0.35	141.1	101.47	100.98
114	116	975	0.35	170.2	102.21	101.61
116	154	1200	0.35	171.2	101.51	101.01
154	156	1200	0.69	311.7	100.75	98.60
705(ex.)	164	375	0.35	65.2	99.49	99.26
164	156	900	0.35	95.4	99.26	98.93
156	158	1800	0.40	202.6	98.26	97.45
160	158	1350	0.15	137.5	96.59	96.38
158	Pl -In	1800	0.15	14.5	96.54	96.52
Ditch Inlet	170	900	1.06	55.8	107.04	106.45
170	172	900	1.06	188.5	106.45	104.47
172	174	1350	0.30	184.4	104.47	103.92
174	178	1350	0.30	168.7	103.92	103.45
176	179	1350	0.30	161.4	103.45	102.96
150	151	900	0.35	152.8	102.60	102.06
Ditch Inlet 2	101	900	0.35	121.1	104.92	104.40
101	102	900	0.35	168.1	104.40	103.81
102	151	900	0.96	158.9	103.81	102.30
151	179	1200	0.35	111.9	102.06	101.67
120	124	1200	0.15	139.2	99.10	98.89
121	122	750	0.15	64.0	101.56	101.46
122	123	750	0.15	75.4	101.46	101.35
123	124	750	0.15	149.9	100.68	100.51
124	178	1200	0.15	122.1	98.89	98.71
178	179	1800	0.15	240.7	101.46	101.09
178	132	1950	0.15	185.9	98.71	98.43
132	134	1950	0.20	131.1	98.43	98.17
134	136	1950	0.20	173.3	98.17	97.82
136	137	1950	0.16	168.8	97.82	97.55
137	P2-IN	1950	0.16	38.0	97.55	97.49
P2-out	HDS825	750	0.15	50.0	98.35	98.28
HDS825	EX 822	1800	0.18	160.8	97.19	96.90
EX 822	EX 821	1800	0.14	123.1	94.07	93.90
EX 821	EX 820	1800	0.15	121.9	93.89	93.71
EX 748	EX 747	600	0.20	83.1	96.96	96.79
EX 747	EX 746	600	0.89	12.1	95.72	95.60
EX 746	EX 744	600	0.22	69.4	95.58	95.44
EX 745	EX 744	450	1.31	81.4	95.59	94.52
EX 744	EX 820	975	0.52	12.4	93.76	93.70
EX 820	EX 102	1800	0.16	121.7	93.71	93.52
270	265	1500	0.15	100.0	99.45	99.30
265	260	1500	0.15	307.3	98.00	97.47
260	245	1500	0.15	227.9	97.47	97.12
250	245	1500	0.15	345.0	97.64	97.12
245	240	2100	0.15	84.9	97.12	97.00
240	Brazeau SWM Pond	2100	0.15	241.7	97.00	96.63
230	225	1500	0.15	450.0	97.66	96.99
225	215	1500	0.15	220.1	96.99	96.66
220	215	1500	0.15	438.7	97.27	96.66
215	Drummond SWM Pond	2100	0.15	350.0	96.66	96.13
Drummond SWM Pond	210	675	0.15	25.0	94.69	94.65
235	210	675	0.17	272.0	95.12	94.65
210	205	825	0.17	223.0	94.65	94.26
205	Flood Plain	825	0.17	817.0	94.26	92.84
900	227 (ex.)	975	0.15	120.0	97.93	97.75

NOTE:

STREETS 1, 2, 3, 4, 5, AND 6 ARE LOCAL ROADS.

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
3	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
2	ISSUED AS PART OF DRAFT MSS	20/09/17
1	ISSUED FOR PRE-TAC WORKING MEETING	31/08/17

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SCALE: 1:4000

CLIENT:

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J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER M. N. L. DALRYMPLE May 4/18 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

KEY SERVICING PLAN WITH CONVENTIONAL STORM SEWER SYSTEM

DESIGN:	JW
DRAWN:	CJM
CHECKED:	LD
JLR #:	26610
DRAWING #:	KS1

PLOT DATE: May 7, 2018 4:30:48 PM

File Location: r:\26000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C KS1.dwg

OUTLET TRUNK STORM SEWER TO JOCK RIVER
DISTANCE FROM MH205 TO JOCK RIVER 1:100 YR FLOOD PLAIN LIMIT IS APPROXIMATELY 815 M
INVERT AT MH205 = 93.42 M
INVERT AT JOCK RIVER 100 YR FLOOD PLAIN = APPROXIMATELY 92.0 M
OUTLET SEWER = 825 MM DIA. @ 0.17 %

CAMBRIAN RD
TO CLARK POND
TODD POND
OUTLET
EX MH12A
EX MH4S
EX GREENBANK RD
BORRISOKANE RD
HIGHWAY 416
TRAIL RD
FUTURE COLLECTOR RD
RIVER MIST RD
DRUMMOND SWM POND
DRUMMOND AGGREGATE EXTRACTION AREA
BRAZEAU SWM POND
BRAZEAU AGGREGATE EXTRACTION AREA
SWM DRY POND
DRY SWM POND
SCHOOL
PARK
DUNDONALD DR
FAMEFLOWER ST
DES SOLDATS
RIENDEAU ST
KILBIRNIE DR
LAURALEAF CR
BREAKSTONE RD
KNOCKADERRY CR
ALEX POLOVIN AVE
NEW GREENBANK RD
STREET 1
STREET 2
STREET 3
STREET 4
STREET 5
STREET 6
PARK & PRIDE
MEDIUM DENSITY
FRENCH PUBLIC ELEMENTARY SCHOOL
FRENCH CATHOLIC ELEMENTARY SCHOOL
PARKETTE
PARKETTE 1
EAST-WEST COLLECTOR
COMMERCIAL
NEIGHBOURHOOD PARK
POND 1 (NORTH)
POND 2 (SOUTH)
825 HDS
710 HDS
BARNSDALE RD

MA10 GRD 93.5 OBV 91.38
MA11 GRD 95.0 OBV 92.27
MA12 GRD 103.0 OBV 96.10
MA13 GRD 93.6 OBV 89.53
MA14 GRD 95.0 OBV 92.27
MA15 GRD 95.0 OBV 92.27
MA16 GRD 95.0 OBV 92.27
MA17 GRD 95.0 OBV 92.27
MH17A GRD 93.6 OBV 89.53
222 OBV 91.41
224A OBV 91.74
224 OBV 92.31
227 OBV 100.46
228 OBV 102.93
230 OBV 91.61

NOTE:
REFER TO DWG SWM-EES FOR DETAILS

LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- PROPOSED STORM (EES SYSTEM), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- PROPOSED WATERMAIN, PER 2018 BSUEA MSS
- FUTURE WATERMAIN, PER 2014 BS MSS
- EXISTING WATERMAIN
- LIMIT OF STUDY AREA FOR BSUEA
- 710 HDS — HYDROLOGY DYNAMIC SEPARATOR

SANITARY SEWERS

M.H. # FROM	M.H. # TO	SEWER DATA DIA. mm	SLOPE %	LENGTH m	Upstream Obvert	Downstream Obvert
572	511	200	2.87	136.5	102.79	98.88
511	512	200	0.80	97.6	98.98	98.10
514	512	200	0.74	212.1	99.87	98.10
512	10 (ex.)	200	1.60	74.4	98.10	96.91
514	516	200	0.35	127.9	102.70	102.25
516	564	200	0.35	170.9	102.25	101.65
500	502	200	0.35	174.0	105.03	104.42
502	561	200	0.89	168.6	104.42	102.92
550	561	200	0.35	161.5	103.30	102.83
551	562	200	0.35	113.6	102.83	102.24
552	554	200	0.35	178.3	102.24	101.61
554	556	250	0.33	295.7	101.61	100.64
517	564	200	0.58	282.4	102.10	100.45
13 (ex.)	14 (ex.)	200	0.67	74.8	102.55	102.05
14 (ex.)	90 (ex.)	200	0.94	112.1	102.00	101.95
90 (ex.)	5 (ex.)	200	0.35	108.2	100.95	100.57
5 (ex.)	564	200	0.35	74.2	100.30	100.04
564	556	200	0.35	94.8	100.04	99.71
556	557	250	1.39	44.3	99.71	99.09
557	558	250	1.39	156.4	99.09	96.89
560	558	200	0.35	142.3	95.32	94.82
558	119	375	0.18	150.7	93.71	93.43
521	522	200	1.50	37.1	102.18	101.62
522	523	200	0.80	73.3	101.52	101.04
523	524	200	0.35	164.0	101.04	100.48
520	524	300	0.20	140.3	98.40	98.11
524	578	300	0.20	126.9	98.11	97.85
578	532	300	0.20	173.7	97.85	97.51
532	534	300	0.20	127.5	97.51	97.25
534	536	450	0.20	173.3	96.50	95.15
536	538	450	0.20	309.7	95.15	94.53
538	119	525	0.15	245.3	93.80	93.43
119	120 (ex.)	600	0.15	168.7	93.43	93.17
900	158 (ex.)	200	0.35	260.0	97.23	97.13
910	163 (ex.)	200	0.35	130.0	98.70	98.65
920	930	200	0.35	165.0	97.42	97.36
930	217 (ex.)	200	0.35	40.0	97.36	97.24
585	575	250	0.24	431.0	98.56	97.52
575	555	250	0.24	228.0	97.52	96.96
560	555	250	0.24	431.0	98.01	96.98
555	545	250	0.24	133.0	96.98	96.66
545	900	250	0.24	72.0	96.66	96.48
900	MA14	250	0.24	160.0	96.48	96.10
900	MA14	250	1.30	60.0	99.88	96.10
MA14	MA13	250	1.30	295.0	96.10	92.27
MA13	MH7A	375	0.30	413.1	90.77	89.53
593	592	200	0.35	302.0	99.19	98.14
592	590	200	0.35	220.0	98.14	97.37
591	590	200	0.35	300.0	98.42	97.37
590	MA11	300	0.33	80.0	97.37	97.09
MA11	MA10	300	0.75	482.1	95.00	91.38
MA10	MH7A	375	0.41	440.7	91.38	89.53

ETOBICOKE EXFILTRATION SYSTEM STORM SEWERS

Maintenance Hole Number FROM	TO	SEWER DATA Dia (mm)	Slope (%)	Length (m)	Upstream Obvert	Downstream Obvert
DI-1	170	900	1.05	68.1	107.54	106.45
170	172	900	1.05	188.5	106.45	104.47
172	174	1350	0.30	184.4	104.47	103.92
174	176	1350	0.30	156.7	103.92	103.45
176	152	1350	0.30	161.4	103.40	102.99
150	152	675	0.15	264.8	102.30	101.90
177	152	675	0.15	237.4	102.00	101.65
152	154	1500	0.35	178.8	101.45	100.82
154	156	1500	0.55	311.7	100.53	98.82
705 (ex.)	103	525	0.42	41.5	100.82	100.65
163	155	750	0.15	118.5	100.55	100.47
156	158	1500	0.55	202.8	97.92	96.74
158	159	1500	0.55	106.1	96.20	95.60
158	158A	1500	0.55	40.0	96.74	97.13
159	159A	1350	3.54	43.0	95.50	97.13
DI-2	300	900	1.05	121.1	105.66	104.39
300	302	900	0.35	158.1	104.39	103.81
302	304	900	0.94	162.8	102.02	100.49
304	321	1200	0.15	63.3	100.49	100.39
321	322	1200	0.15	85.2	100.39	100.26
322	323	1200	0.15	75.4	100.26	100.15
323	324	1200	0.35	149.8	100.15	99.62
320	324	825	0.15	138.2	99.83	99.62
324	330	1500	0.15	163.6	99.62	99.38
330	332	1500	0.15	144.2	99.38	99.10
332	334	1650	0.15	131.1	99.16	98.96
334	336	1650	0.15	173.3	98.96	98.70
336	337	1650	0.15	168.8	97.58	97.33
337	PC-N	1650	0.15	36.6	97.33	97.28
159	825HDS	1050	0.26	28.2	95.15	95.05
825HDS	822	1200	0.12	150.8	95.05	94.86
314	316	1050	0.15	170.2	101.68	101.43
316	318	1200	0.15	98.0	101.43	101.28
318	364	1200	0.58	236.2	101.28	99.62
364	362	1200	0.70	89.2	99.10	98.48
362	190	1200	0.70	177.7	97.78	96.54
361	190	900	0.87	134.4	95.83	94.83
754	190	1800	0.13	15.0	94.95	94.93
190	190A	1200	0.07	30.0	94.32	94.30
190A	190B	1200	0.06	52.7	94.30	94.25
190B	755	900	0.13	15.2	93.64	93.62
110	111	450	2.70	89.4	102.90	100.49
111	112	675	0.90	131.2	100.49	99.68
313	112	525	0.74	140.0	100.60	99.56
112	710	675	1.30	73.3	99.56	98.61
112	710	675	1.30	73.3	99.56	98.61
712	711	375	2.56	104.3	102.031	99.351
711	710	450	1.32	104.4	99.407	98.027
710	720	750	0.61	116.2	98.102	97.397
755	754	1800	0.11	54.9	95.009	94.949
754	755	1900	0.13	78.9	94.939	94.839
755	822	1800	0.13	79.0	94.64	94.74
EX. 822	EX. 821	1800	0.14	123.1	94.07	93.90
EX. 821	EX. 820	1800	0.16	121.9	93.90	93.71
EX. 748	EX. 747	800	0.20	83.1	95.95	95.79
EX. 747	EX. 746	800	0.99	12.1	95.72	95.60
EX. 746	EX. 744	800	0.20	69.4	95.58	95.44
EX. 743	EX. 744	450	1.31	81.4	95.59	94.52
EX. 744	EX. 820	675	0.52	12.4	93.78	93.70
EX. 820	EX. 102	1800	0.16	121.7	93.71	93.52
270	268	1500	0.15	100.0	99.45	99.30
265	260	1500	0.15	337.3	98.00	97.47
260	245	1500	0.15	227.9	97.47	97.12
260	245	1500	0.15	345.0	97.64	97.12
245	240	2100	0.15	84.9	97.12	97.00
240	Brazeau SWM Pond	2100	0.15	241.7	97.00	96.63
Brazeau SWM Pond	235	675	0.17	37.9	95.19	95.12
230	225	1500	0.15	450.3	97.68	96.96
225	215	1500	0.15	220.1	96.99	96.66
220	215	1500	0.15	408.7	97.27	96.66
215	Drummond SWM Pond	2100	0.15	350.0	96.66	96.13
Drummond SWM Pond	210	675	0.15	25.0	94.69	94.65
235	210	675	0.17	272.0	95.12	94.65
210	205	825	0.17	223.0	94.65	94.26
205	Flood Plain	825	0.17	817.0	94.26	92.84
900	227 (ex.)	975	0.15	120.0	97.83	97.75

NOTE:

STREETS 1, 2, 3, 4, 5, AND 6 ARE LOCAL ROADS.

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
3	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
2	ISSUED AS PART OF DRAFT MSS	20/09/17
1	ISSUED FOR PRE-TAC WORKING MEETING	31/08/17

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SCALE: 1:4000

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER M. K. L. DALRYMPLE May 4/18 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

KEY SERVICING PLAN WITH ETOBICOKE EXFILTRATION SYSTEM (EES)

DESIGN:	JW	DRAWING #:
DRAWN:	CJM	KS2
CHECKED:	LD	
JLR #:	26610	

PLOT DATE: May 3, 2018 4:31:06 PM

File Location: n:\26000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\cwf\26610 C S1.dwg

CAMBRIAN RD

CLARK POND

TODD POND

CAMBRIAN RD

BORRISOKANE RD

FUTURE COLLECTOR RD

RIVER MIST RD

EX GREENBANK RD

CULVERT INV = 98.73

CULVERT INV = 98.02

DRUMMOND SWM POND

DRUMMOND AGGREGATE EXTRACTION AREA

SCHOOL

PARK

DUNDONALD DR

SWM DRY POND

FAIRFLOWER ST

DES SOLDATS

RIENDEAU ST

HIGHWAY 416

BRAZEAU SWM POND

BRAZEAU AGGREGATE EXTRACTION AREA

COMMERCIAL

KILBIRNIE DR

LAURALEAF CR.

BREAKSTONE RD

ALEX POLOVINA AVE

KNOCKADERRY CR.

STREET 1

STREET 2

STREET 3

STREET 4

STREET 5

STREET 6

PARK & RIDE

MEDIUM DENSITY

PARKETTE 1

PARKETTE 2

FRENCH PUBLIC ELEMENTARY SCHOOL

FRENCH CATHOLIC ELEMENTARY SCHOOL

NEIGHBOURHOOD PARK

EAST-WEST COLLECTOR

NEW GREENBANK RD

POND 1 (NORTH)

POND 2 (SOUTH)

DRY SWM POND

TRAIL RD

BARNSDALE RD

LEGEND

100.95 *	GRADES TAKEN FROM: TODD POND AND CLARK POND MODEL KEEPER ANALYSIS (JFSA)
102.85 *	MINTO LANDS WITHIN BHSUEA
99.75 *	GRADES TAKEN FROM: STANTEC TOPOGRAPHIC SKETCH OCTOBER 2015
96.13 *	GRADES TAKEN FROM: REALIGNED GREENBANK ROAD AND TRANSITWAY EXTENSION PLANNING AND ENVIRONMENT ASSESSMENT
94.5 *	GRADES TAKEN FROM: BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (STANTEC)
104.0 *	MINIMUM FILL ELEVATION REQUIREMENT WITHIN PITS
	MAJOR OVERLAND FLOW DIRECTION
	LIMIT OF STUDY AREA FOR BSUEA

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
3	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
2	ISSUED AS PART OF DRAFT MSS	20/09/17
1	ISSUED FOR PRE-TAC WORKING MEETING	31/08/17

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SCALE: 1:4000

CLIENT:

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP

LICENCED PROFESSIONAL ENGINEER M. N. L. DALRYMPLE May 4/18 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

MASTER GRADING PLAN (1:4000)

DESIGN:	JW
DRAWN:	CJM
CHECKED:	LD
JLR #:	26610

DRAWING #: MG1

PLOT DATE: May 3, 2018 4:32:08 PM

File Location: r:\26600\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C G1.dwg

BRAZEAU AGGREGATE EXTRACTION AREA

COMMERCIAL

SCHOOL

PARK

KILBIRNIE DR

SCHOOL

PARK

LAURALEAF CR.

BREAKSTONE RD

KNOCKADERRY CR.

FRENCH PUBLIC ELEMENTARY SCHOOL

NEW GREENBANK RD

ALEX POLOWIN AVE

RIVER MIST RD

STREET 1

STREET 2

STREET 3

STREET 4

STREET 5

STREET 6

PARK & RIDE

MEDIUM DENSITY

PARKETTE 1

PARKETTE 2

EAST-WEST COLLECTOR

FRENCH CATHOLIC ELEMENTARY SCHOOL

NEIGHBOURHOOD PARK

POND 1 (NORTH)

POND 2 (SOUTH)

DRY SWM POND

EX GREENBANK RD

BARNSDALE RD

BARNSDALE RD

LEGEND

100.95 *	GRADES TAKEN FROM: TODD POND AND CLARK POND MODEL KEEPER ANALYSIS (JFSA)
102.85 *	MINTO LANDS WITHIN BHSUEA
99.75 *	GRADES TAKEN FROM: STANTEC TOPOGRAPHIC SKETCH OCTOBER 2015
96.13 *	GRADES TAKEN FROM: REALIGNED GREENBANK ROAD AND TRANSITWAY EXTENSION PLANNING AND ENVIRONMENT ASSESSMENT
94.5 *	GRADES TAKEN FROM: BARRHAVEN SOUTH MASTER SERVICING STUDY ADDENDUM (STANTEC)
103.5 *	MINIMUM FILL ELEVATION REQUIREMENT WITHIN PITS
	MAJOR OVERLAND FLOW DIRECTION
	LIMIT OF STUDY AREA FOR BSUEA

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
3	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
2	ISSUED AS PART OF DRAFT MSS	20/09/17
1	ISSUED FOR PRE-TAC WORKING MEETING	31/08/17

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SCALE: 1:2000

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER, N. L. DALRYMPLE, 11/May/18, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

MASTER GRADING PLAN (1:2000)

DESIGN:

DRAWN:

CHECKED:

JLR #:

DRAWING #: MG2

PLOT DATE: May 2, 2018 4:33:33 PM

File Location: r:\26000\26510 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Cwl\26510 C G2.dwg

OUTLET TRUNK STORM SEWER TO JOCK RIVER
DISTANCE FROM MH205 TO JOCK RIVER 1:100 YR FLOOD PLAIN LIMIT IS APPROXIMATELY 815 M
INVERT AT MH205 = 93.42 M
INVERT AT JOCK RIVER 100 YR FLOOD PLAIN = APPROXIMATELY 92.0 M
OUTLET SEWER = 825 MM DIA. @ 0.17 %

CAMBRIAN RD
TO CLARK POND
TODD POND
OUTLET
FUTURE COLLECTOR RD
BORRISOKANE RD
HIGHWAY 416
TRAIL RD
BARNSDALE RD
RIVER MIST RD
EX GREENBANK RD
DUNDONALD DR
KILBIRNIE DR
DES SOLDATS RIENDEAU ST
FAMEFLOWER ST
NEW GREENBANK RD
STREET 1
STREET 2
STREET 3
STREET 4
STREET 5
EAST WEST COLLECTOR
PARKETTE 1
PARKETTE 2
BREAKSTONE RD
LAURALEAF CR
KNOCKADERRY CR
MAPLE POLONIA AVE
DRUMMOND SWM POND
BRAZEAU SWM POND
DRY SWM POND
SWM DRY POND
POND 1 (NORTH)
POND 2 (SOUTH)
DRUMMOND AGGREGATE EXTRACTION AREA
BRAZEAU AGGREGATE EXTRACTION AREA
FRENCH PUBLIC ELEMENTARY SCHOOL
FRENCH CATHOLIC ELEMENTARY SCHOOL
NEIGHBOURHOOD PARK
PARK & RIDE
MEDIUM DENSITY
COMMERCIAL
SCHOOL
PARK
750mmØ
10HDS
630 HDS
OUTLET TO JOCK RIVER

LEGEND

- PROPOSED STORM (CONVENTIONAL SYSTEM), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- DRAINAGE BOUNDARY
- LIMIT OF STUDY AREA FOR BSUEA
- 710 HDS — HYDROLOGY DYNAMIC SEPARATOR
- AREA IN HECTARES*
- RUNOFF COEFFICIENT*
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

* IF RED, AREAS DESIGNATED AS COMMERCIAL, SCHOOLS OR PARKS

NOTE:

ROADWAYS WITHIN A DRAINAGE AREA WHICH IS TRIBUTARY TO AN EES SEWER, ARE TO BE DESIGNED WITH EES SEWERS. CONVERSELY, ROADWAYS WITHIN A DRAINAGE AREA WHICH IS TRIBUTARY TO A CONVENTIONAL SEWER, ARE TO BE DESIGNED WITH CONVENTIONAL SEWERS.

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SCALE: 1:4000

CLIENT:

CONSULTANT: www.jjrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
M. N. L. DALRYMPLE
DATE 4/18
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

MASTER STORM DRAINAGE PLAN CONVENTIONAL SYSTEM

DESIGN: JW
DRAWN: CJM
CHECKED: LD
JLR #: 26610

DRAWING #: MST-1

PLOT DATE: May 4, 2018 8:43:59 AM

File Location: r:\26000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C MST-1.dwg

CONVENTIONAL STORM SEWERS

Maintenance Hole Number		SEWER DATA			Upstream	Downstream
		PIPE				
FROM	TO	Dia (mm)	Slope (%)	Length (m)	Obvert	Obvert
110	111	450	2.70	89.4	102.60	100.49
111	112	675	0.80	101.2	100.49	99.53
113	112	525	0.74	140.0	100.60	99.56
112	710 (ex.)	675	1.30	73.3	99.56	98.61
112	710	675	1.30	73.3	99.56	98.61
712	711	375	2.58	104.3	102.03	99.36
711	710	450	1.32	104.4	99.41	98.03
710	720	750	0.61	115.2	98.10	97.40
753	754	1800	0.11	54.9	95.01	94.95
754	755	1800	0.13	78.9	94.84	94.84
754	190	1800	0.15	15.0	94.95	94.93
190	190A	1200	0.06	30.0	94.32	94.30
190B	190B	1200	0.10	52.7	94.30	94.25
190B	755	600	0.11	15.0	93.64	93.62
755	822	1800	0.13	79.5	94.84	94.74
152	154	525	0.35	141.1	101.47	100.88
114	116	975	0.35	170.2	102.21	101.61
116	154	1200	0.35	171.2	101.61	101.01
154	156	1200	0.69	311.7	100.75	98.60
705(ex)	164	375	0.35	65.2	99.49	99.26
164	156	900	0.35	90.4	99.09	98.93
156	158	1800	0.40	202.8	98.26	97.45
160	158	1350	0.15	137.5	96.59	96.38
158	P1-in	1800	0.15	14.5	96.64	96.62
Ditch Inlet	170	900	1.05	55.9	107.04	106.45
170	172	900	1.05	168.5	106.45	104.47
172	174	1350	0.30	164.4	104.47	103.92
174	176	1350	0.30	158.7	103.92	103.45
176	176	1350	0.30	161.4	103.45	102.96
150	151	900	0.35	152.8	102.60	102.06
Ditch Inlet 2	101	900	0.35	121.1	104.82	104.40
101	102	900	0.35	166.1	104.40	103.81
102	151	900	0.96	156.5	103.81	102.30
151	179	1200	0.35	111.8	102.06	101.67
120	124	1200	0.15	139.2	99.10	98.89
121	122	750	0.15	64.0	101.56	101.46
122	123	750	0.15	75.4	101.46	101.35
123	124	750	0.15	149.8	100.68	100.51
124	178	1200	0.10	122.1	98.89	98.71
176	178	1800	0.15	245.7	101.46	101.09
178	132	1950	0.15	165.5	98.71	98.43
132	134	1950	0.20	131.1	98.43	98.17
134	136	1950	0.20	133.3	98.17	97.82
136	137	1950	0.16	168.8	97.82	97.55
137	P2-N	1950	0.16	36.0	97.55	97.49
P2-out	HDSB25	750	0.15	52.0	96.35	96.28
HDSB25	EX. 822	1800	0.18	180.8	97.19	96.90
EX. 822	EX. 821	1800	0.14	123.1	94.07	93.90
EX. 821	EX. 820	1800	0.15	121.9	93.89	93.71
EX. 748	EX. 747	600	0.20	63.1	95.98	95.79
EX. 747	EX. 746	600	0.99	12.1	95.72	95.60
EX. 746	EX. 744	900	0.20	69.4	95.58	95.44
EX. 743	EX. 744	450	1.31	61.4	95.59	94.52
EX. 744	EX. 820	675	0.52	12.4	93.76	93.70
EX. 820	EX. 102	1800	0.16	121.7	93.71	93.52
270	265	1500	0.10	100.0	99.45	99.30
265	260	1500	0.15	357.3	98.00	97.47
260	245	1500	0.15	227.5	97.47	97.12
250	245	1500	0.15	345.0	97.84	97.12
245	240	2100	0.15	84.9	97.12	97.00
240	Brazeau SWM Pond	2100	0.15	241.7	97.00	96.63
230	225	1500	0.15	450.0	97.06	96.99
225	215	1500	0.15	220.1	96.99	96.66
220	215	1500	0.15	408.7	97.27	96.66
215	Drummond SWM Pond	2100	0.15	350.0	96.66	96.13
Drummond SWM Pond	210	675	0.15	25.0	94.89	94.85
235	210	675	0.17	272.0	95.12	94.65
210	205	825	0.17	223.0	94.65	94.26
205	Flood Plain	825	0.17	617.0	94.26	92.64
900	227 (ex.)	975	0.15	120.0	97.93	97.75

OUTLET TRUNK STORM SEWER TO JOCK RIVER
DISTANCE FROM MH205 TO JOCK RIVER 1:100 YR FLOOD PLAIN LIMIT IS APPROXIMATELY 815 M
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INVERT AT JOCK RIVER 100 YR FLOOD PLAIN = APPROXIMATELY 92.0 M
OUTLET SEWER = 825 MM DIA. @ 0.17 %

CAMBRIAN RD
TO CLARK POND
TODD POND
OUTLET
FUTURE COLLECTOR RD
BORRISOKANE RD
HIGHWAY 416
TRAIL RD
RIVER MIST RD
EX GREENBANK RD
DUNDONALD DR
DES SOLDATS
RIENDEAU ST
FAMEFLOWER ST
KILBIRNIE DR
BRENKSTONE RD
LAURALEAF CR.
KNOCKADERRY CR.
NEW GREENBANK RD
STREET 1
STREET 2
STREET 3
STREET 4
STREET 5
STREET 6
JAMES PADWIN AVE
EAST WEST COLLECTOR
BARNSDALE RD
SCHOOL
PARK
COMMERCIAL
DRUMMOND AGGREGATE EXTRACTION AREA
BRAZEAU AGGREGATE EXTRACTION AREA
FRENCH PUBLIC ELEMENTARY SCHOOL
FRENCH CATHOLIC ELEMENTARY SCHOOL
NEIGHBOURHOOD PARK
PARK & RIDE
MEDIUM DENSITY
PARKETTE 1
PARKETTE 2
DRUMMOND SWM POND
BRAZEAU SWM POND
DRY SWM POND
SWM DRY POND
POND 1 (NORTH)
POND 2 (SOUTH)
710 HDS
825 HDS
EX GREENBANK RD

LEGEND

- PROPOSED STORM (EES SYSTEM), PER 2018 BSUEA MSS
- PROPOSED STORM (CONVENTIONAL), PER 2018 BSUEA MSS
- FUTURE STORM, PER 2014 BS MSS
- EXISTING STORM
- DRAINAGE BOUNDARY
- LIMIT OF STUDY AREA FOR BSUEA
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- AREA IN HECTARES*
- RUNOFF COEFFICIENT*
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

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NOTE:

ROADWAYS WITHIN A DRAINAGE AREA WHICH IS TRIBUTARY TO AN EES SEWER, ARE TO BE DESIGNED WITH EES SEWERS. CONVERSELY, ROADWAYS WITHIN A DRAINAGE AREA WHICH IS TRIBUTARY TO A CONVENTIONAL SEWER, ARE TO BE DESIGNED WITH CONVENTIONAL SEWERS.

ETOBICOKE EXFILTRATION SYSTEM STORM SEWERS

Maintenance Hole Number		SEWER DATA			Upstream	Downstream
		Dia	Slope	Length	Obvert	Obvert
FROM	TO	(mm)	(%)	(m)		
D-1	170	900	1.05	58.1	107.04	106.45
170	172	900	1.39	186.5	106.45	104.47
172	174	1350	0.30	184.4	104.47	103.92
174	176	1350	0.30	156.7	103.92	103.45
176	152	1350	0.30	161.4	103.45	102.96
152	154	675	0.15	264.8	102.30	101.90
177	152	675	0.15	237.4	102.00	101.88
153	154	1500	0.35	176.8	101.45	100.82
154	156	1500	0.55	311.7	100.53	98.82
705 (ex.)	163	525	0.42	41.5	100.62	100.55
163	156	750	0.15	118.5	100.65	100.47
156	158	1500	0.55	202.6	97.66	96.74
158	159	1500	0.55	105.1	96.20	95.90
158	158A	1500	0.95	40.0	98.74	97.13
159	159A	1500	3.54	43.0	95.80	97.13
D1-2	300	900	1.05	121.1	105.68	104.39
300	302	900	0.35	168.1	104.39	103.81
302	304	900	0.94	162.6	102.02	100.49
304	321	1200	0.15	63.3	100.49	100.39
321	322	1200	0.15	88.2	100.39	100.26
322	323	1200	0.15	75.4	100.26	100.15
323	324	1200	0.35	142.8	100.15	99.83
330	324	825	0.15	139.2	99.83	99.62
324	330	1500	0.15	183.8	99.62	99.38
330	332	1500	0.15	144.2	99.38	99.16
332	334	1650	0.15	131.1	99.16	98.96
334	336	1650	0.15	173.3	98.96	98.70
336	337	1650	0.15	168.8	97.58	97.33
337	P2-IN	1650	0.15	36.0	97.33	97.29
159	825HDS	1050	0.35	26.2	95.15	96.05
825HDS	822	1200	0.12	160.8	95.03	94.86
314	316	1050	0.15	170.2	101.68	101.43
316	318	1200	0.15	96.0	101.43	101.28
318	364	1200	0.55	266.2	101.28	99.82
364	362	1200	0.70	88.2	99.10	98.48
362	190	1200	0.70	117.7	97.78	96.54
381	190	600	0.87	134.4	95.83	94.93
704	190	1800	0.13	15.0	94.95	94.93
190	190A	1200	0.07	30.0	94.32	94.30
190A	190B	1200	0.09	52.7	94.30	94.25
190B	755	600	0.13	15.3	93.84	93.82
110	111	450	2.70	89.4	102.99	100.49
111	112	675	0.80	101.2	100.49	99.68
313	112	525	0.74	140.0	100.60	99.56
112	710	675	1.30	73.3	99.56	98.61
112	710	675	1.30	73.3	99.56	98.61
712	711	375	2.56	104.3	132.031	99.361
711	710	450	1.32	104.4	99.407	98.027
710	720	750	0.61	119.2	98.102	97.397
753	754	1800	0.11	54.9	95.008	94.945
754	755	1800	0.13	76.9	94.839	94.839
755	822	1800	0.13	79.5	94.84	94.74
EX.822	EX.821	1800	0.14	123.1	94.07	93.90
EX.821	EX.820	1800	0.15	121.9	93.90	93.71
EX.748	EX.747	600	0.20	83.1	95.95	95.79
EX.747	EX.746	600	0.99	12.1	95.72	95.60
EX.746	EX.744	600	0.20	60.4	95.56	95.44
EX.743	EX.744	450	1.31	81.4	95.50	94.52
EX.744	EX.820	675	0.52	12.4	93.76	93.70
EX.820	EX.102	1800	0.16	121.7	93.71	93.52
270	265	1500	0.15	100.2	99.45	99.30
265	260	1500	0.15	357.3	98.00	97.47
260	245	1500	0.15	227.9	97.47	97.12
250	245	1500	0.15	345.0	97.54	97.12
245	240	2100	0.16	84.9	97.12	97.00
240	Brazeau SWM Pond	2100	0.15	241.7	97.00	96.63
Brazeau SWM Pond	235	675	0.17	37.0	95.10	95.12
230	225	1500	0.15	450.0	97.00	96.99
225	215	1500	0.15	230.1	96.96	96.66
225	215	1500	0.15	408.7	97.27	96.66
215	Drummond SWM Pond	2100	0.15	350.0	96.66	96.13
Drummond SWM Pond	210	675	0.15	25.0	94.89	94.65
235	210	675	0.17	272.0	95.12	94.65
210	205	825	0.17	222.0	94.65	94.25
205	Flood Plain	825	0.17	817.0	94.26	92.84
900	227 (ex.)	975	0.15	120.0	97.93	97.75

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
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SCALE: 1:4000

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER, M. N. L. DALRYMPLE, PROVINCE OF ONTARIO, May 4/18

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

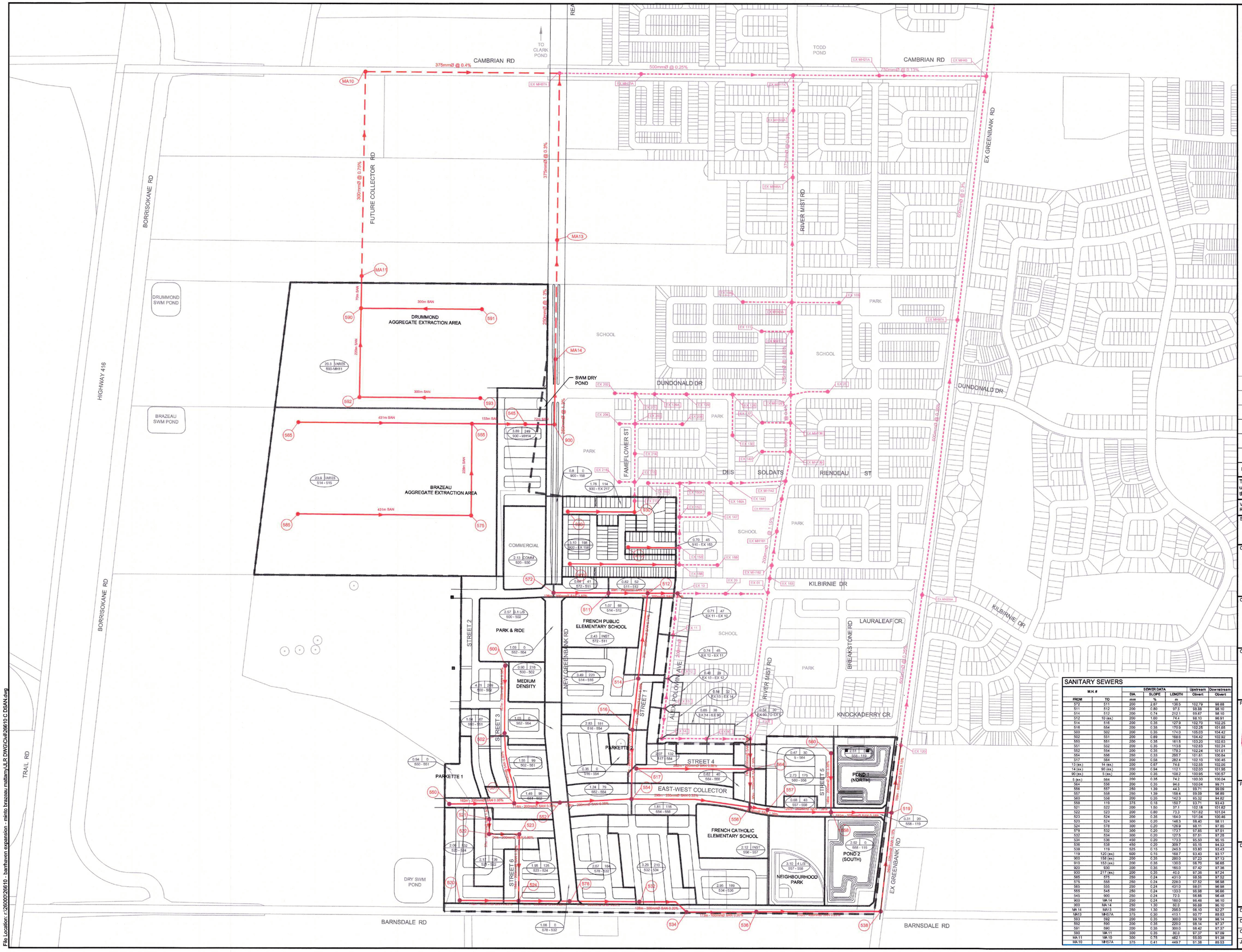
DRAWING:

MASTER STORM DRAINAGE PLAN EES

DESIGN: JW	
DRAWN: CJM	DRAWING #: MST-2
CHECKED: LD	
JLR #: 26610	

PLOT DATE: May 4, 2018 8:44:19 AM

File Location: r:\2000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C MST-2.dwg



LEGEND

- PROPOSED SANITARY, PER 2018 BSUEA MSS
- FUTURE SANITARY, PER 2014 BS MSS
- EXISTING SANITARY
- DRAINAGE BOUNDARY
- LIMIT OF STUDY AREA FOR BSUEA
- AREA IN HECTARES
- POPULATION
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

COMM	COMMERCIAL
INST	INSTITUTIONAL
VARIES	SEE DESIGN SHEET FOR CONTRIBUTING FLOWS

SANITARY SEWERS

M.H. #		SEWER DATA			Upstream	Downstream
FROM	TO	DIA.	SLOPE	LENGTH	Obvert	Obvert
		mm	%	m		
572	511	200	2.87	136.5	102.79	98.88
511	512	200	0.80	97.3	98.88	98.10
514	512	200	0.74	212.1	99.87	98.10
512	19 (ex.)	200	1.60	74.4	98.10	96.91
514	516	200	0.35	127.9	102.70	102.25
516	554	200	0.35	170.9	102.25	101.65
500	502	200	0.35	174.0	105.03	104.42
502	551	200	0.89	168.6	104.42	102.92
550	551	200	0.35	161.5	103.20	102.63
551	552	200	0.35	113.8	102.63	102.24
552	554	200	0.35	178.3	102.24	101.61
554	556	250	0.33	285.7	101.61	100.64
517	564	200	0.58	282.4	102.10	100.45
13 (ex.)	14 (ex.)	200	0.87	74.8	102.55	102.05
14 (ex.)	90 (ex.)	200	0.94	112.1	102.00	101.95
90 (ex.)	5 (ex.)	200	0.35	108.2	100.95	100.57
5 (ex.)	564	200	0.35	74.2	100.30	100.04
564	556	200	0.35	94.8	100.04	99.71
556	557	250	1.39	44.3	99.71	99.09
557	558	250	1.39	158.4	99.09	96.89
560	558	200	0.20	142.3	95.32	94.82
558	119	375	0.18	150.7	93.71	93.43
521	522	200	1.50	37.1	102.18	101.62
522	523	200	0.80	73.3	101.62	101.04
523	524	200	0.35	164.0	101.04	100.46
520	524	200	0.20	148.3	98.40	98.11
524	578	300	0.20	126.9	98.11	97.85
578	532	300	0.20	173.7	97.85	97.51
532	534	300	0.20	127.5	97.51	97.28
534	536	450	0.20	173.3	95.50	95.15
536	538	450	0.20	309.7	95.15	94.33
538	119	525	0.15	245.3	93.80	93.43
119	120 (ex.)	600	0.15	169.7	93.43	93.17
900	158 (ex)	200	0.35	280.0	97.23	97.13
910	153 (ex.)	200	0.35	130.0	98.70	98.65
920	930	200	0.35	165.0	97.42	97.36
930	217 (ex.)	200	0.35	40.0	97.30	97.24
585	575	250	0.24	431.0	98.50	97.52
575	555	250	0.24	228.0	97.52	96.98
565	555	250	0.24	431.0	98.01	96.98
555	545	250	0.24	133.0	96.98	96.66
545	900	250	0.24	72.3	96.66	96.48
900	MA14	250	0.24	160.0	96.48	96.10
900	MA14	250	1.30	60.0	99.88	99.10
MA14	MA13	250	1.30	255.0	99.10	92.27
MA13	MH07A	375	0.30	413.1	90.77	88.53
593	592	200	0.35	300.0	99.18	98.14
592	590	200	0.35	220.0	98.14	97.37
591	590	200	0.35	300.0	98.42	97.37
590	MA11	200	0.35	80.0	97.37	97.09
MA11	MA10	300	0.75	482.1	95.00	91.38
MA10	MH07A	375	0.41	449.7	91.38	89.53

No.	ISSUE / REVISION	DD/MM/YY
4	ISSUED FOR PLANNING COMMITTEE APPROVAL	04/05/18
3	ADDRESS COMMENTS, RE-ISSUE BSUEA MSS 2ND SUBMISSION	26/02/18
2	ISSUED AS PART OF DRAFT MSS	20/09/17
1	ISSUED FOR PRE-TAC WORKING MEETING	31/08/17

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SCALE: 1:4000

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J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER — M. N. L. DALRYMPLE — May 4, 13 — PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

MASTER SANITARY DRAINAGE AREA

DESIGN:	JW
DRAWN:	CJM
CHECKED:	LD
JLR #:	26610

DRAWING #: MSAN

PLOT DATE: May 3, 2018 4:34:47 PM

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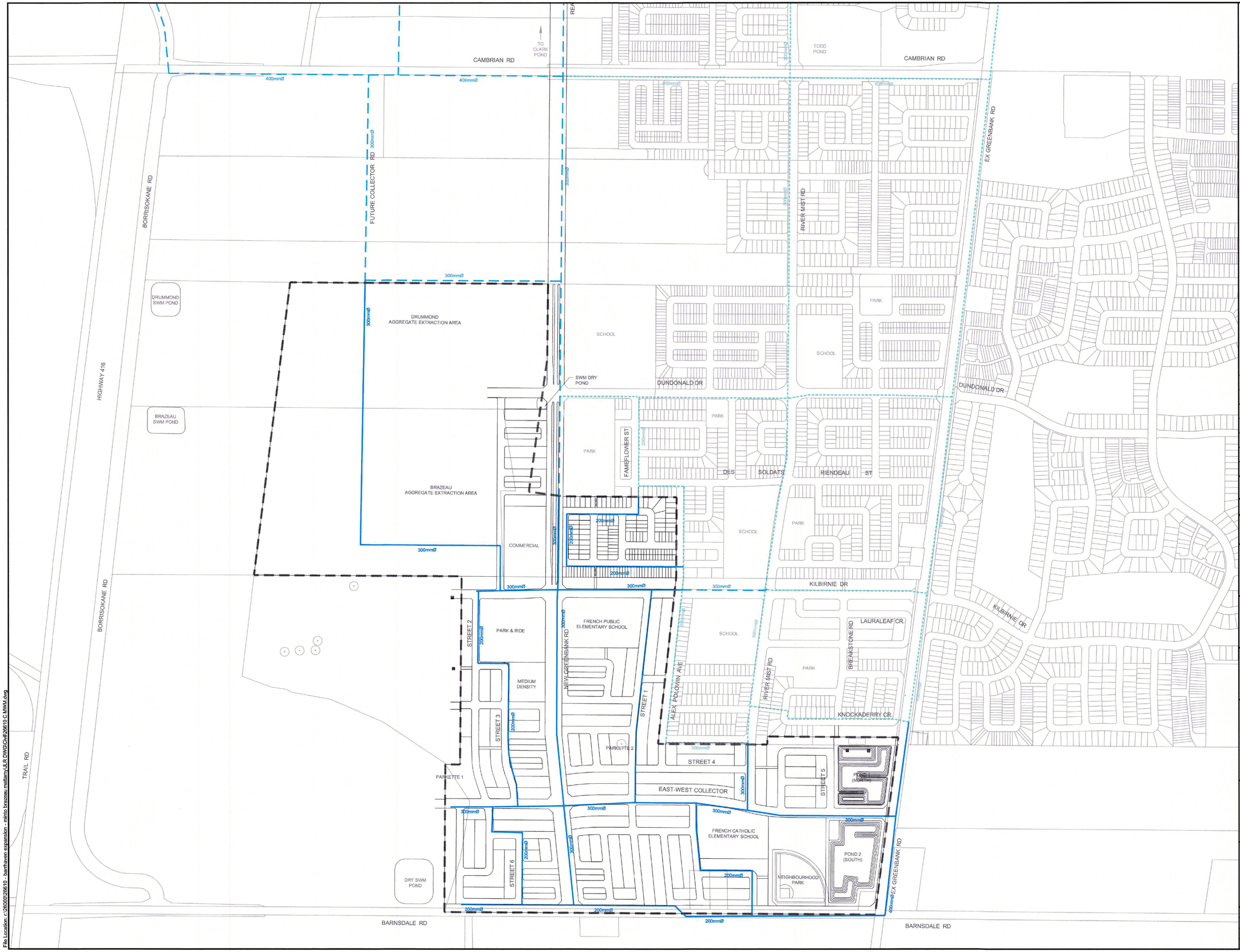

No.	ISSUE / REVISION	DD/MM/YY
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SCALE: 1:4000

CLIENT:

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENCED PROFESSIONAL ENGINEER, W. N. L. DALRYMPLE, May 4/18, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH URBAN EXPANSION AREA (BSUEA)

-

DRAWING:

MASTER WATERMAIN

DESIGN: JW	
DRAWN: CJM	DRAWING #: MWM
CHECKED: LD	
JLR #: 26610	

PLOT DATE: May 4, 2018 8:43:40 AM

File Location: r:\26000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C MWM.dwg

NOTES:

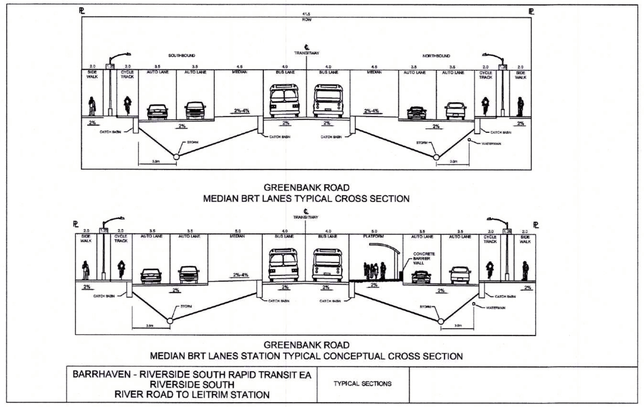
1. THE STANDARDS INDICATE MINIMUM DIMENSIONS THAT ARE TO BE INCORPORATED INTO THE DESIGN OF ANY NEW DEVELOPMENTS INVOLVING NEW AND EXISTING STREETS. ANY VARIATION TO THIS DESIGN WILL REQUIRE APPROVAL OF THE CITY OF OTTAWA.
2. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH APPLICABLE CITY STANDARDS.
3. ALL COMPOSITE UTILITY PLANS MUST ADHERE TO THE CITY OF OTTAWA'S STANDARD LOCATION OF UTILITY PLANT DRAWINGS IN ORDER TO RECEIVE APPROVAL THROUCH THE SITE PLAN CONTROL AND SUBDIVISION APPROVALS PROCESS.
4. TYPICAL CROSS SECTION BOULEVARD WIDTH SHALL BE MAINTAINED WHEN CONSTRUCTING CUL-DE-SACS AND CORNER LOTS REGARDLESS OF ROAD WAY GEOMETRY.
5. WATERMAIN AND HYDRANTS TO BE INSTALLED ON SOUTH AND EAST SIDE OF R.O.W. WHEN POSSIBLE.
6. SANITARY AND STORM SEWERS MAY BE INSTALLED OFF THE STREET CENTERLINE TO ACCOMMODATE LARGE SIZE SEWER PIPES AND STILL MAINTAIN THE CLEARANCES REQUIRED TO WATERMAINS.
7. THE USE IN-ROAD CATCH BASINS INSTEAD OF CURB INLET CATCH BASINS SHALL BE APPROVED BY AN AUTHORIZED CITY REPRESENTATIVE.
8. THE USE OF BARRIER CURB AND MOUNTABLE CURB SHALL BE APPROVED BY AN AUTHORIZED CITY REPRESENTATIVE. MOUNTABLE CURB SHALL BE SPECIFIED FOR TYPICAL TOWNHOUSE DEVELOPMENTS.
9. BUILDING SEWERS AND WATER SERVICES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS.
10. SANITARY AND STORM SERVICE CONNECTIONS WILL BE EXTENDED A MINIMUM OF 2.0m BEYOND THE PROPERTY LINE TO ALLOW FOR FUTURE CONNECTION. WATER SERVICE PIPE MATERIAL SHALL BE LAID IN ONE CONTINUOUS PIPE LENGTH (i.e. SPLICING AND JOINTING SHALL NOT BE PERMITTED) FROM INSIDE FACE OF THE BUILDING TO THE CURBSTOP AND FROM THE CURBSTOP TO THE MAIN / CORPORATION STOP.
11. 1.5m CLEARANCE TO BE MAINTAINED AROUND WATER SERVICE POST.
12. REFER TO UCC PROCEDURE MANUAL FOR UTILITY SPECIFICATION CONCERNING PLANT INSTALLATIONS.
13. TRANSFORMERS AND PEDESTALS SHALL BE LOCATED BETWEEN TOWNHOUSE BUILDING BLOCKS RATHER THAN ENCUMBERING AND/ OR PREVENTING THE INSTALLATION OF ROAD ALLOWANCE TREES.
14. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON HOUSE SIDE OF TRENCH.
15. THE BASE OF A HYDRO TRANSFORMER MUST BE LOCATED A MINIMUM OF 2.0m FROM THE EDGE OF A DRIVEWAY.
16. REQUIREMENTS FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO OR HYDRO ONE ON A CASE BY CASE BASIS.
17. SERVICE LATERALS MUST BE LOCATED A MINIMUM OF 3.0m FROM THE BASE OF A HYDRO TRANSFORMER.
18. STREET LIGHT CABLE SHALL BE PLACED IN JOINT USE TRENCH. STREET LIGHT CABLE SHALL BE AT SAME OFFSET AS STREET LIGHTS WHEN JOINT USE TRENCH NOT CONSTRUCTED.
19. TRAFFIC DUCT ALTERNATIVE PLACEMENT LOCATIONS ARE:
    1) JOINT USE TRENCH (JUT) LOCATION OR
    2) SAME OFFSET AS STREETLIGHT POLES IN A SEPARATE TRENCH.
20. OPTIONAL LOCATION FOR THE TRAFFIC COMMUNICATIONS DUCT IS A TRENCH LOCATED AT THE SAME OFFSET AS THE STREETLIGHT POLES.
21. TRAFFIC ELECTRICAL DUCTS SHALL BE PLACED IN JOINT USE DUCT BANKS.
22. TRAFFIC HANDHOLES MAY BE LOCATED IN THE BOULEVARD AREA ADJACENT TO THE SIDEWALK.
23. USE OF THE FOUR PARTY-UTILITY TRENCH WILL BE CONSIDERED AS AN OPTION, BUT REQUIRES THE AGREEMENT OF ALL UTILITIES PRIOR TO THE DEVELOPMENT OF THE COMPOSITE UTILITY PLAN, AND MUST BE IN CONFORMANCE WITH THE GUIDELINES ESTABLISHED BY THE OTTAWA UTILITY COORDINATING COMMITTEE.
24. THE DEVELOPER SHALL SUPPLY AND INSTALL DUCTS FOR UTILITY CROSSINGS AT INTERSECTIONS.
25. ONE TREE PER LOT TYPICAL 2 TREES ON CORNER LOT WITH ONE OF THE TREES ON THE STREET SIDE OF THE LOT

    SPECIFIC TREE SPECIES SHALL BE SELECTED FOR SOIL TYPES AND AVAILABLE SPACES FOR PLANTINGS.

    TREE PLACEMENT LOCATION AND TREE SPECIES WILL REQUIRE THE APPROVAL OF THE CITY.

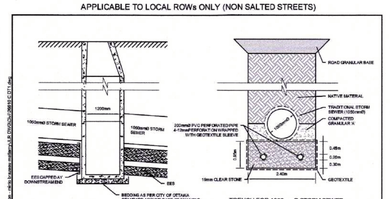
    TREE PLANTING SHALL BE HAND EXCAVATED FOR THOSE LOCATIONS WITH LESS THAN 1 METRE CLEARANCE TO THE JUT.

Ottawa	STANDARD NOTES ROAD ALLOWANCE	DATE: –
		REV. DATE: MARCH 2009
		DWG. No.: ROW–NOTES



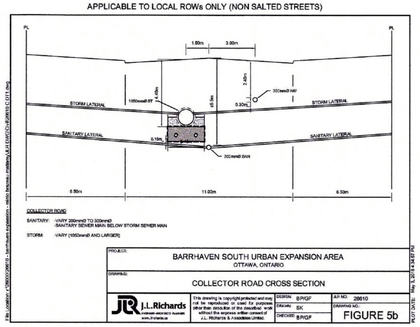
BARRHAVEN - RIVERSIDE SOUTH RAPID TRANSIT EA RIVERSIDE SOUTH RIVER ROAD TO LEITRIM STATION	TYPICAL SECTIONS	

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)



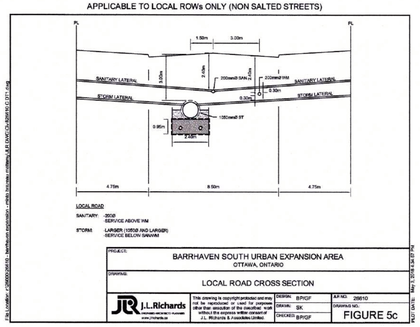
BARRHAVEN SOUTH URBAN EXPANSION AREA OTTAWA, ONTARIO		
STORM TRENCH DETAILS		
J.L.Richards	DESIGN: BPIGP DRAWN: SK CHECKED: BPIGP	JLR NO.: 26610 DRAWING NO.: FIGURE 5a

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)



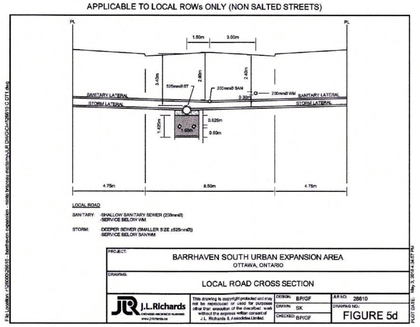
BARRHAVEN SOUTH URBAN EXPANSION AREA OTTAWA, ONTARIO		
COLLECTOR ROAD CROSS SECTION		
J.L.Richards	DESIGN: BPIGP DRAWN: SK CHECKED: BPIGP	JLR NO.: 26610 DRAWING NO.: FIGURE 5b

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)

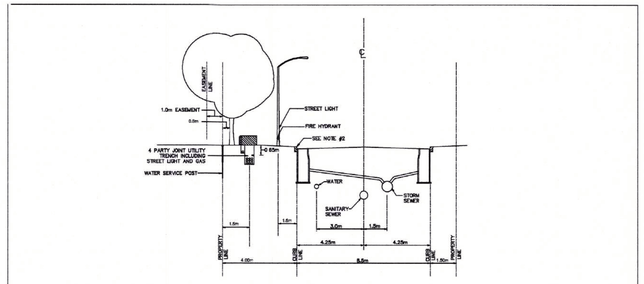


BARRHAVEN SOUTH URBAN EXPANSION AREA OTTAWA, ONTARIO		
LOCAL ROAD CROSS SECTION		
J.L.Richards	DESIGN: BPIGP DRAWN: SK CHECKED: BPIGP	JLR NO.: 26610 DRAWING NO.: FIGURE 5c

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)

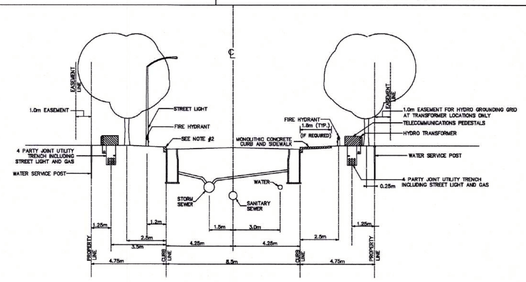


BARRHAVEN SOUTH URBAN EXPANSION AREA OTTAWA, ONTARIO		
LOCAL ROAD CROSS SECTION		
J.L.Richards	DESIGN: BPIGP DRAWN: SK CHECKED: BPIGP	JLR NO.: 26610 DRAWING NO.: FIGURE 5d



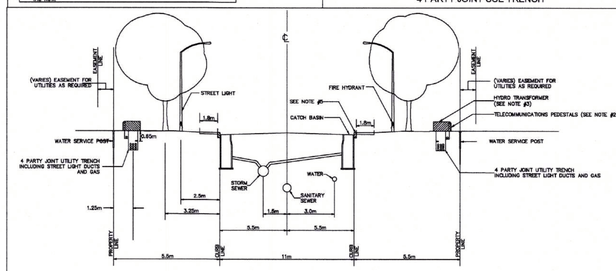
NOTES:
1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (SDN/ROW–NOTES)
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN.

RESIDENTIAL ROAD
14.0m ROAD ALLOWANCE
4 PARTY JOINT USE TRENCH



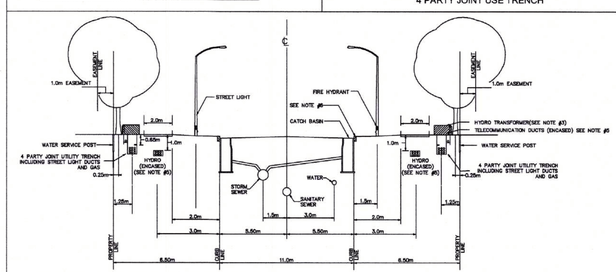
NOTES:
1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (SDN/ROW–NOTES)
2. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON SIDE OF TRENCH AWAY FROM ROAD.
3. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON CASE BY CATCH BASIN.
4. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
5. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN REFERENCE.

RESIDENTIAL ROAD
18.0m ROAD ALLOWANCE
4 PARTY JOINT USE TRENCH



NOTES:
1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (SDN/ROW–NOTES).
2. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON SIDE OF TRENCH AWAY FROM ROAD.
3. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON CASE BY CATCH BASIN.
4. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
5. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN REFERENCE.

RESIDENTIAL ROAD
22.0m ROAD ALLOWANCE
SIDEWALK OPTIONS
4 PARTY JOINT USE TRENCH



NOTES:
1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (SDN/ROW–NOTES).
2. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON SIDE OF TRENCH AWAY FROM ROAD.
3. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON CASE BY CATCH BASIN.
4. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
5. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
6. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN REFERENCE.

RESIDENTIAL ROAD
24.0m ROAD ALLOWANCE
SIDEWALK OPTIONS
4 PARTY JOINT USE TRENCH

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CLIENT:

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CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER K. K. L. DALRYMPLE PROVINCE OF ONTARIO May 4/18

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
URBAN EXPANSION AREA
(BSUEA)

-

DRAWING:

DETAILS

DESIGN: JW	
DRAWN: CJM	DRAWING #:
CHECKED: LD	DT1
JLR #: 26610	

PLOT DATE: May 7, 2018 4:34:57 PM

File Location: r:\26000\26610 - barrhaven expansion - minto brazeau mattamy\JLR DWG\Civil\26610 C DT1.dwg

Appendix N

Data Disc

CANADA'S BEST MANAGED COMPANIES

www.jlrichards.ca

Ottawa

864 Lady Ellen Place
Ottawa ON Canada
K1Z 5M2
Tel: 613 728-3571

ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424

kingston@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174

sudbury@jlrichards.ca

Timmins

201-150 Algonquin Blvd. East
Timmins ON Canada
P4N 1A7
Tel: 705 360-1899
timmins@jlrichards.ca

North Bay

200-175 Progress Road
North Bay ON Canada
P1A 0B8
Tel: 705 495-7597

northbay@jlrichards.ca

Hawkesbury

326 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287

hawkesbury@jlrichards.ca

Guelph

107-450 Speedvale Ave.
West Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713

guelph@jlrichards.ca

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Appendix D

Concept Plan (V54)

Title:

Concept 54 - Rev 13

Project:

S-1 - Barrhaven Urban Expansion

Legend

- Site Boundary
- Singles
- Executive Towns
- Avenue Towns (Back to Backs)
- Rear Lane Towns
- Condos
- SWM Pond
- Parkland
- Open Space
- Industrial
- Woodlot
- Potential Future Conveyance

minto

Drawn By: E.H
Checked By: C.T

Minto Communities Inc
180 Kent Street,
Ottawa, ON
K1P 0B6

North

Scale: **NTS**

Appendix E

Paterson Memorandum and

Bathymetric Survey

PATERSON GROUP

memorandum

re: **Geotechnical Recommendations – Infilling Existing Stormwater Management Pond**
Proposed Residential Development – Barrhaven South Expansion
3882 Barnsdale Road, Ottawa

to: Minto Communities - Mr. Curtiss Scarlett - CScarlett@minto.com

date: September 11, 2024

file: PG6197-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) has prepared the current memo report to provide our backfilling recommendations for the existing stormwater management pond within the proposed residential development located at the subject site. The following memo should be read in conjunction with Paterson Group report PG6197-1 Revision 1 dated March 25, 2024.

1.0 Background Information

Based on the existing soils information within the stormwater management pond and surrounding area, the subsurface profile consists of compact to dense, brown silty sand extending to approximately 2.4 m below the original ground surface, followed by dense to very dense, grey silty sand to sandy silt. The subsoil profile encountered at nearby test holes are detailed in the Soil Profile and Test Data sheets attached.

The following plan was reviewed as part of our study:

- ❑ C1 C2 Functional Servicing and Grading – Final Option 1 – Barrhaven South Serviceability Study – Project No. 26610-100, undated, prepared by J. L. Richards.

Stormwater Management Pond Details

The existing pond is located within the southwest portion of the subject site and is bordered by the proposed Block 52 to the east, the retained woodlots to the north, and Borrisokane Road to the west and south. The location of the pond is presented in Drawing PG6197-1 – Test Hole Location Plan attached to the current memorandum. Based on a previous bathymetry survey completed by Paterson Group, it is understood that the pond sidewalls slope between a 4.5H:1V to 35H:1V slope from a geodetic elevation of 99.0 m at the top of the side walls to a minimum geodetic elevation of 95.5 m at the bottom of the pond.

Proposed Grading

Based on our review of the aforementioned drawing and correspondence with the client, it is understood that the pond will be infilled to a maximum geodetic elevation of 103.5 m.

2.0 Recommendations

The following backfilling program is recommended for development within the pond area. Our backfilling recommendations take into consideration the subsoils profile within the pond area and the anticipated finished grading. It is recommended that the pond be drained before the backfilling procedure begins and the backfilling operation be completed under dry weather conditions (specifically for the clay placement portion of the program).

Based on correspondence with the client, the pond area may be redeveloped for either residential or recreational use. It is also anticipated that right of ways (ROWs) may be proposed. Paterson has provided recommendations for each option for redevelopment.

Stripping Depth and Site Preparations

Topsoil and deleterious fill, such as those containing significant organic materials, should be stripped from under the proposed in-fill area to be occupied by any buildings, paved areas, pipe bedding and other settlement sensitive structures. Any disturbed or oversaturated areas should be removed by the contractor and reviewed and approved by Paterson at the time of excavation.

Pond Backfilling Recommendations

- ❑ The existing SWMP side slopes should be stepped to provide a minimum 1.5H:1V profile with maximum 600 mm high steps. All existing sediment and fill associated with the pond should be removed.

- ❑ A workable, stiff brown silty clay (moisture contents varying between 20 to 40%) should be placed in maximum 300 mm loose lifts under dry conditions and in above freezing temperatures to in-fill the interim pond. Every lift should be adequately compacted using a sheepsfoot roller and approved by Paterson personnel during placement.

<u>For Residential Building Areas</u>

- ❑ A non-woven geotextile liner such as Terratrack 200 or equivalent should be placed directly above the compacted silty clay backfill material. A minimum 300 mm thick layer of suitable granular backfill such as OPSS Granular A or Granular B Type II should be placed directly below the underside of footing elevations of the proposed lots. The engineered granular fill should be placed in maximum 300 mm loose lifts under dry conditions, compacted to a minimum 98% of the material's SPMDD using suitable compaction equipment and approved by Paterson at the time of backfilling.

This may result in surface water pooling within the granular pad located below the finished floor slabs which may increase humidity. Therefore, it is recommended that a damp-proofing membrane be placed below the basement slabs to reduce the anticipated humidity.

- ❑ Where granular fill is required below only a portion of the proposed building footprint, the remainder of the building footprint should be sub-excavated at least 500 mm below underside of footing.

- ❑ The sub-excavation should extend at least 1 m beyond the building perimeter. A woven geotextile liner, such as Terratrack 200 or equivalent, should be placed across the base of the sub-excavated area. A biaxial geogrid liner, such as Terrafix Geosynthetics TBX1500 or equivalent, should be placed over the geotextile liner and extend at least 1 m beyond the building footprint. The sub-excavated area should be backfilled with granular fill, consisting of a Granular B Type II or Granular A crushed stone placed in maximum 300 mm loose lifts and compacted to 98% of its SPMDD.

- ❑ Backfill between footing level and finished grade at the exterior side of the proposed buildings and landscaping areas should consist of a workable brown silty clay fill. A non-woven geotextile liner, such as Terratrack 200 or equivalent, should be placed over the granular fill surface to prevent soil loss.

<u>For Right of Way (ROW) Areas</u>

- ❑ Up to a maximum of 1 m of engineered fill, such as OPSS Granular A or Granular B crushed stone and/or well-graded blast rock, up to 150 mm in particle size, may be used to in-fill the existing SWMP up to the spring line elevation of the proposed services. The engineered fill should be placed in maximum 300 mm loose lifts under dry conditions, compacted to a minimum 98% of the material's SPMDD using suitable compaction equipment and approved by Paterson at the time of backfilling.

- ❑ Where more than 1 m of in-filling is required, a workable brown silty clay, free of organics and deleterious fill is to be placed from the bottom of the existing pond up to approximately 1 m below the invert elevation of the proposed services. The silty clay is to be placed in maximum 400 mm thick loose lifts and compacted to a minimum 98% of the material's SPMDD using a sheepsfoot roller making several passes, under dry conditions and above freezing temperatures and approved by Paterson personnel.

- Where a transition between clay and granular fill is proposed, a non-woven geotextile liner such as Terrafix 360R or equivalent is to be placed above the silty clay subgrade. The above recommendations for placement of engineered fill and/or blast rock are applicable upon placement of the geotextile liner.

For Recreational Areas (i.e. Non-Settlement Sensitive)

- If recreational areas, where settlement is of minor concern, are proposed within the current pond area, the workable, stiff brown silty clay (placed in maximum 300 mm loose lifts, under dry conditions, compacted using a sheepsfoot roller and approved by Paterson personnel at the time of placement) can be placed to the final proposed geodetic elevation of 103.5 m.

- **It is important to note** that if the pond is infilled using the above noted recreational area methodology and the scope of the redevelopment is changed to include settlement sensitive structures, the upper 1 m may need to be modified to accommodate the new construction, requiring a sub excavation to a geodetic elevation of approximately 102.5 m.

- If settlement sensitive structures area proposed within the recreational areas (such as out buildings, parking lots or asphalt/concrete paved courts), a non-woven geotextile liner such as Terratrack 200 or equivalent followed by a bi-axial geogrid liner, such as Terrafix TBX1500 or approved equivalent, should be placed directly above the compacted silty clay backfill material. A minimum 300 mm thick layer of suitable granular backfill such as OPSS Granular A or Granular B Type II should be placed directly below the underside of the settlement sensitive structure(s). The engineered granular fill should be placed in maximum 300 mm loose lifts under dry conditions, compacted to a minimum 98% of the material's SPMDD using suitable compaction equipment and approved by Paterson at the time of backfilling. This may result in surface water pooling within the granular pad located below the structure(s) which may increase humidity. Therefore, it is recommended that a damp-proofing membrane and/or a minimum 100 mm diameter perforated, corrugated drainage pipe connected to a positive outlet be placed below the underside of the structure(s) to reduce the anticipated humidity.

- For unheated slab-on-grade structures, such as tennis courts, splash pads, etc., frost protection may be required. Therefore, once the landscaping plans are finalized, Paterson should review the final grading and provide frost protection design and details.

Inspections During Construction

- ❑ Periodic inspections during the backfilling operation should be completed by Paterson personnel to confirm the above noted recommendations are adhered to.

We trust that this information satisfies your requirements.

Best Regards,

Paterson Group Inc.

Owen R. Canton, B.Eng.

Faisal I. Abou-Seido, P.Eng.

Attachments:

- ❑ Soil Profile and Test Data Sheets
- ❑ Drawing PG6197-1 – Test Hole Location Plan

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - 3882 Barnsdale Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

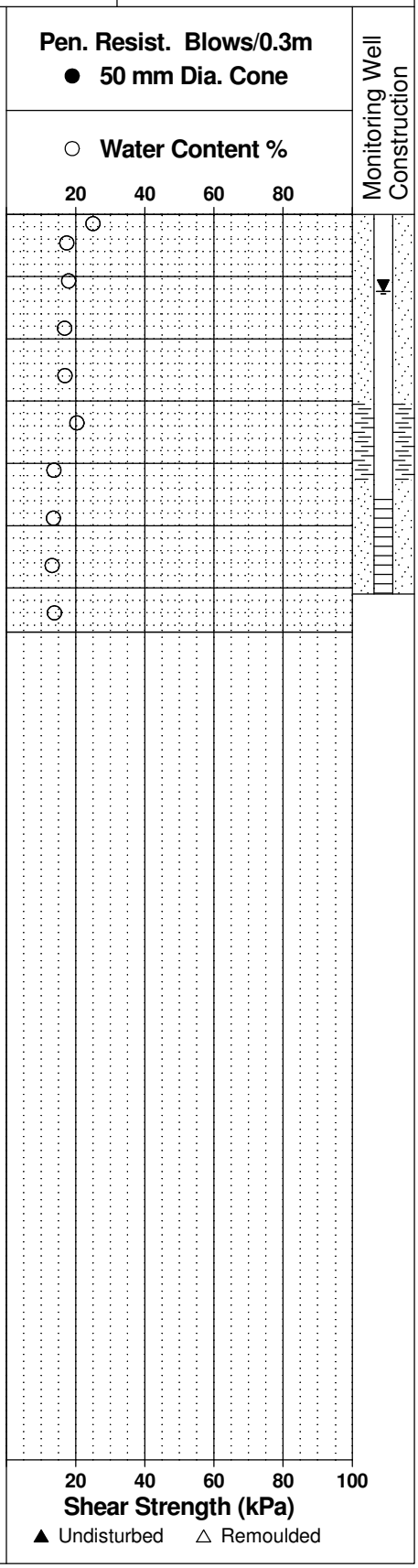
BORINGS BY Track-Mount Power Auger **DATE** April 12, 2022

FILE NO. PG6197

HOLE NO. BH 4-22

SOIL DESCRIPTION		STRATA PLOT	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							0	99.42
TOPSOIL	0.20		SS	1	83	4		
Compact, brown **SILTY SAND**	1.45		SS	2	83	26	1	98.42
Dense, brown **SILTY SAND to SANDY SILT**	2.44		SS	3	100	43	2	97.42
			SS	4	83	26		
			SS	5	100	49	3	96.42
Dense to very dense, grey **SILTY SAND to SANDY SILT**			SS	6	73	50+	4	95.42
			SS	7	100	61	5	94.42
			SS	8	91	50+		
			SS	9	80	50+	6	93.42
End of Borehole	6.71							

(GWL @ 0.16m - April 21, 2022)
(GWL @ 1.24m - October 18, 2022)



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 94-15

BORINGS BY Backhoe **DATE** November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15						0	99.90		
Loose, brown **SILTY SAND**		G	1			1	98.90		▽
- grey by 1.1m depth		G	2						
		G	3			2	97.90		
2.70 End of Test Pit									
(Open hole GWL @ 1.55m depth)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

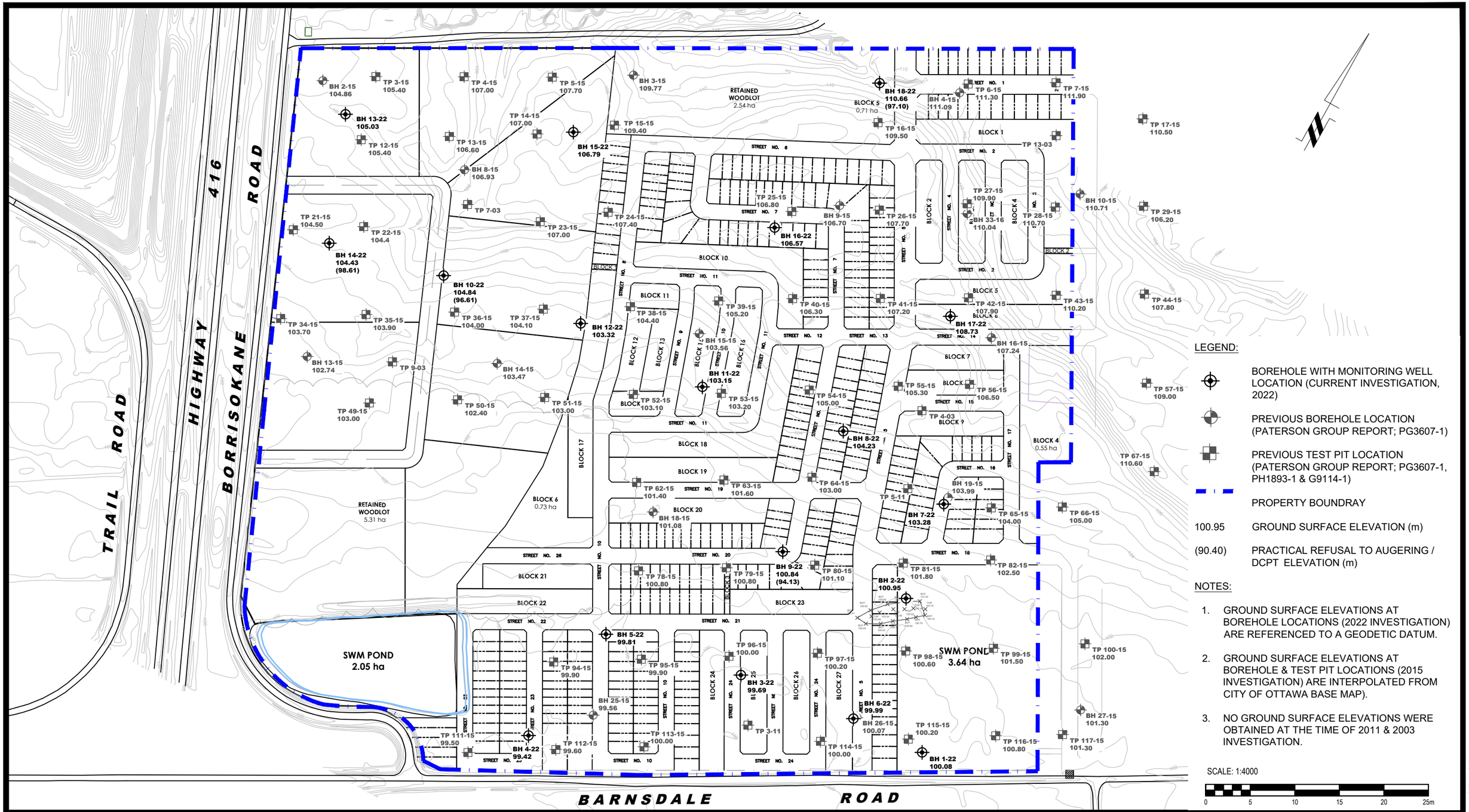
HOLE NO. TP111-15

BORINGS BY Backhoe **DATE** November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	99.50		
TOPSOIL 0.20									
		G	1						
Compact, brown **SILTY SAND**		G	2			1	98.50		▽
- grey by 1.2m depth									
		G	3			2	97.50		
2.60									
End of Test Pit									
(Open hole GWL @ 1.5m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

Shear Strength (kPa)
20 40 60 80 100
▲ Undisturbed △ Remoulded



LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION, 2022)
- PREVIOUS BOREHOLE LOCATION (PATERSON GROUP REPORT; PG3607-1)
- PREVIOUS TEST PIT LOCATION (PATERSON GROUP REPORT; PG3607-1, PH1893-1 & G9114-1)
- PROPERTY BOUNDRAY
- 100.95 GROUND SURFACE ELEVATION (m)
- (90.40) PRACTICAL REFUSAL TO AUGERING / DCPT ELEVATION (m)

NOTES:

1. GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS (2022 INVESTIGATION) ARE REFERENCED TO A GEODETIC DATUM.
2. GROUND SURFACE ELEVATIONS AT BOREHOLE & TEST PIT LOCATIONS (2015 INVESTIGATION) ARE INTERPOLATED FROM CITY OF OTTAWA BASE MAP).
3. NO GROUND SURFACE ELEVATIONS WERE OBTAINED AT THE TIME OF 2011 & 2003 INVESTIGATION.

SCALE: 1:4000

0 5 10 15 20 25m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

MINTO COMMUNITIES

GEOTECHNICAL AND HYDROLOGICAL INVESTIGATION
PROPOSED DEVELOPMENT - BARRHAVEN SOUTH EXPANSION
3882 BARNSDALE ROAD
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:4000	Date: 10/2022
Drawn by: JM	Report No.: PG6197-REP.01
Checked by: MS	Dwg. No.: PG6197-1
Approved by: DJG	Revision No.:

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11x17

HIGHWAY 416

BORRISOKANE ROAD

BARNSDALE ROAD

POND

BH 5-22
99.81

TP 94-15
99.90

BH 25-15
99.56

TP 111-15
99.50

BH 4-22
99.42

TP 112-15
99.60

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (2022)
- PREVIOUS BOREHOLE LOCATION (PATERSON GROUP REPORT; PG3607-1)
- PREVIOUS TEST PIT LOCATION (PATERSON GROUP REPORT; PG3607-1, PH1893-1 & G9114-1)
- PROPERTY BOUNDRAY
- 100.95 GROUND SURFACE ELEVATION (m)
- BATHYMETRIC CONTOUR (m)

0 5 10 15 20 25 50 75m

NOTES:

1. GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS (2022 INVESTIGATION) ARE REFERENCED TO A GEODETIC DATUM.
2. GROUND SURFACE ELEVATIONS AT BOREHOLE & TEST PIT LOCATIONS (2015 INVESTIGATION) ARE INTERPOLATED FROM CITY OF OTTAWA BASE MAP).
3. NO GROUND SURFACE ELEVATIONS WERE OBTAINED AT THE TIME OF 2011 & 2003 INVESTIGATION.

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

NO.	REVISIONS	DATE	INITIAL

MINTO COMMUNITIES

GEOTECHNICAL AND HYDROLOGICAL INVESTIGATION
PROPOSED DEVELOPMENT
3882 BARNSDALE ROAD
OTTAWA, ONTARIO

Title:

BATHYMETRIC CONTOUR PLAN

Scale: 1:1250	Date: 04/2022
Drawn by: RCG	Report No.: PG6197
Checked by: FA	Dwg. No.: PG6197-3
Approved by: DJG	Revision No.:

11x17

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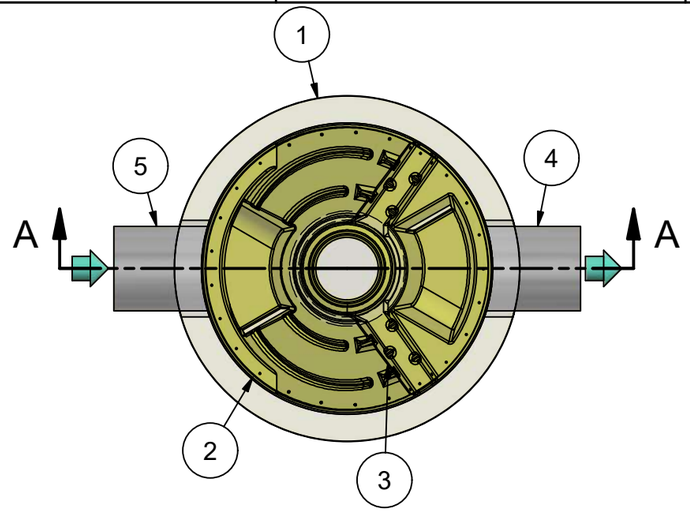
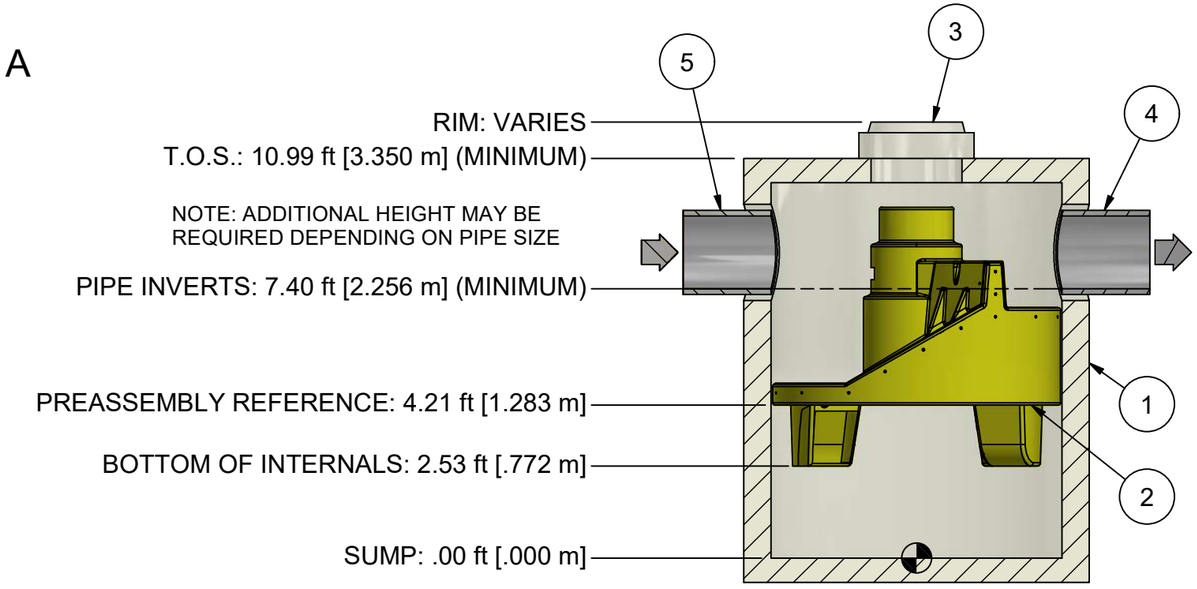
Appendix F

Alternatives 4 and 5 – Conceptual Information



PLAN VIEW



SECTION A-A

HYDRO FRAME AND COVER (INCLUDED)

GRADE RINGS BY OTHERS AS REQUIRED

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

PROJECTION

IF IN DOUBT ASK

DATE:	SCALE:
11/2/2021	1:50

DRAWN BY:	CHECKED BY:	APPROVED BY
ER	MRJ	

Title
8-ft DIAMETER
FIRST DEFENSE

GENERAL ARRANGEMENT

Hydro International®
hydro-int.com
HYDRO INTERNATIONAL

WEIGHT:	MATERIAL:

STOCK NUMBER:

DRAWING NO.:
FD GA-8

SHEET SIZE:	SHEET:	Rev:
B	1 OF 1	-

PRODUCT SPECIFICATION:

1. Peak Hydraulic Flow: 50.0 cfs (1415 l/s)
2. Min Sediment Storage Capacity: 2.8 cu. yd. (2.1 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 48 in. (1200 mm)
4. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
5. For more product information including regulatory acceptances, please visit https://hydro-int.com/en/products/first-defense

GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 48".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	96	2400	I.D. PRECAST MANHOLE
2	1			INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	750	FRAME AND COVER (ROUND)
4	1	48 (MAX)	1200 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	48 (MAX)	1200 (MAX)	INLET PIPE (BY OTHERS)

ADS Treatment Train Sizing

Project Name:	S1 Lands		
Consulting Engineer:	JL Richards		
Location:	Ottawa, ON		
Sizing Completed By:	Daniel Dermardiros	**Email:**	daniel.dermardiros@adspipe.com

Summary of Results	
Isolator Row PLUS TSS Removal:	80.0%
FD-8HC TSS Removal:	37.0%
Combined TSS Removal:	**87.0%**
Total Volume Treated:	**98.8%**

Individual OGS Results		
Model	**TSS Removal**	**Volume Treated**
FD-4HC	23.0%	89.0%
FD-5HC	28.0%	>90%
FD-6HC	32.0%	>90%
FD-8HC	37.0%	>90%
FD-10HC	40.0%	>90%

Overall System Capacities	
Total Sediment Storage Capacity (m3):	2.14
Oil Storage Capacity:	4,239 L
Max. OGS Pipe Diameter:	1,200 mm
Peak OGS Flow Capacity:	1,415 L/s
Peak Stormtech Inlet Flow Capacity:	311 L/s
Peak IR PLUS Water Quality Flow:	1139.6 L/s

OGS Specifications	
Inlet Pipe Diameter (A):	1500 mm
Unit Diameter (B):	2,400 mm
Outlet Pipe Diameter (C):	1500 mm
Rim Elevation (D):	0.00 m
Bottom of Sump Elevation (E):	#N/A
Inlet Pipe Elevation (F):	0.00 m
Outlet Pipe Elevation (G):	0.00 m

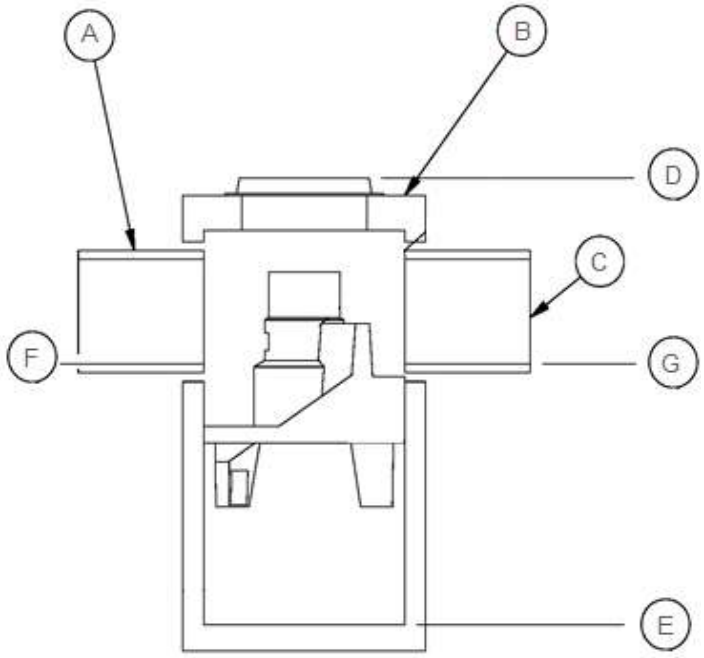
Site Details	
Site Area (ha):	20.585
Rational C:	0.7
Particle Size Distribution:	ETV
Rainfall Station:	Ottawa, ONT

Notes: OGS results based on ETV PSD and results from ETV testing protocols.

Stormtech Details	
Chamber Model:	MC-7200
No. Chambers in Isolator Row PLUS:	88
Volume Treated by Isolator Row PLUS:	98.5%

Notes: Refer to Stormtech drawings for full IR+ configuration.

Isolator Row PLUS must include Flared End Ramp (FLAMP) for proper performance.



Notes:

Isolator Row PLUS removal efficiency based on verified ETV test report. For dimensions and configuration of Isolator Row PLUS, please see Stormtech drawing package.

Project Name: S1 Lands
Consulting Engineer: JL Richards
Location: Ottawa, ON

Net Annual Removal Efficiency Summary

Rainfall Intensity	Fraction of Rainfall	Removal Efficiency		Combined Removal Efficiency	Combined Weighted Removal Efficiency
		FD-8HC	IR PLUS[(2)]		
mm/hr	%	%	%	%	%
0.50	0.1%	51.2%	81.2%	90.8%	0.1%
1.00	14.1%	46.2%	81.2%	89.9%	12.7%
1.50	14.2%	43.3%	81.2%	89.3%	12.7%
2.00	14.1%	41.2%	81.2%	89.0%	12.6%
2.50	4.2%	39.6%	81.2%	88.7%	3.7%
3.00	1.5%	38.3%	81.2%	88.4%	1.3%
3.50	8.5%	37.2%	81.2%	88.2%	7.5%
4.00	5.4%	36.2%	81.2%	88.0%	4.8%
4.50	1.2%	35.4%	81.2%	87.9%	1.0%
5.00	5.5%	34.6%	81.2%	87.7%	4.9%
6.00	4.3%	33.3%	81.2%	87.5%	3.8%
7.00	4.5%	32.2%	81.2%	87.3%	3.9%
8.00	3.1%	31.3%	81.2%	87.1%	2.7%
9.00	2.3%	30.4%	81.2%	86.9%	2.0%
10.00	2.6%	29.7%	81.2%	86.8%	2.2%
20.00	9.2%	24.7%	81.2%	85.8%	7.9%
30.00	2.6%	21.7%	77.5%	82.4%	2.2%
40.00	1.2%	19.7%	58.1%	66.4%	0.8%
50.00	0.5%	18.1%	46.5%	56.2%	0.3%
		Total Net Annual Removal Efficiency			**87.0%**
		Total Runoff Volume Treated			**98.8%**

Notes:

(1) Rainfall Data: 1960:2007, HLY03, Ottawa, ONT, 6105976 & 6105978.

(2) IR PLUS removal based on ETV PSD and ETV protocols.

(3)

(4) Combined removal efficiencies calculated based on NCDENR Stormwater BMP Manual, Section 3.9.4, where Total Removal Efficiency = 1st BMP Efficiency + 2nd BMP Efficiency - (1st BMP Efficiency x 2nd BMP Efficiency)

Version 1.1

Project: **S1 Lands**

Chamber Model -	MC-7200	
Units -	**Metric**	
Number of Chambers -	88	
Number of End Caps -	16	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	99.35	m
Amount of Stone Above Chambers -	305	mm
Amount of Stone Below Chambers -	229	mm

Area of System- 628.5 sq.meters Min. Area - 540.2 sq.meters

StormTech MC-7200 Cumulative Storage Volumes

Height of System (mm)	Incremental Single Chamber (cubic meters)	Incremental Single End Cap (cubic meters)	Incremental Chambers (cubic meters)	Incremental End Cap (cubic meters)	Incremental Stone (cubic meters)	Incremental Ch, EC and Stone (cubic meters)	Cumulative System (cubic	Elevation (meters)
2057	0.000	0.000	0.00	0.00	6.39	6.39	790.97	101.40
2032	0.000	0.000	0.00	0.00	6.39	6.39	784.59	101.38
2007	0.000	0.000	0.00	0.00	6.39	6.39	778.20	101.35
1981	0.000	0.000	0.00	0.00	6.39	6.39	771.82	101.33
1956	0.000	0.000	0.00	0.00	6.39	6.39	765.43	101.30
1930	0.000	0.000	0.00	0.00	6.39	6.39	759.05	101.28
1905	0.000	0.000	0.00	0.00	6.39	6.39	752.66	101.25
1880	0.000	0.000	0.00	0.00	6.39	6.39	746.27	101.23
1854	0.000	0.000	0.00	0.00	6.39	6.39	739.89	101.20
1829	0.000	0.000	0.00	0.00	6.39	6.39	733.50	101.17
1803	0.000	0.000	0.00	0.00	6.39	6.39	727.12	101.15
1778	0.000	0.000	0.00	0.00	6.39	6.39	720.73	101.12
1753	0.002	0.000	0.15	0.01	6.32	6.48	714.35	101.10
1727	0.005	0.001	0.47	0.02	6.19	6.68	707.87	101.07
1702	0.008	0.001	0.69	0.02	6.10	6.81	701.19	101.05
1676	0.010	0.002	0.89	0.03	6.02	6.94	694.38	101.02
1651	0.013	0.002	1.14	0.04	5.91	7.09	687.44	101.00
1626	0.021	0.003	1.85	0.05	5.63	7.52	680.35	100.97
1600	0.031	0.004	2.73	0.06	5.27	8.06	672.82	100.95
1575	0.037	0.005	3.29	0.07	5.04	8.40	664.76	100.92
1549	0.042	0.005	3.73	0.09	4.86	8.68	656.36	100.90
1524	0.047	0.006	4.12	0.10	4.70	8.92	647.69	100.87
1499	0.051	0.007	4.47	0.11	4.55	9.13	638.77	100.84
1473	0.054	0.008	4.78	0.12	4.42	9.33	629.63	100.82
1448	0.058	0.009	5.08	0.14	4.30	9.51	620.30	100.79
1422	0.061	0.009	5.35	0.15	4.19	9.68	610.79	100.77
1397	0.064	0.010	5.60	0.16	4.08	9.84	601.11	100.74
1372	0.066	0.011	5.84	0.17	3.98	9.99	591.26	100.72
1346	0.069	0.012	6.06	0.19	3.89	10.14	581.27	100.69
1321	0.071	0.012	6.28	0.20	3.79	10.27	571.14	100.67
1295	0.074	0.013	6.48	0.21	3.71	10.40	560.86	100.64
1270	0.076	0.014	6.67	0.22	3.63	10.52	550.46	100.62
1245	0.078	0.015	6.86	0.24	3.55	10.64	539.94	100.59
1219	0.080	0.015	7.04	0.25	3.47	10.75	529.30	100.57
1194	0.082	0.016	7.20	0.26	3.40	10.86	518.54	100.54
1168	0.084	0.017	7.37	0.27	3.33	10.97	507.68	100.51
1143	0.085	0.017	7.52	0.28	3.27	11.06	496.71	100.49
1118	0.087	0.018	7.67	0.29	3.20	11.16	485.65	100.46
1092	0.089	0.018	7.82	0.29	3.14	11.25	474.49	100.44
1067	0.090	0.019	7.95	0.31	3.08	11.34	463.24	100.41
1041	0.092	0.020	8.09	0.32	3.02	11.43	451.90	100.39
1016	0.093	0.020	8.21	0.33	2.97	11.51	440.47	100.36
991	0.095	0.021	8.34	0.34	2.92	11.59	428.96	100.34
965	0.096	0.022	8.46	0.35	2.86	11.67	417.37	100.31
940	0.097	0.022	8.57	0.36	2.82	11.74	405.70	100.29
914	0.099	0.023	8.68	0.36	2.77	11.81	393.96	100.26
889	0.100	0.023	8.78	0.37	2.72	11.88	382.15	100.24
864	0.101	0.024	8.89	0.38	2.68	11.95	370.27	100.21
838	0.102	0.024	8.98	0.39	2.64	12.01	358.33	100.18
813	0.103	0.024	9.08	0.39	2.60	12.07	346.32	100.16
787	0.104	0.025	9.17	0.40	2.56	12.13	334.25	100.13
762	0.105	0.026	9.26	0.41	2.52	12.19	322.12	100.11
737	0.106	0.026	9.34	0.42	2.48	12.24	309.94	100.08
711	0.107	0.026	9.42	0.42	2.45	12.29	297.70	100.06
686	0.108	0.027	9.50	0.43	2.41	12.34	285.41	100.03
660	0.109	0.027	9.57	0.43	2.38	12.39	273.07	100.01
635	0.110	0.027	9.64	0.44	2.35	12.44	260.68	99.98
610	0.110	0.028	9.71	0.44	2.32	12.48	248.24	99.96
584	0.111	0.027	9.78	0.44	2.30	12.52	235.76	99.93
559	0.112	0.028	9.84	0.45	2.27	12.56	223.25	99.90
533	0.112	0.029	9.90	0.46	2.24	12.60	210.69	99.88
508	0.113	0.029	9.95	0.46	2.22	12.64	198.09	99.85
483	0.114	0.029	10.01	0.47	2.20	12.67	185.45	99.83
457	0.114	0.029	10.06	0.47	2.17	12.70	172.78	99.80
432	0.115	0.030	10.11	0.47	2.15	12.73	160.08	99.78
406	0.115	0.030	10.15	0.48	2.13	12.76	147.35	99.75
381	0.116	0.030	10.19	0.48	2.12	12.79	134.58	99.73
356	0.116	0.030	10.23	0.48	2.10	12.81	121.80	99.70
330	0.117	0.030	10.27	0.49	2.08	12.84	108.98	99.68
305	0.117	0.031	10.31	0.49	2.07	12.86	96.14	99.65
279	0.118	0.031	10.34	0.49	2.05	12.89	83.28	99.63
254	0.118	0.031	10.39	0.50	2.03	12.92	70.39	99.60
229	0.000	0.000	0.00	0.00	6.39	6.39	57.47	99.57
203	0.000	0.000	0.00	0.00	6.39	6.39	51.08	99.55
178	0.000	0.000	0.00	0.00	6.39	6.39	44.70	99.52
152	0.000	0.000	0.00	0.00	6.39	6.39	38.31	99.50
127	0.000	0.000	0.00	0.00	6.39	6.39	31.93	99.47
102	0.000	0.000	0.00	0.00	6.39	6.39	25.54	99.45
76	0.000	0.000	0.00	0.00	6.39	6.39	19.16	99.42
51	0.000	0.000	0.00	0.00	6.39	6.39	12.77	99.40
25	0.000	0.000	0.00	0.00	6.39	6.39	6.39	99.37

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	STEVE BUCKLEY 519-465-9958 STEVE.BUCKLEY@ADSPIPE.COM
ADS SALES REP:	BRAD DUNLOP 613-893-7336 BRAD.DUNLOP@ADSPIPE.COM
PROJECT NO:	S509412
ONTARIO SITE COORDINATOR:	RYAN RUBENSTEIN 519-710-3687 RYAN.RUBENSTEIN@ADSPIPE.COM

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
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S1 LANDS

OTTAWA, ON

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL NOTE 6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

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IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH INSTALLATION GUIDE MC-7200 CHAMBER".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 230 mm (9") SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH INSTALLATION GUIDE MC-7200 CHAMBER".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH INSTALLATION GUIDE MC-7200 CHAMBER".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH INSTALLATION GUIDE MC-7200 CHAMBER".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

88	STORMTECH MC-7200 CHAMBERS
16	STORMTECH MC-7200 END CAPS
305	STONE ABOVE (mm)
229	STONE BELOW (mm)
40	% STONE VOID
791.1	**INSTALLED SYSTEM VOLUME (m³) (PERIMETER STONE INCLUDED)**
628.5	SYSTEM AREA (m²)
100.8	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS

102.904	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
101.532	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
101.380	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
101.380	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
101.380	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
101.075	TOP OF STONE
100.770	TOP OF MC-7200 CHAMBER
99.303	600 mm ISOLATOR ROW PLUS CONNECTION INVERT
99.303	600 mm BOTTOM MANIFOLD/CONNECTION INVERT
99.246	BOTTOM OF MC-7200 CHAMBER
99.017	UNDERDRAIN INVERT
99.017	BOTTOM OF STONE

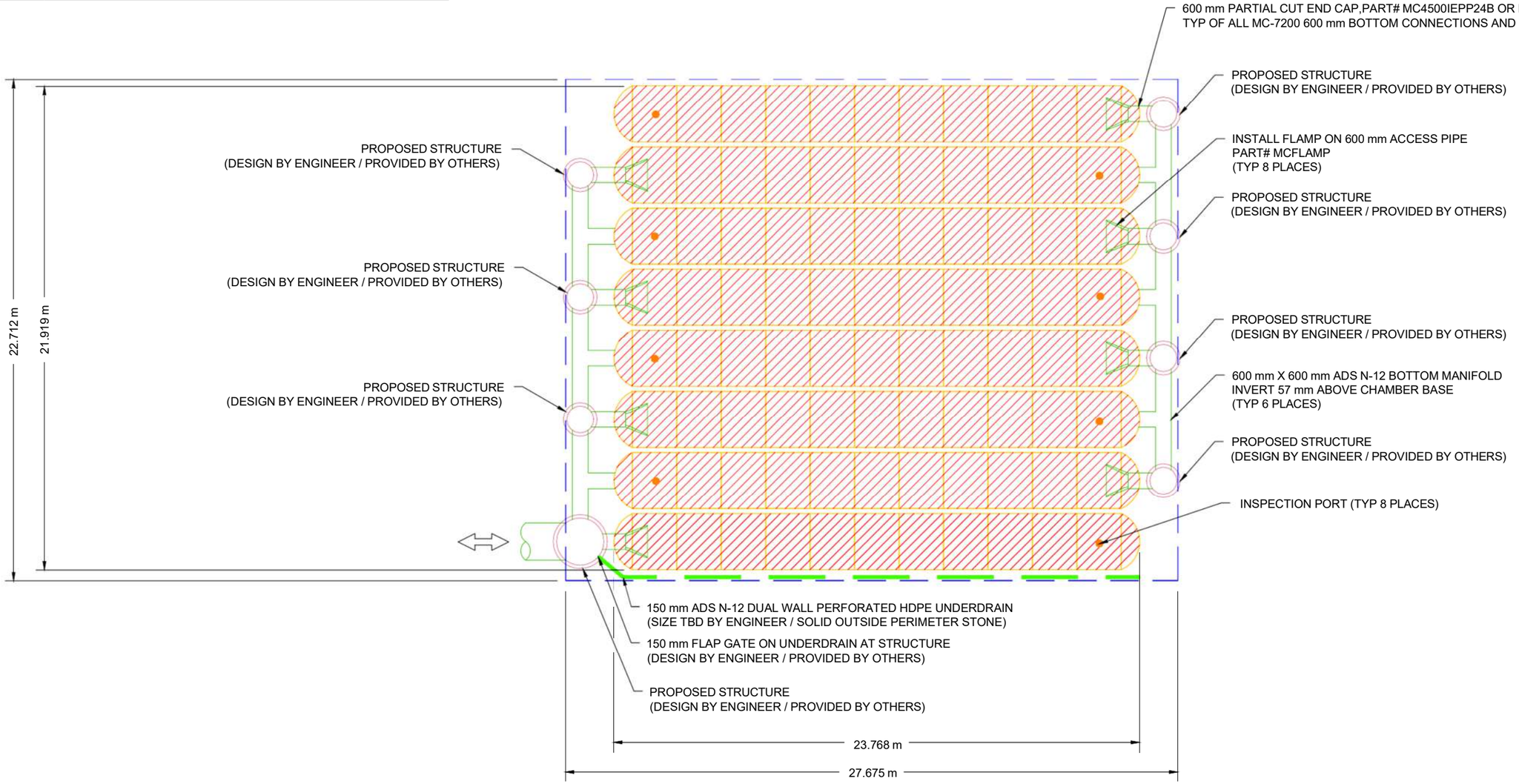
NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 5.33 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS



S1 LANDS
OTTAWA, ON

DATE: 26/02/09 | DRAWN: MAH
PROJECT #: S509412 | CHECKED: RWD

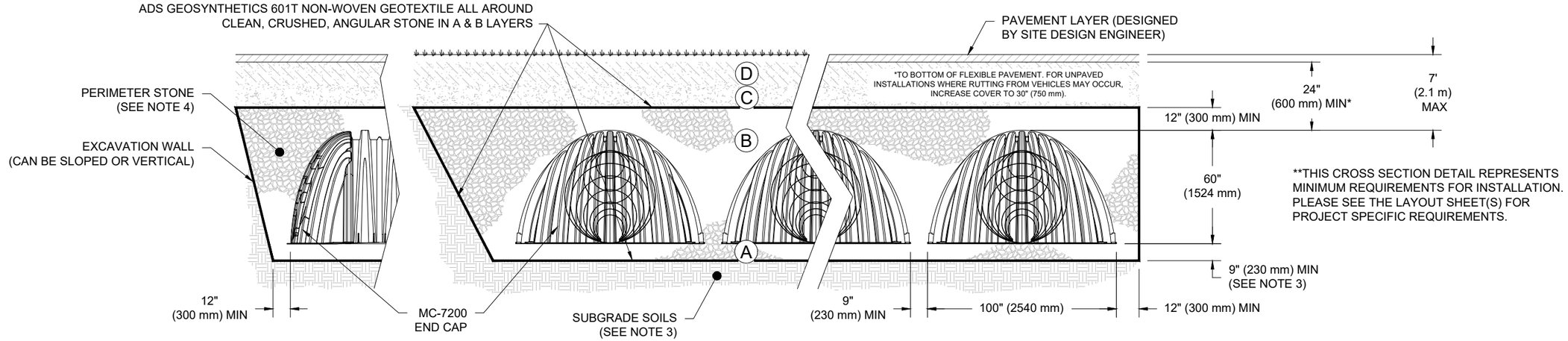
DATE	DWN	CHK

THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S REVIEW OF OTHER PROJECT REPRESENTATIVE.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3" (75 mm).
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

S1 LANDS
OTTAWA, ON
DATE: 26/02/09 | DRAWN: MAH
PROJECT #: S509412 | CHECKED: RWD

DATE	DWN	CHK

StormTech® Chamber System

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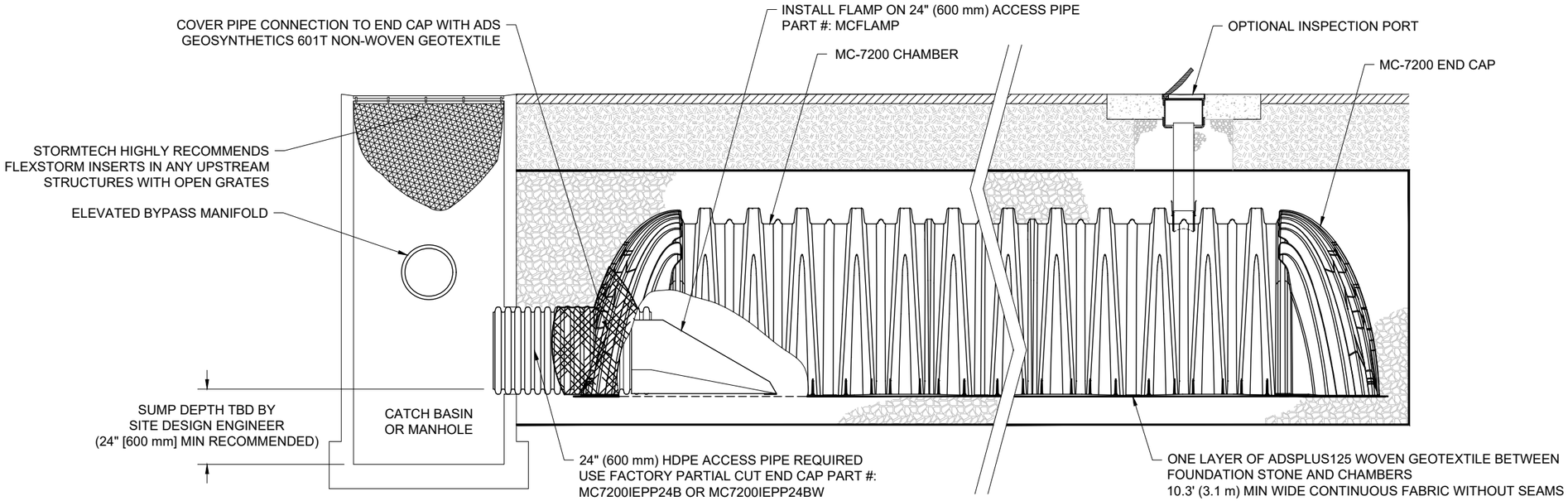


MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

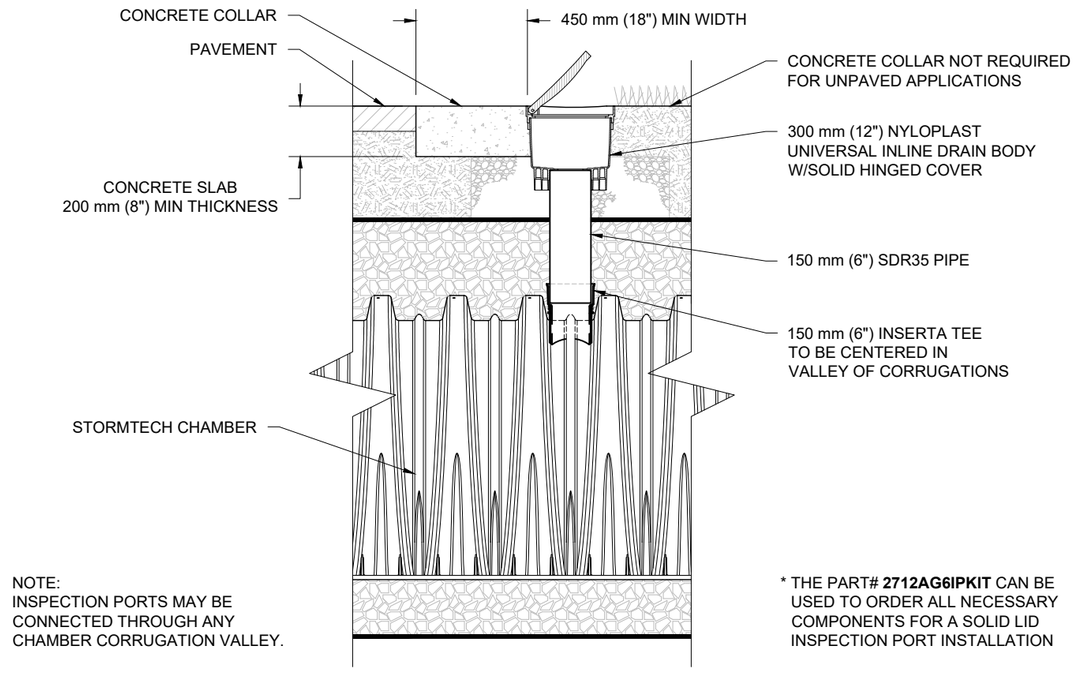
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



150 mm (6") PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)
NTS

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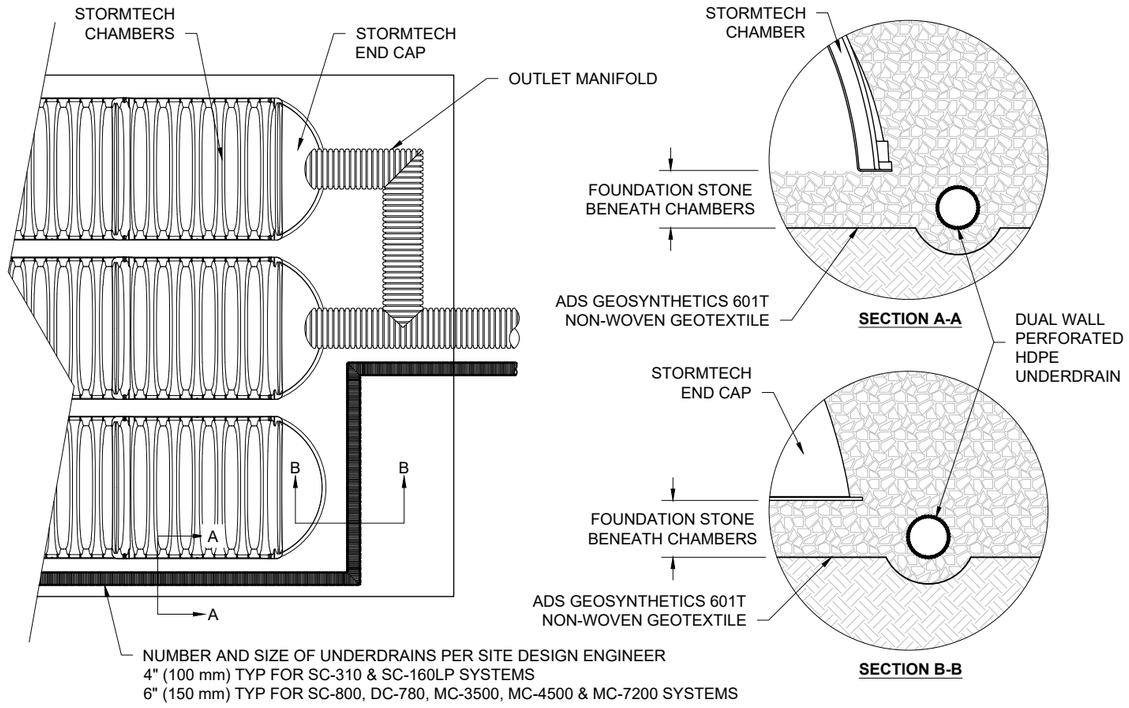
UNDERDRAIN DETAIL

NTS



MC-SERIES END CAP INSERTION DETAIL

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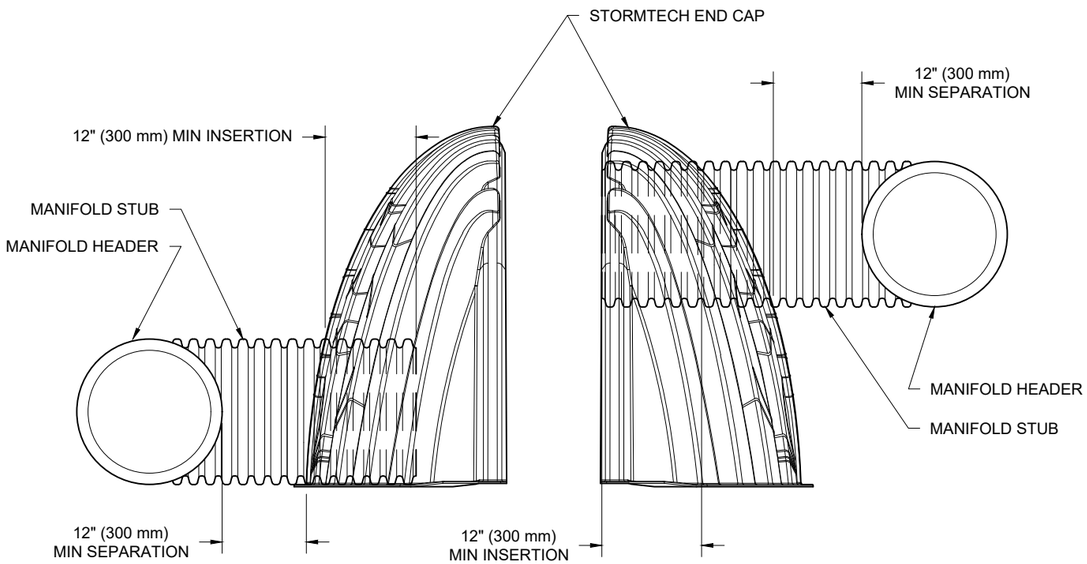
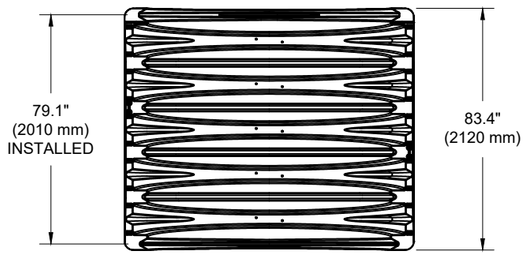
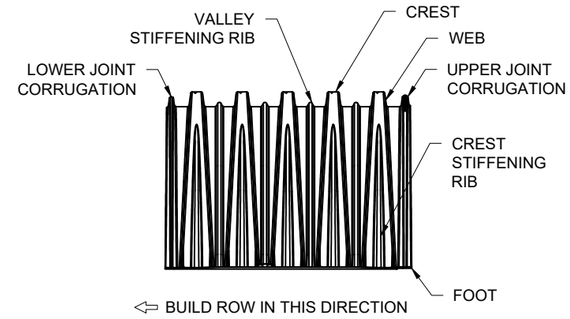


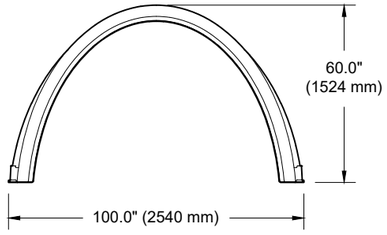
NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

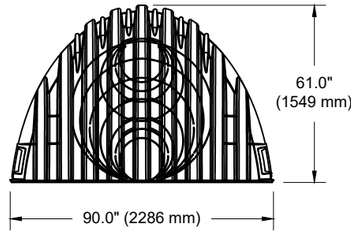
MC-7200 TECHNICAL SPECIFICATION

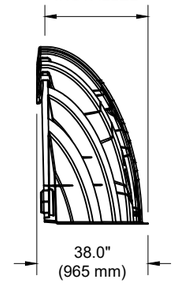
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

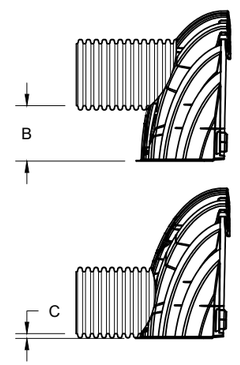
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500IEPP06B		---	0.86" (22 mm)
MC4500IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC4500IEPP08B		---	1.01" (26 mm)
MC4500IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC4500IEPP10B		---	1.33" (34 mm)
MC4500IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC4500IEPP12B		---	1.55" (39 mm)
MC4500IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500IEPP15B		---	1.70" (43 mm)
MC4500IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500IEPP18TW			
MC4500IEPP18B		---	1.97" (50 mm)
MC4500IEPP18BW			
MC4500IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24TW			
MC4500IEPP24B		---	2.26" (57 mm)
MC4500IEPP24BW			
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

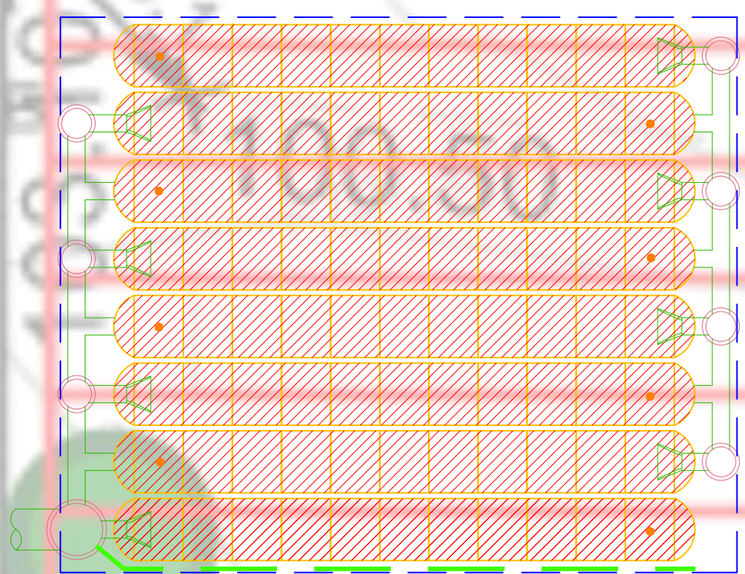
S1 LANDS
OTTAWA, ON
DATE: 26/02/09 | DRAWN: MAH | CHECKED: RWD
PROJECT #: S509412

DATE	DWN	CHK

StormTech® Chamber System

WWW.ADSPIPE.COM

THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PROJECT'S ENGINEER OF RECORD ('EOR') OR OTHER PROJECT REPRESENTATIVE. THE DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD ('EOR') OR OTHER PROJECT REPRESENTATIVE. THE DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO BIDDING AND/OR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



ISOLATOR® ROW PLUS

The StormTech Isolator Row PLUS is an enhancement to our proven water quality treatment system. This updated system is an NJCAT verified water quality treatment device that can be incorporated into any system layout.

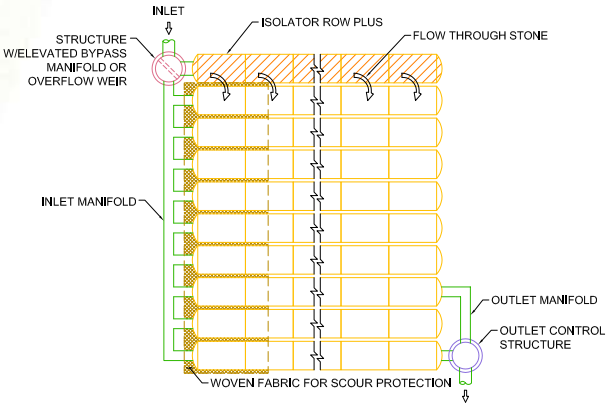
FEATURES:

- Isolator Row PLUS is now NJCAT verified. As a Manufactured Treatment Device it achieves over 81% TSS removal by filtration NJDEP Laboratory Protocol Assessment NJCAT Technology Verification.
- A patented FLAMP™ (Flared End Ramp) provides a smooth transition from pipe invert to fabric bottom. The FLAMP is attached to the inlet pipe inside the chamber end cap and improves chamber function over time by distributing sediment and debris that would otherwise collect at the inlet. It also serves to improve the fluid and solid flow back into the inlet pipe during maintenance and cleaning.
- Proprietary ADS PLUS fabric maintains durability and sediment removal while allowing for higher water quality flow rates. A single layer of ADS PLUS fabric is placed between the angular base stone and the Isolator Row PLUS chambers.

TECHNOLOGY DESCRIPTIONS:

The Isolator Row PLUS is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume or a flow basis. An upstream manhole not only provides access to the Isolator Row PLUS but includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row PLUS bypass through a manifold to the other chambers. This is achieved with either an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row PLUS row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row PLUS. After Stormwater flows through the Isolator Row PLUS and into the rest of the StormTech chamber system it is either infiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

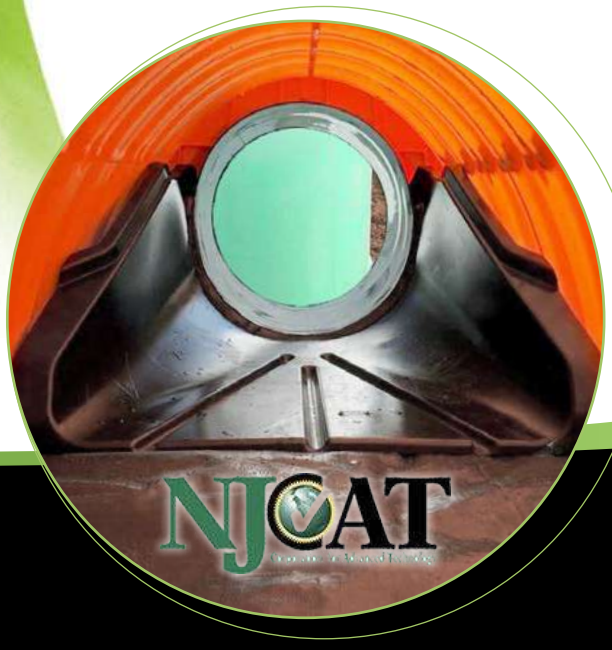
Schematic of the StormTech Isolator Row PLUS System



Summary of Verified Claims[1]

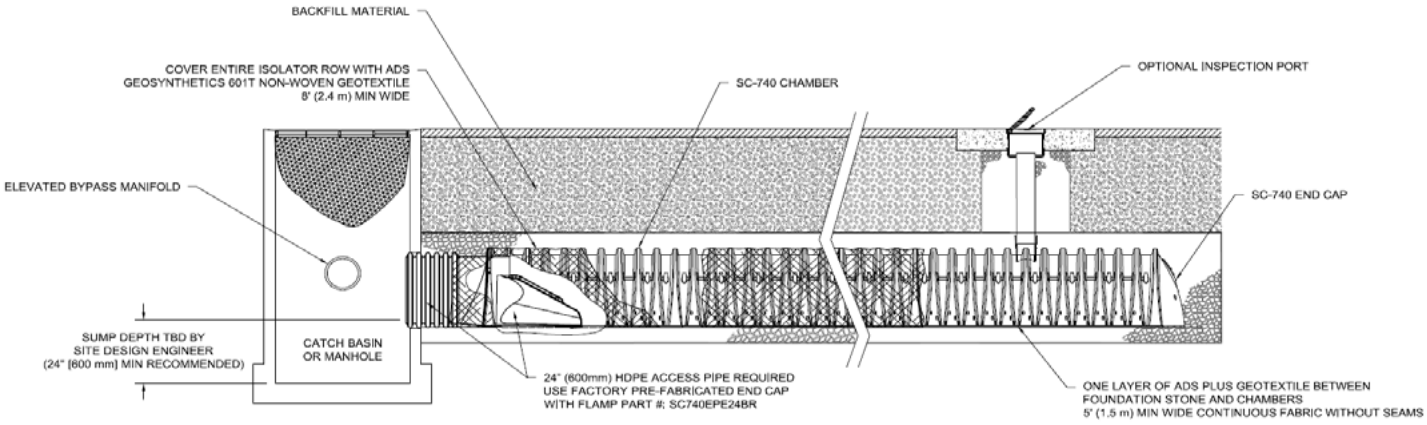
Treatment Rate (gpm/ft²)	4.1
Underlying Geotextile Layers	1
NJDEP Test Sediment	1-1000µ
Mean Particle Concentration (mg/L)	200
TSS Removal Efficiency	81%

[1] Verification testing of the StormTech SC-740 Isolator Row PLUS in accordance with NJDEP Laboratory protocol to access total suspended solids removal by filtration manufactured treatment device, 2013



StormTech Isolator Row PLUS (not to scale)

Note: Non-woven fabric is only required over the chambers for the SC-310 and SC-740 chamber models.



MAINTENANCE

The Isolator Row PLUS was designed to reduce the cost of periodic maintenance. By "isolating" sediment to just one row of the StormTech system, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout.

Maintenance is accomplished with the JetVac process. The JetVac® process utilizes a high-pressure water nozzle to propel itself down the Isolator Row PLUS while scouring and suspending sediment. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency.

StormTech Isolator Row PLUS

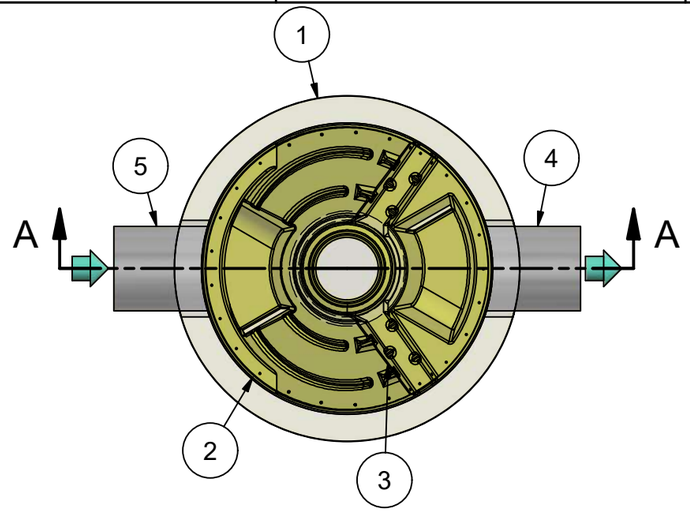
Chamber Model	Chamber Storage	Chamber Footprint	Treatment Rate
SC-160LP	15.0 cf (0.42)	11.45 sf (1.06)	0.11 cfs (3.11 L/s)
SC-310	31.0 cf (0.88)	17.7 sf (1.64)	0.16 cfs (4.53 L/s)
SC-740	74.9 cf (2.12)	27.8 sf (2.58)	0.26 cfs (7.36 L/s)
DC-780	78.4 cf (2.22)	27.8 sf (2.58)	0.26 cfs (7.36 L/s)
MC-3500	175.0 cf (4.96)	42.9 sf (3.99)	0.40 cfs (11.32 L/s)
MC-4500	162.6 cf (4.60)	30.1 sf (2.80)	0.28 cfs (7.93 L/s)

INSTALLATION

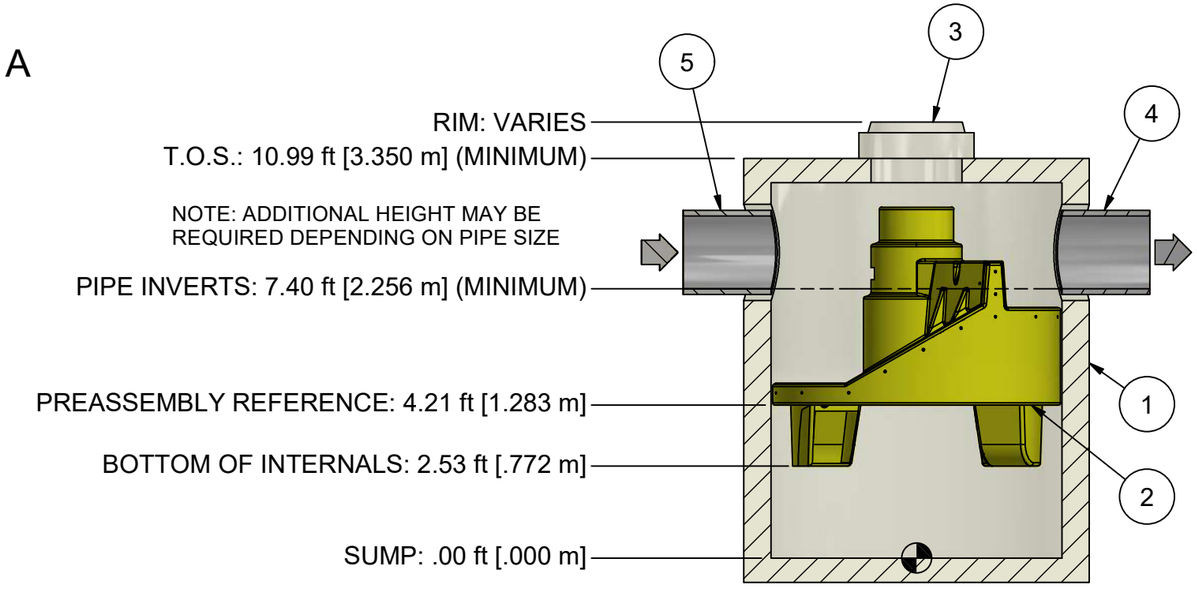
Installation of the stormwater treatment unit(s) shall be preformed per manufacture's installation instructions. Such instructions can be obtained by calling Advanced Drainage systems at (800) 821-6710 or by logging on to www.ads-pipe.com or www.stormtech.com

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com
The ADS logo, FLAMP™ and the Green Stripe are registered trademarks of Advanced Drainage Systems, Inc.
StormTech® is a registered trademark of StormTech, Inc. JetVac® is a registered trademark of JetVac Enviromental.
© 2020 Advanced Drainage Systems, Inc. #11085 09/20 CS



PLAN VIEW



SECTION A-A

HYDRO FRAME AND COVER (INCLUDED)

GRADE RINGS BY OTHERS AS REQUIRED

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

PROJECTION

IF IN DOUBT ASK

DATE:	SCALE:
11/2/2021	1:50

DRAWN BY:	CHECKED BY:	APPROVED BY
ER	MRJ	

Title
8-ft DIAMETER
FIRST DEFENSE

GENERAL ARRANGEMENT

Hydro International®
hydro-int.com
HYDRO INTERNATIONAL

WEIGHT:	MATERIAL:

STOCK NUMBER:

DRAWING NO.:
FD GA-8

SHEET SIZE:	SHEET:	Rev:
B	1 OF 1	-

PRODUCT SPECIFICATION:

1. Peak Hydraulic Flow: 50.0 cfs (1415 l/s)
2. Min Sediment Storage Capacity: 2.8 cu. yd. (2.1 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 48 in. (1200 mm)
4. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
5. For more product information including regulatory acceptances, please visit https://hydro-int.com/en/products/first-defense

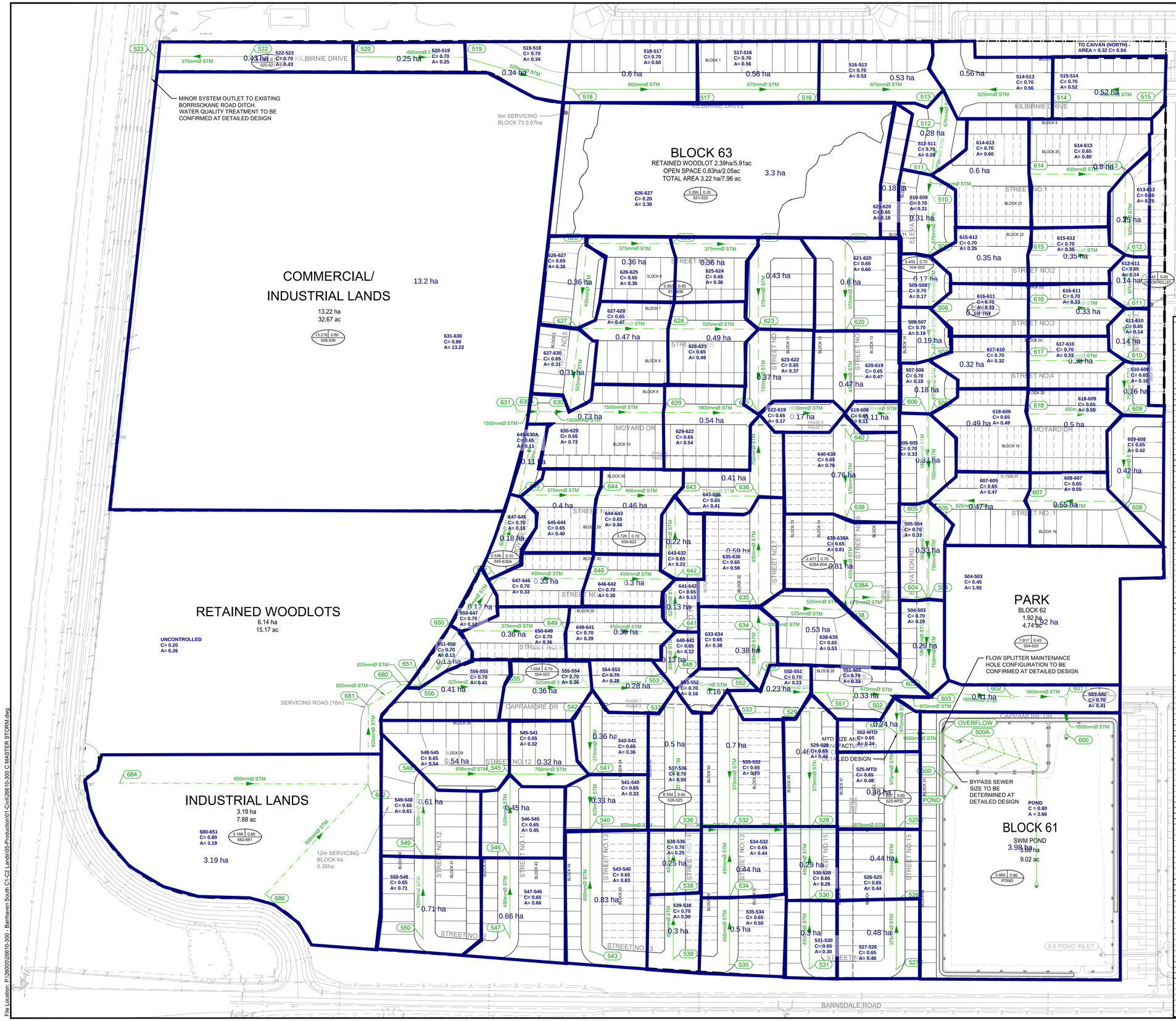
GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 48".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	96	2400	I.D. PRECAST MANHOLE
2	1			INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	750	FRAME AND COVER (ROUND)
4	1	48 (MAX)	1200 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	48 (MAX)	1200 (MAX)	INLET PIPE (BY OTHERS)

Appendix G

Figure (EES separation) and
Storm Sewer Design Sheets



LEGEND:

- LIMIT OF STUDY AREA
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- PERFORATED PIPE
- EXISTING STORM SEWER
- STORM DRAINAGE BOUNDARY
- AREA IN HECTARES
- RUNOFF COEFFICIENT
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

C-FACTORS:

WOODLOTS: 0.20
PARK: 0.45

SINGLES: 0.65
ROW TOWNHOUSES: 0.65
BACK-TO-BACKS: 0.70

COLLECTOR ROADS: 0.70
INDUSTRIAL/COMMERCIAL: 0.80

POND: 0.80

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
522	523	375	0.25%	81.88	104.986	104.781
550	549	450	0.20%	71.20	102.571	102.429
549	548	525	0.20%	71.20	102.429	102.286
548	545	600	0.15%	75.02	102.286	102.174
547	546	450	0.20%	70.49	102.456	102.315
546	545	525	0.20%	70.49	102.315	102.174
545	541	750	0.15%	69.00	102.174	102.070
542	541	375	0.30%	58.34	102.245	102.070
541	540	825	0.15%	47.74	102.070	101.999
543	540	450	0.20%	104.45	102.208	101.999
540	536	825	0.15%	72.00	101.999	101.891
537	536	375	0.30%	165.23	102.296	101.891
539	538	450	0.20%	55.72	102.114	102.002
538	536	450	0.20%	55.72	102.002	101.891
536	532	900	0.15%	48.50	101.891	101.818
533	532	375	0.35%	103.93	102.182	101.818
535	534	450	0.20%	58.20	102.051	101.934
534	532	450	0.20%	58.20	101.934	101.818
532	528	975	0.15%	69.00	101.818	101.714
529	528	375	0.30%	101.87	102.020	101.714
531	530	450	0.20%	60.10	101.955	101.835
530	528	450	0.20%	60.10	101.835	101.714
528	525	975	0.15%	74.99	101.714	101.602
556	555	525	0.16%	75.20	102.200	102.079
555	554	525	0.16%	75.20	102.079	101.959
554	553	600	0.16%	72.01	101.959	101.844
553	552	600	0.16%	72.08	101.844	101.729
552	551	675	0.16%	60.25	101.729	101.632
551	502	675	0.16%	60.77	101.632	101.535
520	519	450	0.20%	95.85	107.100	106.908
519	518	525	0.15%	97.45	106.908	106.762
518	517	600	0.15%	106.64	106.762	106.602
517	516	675	0.15%	105.97	106.002	106.443
516	513	675	0.20%	106.63	106.443	106.230
515	514	450	0.20%	95.14	106.610	106.420
514	513	525	0.20%	95.15	106.420	106.230
513	512	675	0.45%	29.32	106.230	106.098
512	511	675	0.45%	44.46	106.098	105.898
511	510	675	0.45%	14.54	105.898	105.832
510	509	675	0.45%	55.69	105.832	105.582
509	508	675	0.50%	45.50	105.582	105.354
508	507	675	0.50%	45.50	105.354	105.127
507	506	675	0.50%	48.77	105.127	104.883
506	505	750	0.50%	73.50	104.883	104.515
505	504	750	0.50%	83.54	104.515	104.098
504	503	750	0.60%	83.54	104.098	103.596
503	502	975	0.13%	27.54	101.576	101.535
502	MTO	975	0.30%	33.22	101.535	101.435
527	526	375	0.25%	60.15	101.903	101.753
526	525	450	0.25%	60.33	101.753	101.602
525	MTO	975	0.20%	83.30	101.602	101.435
MTO	OVERFLOW	1050	0.50%	38.50	101.435	101.243
OVERFLOW	500A	1050	0.50%	15.21	101.243	101.167
OVERFLOW	500	600	0.50%	37.15	101.410	101.224
500	POND	600	0.50%	12.95	101.224	101.159

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
686	682	675	0.15%	80.00	103.744	103.624
684	682	675	0.15%	80.00	103.744	103.624
682	681	825	0.15%	67.69	103.624	103.522
681	680	825	0.15%	33.43	103.522	103.472
680	651	825	0.15%	16.16	103.472	103.448
651	650	825	0.15%	57.03	103.448	103.363
650	647	825	0.15%	56.94	103.363	103.277
647	645	825	0.15%	74.23	103.277	103.166
645	630A	825	0.15%	73.79	103.166	103.055
650	649	375	0.25%	93.85	103.893	103.658
649	641	450	0.20%	93.85	103.658	103.470
648	641	300	0.35%	35.70	103.595	103.470
641	642	525	0.20%	45.50	103.379	103.379
647	646	450	0.20%	76.60	103.586	103.532
646	642	450	0.20%	76.60	103.532	103.379
642	643	525	0.15%	72.00	103.379	103.307
645	644	375	0.25%	67.58	103.644	103.475
644	643	450	0.25%	67.13	103.475	103.307
643	636	750	0.15%	72.00	103.307	103.199
635	636	450	0.20%	96.07	103.591	103.399
636	622	750	0.20%	71.72	103.199	103.056
640	639	375	0.45%	78.03	104.516	104.165
639	639A	450	0.45%	67.32	104.165	103.862
633	634	300	0.25%	25.10	103.401	103.400
634	635	300	0.35%	0.25	103.400	103.399
635	638	525	0.15%	74.97	103.399	103.279
638	638A	525	0.15%	70.77	103.279	103.262
638A	604	675	0.15%	70.60	103.262	103.156
626	627	450	1.00%	73.80	104.700	103.962
627	630	525	0.50%	72.39	103.962	103.600
631	630A	1500	0.15%	17.01	103.697	103.641
630A	630	1500	0.15%	27.37	103.641	103.460
630	629	1500	0.15%	81.40	103.600	103.478
629	622	1800	0.15%	81.40	103.478	103.356
626	625	375	0.50%	73.88	105.047	104.678
625	624	375	0.50%	74.01	104.678	104.308
624	623	375	1.00%	73.52	104.308	103.573
627	628	525	0.50%	77.46	104.347	103.960
628	623	525	0.50%	77.46	103.960	103.573
623	622	750	0.15%	72.29	103.573	103.356
622	619	1800	0.20%	75.00	103.356	103.206
621	620	375	0.50%	72.75	103.926	103.562
620	619	450	0.50%	71.26	103.562	103.206
619	606	1800	0.20%	70.51	103.206	103.065
606	605	1800	0.20%	75.01	103.065	102.915
614	613	450	1.00%	83.37	106.008	105.175
613	612	525	0.50%	69.95	105.175	104.825
615	612	375	0.50%	83.32	105.242	104.825
612	611	675	0.50%	45.50	104.825	104.597
616	611	375	0.50%	83.29	105.014	104.597
611	610	675	0.50%	45.50	104.597	104.370
617	610	375	0.50%	83.24	104.786	104.370
610	609	750	0.50%	46.56	104.370	104.137
618	609	450	0.50%	83.19	104.553	104.137
609	608	825	0.50%	75.00	104.137	103.762
608	607	825	0.50%	84.74	103.702	103.338
607	605	825	0.50%	84.74	103.338	102.915
605	604	1800	0.25%	83.52	102.915	102.706
604	603	1800	0.30%	82.30	102.706	102.459
603	602	1800	0.15%	74.34	102.459	102.348
602	601	1800	0.15%	46.69	102.348	102.278
601	600	1800	0.15%	32.50	102.278	102.229

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/2026
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/2025

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
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CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

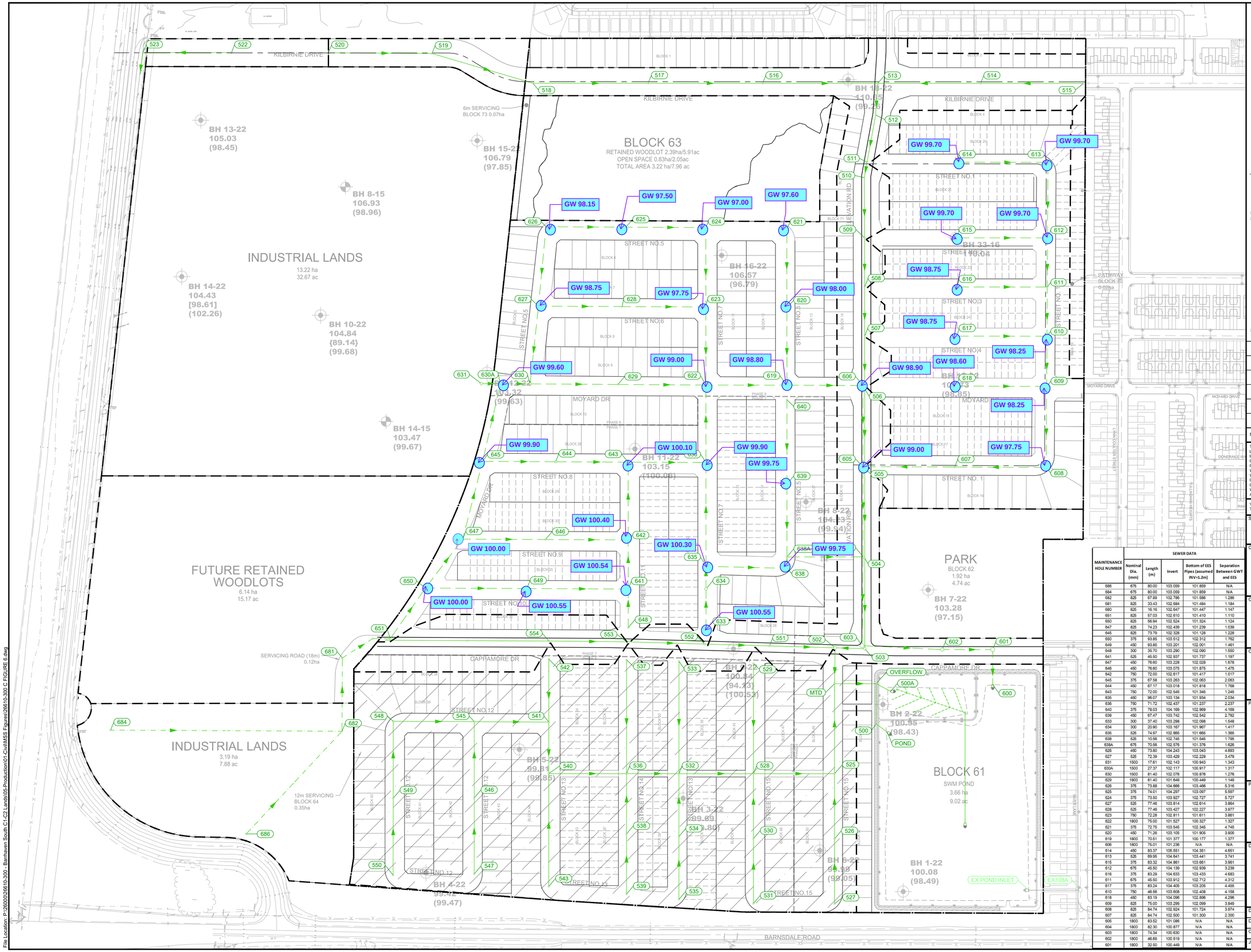
PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
DETAILED
DRAINAGE
BREAKDOWN FOR
DESIGN SHEETS

DESIGN:	KF/GF	
DRAWN:	KC	DRAWING #:
CHECKED:	KF/GF	MST
JLR #:	26610-300	

PLOT DATE: Thursday, April 9, 2026 5:09:49 PM

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C MASTER STORM.dwg



LEGEND:

- LIMIT OF STUDY AREA
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- EXISTING STORM SEWER
- UNCONTROLLED AREAS

OPPORTUNITIES:

- LOCAL ROADS WITH EES
- RETAINED WOODLOTS WITH EXISTING CONDITIONS INFILTRATION WITHOUT EES
- INDUSTRIAL LANDS: ROOFTOP INFILTRATION WITHOUT EES PARK AND POND WITHOUT EES INFILTRATION TO BE DETERMINED BY PARKS GROUP

CONSTRAINTS:

- LOCAL ROADS WITHOUT EES
- COLLECTOR ROADS WITHOUT EES

BH 8-15
106.93
(98.96)
BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025

DUAL SYSTEMS MAY BE PRESENT ON ELEVATION ROAD FROM MOYARD TO CAPPAMORE. TO BE CONFIRMED AT DETAILED DESIGN.

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
J.L.Richards ENGINEERS-ARCHITECTS-PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
GROUNDWATER ELEVATIONS

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: FIGURE 9A

PLOT DATE: Tuesday, May 26, 2026 1:26:11 PM

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\MSS Figures\26610-300 C FIGURE 6.dwg

SEWER DATA

MAINTENANCE HOLE NUMBER	Nominal Dia. (mm)	Length (m)	Invert	Bottom of EES Pipes (assumed INV+1.2m)	Separation Between GWT and EES
686	675	80.00	103.059	101.859	N/A
684	675	80.00	103.059	101.859	N/A
682	825	67.89	102.786	101.586	1.286
681	825	33.43	102.684	101.484	1.184
680	825	16.16	102.647	101.447	1.147
651	825	57.03	102.610	101.410	1.110
650	825	56.94	102.524	101.324	1.124
647	825	74.23	102.439	101.239	1.039
645	825	73.79	102.328	101.128	1.228
650	375	93.65	103.512	102.312	1.762
649	450	93.85	103.201	102.001	1.461
648	300	35.70	103.290	102.090	1.550
641	525	45.50	102.937	101.737	1.197
647	450	76.60	103.228	102.028	1.678
646	450	76.60	103.075	101.875	1.475
642	750	72.00	102.617	101.417	1.017
645	375	67.58	103.263	102.063	2.063
644	450	67.17	103.018	101.818	1.768
643	750	72.00	102.545	101.345	1.245
635	450	96.07	103.134	101.934	2.034
636	750	71.72	102.437	101.237	2.237
640	375	78.03	104.169	102.969	4.169
639	450	67.47	103.742	102.542	2.792
633	300	37.40	103.298	102.098	1.548
634	300	20.90	103.167	101.967	1.417
635	525	74.97	102.865	101.665	1.365
638	525	10.56	102.745	101.545	1.795
638A	675	70.55	102.576	101.376	1.626
628	450	73.80	104.243	103.043	4.693
627	525	72.39	103.429	102.229	3.479
631	1500	17.61	102.143	100.943	1.343
630A	1500	27.37	102.117	100.917	1.317
630	1500	81.40	102.076	100.876	1.276
629	1800	81.40	101.649	100.449	1.149
626	375	73.88	104.666	103.466	5.316
625	375	74.01	104.297	103.097	5.597
624	375	73.50	103.927	102.727	5.727
627	525	77.46	103.814	102.614	3.864
628	525	77.46	103.427	102.227	3.977
623	750	72.28	102.811	101.611	3.861
622	1800	75.00	101.527	100.327	1.327
621	375	72.75	103.545	102.345	4.745
620	450	71.26	103.105	101.905	3.905
619	1800	70.61	101.377	100.177	1.377
606	1800	75.01	101.236	N/A	N/A
614	450	83.37	105.551	104.351	4.651
613	525	69.95	104.541	103.441	3.741
615	375	83.32	104.861	103.661	3.961
612	675	45.50	104.139	102.939	3.239
616	375	83.29	104.633	103.433	4.683
611	675	45.50	103.912	102.712	4.312
617	375	83.24	104.405	103.205	4.455
610	750	46.56	103.608	102.408	4.158
618	450	83.19	104.096	102.896	4.296
609	825	75.00	103.299	102.099	3.849
608	825	84.74	102.924	101.724	3.974
607	825	84.74	102.500	101.300	2.300
605	1800	83.52	101.086	N/A	N/A
604	1800	82.30	100.877	N/A	N/A
603	1800	74.34	100.630	N/A	N/A
602	1800	46.69	100.519	N/A	N/A
601	1800	32.50	100.449	N/A	N/A

STORM SEWER DESIGN SHEET - EES SYSTEM

BARRHAVEN SOUTH PHASE 3 - S1 AREA

JLR NO.: 26610-300

Prepared By: MM
Reviewed By: KF

LOCATION			C-FACTORS				DRAINAGE AREAS		TIME OF CONCENTRATION			PEAK FLOW ESTIMATION											SEWER DATA									UPSTREAM GEOMETRY						DOWNSTREAM GEOMETRY			
			1:2 Year Storm (Residential/Local Streets)			1:5 Year Storm (ICI)						1:2 Year Storm (Residential/Local Streets)					1:5 Year Storm (ICI)					Plug Flow (L/s)	Total Peak Flow (L/s)																	
Street	From MH	To MH	0.20	0.65	0.70	0.80	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:5 Yr Intensity (mm/hr)	Peak Flow (L/s)	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:5 Yr Intensity (mm/hr)	Peak Flow (L/s)			Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity (L/s)	% Full	TG From	Obvert	Invert	Bottom of EES Pipes (assumed INV - 1.2m)	Assumed GWT at Location	Separation between GWT and EES	Cover	TG To	Drop	Obvert	Invert	Cover
PHASE 7 - EES SYSTEM (TO MH 603)																																								
Industrial Lands (South)	686	682				1.60	1.60	1.60	15.00	1.45	**16.45**	0.00		0.00	61.77	0.00	3.55		3.55	83.56	296.40		**296.40**	CONCRETE	675	685.80	0.15%	80.00	339.63	0.92	**43.23**	87%	105.00	103.744	103.059	101.859			**1.256**	104.800		103.624	102.939	**1.176**
Industrial Lands (South)	684	682				1.60	1.60	1.60	15.00	1.45	**16.45**	0.00		0.00	61.77	0.00	3.55		3.55	83.56	296.40		**296.40**	CONCRETE	675	685.80	0.15%	80.00	339.63	0.92	**43.23**	87%	105.00	103.744	103.059	101.859			**1.256**	104.800		103.624	102.939	**1.176**
Easement	682	681					0.00	3.19	**16.45**	1.08	**17.53**	0.00		0.00	58.54	0.00	0.00		7.09	79.15	561.51		**561.51**	CONCRETE	825	838.20	0.15%	67.89	579.98	1.05	**18.46**	97%	104.80	103.624	102.786	101.586	100.300	1.286	**1.176**	104.800		103.522	102.684	**1.278**
Easement	681	680					0.00	3.19	**17.53**	0.53	**18.06**	0.00		0.00	56.38	0.00	0.00		7.09	76.19	540.56		**540.56**	CONCRETE	825	838.20	0.15%	33.43	579.98	1.05	**39.42**	93%	104.80	103.522	102.684	101.484	100.300	1.184	**1.278**	104.800		103.472	102.634	**1.328**
Cappamore Drive / Easement	680	651					0.00	3.19	**18.06**	0.26	**18.32**	0.00		0.00	55.38	0.00	0.00		7.09	74.83	530.86		**530.86**	CONCRETE	825	825.00	0.15%	16.16	555.94	1.04	**25.08**	95%	104.80	103.472	102.647	101.447	100.300	1.147	**1.328**	105.344		103.448	102.623	**1.896**
Moyard Drive	651	650			0.13		0.13	3.32	**18.32**	0.90	**19.22**	0.25		0.25	54.91	13.89	0.00		7.09	74.18	526.26		**540.15**	CONCRETE	825	838.20	0.15%	57.03	579.98	1.05	**39.83**	93%	105.34	103.448	102.610	101.410	100.300	1.110	**1.896**	105.415		103.363	102.524	**2.053**
Moyard Drive	650	647			0.12		0.12	3.44	**19.22**	0.90	**20.12**	0.23		0.49	53.32	25.94	0.00		7.09	72.01	510.88		**536.82**	CONCRETE	825	838.20	0.15%	56.94	579.98	1.05	**43.16**	93%	105.42	103.363	102.524	101.324	100.200	1.124	**2.053**	105.543		103.277	102.439	**2.266**
Moyard Drive	647	645			0.18		0.18	3.62	**20.12**	1.18	**21.30**	0.34		0.83	51.83	42.97	0.00		7.09	69.98	496.49		**539.46**	CONCRETE	825	838.20	0.15%	74.23	579.98	1.05	**40.52**	93%	105.54	103.277	102.439	101.239	100.200	1.039	**2.266**	105.720		103.166	102.328	**2.554**
Moyard Drive	645	**630A**		0.11			0.11	3.73	**21.30**	1.17	**22.47**	0.20		1.03	50.03	51.42	0.00		7.09	67.52	479.03		**530.45**	CONCRETE	825	838.20	0.15%	73.79	579.98	1.05	**49.53**	91%	105.72	103.166	102.328	101.128	99.900	1.228	**2.554**	106.016	-0.586	103.055	102.217	**2.961**
Street No. 10	650	649			0.360		0.36	0.36	**10.00**	1.95	**11.95**	0.70		0.95	76.81	73.24	0.00		0.00	104.19	0.00		**73.24**	CONCRETE	375	381.00	0.25%	93.85	91.46	0.80	**18.22**	80%	105.42	103.893	103.512	102.312	100.550	1.762	**1.523**	105.232		103.658	103.277	**1.574**
Street No. 10	649	641			0.390		0.39	0.75	**11.95**	1.93	**13.88**	0.76		1.71	70.05	119.96	0.00		0.00	94.91	0.00		**119.96**	CONCRETE	450	457.20	0.20%	93.85	133.02	0.81	**13.06**	90%	105.23	103.658	103.201	102.001	100.540	1.461	**1.574**	105.013		103.470	103.013	**1.543**
Street No. 11	648	641		0.130			0.13	0.13	**10.00**	0.73	**10.73**	0.23		0.23	76.81	18.04	0.00		0.00	104.19	0.00		**18.04**	CONCRETE	300	304.80	0.35%	35.70	59.68	0.82	**41.64**	30%	104.79	103.595	103.290	102.090	100.540	1.550	**1.196**	105.013		103.470	103.165	**1.543**
Street No. 11	641	642		0.130			0.13	1.01	**13.88**	0.84	**14.72**	0.23		2.18	64.54	140.85	0.00		0.00	87.36	0.00		**140.85**	CONCRETE	525	533.40	0.20%	45.50	200.65	0.90	**59.79**	70%	105.01	103.470	102.937	101.737	100.540	1.197	**1.543**	105.355		103.379	102.846	**1.976**
Street No. 9	647	646			0.330		0.33	0.33	**20.12**	1.58	**21.70**	0.64		1.13	51.83	58.50	0.00		0.00	69.98	0.00		**58.50**	CONCRETE	450	457.20	0.20%	76.60	133.02	0.81	**74.51**	44%	105.54	103.686	103.228	102.028	100.350	1.678	**1.858**	105.450		103.532	103.075	**1.917**
Street No. 9	646	642			0.300		0.30	0.63	**21.70**	1.58	**23.27**	0.58		1.71	49.45	84.68	0.00		0.00	66.73	0.00		**84.68**	CONCRETE	450	457.20	0.20%	76.60	133.02	0.81	**48.33**	64%	105.45	103.532	103.075	101.875	100.400	1.475	**1.917**	105.355		103.379	102.922	**1.976**
Street No. 11	642	643		0.220			0.22	1.86	**23.27**	1.49	**24.76**	0.40		4.29	47.30	203.01	0.00		0.00	63.80	0.00		**203.01**	CONCRETE	750	762.00	0.10%	72.00	367.27	0.81	**164.26**	55%	105.36	103.379	102.617	101.417	100.400	1.017	**1.976**	105.515		103.307	102.545	**2.208**
Street No. 8	645	644		0.400			0.40	0.40	**21.30**	1.40	**22.70**	0.72		1.55	50.03	77.64	0.00		0.00	67.52	0.00		**77.64**	CONCRETE	375	381.00	0.25%	67.58	91.46	0.80	**13.82**	85%	105.72	103.644	103.263	102.063	100.000	2.063	**2.076**	105.609		103.475	103.094	**2.133**
Street No. 8	644	643		0.460			0.46	0.86	**22.70**	1.24	**23.94**	0.83		2.38	48.05	114.51	0.00		0.00	64.82	0.00		**114.51**	CONCRETE	450	457.20	0.25%	67.17	148.72	0.91	**34.21**	77%	105.61	103.475	103.018	101.818	100.050	1.768	**2.133**	105.515		103.307	102.850	**2.208**
Street No. 11	643	636		0.410			0.41	3.13	**24.76**	1.22	**25.98**	0.74		7.42	45.44	337.03	0.00		0.00	61.27	0.00		**337.03**	CONCRETE	750	762.00	0.15%	72.00	449.81	0.99	**112.78**	75%	105.51	103.307	102.545	101.345	100.100	1.245	**2.208**	105.703		103.199	102.437	**2.504**
Street No. 7	635	636		0.590			0.59	0.59	**10.00**	1.98	**11.98**	1.07		1.07	76.81	81.88	0.00		0.00	104.19	0.00		**81.88**	CONCRETE	450	457.20	0.20%	96.07	133.02	0.81	**51.13**	62%	105.29	103.591	103.134	101.934	99.900	2.034	**1.695**	105.703		103.399	102.941	**2.304**
Street No. 7	636	**622**					0.00	3.72	**25.98**	1.05	**27.03**	0.00		8.48	44.05	373.63	0.00		0.00	59.37	0.00		**373.63**	CONCRETE	750	762.00	0.20%	71.72	519.40	1.14	**145.77**	72%	105.70	103.199	102.437	101.237	99.000	2.237	**2.504**	106.012	-0.300	103.056	102.294	**2.956**
Street No. 5	640	639		0.757			0.76	0.76	**10.00**	1.21	**11.21**	1.37		1.37	76.81	105.06	0.00		0.00	104.19	0.00		**105.06**	CONCRETE	375	381.00	0.45%	78.03	122.70	1.08	**17.64**	86%	106.44	104.550	104.169	102.969	98.800	4.169	**1.890**	105.967		104.199	103.818	**1.768**
Street No. 5	639	638A		0.810			0.81	1.57	**11.21**	0.88	**12.09**	1.46		2.83	72.46	205.17	0.00		0.00	98.22	0.00		**205.17**	CONCRETE	450	457.20	0.50%	67.47	210.32	1.28	**5.15**	98%	105.97	104.199	103.742	102.542	99.750	2.792	**1.768**	105.548	0.600	103.862	103.405	**1.686**
Street No. 7	633	634		0.38			0.38	0.38	**10.00**	0.76	**10.76**	0.69		0.69	76.81	52.74	0.00		0.00	104.19	0.00		**52.74**	CONCRETE	300	304.80	0.35%	37.40	59.68	0.82	**6.94**	88%	104.74	103.603	103.298	102.098	100.550	1.548	**1.142**	105.094		103.472	103.167	**1.622**
Street No. 7	634	635					0.00	0.38	**10.76**	0.43	**11.19**	0.00		0.69	74.00	50.81	0.00		0.00	100.33	0.00		**50.81**	CONCRETE	300	304.80	0.35%	20.90	59.68	0.82	**8.87**	85%	105.09	103.472	103.167	101.967	100.550	1.417	**1.622**	105.286		103.399	103.094	**1.887**
Street No. 5	635	638		0.53			0.53	0.91	**11.19**	1.56	**12.74**	0.96		1.64	72.53	119.26	0.00		0.00	98.31	0.00		**119.26**	CONCRETE	525	533.40	0.16%	74.97	179.46	0.80	**60.20**	66%	105.29	103.399	102.865	101.665	100.300	1.365	**1.887**	105.436		103.279	102.745	**2.157**
Street No. 5	638	638A					0.00	0.91	**12.74**	0.22	**12.96**	0.00		1.64	67.66	111.26	0.00		0.00	91.63	0.00		**111.26**	CONCRETE	525	533.40	0.16%	10.56	179.46	0.80	**68.20**	62%	105.44	103.279	102.745	101.545	99.750	1.795	**2.157**	105.548		103.262	102.728	**2.286**
Easement Street 5 to Elevation Road	638A	**604**					0.00	2.48	**12.96**	1.28	**14.24**	0.00		4.48	67.03	300.04	0.00		0.00	90.77	0.00		**300.04**	CONCRETE	675	685.80	0.15%	70.56	339.63	0.92	**39.59**	88%	105.55	103.262	102.576	101.376	99.750	1.626	**2.286**	105.751	0.450	103.156	102.470	**2.595**
PHASE 6 - EES SYSTEM (TO BLOCK 61 SWM POND NORTH ENTRANCE)																																								
Street No. 5	626	627	3.30	0.36			3.66	3.66	**10.00**	0.68	**10.68**	2.49		2.49	76.81	191.09	0.00		0.00	104.19	0.00		**191.09**	CONCRETE	450	457.20	1.00%	73.80	297.43	1.81	**106.35**	64%	107.27	104.700	104.243	103.043	98.150	4.893	**2.570**	106.703		103.962	103.505	**2.741**
Street No. 5	627	630		0.31			0.31	3.97	**10.68**	0.85	**11.53**	0.56		3.05	74.29	226.45	0.00		0.00	100.74	0.00		**226.45**	CONCRETE	525	533.40	0.50%	72.39	317.25	1.42	**90.79**	71%	106.70	103.962	103.429	102.229	98.750	3.479	**2.741**	106.200		103.600	103.067	**2.599**
Industrial Lands (North) / Moyard Drive	631	**630A**				13.22	13.22	13.22	15.00	0.19	**15.19**	0.00		0.00	61.77	0.00	29.40		29.40	83.56	2456.69		**2456.69**	CONCRETE	1500	1524.00	0.15%	17.61	2856.14	1.57	**399.45**	86%	105.98	103.667	102.143	100.943	99.600	1.343	**2.310**	106.016		103.641	102.117	**2.375**
Industrial Lands (North) / Moyard Drive	**630A**	630					0.00	16.95	**22.47**	0.29	**22.76**	0.00		1.03	48.37	49.71	0.00		36.50	65.26	2381.61		**2431.33**	CONCRETE	1500	1524.00	0.15%	27.37	2856.14	1.57	**424.81**	85%	106.02	103.641	102.117	100.917	99.600	1.317	**2.375**	106.200		103.600	102.076	**2.599**
Moyard Drive	630	629		0.73			0.73	21.64	**22.76**	0.87	**23.63**	1.32		5.40	47.97	258.82	0.00		36.50	64.72	2361.99		**2620.81**	CONCRETE	1500	1524.00	0.15%	81.40	2856.14	1.57	**235.32**	92%	106.20	103.600	102.076	100.876	99.600	1.276	**2.599**	106.113		103.478	101.954	**2.635**
Moyard Drive	629	622		0.54			0.54	22.18	**23.63**	0.77	**24.40**	0.98		6.37	46.84	298.42	0.00		36.50	63.18	2305.71		**2604.14**	CONCRETE	1800	1828.80	0.15%	81.40	4644.39	1.77	**2040.25**	56%	106.11	103.478	101.649	100.449	99.300	1.149	**2.635**	106.012		103.356	101.527	**2.656**
Street No. 5	626	625		0.36			0.36	0.36	**10.00**	1.09	**11.09**	0.65		0.65	76.81	49.96	0.00		0.00	104.19	0.00		**49.96**	CONCRETE	375	381.00	0.50%	73.88	129.34	1.13	**79.37**	39%	107.27	105.047	104.666	103.466	98.150	5.316	**2.222**	107.138		104.678	104.297	**2.460**
Street No. 5	625	624		0.36			0.36	0.72	**11.09**	1.09	**12.17**	0.65		1.30	72.87	94.81	0.00		0.00	98.79	0.00		**94.81**	CONCRETE	375	381.00	0.50%	74.01	129.34	1.13	**34.52**	73%	107.14	104.678	104.297	103.097	97.500	5.597	**2.460**	107.037		104.308	103.927	**2.729**
Street No. 7	624	623		0.43			0.43	1.15	**12.17**	0.76	**12.94**	0.78		2.08	69.36	144.14	0.00		0.00	93.96	0.00		**144.14**	CONCRETE	375	381.00	1.00%	73.50	182.91	1.60	**38.78**	79%	107.04	104.308	103.927	102.727	97.000	5.727	**2.729**	106.512		103.573	103.192	**2.940**
Street No. 6	627	628		0.47			0.47	0.47	**10.68**	0.91	**11.59**	0.85		3.34	74.29	247.93	0.00		0.00	100.74	0.00		**247.93**	CONCRETE	525	533.40	0.50%	77.46	317.25	1.42	**69.31**	78%	106.70	104.347	103.814	102.614	98.750	3.864	**2.356**	106.612		103.960	103.427	**2.653**
Street No. 6	628	623		0.49			0.49	0.96	**11.59**	0.91	**12.50**	0.89		4.22	71.20	300.66	0.00		0.00	96.49	0.00		**300.66**	CONCRETE	525	533.40	0.50%	77.46	317.25	1.42	**16.59**	95%	106.61	103.960	103.427	102.227	98.250	3.977	**2.653**	106.512		103.573	103.039	**2.940**
Street No. 7	623	622		0.37			0.37	2.48	**12.94**	0.86	**13.80**	0.67		6.97	67.11	467.71	0.00		0.00	90.88	0.00		**467.71**	CONCRETE	750	762.00	0.30%	72.28	636.13	1.39	**168.42**	74%	106.51	103.573	102.811	101.611	97.750	3.861	**2.940**	106.012		103.356	102.594	**2.656**
Moyard Drive	622	619		0.17			0.17	28.55	**27.03**	0.61	**27.64**	0.31		22.13	42.92	949.75	0.00		36.50	57.84	2110.75		**3060.51**	CONCRETE	1800	1828.80	0.20%	75.00	5362.88	2.04	**2302.37**	57%	106.01	103.356	101.527	100.327	99.000	1.327	**2.656**	106.517		103.206	101.377	**3.311**
Street No. 5	621	620		0.78			0.78	0.78	**10.00**	1.07	**11.07**	1.41		1.41	76.81	108.25	0.00		0.00	104.19	0.00		**108.25**	CONCRETE	375	381.00	0.50%	72.75	129.34	1.13	**21.08**	84%	106.97	103.926	103.545	102.345	97.600	4.745	**3.048**	106.717		103.562	103.181	**3.155**
Street No. 5	620	619		0.47			0.47	1.25	**11.07**	0.93	**12.00**	0.85		2.26	72.93	164.73	0.00		0.00	98.87	0.00		**164.73**	CONCRETE	450	457.20	0.50%	71.26	210.32	1.28	**45.58**	78%	106.72	103.562	103.105	101.905	98.000	3.905	**3.155**	106.517		103.206	102.749	**3.311**
Moyard Drive	619	606		0.11			0.11	29.91	**27.64**	0.58	**28.22**	0.20		24.59	42.29	1039.74	0.00		36.50	56.98	2079.48		**3119.22**	CONCRETE	1800	1828.80	0.20%	70.51	5362.88	2.04	**2243.66**	58%	106.52	103.206	101.377	100.177	98.800	1.377	**3.311**	106.988		103.065	101.236	**3.923**
Elevation Road	606	605					0.00	29.91	**28.22**	0.61	**28.83**	0.00		24.59	41.71	1025.63	0.00		36.50	56.20	2051.01		**3076.64**	CONCRETE	1800	1828.80	0.20%	75.01	5362.88	2.04	**2286.24**	57%	106.99	103.065	101.236	N/A	98.900	N/A	**3.923**	106.713		102.915	101.086	**3.799**
Street No. 1	614	613		1.39			1.39	1.39	**10.00**	0.77	**10.77**	2.52		2.52	76.81	193.47	0.00		0.00	104.19	0.00		**193.47**	CONCRETE	450	457.20	1.00%	83.37	297.43	1.81	**103.96**	65%	108.52	106.008	105.551	104.351	99.700	4.651	**2.507**	109.001		105.175	104.717	**3.826**
Street No. 1	613	612		0.25			0.25	1.64	**10.77**	0.82	**11.59**	0.45		2.97	73.98	219.77	0.00		0.00	100.31	0.00		**219.77**	CONCRETE	525	533.40	0.50%	69.95	317.25	1.42	**97.47**	69%	109.00	105.175	104.641	103.441	99.700	3.741	**3.826**	108.800		104.825	104.292	**3.975**
Street No. 2	615	612			0.70		0.70	0.70	**10.00**	1.22	**11.22**	1.36		1.36	76.81	104.62	0.00		0.00	104.19	0.00		**104.62**	CONCRETE	375	381.00	0.50%	83.32	129.34	1.13	**24.71**	81%	108.29	105.242	104.861	103.661	99.700	3.961	**3.047**	108.800		104.825	104.444	**3.975**
Street No. 1	612	611		0.14			0.14	2.48	**11.59**	0.45	**12.04**	0.25		4.59	71.20	326.52	0.00		0.00	96.49	0.00		**326.52**	CONCRETE	675	685.80	0.50%	45.50	620.09	1.68	**293.56**	53%	108.80	104.825	104.139	102.939	99.700	3.239	**3.975**	108.700		104.597	103.912	**4.103**
Street No. 3	616	611			0.66		0.66	0.66	**10.00**	1.22	**11.22**	1.28		1.28	76.81	98.65	0.00		0.00	104.19	0.00		**98.65**	CONCRETE	375	381.00	0.50%	83.29	129.34	1.13	**30.69**	76%	108.12	105.014	104.633	103.433	98.750	4.683	**3.103**	108.700		104.597	104.216	**4.103**
Street No. 1	611	610		0.14			0.14	3.28	**12.04**	0.45	**12.49**	0.25		6.12	69.77	427.21	0.00		0.00	94.53	0.00		**427.21**	CONCRETE	675	685.80	0.50%	45.50	620.09	1.68	**192.87**	69%	108.70	104.597	103.912	102.712	98.400	4.312	**4.103**	108.651		104.370	103.684	**4.281**
Street No. 4	617	610			0.65		0.65	0.65	**10.00**	1.22	**11.22**	1.26		1.26	76.81	97.15	0.00		0.00	104.19	0.00		**97.15**	CONCRETE	375	381.00	0.50%	83.24	129.34	1.13	**32.19**	75%	107.94	104.786	104.405	103.205	98.750	4.455	**3.156**	108.651		104.370	103.989	**4.281**
Street No. 1	610	609		0.16			0.16	4.09	**12.49**	0.43	**12.92**	0.29		7.68	68.40	525.13	0.00		0.00	92.65	0.00		**525.13**	CONCRETE	750	762.00	0.50%	46.56	821.24	1.80	**296.12**	64%	108.65	104.370	103.608	102.408	98.250	4.158	**4.281**	109.018		104.137	103.375	**4.881**
Moyard Drive	618	609		0.99			0.99	0.99	**10.00**	1.08	**11.08**	1.79		1.79	76.81	137.40	0.00		0.00	104.19	0.00		**137.40**	CONCRETE	450	457.20	0.50%	83.19	210.32	1.28	**72.92**	65%	108.00	104.553	104.096	102.896	98.600	4.296	**3.446**	109.018		104.137	103.680	**4.881**
Street No. 1	609	608		0.42			0.42	5.50	**12.92**	0.65	**13.57**	0.76		10.23	67.15	686.61	0.00		0.00	90.93	0.00		**686.61**	CONCRETE	825	838.20	0.50%	75.00	1058.89	1.92	**372.28**	65%	109.02	104.137	103.299	102.099	98.250	3.849	**4.881**	107.952		103.762	102.924	**4.190**
Street No. 1	608	607		0.55			0.55	6.05	**13.57**	0.74	**14.31**	0.99		11.22	65.35	733.18	0.00		0.00	88.47	0.00		**733.18**	CONCRETE	825	838.20	0.50%	84.74	1058.89	1.92	**325.71**	69%	107.95	103.762	102.924	101.724	97.750	3.974	**4.190**	107.359		103.338	102.500	**4.021**
Street No. 1	607	605		0.47			0.47	6.52	**14.31**	0.74	**15.05**	0.85		12.07	63.45	765.68	0.00		0.00	85.86	0.00		**765.68**	CONCRETE	825	838.20	0.50%	84.74	1058.89	1.92	**293.21**	72%	107.36	103.338	102.500	101.300	99.000	2.300	**4.021**	106.713		102.915	102.077	**3.799**
Elevation Road	605	**604**					0.00	36.44	**28.83**	0.61	**29.44**	0.00		36.66	41.12	1507.36	0.00		36.50	55.39	2021.65		**3529.01**	CONCRETE	1800	1828.80	0.25%	83.52	5995.88	2.28	**2466.87**	59%	106.71	102.915	101.086	N/A	N/A	N/A	**3.799**	105.751		102.706	100.877	**3.045**
Elevation Road	604	**603**					0.00	38.92	**29.44**	0.55	**29.99**	0.00		41.13	40.55	1667.94	0.00		36.50	54.62	1993.33		**3661.27**	CONCRETE	1800	1828.80	0.30%	82.30	6568.16	2.50	**2906.89**	56%	105.75	102.706	100.877	N/A	N/A	N/A	**3.045**	104.522		102.459	100.630	**2.063**
Cappamore Drive	**603**	602					0.00	38.92	**29.99**	0.70	**30.69**	0.00		41.13	40.05	1647.43	0.00		36.50	53.94	1968.60		**3616.03**	CONCRETE	1800	1828.80	0.15%	74.34	4644.39	1.77	**1028.36**	78%	104.52	102.459	100.630	N/A	N/A	N/A	**2.063**	104.625		102.348	100.519	**2.278**
Cappamore Drive	602	601					0.00	38.92	**30.69**	0.44	**31.13**	0.00		41.13	39.44	1622.03	0.00		36.50	53.10	1937.99		**3560.02**	CONCRETE	1800	1828.80	0.15%	46.69	4644.39	1.77	**1084.37**	77%	104.63	102.348	100.519	N/A	N/A	N/A	**2.278**	104.875		102.278	100.449	**2.598**
To Block 61 SWM Pond (North Entrance)	601	600					0.00	38.92	**31.13**	0.31	**31.44**	0.00		41.13	39.06	1606.53	0.00		36.50	52.59	1919.30		**3525.82**	CONCRETE	1800	1828.80	0.15%	32.50	4644.39	1.77	**1118.57**	76%	104.88	102.278	100.449	N/A	N/A	N/A	**2.598**	102.300		102.229	**100.400**	**0.071**

Design Parameters (Per OSDG)	
Manning's Coefficient =	0.013
1:2 Year Intensity =	732.951 / (Tc + 6.199)^0.810
1:5 Year Intensity =	998.071 / (Tc + 6.053)^0.814
1:100 Year Intensity =	1735.688 / (Tc + 6.014)^0.820

Legend	
75.43	Proposed

STORM SEWER DESIGN SHEET - CONVENTIONAL SYSTEM

BARRHAVEN SOUTH PHASE 3 - S1 AREA

JLR NO.: 26610-300

Prepared By: MM
Reviewed By: KF

LOCATION			C-FACTORS				DRAINAGE AREAS		TIME OF CONCENTRATION			PEAK FLOW ESTIMATION											SEWER DATA									UPSTREAM GEOMETRY				DOWNSTREAM GEOMETRY				
			1:2 Year Storm (Residential/Local Streets)			1:5 Year Storm (Collector Roads)						1:2 Year Storm (Residential/Local Streets)					1:5 Year Storm (ICI)																							
Street	From MH	To MH	0.45	0.65	0.70	0.70	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:5 Yr Intensity (mm/hr)	Peak Flow (L/s)	2.78AR	Add. 2.78AR	Cum. 2.78AR	1:5 Yr Intensity (mm/hr)	Peak Flow (L/s)	Plug Flow (L/s)	Total Peak Flow (L/s)	Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity (L/s)	% Full	TG From	Obvert	Invert	Cover	TG To	Drop	Obvert	Invert	Cover
TO BORROSIKANE DITCH																																							
Kilbirnie Road	522	523				0.44	0.44	0.44	10.00	1.70	**11.70**	0.00		0.00	76.81	0.00	0.85		0.85	104.19	88.20		**88.20**	CONCRETE	375	381.00	0.25%	81.88	91.46	0.80	**3.26**	**96%**	107.30	104.986	104.605	**2.314**	105.749		104.781	104.400	**0.968**
LANDS SOUTH OF CAPPAMORE -PHASE 8 & INDUSTRIAL LANDS- CONVENTIONAL SYSTEM (INDUSTRIAL LANDS TO MH 525)																																							
Street No. 12	550	549		0.71			0.71	0.71	**10.00**	1.46	**11.46**	1.28		1.28	76.81	98.54	0.00		0.00	104.19	0.00		**98.54**	CONCRETE	450	457.20	0.20%	71.20	133.02	0.81	**34.48**	**74%**	104.15	102.571	102.114	**1.579**	104.100		102.429	101.972	**1.671**
Street No. 12	549	548		0.61			0.61	1.32	**11.46**	1.32	**12.79**	1.10		2.39	71.60	170.79	0.00		0.00	97.04	0.00		**170.79**	CONCRETE	525	533.40	0.20%	71.20	200.65	0.90	**29.85**	**85%**	104.10	102.429	101.895	**1.671**	104.000		102.286	101.753	**1.714**
Street No. 12	548	545		0.54			0.54	1.86	**12.79**	1.47	**14.26**	0.98		3.36	67.54	227.00	0.00		0.00	91.47	0.00		**227.00**	CONCRETE	600	609.60	0.15%	75.02	248.09	0.85	**21.09**	**92%**	104.00	102.286	101.677	**1.714**	103.921		102.174	101.564	**1.747**
Street No. 12	547	546		0.66			0.66	0.66	**10.00**	1.45	**11.45**	1.19		1.19	76.81	91.60	0.00		0.00	104.19	0.00		**91.60**	CONCRETE	450	457.20	0.20%	70.49	133.02	0.81	**41.42**	**69%**	104.08	102.456	101.999	**1.629**	103.988		102.315	101.858	**1.674**
Street No. 12	546	545		0.45			0.45	1.11	**11.45**	1.31	**12.76**	0.81		2.01	71.65	143.72	0.00		0.00	97.11	0.00		**143.72**	CONCRETE	525	533.40	0.20%	70.49	200.65	0.90	**56.93**	**72%**	103.99	102.315	101.781	**1.674**	103.921		102.174	101.640	**1.747**
Street No. 12	545	541		0.32			0.32	3.29	**14.26**	1.17	**15.42**	0.58		5.95	63.58	377.97	0.00		0.00	86.04	0.00		**377.97**	CONCRETE	750	762.00	0.15%	69.00	449.81	0.99	**71.84**	**84%**	103.92	102.174	101.412	**1.747**	103.825		102.070	101.308	**1.754**
Street No. 13	542	541		0.36			0.36	0.36	**10.00**	1.11	**11.11**	0.65		0.65	76.81	49.96	0.00		0.00	104.19	0.00		**49.96**	CONCRETE	375	381.00	0.30%	58.34	100.18	0.88	**50.22**	**50%**	104.70	102.245	101.864	**2.457**	103.825		102.070	101.689	**1.754**
Street No. 13	541	540		0.33			0.33	3.98	**15.42**	0.76	**16.18**	0.60		7.19	60.79	437.17	0.00		0.00	82.21	0.00		**437.17**	CONCRETE	825	838.20	0.15%	47.74	579.98	1.05	**142.81**	**75%**	103.82	102.070	101.232	**1.754**	103.705		101.999	101.160	**1.707**
Street No. 13	543	540		0.83			0.83	0.83	**10.00**	2.15	**12.15**	1.50		1.50	76.81	115.19	0.00		0.00	104.19	0.00		**115.19**	CONCRETE	450	457.20	0.20%	104.45	133.02	0.81	**17.82**	**87%**	103.86	102.208	101.750	**1.653**	103.705		101.999	101.541	**1.707**
Easement (ST 13 to ST14)	540	536					0.00	4.81	**16.18**	1.14	**17.32**	0.00		8.69	59.12	513.81	0.00		0.00	79.93	0.00		**513.81**	CONCRETE	825	838.20	0.15%	72.00	579.98	1.05	**66.17**	**89%**	103.71	101.999	101.160	**1.707**	103.603		101.891	101.052	**1.712**
Street No. 14	537	536			0.50		0.50	0.50	**10.00**	2.00	**12.00**	0.97		0.97	76.81	74.73	0.00		0.00	104.19	0.00		**74.73**	CONCRETE	375	381.00	0.30%	105.23	100.18	0.88	**25.45**	**75%**	104.57	102.206	101.825	**2.359**	103.603		101.891	101.510	**1.712**
Street No. 14	539	538			0.30		0.30	0.30	**10.00**	1.15	**11.15**	0.59		0.59	76.81	45.44	0.00		0.00	104.19	0.00		**45.44**	CONCRETE	450	457.20	0.20%	55.72	133.02	0.81	**87.58**	**34%**	103.70	102.114	101.656	**1.588**	103.652		102.002	101.545	**1.650**
Street No. 14	538	536			0.25		0.25	0.55	**11.15**	1.15	**12.29**	0.49		1.08	72.67	78.34	0.00		0.00	98.50	0.00		**78.34**	CONCRETE	450	457.20	0.20%	55.72	133.02	0.81	**54.67**	**59%**	103.65	102.002	101.545	**1.650**	103.603		101.891	101.433	**1.712**
Easement (ST 14 to ST13	536	532					0.00	5.86	**17.32**	0.73	**18.05**	0.00		10.74	56.78	609.98	0.00		0.00	76.74	0.00		**609.98**	CONCRETE	900	914.40	0.15%	48.50	731.45	1.11	**121.47**	**83%**	103.60	101.891	100.976	**1.712**	103.501		101.818	100.904	**1.683**
Street No. 13	533	532		0.70			0.70	0.70	**10.00**	1.83	**11.83**	1.26		1.26	76.81	97.15	0.00		0.00	104.19	0.00		**97.15**	CONCRETE	375	381.00	0.35%	103.93	108.21	0.95	**11.06**	**90%**	104.50	102.182	101.801	**2.319**	103.501		101.818	101.437	**1.683**
Street No. 13	535	534		0.50			0.50	0.50	**10.00**	1.20	**11.20**	0.90		0.90	76.81	69.39	0.00		0.00	104.19	0.00		**69.39**	CONCRETE	450	457.20	0.20%	58.20	133.02	0.81	**63.62**	**52%**	102.43	102.051	101.594	**0.376**	103.575		101.934	101.477	**1.640**
Street No. 13	534	532		0.44			0.44	0.94	**11.20**	1.20	**12.39**	0.80		1.70	72.49	123.14	0.00		0.00	98.27	0.00		**123.14**	CONCRETE	450	457.20	0.20%	58.20	133.02	0.81	**9.88**	**93%**	103.57	101.934	101.477	**1.640**	103.501		101.818	101.361	**1.683**
Easement (ST 13 to ST 15)	532	528					0.00	7.50	**18.05**	0.98	**19.03**	0.00		13.71	55.40	759.32	0.00		0.00	74.85	0.00		**759.32**	CONCRETE	975	990.60	0.15%	69.00	905.48	1.17	**146.16**	**84%**	103.50	101.818	100.827	**1.683**	103.405		101.714	100.724	**1.690**
Street No. 15	529	528		0.46			0.46	0.46	**10.00**	1.93	**11.93**	0.83		0.83	76.81	63.84	0.00		0.00	104.19	0.00		**63.84**	CONCRETE	375	381.00	0.30%	101.87	100.18	0.88	**36.34**	**64%**	104.32	102.020	101.639	**2.297**	103.405		101.714	101.333	**1.690**
Street No. 15	531	530		0.30			0.30	0.30	**10.00**	1.24	**11.24**	0.54		0.54	76.81	41.64	0.00		0.00	104.19	0.00		**41.64**	CONCRETE	450	457.20	0.20%	60.10	133.02	0.81	**91.38**	**31%**	103.50	101.955	101.498	**1.545**	103.454		101.835	101.377	**1.619**
Street No. 15	530	528		0.29			0.29	0.59	**11.24**	1.24	**12.47**	0.52		1.07	72.36	77.15	0.00		0.00	98.09	0.00		**77.15**	CONCRETE	450	457.20	0.20%	60.10	133.02	0.81	**55.87**	**58%**	103.45	101.835	101.377	**1.619**	103.405		101.714	101.257	**1.690**
Easement (ST 15 to ST 15)	528	525					0.00	**8.554**	**19.03**	1.06	**20.09**	0.00		15.60	53.65	837.16	0.00		0.00	72.46	0.00		**837.16**	CONCRETE	975	990.60	0.15%	74.99	905.48	1.17	**68.32**	**92%**	103.40	101.714	100.724	**1.690**	103.300		101.602	100.611	**1.698**
PHASE 7 - CONVENTIONAL SYSTEM (CAPPAMORE DRIVE TO MH 502)																																							
Cappamore Drive	556	555				0.41	0.41	0.41	**10.00**	1.56	**11.56**	0.00		0.00	76.81	0.00	0.81		0.81	104.19	83.94		**83.94**	CONCRETE	525	533.40	0.16%	75.20	179.46	0.80	**95.52**	**47%**	105.25	102.200	101.666	**3.052**	105.178		102.079	101.546	**3.097**
Cappamore Drive	555	554				0.36	0.36	0.77	**11.56**	1.56	**13.12**	0.00		0.00	71.29	0.00	0.70		1.51	96.61	145.52		**145.52**	CONCRETE	525	533.40	0.16%	75.20	179.46	0.80	**33.94**	**81%**	105.18	102.079	101.546	**3.097**	104.940		101.959	101.426	**2.980**
Cappamore Drive	554	553				0.28	0.28	1.05	**13.12**	1.37	**14.49**	0.00		0.00	66.59	0.00	0.54		2.05	90.16	184.93		**184.93**	CONCRETE	600	609.60	0.16%	72.01	256.22	0.88	**71.29**	**72%**	104.94	101.959	101.350	**2.980**	104.714		101.844	101.234	**2.870**
Cappamore Drive	553	552				0.16	0.16	1.21	**14.49**	1.37	**15.86**	0.00		0.00	63.00	0.00	0.31		2.36	85.25	201.39		**201.39**	CONCRETE	600	609.60	0.16%	72.08	256.22	0.88	**54.83**	**79%**	104.71	101.844	101.234	**2.870**	104.619		101.729	101.119	**2.891**
Cappamore Drive	552	551				0.23	0.23	1.44	**15.86**	1.06	**16.91**	0.00		0.00	59.82	0.00	0.45		2.81	80.89	227.30		**227.30**	CONCRETE	675	685.80	0.16%	60.25	350.77	0.95	**123.47**	**65%**	104.62	101.729	101.043	**2.891**	104.425		101.632	100.946	**2.792**
Cappamore Drive	551	**502**				0.33	0.33	1.78	**16.91**	1.07	**17.98**	0.00		0.00	57.59	0.00	0.65		3.46	77.84	269.19		**269.19**	CONCRETE	675	685.80	0.16%	60.77	350.77	0.95	**81.59**	**77%**	104.42	101.632	100.946	**2.792**	104.241		101.535	100.849	**2.706**
PHASE 6 - CONVENTIONAL SYSTEM (ELEVATION ROAD TO FILTRATION POND)																																							
Kilbirnie Drive	520	519				0.25	0.25	0.25	**10.00**	1.97	**11.97**	0.00		0.00	76.81	0.00	0.49		0.49	104.19	50.69		**50.69**	CONCRETE	450	457.20	0.20%	95.85	133.02	0.81	**82.33**	**38%**	109.00	107.100	106.643	**1.900**	108.893		106.908	106.451	**1.985**
Kilbirnie Drive	519	518				0.34	0.34	0.59	**11.97**	2.09	**14.06**	0.00		0.00	69.98	0.00	0.66		1.15	94.82	108.86		**108.86**	CONCRETE	525	533.40	0.15%	97.45	173.76	0.78	**64.90**	**63%**	108.89	106.908	106.375	**1.985**	108.772		106.762	106.228	**2.010**
Kilbirnie Drive	518	517				0.60	0.60	1.19	**14.06**	2.09	**16.15**	0.00		0.00	64.08	0.00	1.17		2.32	86.72	200.82		**200.82**	CONCRETE	600	609.60	0.15%	106.64	248.09	0.85	**47.26**	**81%**	108.77	106.762	106.152	**2.010**	108.643		106.602	105.992	**2.041**
Kilbirnie Drive	517	516				0.56	0.56	1.75	**16.15**	1.92	**18.07**	0.00		0.00	59.18	0.00	1.09		3.41	80.01	272.49		**272.49**	CONCRETE	675	685.80	0.15%	105.97	339.63	0.92	**67.15**	**80%**	108.64	106.602	105.916	**2.041**	108.514		106.443	105.757	**2.071**
Kilbirnie Drive	516	513				0.53	0.53	2.28	**18.07**	1.67	**19.75**	0.00		0.00	55.35	0.00	1.03		4.44	74.79	331.82		**331.82**	CONCRETE	675	685.80	0.20%	106.63	392.18	1.06	**60.35**	**85%**	108.51	106.443	105.757	**2.071**	108.385		106.230	105.544	**2.156**
Kilbirnie Drive	515	514				0.53	0.53	0.53	**10.00**	1.96	**11.96**	0.00		0.00	76.81	0.00	1.02		1.02	104.19	106.45		**106.45**	CONCRETE	450	457.20	0.20%	95.14	133.02	0.81	**26.57**	**80%**	109.09	106.610	106.153	**2.483**	108.744		106.420	105.963	**2.324**
Kilbirnie Drive	514	513				0.56	0.56	1.09	**11.96**	1.77	**13.72**	0.00		0.00	70.03	0.00	1.09		2.11	94.88	200.33		**200.33**	CONCRETE	525	533.40	0.20%	95.15	200.65	0.90	**0.32**	**100%**	108.74	106.420	105.887	**2.324**	108.385		106.230	105.696	**2.156**
Elevation Road	513	512					0.00	3.37	**19.75**	0.31	**20.05**	0.00		0.00	52.44	0.00	0.00		6.55	70.81	463.71		**463.71**	CONCRETE	675	685.80	0.45%	29.32	588.26	1.59	**124.56**	**79%**	108.39	106.230	105.544	**2.156**	108.231		106.098	105.412	**2.134**
Elevation Road	512	511				0.28	0.28	3.65	**20.05**	0.47	**20.52**	0.00		0.00	51.95	0.00	0.54		7.09	70.14	497.48		**497.48**	CONCRETE	675	685.80	0.45%	44.46	588.26	1.59	**90.78**	**85%**	108.23	106.098	105.412	**2.134**	107.992		105.898	105.212	**2.095**
Elevation Road	511	510					0.00	3.65	**20.52**	0.15	**20.67**	0.00		0.00	51.21	0.00	0.00		7.09	69.13	490.38		**490.38**	CONCRETE	675	685.80	0.45%	14.54	588.26	1.59	**97.89**	**83%**	107.99	105.898	105.212	**2.095**	107.934		105.832	105.146	**2.102**
Elevation Road	510	509				0.31	0.31	3.96	**20.67**	0.58	**21.25**	0.00		0.00	50.98	0.00	0.60		7.70	68.81	529.61		**529.61**	CONCRETE	675	685.80	0.45%	55.69	588.26	1.59	**58.65**	**90%**	107.93	105.832	105.146	**2.102**	107.739		105.582	104.896	**2.157**
Elevation Road	509	508				0.17	0.17	4.13	**21.25**	0.45	**21.71**	0.00		0.00	50.10	0.00	0.33		8.03	67.62	542.76		**542.76**	CONCRETE	675	685.80	0.50%	45.50	620.09	1.68	**77.32**	**88%**	107.74	105.582	104.896	**2.157**	107.491		105.354	104.668	**2.137**
Elevation Road	508	507				0.19	0.19	4.32	**21.71**	0.45	**22.16**	0.00		0.00	49.44	0.00	0.37		8.40	66.72	560.23		**560.23**	CONCRETE	675	685.80	0.50%	45.50	620.09	1.68	**59.86**	**90%**	107.49	105.354	104.668	**2.137**	107.242		105.127	104.441	**2.115**
Elevation Road	507	506				0.18	0.18	4.50	**22.16**	0.48	**22.64**	0.00		0.00	48.80	0.00	0.35		8.75	65.85	575.98		**575.98**	CONCRETE	675	685.80	0.50%	48.77	620.09	1.68	**44.10**	**93%**	107.24	105.127	104.441	**2.115**	106.985		104.883	104.197	**2.102**
Elevation Road	506	505				0.33	0.33	4.83	**22.64**	0.68	**23.32**	0.00		0.00	48.14	0.00	0.64		9.39	64.94	609.76		**609.76**	CONCRETE	750	762.00	0.50%	73.50	821.24	1.80	**211.48**	**74%**	106.98	104.883	104.121	**2.102**	106.711		104.515	103.753	**2.196**
Elevation Road	505	504				0.33	0.33	5.16	**23.32**	0.77	**24.09**	0.00		0.00	47.24	0.00	0.64		10.03	63.71	639.16		**639.16**	CONCRETE	750	762.00	0.50%	83.54	821.24	1.80	**182.09**	**78%**	106.71	104.515	103.753	**2.196**	105.734		104.098	103.336	**1.637**
Elevation Road	504	503	1.92			0.29	2.21	7.37	**24.09**	0.71	**24.80**	2.40		2.40	46.26	111.11	0.56		10.60	62.38	660.99		**772.09**	CONCRETE	750	762.00	0.60%	83.54	899.63	1.97	**127.53**	**86%**	105.73	104.098	103.336	**1.637**	104.507	2.020	103.596	102.834	**0.911**
Cappamore Drive	503	502				0.41	0.41	7.78	**24.80**	0.39	**25.19**	0.00		2.40	45.40	109.05	0.81		11.40	61.22	697.97		**807.02**	CONCRETE	975	990.60	0.15%	27.54	905.48	1.17	**98.46**	**89%**	104.51	101.576	100.586	**2.931**	104.241		101.535	100.544	**2.706**
Street No. 17	502	MTD		0.24			0.24	9.80	**25.19**	0.33	**25.52**	0.43		2.84	44.94	127.44	0.00		14.86	60.59	900.39		**1027.84**	CONCRETE	975	990.60	0.30%	33.22	1280.55	1.66	**252.71**	**80%**	104.24	101.535	100.544	**2.706**	103.560		101.435	100.445	**2.125**
Street No. 17	527	526		0.48			0.48	0.48	**10.00**	1.25	**11.25**	0.86		0.86	76.81	66.20	0.00		0.00	104.19	0.00		**66.20**	CONCRETE	375	381.00	0.25%	60.15	91.46	0.80	**25.25**	**72%**	103.45	101.903	101.522	**1.547**	103.375		101.753	101.372	**1.622**
Street No. 17	526	525		0.44			0.44	0.92	**11.25**	1.11	**12.36**	0.80		1.66	72.32	119.83	0.00		0.00	98.02	0.00		**119.83**	CONCRETE	450	457.20	0.25%	60.33	148.72	0.91	**28.88**	**81%**	103.38	101.753	101.296	**1.622**	103.300		101.602	101.145	**1.698**
Street No. 17	525	**MTD**		0.48			0.48	9.95	**20.09**	1.02	**21.11**	0.87		18.13	51.89	940.60	0.00		0.00	70.05	0.00		**940.60**	CONCRETE	975	990.60	0.20%	83.30	1045.56	1.36	**104.97**	**90%**	103.30	101.602	100.611	**1.698**	103.560		101.435	100.445	**2.125**
To Block 61 SWM Pond (West Entrance)	MTD	OVERFLOW					0.00	19.75	**25.52**	0.28	**25.81**	0.00		20.96	44.56	934.17	0.00		14.86	60.07	892.65		**1826.82**	CONCRETE	1050	1066.80	0.50%	38.50	2014.40	2.25	**187.58**	**91%**	103.56	101.435	100.369	**2.125**	103.120		101.243	100.176	**1.877**
Street No. 17	OVERFLOW	500A					0.00	19.75	**25.81**	0.11	**25.92**	0.00		20.96	44.24	927.43	0.00		14.86	59.63	886.15		**1813.58**	CONCRETE	1050	1066.80	0.50%	15.21	2014.40	2.25	**200.82**	**90%**	103.12	101.243	100.176	**1.877**	101.583		101.167	100.100	**0.416**
Street No. 17	OVERFLOW	500							**10.00**	0.40	**10.40**												**0.00**	CONCRETE	600	609.60	0.50%	37.15	452.94	1.55	**452.94**	**0%**	102.94	101.410	**100.800**	**1.527**	103.153		101.224	100.614	**1.929**
SWM Pond (OVERFLOW)	500	POND							**10.40**	0.14	**10.54**												**0.00**	CONCRETE	600	609.60	0.50%	12.95	452.94	1.55	**452.94**	**0%**	103.15	101.224	100.614	**1.929**	101.645		101.159	100.550	**0.485**

Design Parameters (Per OSDG)	
Manning's Coefficient =	0.013
1:2 Year Intensity =	732.951 / (Tc + 6.199)^0.810
1:5 Year Intensity =	998.071 / (Tc + 6.053)^0.814
1:100 Year Intensity =	1735.688 / (Tc + 6.014)^0.820

Legend	
75.43	Proposed

Appendix H

PCSWMM Model Inputs and Results and Schematics

Legend

- Surface Junction
- Roadside Ditch
- Subcatchments

N

300 m

PROJECT:

BARRHAVEN SOUTH PHASE 3 (S1 AREA)
Ottawa, ON

DRAWING:

Pre-Development Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN:	ML	JLR NO.:	
DRAWN:	ML	DRAWING NO.:	
CHECKED:	GF		

Legend

- Surface Junction
- Trunk Sewer Manhole
- On-Site Storage
- Traditional STM Manhole
- Dry Pond
- StormTrunk Sewers
- Storm_Sewer
- Street ROW
- Roadside Ditch
- Overland Flow Route
- Minor System Inlet
- Subcatchments

N

300 m

PROJECT:

BARRHAVEN SOUTH PHASE 3 (S1 AREA)
Ottawa, ON

DRAWING:

Post-Development Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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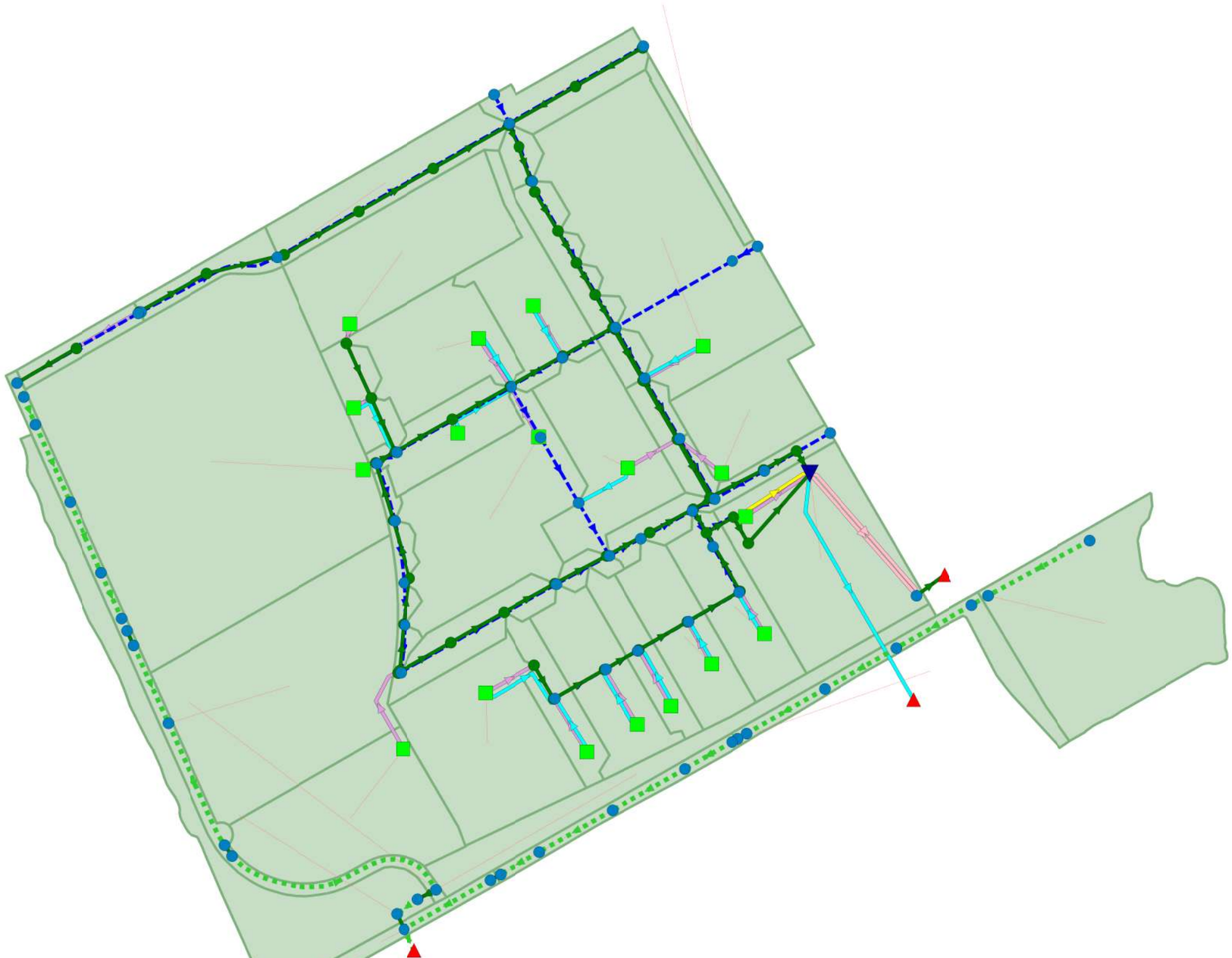
DESIGN:	ML	JLR NO.:	
DRAWN:	ML	DRAWING NO.:	
CHECKED:	GF		



Legend

- Street High Points/Junctions
- Outfall

Storm Sewer Network
- On-Site Storage/Surface Storage
- Traditional STM Manhole
- Dry Pond

Storm Sewer Network
- Spillway
- Storm_Sewer
- Street ROW
- Roadside Ditch
- Orifices
- Weirs

Minor System Inlet

N

300 m

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

Ottawa, ON

DRAWING:

Overall Model Schematic

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

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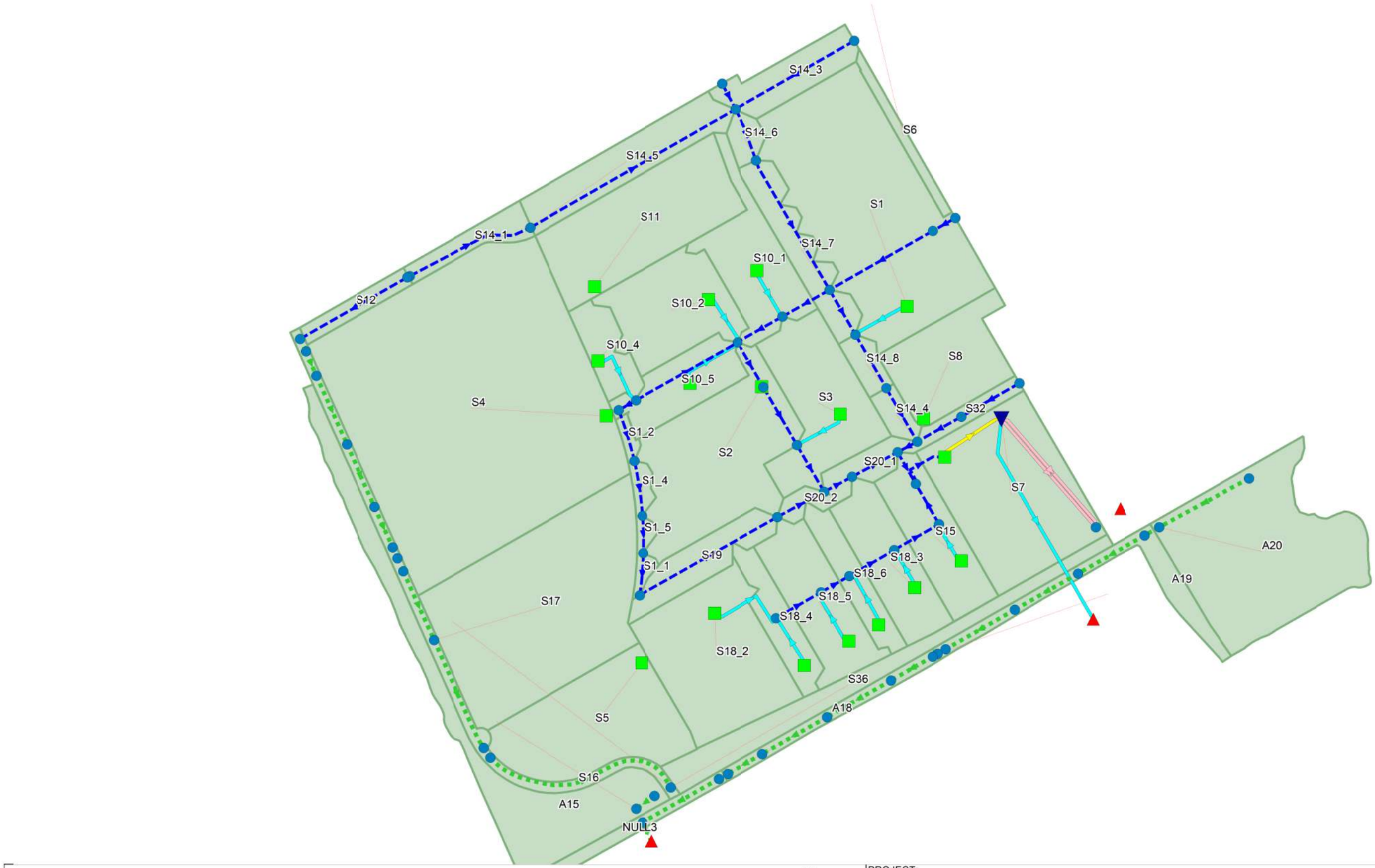
DESIGN:	ML	JLR NO.:	26610-003
DRAWN:	ML	DRAWING NO.:	
CHECKED:	GF		



Legend

- Street High Points/Junctions
- Outfall

Storm Sewer Network
- On-Site Storage/Surface Storage
- Dry Pond

Storm Sewer Network
- Spillway
- Street ROW
- Roadside Ditch
- Orifices
- Weirs
- Subcatchments

N

300 m

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

Ottawa, ON

DRAWING:

Major Systeml Model Schematic

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN:	ML	JLR NO.:	26610-003
DRAWN:	ML	DRAWING NO.:	
CHECKED:	GF		

Legend

- Outfall
- Storm Sewer Network
  - On-Site Storage/Surface Storage
  - Traditional STM Manhole
  - Dry Pond
  - Storm Sewer Network
- Orifices
- Minor System Inlet
- Subcatchments

N

300 m

PROJECT:

BARRHAVEN SOUTH PHASE 3 - S1 AREA

Ottawa, ON

DRAWING:

Minor System Model Schematic

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN:	ML	JLR NO.:	26610-003
DRAWN:	ML	DRAWING NO.:	
CHECKED:	GF		

Major Overland Flow Results (Continued)

Major System Node	July 1, 1979 Ponding Depth (mm)	August 8, 1996 Ponding Depth (mm)	August 4, 1988 Ponding Depth (mm)	1:100-yr + 20% 3-hr Chi Ponding Depth (mm)	1:100-yr + 20% 24-hr SCS Type II Ponding Depth (mm)
S_525-MTD	180	100	140	370	290
S_528-525	140	100	140	250	220
S_536-532	200	160	190	280	250
S_619-606	190	130	180	270	250
S_622-619_2	200	150	200	280	260
S_604-603	150	100	140	220	210
S_541-540	170	110	170	250	230
S_622-619	200	140	210	290	270
S_605-604	180	110	160	290	260
S_627-630	120	80	110	170	150
S_532-528	130	100	130	240	200
S_540-536	180	140	180	230	220
S_629-622	140	110	150	220	200

Post-Development 1:2 year 24-hour SCS Event

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option             Value
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           07/23/2009
START_TIME           00:00:00
REPORT_START_DATE    07/23/2009
REPORT_START_TIME    00:00:00
END_DATE             07/25/2009
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         1
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              18

[EVAPORATION]
;;Data Source    Parameters
;;--------------- ----------
CONSTANT         0.0
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- -------- -------- ----------
24SCS100         INTENSITY 0:15     1.0      TIMESERIES 24SCS100
6SCS050          INTENSITY 0:15     1.0      TIMESERIES 6SCS050
Rainfall         INTENSITY 0:15     1.0      TIMESERIES SCS_24h_2

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------
;DONE
A15              Rainfall         EXD_12           3.4644   18.978   13.1     0.5      0
;DONE
A18              Rainfall         EXD_25           0.5932   39.122   338.21   0.5      0
;DONE
A19              Rainfall         EXD_20           1.1065   22.322   332.78   0.5      0
A20              Rainfall         EXD_15           4.8334   8.369    279.76   1.5      0
NULL3            Rainfall         EXD_27           0.5651   83.329   312.75   1.45     0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (15.05)
S1               Rainfall         S_605-604        6.5243   66.38    1467.982 2        0
S1_1             Rainfall         J19              0.1211   71.429   118.05   2        0
S1_2             Rainfall         J22              0.1167   71.429   147.716  2        0
S1_4             Rainfall         J21              0.1909   71.429   154.58   2        0
S1_5             Rainfall         J20              0.1081   71.429   103.566  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.00)
S10_1            Rainfall         S_619-606        1.8437   64.286   414.837  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (13.80)
S10_2            Rainfall         S_622-619_2      2.1249   64.286   478.107  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (10.68)
S10_4            Rainfall         S_627-630        0.7263   64.286   163.419  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (15+0.19+0.29+0.87)
S10_5            Rainfall         S_629-622        1.2601   64.286   283.525  2        0
S11              Rainfall         SU2              3.2951   0        287      2        0
S12              Rainfall         J6               0.4354   71.429   334.74   2        0
S14_1            Rainfall         J28              0.5987   71.429   367.102  2        0
S14_3            Rainfall         J58              1.0625   71.429   381.294  2        0
S14_4            Rainfall         J44              0.2971   71.429   171.63   2        0
S14_5            Rainfall         J29              1.6863   71.429   659.05   2        0
S14_6            Rainfall         J59              0.2889   71.429   153.642  2        0
S14_7            Rainfall         J61              1.1749   71.429   557.968  2        0
S14_8            Rainfall         J48              0.3376   71.429   171.63   2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.36)
S15              Rainfall         S_525-MTD        1.6367   64.286   368.261  2        0
S16              Rainfall         EXD_10           1.4691   100      16.6     0.5      0
S17              Rainfall         EXD_7            6.2561   3.33     202      0.5      0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (15.42)
S18_2            Rainfall         S_541-540        3.3513   64.286   754.05   2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.47)
S18_3            Rainfall         S_528-525        1.6567   64.286   372.761  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.15)
S18_4            Rainfall         S_540-536        0.8758   64.286   197.057  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.29)
S18_5            Rainfall         S_536-532        1.8312   71.428   412.024  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (12.39)
S18_6            Rainfall         S_532-528        0.8398   64.286   188.957  2        0
S19              Rainfall         J19              1.0541   71.429   441.382  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (26.25)
S2               Rainfall         S_622-619        3.7207   66.87    837.166  2        0
S20_1            Rainfall         J40              0.4963   71.429   441.344  2        0
S20_2            Rainfall         J36              0.2267   71.429   441.344  2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (13.41)
S3               Rainfall         S_604-603        2.4768   64.286   557.286  2        0
S32              Rainfall         J46              0.4144   71.429   327.124  2        0
S36              Rainfall         EXD_10           1.8184   100      21       0.5      0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (15.19)
S4               Rainfall         631_(C-STRM)     13.2176  85.714   348.8    2        0
;Imperviousness Based on DS Breakdown, Tc or inlet time based on downstream Tc taken from DS (18.32)
S5               Rainfall         682_(C-STRM)     3.1877   85.714   291.5    1        0
S6               Rainfall         OF2              0.3419   57.143   260.95   2        0
S7               Rainfall         POND_(C-STRM)    3.9852   85.714   402.8    0.5      0
S8               Rainfall         SU5              1.9171   35.714   119.9    2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A15              0.013      0.25       1.57       4.67       0          PERVIOUS   20
A18              0.013      0.25       1.57       4.67       0          PERVIOUS   20
A19              0.013      0.25       1.57       4.67       0          PERVIOUS   20
A20              0.013      0.25       1.57       4.67       0          PERVIOUS   20
NULL3            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S1               0.013      0.25       1.57       4.67       0          PERVIOUS   70
S1_1             0.013      0.25       1.57       4.67       0          PERVIOUS   20
S1_2             0.013      0.25       1.57       4.67       0          PERVIOUS   20
S1_4             0.013      0.25       1.57       4.67       0          PERVIOUS   20
S1_5             0.013      0.25       1.57       4.67       0          PERVIOUS   20
S10_1            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S10_2            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S10_4            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S10_5            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S11              0.013      0.25       1.57       4.67       0          PERVIOUS   100
S12              0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_1            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_3            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_4            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_5            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_6            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_7            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S14_8            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S15              0.013      0.25       1.57       4.67       0          PERVIOUS   70
S16              0.013      0.25       1.57       4.67       0          PERVIOUS   20
S17              0.013      0.25       1.57       4.67       0          PERVIOUS   100
S18_2            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S18_3            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S18_4            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S18_5            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S18_6            0.013      0.25       1.57       4.67       0          PERVIOUS   70
S19              0.013      0.25       1.57       4.67       0          PERVIOUS   20
S2               0.013      0.25       1.57       4.67       0          PERVIOUS   70
S20_1            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S20_2            0.013      0.25       1.57       4.67       0          PERVIOUS   20
S3               0.013      0.25       1.57       4.67       0          PERVIOUS   70
S32              0.013      0.25       1.57       4.67       0          PERVIOUS   20
S36              0.013      0.25       1.57       4.67       0          PERVIOUS   20
S4               0.013      0.25       1.57       4.67       0          OUTLET
S5               0.013      0.25       1.57       4.67       0          OUTLET
S6               0.013      0.25       1.57       4.67       0          PERVIOUS   20
S7               0.013      0.25       1.57       4.67       0          OUTLET
S8               0.013      0.25       1.57       4.67       0          PERVIOUS   100

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
A15              61         0.5        7          0          0          CURVE_NUMBER
A18              76.2       13.2       4.14       7          0
A19              76.2       13.2       4.14       7          0
A20              49         0.5        7          0          0          CURVE_NUMBER
NULL3            76.2       13.2       4.14       7          0
S1               76.2       13.2       4.14       7          0
S1_1             76.2       13.2       4.14       7          0
S1_2             76.2       13.2       4.14       7          0
S1_4             76.2       13.2       4.14       7          0
S1_5             76.2       13.2       4.14       7          0
S10_1            76.2       13.2       4.14       7          0
S10_2            76.2       13.2       4.14       7          0
S10_4            76.2       13.2       4.14       7          0
S10_5            76.2       13.2       4.14       7          0
S11              76.2       13.2       4.14       7          0
S12              76.2       13.2       4.14       7          0
S14_1            76.2       13.2       4.14       7          0
S14_3            76.2       13.2       4.14       7          0
S14_4            76.2       13.2       4.14       7          0
S14_5            76.2       13.2       4.14       7          0
S14_6            76.2       13.2       4.14       7          0
S14_7            76.2       13.2       4.14       7          0
S14_8            76.2       13.2       4.14       7          0
S15              76.2       13.2       4.14       7          0
S16              76         12.7       4          7          0
S17              76.2       13.2       4.14       7          0
S18_2            76.2       13.2       4.14       7          0
S18_3            76.2       13.2       4.14       7          0
S18_4            76.2       13.2       4.14       7          0
S18_5            76.2       13.2       4.14       7          0
S18_6            76.2       13.2       4.14       7          0
S19              76.2       13.2       4.14       7          0
S2               76.2       13.2       4.14       7          0
S20_1            76.2       13.2       4.14       7          0
S20_2            76.2       13.2       4.14       7          0
S3               76.2       13.2       4.14       7          0
S32              76.2       13.2       4.14       7          0
S36              76         12.7       4          7          0
S4               76.2       13.2       4.14       7          0
S5               76.2       13.2       4.14       7          0
S6               76.2       13.2       4.14       7          0
S7               76.2       13.2       4.14       7          0
S8               76.2       13.2       4.14       7          0

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
EXD_1            104.392    1.008      0          0          0
EXD_10           98.653     1.005      0          0          0
EXD_11           98.498     1.005      0          0          0
EXD_12           98.305     1.005      0          0          0
EXD_13           104.324    1.076      0          0          0
EXD_14           102.49     0.405      0          0          0
EXD_15           100.269    0.781      0          0          0
EXD_16           100.201    0.405      0          0          0
EXD_17           99.888     0.288      0          0          0
EXD_18           99.401     0.426      0          0          0
EXD_19           99.193     0.22       0          0          0
EXD_2            103.469    1.931      0          0          0
EXD_20           99.186     0.226      0          0          0
EXD_21           99.181     0.231      0          0          0
EXD_22           99.144     0.266      0          0          0
EXD_23           98.748     0.565      0          0          0
EXD_24           98.668     1.099      0          0          0
EXD_25           98.523     1.099      0          0          0
EXD_26           98.485     1.099      0          0          0
EXD_27           98.165     1.099      0          0          0
EXD_3            103.19     1.41       0          0          0
EXD_4            102.643    1.202      0          0          0
EXD_5            102.496    1.147      0          0          0
EXD_6            102.32     1.08       0          0          0
EXD_7            101.495    1.005      0          0          0
EXD_8            100.485    1.005      0          0          0
EXD_9            100.385    1.005      0          0          0
J10              103.6      0.5        0          0          0
J11              103.5      0.5        0          0          0
J12              103.4      0.5        0          0          0
J13              103.3      0.5        0          0          0
J17              104.372    1.028      0          0          0
J19              105.4      0.5        0          0          0
J20              105.45     0.5        0          0          0
J21              105.55     0.5        0          0          0
J22              105.7      0.5        0          0          0
J23              106        0.5        0          0          0
J24              106.2      0.5        0          0          0
J25              105.3      0.5        0          0          0
J26              105.7      0.5        0          0          0
J28              109        0.5        0          0          0
J29              108.8      0.5        0          0          0
J32              106        0.5        0          0          0
J36              104.7      0.5        0          0          0
J39              104.6      0.5        0          0          0
J40              104.45     0.5        0          0          0
J41              103.2      0.5        0          0          0
J43              104.2      0.5        0          0          0
J44              104.5      0.5        0          0          0
J46              104.6      0.5        0          0          0
J47              105.1      0.5        0          0          0
J48              105.75     0.5        0          0          0
J51              106.75     0.5        0          0          0
J52              109.75     0.5        0          0          0
J53              109        0.5        0          0          0
J56              109.1      0.5        0          0          0
J57              108.47     0.5        0          0          0
```

```
J58              108.4      0.5        0          0          0
J59              108        0.5        0          0          0
J6               109.829    0          0          0          0
J61              107        0.5        0          0          0
J62              106.5      0.5        0          0          0
J74              98.45      0.77       0          5          0
J9               103.7      0.5        0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;---------------- ---------- ---------- ---------------- -------- ----------------
OF1              100.8      FREE                        NO
OF2              0          FREE                        NO
OF3              98         FREE                        NO
;SP
ST4_108A_(P-Stm) 98.019     TIMESERIES 24SCS002_QUINNS_ST4_108A_HEAD NO
0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape       Curve Name/Params
SurDepth Fevap    Psi      Ksat     IMD
;;---------------- -------- ---------- ---------- ----------- ---------------------------- -----
--- -------- -------- -------- --------
;Cylindrical Structure Slab Top Circular Frame SI
500_(C-STRM)     100.314  2.839      0          FUNCTIONAL  0          0          1.13     0
0
500A_(C-STRM)    100.1    1          0          TABULAR     Filtration_POND              0
0
;Cylindrical Structure Slab Top Circular Frame SI
502_(C-STRM)     100.544  3.697      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
503_(C-STRM)     100.586  3.921      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
504_(C-STRM)     103.036  2.699      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
505_(C-STRM)     103.453  3.258      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
506_(C-STRM)     103.821  3.164      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
507_(C-STRM)     104.141  3.101      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
508_(C-STRM)     104.368  3.123      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
509_(C-STRM)     104.596  3.143      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
510_(C-STRM)     104.846  3.087      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
511_(C-STRM)     104.912  3.081      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
512_(C-STRM)     105.112  3.119      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
513_(C-STRM)     105.244  3.141      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
514_(C-STRM)     105.587  3.157      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
515_(C-STRM)     105.853  3.24       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
516_(C-STRM)     105.457  3.057      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
517_(C-STRM)     105.616  3.027      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
518_(C-STRM)     105.852  2.92       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
519_(C-STRM)     106.075  2.818      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
520_(C-STRM)     106.343  2.657      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
522_(C-STRM)     104.305  2.995      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
525_(C-STRM)     100.611  2.689      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
528_(C-STRM)     100.724  2.681      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
532_(C-STRM)     100.827  2.673      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
536_(C-STRM)     100.976  2.626      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
540_(C-STRM)     100.86   2.845      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
541_(C-STRM)     100.932  2.893      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
551_(C-STRM)     100.646  3.778      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
552_(C-STRM)     100.743  3.877      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
553_(C-STRM)     100.934  3.78       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
554_(C-STRM)     101.05   3.89       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
555_(C-STRM)     101.246  3.93       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
556_(C-STRM)     101.366  3.886      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
601_(C-STRM)     100.449  4.427      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
602_(C-STRM)     100.519  4.106      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
603_(C-STRM)     100.63   3.892      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
604_(C-STRM)     100.877  4.874      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
605_(C-STRM)     101.086  5.627      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
606_(C-STRM)     101.236  5.752      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
619_(C-STRM)     101.377  5.14       0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
622_(C-STRM)     101.527  4.485      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
626_(C-STRM)     103.943  3.327      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
627_(C-STRM)     103.129  3.575      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
629_(C-STRM)     101.649  4.464      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
630_(C-STRM)     102.076  4.123      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
630A_(C-STRM)    102.117  3.899      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
631_(C-STRM)     106      0.5        0          FUNCTIONAL  0          0          5000     0
0
;Cylindrical Structure Slab Top Circular Frame SI
645_(C-STRM)     102.028  3.692      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
647_(C-STRM)     102.139  3.404      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
650_(C-STRM)     102.224  3.191      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
651_(C-STRM)     102.31   3.034      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
682_(C-STRM)     105.4    0.5        0          FUNCTIONAL  0          0          1500     0
0
;Cylindrical Structure Slab Top Circular Frame SI
MTD_(C-STRM)     100.369  3.192      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
OVERFLOW_(C-STRM) 100.176 2.761      0          FUNCTIONAL  0          0          1.13     0
0
;Cylindrical Structure Slab Top Circular Frame SI
POND_(C-STRM)    98.45    2.65       0          TABULAR     POND_UPDATED                 0
0
;70m3/ha below weir elevation (114.569 m3)
S_525-MTD        103.3    0.5        0          FUNCTIONAL  0          0          1145.69  0
0
;70m3/ha below weir elevation (115.969 m3)
S_528-525        103.405  0.5        0          FUNCTIONAL  0          0          1159.69  0
0
;70m3/ha below weir elevation (58.786 m3)
S_532-528        103.5    0.5        0          FUNCTIONAL  0          0          587.86   0
0
;70m3/ha below weir elevation (128.184 m3)
S_536-532        103.602  0.5        0          FUNCTIONAL  0          0          854.56   0
0
;70m3/ha below weir elevation (61.306 m3)
S_540-536        103.705  0.5        0          FUNCTIONAL  0          0          408.706  0
0
;70m3/ha below weir elevation (234.59 m3)
S_541-540        103.815  0.5        0          FUNCTIONAL  0          0          2345.9   0
0
;70m3/ha below weir elevation (173.376m3) - average of unfactored infiltration rates from
Paterson report for BH 9-22(34mm/hr) and BH 8-22 (23.8mm/hr)
S_604-603        105.5    0.5        0          FUNCTIONAL  0          0          1733.76  0
0          0        28.9     0
;70m3/ha below weir elevation (456.701m3)- average of unfactored infiltration rates from
Paterson report for BH 17-22(35.2mm/hr) and BH 18-22 (32mm/hr)
S_605-604        106.714  0.5        0          FUNCTIONAL  0          0          4567.01  0
0          0        33.6     0
;70m3/ha below weir elevation (129.059m3) - average of unfactored infiltration rates from
Paterson report for BH 11-22(44.8mm/hr) and BH 16-22 (42.8mm/hr)
S_619-606        106.5    0.5        0          FUNCTIONAL  0          0          860.393  0
0          0        43.8     0
;70m3/ha below weir elevation (260.449m3) - average of unfactored infiltration rates from
Paterson report for BH 11-22(44.8mm/hr) and BH 18-15 (26mm/hr)
S_622-619        105.7    0.5        0          FUNCTIONAL  0          0          2604.49  0
0          0        35.4     0
;70m3/ha below weir elevation (148.743m3) - average of unfactored infiltration rates from
Paterson report for BH 11-22(44.8mm/hr) and BH 16-22 (42.8mm/hr)
S_622-619_2      106.5    0.5        0          FUNCTIONAL  0          0          991.62   0
0          0        43.8     0
;70m3/ha below weir elevation (50.841 m3)- average of unfactored infiltration rates from
Paterson report for BH 11-22(44.8mm/hr) and BH 18-15 (26mm/hr)
S_627-630        106.7    0.5        0          FUNCTIONAL  0          0          508.41   0
0          0        43.8     0
;70m3/ha below weir elevation (88.207m3)- average of unfactored infiltration rates from
Paterson report for BH 11-22(44.8mm/hr) and BH 18-15 (26mm/hr)
S_629-622        106.012  0.5        0          FUNCTIONAL  0          0          882.07   0
0          0        35.4     0
SU2              106.75   0.5        0          FUNCTIONAL  0          0          1000     0
0
SU5              104.18   0.5        0          FUNCTIONAL  0          0          1000     0
0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset
InitFlow   MaxFlow
;;---------------- ---------------- ---------------- ---------- ---------- ---------- ----------
---------- ---------
BDR-C1           EXD_15           EXD_16           17.689     0.025      100.269    100.201
0          0
BDR-C2           EXD_20           EXD_21           7.913      0.013      99.186     99.181
0          0
BDR-C3           EXD_25           EXD_26           14.161     0.013      98.523     98.485
0          0
BDR-C4           EXD_12           EXD_27           23.037     0.013      98.305     98.165
0          0
C1_1             J32              J26              71.757     0.01       106        105.7
0          0
C1_17            J6               EXD_1            171.906    0.01       109        105.6
0          0
C1_3             J28              J29              183.551    0.01       109        108.8
0          0
C1_30            J26              J25              93.112     0.01       105.7      105.3
0          0
C1_4             J25              J39              75.037     0.01       105.3      104.6
0          0
C14_1            J20              J19              59.025     0.01       105.45     105.4
0          0
C14_2            J23              J22              73.858     0.01       106        105.7
0          0
C14_4            J22              J21              77.29      0.01       105.7      105.55
0          0
C14_5            J21              J20              51.783     0.01       105.55     105.45
0          0
C15_1            J29              J58              329.525    0.01       108.8      108.4
0          0
C15_2            J56              J58              190.647    0.01       109.1      108.4
0          0
C2               J41              500A_(C-STRM)    74.65      0.01       103.2      103
0          0
C20_1            J57              J58              40.021     0.01       108.47     108.4
0          0
C20_2            J59              J61              206.979    0.01       108        107
0          0
C20_3            J58              J59              76.821     0.01       108.4      108
0          0
C20_4            J61              J51              72.005     0.01       107        106.75
0          0
C20_5            J51              J48              85.815     0.01       106.75     105.75
0          0
C20_7            J48              J44              85.815     0.01       105.75     104.5
0          0
C23_5            J13              J41              64.406     0.01       103.3      103.2
0          0
C23_7            J43              J41              50.677     0.01       104.2      103.2
0          0
C3               J9               J10              71.953     0.01       103.7      103.6
0          0
C4               J10              J11              45.538     0.01       103.6      103.5
0          0
```

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C4_1              J24               J23               27.626     0.01       106.2      106
0          0
C4_2              J62               J32               72.007     0.01       106.5      106
0          0
C4_3              J24               J32               162.96     0.01       106.2      106
0          0
C4_4              J61               J62               75.014     0.01       107        106.5
0          0
C4_5              J53               J61               165.502    0.01       109        107
0          0
C4_7              J52               J53               35.903     0.01       109.75     109
0          0
C5                J11               J12               72.05      0.01       103.5      103.4
0          0
C5_1              EXD_1             J17               18.978     0.025      104.392    104.372
0          0
C5_10             EXD_16            EXD_17            80.972     0.025      100.201    99.888
0          0
C5_11             EXD_18            EXD_19            109.87     0.025      99.401     99.193
0          0
C5_12             EXD_27            OF3               27.06      0.025      98.165     98
0          0
C5_13             EXD_17            EXD_18            99.871     0.025      99.888     99.401
0          0
C5_14             EXD_19            EXD_20            12.732     0.025      99.193     99.186
0          0
C5_15             EXD_22            EXD_23            101.723    0.025      99.144     98.748
0          0
C5_16             EXD_23            EXD_24            102.447    0.025      98.748     98.668
0          0
C5_17             EXD_24            EXD_25            54.83      0.025      98.668     98.523
0          0
C5_19             EXD_21            EXD_22            66.275     0.025      99.181     99.144
0          0
C5_2              EXD_2             EXD_3             95.136     0.025      103.469    103.19
0          0
C5_20             EXD_26            EXD_27            120.962    0.025      98.485     98.165
0          0
C5_21             EXD_14            EXD_15            142.148    0.025      102.49     100.269
0          0
C5_23             J17               EXD_13            36.963     0.025      104.372    104.324
0          0
C5_3              EXD_13            EXD_2             104.333    0.025      104.324    103.469
0          0
C5_4              EXD_4             EXD_5             16.555     0.025      102.643    102.496
0          0
C5_5              EXD_6             EXD_7             104.528    0.025      102.32     101.495
0          0
C5_6              EXD_3             EXD_4             61.663     0.025      103.19     102.643
0          0
C5_7              EXD_9             EXD_10            284.352    0.025      100.385    98.653
0          0
C5_8              EXD_7             EXD_8             165.719    0.025      101.495    100.485
0          0
C5_9              EXD_11            EXD_12            31.708     0.025      98.498     98.305
0          0
C6                J12               J13               71.942     0.01       103.4      103.3
0          0
C7                J46               J44               70.191     0.01       104.6      104.5
0          0
C9_1              J19               J36               220.686    0.01       105.4      104.7
0          0
C9_11             J47               J46               93.364     0.01       105.1      104.6
0          0
C9_2              J36               J39               45.522     0.01       104.7      104.6
0          0
C9_5              J39               J40               43.972     0.01       104.6      104.45
0          0
C9_6              J40               J43               72.033     0.01       104.45     104.2
0          0
C9_7              J44               J43               31.084     0.01       104.5      104.2
0          0
;Concrete Pipes 100-D
C-STRM-1_(1)_(1)_(C-STRM) 516_(C-STRM) 513_(C-STRM) 106.63    0.013      105.757    105.544
0          0
;Concrete Pipes 100-D
C-STRM-1_(1)_(C-STRM) 517_(C-STRM) 516_(C-STRM)    105.974    0.013      105.916    105.757
0          0
;Concrete Pipes 100-D
C-STRM-1_(C-STRM) 518_(C-STRM)     517_(C-STRM)    106.639    0.013      106.152    105.992
0          0
;Concrete Pipes 100-D
C-STRM-100_(C-STRM) OVERFLOW_(C-STRM) 500_(C-STRM) 37.146     0.013      100.8      100.614
0          0
;Concrete Pipes 100-D
C-STRM-101_(C-STRM) 500_(C-STRM)   POND_(C-STRM)   12.947     0.013      100.614    100.4
0          0
;Concrete Pipes 100-D
C-STRM-102_(C-STRM) OVERFLOW_(C-STRM) 500A_(C-STRM) 15.211    0.01       100.176    100.1
0          0
;Concrete Pipes 100-D
C-STRM-103_(C-STRM) 650_(C-STRM)   647_(C-STRM)    56.943     0.013      102.524    102.439
0          0
;Concrete Pipes 100-D
C-STRM-104_(C-STRM) 647_(C-STRM)   645_(C-STRM)    74.229     0.013      102.439    102.328
0          0
;Concrete Pipes 100-D
C-STRM-105_(C-STRM) 645_(C-STRM)   630A_(C-STRM)   73.795     0.013      102.328    102.217
0          0
;Concrete Pipes 100-D
C-STRM-2_(1)_(C-STRM) 512_(C-STRM) 511_(C-STRM)    44.46      0.013      105.412    105.212
0          0
;Concrete Pipes 100-D
C-STRM-2_(C-STRM) 513_(C-STRM)     512_(C-STRM)    29.322     0.013      105.544    105.412
0          0
;Concrete Pipes 100-D
C-STRM-20_(C-STRM) 626_(C-STRM)    627_(C-STRM)    73.802     0.013      104.243    103.505
0          0
;Concrete Pipes 100-D
C-STRM-21_(C-STRM) 627_(C-STRM)    630_(C-STRM)    72.391     0.013      103.429    103.067
0          0
;Concrete Pipes 100-D
C-STRM-22_(1)_(C-STRM) 629_(C-STRM) 622_(C-STRM)   81.395     0.013      101.649    101.527
0          0
;Concrete Pipes 100-D
C-STRM-22_(C-STRM) 630_(C-STRM)    629_(C-STRM)    81.395     0.013      102.076    101.954
0          0
;Concrete Pipes 100-D
C-STRM-26_(1)_(C-STRM) 551_(C-STRM) 502_(C-STRM)   60.766     0.013      100.946    100.849
0          0
;Concrete Pipes 100-D
C-STRM-26_(C-STRM) 552_(C-STRM)    551_(C-STRM)    60.251     0.013      101.043    100.946
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) 506_(C-STRM) 505_(C-STRM) 73.504 0.013 104.121 103.753
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) 507_(C-STRM) 506_(C-STRM) 48.771 0.013 104.441    104.197
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(1)_(1)_(C-STRM) 508_(C-STRM) 507_(C-STRM) 45.501 0.013     104.668    104.441
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(1)_(C-STRM) 509_(C-STRM) 508_(C-STRM) 45.501    0.013      104.896    104.668
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(2)_(C-STRM) 510_(C-STRM) 509_(C-STRM) 55.691    0.013      105.146    104.896
0          0
;Concrete Pipes 100-D
C-STRM-3_(1)_(C-STRM) 511_(C-STRM) 510_(C-STRM)    14.544     0.013      105.212    105.146
0          0
;Concrete Pipes 100-D
C-STRM-33_(C-STRM) 651_(C-STRM)    650_(C-STRM)    57.032     0.013      102.61     102.524
0          0
;Concrete Pipes 100-D
C-STRM-34_(1)_(1)_(C-STRM) 555_(C-STRM) 554_(C-STRM) 75.195   0.013      101.546    101.426
0          0
;Concrete Pipes 100-D
C-STRM-34_(1)_(C-STRM) 556_(C-STRM) 555_(C-STRM)   75.195     0.013      101.666    101.546
0          0
;Concrete Pipes 100-D
C-STRM-35_(1)_(C-STRM) 553_(C-STRM) 552_(C-STRM)   72.076     0.013      101.234    101.119
0          0
;Concrete Pipes 100-D
C-STRM-35_(C-STRM) 554_(C-STRM)    553_(C-STRM)    72.007     0.013      101.35     101.234
0          0
;Concrete Pipes 100-D
C-STRM-4_(1)_(C-STRM) 504_(C-STRM) 503_(C-STRM)    83.543     0.013      103.336    102.835
0          0
;Concrete Pipes 100-D
C-STRM-4_(C-STRM) 505_(C-STRM)     504_(C-STRM)    83.542     0.013      103.753    103.336
0          0
;Concrete Pipes 100-D
C-STRM-49_(C-STRM) 541_(C-STRM)    540_(C-STRM)    47.743     0.013      101.232    101.16
0          0
;Concrete Pipes 100-D
C-STRM-50_(C-STRM) 540_(C-STRM)    536_(C-STRM)    71.999     0.013      101.16     101.052
0          0
;Concrete Pipes 100-D
C-STRM-51_(C-STRM) 536_(C-STRM)    532_(C-STRM)    48.5       0.013      100.976    100.903
0          0
;Concrete Pipes 100-D
C-STRM-52_(C-STRM) 532_(C-STRM)    528_(C-STRM)    69         0.013      100.827    100.724
0          0
;Concrete Pipes 100-D
C-STRM-53_(C-STRM) 528_(C-STRM)    525_(C-STRM)    74.995     0.013      100.724    100.611
0          0
;Concrete Pipes 100-D
C-STRM-57_(C-STRM) 503_(C-STRM)    502_(C-STRM)    27.537     0.013      100.586    100.544
0          0
;Concrete Pipes 100-D
C-STRM-62_(C-STRM) 520_(C-STRM)    519_(C-STRM)    95.854     0.013      106.643    106.451
0          0
;Concrete Pipes 100-D
C-STRM-63_(C-STRM) 519_(C-STRM)    518_(C-STRM)    97.445     0.013      106.375    106.228
0          0
;Concrete Pipes 100-D
C-STRM-64_(C-STRM) 522_(C-STRM)    EXD_1           81.884     0.013      104.605    104.4
0          0
;Concrete Pipes 100-D
C-STRM-74_(C-STRM) 619_(C-STRM)    606_(C-STRM)    70.512     0.013      101.377    101.236
0          0
;Concrete Pipes 100-D
C-STRM-75_(C-STRM) 606_(C-STRM)    605_(C-STRM)    75.01      0.013      101.236    101.086
0          0
;Concrete Pipes 100-D
C-STRM-76_(C-STRM) 525_(C-STRM)    MTD_(C-STRM)    83.302     0.013      100.611    100.445
0          0
;Concrete Pipes 100-D
C-STRM-77_(C-STRM) MTD_(C-STRM)    OVERFLOW_(C-STRM) 38.5     0.013      100.369    100.176
0          0
;Concrete Pipes 100-D
C-STRM-78_(C-STRM) 502_(C-STRM)    MTD_(C-STRM)    33.221     0.013      100.544    100.445
0          0
;Concrete Pipes 100-D
C-STRM-79_(1)_(C-STRM) 604_(C-STRM) 603_(C-STRM)   82.3       0.013      100.877    100.63
0          0
;Concrete Pipes 100-D
C-STRM-79_(C-STRM) 605_(C-STRM)    604_(C-STRM)    83.519     0.013      101.086    100.877
0          0
;Concrete Pipes 100-D
C-STRM-8_(1)_(C-STRM) 514_(C-STRM) 513_(C-STRM)    95.15      0.013      105.887    105.696
0          0
;Concrete Pipes 100-D
C-STRM-8_(C-STRM) 515_(C-STRM)     514_(C-STRM)    95.141     0.013      106.153    105.963
0          0
;Concrete Pipes 100-D
C-STRM-80_(C-STRM) 603_(C-STRM)    602_(C-STRM)    74.339     0.013      100.63     100.519
0          0
;Concrete Pipes 100-D
C-STRM-81_(C-STRM) 602_(C-STRM)    601_(C-STRM)    46.689     0.013      100.519    100.449
0          0
;Concrete Pipes 100-D
C-STRM-82_(C-STRM) 601_(C-STRM)    POND_(C-STRM)   32.5       0.013      100.449    100.4
0          0
;Concrete Pipes 100-D
C-STRM-83_(1)_(C-STRM) 630A_(C-STRM) 630_(C-STRM)  27.373     0.013      102.117    102.076
0          0
;Concrete Pipes 100-D
C-STRM-84_(C-STRM) 622_(C-STRM)    619_(C-STRM)    75         0.013      101.527    101.377
0          0
CVR-C2            EXD_5             EXD_6             19.831     0.013      102.496    102.32
0          0
CVR-C3            EXD_8             EXD_9             16.356     0.013      100.485    100.385
0          0
CVR-C4            EXD_10            EXD_11            25.368     0.013      98.653     98.498
0          0
;Concrete Pipes 100-D
ST4-Pipe_-_(99)_(P-Stm) J74        ST4_108A_(P-Stm) 49.3        0.013      98.45      98.31
0          0
W1                500A_(C-STRM)     POND_(C-STRM)   4.86       0.013      100.8      100.8
0          0

[ORIFICES]
;;Name           From Node         To Node           Type         Offset     Qcoeff     Gated
CloseTime
;;---------------- ----------------- ----------------- ------------ ---------- ---------- --------
----------
OR1               POND_(C-STRM)     J74               SIDE         98.45      0.65       NO
0
OR2               POND_(C-STRM)     J74               SIDE         100.8      0.65       NO
0

[WEIRS]
;;Name           From Node         To Node           Type         CrestHt    Qcoeff     Gated
EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf   Coeff. Curve
;;---------------- ----------------- ----------------- ------------ ---------- ---------- --------
-------- ---------- ---------- ---------- ---------- ----------------
W10               S_536-532         J10               TRANSVERSE   103.752    1.67       NO
0         0          YES
W11               S_532-528         J11               TRANSVERSE   103.6      1.67       NO
0         0          YES
W12               S_528-525         J12               TRANSVERSE   103.505    1.67       NO
0         0          YES
W13               S_525-MTD         J13               TRANSVERSE   103.4      1.67       NO
0         0          YES
W14               S_629-622         J32               TRANSVERSE   106.112    1.67       NO
0         0          YES
W15               S_622-619         J26               TRANSVERSE   105.8      1.67       NO
0         0          YES
W2                POND_(C-STRM)     OF1               TRANSVERSE   100.8      1.67       NO
0         0          YES
W3                S_627-630         J24               TRANSVERSE   106.8      1.67       NO
0         0          YES
W4                S_622-619_2       J32               TRANSVERSE   106.65     1.67       NO
0         0          YES
W5                S_619-606         J62               TRANSVERSE   106.65     1.67       NO
0         0          YES
W6                S_605-604         J51               TRANSVERSE   106.814    1.67       NO
0         0          YES
W7                S_604-603         J25               TRANSVERSE   105.6      1.67       NO
0         0          YES
W8                S_541-540         J9                TRANSVERSE   103.915    1.67       NO
0         0          YES
W9                S_540-536         J9                TRANSVERSE   103.855    1.67       NO
0         0          YES

[OUTLETS]
;;Name           From Node         To Node           Offset     Type            QTable/Qcoeff
Qexpon     Gated
;;---------------- ----------------- ----------------- ---------- ---------------- ----------------
---------- --------
C1                S_622-619_2       622_(C-STRM)      106.5      TABULAR/HEAD     C_622-619_2
YES
;Concrete Pipes 100-D
C-STRM-107_(C-STRM) S_604-603      604_(C-STRM)      105.5      TABULAR/HEAD     C_604-603
YES
```

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;Concrete Pipes 100-D
C-STRM-14_(1)_(C-STRM) S_605-604  605_(C-STRM)     106.714    TABULAR/HEAD     C_605-604
YES
;Concrete Pipes 100-D
C-STRM-23_(C-STRM) S_622-619      622_(C-STRM)     105.7      TABULAR/HEAD     C_622-619
YES
;Concrete Pipes 100-D
C-STRM-42_(C-STRM) S_541-540      541_(C-STRM)     103.815    TABULAR/HEAD     C_541-540
YES
;Concrete Pipes 100-D
C-STRM-44_(1)_(C-STRM) S_525-MTD  525_(C-STRM)     103.3      TABULAR/HEAD     C_525-MTD
YES
;Concrete Pipes 100-D
C-STRM-45_(1)_(C-STRM) S_619-606  619_(C-STRM)     106.5      TABULAR/HEAD     C_619-606
YES
;Concrete Pipes 100-D
C-STRM-71_(C-STRM) 682_(C-STRM)   651_(C-STRM)     105.4      TABULAR/HEAD     C_681-
680_Industrial          YES
;Concrete Pipes 100-D
C-STRM-83_(C-STRM) 631_(C-STRM)   630A_(C-STRM)    106        TABULAR/HEAD     C_630A-
630_Industrial          YES
;Concrete Pipes 100-D
C-STRM-96_(1)_(C-STRM) S_536-532  536_(C-STRM)     103.602    TABULAR/HEAD     C_536-532
YES
;Concrete Pipes 100-D
C-STRM-97_(1)_(C-STRM) S_532-528  532_(C-STRM)     103.5      TABULAR/HEAD     C_532-528
YES
;Concrete Pipes 100-D
C-STRM-98_(1)_(C-STRM) S_528-525  528_(C-STRM)     103.405    TABULAR/HEAD     C_528-525
YES
OL1               S_627-630       627_(C-STRM)     106.2      TABULAR/HEAD     C_627-630
YES
;Re-using existing soils - Assumes infiltration rate at BH2-22 per Paterson's report of
50.4mm/hr. 50.4mm/hr is multiplied by area of filtration bed(0.182180 ha).
OL10              500A_(C-STRM)   POND_(C-STRM)    100.1      FUNCTIONAL/DEPTH 0.026
0          YES
OL11              J36             553_(C-STRM)     104.7      TABULAR/HEAD     C_552-551
YES
OL12              J40             551_(C-STRM)     104.45     TABULAR/HEAD     C_502-OGS
YES
OL13              J46             602_(C-STRM)     104.2      TABULAR/HEAD     C_602-601
YES
OL14              J28             520_(C-STRM)     109        TABULAR/HEAD     C_520-529
YES
OL15              J6              522_(C-STRM)     109        TABULAR/HEAD     C_522-523
YES
OL16              J29             518_(C-STRM)     108.8      TABULAR/HEAD     C_518-517
YES
OL17              J58             513_(C-STRM)     108.4      TABULAR/HEAD     C_513-512
YES
OL18              J59             511_(C-STRM)     108        TABULAR/HEAD     C_511-510
YES
OL19              J61             506_(C-STRM)     107        TABULAR/HEAD     C_506-505
YES
OL2               SU2             626_(C-STRM)     106.75     TABULAR/HEAD     C_624-
623_WOODLOT          YES
OL20              J48             504_(C-STRM)     105.75     TABULAR/HEAD     C_504-503
YES
OL21              J44             503_(C-STRM)     104.5      TABULAR/HEAD     C_503-502
YES
OL22              SU5             504_(C-STRM)     104.18     TABULAR/HEAD     C_503-502_Park
YES
OL3               S_629-622       629_(C-STRM)     106.012    TABULAR/HEAD     C_629-622
YES
OL4               S_540-536       540_(C-STRM)     103.705    TABULAR/HEAD     C_540-536
YES
OL5               J22             645_(C-STRM)     105.7      TABULAR/HEAD     C_645-630A
YES
OL6               J21             647_(C-STRM)     105.55     TABULAR/HEAD     C_647-645
YES
OL7               J20             650_(C-STRM)     105.45     TABULAR/HEAD     C_650-647
YES
OL8               J19             651_(C-STRM)     105.4      TABULAR/HEAD     C_651-650
YES
OL9               J19             556_(C-STRM)     105.4      TABULAR/HEAD     C_554-553
YES

[XSECTIONS]
;;Link            Shape       Geom1           Geom2     Geom3     Geom4     Barrels
Culvert
;;--------------- ----------- --------------- --------- --------- --------- ---------
--------
BDR-C1            CIRCULAR    0.4             0         0         0         1
BDR-C2            CIRCULAR    0.4             0         0         0         1
BDR-C3            CIRCULAR    0.5             0         0         0         1
BDR-C4            CIRCULAR    1.2             0         0         0         1
C1_1              IRREGULAR   ROW_18m
C1_17             IRREGULAR   ROW_26m
C1_3              IRREGULAR   ROW_26m
C1_30             IRREGULAR   ROW_18m
C1_4              IRREGULAR   ROW_18m
C14_1             IRREGULAR   ROW_18m
C14_2             IRREGULAR   ROW_18m
C14_4             IRREGULAR   ROW_18m
C14_5             IRREGULAR   ROW_18m
C15_1             IRREGULAR   ROW_26m
C15_2             IRREGULAR   ROW_26m
C2                RECT_OPEN   0.5             6.19      0         0         1
C20_1             IRREGULAR   ROW_24m
C20_2             IRREGULAR   ROW_24m
C20_3             IRREGULAR   ROW_24m
C20_4             IRREGULAR   ROW_24m
C20_5             IRREGULAR   ROW_24m
C20_7             IRREGULAR   ROW_24m
C23_5             IRREGULAR   ROW_18m
C23_7             IRREGULAR   ROW_18m
C3                RECT_OPEN   0.5             6.19      0         0         1
C4                RECT_OPEN   0.5             6.19      0         0         1
C4_1              IRREGULAR   ROW_18m
C4_2              IRREGULAR   ROW_18m
C4_3              IRREGULAR   ROW_18m
C4_4              IRREGULAR   ROW_18m
C4_5              IRREGULAR   ROW_18m
C4_7              IRREGULAR   ROW_18m
C5                RECT_OPEN   0.5             6.19      0         0         1
C5_1              IRREGULAR   Upstream1
C5_10             IRREGULAR   Barnsdale_UPST1
C5_11             IRREGULAR   Barnsdale_UPST3
C5_12             IRREGULAR   Upstream6
C5_13             IRREGULAR   Barnsdale_UPST2
C5_14             IRREGULAR   Barnsdale_UPST4
C5_15             IRREGULAR   Barnsdale_UPST5
C5_16             IRREGULAR   Barnsdale_UPST6
C5_17             IRREGULAR   Barnsdale_UPST7
C5_19             IRREGULAR   Barnsdale_UPST4
C5_2              IRREGULAR   Upstream3
C5_20             IRREGULAR   Barnsdale_UPST7
C5_21             IRREGULAR   Barnsdale_UPST1
C5_23             IRREGULAR   Upstream1
C5_3              IRREGULAR   Upstream2
C5_4              IRREGULAR   Upstream4
C5_5              IRREGULAR   Upstream5
C5_6              IRREGULAR   Upstream4
C5_7              IRREGULAR   Upstream6
C5_8              IRREGULAR   Upstream6
C5_9              IRREGULAR   Upstream6
C6                RECT_OPEN   0.5             6.19      0         0         1
C7                IRREGULAR   ROW_24m
C9_1              IRREGULAR   ROW_24m
C9_11             IRREGULAR   ROW_24m
C9_2              IRREGULAR   ROW_24m
C9_5              IRREGULAR   ROW_24m
C9_6              IRREGULAR   ROW_24m
C9_7              IRREGULAR   ROW_24m
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR 0.675      0         0         0         1
C-STRM-1_(1)_(C-STRM) CIRCULAR 0.675          0         0         0         1
C-STRM-1_(C-STRM) CIRCULAR    0.6             0         0         0         1
C-STRM-100_(C-STRM) CIRCULAR  0.6             0         0         0         1
C-STRM-101_(C-STRM) CIRCULAR  0.6             0         0         0         1
C-STRM-102_(C-STRM) CIRCULAR  1.05            0         0         0         1
C-STRM-103_(C-STRM) CIRCULAR  0.825           0         0         0         1
C-STRM-104_(C-STRM) CIRCULAR  0.825           0         0         0         1
C-STRM-105_(C-STRM) CIRCULAR  0.825           0         0         0         1
C-STRM-2_(1)_(C-STRM) CIRCULAR 0.675          0         0         0         1
C-STRM-2_(C-STRM) CIRCULAR    0.675           0         0         0         1
C-STRM-20_(C-STRM) CIRCULAR   0.45            0         0         0         1
C-STRM-21_(C-STRM) CIRCULAR   0.525           0         0         0         1
C-STRM-22_(1)_(C-STRM) CIRCULAR 1.8           0         0         0         1
C-STRM-22_(C-STRM) CIRCULAR   1.5             0         0         0         1
C-STRM-26_(1)_(C-STRM) CIRCULAR 0.675         0         0         0         1
C-STRM-26_(C-STRM) CIRCULAR   0.675           0         0         0         1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR 0.75 0     0         0         1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR 0.675 0    0         0         1
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR 0.675  0           0         0         1
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR 0.675      0           0         0         1
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR 0.675      0           0         0         1
C-STRM-3_(1)_(C-STRM) CIRCULAR 0.675          0           0         0         1
C-STRM-33_(C-STRM) CIRCULAR   0.825           0           0         0         1
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR 0.525     0           0         0         1
C-STRM-34_(1)_(C-STRM) CIRCULAR 0.525         0           0         0         1
C-STRM-35_(1)_(C-STRM) CIRCULAR 0.6           0           0         0         1
C-STRM-35_(C-STRM) CIRCULAR   0.6             0           0         0         1
C-STRM-4_(1)_(C-STRM) CIRCULAR 0.75           0           0         0         1
C-STRM-4_(C-STRM) CIRCULAR    0.75            0           0         0         1
C-STRM-49_(C-STRM) CIRCULAR   0.825           0           0         0         1
C-STRM-50_(C-STRM) CIRCULAR   0.825           0           0         0         1
C-STRM-51_(C-STRM) CIRCULAR   0.9             0           0         0         1
C-STRM-52_(C-STRM) CIRCULAR   0.975           0           0         0         1
C-STRM-53_(C-STRM) CIRCULAR   0.975           0           0         0         1
C-STRM-57_(C-STRM) CIRCULAR   0.975           0           0         0         1
C-STRM-62_(C-STRM) CIRCULAR   0.45            0           0         0         1
C-STRM-63_(C-STRM) CIRCULAR   0.525           0           0         0         1
C-STRM-64_(C-STRM) CIRCULAR   0.375           0           0         0         1
C-STRM-74_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-75_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-76_(C-STRM) CIRCULAR   0.975           0           0         0         1
C-STRM-77_(C-STRM) CIRCULAR   1.05            0           0         0         1
C-STRM-78_(C-STRM) CIRCULAR   0.975           0           0         0         1
C-STRM-79_(1)_(C-STRM) CIRCULAR 1.8           0           0         0         1
C-STRM-79_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-8_(1)_(C-STRM) CIRCULAR 0.525          0           0         0         1
C-STRM-8_(C-STRM) CIRCULAR    0.45            0           0         0         1
C-STRM-80_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-81_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-82_(C-STRM) CIRCULAR   1.8             0           0         0         1
C-STRM-83_(1)_(C-STRM) CIRCULAR 1.5           0           0         0         1
C-STRM-84_(C-STRM) CIRCULAR   1.8             0           0         0         1
CVR-C2            CIRCULAR    0.45            0           0         0         1
CVR-C3            CIRCULAR    0.4             0           0         0         1
CVR-C4            CIRCULAR    1.2             0           0         0         1
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR 0.9          0           0         0         1
W1                IRREGULAR   Pond_SpillWay
OR1               CIRCULAR    0.335           0         0
OR2               RECT_CLOSED 0.25            0.9       0         0
W10               RECT_OPEN   0.35            8.5       0         0
W11               RECT_OPEN   0.4             8.5       0         0
W12               RECT_OPEN   0.4             8.5       0         0
W13               RECT_OPEN   0.4             8.5       0         0
W14               RECT_OPEN   0.4             8.5       0         0
W15               RECT_OPEN   0.4             8.5       0         0
W2                RECT_OPEN   0.3             10        0         0
W3                RECT_OPEN   0.4             8.5       0         0
W4                RECT_OPEN   0.35            8.5       0         0
W5                RECT_OPEN   0.35            8.5       0         0
W6                RECT_OPEN   0.4             8.5       0         0
W7                RECT_OPEN   0.4             8.5       0         0
W8                RECT_OPEN   0.4             8.5       0         0
W9                RECT_OPEN   0.35            8.5       0         0

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST1   21        12.5      17        0.0       0.0       0.0       0.0       0.0
GR 100.691   12.5      100.65    13        100.533   13.5      100.432   14        100.385   14.5
GR 100.309   15        100.269   15.5      100.412   16        100.596   16.5      100.781   17
GR 100.862   17.5      100.907   18        100.956   18.5      100.974   19        100.994   19.5
GR 101.017   20        101.028   20.5      101.047   21        101.058   21.5      101.066   22
GR 101.069   22.5
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST2   20        13.5      17        0.0       0.0       0.0       0.0       0.0
GR 100.176   12.5      100.155   13        100.148   13.5      100.035   14        99.888    14.5
GR 99.95     15        99.972    15.5      100.065   16        100.176   16.5      100.28    17
GR 100.471   17.5      100.549   18        100.593   18.5      100.62    19        100.637   19.5
GR 100.65    20        100.654   20.5      100.657   21        100.66    21.5      100.663   22
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST3   21        12.5      17        0.0       0.0       0.0       0.0       0.0
GR 99.827    12.5      99.741    13        99.574    13.5      99.465    14        99.405    14.5
GR 99.401    15        99.473    15.5      99.526    16        99.69     16.5      99.975    17
GR 100.069   17.5      100.149   18        100.151   18.5      100.159   19        100.193   19.5
GR 100.203   20        100.217   20.5      100.223   21        100.23    21.5      100.24    22
GR 100.246   22.5
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST4   18        13        17        0.0       0.0       0.0       0.0       0.0
GR 99.413    13        99.366    13.5      99.276    14        99.193    14.5      99.208    15
GR 99.285    15.5      99.351    16        99.516    16.5      99.773    17        99.929    17.5
GR 99.977    18        100.005   18.5      100.018   19        100.025   19.5      100.057   20
GR 100.067   20.5      100.074   21        100.077   21.5
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST5   19        12        16.5      0.0       0.0       0.0       0.0       0.0
GR 99.41     12        99.347    12.5      99.236    13        99.19     13.5      99.144    14
GR 99.173    14.5      99.2      15        99.391    15.5      99.572    16        99.771    16.5
GR 99.841    17        99.856    17.5      99.86     18        99.865    18.5      99.872    19
GR 99.889    19.5      99.909    20        99.933    20.5      99.94     21
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST6   27        9.5       14.5      0.0       0.0       0.0       0.0       0.0
GR 99.314    7.5       99.313    8         99.293    8.5       99.279    9         99.263    9.5
GR 99.146    10        99.072    10.5      98.903    11        98.776    11.5      98.765    12
GR 98.748    12.5      98.878    13        99.036    13.5      99.189    14        99.457    14.5
GR 99.555    15        99.603    15.5      99.754    16        99.774    16.5      99.811    17
GR 99.829    17.5      99.844    18        99.849    18.5      99.86     19        99.878    19.5
GR 99.882    20        99.889    20.5
;
NC 0.025    0.025    0.025
X1 Barnsdale_UPST7   30        10        16.5      0.0       0.0       0.0       0.0       0.0
GR 99.264    8         99.257    8.5       99.227    9         99.222    9.5       99.214    10
GR 99.106    10.5      98.999    11        98.843    11.5      98.763    12        98.745    12.5
GR 98.704    13        98.673    13.5      98.668    14        98.673    14.5      98.81     15
GR 99.067    15.5      99.24     16        99.379    16.5      99.43     17        99.552    17.5
GR 99.655    18        99.728    18.5      99.776    19        99.788    19.5      99.796    20
GR 99.797    20.5      99.798    21        99.801    21.5      99.801    22        99.801    22.5
;
;New Greenbak Road
NC 0.025    0.025    0.013
X1 GBR               9         5.25      36.25     0.0       0.0       0.0       0.0       0.0
GR 0.255     0         0.15      5.25      0         5.25      0.07      8.75      0.08      20.75
GR 0.07      32.75     0         36.25     0.15      36.25     0.255     41.5
;
NC 0.013    0.025    0.025
X1 Pond_SpillWay     4         47.99     62.99     0.0       0.0       0.0       0.0       0.0
GR 103.08    0         100.8     47.99     100.8     62.99     104.69    128.79
;
;Full street, width = 8.5m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.23m.
NC 0.025    0.025    0.013
X1 ROW_14m           7         4         12.5      0.0       0.0       0.0       0.0       0.0
GR 0.23      0         0.15      4         0         4         0.13      8.25      0         12.5
GR 0.15      12.5      0.18      14
;
;Full street, width = 8.5m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.23m.
NC 0.025    0.025    0.013
X1 ROW_14m_Mountable  7         4         12.5      0.0       0.0       0.0       0.0       0.0
```

```
GR 0.155    0       0.075    4       0       4       0.13    8.25    0       12.5
GR 0.075    12.5    0.105    14
;
NC 0.025    0.025   0.013
X1 ROW_14m_PH3      7       2.75    11.25   0.0     0.0     0.0     0.0     0.0
GR 0.23     0       0.15     2.75    0       2.75    0.13    7       0       11.25
GR 0.15     11.25   0.23     14
;
;Full street, width = 8.5m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.23m.
NC 0.025    0.025   0.013
X1 ROW_14m-MB_1     7       4       12.5    0.0     0.0     0.0     0.0     0.0
GR 0.155    0       0.075    4       0       4       0.13    8.25    0       12.5
GR 0.15     12.5    0.18     14
;
;Full street, width = 8.5m, curb = 0.075m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.155m.
NC 0.025    0.025   0.013
X1 ROW_16.5m_Mountable  7       4       12.5    0.0     0.0     0.0     0.0     0.0
GR 0.16     0       0.08     4       0       4       0.13    8.25    0       12.5
GR 0.08     12.5    0.16     16.5
;
NC 0.025    0.025   0.013
X1 ROW_16.5m_PH3    7       4       12.5    0.0     0.0     0.0     0.0     0.0
GR 0.27     0       0.15     4       0       4       0.13    8.25    0       12.5
GR 0.15     12.5    0.27     16.5
;
;Full street, width = 8.5m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.245m.
NC 0.025    0.025   0.013
X1 ROW_18m          7       4.75    13.25   0.0     0.0     0.0     0.0     0.0
GR 0.25     0       0.15     4.75    0       4.75    0.13    9       0       13.25
GR 0.15     13.25   0.25     18
;
NC 0.025    0.025   0.013
X1 ROW_18m_MB_1     7       4.75    13.25   0.0     0.0     0.0     0.0     0.0
GR 0.17     0       0.075    4.75    0       4.75    0.13    9       0       13.25
GR 0.15     13.25   0.245    18
;
NC 0.025    0.025   0.013
X1 ROW_18m_MB_2     7       4.75    13.25   0.0     0.0     0.0     0.0     0.0
GR 0.245    0       0.15     4.75    0       4.75    0.13    9       0       13.25
GR 0.075    13.25   0.17     18
;
;Full street, width = 8.5m, curb = 0.075m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.17m.
NC 0.025    0.025   0.013
X1 ROW_18m_Mountable  7       4.75    13.25   0.0     0.0     0.0     0.0     0.0
GR 0.17     0       0.08     4.75    0       4.75    0.13    9       0       13.25
GR 0.08     13.25   0.17     18
;
NC 0.025    0.025   0.013
X1 ROW_18m_PH3      7       4.75    13.25   0.0     0.0     0.0     0.0     0.0
GR 0.29     0       0.15     4.75    0       4.75    0.13    9       0       13.25
GR 0.15     13.25   0.29     18
;
;Full street, width = 11m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.26m.
NC 0.025    0.025   0.013
X1 ROW_22m          7       5.5     16.5    0.0     0.0     0.0     0.0     0.0
GR 0.26     0       0.15     5.5     0       5.5     0.17    11      0       16.5
GR 0.15     16.5    0.26     22
;
;Full street, width = 7.0m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.32m.
NC 0.025    0.025   0.013
X1 ROW_24m          7       8.5     15.5    0.0     0.0     0.0     0.0     0.0
GR 0.32     0       0.15     8.5     0       8.5     0.1     12      0       15.5
GR 0.15     15.5    0.32     24
;
;Based on cross section shown on Figure 4A
NC 0.025    0.025   0.013
X1 ROW_24m_1        8       8.5     18      0.0     0.0     0.0     0.0     0.0
GR 0.395    0       0.225    8.5     0.075   8.5     0.18    12      0.075   15.5
GR 0        18      0.15     18      0.27    24
;
;Full street, width = 9.5m, curb = 0.15m , cross-slope = 0.03m/m, bank-slope = 0.02m/m, bank-
height = 0.32m.
NC 0.025    0.025   0.013
X1 ROW_24m_Parking  7       8.5     18      0.0     0.0     0.0     0.0     0.0
GR 0.4      0       0.23     8.5     0       8.5     0.18    12      0       18
GR 0.15     18      0.27     24
;
NC 0.025    0.025   0.013
X1 ROW_26m          7       7.5     18.5    0.0     0.0     0.0     0.0     0.0
GR 0.3      0       0.15     7.5     0       7.5     0.17    13      0       18.5
GR 0.15     18.5    0.3      26
;
NC 0.025    0.025   0.025
X1 Upstream1        27      11      16.5    0.0     0.0     0.0     0.0     0.0
GR 104.975  10      104.956  10.5    104.947 11      104.795 11.5    104.503 12
GR 104.392  12.5    104.395  13      104.369 13.5    104.38  14      104.399 14.5
GR 104.367  15      104.55   15.5    104.92  16      105.076 16.5    105.107 17
GR 105.181  17.5    105.224  18      105.252 18.5    105.255 19      105.269 19.5
GR 105.315  20      105.341  20.5    105.352 21      105.372 21.5    105.382 22
GR 105.401  22.5    105.405  23
;
NC 0.025    0.025   0.025
X1 Upstream2        29      12      17.5    0.0     0.0     0.0     0.0     0.0
GR 104.907  10      104.882  10.5    104.836 11      104.798 11.5    104.755 12
GR 104.652  12.5    104.571  13      104.444 13.5    104.324 14      104.346 14.5
GR 104.488  15      104.616  15.5    104.704 16      104.823 16.5    104.887 17
GR 104.94   17.5    105.082  18      105.133 18.5    105.218 19      105.254 19.5
GR 105.29   20      105.311  20.5    105.324 21      105.334 21.5    105.364 22
GR 105.381  22.5    105.401  23      105.417 23.5    105.423 24
;
NC 0.025    0.025   0.025
X1 Upstream3        27      12.5    20      0.0     0.0     0.0     0.0     0.0
GR 103.883  12      103.87   12.5    103.801 13      103.73  13.5    103.599 14
GR 103.469  14.5    103.516  15      103.673 15.5    103.703 16      103.756 16.5
GR 103.866  17      103.988  17.5    104.041 18      104.181 18.5    104.232 19
GR 104.327  19.5    104.377  20      104.378 20.5    104.384 21      104.401 21.5
GR 104.439  22      104.484  22.5    104.497 23      104.522 23.5    104.533 24
GR 104.541  24.5    104.541  25
;
NC 0.025    0.025   0.025
X1 Upstream4        28      12.5    18      0.0     0.0     0.0     0.0     0.0
GR 102.76   11.5    102.753  12      102.721 12.5    102.662 13      102.549 13.5
GR 102.547  14      102.52   14.5    102.411 15      102.32  15.5    102.325 16
GR 102.42   16.5    102.61   17      102.84  17.5    102.949 18      102.945 18.5
GR 103.146  19      103.221  19.5    103.245 20      103.327 20.5    103.369 21
GR 103.42   21.5    103.446  22      103.462 22.5    103.481 23      103.492 23.5
GR 103.498  24      103.511  24.5    103.516 25
;
NC 0.025    0.025   0.025
X1 Upstream5        31      13      21      0.0     0.0     0.0     0.0     0.0
GR 102.284  10.5    102.279  11      102.263 11.5    102.244 12      102.191 12.5
GR 102.181  13      102.096  13.5    101.988 14      101.809 14.5    101.714 15
GR 101.588  15.5    101.512  16      101.495 16.5    101.567 17      101.593 17.5
GR 101.727  18      102.028  18.5    102.112 19      102.196 19.5    102.23  20
GR 102.303  20.5    102.334  21      102.338 21.5    102.38  22      102.459 22.5
GR 102.497  23      102.502  23.5    102.517 24      102.529 24.5    102.548 25
GR 102.552  25.5
;
NC 0.025    0.025   0.025
X1 Upstream6        35      11.5    24.5    0.0     0.0     0.0     0.0     0.0
GR 101.519  10.5    101.427  11      101.44  11.5    101.362 12      101.167 12.5
GR 101.095  13      101.096  13.5    100.989 14      100.862 14.5    100.78  15
GR 100.611  15.5    100.546  16      100.483 16.5    100.461 17      100.469 17.5
GR 100.568  18      100.681  18.5    100.767 19      100.99  19.5    101.065 20
GR 101.154  20.5    101.202  21      101.236 21.5    101.267 22      101.287 22.5
GR 101.329  23      101.422  23.5    101.458 24      101.486 24.5    101.49  25
GR 101.499  25.5    101.5    26      101.503 26.5    101.508 27      101.519 27.5

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
C-STRM-1_(1)_(1)_(C-STRM) 0 1.02       0          NO         0
C-STRM-1_(1)_(C-STRM) 0     1.02       0          NO         0
C-STRM-1_(C-STRM) 0         0.04       0          NO         0
C-STRM-100_(C-STRM) 0       1.02       0          NO         0
C-STRM-103_(C-STRM) 0       0.155      0          NO         0
C-STRM-104_(C-STRM) 0       0.04       0          NO         0
C-STRM-105_(C-STRM) 0       0.82       0          NO         0
C-STRM-2_(1)_(C-STRM) 0     0.04       0          NO         0
C-STRM-2_(C-STRM) 0         0.04       0          NO         0
C-STRM-20_(C-STRM) 0        0.04       0          NO         0
C-STRM-21_(C-STRM) 0        1.02       0          NO         0
C-STRM-22_(1)_(C-STRM) 0    0.04       0          NO         0
C-STRM-22_(C-STRM) 0        0.04       0          NO         0
C-STRM-26_(1)_(C-STRM) 0    1.02       0          NO         0
C-STRM-26_(C-STRM) 0        0.04       0          NO         0
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) 0 1.02 0         NO         0
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) 0 1.02 0         NO         0
C-STRM-3_(1)_(1)_(1)_(C-STRM) 0 1.02   0           NO         0
C-STRM-3_(1)_(1)_(1)_(C-STRM) 0 1.02   0           NO         0
C-STRM-3_(1)_(2)_(C-STRM) 0 0.04       0           NO         0
C-STRM-3_(1)_(C-STRM) 0     0.09       0          NO         0
C-STRM-33_(C-STRM) 0        0.04       0          NO         0
C-STRM-34_(1)_(1)_(C-STRM) 0 0.04      0          NO         0
C-STRM-34_(1)_(C-STRM) 0    0.04       0          NO         0
C-STRM-35_(1)_(C-STRM) 0    0.04       0          NO         0
C-STRM-35_(C-STRM) 0        0.04       0          NO         0
C-STRM-4_(1)_(C-STRM) 0     1.02       0          NO         0
C-STRM-4_(C-STRM) 0         1.02       0          NO         0
C-STRM-49_(C-STRM) 0        1.02       0          NO         0
C-STRM-50_(C-STRM) 0        1.02       0          NO         0
C-STRM-51_(C-STRM) 0        1.02       0          NO         0
C-STRM-52_(C-STRM) 0        1.02       0          NO         0
C-STRM-53_(C-STRM) 0        1.02       0          NO         0
C-STRM-57_(C-STRM) 0        1.02       0          NO         0
C-STRM-62_(C-STRM) 0        0.09       0          NO         0
C-STRM-63_(C-STRM) 0        0.09       0          NO         0
C-STRM-74_(C-STRM) 0        1.02       0          NO         0
C-STRM-75_(C-STRM) 0        1.02       0          NO         0
C-STRM-76_(C-STRM) 0        1.02       0          NO         0
C-STRM-77_(C-STRM) 0        1.02       0          NO         0
C-STRM-78_(C-STRM) 0        1.02       0          NO         0
C-STRM-79_(1)_(C-STRM) 0    1.02       0          NO         0
C-STRM-79_(C-STRM) 0        0.04       0          NO         0
C-STRM-8_(1)_(C-STRM) 0     1.02       0          NO         0
C-STRM-8_(C-STRM) 0         1.02       0          NO         0
C-STRM-80_(C-STRM) 0        0.04       0          NO         0
C-STRM-81_(C-STRM) 0        1.02       0          NO         0
C-STRM-83_(1)_(C-STRM) 0    0.04       0          NO         0
C-STRM-84_(C-STRM) 0        0.04       0          NO         0
ST4-Pipe_-_(99)_(P-Stm) 0   1.32       0          NO         0

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------
-
POND_(C-STRM)    FLOW             24SCS002_QUINNS_OVERLAND-INFLOW FLOW     1.0      1        0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
;5-Year Rational Flow
C_502-OGS        Rating     0          0
C_502-OGS                   0.01       0.101
C_502-OGS                   0.5        0.101

;5-Year Rational Flow
C_503-502        Rating     0          0
C_503-502                   0.01       0.06
C_503-502                   0.5        0.06

;2-Year Rational Flow
C_503-502_Park   Rating     0          0
C_503-502_Park              0.01       0.184
C_503-502_Park              0.5        0.184

;5-Year Rational Flow
C_504-503        Rating     0          0
C_504-503                   0.01       0.068
C_504-503                   0.5        0.068

;5-Year Rational Flow
C_506-505        Rating     0          0
C_506-505                   0.01       0.238
C_506-505                   0.5        0.238

;5-Year Rational Flow
C_511-510        Rating     0          0
C_511-510                   0.01       0.059
C_511-510                   0.5        0.059

;5-Year Rational Flow
C_513-512        Rating     0          0
C_513-512                   0.01       0.215
C_513-512                   0.5        0.215

;5-Year Rational Flow
C_518-517        Rating     0          0
C_518-517                   0.01       0.342
C_518-517                   0.5        0.342

;5-Year Rational Flow
C_520-529        Rating     0          0
C_520-529                   0.01       0.121
C_520-529                   0.5        0.121

;5-year Rational Flow
C_522-523        Rating     0          0
C_522-523                   0.01       0.088
C_522-523                   0.5        0.088

;2-Year Rational Flow, Tc From DS
C_525-MTD        Rating     0          0
C_525-MTD                   0.01       0.203
C_525-MTD                   0.5        0.203

;2-Year Rational Flow, Tc From DS
C_528-525        Rating     0          0
C_528-525                   0.01       0.205
C_528-525                   0.5        0.205

;2-Year Rational Flow, Tc From DS
C_532-528        Rating     0          0
C_532-528                   0.01       0.104
C_532-528                   0.5        0.104

;2-Year Rational Flow, Tc from DS
C_536-532        Rating     0          0
C_536-532                   0.01       0.246
C_536-532                   0.5        0.246

;2-Year Rational Flow, Tc From DS
C_540-536        Rating     0          0
C_540-536                   0.01       0.11
C_540-536                   0.5        0.11

;2-Year Rational Flow, Tc from DS
C_541-540        Rating     0          0
C_541-540                   0.01       0.368
C_541-540                   0.5        0.368

;5-Year Rational Flow
C_552-551        Rating     0          0
C_552-551                   0.01       0.046
C_552-551                   0.5        0.046

;5-Year Rational Flow
C_554-553        Rating     0          0
C_554-553                   0.01       0.214
C_554-553                   0.05       0.214

;5-Year Rational Flow
```

```
C_602-601        Rating     0          0
C_602-601                   0.01       0.084
C_602-601                   0.5        0.084

;2-Year Rational Flow, Tc From DS
C_604-603        Rating     0          0
C_604-603                   0.01       0.294
C_604-603                   0.5        0.294

;2-Year Rational Flow, Tc From DS
C_605-604        Rating     0          0
C_605-604                   0.01       0.743
C_605-604                   0.5        0.743

;2-Year Rational Flow, Tc from DS
C_619-606        Rating     0          0
C_619-606                   0.01       0.233
C_619-606                   0.5        0.233

;2-Year Rational Flow, Tc taken from DS
C_622-619        Rating     0          0
C_622-619                   0.01       0.302
C_622-619                   0.5        0.302

;2-Year Rational Flow, Tc from DS
C_622-619_2      Rating     0          0
C_622-619_2                 0.01       0.249
C_622-619_2                 0.5        0.249

;2-Year Rational Flow
C_624-623_WOODLOT Rating     0          0
C_624-623_WOODLOT            0.01       0.141
C_624-623_WOODLOT            0.5        0.141

;2-Year Rational Flow, Tc Based on DS
C_627-630        Rating     0          0
C_627-630                   0.01       0.097
C_627-630                   0.5        0.097

;2-Year Rational Flow, Tc from DS
C_629-622        Rating     0          0
C_629-622                   0.01       0.134
C_629-622                   0.5        0.134

;2-Year Rational Flow
C_630A-630       Rating     0          0
C_630A-630                  0.01       0.08
C_630A-630                  0.5        0.08

;5-year Rational Flow, Tc from DS
C_630A-630_Industrial Rating     0          0
C_630A-630_Industrial            0.01       2.438
C_630A-630_Industrial            0.5        2.438

;2-Year Rational Flow
C_645-630A       Rating     0          0
C_645-630A                  0.01       0.046
C_645-630A                  0.5        0.046

;2 Year Rational Flow
C_647-645        Rating     0          0
C_647-645                   0.01       0.029
C_647-645                   0.5        0.029

;2-Year Rational Flow
C_650-647        Rating     0          0
C_650-647                   0.01       0.034
C_650-647                   0.5        0.034

;2-Year Rational Flow
C_651-650        Rating     0          0
C_651-650                   0.01       0.018
C_651-650                   0.5        0.018

;5-Year Rational Flow - Tc from DS
C_681-680_Industrial Rating     0          0
C_681-680_Industrial            0.01       0.526
C_681-680_Industrial            0.5        0.526

DI_GRATE_A_OPSD403.01 Rating     0.02       0.00762
DI_GRATE_A_OPSD403.01            0.04       0.01524
DI_GRATE_A_OPSD403.01            0.08       0.0381
DI_GRATE_A_OPSD403.01            0.12       0.06858
DI_GRATE_A_OPSD403.01            0.2        0.1524
DI_GRATE_A_OPSD403.01            0.26       0.23622
DI_GRATE_A_OPSD403.01            0.36       0.4572
DI_GRATE_A_OPSD403.01            0.46       0.6858

DI_GRATE_C_OPSD403.01 Rating     0.02       0.01465
DI_GRATE_C_OPSD403.01            0.04       0.0293
DI_GRATE_C_OPSD403.01            0.08       0.07325
DI_GRATE_C_OPSD403.01            0.12       0.13185
DI_GRATE_C_OPSD403.01            0.2        0.293
DI_GRATE_C_OPSD403.01            0.26       0.45415
DI_GRATE_C_OPSD403.01            0.36       0.879
DI_GRATE_C_OPSD403.01            0.46       1.3185

Dry_Pond         Rating     0          0
Dry_Pond                    0.1        0.49
Dry_Pond                    1.5        0.49

;L/s/m2
IsolatorRowPercolation Rating     0          0
IsolatorRowPercolation            1.518      1.121

;Reversed Flow from rear yard manhole_Lid to the Street
Manhole_Lid      Rating     0          0
Manhole_Lid                 0.11       0
Manhole_Lid                 0.2        0.187
Manhole_Lid                 0.3        0.395
Manhole_Lid                 0.4        0.602
Manhole_Lid                 0.5        0.81
Manhole_Lid                 0.6        1.018
Manhole_Lid                 0.7        1.225
Manhole_Lid                 0.8        1.433
Manhole_Lid                 0.9        1.641
Manhole_Lid                 1          1.848

;Tempest Rating Curve for MHF IPEX TYPE A, No grate allowance
MHF_IPEX_TYPE_A  Rating     0          0
MHF_IPEX_TYPE_A             0.1        0.0057
MHF_IPEX_TYPE_A             0.2        0.0081
MHF_IPEX_TYPE_A             0.3        0.0099
MHF_IPEX_TYPE_A             0.4        0.0114
MHF_IPEX_TYPE_A             0.5        0.0128
MHF_IPEX_TYPE_A             0.6        0.014
MHF_IPEX_TYPE_A             0.7        0.0151
MHF_IPEX_TYPE_A             0.8        0.0162
MHF_IPEX_TYPE_A             0.9        0.0172
MHF_IPEX_TYPE_A             1          0.0181
MHF_IPEX_TYPE_A             1.2        0.0198
MHF_IPEX_TYPE_A             1.4        0.0214
MHF_IPEX_TYPE_A             1.6        0.0229
MHF_IPEX_TYPE_A             1.8        0.0243
MHF_IPEX_TYPE_A             2          0.0256
MHF_IPEX_TYPE_A             2.5        0.0286
MHF_IPEX_TYPE_A             3          0.0313

;Tempest Rating Curve for MHF IPEX TYPE B, No grate allowance
MHF_IPEX_TYPE_B  Rating     0          0
MHF_IPEX_TYPE_B             0.1        0.0081
MHF_IPEX_TYPE_B             0.2        0.0115
MHF_IPEX_TYPE_B             0.3        0.0141
MHF_IPEX_TYPE_B             0.4        0.0162
MHF_IPEX_TYPE_B             0.5        0.0182
MHF_IPEX_TYPE_B             0.6        0.0199
MHF_IPEX_TYPE_B             0.7        0.0215
MHF_IPEX_TYPE_B             0.8        0.023
MHF_IPEX_TYPE_B             0.9        0.0244
MHF_IPEX_TYPE_B             1          0.0257
MHF_IPEX_TYPE_B             1.2        0.0281
MHF_IPEX_TYPE_B             1.4        0.0304
MHF_IPEX_TYPE_B             1.6        0.0325
MHF_IPEX_TYPE_B             1.8        0.0344
MHF_IPEX_TYPE_B             2          0.0363
MHF_IPEX_TYPE_B             2.5        0.0406
MHF_IPEX_TYPE_B             3          0.0445

;Tempest Rating Curve for MHF IPEX TYPE C, No grate allowance
MHF_IPEX_TYPE_C  Rating     0          0
MHF_IPEX_TYPE_C             0.1        0.0106
MHF_IPEX_TYPE_C             0.2        0.015
MHF_IPEX_TYPE_C             0.3        0.0183
MHF_IPEX_TYPE_C             0.4        0.0212
MHF_IPEX_TYPE_C             0.5        0.0237
MHF_IPEX_TYPE_C             0.6        0.0259
MHF_IPEX_TYPE_C             0.7        0.028
MHF_IPEX_TYPE_C             0.8        0.0299
MHF_IPEX_TYPE_C             0.9        0.0317
MHF_IPEX_TYPE_C             1          0.0335
MHF_IPEX_TYPE_C             1.2        0.0366
MHF_IPEX_TYPE_C             1.4        0.0396
MHF_IPEX_TYPE_C             1.6        0.0423
MHF_IPEX_TYPE_C             1.8        0.0449
MHF_IPEX_TYPE_C             2          0.0473
MHF_IPEX_TYPE_C             2.5        0.0529
MHF_IPEX_TYPE_C             3          0.0579

;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance
MHF_IPEX_TYPE_D  Rating     0          0
MHF_IPEX_TYPE_D             0.1        0.0154
MHF_IPEX_TYPE_D             0.2        0.0217
MHF_IPEX_TYPE_D             0.3        0.0266
MHF_IPEX_TYPE_D             0.4        0.0307
MHF_IPEX_TYPE_D             0.5        0.0343
MHF_IPEX_TYPE_D             0.6        0.0376
MHF_IPEX_TYPE_D             0.7        0.0406
MHF_IPEX_TYPE_D             0.8        0.0434
MHF_IPEX_TYPE_D             0.9        0.0461
MHF_IPEX_TYPE_D             1          0.0485
MHF_IPEX_TYPE_D             1.2        0.0532
MHF_IPEX_TYPE_D             1.4        0.0574
MHF_IPEX_TYPE_D             1.6        0.0614
MHF_IPEX_TYPE_D             1.8        0.0651
MHF_IPEX_TYPE_D             2          0.0687
MHF_IPEX_TYPE_D             2.5        0.0768
MHF_IPEX_TYPE_D             3          0.0841

;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance
MHF_IPEX_TYPE_E  Rating     0          0
MHF_IPEX_TYPE_E             0.1        0.0205
MHF_IPEX_TYPE_E             0.2        0.0289
MHF_IPEX_TYPE_E             0.3        0.0355
MHF_IPEX_TYPE_E             0.4        0.0409
MHF_IPEX_TYPE_E             0.5        0.0458
MHF_IPEX_TYPE_E             0.6        0.0501
MHF_IPEX_TYPE_E             0.7        0.0542
MHF_IPEX_TYPE_E             0.8        0.0579
MHF_IPEX_TYPE_E             0.9        0.0614
MHF_IPEX_TYPE_E             1          0.0647
MHF_IPEX_TYPE_E             1.2        0.0709
MHF_IPEX_TYPE_E             1.4        0.0766
MHF_IPEX_TYPE_E             1.6        0.0819
MHF_IPEX_TYPE_E             1.8        0.0868
MHF_IPEX_TYPE_E             2          0.0915
MHF_IPEX_TYPE_E             2.5        0.1023
MHF_IPEX_TYPE_E             3          0.1121

;Tempest Rating Curve for Vortex ICD 100, No grate allowance
Vortex_ICD_100   Rating     0          0
Vortex_ICD_100              0.1        0.0028
Vortex_ICD_100              0.2        0.004
Vortex_ICD_100              0.3        0.0049
Vortex_ICD_100              0.4        0.0056
Vortex_ICD_100              0.5        0.0063
Vortex_ICD_100              0.6        0.0069
Vortex_ICD_100              0.7        0.0075
Vortex_ICD_100              0.8        0.008
Vortex_ICD_100              0.9        0.0085
Vortex_ICD_100              1          0.0089
Vortex_ICD_100              1.2        0.0098
Vortex_ICD_100              1.4        0.0106
Vortex_ICD_100              1.6        0.0113
Vortex_ICD_100              1.8        0.012
Vortex_ICD_100              2          0.0126
Vortex_ICD_100              2.5        0.0141
Vortex_ICD_100              3          0.0155

;Tempest Rating Curve for Vortex ICD 105, No grate allowance
Vortex_ICD_105   Rating     0          0
Vortex_ICD_105              0.1        0.0031
Vortex_ICD_105              0.2        0.0044
Vortex_ICD_105              0.3        0.0054
Vortex_ICD_105              0.4        0.0062
Vortex_ICD_105              0.5        0.0069
Vortex_ICD_105              0.6        0.0076
Vortex_ICD_105              0.7        0.0082
Vortex_ICD_105              0.8        0.0088
Vortex_ICD_105              0.9        0.0093
Vortex_ICD_105              1          0.0098
Vortex_ICD_105              1.2        0.0107
Vortex_ICD_105              1.4        0.0116
Vortex_ICD_105              1.6        0.0124
Vortex_ICD_105              1.8        0.0131
Vortex_ICD_105              2          0.0139
Vortex_ICD_105              2.5        0.0155
Vortex_ICD_105              3          0.017

;Tempest Rating Curve for Vortex ICD 40, No grate allowance
Vortex_ICD_40    Rating     0          0
Vortex_ICD_40               0.1        0.0004
Vortex_ICD_40               0.2        0.0006
Vortex_ICD_40               0.3        0.0007
Vortex_ICD_40               0.4        0.0009
Vortex_ICD_40               0.5        0.001
Vortex_ICD_40               0.6        0.001
Vortex_ICD_40               0.7        0.0011
Vortex_ICD_40               0.8        0.0012
Vortex_ICD_40               0.9        0.0013
Vortex_ICD_40               1          0.0014
Vortex_ICD_40               1.2        0.0015
Vortex_ICD_40               1.4        0.0016
Vortex_ICD_40               1.6        0.0017
Vortex_ICD_40               1.8        0.0018
Vortex_ICD_40               2          0.0019
Vortex_ICD_40               2.5        0.0022
Vortex_ICD_40               3          0.0024

;Tempest Rating Curve for Vortex ICD 45, No grate allowance
Vortex_ICD_45    Rating     0          0
Vortex_ICD_45               0.1        0.0006
Vortex_ICD_45               0.2        0.0008
Vortex_ICD_45               0.3        0.001
Vortex_ICD_45               0.4        0.0011
Vortex_ICD_45               0.5        0.0013
Vortex_ICD_45               0.6        0.0014
Vortex_ICD_45               0.7        0.0015
Vortex_ICD_45               0.8        0.0016
Vortex_ICD_45               0.9        0.0017
Vortex_ICD_45               1          0.0018
Vortex_ICD_45               1.2        0.002
Vortex_ICD_45               1.4        0.0021
Vortex_ICD_45               1.6        0.0023
Vortex_ICD_45               1.8        0.0024
Vortex_ICD_45               2          0.0026
Vortex_ICD_45               2.5        0.0029
Vortex_ICD_45               3          0.0031
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;Tempest Rating Curve for Vortex ICD 50, No grate allowance
Vortex_ICD_50    Rating     0          0
Vortex_ICD_50               0.1        0.0007
Vortex_ICD_50               0.2        0.001
Vortex_ICD_50               0.3        0.0012
Vortex_ICD_50               0.4        0.0014
Vortex_ICD_50               0.5        0.0016
Vortex_ICD_50               0.6        0.0018
Vortex_ICD_50               0.7        0.0019
Vortex_ICD_50               0.8        0.002
Vortex_ICD_50               0.9        0.0021
Vortex_ICD_50               1          0.0023
Vortex_ICD_50               1.2        0.0025
Vortex_ICD_50               1.4        0.0027
Vortex_ICD_50               1.6        0.0029
Vortex_ICD_50               1.8        0.003
Vortex_ICD_50               2          0.0032
Vortex_ICD_50               2.5        0.0036
Vortex_ICD_50               3          0.0039

;Tempest Rating Curve for Vortex ICD 55, No grate allowance
Vortex_ICD_55    Rating     0          0
Vortex_ICD_55               0.1        0.0009
Vortex_ICD_55               0.2        0.0012
Vortex_ICD_55               0.3        0.0015
Vortex_ICD_55               0.4        0.0017
Vortex_ICD_55               0.5        0.0019
Vortex_ICD_55               0.6        0.0021
Vortex_ICD_55               0.7        0.0023
Vortex_ICD_55               0.8        0.0024
Vortex_ICD_55               0.9        0.0026
Vortex_ICD_55               1          0.0027
Vortex_ICD_55               1.2        0.003
Vortex_ICD_55               1.4        0.0032
Vortex_ICD_55               1.6        0.0034
Vortex_ICD_55               1.8        0.0036
Vortex_ICD_55               2          0.0038
Vortex_ICD_55               2.5        0.0043
Vortex_ICD_55               3          0.0047

;Tempest Rating Curve for Vortex ICD 60, No grate allowance
Vortex_ICD_60    Rating     0          0
Vortex_ICD_60               0.1        0.0011
Vortex_ICD_60               0.2        0.0015
Vortex_ICD_60               0.3        0.0018
Vortex_ICD_60               0.4        0.0021
Vortex_ICD_60               0.5        0.0023
Vortex_ICD_60               0.6        0.0025
Vortex_ICD_60               0.7        0.0027
Vortex_ICD_60               0.8        0.0029
Vortex_ICD_60               0.9        0.0031
Vortex_ICD_60               1          0.0032
Vortex_ICD_60               1.2        0.0036
Vortex_ICD_60               1.4        0.0038
Vortex_ICD_60               1.6        0.0041
Vortex_ICD_60               1.8        0.0043
Vortex_ICD_60               2          0.0046
Vortex_ICD_60               2.5        0.0051
Vortex_ICD_60               3          0.0056

;Tempest Rating Curve for Vortex ICD 65, No grate allowance
Vortex_ICD_65    Rating     0          0
Vortex_ICD_65               0.1        0.0012
Vortex_ICD_65               0.2        0.0016
Vortex_ICD_65               0.3        0.002
Vortex_ICD_65               0.4        0.0023
Vortex_ICD_65               0.5        0.0025
Vortex_ICD_65               0.6        0.0028
Vortex_ICD_65               0.7        0.003
Vortex_ICD_65               0.8        0.0032
Vortex_ICD_65               0.9        0.0034
Vortex_ICD_65               1          0.0036
Vortex_ICD_65               1.2        0.004
Vortex_ICD_65               1.4        0.0043
Vortex_ICD_65               1.6        0.0046
Vortex_ICD_65               1.8        0.0049
Vortex_ICD_65               2          0.0051
Vortex_ICD_65               2.5        0.0057
Vortex_ICD_65               3          0.0063

;Tempest Rating Curve for Vortex ICD 70, No grate allowance
Vortex_ICD_70    Rating     0          0
Vortex_ICD_70               0.1        0.0013
Vortex_ICD_70               0.2        0.0019
Vortex_ICD_70               0.3        0.0023
Vortex_ICD_70               0.4        0.0027
Vortex_ICD_70               0.5        0.003
Vortex_ICD_70               0.6        0.0033
Vortex_ICD_70               0.7        0.0036
Vortex_ICD_70               0.8        0.0038
Vortex_ICD_70               0.9        0.0041
Vortex_ICD_70               1          0.0043
Vortex_ICD_70               1.2        0.0047
Vortex_ICD_70               1.4        0.0051
Vortex_ICD_70               1.6        0.0055
Vortex_ICD_70               1.8        0.0058
Vortex_ICD_70               2          0.0061
Vortex_ICD_70               2.5        0.0068
Vortex_ICD_70               3          0.0075

;Tempest Rating Curve for Vortex ICD 75, No grate allowance
Vortex_ICD_75    Rating     0          0
Vortex_ICD_75               0.1        0.0016
Vortex_ICD_75               0.2        0.0022
Vortex_ICD_75               0.3        0.0027
Vortex_ICD_75               0.4        0.0032
Vortex_ICD_75               0.5        0.0035
Vortex_ICD_75               0.6        0.0039
Vortex_ICD_75               0.7        0.0042
Vortex_ICD_75               0.8        0.0045
Vortex_ICD_75               0.9        0.0048
Vortex_ICD_75               1          0.005
Vortex_ICD_75               1.2        0.0055
Vortex_ICD_75               1.4        0.0059
Vortex_ICD_75               1.6        0.0063
Vortex_ICD_75               1.8        0.0067
Vortex_ICD_75               2          0.0071
Vortex_ICD_75               2.5        0.0079
Vortex_ICD_75               3          0.0087

;Tempest Rating Curve for Vortex ICD 80, No grate allowance
Vortex_ICD_80    Rating     0          0
Vortex_ICD_80               0.1        0.0018
Vortex_ICD_80               0.2        0.0026
Vortex_ICD_80               0.3        0.0031
Vortex_ICD_80               0.4        0.0036
Vortex_ICD_80               0.5        0.004
Vortex_ICD_80               0.6        0.0044
Vortex_ICD_80               0.7        0.0048
Vortex_ICD_80               0.8        0.0051
Vortex_ICD_80               0.9        0.0054
Vortex_ICD_80               1          0.0057
Vortex_ICD_80               1.2        0.0063
Vortex_ICD_80               1.4        0.0068
Vortex_ICD_80               1.6        0.0072
Vortex_ICD_80               1.8        0.0077
Vortex_ICD_80               2          0.0081
Vortex_ICD_80               2.5        0.009
Vortex_ICD_80               3          0.0099

;Tempest Rating Curve for Vortex ICD 85, No grate allowance
Vortex_ICD_85    Rating     0          0
Vortex_ICD_85               0.1        0.002
Vortex_ICD_85               0.2        0.0029
Vortex_ICD_85               0.3        0.0035
Vortex_ICD_85               0.4        0.0041
Vortex_ICD_85               0.5        0.0045
Vortex_ICD_85               0.6        0.005
Vortex_ICD_85               0.7        0.0054
Vortex_ICD_85               0.8        0.0057
Vortex_ICD_85               0.9        0.0061
Vortex_ICD_85               1          0.0064
Vortex_ICD_85               1.2        0.007
Vortex_ICD_85               1.4        0.0076
Vortex_ICD_85               1.6        0.0081
Vortex_ICD_85               1.8        0.0086
Vortex_ICD_85               2          0.0091
Vortex_ICD_85               2.5        0.0101
Vortex_ICD_85               3          0.0111

;Tempest Rating Curve for Vortex ICD 90, No grate allowance
Vortex_ICD_90    Rating     0          0
Vortex_ICD_90               0.1        0.0022
Vortex_ICD_90               0.2        0.0032
Vortex_ICD_90               0.3        0.0039
Vortex_ICD_90               0.4        0.0045
Vortex_ICD_90               0.5        0.0051
Vortex_ICD_90               0.6        0.0055
Vortex_ICD_90               0.7        0.006
Vortex_ICD_90               0.8        0.0064
Vortex_ICD_90               0.9        0.0068
Vortex_ICD_90               1          0.0072
Vortex_ICD_90               1.2        0.0079
Vortex_ICD_90               1.4        0.0085
Vortex_ICD_90               1.6        0.0091
Vortex_ICD_90               1.8        0.0096
Vortex_ICD_90               2          0.0102
Vortex_ICD_90               2.5        0.0114
Vortex_ICD_90               3          0.0125

;Tempest Rating Curve for Vortex ICD 95, No grate allowance
Vortex_ICD_95    Rating     0          0
Vortex_ICD_95               0.1        0.0026
Vortex_ICD_95               0.2        0.0036
Vortex_ICD_95               0.3        0.0044
Vortex_ICD_95               0.4        0.0051
Vortex_ICD_95               0.5        0.0057
Vortex_ICD_95               0.6        0.0062
Vortex_ICD_95               0.7        0.0067
Vortex_ICD_95               0.8        0.0071
Vortex_ICD_95               0.9        0.0076
Vortex_ICD_95               1          0.008
Vortex_ICD_95               1.2        0.0087
Vortex_ICD_95               1.4        0.0094
Vortex_ICD_95               1.6        0.0101
Vortex_ICD_95               1.8        0.0107
Vortex_ICD_95               2          0.0113
Vortex_ICD_95               2.5        0.0126
Vortex_ICD_95               3          0.0138

Filtration_POND  Storage    0          1821.8
Filtration_POND             0.01       1827.49
Filtration_POND             0.02       1833.17
Filtration_POND             0.03       1838.86
Filtration_POND             0.04       1844.56
Filtration_POND             0.05       1850.26
Filtration_POND             0.06       1855.97
Filtration_POND             0.07       1861.68
Filtration_POND             0.08       1867.4
Filtration_POND             0.09       1873.13
Filtration_POND             0.1        1878.87
Filtration_POND             0.11       1884.61
Filtration_POND             0.12       1890.36
Filtration_POND             0.13       1896.11
Filtration_POND             0.14       1901.87
Filtration_POND             0.15       1907.64
Filtration_POND             0.16       1913.41
Filtration_POND             0.17       1919.19
Filtration_POND             0.18       1924.98
Filtration_POND             0.19       1930.78
Filtration_POND             0.2        1936.58
Filtration_POND             0.21       1942.38
Filtration_POND             0.22       1948.2
Filtration_POND             0.23       1954.02
Filtration_POND             0.24       1959.84
Filtration_POND             0.25       1965.68
Filtration_POND             0.26       1971.52
Filtration_POND             0.27       1977.36
Filtration_POND             0.28       1983.22
Filtration_POND             0.29       1989.08
Filtration_POND             0.3        1994.94
Filtration_POND             0.31       2000.81
Filtration_POND             0.32       2006.69
Filtration_POND             0.33       2012.58
Filtration_POND             0.34       2018.47
Filtration_POND             0.35       2024.37
Filtration_POND             0.36       2030.28
Filtration_POND             0.37       2036.19
Filtration_POND             0.38       2042.11
Filtration_POND             0.39       2048.03
Filtration_POND             0.4        2053.97
Filtration_POND             0.41       2059.9
Filtration_POND             0.42       2065.85
Filtration_POND             0.43       2071.8
Filtration_POND             0.44       2077.76
Filtration_POND             0.45       2083.72
Filtration_POND             0.46       2089.69
Filtration_POND             0.47       2095.67
Filtration_POND             0.48       2101.66
Filtration_POND             0.49       2107.65
Filtration_POND             0.5        2113.65
Filtration_POND             0.51       2119.65
Filtration_POND             0.52       2125.66
Filtration_POND             0.53       2131.68
Filtration_POND             0.54       2137.7
Filtration_POND             0.55       2143.73
Filtration_POND             0.56       2149.77
Filtration_POND             0.57       2155.81
Filtration_POND             0.58       2161.86
Filtration_POND             0.59       2167.92
Filtration_POND             0.6        2173.98
Filtration_POND             0.61       2180.05
Filtration_POND             0.62       2186.13
Filtration_POND             0.63       2192.21
Filtration_POND             0.64       2198.3
Filtration_POND             0.65       2204.4
Filtration_POND             0.66       2210.5
Filtration_POND             0.67       2216.61
Filtration_POND             0.68       2222.73
Filtration_POND             0.69       2228.85
Filtration_POND             0.7        2234.98
Filtration_POND             0.71       2240.66
Filtration_POND             0.72       2246.33
Filtration_POND             0.73       2252
Filtration_POND             0.74       2257.67
Filtration_POND             0.75       2263.33
Filtration_POND             0.76       2268.99
Filtration_POND             0.77       2274.64
Filtration_POND             0.78       2280.28
Filtration_POND             0.79       2285.92
Filtration_POND             0.8        2291.56
Filtration_POND             0.81       2297.19
Filtration_POND             0.82       2302.82
Filtration_POND             0.83       2308.44
Filtration_POND             0.84       2314.06
Filtration_POND             0.85       2319.67
Filtration_POND             0.86       2325.28
Filtration_POND             0.87       2330.88
Filtration_POND             0.88       2336.48
Filtration_POND             0.89       2342.07
Filtration_POND             0.9        2347.66
Filtration_POND             0.91       2353.24
Filtration_POND             0.92       2358.82
Filtration_POND             0.93       2364.4
Filtration_POND             0.94       2369.97
Filtration_POND             0.95       2375.53
Filtration_POND             0.96       2381.09
Filtration_POND             0.97       2386.64
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Filtration_POND             0.98        2392.19
Filtration_POND             0.99        2397.74
Filtration_POND             1           2403.28

INFIL_1          Storage    0           90
INFIL_1                     0.9         90
INFIL_1                     0.901       0
INFIL_1                     2.15        0

INFIL_2          Storage    0           90
INFIL_2                     0.9         90
INFIL_2                     0.901       0
INFIL_2                     2.15        0

;Represents the storage of Perforated Pipes
MH_300           Storage    0           899.812
MH_300                      0.41        899.812
MH_300                      0.42        1.13
MH_300                      10          1.13

;Represents the storage of Perforated Pipes
MH_302           Storage    0           765.752
MH_302                      0.41        765.752
MH_302                      0.42        1.13
MH_302                      10          1.13

;Represents the storage of Perforated Pipes
MH_304           Storage    0           155
MH_304                      1.01        155
MH_304                      1.02        1.13
MH_304                      10          1.13

;Represents the storage of Perforated Pipes
MH_320           Storage    0           776.567
MH_320                      0.41        776.567
MH_320                      0.42        1.13
MH_320                      10          1.13

;Represents the storage of Perforated Pipes
MH_322           Storage    0           363.575
MH_322                      0.41        363.575
MH_322                      0.42        1.13
MH_322                      10          1.13

;Represents the storage of Perforated Pipes
MH_323           Storage    0           834.664
MH_323                      0.41        834.664
MH_323                      0.42        1.13
MH_323                      10          1.13

;Represents the storage of Perforated Pipes
MH_330           Storage    0           915.702963
MH_330                      0.41        915.702963
MH_330                      0.42        1.13
MH_330                      10          1.13

;Represents the storage of Perforated Pipes
MH_332           Storage    0           1014.107
MH_332                      0.41        1014.107
MH_332                      0.42        1.13
MH_332                      10          1.13

;Represents the storage of Perforated Pipes
MH_334           Storage    0           979.695
MH_334                      0.41        979.695
MH_334                      0.42        1.13
MH_334                      10          1.13

MH104            Storage    0           362.605
MH104                       0.43        362.605
MH104                       0.44        1.13
MH104                       10          1.13

MH105            Storage    0           39.254
MH105                       0.43        39.254
MH105                       0.44        1.13
MH105                       10          1.13

MH105A           Storage    0           102.398
MH105A                      0.47        102.398
MH105A                      0.48        1.13
MH105A                      10          1.13

MH106            Storage    0           187.305
MH106                       0.43        187.305
MH106                       0.44        1.13
MH106                       10          1.13

MH108            Storage    0           216.638
MH108                       0.43        216.638
MH108                       0.44        1.13
MH108                       10          1.13

MH109            Storage    0           222.269
MH109                       0.43        222.269
MH109                       0.44        1.13
MH109                       10          1.13

MH110            Storage    0           197.102
MH110                       0.43        197.102
MH110                       0.44        1.13
MH110                       10          1.13

MH111            Storage    0           253.581
MH111                       0.43        253.581
MH111                       0.44        1.13
MH111                       10          1.13

MH112            Storage    0           210.826
MH112                       0.43        210.826
MH112                       0.44        1.13
MH112                       10          1.13

MH113            Storage    0           173.1375
MH113                       0.43        173.1375
MH113                       0.44        1.13
MH113                       10          1.13

MH114            Storage    0           122.95
MH114                       0.43        122.95
MH114                       0.44        1.13
MH114                       10          1.13

MH115            Storage    0           118.356
MH115                       0.46        118.356
MH115                       0.47        1.13
MH115                       10          1.13

MH115A           Storage    0           40.041
MH115A                      0.47        40.041
MH115A                      0.48        1.13
MH115A                      10          1.13

MH116            Storage    0           103.891
MH116                       0.47        103.891
MH116                       0.48        1.13
MH116                       10          1.13

MH117            Storage    0           101.402
MH117                       0.46        101.402
MH117                       0.47        1.13
MH117                       10          1.13

MH118            Storage    0           83.412
MH118                       0.47        83.412
MH118                       0.48        1.13
MH118                       10          1.13

MH120            Storage    0           131.188
MH120                       0.46        131.188
MH120                       0.47        1.13
MH120                       10          1.13

MH122            Storage    0           99.399
MH122                       0.46        99.399
MH122                       0.47        1.13
MH122                       10          1.13

MH123            Storage    0           54.162
MH123                       0.46        54.162
MH123                       0.47        1.13
MH123                       10          1.13

MH124            Storage    0           88.243
MH124                       0.47        88.243
MH124                       0.48        1.13
MH124                       10          1.13

MH125            Storage    0           7.764
MH125                       0.47        7.764
MH125                       0.48        1.13
MH125                       10          1.13

;EES Storage
MH308            Storage    0           61.5
MH308                       0.43        61.5
MH308                       0.44        1.13
MH308                       10          1.13

;EES Storage
MH309            Storage    0           124.79
MH309                       0.41        124.79
MH309                       0.42        1.13
MH309                       10          1.13

;EES Storage
MH311            Storage    0           135.11
MH311                       0.43        135.11
MH311                       0.44        1.13
MH311                       10          1.13

;EES Storage
MH312            Storage    0           17.11
MH312                       0.43        17.11
MH312                       0.44        1.13
MH312                       10          1.13

;EES Storage
MH314            Storage    0           159.861
MH314                       0.43        159.861
MH314                       0.44        1.13
MH314                       10          1.13

;EES Storage
MH316            Storage    0           170.358
MH316                       0.42        170.358
MH316                       0.43        1.13
MH316                       10          1.13

;EES Storage
MH317            Storage    0           16.36
MH317                       0.43        16.36
MH317                       0.44        1.13
MH317                       10          1.13

;EES Storage
MH318            Storage    0           122.6
MH318                       0.43        122.6
MH318                       0.44        1.13
MH318                       10          1.13

;EES Storage
MH319            Storage    0           291.366
MH319                       0.41        291.366
MH319                       0.42        1.13
MH319                       10          1.13

;EES Storage
MH321            Storage    0           115.77
MH321                       0.43        115.77
MH321                       0.44        1.13
MH321                       10          1.13

;EES Storage
MH324            Storage    0           93.848
MH324                       0.43        93.848
MH324                       0.44        1.13
MH324                       10          1.13

;EES Storage
MH325            Storage    0           113.076
MH325                       0.42        113.076
MH325                       0.43        1.13
MH325                       10          1.13

;EES Storage
MH326            Storage    0           148.56
MH326                       0.4         148.56
MH326                       0.41        1.13
MH326                       10          1.13

;EES Storage
MH327            Storage    0           219.857
MH327                       0.4         219.857
MH327                       0.41        1.13
MH327                       10          1.13

;EES Storage
MH329            Storage    0           205.619
MH329                       0.4         205.619
MH329                       0.41        1.13
MH329                       10          1.13

;EES Storage
MH331            Storage    0           161.713
MH331                       0.4         161.713
MH331                       0.41        1.13
MH331                       10          1.13

;EES Storage
MH347            Storage    0           75.156
MH347                       0.43        75.156
MH347                       0.44        1.13
MH347                       10          1.13

;EES Storage
MH348            Storage    0           106.728
MH348                       0.43        106.728
MH348                       0.44        1.13
MH348                       10          1.13

;EES Storage
MH349            Storage    0           155.6
MH349                       0.43        155.6
MH349                       0.44        1.13
MH349                       10          1.13

;EES Storage
MH351            Storage    0           258.92
MH351                       0.4         258.92
MH351                       0.41        1.13
MH351                       10          1.13

;EES Storage
MH354            Storage    0           71.65
MH354                       0.4         71.65
MH354                       0.41        1.13
MH354                       10          1.13
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;EES Storage
MH356             Storage    0          95.1
MH356                        0.42       95.1
MH356                        0.43       1.13
MH356                        10         1.13

North_Pond        Storage    0          12163
North_Pond                   0.2        13445
North_Pond                   0.4        13911
North_Pond                   0.6        14383
North_Pond                   0.8        14861
North_Pond                   1          15345
North_Pond                   1.2        15633
North_Pond                   1.4        15913
North_Pond                   1.6        16196
North_Pond                   1.8        16482
North_Pond                   2          16771

North_Pond_REV1   Storage    0          0
North_Pond_REV1              0.1        194
North_Pond_REV1              0.2        777
North_Pond_REV1              0.3        1835
North_Pond_REV1              0.4        7762
North_Pond_REV1              0.5        9920
North_Pond_REV1              0.6        10054
North_Pond_REV1              0.7        10190
North_Pond_REV1              0.8        10326
North_Pond_REV1              0.9        10463
North_Pond_REV1              1          10601
North_Pond_REV1              1.1        10739
North_Pond_REV1              1.2        10878
North_Pond_REV1              1.3        11019
North_Pond_REV1              1.4        11159
North_Pond_REV1              1.5        11301
North_Pond_REV1              1.6        11444
North_Pond_REV1              1.7        11587
North_Pond_REV1              1.8        11731
North_Pond_REV1              1.9        11876
North_Pond_REV1              2          12022
North_Pond_REV1              2.1        12168
North_Pond_REV1              2.2        12315
North_Pond_REV1              2.3        12540
North_Pond_REV1              2.4        12731
North_Pond_REV1              2.5        12931
North_Pond_REV1              2.6        13140
North_Pond_REV1              2.7        13361
North_Pond_REV1              2.8        13594
North_Pond_REV1              2.9        13839
North_Pond_REV1              3          14093
North_Pond_REV1              3.1        14358
North_Pond_REV1              3.2        14635
North_Pond_REV1              3.3        14926
North_Pond_REV1              3.4        15246
North_Pond_REV1              3.5        15596
North_Pond_REV1              3.6        16292
North_Pond_REV1              3.7        17007
North_Pond_REV1              3.8        17657

;Pond bottom slope  - 1.5%
North_Pond_REV2   Storage    0          4.16
North_Pond_REV2              0.1        141.5
North_Pond_REV2              0.2        156.97
North_Pond_REV2              0.3        1239.26
North_Pond_REV2              0.4        2276.22
North_Pond_REV2              0.5        3516.84
North_Pond_REV2              0.6        5126.66
North_Pond_REV2              0.7        6677.84
North_Pond_REV2              0.8        8170.4
North_Pond_REV2              0.9        9604.25
North_Pond_REV2              1          10837.64
North_Pond_REV2              1.1        11036.08
North_Pond_REV2              1.2        11235.69
North_Pond_REV2              1.3        11436.49
North_Pond_REV2              1.4        11638.46
North_Pond_REV2              1.5        11841.61
North_Pond_REV2              1.6        12045.93
North_Pond_REV2              1.7        12251.44
North_Pond_REV2              1.8        12458.12
North_Pond_REV2              1.9        12665.97
North_Pond_REV2              2          12880.46
North_Pond_REV2              2.1        13090.3
North_Pond_REV2              2.2        13301.08
North_Pond_REV2              2.3        13637.88
North_Pond_REV2              2.4        13903.9
North_Pond_REV2              2.5        14181.8
North_Pond_REV2              2.6        14473.79
North_Pond_REV2              2.7        14780.61
North_Pond_REV2              2.8        15101.01
North_Pond_REV2              2.9        15432.83
North_Pond_REV2              3          15778.33

POND_UPDATED      Storage    0          0
POND_UPDATED                 0.01       1.26
POND_UPDATED                 0.02       5.06
POND_UPDATED                 0.03       11.38
POND_UPDATED                 0.04       20.23
POND_UPDATED                 0.05       31.77
POND_UPDATED                 0.06       45.25
POND_UPDATED                 0.07       59.42
POND_UPDATED                 0.08       74.26
POND_UPDATED                 0.09       89.8
POND_UPDATED                 0.1        106.62
POND_UPDATED                 0.11       125.04
POND_UPDATED                 0.12       145.05
POND_UPDATED                 0.13       166.63
POND_UPDATED                 0.14       189.47
POND_UPDATED                 0.15       214.1
POND_UPDATED                 0.16       240.56
POND_UPDATED                 0.17       268.7
POND_UPDATED                 0.18       297.76
POND_UPDATED                 0.19       328.55
POND_UPDATED                 0.2        361.5
POND_UPDATED                 0.21       396.11
POND_UPDATED                 0.22       431.62
POND_UPDATED                 0.23       468.5
POND_UPDATED                 0.24       507.91
POND_UPDATED                 0.25       548.86
POND_UPDATED                 0.26       590.91
POND_UPDATED                 0.27       634.13
POND_UPDATED                 0.28       679.73
POND_UPDATED                 0.29       726.93
POND_UPDATED                 0.3        775.59
POND_UPDATED                 0.31       825.69
POND_UPDATED                 0.32       877.01
POND_UPDATED                 0.33       930.31
POND_UPDATED                 0.34       985.68
POND_UPDATED                 0.35       1042.98
POND_UPDATED                 0.36       1099.93
POND_UPDATED                 0.37       1158.92
POND_UPDATED                 0.38       1221.22
POND_UPDATED                 0.39       1285.8
POND_UPDATED                 0.4        1348.93
POND_UPDATED                 0.41       1412.7
POND_UPDATED                 0.42       1482.37
POND_UPDATED                 0.43       1554.16
POND_UPDATED                 0.44       1623.64
POND_UPDATED                 0.45       1691.61
POND_UPDATED                 0.46       1769.73
POND_UPDATED                 0.47       1849.58
POND_UPDATED                 0.48       1927
POND_UPDATED                 0.49       2001.98
POND_UPDATED                 0.5        2246.52
POND_UPDATED                 0.51       2354.16
POND_UPDATED                 0.52       2463.55
POND_UPDATED                 0.53       2574.69
POND_UPDATED                 0.54       2687.57
POND_UPDATED                 0.55       2802.21
POND_UPDATED                 0.56       2918.61
POND_UPDATED                 0.57       3036.77
POND_UPDATED                 0.58       3156.69
POND_UPDATED                 0.59       3278.38
POND_UPDATED                 0.6        3401.85
POND_UPDATED                 0.61       3527.09
POND_UPDATED                 0.62       3654.12
POND_UPDATED                 0.63       3782.92
POND_UPDATED                 0.64       3913.51
POND_UPDATED                 0.65       4045.9
POND_UPDATED                 0.66       4180.08
POND_UPDATED                 0.67       4316.06
POND_UPDATED                 0.68       4453.87
POND_UPDATED                 0.69       4593.55
POND_UPDATED                 0.7        4735.01
POND_UPDATED                 0.71       4878.25
POND_UPDATED                 0.72       5023.27
POND_UPDATED                 0.73       5170.08
POND_UPDATED                 0.74       5318.7
POND_UPDATED                 0.75       5469.12
POND_UPDATED                 0.76       5621.35
POND_UPDATED                 0.77       5775.39
POND_UPDATED                 0.78       5931.25
POND_UPDATED                 0.79       6088.93
POND_UPDATED                 0.8        6248.43
POND_UPDATED                 0.81       6409.76
POND_UPDATED                 0.82       6572.92
POND_UPDATED                 0.83       6737.92
POND_UPDATED                 0.84       6904.75
POND_UPDATED                 0.85       7073.42
POND_UPDATED                 0.86       7243.73
POND_UPDATED                 0.87       7415.41
POND_UPDATED                 0.88       7588.46
POND_UPDATED                 0.89       7762.89
POND_UPDATED                 0.9        7938.68
POND_UPDATED                 0.91       8114.81
POND_UPDATED                 0.92       8290.2
POND_UPDATED                 0.93       8464.88
POND_UPDATED                 0.94       8638.82
POND_UPDATED                 0.95       8812.04
POND_UPDATED                 0.96       8984.53
POND_UPDATED                 0.97       9156.3
POND_UPDATED                 0.98       9327.34
POND_UPDATED                 0.99       9497.66
POND_UPDATED                 1          9667.25
POND_UPDATED                 1.01       9836.11
POND_UPDATED                 1.02       10004.25
POND_UPDATED                 1.03       10171.67
POND_UPDATED                 1.04       10338.34
POND_UPDATED                 1.05       10504.27
POND_UPDATED                 1.06       10669.45
POND_UPDATED                 1.07       10833.88
POND_UPDATED                 1.08       10997.56
POND_UPDATED                 1.09       11160.5
POND_UPDATED                 1.1        11322.68
POND_UPDATED                 1.11       11484.12
POND_UPDATED                 1.12       11644.8
POND_UPDATED                 1.13       11804.75
POND_UPDATED                 1.14       11963.99
POND_UPDATED                 1.15       12122.54
POND_UPDATED                 1.16       12280.41
POND_UPDATED                 1.17       12437.57
POND_UPDATED                 1.18       12594.03
POND_UPDATED                 1.19       12749.77
POND_UPDATED                 1.2        12904.8
POND_UPDATED                 1.21       13059.12
POND_UPDATED                 1.22       13212.73
POND_UPDATED                 1.23       13365.62
POND_UPDATED                 1.24       13517.8
POND_UPDATED                 1.25       13669.27
POND_UPDATED                 1.26       13820.03
POND_UPDATED                 1.27       13970.07
POND_UPDATED                 1.28       14119.4
POND_UPDATED                 1.29       14267.99
POND_UPDATED                 1.3        14415.72
POND_UPDATED                 1.31       14562.56
POND_UPDATED                 1.32       14708.52
POND_UPDATED                 1.33       14853.59
POND_UPDATED                 1.34       14997.79
POND_UPDATED                 1.35       15141.1
POND_UPDATED                 1.36       15283.52
POND_UPDATED                 1.37       15425.06
POND_UPDATED                 1.38       15565.72
POND_UPDATED                 1.39       15705.49
POND_UPDATED                 1.4        15844.39
POND_UPDATED                 1.41       15982.41
POND_UPDATED                 1.42       16119.55
POND_UPDATED                 1.43       16255.81
POND_UPDATED                 1.44       16391.19
POND_UPDATED                 1.45       16525.74
POND_UPDATED                 1.46       16659.43
POND_UPDATED                 1.47       16792.25
POND_UPDATED                 1.48       16924.22
POND_UPDATED                 1.49       17055.38
POND_UPDATED                 1.5        17185.72
POND_UPDATED                 1.51       17315.23
POND_UPDATED                 1.52       17443.93
POND_UPDATED                 1.53       17571.91
POND_UPDATED                 1.54       17699.2
POND_UPDATED                 1.55       17825.8
POND_UPDATED                 1.56       17951.7
POND_UPDATED                 1.57       18076.88
POND_UPDATED                 1.58       18201.34
POND_UPDATED                 1.59       18325.08
POND_UPDATED                 1.6        18448.08
POND_UPDATED                 1.61       18570.33
POND_UPDATED                 1.62       18692.01
POND_UPDATED                 1.63       18815.19
POND_UPDATED                 1.64       18940.47
POND_UPDATED                 1.65       19067.85
POND_UPDATED                 1.66       19197.33
POND_UPDATED                 1.67       19328.92
POND_UPDATED                 1.68       19462.62
POND_UPDATED                 1.69       19598.41
POND_UPDATED                 1.7        19735.7
POND_UPDATED                 1.71       19873.79
POND_UPDATED                 1.72       20012.89
POND_UPDATED                 1.73       20153.35
POND_UPDATED                 1.74       20295.17
POND_UPDATED                 1.75       20438.35
POND_UPDATED                 1.76       20583
POND_UPDATED                 1.77       20729.17
POND_UPDATED                 1.78       20876.88
POND_UPDATED                 1.79       21026.11
POND_UPDATED                 1.8        21176.87
POND_UPDATED                 1.81       21329.16
POND_UPDATED                 1.82       21482.97
POND_UPDATED                 1.83       21638.32
POND_UPDATED                 1.84       21795.19
POND_UPDATED                 1.85       21953.59
POND_UPDATED                 1.86       22113.51
POND_UPDATED                 1.87       22275.11
POND_UPDATED                 1.88       22439.96
POND_UPDATED                 1.89       22608.53
POND_UPDATED                 1.9        22780.8
POND_UPDATED                 1.91       22956.79
POND_UPDATED                 1.92       23136.49
POND_UPDATED                 1.93       23319.89
POND_UPDATED                 1.94       23497.21
POND_UPDATED                 1.95       23643.49
POND_UPDATED                 1.96       23772.08
POND_UPDATED                 1.97       23890.87
POND_UPDATED                 1.98       23964.36
POND_UPDATED                 1.99       24009.65
POND_UPDATED                 2          24036.63
POND_UPDATED                 2.01       24054.44
POND_UPDATED                 2.02       24072.26
POND_UPDATED                 2.03       24090.09
POND_UPDATED                 2.04       24107.92
POND_UPDATED                 2.05       24125.76
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POND_UPDATED                2.06        24143.6
POND_UPDATED                2.07        24161.44
POND_UPDATED                2.08        24179.29
POND_UPDATED                2.09        24197.15
POND_UPDATED                2.1         24215
POND_UPDATED                2.11        24232.87
POND_UPDATED                2.12        24250.74
POND_UPDATED                2.13        24268.61
POND_UPDATED                2.14        24286.49
POND_UPDATED                2.15        24304.37
POND_UPDATED                2.16        24322.26
POND_UPDATED                2.17        24340.15
POND_UPDATED                2.18        24358.04
POND_UPDATED                2.19        24375.95
POND_UPDATED                2.2         24393.85
POND_UPDATED                2.21        24411.76
POND_UPDATED                2.22        24429.68
POND_UPDATED                2.23        24452.66
POND_UPDATED                2.24        24476.44
POND_UPDATED                2.25        24500.88
POND_UPDATED                2.26        24525.86
POND_UPDATED                2.27        24551.37
POND_UPDATED                2.28        24577.47
POND_UPDATED                2.29        24604.16
POND_UPDATED                2.3         24631.45
POND_UPDATED                2.31        24659.02
POND_UPDATED                2.32        24687.14
POND_UPDATED                2.33        24715.79
POND_UPDATED                2.34        24744.97
POND_UPDATED                2.35        24774.57
POND_UPDATED                2.65        24774.57

South_Pond       Storage    0           247.03
South_Pond                  0.05        1261.14
South_Pond                  0.25        7886.8
South_Pond                  0.45        16053.19
South_Pond                  0.65        16379.85
South_Pond                  0.85        16710.01
South_Pond                  1.05        17043.68
South_Pond                  1.25        17380.85
South_Pond                  1.45        17721.53
South_Pond                  1.65        18065.71
South_Pond                  1.85        18413.4
South_Pond                  2.05        18764.59
South_Pond                  2.25        19119.29
South_Pond                  2.45        19477.5
South_Pond                  2.65        19839.21
South_Pond                  2.85        20204.43
South_Pond                  3.05        20573.15
South_Pond                  3.25        20945.37
South_Pond                  3.45        21321.11
South_Pond                  3.65        21700.35
South_Pond                  3.85        22083.09
South_Pond                  4.05        22469.34

South_Pond_REV1  Storage    0           172.921
South_Pond_REV1             0.05        882.798
South_Pond_REV1             0.25        5520.76
South_Pond_REV1             0.45        11237.233
South_Pond_REV1             0.65        11465.895
South_Pond_REV1             0.85        11697.007
South_Pond_REV1             1.05        11930.576
South_Pond_REV1             1.25        12166.595
South_Pond_REV1             1.45        12405.071
South_Pond_REV1             1.65        12645.997
South_Pond_REV1             1.85        12889.38
South_Pond_REV1             2.05        13135.213
South_Pond_REV1             2.25        13383.503
South_Pond_REV1             2.45        13634.25
South_Pond_REV1             2.65        13887.447
South_Pond_REV1             2.85        14143.101
South_Pond_REV1             3.05        14401.205
South_Pond_REV1             3.25        14661.759
South_Pond_REV1             3.45        14924.777
South_Pond_REV1             3.65        15190.245
South_Pond_REV1             3.85        15458.163
South_Pond_REV1             4.05        15728.538

South_Pond_REV2  Storage    0           30.99
South_Pond_REV2             0.05        559.34
South_Pond_REV2             0.25        10526.39
South_Pond_REV2             0.45        11301.52
South_Pond_REV2             0.65        11535.4
South_Pond_REV2             0.85        11771.33
South_Pond_REV2             1.05        12009.3
South_Pond_REV2             1.25        12249.32
South_Pond_REV2             1.45        12491.37
South_Pond_REV2             1.65        12735.47
South_Pond_REV2             1.85        12981.62
South_Pond_REV2             2.05        13229.8
South_Pond_REV2             2.25        13480.03
South_Pond_REV2             2.45        13732.3
South_Pond_REV2             2.65        13986.62
South_Pond_REV2             2.85        14242.97
South_Pond_REV2             3.05        14506.06
South_Pond_REV2             3.25        14950.69
South_Pond_REV2             3.45        15461.77
South_Pond_REV2             3.65        16124.96
South_Pond_REV2             3.85        16986.19
South_Pond_REV2             4.05        17983.56

;Configuration of south pond has been revised to accomodate new location for CBs (DWG File:
26610-001.1 C GRD.dwg from April 2019)
South_Pond_REV3  Storage    0           247.45
South_Pond_REV3             0.05        907.95
South_Pond_REV3             0.25        3814.6
South_Pond_REV3             0.45        10218.01
South_Pond_REV3             0.65        14167.31
South_Pond_REV3             0.85        16362.74
South_Pond_REV3             1.05        16694.43
South_Pond_REV3             1.25        17029.45
South_Pond_REV3             1.45        17367.8
South_Pond_REV3             1.65        17709.48
South_Pond_REV3             1.85        18054.47
South_Pond_REV3             2.05        18402.8
South_Pond_REV3             2.25        18754.45
South_Pond_REV3             2.45        19109.42
South_Pond_REV3             2.65        19467.73
South_Pond_REV3             2.85        19829.35
South_Pond_REV3             3.05        20194.31
South_Pond_REV3             3.25        20562.58
South_Pond_REV3             3.45        20934.19
South_Pond_REV3             3.65        21309.12
South_Pond_REV3             3.85        21687.73
South_Pond_REV3             4.05        22080.22

South-West_Dry_Pond Storage    0            0
South-West_Dry_Pond            0.01         1
South-West_Dry_Pond            0.16         132.02
South-West_Dry_Pond            0.36         198.42
South-West_Dry_Pond            0.56         267.05
South-West_Dry_Pond            0.76         339.34
South-West_Dry_Pond            1.16         494.94
South-West_Dry_Pond            1.56         665.2
South-West_Dry_Pond            1.96         852.23
South-West_Dry_Pond            2.36         1070.67
South-West_Dry_Pond            2.55         1192.33

St_EX_315-314    Storage    0           0
St_EX_315-314               0.05        953
St_EX_315-314               0.3         3053
St_EX_315-314               0.55        4809
St_EX_315-314               0.8         8259
St_EX_315-314               1.05        9641
St_EX_315-314               1.3         11335
St_EX_315-314               1.55        13235
St_EX_315-314               1.8         15620
St_EX_315-314               2.05        17776
St_EX_315-314               2.3         20653
St_EX_315-314               2.55        24105
St_EX_315-314               2.8         28808
St_EX_315-314               3.05        33125
St_EX_315-314               3.3         37840
St_EX_315-314               3.55        42900
St_EX_315-314               3.8         46200
St_EX_315-314               4.05        49400
St_EX_315-314               4.3         52386
St_EX_315-314               4.55        55432
St_EX_315-314               4.8         59922
St_EX_315-314               5.05        68322
St_EX_315-314               5.3         74748
St_EX_315-314               5.55        79516
St_EX_315-314               5.8         83846
St_EX_315-314               6.05        88185
St_EX_315-314               6.3         93332
St_EX_315-314               6.55        100554
St_EX_315-314               6.8         107454
St_EX_315-314               7.05        110971
St_EX_315-314               7.3         114937
St_EX_315-314               7.55        119955
St_EX_315-314               7.8         122998
St_EX_315-314               8.05        124891
St_EX_315-314               8.3         126379
St_EX_315-314               8.55        127185
St_EX_315-314               8.8         128151
St_EX_315-314               9.05        128288
St_EX_315-314               9.3         128334
St_EX_315-314               9.55        128351
St_EX_315-314               9.8         128365
St_EX_315-314               10.05       128378
St_EX_315-314               10.3        128389
St_EX_315-314               10.55       128401
St_EX_315-314               10.8        128417

;Park - South end of subdivision
St_Park_624      Storage    0           0.36
St_Park_624                 1.8         0.36
St_Park_624                 1.81        2
St_Park_624                 2.15        2

;Parkette
St_Park_625      Storage    0           0.36
St_Park_625                 1.8         0.36
St_Park_625                 1.81        2887
St_Park_625                 2.15        2887

St_Park3         Storage    0           0.36
St_Park3                    1.83        0.36
St_Park3                    1.84        2.76
St_Park3                    2.13        526.74
St_Park3                    2.18        782.29
St_Park3                    2.33        1594.39

;School (Loction: Adjacent to Kilbirnie Dr))
St_SCH_622       Storage    0           0.36
St_SCH_622                  1.8         0.36
St_SCH_622                  1.81        1400
St_SCH_622                  2.15        1400

St_SCH_623       Storage    0           0.36
St_SCH_623                  1.8         0.36
St_SCH_623                  1.81        1400
St_SCH_623                  2.16        1400

St_STUB6         Storage    0           0.72
St_STUB6                    0.2         35.34
St_STUB6                    0.4         116.75
St_STUB6                    0.6         245.75
St_STUB6                    0.75        378
St_STUB6                    0.91        610.39

ST4_105_(P-Stm)  Storage    0           132.83
ST4_105_(P-Stm)             0.43        132.83
ST4_105_(P-Stm)             0.44        1.13
ST4_105_(P-Stm)             10          1.13

ST4_106_(P-Stm)  Storage    0           232.238
ST4_106_(P-Stm)             0.43        232.238
ST4_106_(P-Stm)             0.44        1.13
ST4_106_(P-Stm)             10          1.13

ST4_107_(P-Stm)  Storage    0           176.843
ST4_107_(P-Stm)             0.43        176.843
ST4_107_(P-Stm)             0.44        1.13
ST4_107_(P-Stm)             10          1.13

ST4_108_(P-Stm)  Storage    0           176.063
ST4_108_(P-Stm)             0.43        176.063
ST4_108_(P-Stm)             0.44        1.13
ST4_108_(P-Stm)             10          1.13

ST4_108A_(P-Stm) Storage    0           45.835
ST4_108A_(P-Stm)            0.43        45.835
ST4_108A_(P-Stm)            0.44        1.13
ST4_108A_(P-Stm)            10          1.13

ST4_109_(P-Stm)  Storage    0           134.897
ST4_109_(P-Stm)             0.43        134.897
ST4_109_(P-Stm)             0.44        1.13
ST4_109_(P-Stm)             10          1.13

ST4_111_(P-Stm)  Storage    0           72.443
ST4_111_(P-Stm)             0.46        72.443
ST4_111_(P-Stm)             0.47        1.13
ST4_111_(P-Stm)             10          1.13

ST4_112_(P-Stm)  Storage    0           61.988
ST4_112_(P-Stm)             0.46        61.988
ST4_112_(P-Stm)             0.47        1.13
ST4_112_(P-Stm)             10          1.13

ST4_113_(P-Stm)  Storage    0           95.037
ST4_113_(P-Stm)             0.47        95.037
ST4_113_(P-Stm)             0.48        1.13
ST4_113_(P-Stm)             10          1.13

ST4_119_(P-Stm)  Storage    0           175.406
ST4_119_(P-Stm)             0.44        175.406
ST4_119_(P-Stm)             0.45        1.13
ST4_119_(P-Stm)             10          1.13

ST4_120_(P-Stm)  Storage    0           165.736
ST4_120_(P-Stm)             0.44        165.736
ST4_120_(P-Stm)             0.45        1.13
ST4_120_(P-Stm)             10          1.13

ST4_123_(P-Stm)  Storage    0           132.572
ST4_123_(P-Stm)             0.44        132.572
ST4_123_(P-Stm)             0.45        1.13
ST4_123_(P-Stm)             10          1.13

ST4_125_(P-Stm)  Storage    0           173.66
ST4_125_(P-Stm)             0.44        173.66
ST4_125_(P-Stm)             0.45        1.13
ST4_125_(P-Stm)             10          1.13

ST4_126_(P-Stm)  Storage    0           69.445
ST4_126_(P-Stm)             0.45        69.445
ST4_126_(P-Stm)             0.46        1.13
ST4_126_(P-Stm)             10          1.13

ST4_127_(P-Stm)  Storage    0           181.655
ST4_127_(P-Stm)             0.46        181.655
ST4_127_(P-Stm)             0.47        1.13
ST4_127_(P-Stm)             10          1.13

ST4_128_(P-Stm)  Storage    0           115.355
ST4_128_(P-Stm)             0.45        115.355
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ST4_128_(P-Stm)             0.46        1.13
ST4_128_(P-Stm)             10          1.13

ST4_129_(P-Stm)  Storage    0           82.002
ST4_129_(P-Stm)             0.45        82.002
ST4_129_(P-Stm)             0.46        1.13
ST4_129_(P-Stm)             10          1.13

ST4_130_(P-Stm)  Storage    0           71.759
ST4_130_(P-Stm)             0.45        71.759
ST4_130_(P-Stm)             0.46        1.13
ST4_130_(P-Stm)             10          1.13

ST4_131_(P-Stm)  Storage    0           113.471
ST4_131_(P-Stm)             0.45        113.471
ST4_131_(P-Stm)             0.46        1.13
ST4_131_(P-Stm)             10          1.13

ST4_134_(P-Stm)  Storage    0           130.106
ST4_134_(P-Stm)             0.47        130.106
ST4_134_(P-Stm)             0.48        1.13
ST4_134_(P-Stm)             10          1.13

ST5_MH_501       Storage    0           142.46
ST5_MH_501                  0.46        142.46
ST5_MH_501                  0.47        1.13
ST5_MH_501                  10          1.13

ST5_MH_502       Storage    0           156.248
ST5_MH_502                  0.46        156.248
ST5_MH_502                  0.47        1.13
ST5_MH_502                  10          1.13

ST5_MH_503       Storage    0           590.625
ST5_MH_503                  0.46        590.625
ST5_MH_503                  0.47        1.13
ST5_MH_503                  10          1.13

ST5_MH_504       Storage    0           172.89
ST5_MH_504                  0.46        172.89
ST5_MH_504                  0.47        1.13
ST5_MH_504                  10          1.13

[TIMESERIES]
;;Name           Date       Time        Value
;;-------------- ---------- ----------  ----------
;Rainfall (mm/hr)
12SCS002         01/01/2000 00:00:00    1.296
12SCS002         01/01/2000 00:15:00    1.296
12SCS002         01/01/2000 00:30:00    0.6048
12SCS002         01/01/2000 00:45:00    0.6048
12SCS002         01/01/2000 01:00:00    1.1232
12SCS002         01/01/2000 01:15:00    1.1232
12SCS002         01/01/2000 01:30:00    1.1232
12SCS002         01/01/2000 01:45:00    1.1232
12SCS002         01/01/2000 02:00:00    1.4688
12SCS002         01/01/2000 02:15:00    1.4688
12SCS002         01/01/2000 02:30:00    1.296
12SCS002         01/01/2000 02:45:00    1.296
12SCS002         01/01/2000 03:00:00    1.728
12SCS002         01/01/2000 03:15:00    1.728
12SCS002         01/01/2000 03:30:00    1.728
12SCS002         01/01/2000 03:45:00    1.728
12SCS002         01/01/2000 04:00:00    2.3328
12SCS002         01/01/2000 04:15:00    2.3328
12SCS002         01/01/2000 04:30:00    2.9376
12SCS002         01/01/2000 04:45:00    2.9376
12SCS002         01/01/2000 05:00:00    4.6656
12SCS002         01/01/2000 05:15:00    4.6656
12SCS002         01/01/2000 05:30:00    23.328
12SCS002         01/01/2000 05:45:00    50.6304
12SCS002         01/01/2000 06:00:00    9.4176
12SCS002         01/01/2000 06:15:00    9.4176
12SCS002         01/01/2000 06:30:00    4.1472
12SCS002         01/01/2000 06:45:00    4.1472
12SCS002         01/01/2000 07:00:00    2.7648
12SCS002         01/01/2000 07:15:00    2.7648
12SCS002         01/01/2000 07:30:00    2.4192
12SCS002         01/01/2000 07:45:00    2.4192
12SCS002         01/01/2000 08:00:00    1.9008
12SCS002         01/01/2000 08:15:00    1.9008
12SCS002         01/01/2000 08:30:00    1.9872
12SCS002         01/01/2000 08:45:00    1.9872
12SCS002         01/01/2000 09:00:00    1.296
12SCS002         01/01/2000 09:15:00    1.296
12SCS002         01/01/2000 09:30:00    1.0368
12SCS002         01/01/2000 09:45:00    1.0368
12SCS002         01/01/2000 10:00:00    1.4688
12SCS002         01/01/2000 10:15:00    1.4688
12SCS002         01/01/2000 10:30:00    0.9504
12SCS002         01/01/2000 10:45:00    0.9504
12SCS002         01/01/2000 11:00:00    0.864
12SCS002         01/01/2000 11:15:00    0.864
12SCS002         01/01/2000 11:30:00    0.864
12SCS002         01/01/2000 11:45:00    0.864
12SCS002         01/01/2000 12:00:00    0

;Rainfall (mm/hr)
12SCS005         01/01/2000 00:00:00    1.728
12SCS005         01/01/2000 00:15:00    1.728
12SCS005         01/01/2000 00:30:00    0.8064
12SCS005         01/01/2000 00:45:00    0.8064
12SCS005         01/01/2000 01:00:00    1.4976
12SCS005         01/01/2000 01:15:00    1.4976
12SCS005         01/01/2000 01:30:00    1.4976
12SCS005         01/01/2000 01:45:00    1.4976
12SCS005         01/01/2000 02:00:00    1.9584
12SCS005         01/01/2000 02:15:00    1.9584
12SCS005         01/01/2000 02:30:00    1.728
12SCS005         01/01/2000 02:45:00    1.728
12SCS005         01/01/2000 03:00:00    2.304
12SCS005         01/01/2000 03:15:00    2.304
12SCS005         01/01/2000 03:30:00    2.304
12SCS005         01/01/2000 03:45:00    2.304
12SCS005         01/01/2000 04:00:00    3.1104
12SCS005         01/01/2000 04:15:00    3.1104
12SCS005         01/01/2000 04:30:00    3.9168
12SCS005         01/01/2000 04:45:00    3.9168
12SCS005         01/01/2000 05:00:00    6.2208
12SCS005         01/01/2000 05:15:00    6.2208
12SCS005         01/01/2000 05:30:00    31.104
12SCS005         01/01/2000 05:45:00    67.5072
12SCS005         01/01/2000 06:00:00    12.5568
12SCS005         01/01/2000 06:15:00    12.5568
12SCS005         01/01/2000 06:30:00    5.5296
12SCS005         01/01/2000 06:45:00    5.5296
12SCS005         01/01/2000 07:00:00    3.6864
12SCS005         01/01/2000 07:15:00    3.6864
12SCS005         01/01/2000 07:30:00    3.2256
12SCS005         01/01/2000 07:45:00    3.2256
12SCS005         01/01/2000 08:00:00    2.5344
12SCS005         01/01/2000 08:15:00    2.5344
12SCS005         01/01/2000 08:30:00    2.6496
12SCS005         01/01/2000 08:45:00    2.6496
12SCS005         01/01/2000 09:00:00    1.728
12SCS005         01/01/2000 09:15:00    1.728
12SCS005         01/01/2000 09:30:00    1.3824
12SCS005         01/01/2000 09:45:00    1.3824
12SCS005         01/01/2000 10:00:00    1.9584
12SCS005         01/01/2000 10:15:00    1.9584
12SCS005         01/01/2000 10:30:00    1.2672
12SCS005         01/01/2000 10:45:00    1.2672
12SCS005         01/01/2000 11:00:00    1.152
12SCS005         01/01/2000 11:15:00    1.152
12SCS005         01/01/2000 11:30:00    1.152
12SCS005         01/01/2000 11:45:00    1.152
12SCS005         01/01/2000 12:00:00    0

;Rainfall (mm/hr)
12SCS100         01/01/2000 00:00:00    2.88
12SCS100         01/01/2000 00:15:00    2.88
12SCS100         01/01/2000 00:30:00    1.344
12SCS100         01/01/2000 00:45:00    1.344
12SCS100         01/01/2000 01:00:00    2.496
12SCS100         01/01/2000 01:15:00    2.496
12SCS100         01/01/2000 01:30:00    2.496
12SCS100         01/01/2000 01:45:00    2.496
12SCS100         01/01/2000 02:00:00    3.264
12SCS100         01/01/2000 02:15:00    3.264
12SCS100         01/01/2000 02:30:00    2.88
12SCS100         01/01/2000 02:45:00    2.88
12SCS100         01/01/2000 03:00:00    3.84
12SCS100         01/01/2000 03:15:00    3.84
12SCS100         01/01/2000 03:30:00    3.84
12SCS100         01/01/2000 03:45:00    3.84
12SCS100         01/01/2000 04:00:00    5.184
12SCS100         01/01/2000 04:15:00    5.184
12SCS100         01/01/2000 04:30:00    6.528
12SCS100         01/01/2000 04:45:00    6.528
12SCS100         01/01/2000 05:00:00    10.368
12SCS100         01/01/2000 05:15:00    10.368
12SCS100         01/01/2000 05:30:00    51.84
12SCS100         01/01/2000 05:45:00    112.512
12SCS100         01/01/2000 06:00:00    20.928
12SCS100         01/01/2000 06:15:00    20.928
12SCS100         01/01/2000 06:30:00    9.216
12SCS100         01/01/2000 06:45:00    9.216
12SCS100         01/01/2000 07:00:00    6.144
12SCS100         01/01/2000 07:15:00    6.144
12SCS100         01/01/2000 07:30:00    5.376
12SCS100         01/01/2000 07:45:00    5.376
12SCS100         01/01/2000 08:00:00    4.224
12SCS100         01/01/2000 08:15:00    4.224
12SCS100         01/01/2000 08:30:00    4.416
12SCS100         01/01/2000 08:45:00    4.416
12SCS100         01/01/2000 09:00:00    2.88
12SCS100         01/01/2000 09:15:00    2.88
12SCS100         01/01/2000 09:30:00    2.304
12SCS100         01/01/2000 09:45:00    2.304
12SCS100         01/01/2000 10:00:00    3.264
12SCS100         01/01/2000 10:15:00    3.264
12SCS100         01/01/2000 10:30:00    2.112
12SCS100         01/01/2000 10:45:00    2.112
12SCS100         01/01/2000 11:00:00    1.92
12SCS100         01/01/2000 11:15:00    1.92
12SCS100         01/01/2000 11:30:00    1.92
12SCS100         01/01/2000 11:45:00    1.92
12SCS100         01/01/2000 12:00:00    0

;Rainfall (mm/hr)
24SCS002         01/01/2000 00:00:00    0.72
24SCS002         01/01/2000 00:15:00    0.72
24SCS002         01/01/2000 00:30:00    0.72
24SCS002         01/01/2000 00:45:00    0.72
24SCS002         01/01/2000 01:00:00    0.336
24SCS002         01/01/2000 01:15:00    0.336
24SCS002         01/01/2000 01:30:00    0.336
24SCS002         01/01/2000 01:45:00    0.336
24SCS002         01/01/2000 02:00:00    0.624
24SCS002         01/01/2000 02:15:00    0.624
24SCS002         01/01/2000 02:30:00    0.624
24SCS002         01/01/2000 02:45:00    0.624
24SCS002         01/01/2000 03:00:00    0.624
24SCS002         01/01/2000 03:15:00    0.624
24SCS002         01/01/2000 03:30:00    0.624
24SCS002         01/01/2000 03:45:00    0.624
24SCS002         01/01/2000 04:00:00    0.816
24SCS002         01/01/2000 04:15:00    0.816
24SCS002         01/01/2000 04:30:00    0.816
24SCS002         01/01/2000 04:45:00    0.816
24SCS002         01/01/2000 05:00:00    0.72
24SCS002         01/01/2000 05:15:00    0.72
24SCS002         01/01/2000 05:30:00    0.72
24SCS002         01/01/2000 05:45:00    0.72
24SCS002         01/01/2000 06:00:00    0.96
24SCS002         01/01/2000 06:15:00    0.96
24SCS002         01/01/2000 06:30:00    0.96
24SCS002         01/01/2000 06:45:00    0.96
24SCS002         01/01/2000 07:00:00    0.96
24SCS002         01/01/2000 07:15:00    0.96
24SCS002         01/01/2000 07:30:00    0.96
24SCS002         01/01/2000 07:45:00    0.96
24SCS002         01/01/2000 08:00:00    1.296
24SCS002         01/01/2000 08:15:00    1.296
24SCS002         01/01/2000 08:30:00    1.296
24SCS002         01/01/2000 08:45:00    1.296
24SCS002         01/01/2000 09:00:00    1.536
24SCS002         01/01/2000 09:15:00    1.536
24SCS002         01/01/2000 09:30:00    1.728
24SCS002         01/01/2000 09:45:00    1.728
24SCS002         01/01/2000 10:00:00    2.208
24SCS002         01/01/2000 10:15:00    2.208
24SCS002         01/01/2000 10:30:00    2.976
24SCS002         01/01/2000 10:45:00    2.976
24SCS002         01/01/2000 11:00:00    4.608
24SCS002         01/01/2000 11:15:00    4.608
24SCS002         01/01/2000 11:30:00    19.968
24SCS002         01/01/2000 11:45:00    52.992
24SCS002         01/01/2000 12:00:00    6.912
24SCS002         01/01/2000 12:15:00    6.912
24SCS002         01/01/2000 12:30:00    3.552
24SCS002         01/01/2000 12:45:00    3.552
24SCS002         01/01/2000 13:00:00    2.592
24SCS002         01/01/2000 13:15:00    2.592
24SCS002         01/01/2000 13:30:00    2.016
24SCS002         01/01/2000 13:45:00    2.016
24SCS002         01/01/2000 14:00:00    1.536
24SCS002         01/01/2000 14:15:00    1.536
24SCS002         01/01/2000 14:30:00    1.536
24SCS002         01/01/2000 14:45:00    1.536
24SCS002         01/01/2000 15:00:00    1.344
24SCS002         01/01/2000 15:15:00    1.344
24SCS002         01/01/2000 15:30:00    1.344
24SCS002         01/01/2000 15:45:00    1.344
24SCS002         01/01/2000 16:00:00    1.056
24SCS002         01/01/2000 16:15:00    1.056
24SCS002         01/01/2000 16:30:00    1.056
24SCS002         01/01/2000 16:45:00    1.056
24SCS002         01/01/2000 17:00:00    1.104
24SCS002         01/01/2000 17:15:00    1.104
24SCS002         01/01/2000 17:30:00    1.104
24SCS002         01/01/2000 17:45:00    1.104
24SCS002         01/01/2000 18:00:00    0.72
24SCS002         01/01/2000 18:15:00    0.72
24SCS002         01/01/2000 18:30:00    0.72
24SCS002         01/01/2000 18:45:00    0.72
24SCS002         01/01/2000 19:00:00    0.576
24SCS002         01/01/2000 19:15:00    0.576
24SCS002         01/01/2000 19:30:00    0.576
24SCS002         01/01/2000 19:45:00    0.576
24SCS002         01/01/2000 20:00:00    0.816
24SCS002         01/01/2000 20:15:00    0.816
24SCS002         01/01/2000 20:30:00    0.816
24SCS002         01/01/2000 20:45:00    0.816
24SCS002         01/01/2000 21:00:00    0.528
24SCS002         01/01/2000 21:15:00    0.528
24SCS002         01/01/2000 21:30:00    0.528
24SCS002         01/01/2000 21:45:00    0.528
24SCS002         01/01/2000 22:00:00    0.48
24SCS002         01/01/2000 22:15:00    0.48
24SCS002         01/01/2000 22:30:00    0.48
24SCS002         01/01/2000 22:45:00    0.48
24SCS002         01/01/2000 23:00:00    0.48
24SCS002         01/01/2000 23:15:00    0.48
24SCS002         01/01/2000 23:30:00    0.48
24SCS002         01/01/2000 23:45:00    0.48
24SCS002         01/02/2000 00:00:00    0
```

```
;24SCS002 - Flow (m³/s)
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
24SCS002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

;24SCS002 - Head (m)
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    97.119
24SCS002_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    97.119
......
Too many data points (1439 in total).

;Rainfall (mm/hr)
24SCS005          01/01/2000 00:00:00   0.936
24SCS005          01/01/2000 00:15:00   0.936
24SCS005          01/01/2000 00:30:00   0.936
24SCS005          01/01/2000 00:45:00   0.936
24SCS005          01/01/2000 01:00:00   0.4368
24SCS005          01/01/2000 01:15:00   0.4368
24SCS005          01/01/2000 01:30:00   0.4368
24SCS005          01/01/2000 01:45:00   0.4368
24SCS005          01/01/2000 02:00:00   0.8112
24SCS005          01/01/2000 02:15:00   0.8112
24SCS005          01/01/2000 02:30:00   0.8112
24SCS005          01/01/2000 02:45:00   0.8112
24SCS005          01/01/2000 03:00:00   0.8112
24SCS005          01/01/2000 03:15:00   0.8112
24SCS005          01/01/2000 03:30:00   0.8112
24SCS005          01/01/2000 03:45:00   0.8112
24SCS005          01/01/2000 04:00:00   1.0608
24SCS005          01/01/2000 04:15:00   1.0608
24SCS005          01/01/2000 04:30:00   1.0608
24SCS005          01/01/2000 04:45:00   1.0608
24SCS005          01/01/2000 05:00:00   0.936
24SCS005          01/01/2000 05:15:00   0.936
24SCS005          01/01/2000 05:30:00   0.936
24SCS005          01/01/2000 05:45:00   0.936
24SCS005          01/01/2000 06:00:00   1.248
24SCS005          01/01/2000 06:15:00   1.248
24SCS005          01/01/2000 06:30:00   1.248
24SCS005          01/01/2000 06:45:00   1.248
24SCS005          01/01/2000 07:00:00   1.248
24SCS005          01/01/2000 07:15:00   1.248
24SCS005          01/01/2000 07:30:00   1.248
24SCS005          01/01/2000 07:45:00   1.248
24SCS005          01/01/2000 08:00:00   1.6848
24SCS005          01/01/2000 08:15:00   1.6848
24SCS005          01/01/2000 08:30:00   1.6848
24SCS005          01/01/2000 08:45:00   1.6848
24SCS005          01/01/2000 09:00:00   1.9968
24SCS005          01/01/2000 09:15:00   1.9968
24SCS005          01/01/2000 09:30:00   2.2464
24SCS005          01/01/2000 09:45:00   2.2464
24SCS005          01/01/2000 10:00:00   2.8704
24SCS005          01/01/2000 10:15:00   2.8704
24SCS005          01/01/2000 10:30:00   3.8688
24SCS005          01/01/2000 10:45:00   3.8688
24SCS005          01/01/2000 11:00:00   5.9904
24SCS005          01/01/2000 11:15:00   5.9904
24SCS005          01/01/2000 11:30:00   25.9584
24SCS005          01/01/2000 11:45:00   68.8896
24SCS005          01/01/2000 12:00:00   8.9856
24SCS005          01/01/2000 12:15:00   8.9856
24SCS005          01/01/2000 12:30:00   4.6176
24SCS005          01/01/2000 12:45:00   4.6176
24SCS005          01/01/2000 13:00:00   3.3696
24SCS005          01/01/2000 13:15:00   3.3696
24SCS005          01/01/2000 13:30:00   2.6208
24SCS005          01/01/2000 13:45:00   2.6208
24SCS005          01/01/2000 14:00:00   1.9968
24SCS005          01/01/2000 14:15:00   1.9968
24SCS005          01/01/2000 14:30:00   1.9968
24SCS005          01/01/2000 14:45:00   1.9968
24SCS005          01/01/2000 15:00:00   1.7472
24SCS005          01/01/2000 15:15:00   1.7472
24SCS005          01/01/2000 15:30:00   1.7472
24SCS005          01/01/2000 15:45:00   1.7472
24SCS005          01/01/2000 16:00:00   1.3728
24SCS005          01/01/2000 16:15:00   1.3728
24SCS005          01/01/2000 16:30:00   1.3728
24SCS005          01/01/2000 16:45:00   1.3728
24SCS005          01/01/2000 17:00:00   1.4352
24SCS005          01/01/2000 17:15:00   1.4352
24SCS005          01/01/2000 17:30:00   1.4352
24SCS005          01/01/2000 17:45:00   1.4352
24SCS005          01/01/2000 18:00:00   0.936
24SCS005          01/01/2000 18:15:00   0.936
24SCS005          01/01/2000 18:30:00   0.936
24SCS005          01/01/2000 18:45:00   0.936
24SCS005          01/01/2000 19:00:00   0.7488
24SCS005          01/01/2000 19:15:00   0.7488
24SCS005          01/01/2000 19:30:00   0.7488
24SCS005          01/01/2000 19:45:00   0.7488
24SCS005          01/01/2000 20:00:00   1.0608
24SCS005          01/01/2000 20:15:00   1.0608
24SCS005          01/01/2000 20:30:00   1.0608
24SCS005          01/01/2000 20:45:00   1.0608
24SCS005          01/01/2000 21:00:00   0.6864
24SCS005          01/01/2000 21:15:00   0.6864
24SCS005          01/01/2000 21:30:00   0.6864
24SCS005          01/01/2000 21:45:00   0.6864
24SCS005          01/01/2000 22:00:00   0.624
24SCS005          01/01/2000 22:15:00   0.624
24SCS005          01/01/2000 22:30:00   0.624
24SCS005          01/01/2000 22:45:00   0.624
24SCS005          01/01/2000 23:00:00   0.624
24SCS005          01/01/2000 23:15:00   0.624
24SCS005          01/01/2000 23:30:00   0.624
24SCS005          01/01/2000 23:45:00   0.624
24SCS005          01/02/2000 00:00:00   0

24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
24SCS005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    97.119
24SCS005_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    97.119
......
Too many data points (1439 in total).

;Rainfall (mm/hr)
24SCS100          01/01/2000 00:00:00   1.548
24SCS100          01/01/2000 00:15:00   1.548
24SCS100          01/01/2000 00:30:00   1.548
24SCS100          01/01/2000 00:45:00   1.548
24SCS100          01/01/2000 01:00:00   0.7224
24SCS100          01/01/2000 01:15:00   0.7224
24SCS100          01/01/2000 01:30:00   0.7224
24SCS100          01/01/2000 01:45:00   0.7224
24SCS100          01/01/2000 02:00:00   1.3416
24SCS100          01/01/2000 02:15:00   1.3416
24SCS100          01/01/2000 02:30:00   1.3416
24SCS100          01/01/2000 02:45:00   1.3416
24SCS100          01/01/2000 03:00:00   1.3416
24SCS100          01/01/2000 03:15:00   1.3416
24SCS100          01/01/2000 03:30:00   1.3416
24SCS100          01/01/2000 03:45:00   1.3416
24SCS100          01/01/2000 04:00:00   1.7544
24SCS100          01/01/2000 04:15:00   1.7544
24SCS100          01/01/2000 04:30:00   1.7544
24SCS100          01/01/2000 04:45:00   1.7544
24SCS100          01/01/2000 05:00:00   1.548
24SCS100          01/01/2000 05:15:00   1.548
24SCS100          01/01/2000 05:30:00   1.548
24SCS100          01/01/2000 05:45:00   1.548
24SCS100          01/01/2000 06:00:00   2.064
24SCS100          01/01/2000 06:15:00   2.064
24SCS100          01/01/2000 06:30:00   2.064
24SCS100          01/01/2000 06:45:00   2.064
24SCS100          01/01/2000 07:00:00   2.064
24SCS100          01/01/2000 07:15:00   2.064
24SCS100          01/01/2000 07:30:00   2.064
24SCS100          01/01/2000 07:45:00   2.064
24SCS100          01/01/2000 08:00:00   2.7864
24SCS100          01/01/2000 08:15:00   2.7864
24SCS100          01/01/2000 08:30:00   2.7864
24SCS100          01/01/2000 08:45:00   2.7864
24SCS100          01/01/2000 09:00:00   3.3024
24SCS100          01/01/2000 09:15:00   3.3024
24SCS100          01/01/2000 09:30:00   3.7152
24SCS100          01/01/2000 09:45:00   3.7152
24SCS100          01/01/2000 10:00:00   4.7472
24SCS100          01/01/2000 10:15:00   4.7472
24SCS100          01/01/2000 10:30:00   6.3984
24SCS100          01/01/2000 10:45:00   6.3984
24SCS100          01/01/2000 11:00:00   9.9072
24SCS100          01/01/2000 11:15:00   9.9072
24SCS100          01/01/2000 11:30:00   42.9312
24SCS100          01/01/2000 11:45:00   113.9328
24SCS100          01/01/2000 12:00:00   14.8608
24SCS100          01/01/2000 12:15:00   14.8608
24SCS100          01/01/2000 12:30:00   7.6368
24SCS100          01/01/2000 12:45:00   7.6368
24SCS100          01/01/2000 13:00:00   5.5728
24SCS100          01/01/2000 13:15:00   5.5728
24SCS100          01/01/2000 13:30:00   4.3344
24SCS100          01/01/2000 13:45:00   4.3344
24SCS100          01/01/2000 14:00:00   3.3024
24SCS100          01/01/2000 14:15:00   3.3024
24SCS100          01/01/2000 14:30:00   3.3024
24SCS100          01/01/2000 14:45:00   3.3024
24SCS100          01/01/2000 15:00:00   2.8896
24SCS100          01/01/2000 15:15:00   2.8896
24SCS100          01/01/2000 15:30:00   2.8896
24SCS100          01/01/2000 15:45:00   2.8896
24SCS100          01/01/2000 16:00:00   2.2704
24SCS100          01/01/2000 16:15:00   2.2704
24SCS100          01/01/2000 16:30:00   2.2704
24SCS100          01/01/2000 16:45:00   2.2704
24SCS100          01/01/2000 17:00:00   2.3736
24SCS100          01/01/2000 17:15:00   2.3736
24SCS100          01/01/2000 17:30:00   2.3736
24SCS100          01/01/2000 17:45:00   2.3736
24SCS100          01/01/2000 18:00:00   1.548
24SCS100          01/01/2000 18:15:00   1.548
24SCS100          01/01/2000 18:30:00   1.548
24SCS100          01/01/2000 18:45:00   1.548
24SCS100          01/01/2000 19:00:00   1.2384
24SCS100          01/01/2000 19:15:00   1.2384
24SCS100          01/01/2000 19:30:00   1.2384
24SCS100          01/01/2000 19:45:00   1.2384
24SCS100          01/01/2000 20:00:00   1.7544
24SCS100          01/01/2000 20:15:00   1.7544
24SCS100          01/01/2000 20:30:00   1.7544
24SCS100          01/01/2000 20:45:00   1.7544
24SCS100          01/01/2000 21:00:00   1.1352
24SCS100          01/01/2000 21:15:00   1.1352
24SCS100          01/01/2000 21:30:00   1.1352
24SCS100          01/01/2000 21:45:00   1.1352
24SCS100          01/01/2000 22:00:00   1.032
24SCS100          01/01/2000 22:15:00   1.032
24SCS100          01/01/2000 22:30:00   1.032
24SCS100          01/01/2000 22:45:00   1.032
24SCS100          01/01/2000 23:00:00   1.032
24SCS100          01/01/2000 23:15:00   1.032
24SCS100          01/01/2000 23:30:00   1.032
24SCS100          01/01/2000 23:45:00   1.032
24SCS100          01/02/2000 00:00:00   0

24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0.00
24SCS100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0.00
......
Too many data points (1439 in total).

24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.02
24SCS100_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.02
......
Too many data points (1439 in total).

24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
24SCS100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).
```

```
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
24SCS100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0.00
3CHI002_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0.00
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.02
3CHI002_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.02
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0.00
3CHI005_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0.00
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
3CHI005_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
3CHI010_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
3CHI010_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
3CHI025_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
3CHI025_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
3CHI100_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
```

```
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
3CHI100_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
3CHI100CC_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    3.58E-05
......
Too many data points (1439 in total).

;Taken from QP4 R5 model - most recent approved submission
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
3CHI100CC_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.0190048
......
Too many data points (1439 in total).

4CHI22MM          01/01/2000 00:00:00   1.56376
4CHI22MM          01/01/2000 00:15:00   2.07416
4CHI22MM          01/01/2000 00:30:00   3.18384
4CHI22MM          01/01/2000 00:45:00   7.898
4CHI22MM          01/01/2000 01:00:00   40.15528
4CHI22MM          01/01/2000 01:15:00   10.48168
4CHI22MM          01/01/2000 01:30:00   5.32488
4CHI22MM          01/01/2000 01:45:00   3.61504
4CHI22MM          01/01/2000 02:00:00   2.76144
4CHI22MM          01/01/2000 02:15:00   2.2484
4CHI22MM          01/01/2000 02:30:00   1.9052
4CHI22MM          01/01/2000 02:45:00   1.6588
4CHI22MM          01/01/2000 03:00:00   1.474
4CHI22MM          01/01/2000 03:15:00   1.32792
4CHI22MM          01/01/2000 03:30:00   1.21088
4CHI22MM          01/01/2000 03:45:00   1.11408

4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:01:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:02:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:03:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:04:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:05:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:06:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:07:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:08:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:09:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:10:00    0
4CHI22MM_QUINNS_OVERLAND-INFLOW 1/1/2000   0:11:00    0
......
Too many data points (1439 in total).

4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:01:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:02:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:03:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:04:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:05:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:06:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:07:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:08:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:09:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:10:00    98.019
4CHI22MM_QUINNS_ST4_108A_HEAD 1/1/2000   0:11:00    98.019
......
Too many data points (1439 in total).

4CHI25MM          01/01/2000 00:00:00   1.77
4CHI25MM          01/01/2000 00:15:00   2.357
4CHI25MM          01/01/2000 00:30:00   3.618
4CHI25MM          01/01/2000 00:45:00   8.975
4CHI25MM          01/01/2000 01:00:00   45.631
4CHI25MM          01/01/2000 01:15:00   11.911
4CHI25MM          01/01/2000 01:30:00   6.051
4CHI25MM          01/01/2000 01:45:00   4.108
4CHI25MM          01/01/2000 02:00:00   3.138
4CHI25MM          01/01/2000 02:15:00   2.555
4CHI25MM          01/01/2000 02:30:00   2.165
4CHI25MM          01/01/2000 02:45:00   1.885
4CHI25MM          01/01/2000 03:00:00   1.675
4CHI25MM          01/01/2000 03:15:00   1.509
4CHI25MM          01/01/2000 03:30:00   1.376
4CHI25MM          01/01/2000 03:45:00   1.266

;Rainfall (mm/hr)
6SCS002           01/01/2000 00:00:00   2.232
6SCS002           01/01/2000 00:15:00   1.0416
6SCS002           01/01/2000 00:30:00   1.9344
6SCS002           01/01/2000 00:45:00   1.9344
6SCS002           01/01/2000 01:00:00   2.5296
6SCS002           01/01/2000 01:15:00   2.232
6SCS002           01/01/2000 01:30:00   2.976
6SCS002           01/01/2000 01:45:00   2.976
6SCS002           01/01/2000 02:00:00   4.0176
6SCS002           01/01/2000 02:15:00   5.0592
6SCS002           01/01/2000 02:30:00   8.0352
6SCS002           01/01/2000 02:45:00   63.6864
6SCS002           01/01/2000 03:00:00   16.2192
6SCS002           01/01/2000 03:15:00   7.1424
6SCS002           01/01/2000 03:30:00   4.7616
6SCS002           01/01/2000 03:45:00   4.1664
6SCS002           01/01/2000 04:00:00   3.2736
6SCS002           01/01/2000 04:15:00   3.4224
6SCS002           01/01/2000 04:30:00   2.232
6SCS002           01/01/2000 04:45:00   1.7856
6SCS002           01/01/2000 05:00:00   2.5296
6SCS002           01/01/2000 05:15:00   1.6368
6SCS002           01/01/2000 05:30:00   1.488
6SCS002           01/01/2000 05:45:00   1.488
6SCS002           01/01/2000 06:00:00   0

;Rainfall (mm/hr)
6SCS005           01/01/2000 00:00:00   3.024
6SCS005           01/01/2000 00:15:00   1.4112
6SCS005           01/01/2000 00:30:00   2.6208
6SCS005           01/01/2000 00:45:00   2.6208
6SCS005           01/01/2000 01:00:00   3.4272
6SCS005           01/01/2000 01:15:00   3.024
6SCS005           01/01/2000 01:30:00   4.032
6SCS005           01/01/2000 01:45:00   4.032
6SCS005           01/01/2000 02:00:00   5.4432
6SCS005           01/01/2000 02:15:00   6.854401
6SCS005           01/01/2000 02:30:00   10.8864
6SCS005           01/01/2000 02:45:00   86.28481
6SCS005           01/01/2000 03:00:00   21.9744
6SCS005           01/01/2000 03:15:00   9.676801
6SCS005           01/01/2000 03:30:00   6.4512
6SCS005           01/01/2000 03:45:00   5.6448
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6SCS005          01/01/2000 04:00:00   4.4352
6SCS005          01/01/2000 04:15:00   4.6368
6SCS005          01/01/2000 04:30:00   3.024
6SCS005          01/01/2000 04:45:00   2.4192
6SCS005          01/01/2000 05:00:00   3.4272
6SCS005          01/01/2000 05:15:00   2.2176
6SCS005          01/01/2000 05:30:00   2.016
6SCS005          01/01/2000 05:45:00   2.016
6SCS005          01/01/2000 06:00:00   0

;Rainfall (mm/hr)
6SCS050          01/01/2000 00:00:00   4.716
6SCS050          01/01/2000 00:15:00   2.2008
6SCS050          01/01/2000 00:30:00   4.0872
6SCS050          01/01/2000 00:45:00   4.0872
6SCS050          01/01/2000 01:00:00   5.3448
6SCS050          01/01/2000 01:15:00   4.716
6SCS050          01/01/2000 01:30:00   6.288
6SCS050          01/01/2000 01:45:00   6.288
6SCS050          01/01/2000 02:00:00   8.4888
6SCS050          01/01/2000 02:15:00   10.6896
6SCS050          01/01/2000 02:30:00   16.9776
6SCS050          01/01/2000 02:45:00   134.5632
6SCS050          01/01/2000 03:00:00   34.2696
6SCS050          01/01/2000 03:15:00   15.0912
6SCS050          01/01/2000 03:30:00   10.0608
6SCS050          01/01/2000 03:45:00   8.8032
6SCS050          01/01/2000 04:00:00   6.9168
6SCS050          01/01/2000 04:15:00   7.2312
6SCS050          01/01/2000 04:30:00   4.716
6SCS050          01/01/2000 04:45:00   3.7728
6SCS050          01/01/2000 05:00:00   5.3448
6SCS050          01/01/2000 05:15:00   3.4584
6SCS050          01/01/2000 05:30:00   3.144
6SCS050          01/01/2000 05:45:00   3.144
6SCS050          01/01/2000 06:00:00   0

;Rainfall (mm/hr)
6SCS100          01/01/2000 00:00:00   5.22
6SCS100          01/01/2000 00:15:00   2.436
6SCS100          01/01/2000 00:30:00   4.524
6SCS100          01/01/2000 00:45:00   4.524
6SCS100          01/01/2000 01:00:00   5.916
6SCS100          01/01/2000 01:15:00   5.22
6SCS100          01/01/2000 01:30:00   6.96
6SCS100          01/01/2000 01:45:00   6.96
6SCS100          01/01/2000 02:00:00   9.396
6SCS100          01/01/2000 02:15:00   11.832
6SCS100          01/01/2000 02:30:00   18.792
6SCS100          01/01/2000 02:45:00   148.944
6SCS100          01/01/2000 03:00:00   37.932
6SCS100          01/01/2000 03:15:00   16.704
6SCS100          01/01/2000 03:30:00   11.136
6SCS100          01/01/2000 03:45:00   9.744
6SCS100          01/01/2000 04:00:00   7.656
6SCS100          01/01/2000 04:15:00   8.004
6SCS100          01/01/2000 04:30:00   5.22
6SCS100          01/01/2000 04:45:00   4.176
6SCS100          01/01/2000 05:00:00   5.916
6SCS100          01/01/2000 05:15:00   3.828
6SCS100          01/01/2000 05:30:00   3.48
6SCS100          01/01/2000 05:45:00   3.48
6SCS100          01/01/2000 06:00:00   0

;Flow (m³/s)
700              01/01/2000 00:00:00   0
700              01/01/2000 00:01:00   0
700              01/01/2000 00:02:00   0
700              01/01/2000 00:03:00   0
700              01/01/2000 00:04:00   0
700              01/01/2000 00:05:00   0
700              01/01/2000 00:06:00   0
700              01/01/2000 00:07:00   0
700              01/01/2000 00:08:00   0
700              01/01/2000 00:09:00   0
700              01/01/2000 00:10:00   0
700              01/01/2000 00:11:00   0
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700              01/01/2000 00:14:00   0
700              01/01/2000 00:15:00   0.000276
700              01/01/2000 00:16:00   0.000565
700              01/01/2000 00:17:00   0.00061
700              01/01/2000 00:18:00   0.000617
700              01/01/2000 00:19:00   0.000618
700              01/01/2000 00:20:00   0.000618
700              01/01/2000 00:21:00   0.000799
700              01/01/2000 00:22:00   0.000827
700              01/01/2000 00:23:00   0.000831
700              01/01/2000 00:24:00   0.000833
700              01/01/2000 00:25:00   0.000833
700              01/01/2000 00:26:00   0.000833
700              01/01/2000 00:27:00   0.000833
700              01/01/2000 00:28:00   0.000833
700              01/01/2000 00:29:00   0.000833
700              01/01/2000 00:30:00   0.000833
700              01/01/2000 00:31:00   0.001235
700              01/01/2000 00:32:00   0.001297
700              01/01/2000 00:33:00   0.001307
700              01/01/2000 00:34:00   0.001308
700              01/01/2000 00:35:00   0.001308
700              01/01/2000 00:36:00   0.001308
700              01/01/2000 00:37:00   0.001308
700              01/01/2000 00:38:00   0.001308
700              01/01/2000 00:39:00   0.001308
700              01/01/2000 00:40:00   0.001308
700              01/01/2000 00:41:00   0.003238
700              01/01/2000 00:42:00   0.003963
700              01/01/2000 00:43:00   0.004462
700              01/01/2000 00:44:00   0.004968
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700              01/01/2000 00:46:00   0.006169
700              01/01/2000 00:47:00   0.006755
700              01/01/2000 00:48:00   0.007295
700              01/01/2000 00:49:00   0.007796
700              01/01/2000 00:50:00   0.008259
700              01/01/2000 00:51:00   0.010412
700              01/01/2000 00:52:00   0.012
700              01/01/2000 00:53:00   0.012
700              01/01/2000 00:54:00   0.012
700              01/01/2000 00:55:00   0.012
700              01/01/2000 00:56:00   0.012
700              01/01/2000 00:57:00   0.012
700              01/01/2000 00:58:00   0.012
700              01/01/2000 00:59:00   0.012
700              01/01/2000 01:00:00   0.012
700              01/01/2000 01:01:00   0.012
700              01/01/2000 01:02:00   0.012
700              01/01/2000 01:03:00   0.012
700              01/01/2000 01:04:00   0.012
700              01/01/2000 01:05:00   0.012
700              01/01/2000 01:06:00   0.012
700              01/01/2000 01:07:00   0.012
700              01/01/2000 01:08:00   0.012
700              01/01/2000 01:09:00   0.012
700              01/01/2000 01:10:00   0.012
700              01/01/2000 01:11:00   0.011798
700              01/01/2000 01:12:00   0.010678
700              01/01/2000 01:13:00   0.01019
700              01/01/2000 01:14:00   0.00995
700              01/01/2000 01:15:00   0.00983
700              01/01/2000 01:16:00   0.009772
700              01/01/2000 01:17:00   0.009747
700              01/01/2000 01:18:00   0.009739
700              01/01/2000 01:19:00   0.009739
700              01/01/2000 01:20:00   0.009744
700              01/01/2000 01:21:00   0.008978
700              01/01/2000 01:22:00   0.008601
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700              01/01/2000 01:56:00   0.001762
700              01/01/2000 01:57:00   0.001704
700              01/01/2000 01:58:00   0.001659
700              01/01/2000 01:59:00   0.001621
700              01/01/2000 02:00:00   0.001589
700              01/01/2000 02:01:00   0.00145
700              01/01/2000 02:02:00   0.001363
700              01/01/2000 02:03:00   0.001304
700              01/01/2000 02:04:00   0.001254
700              01/01/2000 02:05:00   0.001205
700              01/01/2000 02:06:00   0.001156
700              01/01/2000 02:07:00   0.001115
700              01/01/2000 02:08:00   0.001083
700              01/01/2000 02:09:00   0.001056
700              01/01/2000 02:10:00   0.001034
700              01/01/2000 02:11:00   0.000942
700              01/01/2000 02:12:00   0.000902
700              01/01/2000 02:13:00   0.00087
700              01/01/2000 02:14:00   0.000838
700              01/01/2000 02:15:00   0.000806
700              01/01/2000 02:16:00   0.000771
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700              01/01/2000 02:19:00   0.000698
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700              01/01/2000 02:22:00   0.000597
700              01/01/2000 02:23:00   0.000585
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700              01/01/2000 02:31:00   0.000495
700              01/01/2000 02:32:00   0.000486
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700              01/01/2000 02:35:00   0.00047
700              01/01/2000 02:36:00   0.00047
700              01/01/2000 02:37:00   0.00047
700              01/01/2000 02:38:00   0.00047
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700              01/01/2000 02:41:00   0.000437
700              01/01/2000 02:42:00   0.000432
700              01/01/2000 02:43:00   0.000431
700              01/01/2000 02:44:00   0.000431
700              01/01/2000 02:45:00   0.000431
700              01/01/2000 02:46:00   0.000431
700              01/01/2000 02:47:00   0.000431
700              01/01/2000 02:48:00   0.000431
700              01/01/2000 02:49:00   0.000431
700              01/01/2000 02:50:00   0.000431
700              01/01/2000 02:51:00   0.000403
700              01/01/2000 02:52:00   0.000399
700              01/01/2000 02:53:00   0.000399
700              01/01/2000 02:54:00   0.000398
700              01/01/2000 02:55:00   0.000398
700              01/01/2000 02:56:00   0.000398
700              01/01/2000 02:57:00   0.000398
700              01/01/2000 02:58:00   0.000398
700              01/01/2000 02:59:00   0.000398
700              01/01/2000 03:00:00   0.000398
700              01/01/2000 03:01:00   6E-05
700              01/01/2000 03:02:00   0
700              01/01/2000 03:03:00   0
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700              01/01/2000 03:21:00   0
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700              01/01/2000 03:29:00   0
700              01/01/2000 03:30:00   0
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700              01/01/2000 03:38:00   0
700              01/01/2000 03:39:00   0
700              01/01/2000 03:40:00   0
700              01/01/2000 03:41:00   0
700              01/01/2000 03:42:00   0
700              01/01/2000 03:43:00   0
700              01/01/2000 03:44:00   0
700              01/01/2000 03:45:00   0
700              01/01/2000 03:46:00   0
700              01/01/2000 03:47:00   0
700              01/01/2000 03:48:00   0
700              01/01/2000 03:49:00   0
700              01/01/2000 03:50:00   0
700              01/01/2000 03:51:00   0
700              01/01/2000 03:52:00   0
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700             01/01/2000 03:54:00   0
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700             01/01/2000 03:57:00   0
700             01/01/2000 03:58:00   0
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700             01/01/2000 04:01:00   0
700             01/01/2000 04:02:00   0
700             01/01/2000 04:03:00   0
700             01/01/2000 04:04:00   0
700             01/01/2000 04:05:00   0
700             01/01/2000 04:06:00   0
700             01/01/2000 04:07:00   0
700             01/01/2000 04:08:00   0
700             01/01/2000 04:09:00   0
700             01/01/2000 04:10:00   0
700             01/01/2000 04:11:00   0
700             01/01/2000 04:12:00   0
700             01/01/2000 04:13:00   0
700             01/01/2000 04:14:00   0
700             01/01/2000 04:15:00   0
700             01/01/2000 04:16:00   0

;Flow (m³/s)
701             01/01/2000 00:00:00   0
701             01/01/2000 00:01:00   0
701             01/01/2000 00:02:00   0
701             01/01/2000 00:03:00   0
701             01/01/2000 00:04:00   0
701             01/01/2000 00:05:00   0
701             01/01/2000 00:06:00   0
701             01/01/2000 00:07:00   0
701             01/01/2000 00:08:00   0
701             01/01/2000 00:09:00   0
701             01/01/2000 00:10:00   0
701             01/01/2000 00:11:00   0
701             01/01/2000 00:12:00   0
701             01/01/2000 00:13:00   0
701             01/01/2000 00:14:00   0
701             01/01/2000 00:15:00   0.000216
701             01/01/2000 00:16:00   0.000949
701             01/01/2000 00:17:00   0.001841
701             01/01/2000 00:18:00   0.002392
701             01/01/2000 00:19:00   0.002684
701             01/01/2000 00:20:00   0.00286
701             01/01/2000 00:21:00   0.003098
701             01/01/2000 00:22:00   0.00351
701             01/01/2000 00:23:00   0.00381
701             01/01/2000 00:24:00   0.003949
701             01/01/2000 00:25:00   0.004043
701             01/01/2000 00:26:00   0.004089
701             01/01/2000 00:27:00   0.004119
701             01/01/2000 00:28:00   0.004135
701             01/01/2000 00:29:00   0.004144
701             01/01/2000 00:30:00   0.004149
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701             01/01/2000 00:43:00   0.016126
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701             01/01/2000 00:45:00   0.021876
701             01/01/2000 00:46:00   0.024501
701             01/01/2000 00:47:00   0.026868
701             01/01/2000 00:48:00   0.028959
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701             01/01/2000 00:52:00   0.110499
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701             01/01/2000 00:56:00   0.117418
701             01/01/2000 00:57:00   0.118
701             01/01/2000 00:58:00   0.119
701             01/01/2000 00:59:00   0.119
701             01/01/2000 01:00:00   0.119553
701             01/01/2000 01:01:00   0.12
701             01/01/2000 01:02:00   0.12
701             01/01/2000 01:03:00   0.12
701             01/01/2000 01:04:00   0.12
701             01/01/2000 01:05:00   0.120369
701             01/01/2000 01:06:00   0.120695
701             01/01/2000 01:07:00   0.120847
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701             01/01/2000 01:10:00   0.120551
701             01/01/2000 01:11:00   0.120351
701             01/01/2000 01:12:00   0.120128
701             01/01/2000 01:13:00   0.12
701             01/01/2000 01:14:00   0.12
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701             01/01/2000 01:16:00   0.119909
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701             01/01/2000 01:24:00   0.116007
701             01/01/2000 01:25:00   0.114407
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701             01/01/2000 01:29:00   0.012893
701             01/01/2000 01:30:00   0.029999
701             01/01/2000 01:31:00   0.020133
701             01/01/2000 01:32:00   0.022957
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701             01/01/2000 01:35:00   0.017773
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701             01/01/2000 01:39:00   0.015228
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701             01/01/2000 01:41:00   0.014321
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701             01/01/2000 01:51:00   0.009574
701             01/01/2000 01:52:00   0.009083
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701             01/01/2000 02:00:00   0.006769
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701             01/01/2000 02:02:00   0.006216
701             01/01/2000 02:03:00   0.005893
701             01/01/2000 02:04:00   0.005612
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701             01/01/2000 02:06:00   0.005131
701             01/01/2000 02:07:00   0.004951
701             01/01/2000 02:08:00   0.004809
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701             01/01/2000 02:11:00   0.004456
701             01/01/2000 02:12:00   0.004231
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701             01/01/2000 02:24:00   0.002852
701             01/01/2000 02:25:00   0.002799
701             01/01/2000 02:26:00   0.002761
701             01/01/2000 02:27:00   0.00273
701             01/01/2000 02:28:00   0.002708
701             01/01/2000 02:29:00   0.002689
701             01/01/2000 02:30:00   0.002674
701             01/01/2000 02:31:00   0.00263
701             01/01/2000 02:32:00   0.00254
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701             01/01/2000 02:37:00   0.002387
701             01/01/2000 02:38:00   0.002381
701             01/01/2000 02:39:00   0.002376
701             01/01/2000 02:40:00   0.002372
701             01/01/2000 02:41:00   0.002343
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701             01/01/2000 02:52:00   0.002086
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701             01/01/2000 02:54:00   0.002026
701             01/01/2000 02:55:00   0.002012
701             01/01/2000 02:56:00   0.002006
701             01/01/2000 02:57:00   0.002002
701             01/01/2000 02:58:00   0.002
701             01/01/2000 02:59:00   0.001998
701             01/01/2000 03:00:00   0.001998
701             01/01/2000 03:01:00   0.001731
701             01/01/2000 03:02:00   0.00107
701             01/01/2000 03:03:00   0.000567
701             01/01/2000 03:04:00   0.000343
701             01/01/2000 03:05:00   0.000185
701             01/01/2000 03:06:00   0.00011
701             01/01/2000 03:07:00   6E-05
701             01/01/2000 03:08:00   3.6E-05
701             01/01/2000 03:09:00   2E-05
701             01/01/2000 03:10:00   1.1E-05
701             01/01/2000 03:11:00   0
701             01/01/2000 03:12:00   0
701             01/01/2000 03:13:00   0
701             01/01/2000 03:14:00   0
701             01/01/2000 03:15:00   0
701             01/01/2000 03:16:00   0
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701             01/01/2000 03:18:00   0
701             01/01/2000 03:19:00   0
701             01/01/2000 03:20:00   0
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701             01/01/2000 03:25:00   0
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701             01/01/2000 03:29:00   0
701             01/01/2000 03:30:00   0
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701             01/01/2000 03:36:00   0
701             01/01/2000 03:37:00   0
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701             01/01/2000 03:41:00   0
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701             01/01/2000 04:00:00   0
701             01/01/2000 04:01:00   0
701             01/01/2000 04:02:00   0
701             01/01/2000 04:03:00   0
701             01/01/2000 04:04:00   0
701             01/01/2000 04:05:00   0
701             01/01/2000 04:06:00   0
701             01/01/2000 04:07:00   0
701             01/01/2000 04:08:00   0
701             01/01/2000 04:09:00   0
701             01/01/2000 04:10:00   0
701             01/01/2000 04:11:00   0
701             01/01/2000 04:12:00   0
701             01/01/2000 04:13:00   0
701             01/01/2000 04:14:00   0
701             01/01/2000 04:15:00   0
701             01/01/2000 04:16:00   0

;Flow (m³/s)
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702             01/01/2000 00:01:00   0
702             01/01/2000 00:02:00   0
702             01/01/2000 00:03:00   0
702             01/01/2000 00:04:00   0
702             01/01/2000 00:05:00   0
702             01/01/2000 00:06:00   0
702             01/01/2000 00:07:00   0
702             01/01/2000 00:08:00   0
702             01/01/2000 00:09:00   0
702             01/01/2000 00:10:00   0
702             01/01/2000 00:11:00   0
702             01/01/2000 00:12:00   0
```

702	01/01/2000 00:13:00	0
702	01/01/2000 00:14:00	0
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702	01/01/2000 00:16:00	0.001483
702	01/01/2000 00:17:00	0.002571
702	01/01/2000 00:18:00	0.003148
702	01/01/2000 00:19:00	0.003453
702	01/01/2000 00:20:00	0.003615
702	01/01/2000 00:21:00	0.003952
702	01/01/2000 00:22:00	0.004499
702	01/01/2000 00:23:00	0.004789
702	01/01/2000 00:24:00	0.004943
702	01/01/2000 00:25:00	0.005024
702	01/01/2000 00:26:00	0.005068
702	01/01/2000 00:27:00	0.00509
702	01/01/2000 00:28:00	0.005103
702	01/01/2000 00:29:00	0.005109
702	01/01/2000 00:30:00	0.005112
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702	01/01/2000 00:32:00	0.006785
702	01/01/2000 00:33:00	0.007376
702	01/01/2000 00:34:00	0.007689
702	01/01/2000 00:35:00	0.007855
702	01/01/2000 00:36:00	0.007943
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702	01/01/2000 00:38:00	0.008014
702	01/01/2000 00:39:00	0.008027
702	01/01/2000 00:40:00	0.008034
702	01/01/2000 00:41:00	0.010752
702	01/01/2000 00:42:00	0.016241
702	01/01/2000 00:43:00	0.019972
702	01/01/2000 00:44:00	0.022402
702	01/01/2000 00:45:00	0.024104
702	01/01/2000 00:46:00	0.025387
702	01/01/2000 00:47:00	0.026419
702	01/01/2000 00:48:00	0.02729
702	01/01/2000 00:49:00	0.028054
702	01/01/2000 00:50:00	0.028738
702	01/01/2000 00:51:00	0.034
702	01/01/2000 00:52:00	0.034
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702	01/01/2000 00:54:00	0.034
702	01/01/2000 00:55:00	0.034
702	01/01/2000 00:56:00	0.034
702	01/01/2000 00:57:00	0.034
702	01/01/2000 00:58:00	0.034
702	01/01/2000 00:59:00	0.034
702	01/01/2000 01:00:00	0.034
702	01/01/2000 01:01:00	0.034
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702	01/01/2000 01:03:00	0.034
702	01/01/2000 01:04:00	0.034
702	01/01/2000 01:05:00	0.034
702	01/01/2000 01:06:00	0.034
702	01/01/2000 01:07:00	0.034
702	01/01/2000 01:08:00	0.034
702	01/01/2000 01:09:00	0.034
702	01/01/2000 01:10:00	0.034
702	01/01/2000 01:11:00	0.034
702	01/01/2000 01:12:00	0.034
702	01/01/2000 01:13:00	0.034
702	01/01/2000 01:14:00	0.034
702	01/01/2000 01:15:00	0.034
702	01/01/2000 01:16:00	0.034
702	01/01/2000 01:17:00	0.034
702	01/01/2000 01:18:00	0.034
702	01/01/2000 01:19:00	0.034
702	01/01/2000 01:20:00	0.034
702	01/01/2000 01:21:00	0.034
702	01/01/2000 01:22:00	0.034
702	01/01/2000 01:23:00	0.033826
702	01/01/2000 01:24:00	0.028045
702	01/01/2000 01:25:00	0.023542
702	01/01/2000 01:26:00	0.020303
702	01/01/2000 01:27:00	0.017638
702	01/01/2000 01:28:00	0.016373
702	01/01/2000 01:29:00	0.015062
702	01/01/2000 01:30:00	0.014429
702	01/01/2000 01:31:00	0.013772
702	01/01/2000 01:32:00	0.012536
702	01/01/2000 01:33:00	0.01155
702	01/01/2000 01:34:00	0.010933
702	01/01/2000 01:35:00	0.010542
702	01/01/2000 01:36:00	0.010291
702	01/01/2000 01:37:00	0.01013
702	01/01/2000 01:38:00	0.010025
702	01/01/2000 01:39:00	0.009958
702	01/01/2000 01:40:00	0.009917
702	01/01/2000 01:41:00	0.009534
702	01/01/2000 01:42:00	0.008803
702	01/01/2000 01:43:00	0.008218
702	01/01/2000 01:44:00	0.007853
702	01/01/2000 01:45:00	0.00762
702	01/01/2000 01:46:00	0.00747
702	01/01/2000 01:47:00	0.007373
702	01/01/2000 01:48:00	0.00731
702	01/01/2000 01:49:00	0.007269
702	01/01/2000 01:50:00	0.007243
702	01/01/2000 01:51:00	0.006989
702	01/01/2000 01:52:00	0.006505
702	01/01/2000 01:53:00	0.006117
702	01/01/2000 01:54:00	0.005873
702	01/01/2000 01:55:00	0.005718
702	01/01/2000 01:56:00	0.005617
702	01/01/2000 01:57:00	0.005551
702	01/01/2000 01:58:00	0.005507
702	01/01/2000 01:59:00	0.005479
702	01/01/2000 02:00:00	0.00546
702	01/01/2000 02:01:00	0.005279
702	01/01/2000 02:02:00	0.004934
702	01/01/2000 02:03:00	0.004657
702	01/01/2000 02:04:00	0.004483
702	01/01/2000 02:05:00	0.004371
702	01/01/2000 02:06:00	0.004298
702	01/01/2000 02:07:00	0.00425
702	01/01/2000 02:08:00	0.004218
702	01/01/2000 02:09:00	0.004197
702	01/01/2000 02:10:00	0.004182
702	01/01/2000 02:11:00	0.004074
702	01/01/2000 02:12:00	0.003871
702	01/01/2000 02:13:00	0.003747
702	01/01/2000 02:14:00	0.003675
702	01/01/2000 02:15:00	0.003634
702	01/01/2000 02:16:00	0.003609
702	01/01/2000 02:17:00	0.003594
702	01/01/2000 02:18:00	0.003584
702	01/01/2000 02:19:00	0.003578
702	01/01/2000 02:20:00	0.003574
702	01/01/2000 02:21:00	0.003501
702	01/01/2000 02:22:00	0.003359
702	01/01/2000 02:23:00	0.003283
702	01/01/2000 02:24:00	0.003243
702	01/01/2000 02:25:00	0.003221
702	01/01/2000 02:26:00	0.00321
702	01/01/2000 02:27:00	0.003204
702	01/01/2000 02:28:00	0.0032
702	01/01/2000 02:29:00	0.003199
702	01/01/2000 02:30:00	0.003198
702	01/01/2000 02:31:00	0.003141
702	01/01/2000 02:32:00	0.003028
702	01/01/2000 02:33:00	0.002968
702	01/01/2000 02:34:00	0.002937
702	01/01/2000 02:35:00	0.00292
702	01/01/2000 02:36:00	0.002911
702	01/01/2000 02:37:00	0.002906
702	01/01/2000 02:38:00	0.002904
702	01/01/2000 02:39:00	0.002902
702	01/01/2000 02:40:00	0.002902
702	01/01/2000 02:41:00	0.002855
702	01/01/2000 02:42:00	0.002763
702	01/01/2000 02:43:00	0.002714
702	01/01/2000 02:44:00	0.002688
702	01/01/2000 02:45:00	0.002675
702	01/01/2000 02:46:00	0.002667
702	01/01/2000 02:47:00	0.002663
702	01/01/2000 02:48:00	0.002661
702	01/01/2000 02:49:00	0.00266
702	01/01/2000 02:50:00	0.00266
702	01/01/2000 02:51:00	0.002621
702	01/01/2000 02:52:00	0.002544
702	01/01/2000 02:53:00	0.002503
702	01/01/2000 02:54:00	0.002482
702	01/01/2000 02:55:00	0.00247
702	01/01/2000 02:56:00	0.002464
702	01/01/2000 02:57:00	0.002461
702	01/01/2000 02:58:00	0.002459
702	01/01/2000 02:59:00	0.002458
702	01/01/2000 03:00:00	0.002458
702	01/01/2000 03:01:00	0.00199
702	01/01/2000 03:02:00	0.001055
702	01/01/2000 03:03:00	0.000559
702	01/01/2000 03:04:00	0.000296
702	01/01/2000 03:05:00	0.000157
702	01/01/2000 03:06:00	8.3E-05
702	01/01/2000 03:07:00	4.4E-05
702	01/01/2000 03:08:00	2.3E-05
702	01/01/2000 03:09:00	1.2E-05
702	01/01/2000 03:10:00	0
702	01/01/2000 03:11:00	0
702	01/01/2000 03:12:00	0
702	01/01/2000 03:13:00	0
702	01/01/2000 03:14:00	0
702	01/01/2000 03:15:00	0
702	01/01/2000 03:16:00	0
702	01/01/2000 03:17:00	0
702	01/01/2000 03:18:00	0
702	01/01/2000 03:19:00	0
702	01/01/2000 03:20:00	0
702	01/01/2000 03:21:00	0
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702	01/01/2000 03:25:00	0
702	01/01/2000 03:26:00	0
702	01/01/2000 03:27:00	0
702	01/01/2000 03:28:00	0
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702	01/01/2000 03:30:00	0
702	01/01/2000 03:31:00	0
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702	01/01/2000 04:02:00	0
702	01/01/2000 04:03:00	0
702	01/01/2000 04:04:00	0
702	01/01/2000 04:05:00	0
702	01/01/2000 04:06:00	0
702	01/01/2000 04:07:00	0
702	01/01/2000 04:08:00	0
702	01/01/2000 04:09:00	0
702	01/01/2000 04:10:00	0
702	01/01/2000 04:11:00	0
702	01/01/2000 04:12:00	0
702	01/01/2000 04:13:00	0
702	01/01/2000 04:14:00	0
702	01/01/2000 04:15:00	0
702	01/01/2000 04:16:00	0

;Flow (m^3/s)

703N	01/01/2000 00:00:00	0
703N	01/01/2000 00:01:00	0
703N	01/01/2000 00:02:00	0
703N	01/01/2000 00:03:00	0
703N	01/01/2000 00:04:00	0
703N	01/01/2000 00:05:00	0
703N	01/01/2000 00:06:00	0
703N	01/01/2000 00:07:00	0
703N	01/01/2000 00:08:00	0
703N	01/01/2000 00:09:00	0
703N	01/01/2000 00:10:00	0
703N	01/01/2000 00:11:00	0
703N	01/01/2000 00:12:00	0
703N	01/01/2000 00:13:00	0
703N	01/01/2000 00:14:00	0
703N	01/01/2000 00:15:00	0.000139
703N	01/01/2000 00:16:00	0.000689
703N	01/01/2000 00:17:00	0.001526
703N	01/01/2000 00:18:00	0.002193
703N	01/01/2000 00:19:00	0.002563
703N	01/01/2000 00:20:00	0.00276
703N	01/01/2000 00:21:00	0.002955
703N	01/01/2000 00:22:00	0.003291
703N	01/01/2000 00:23:00	0.003619
703N	01/01/2000 00:24:00	0.003805
703N	01/01/2000 00:25:00	0.003904
703N	01/01/2000 00:26:00	0.003956
703N	01/01/2000 00:27:00	0.003984
703N	01/01/2000 00:28:00	0.003998
703N	01/01/2000 00:29:00	0.004006
703N	01/01/2000 00:30:00	0.00401
703N	01/01/2000 00:31:00	0.004216
703N	01/01/2000 00:32:00	0.004839
703N	01/01/2000 00:33:00	0.005505
703N	01/01/2000 00:34:00	0.005883
703N	01/01/2000 00:35:00	0.006084
703N	01/01/2000 00:36:00	0.006191
703N	01/01/2000 00:37:00	0.006248
703N	01/01/2000 00:38:00	0.006277
703N	01/01/2000 00:39:00	0.006293
703N	01/01/2000 00:40:00	0.006302
703N	01/01/2000 00:41:00	0.007351
703N	01/01/2000 00:42:00	0.010539
703N	01/01/2000 00:43:00	0.014338
703N	01/01/2000 00:44:00	0.017129
703N	01/01/2000 00:45:00	0.019146
703N	01/01/2000 00:46:00	0.020741
703N	01/01/2000 00:47:00	0.021922
703N	01/01/2000 00:48:00	0.022996
703N	01/01/2000 00:49:00	0.02413
703N	01/01/2000 00:50:00	0.025251
703N	01/01/2000 00:51:00	0.030891

703N	01/01/2000 00:52:00	0.033441
703N	01/01/2000 00:53:00	0.036863
703N	01/01/2000 00:54:00	0.038347
703N	01/01/2000 00:55:00	0.038902
703N	01/01/2000 00:56:00	0.039
703N	01/01/2000 00:57:00	0.039
703N	01/01/2000 00:58:00	0.039951
703N	01/01/2000 00:59:00	0.04
703N	01/01/2000 01:00:00	0.04
703N	01/01/2000 01:01:00	0.04
703N	01/01/2000 01:02:00	0.04
703N	01/01/2000 01:03:00	0.04
703N	01/01/2000 01:04:00	0.04
703N	01/01/2000 01:05:00	0.04
703N	01/01/2000 01:06:00	0.04
703N	01/01/2000 01:07:00	0.04
703N	01/01/2000 01:08:00	0.04
703N	01/01/2000 01:09:00	0.04
703N	01/01/2000 01:10:00	0.04
703N	01/01/2000 01:11:00	0.04
703N	01/01/2000 01:12:00	0.04
703N	01/01/2000 01:13:00	0.04
703N	01/01/2000 01:14:00	0.04
703N	01/01/2000 01:15:00	0.04
703N	01/01/2000 01:16:00	0.04
703N	01/01/2000 01:17:00	0.039962
703N	01/01/2000 01:18:00	0.039686
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703N	01/01/2000 01:20:00	0.039193
703N	01/01/2000 01:21:00	0.039
703N	01/01/2000 01:22:00	0.039
703N	01/01/2000 01:23:00	0.039
703N	01/01/2000 01:24:00	0.039
703N	01/01/2000 01:25:00	0.039
703N	01/01/2000 01:26:00	0.039
703N	01/01/2000 01:27:00	0.039
703N	01/01/2000 01:28:00	0.038971
703N	01/01/2000 01:29:00	0.03822
703N	01/01/2000 01:30:00	0.037559
703N	01/01/2000 01:31:00	0.036955
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703N	01/01/2000 01:33:00	0.035886
703N	01/01/2000 01:34:00	0.035404
703N	01/01/2000 01:35:00	0.034949
703N	01/01/2000 01:36:00	0.034478
703N	01/01/2000 01:37:00	0.033942
703N	01/01/2000 01:38:00	0.033417
703N	01/01/2000 01:39:00	0.032942
703N	01/01/2000 01:40:00	0.03251
703N	01/01/2000 01:41:00	0.032103
703N	01/01/2000 01:42:00	0.031714
703N	01/01/2000 01:43:00	0.03134
703N	01/01/2000 01:44:00	0.030978
703N	01/01/2000 01:45:00	0.030733
703N	01/01/2000 01:46:00	0.030511
703N	01/01/2000 01:47:00	0.030294
703N	01/01/2000 01:48:00	0.030079
703N	01/01/2000 01:49:00	0.026435
703N	01/01/2000 01:50:00	0.01253
703N	01/01/2000 01:51:00	0.008454
703N	01/01/2000 01:52:00	0.007737
703N	01/01/2000 01:53:00	0.00723
703N	01/01/2000 01:54:00	0.006834
703N	01/01/2000 01:55:00	0.00654
703N	01/01/2000 01:56:00	0.00631
703N	01/01/2000 01:57:00	0.00612
703N	01/01/2000 01:58:00	0.005953
703N	01/01/2000 01:59:00	0.005816
703N	01/01/2000 02:00:00	0.005703
703N	01/01/2000 02:01:00	0.005538
703N	01/01/2000 02:02:00	0.00525
703N	01/01/2000 02:03:00	0.004919
703N	01/01/2000 02:04:00	0.004648
703N	01/01/2000 02:05:00	0.004448
703N	01/01/2000 02:06:00	0.004293
703N	01/01/2000 02:07:00	0.004164
703N	01/01/2000 02:08:00	0.004051
703N	01/01/2000 02:09:00	0.003958
703N	01/01/2000 02:10:00	0.003882
703N	01/01/2000 02:11:00	0.003779
703N	01/01/2000 02:12:00	0.003611
703N	01/01/2000 02:13:00	0.003436
703N	01/01/2000 02:14:00	0.003311
703N	01/01/2000 02:15:00	0.003224
703N	01/01/2000 02:16:00	0.00316
703N	01/01/2000 02:17:00	0.003109
703N	01/01/2000 02:18:00	0.003066
703N	01/01/2000 02:19:00	0.003031
703N	01/01/2000 02:20:00	0.003001
703N	01/01/2000 02:21:00	0.00295
703N	01/01/2000 02:22:00	0.00285
703N	01/01/2000 02:23:00	0.002747
703N	01/01/2000 02:24:00	0.002683
703N	01/01/2000 02:25:00	0.002643
703N	01/01/2000 02:26:00	0.002617
703N	01/01/2000 02:27:00	0.002599
703N	01/01/2000 02:28:00	0.002586
703N	01/01/2000 02:29:00	0.002575
703N	01/01/2000 02:30:00	0.002566
703N	01/01/2000 02:31:00	0.002539
703N	01/01/2000 02:32:00	0.00247
703N	01/01/2000 02:33:00	0.002397
703N	01/01/2000 02:34:00	0.002354
703N	01/01/2000 02:35:00	0.00233
703N	01/01/2000 02:36:00	0.002315
703N	01/01/2000 02:37:00	0.002306
703N	01/01/2000 02:38:00	0.002301
703N	01/01/2000 02:39:00	0.002297
703N	01/01/2000 02:40:00	0.002294
703N	01/01/2000 02:41:00	0.002274
703N	01/01/2000 02:42:00	0.002221
703N	01/01/2000 02:43:00	0.002164
703N	01/01/2000 02:44:00	0.002132
703N	01/01/2000 02:45:00	0.002114
703N	01/01/2000 02:46:00	0.002104
703N	01/01/2000 02:47:00	0.002099
703N	01/01/2000 02:48:00	0.002095
703N	01/01/2000 02:49:00	0.002093
703N	01/01/2000 02:50:00	0.002092
703N	01/01/2000 02:51:00	0.002077
703N	01/01/2000 02:52:00	0.002033
703N	01/01/2000 02:53:00	0.001987
703N	01/01/2000 02:54:00	0.001961
703N	01/01/2000 02:55:00	0.001946
703N	01/01/2000 02:56:00	0.001939
703N	01/01/2000 02:57:00	0.001934
703N	01/01/2000 02:58:00	0.001932
703N	01/01/2000 02:59:00	0.001931
703N	01/01/2000 03:00:00	0.00193
703N	01/01/2000 03:01:00	0.001759
703N	01/01/2000 03:02:00	0.001236
703N	01/01/2000 03:03:00	0.000677
703N	01/01/2000 03:04:00	0.00036
703N	01/01/2000 03:05:00	0.000191
703N	01/01/2000 03:06:00	0.000101
703N	01/01/2000 03:07:00	5.4E-05
703N	01/01/2000 03:08:00	2.8E-05
703N	01/01/2000 03:09:00	1.5E-05
703N	01/01/2000 03:10:00	0
703N	01/01/2000 03:11:00	0
703N	01/01/2000 03:12:00	0
703N	01/01/2000 03:13:00	0
703N	01/01/2000 03:14:00	0
703N	01/01/2000 03:15:00	0
703N	01/01/2000 03:16:00	0
703N	01/01/2000 03:17:00	0
703N	01/01/2000 03:18:00	0
703N	01/01/2000 03:19:00	0
703N	01/01/2000 03:20:00	0
703N	01/01/2000 03:21:00	0
703N	01/01/2000 03:22:00	0
703N	01/01/2000 03:23:00	0
703N	01/01/2000 03:24:00	0
703N	01/01/2000 03:25:00	0
703N	01/01/2000 03:26:00	0
703N	01/01/2000 03:27:00	0
703N	01/01/2000 03:28:00	0
703N	01/01/2000 03:29:00	0
703N	01/01/2000 03:30:00	0
703N	01/01/2000 03:31:00	0
703N	01/01/2000 03:32:00	0
703N	01/01/2000 03:33:00	0
703N	01/01/2000 03:34:00	0
703N	01/01/2000 03:35:00	0
703N	01/01/2000 03:36:00	0
703N	01/01/2000 03:37:00	0
703N	01/01/2000 03:38:00	0
703N	01/01/2000 03:39:00	0
703N	01/01/2000 03:40:00	0
703N	01/01/2000 03:41:00	0
703N	01/01/2000 03:42:00	0
703N	01/01/2000 03:43:00	0
703N	01/01/2000 03:44:00	0
703N	01/01/2000 03:45:00	0
703N	01/01/2000 03:46:00	0
703N	01/01/2000 03:47:00	0
703N	01/01/2000 03:48:00	0
703N	01/01/2000 03:49:00	0
703N	01/01/2000 03:50:00	0
703N	01/01/2000 03:51:00	0
703N	01/01/2000 03:52:00	0
703N	01/01/2000 03:53:00	0
703N	01/01/2000 03:54:00	0
703N	01/01/2000 03:55:00	0
703N	01/01/2000 03:56:00	0
703N	01/01/2000 03:57:00	0
703N	01/01/2000 03:58:00	0
703N	01/01/2000 03:59:00	0
703N	01/01/2000 04:00:00	0
703N	01/01/2000 04:01:00	0
703N	01/01/2000 04:02:00	0
703N	01/01/2000 04:03:00	0
703N	01/01/2000 04:04:00	0
703N	01/01/2000 04:05:00	0
703N	01/01/2000 04:06:00	0
703N	01/01/2000 04:07:00	0
703N	01/01/2000 04:08:00	0
703N	01/01/2000 04:09:00	0
703N	01/01/2000 04:10:00	0
703N	01/01/2000 04:11:00	0
703N	01/01/2000 04:12:00	0
703N	01/01/2000 04:13:00	0
703N	01/01/2000 04:14:00	0
703N	01/01/2000 04:15:00	0
703N	01/01/2000 04:16:00	0

;Flow (m³/s)

703S	01/01/2000 00:00:00	0
703S	01/01/2000 00:01:00	0
703S	01/01/2000 00:02:00	0
703S	01/01/2000 00:03:00	0
703S	01/01/2000 00:04:00	0
703S	01/01/2000 00:05:00	0
703S	01/01/2000 00:06:00	0
703S	01/01/2000 00:07:00	0
703S	01/01/2000 00:08:00	0
703S	01/01/2000 00:09:00	0
703S	01/01/2000 00:10:00	0
703S	01/01/2000 00:11:00	0
703S	01/01/2000 00:12:00	0
703S	01/01/2000 00:13:00	0
703S	01/01/2000 00:14:00	0
703S	01/01/2000 00:15:00	0.000412
703S	01/01/2000 00:16:00	0.001417
703S	01/01/2000 00:17:00	0.002322
703S	01/01/2000 00:18:00	0.002795
703S	01/01/2000 00:19:00	0.003035
703S	01/01/2000 00:20:00	0.003158
703S	01/01/2000 00:21:00	0.003492
703S	01/01/2000 00:22:00	0.003942
703S	01/01/2000 00:23:00	0.004179
703S	01/01/2000 00:24:00	0.0043
703S	01/01/2000 00:25:00	0.004361
703S	01/01/2000 00:26:00	0.004392
703S	01/01/2000 00:27:00	0.004408
703S	01/01/2000 00:28:00	0.004416
703S	01/01/2000 00:29:00	0.004421
703S	01/01/2000 00:30:00	0.004423
703S	01/01/2000 00:31:00	0.005027
703S	01/01/2000 00:32:00	0.005955
703S	01/01/2000 00:33:00	0.006446
703S	01/01/2000 00:34:00	0.006696
703S	01/01/2000 00:35:00	0.006823
703S	01/01/2000 00:36:00	0.006888
703S	01/01/2000 00:37:00	0.006921
703S	01/01/2000 00:38:00	0.006938
703S	01/01/2000 00:39:00	0.006947
703S	01/01/2000 00:40:00	0.006951
703S	01/01/2000 00:41:00	0.009662
703S	01/01/2000 00:42:00	0.014075
703S	01/01/2000 00:43:00	0.017007
703S	01/01/2000 00:44:00	0.019073
703S	01/01/2000 00:45:00	0.020526
703S	01/01/2000 00:46:00	0.021629
703S	01/01/2000 00:47:00	0.022309
703S	01/01/2000 00:48:00	0.022883
703S	01/01/2000 00:49:00	0.023513
703S	01/01/2000 00:50:00	0.02413
703S	01/01/2000 00:51:00	0.03
703S	01/01/2000 00:52:00	0.03
703S	01/01/2000 00:53:00	0.03
703S	01/01/2000 00:54:00	0.030374
703S	01/01/2000 00:55:00	0.030819
703S	01/01/2000 00:56:00	0.031
703S	01/01/2000 00:57:00	0.031
703S	01/01/2000 00:58:00	0.031384
703S	01/01/2000 00:59:00	0.032
703S	01/01/2000 01:00:00	0.032
703S	01/01/2000 01:01:00	0.032
703S	01/01/2000 01:02:00	0.032
703S	01/01/2000 01:03:00	0.032
703S	01/01/2000 01:04:00	0.032
703S	01/01/2000 01:05:00	0.032
703S	01/01/2000 01:06:00	0.032
703S	01/01/2000 01:07:00	0.032
703S	01/01/2000 01:08:00	0.032
703S	01/01/2000 01:09:00	0.032
703S	01/01/2000 01:10:00	0.031992
703S	01/01/2000 01:11:00	0.031833
703S	01/01/2000 01:12:00	0.031625
703S	01/01/2000 01:13:00	0.031397
703S	01/01/2000 01:14:00	0.031165
703S	01/01/2000 01:15:00	0.031
703S	01/01/2000 01:16:00	0.031
703S	01/01/2000 01:17:00	0.031
703S	01/01/2000 01:18:00	0.031
703S	01/01/2000 01:19:00	0.031
703S	01/01/2000 01:20:00	0.031
703S	01/01/2000 01:21:00	0.031
703S	01/01/2000 01:22:00	0.031
703S	01/01/2000 01:23:00	0.031
703S	01/01/2000 01:24:00	0.031
703S	01/01/2000 01:25:00	0.031
703S	01/01/2000 01:26:00	0.031
703S	01/01/2000 01:27:00	0.031
703S	01/01/2000 01:28:00	0.031
703S	01/01/2000 01:29:00	0.031
703S	01/01/2000 01:30:00	0.031

703S	01/01/2000 01:31:00	0.03094
703S	01/01/2000 01:32:00	0.030845
703S	01/01/2000 01:33:00	0.030748
703S	01/01/2000 01:34:00	0.030648
703S	01/01/2000 01:35:00	0.030547
703S	01/01/2000 01:36:00	0.030445
703S	01/01/2000 01:37:00	0.030343
703S	01/01/2000 01:38:00	0.030241
703S	01/01/2000 01:39:00	0.030139
703S	01/01/2000 01:40:00	0.030038
703S	01/01/2000 01:41:00	0.03
703S	01/01/2000 01:42:00	0.03
703S	01/01/2000 01:43:00	0.03
703S	01/01/2000 01:44:00	0.03
703S	01/01/2000 01:45:00	0.03
703S	01/01/2000 01:46:00	0.023934
703S	01/01/2000 01:47:00	0.008268
703S	01/01/2000 01:48:00	0.006396
703S	01/01/2000 01:49:00	0.006301
703S	01/01/2000 01:50:00	0.006272
703S	01/01/2000 01:51:00	0.006043
703S	01/01/2000 01:52:00	0.005663
703S	01/01/2000 01:53:00	0.005362
703S	01/01/2000 01:54:00	0.005132
703S	01/01/2000 01:55:00	0.004983
703S	01/01/2000 01:56:00	0.004885
703S	01/01/2000 01:57:00	0.00482
703S	01/01/2000 01:58:00	0.004777
703S	01/01/2000 01:59:00	0.004748
703S	01/01/2000 02:00:00	0.004728
703S	01/01/2000 02:01:00	0.004565
703S	01/01/2000 02:02:00	0.004294
703S	01/01/2000 02:03:00	0.004079
703S	01/01/2000 02:04:00	0.003915
703S	01/01/2000 02:05:00	0.003807
703S	01/01/2000 02:06:00	0.003737
703S	01/01/2000 02:07:00	0.00369
703S	01/01/2000 02:08:00	0.003658
703S	01/01/2000 02:09:00	0.003637
703S	01/01/2000 02:10:00	0.003622
703S	01/01/2000 02:11:00	0.003511
703S	01/01/2000 02:12:00	0.003343
703S	01/01/2000 02:13:00	0.003242
703S	01/01/2000 02:14:00	0.00318
703S	01/01/2000 02:15:00	0.003144
703S	01/01/2000 02:16:00	0.003123
703S	01/01/2000 02:17:00	0.003109
703S	01/01/2000 02:18:00	0.003101
703S	01/01/2000 02:19:00	0.003096
703S	01/01/2000 02:20:00	0.003092
703S	01/01/2000 02:21:00	0.003013
703S	01/01/2000 02:22:00	0.002895
703S	01/01/2000 02:23:00	0.002832
703S	01/01/2000 02:24:00	0.002799
703S	01/01/2000 02:25:00	0.002783
703S	01/01/2000 02:26:00	0.002774
703S	01/01/2000 02:27:00	0.00277
703S	01/01/2000 02:28:00	0.002767
703S	01/01/2000 02:29:00	0.002766
703S	01/01/2000 02:30:00	0.002765
703S	01/01/2000 02:31:00	0.002704
703S	01/01/2000 02:32:00	0.00261
703S	01/01/2000 02:33:00	0.00256
703S	01/01/2000 02:34:00	0.002535
703S	01/01/2000 02:35:00	0.002522
703S	01/01/2000 02:36:00	0.002516
703S	01/01/2000 02:37:00	0.002512
703S	01/01/2000 02:38:00	0.002511
703S	01/01/2000 02:39:00	0.00251
703S	01/01/2000 02:40:00	0.002509
703S	01/01/2000 02:41:00	0.002459
703S	01/01/2000 02:42:00	0.002382
703S	01/01/2000 02:43:00	0.002342
703S	01/01/2000 02:44:00	0.002321
703S	01/01/2000 02:45:00	0.002311
703S	01/01/2000 02:46:00	0.002305
703S	01/01/2000 02:47:00	0.002303
703S	01/01/2000 02:48:00	0.002301
703S	01/01/2000 02:49:00	0.0023
703S	01/01/2000 02:50:00	0.0023
703S	01/01/2000 02:51:00	0.002258
703S	01/01/2000 02:52:00	0.002194
703S	01/01/2000 02:53:00	0.00216
703S	01/01/2000 02:54:00	0.002143
703S	01/01/2000 02:55:00	0.002134
703S	01/01/2000 02:56:00	0.00213
703S	01/01/2000 02:57:00	0.002127
703S	01/01/2000 02:58:00	0.002126
703S	01/01/2000 02:59:00	0.002126
703S	01/01/2000 03:00:00	0.002125
703S	01/01/2000 03:01:00	0.001619
703S	01/01/2000 03:02:00	0.00084
703S	01/01/2000 03:03:00	0.000428
703S	01/01/2000 03:04:00	0.000218
703S	01/01/2000 03:05:00	0.000111
703S	01/01/2000 03:06:00	5.6E-05
703S	01/01/2000 03:07:00	2.9E-05
703S	01/01/2000 03:08:00	1.5E-05
703S	01/01/2000 03:09:00	0
703S	01/01/2000 03:10:00	0
703S	01/01/2000 03:11:00	0
703S	01/01/2000 03:12:00	0
703S	01/01/2000 03:13:00	0
703S	01/01/2000 03:14:00	0
703S	01/01/2000 03:15:00	0
703S	01/01/2000 03:16:00	0
703S	01/01/2000 03:17:00	0
703S	01/01/2000 03:18:00	0
703S	01/01/2000 03:19:00	0
703S	01/01/2000 03:20:00	0
703S	01/01/2000 03:21:00	0
703S	01/01/2000 03:22:00	0
703S	01/01/2000 03:23:00	0
703S	01/01/2000 03:24:00	0
703S	01/01/2000 03:25:00	0
703S	01/01/2000 03:26:00	0
703S	01/01/2000 03:27:00	0
703S	01/01/2000 03:28:00	0
703S	01/01/2000 03:29:00	0
703S	01/01/2000 03:30:00	0
703S	01/01/2000 03:31:00	0
703S	01/01/2000 03:32:00	0
703S	01/01/2000 03:33:00	0
703S	01/01/2000 03:34:00	0
703S	01/01/2000 03:35:00	0
703S	01/01/2000 03:36:00	0
703S	01/01/2000 03:37:00	0
703S	01/01/2000 03:38:00	0
703S	01/01/2000 03:39:00	0
703S	01/01/2000 03:40:00	0
703S	01/01/2000 03:41:00	0
703S	01/01/2000 03:42:00	0
703S	01/01/2000 03:43:00	0
703S	01/01/2000 03:44:00	0
703S	01/01/2000 03:45:00	0
703S	01/01/2000 03:46:00	0
703S	01/01/2000 03:47:00	0
703S	01/01/2000 03:48:00	0
703S	01/01/2000 03:49:00	0
703S	01/01/2000 03:50:00	0
703S	01/01/2000 03:51:00	0
703S	01/01/2000 03:52:00	0
703S	01/01/2000 03:53:00	0
703S	01/01/2000 03:54:00	0
703S	01/01/2000 03:55:00	0
703S	01/01/2000 03:56:00	0
703S	01/01/2000 03:57:00	0
703S	01/01/2000 03:58:00	0
703S	01/01/2000 03:59:00	0
703S	01/01/2000 04:00:00	0
703S	01/01/2000 04:01:00	0
703S	01/01/2000 04:02:00	0
703S	01/01/2000 04:03:00	0
703S	01/01/2000 04:04:00	0
703S	01/01/2000 04:05:00	0
703S	01/01/2000 04:06:00	0
703S	01/01/2000 04:07:00	0
703S	01/01/2000 04:08:00	0
703S	01/01/2000 04:09:00	0
703S	01/01/2000 04:10:00	0
703S	01/01/2000 04:11:00	0
703S	01/01/2000 04:12:00	0
703S	01/01/2000 04:13:00	0
703S	01/01/2000 04:14:00	0
703S	01/01/2000 04:15:00	0
703S	01/01/2000 04:16:00	0

;Flow (m^3/s)

704	01/01/2000 00:00:00	0
704	01/01/2000 00:01:00	0
704	01/01/2000 00:02:00	0
704	01/01/2000 00:03:00	0
704	01/01/2000 00:04:00	0
704	01/01/2000 00:05:00	0
704	01/01/2000 00:06:00	0
704	01/01/2000 00:07:00	0
704	01/01/2000 00:08:00	0
704	01/01/2000 00:09:00	0
704	01/01/2000 00:10:00	0
704	01/01/2000 00:11:00	0
704	01/01/2000 00:12:00	0
704	01/01/2000 00:13:00	0
704	01/01/2000 00:14:00	0
704	01/01/2000 00:15:00	2E-06
704	01/01/2000 00:16:00	6E-06
704	01/01/2000 00:17:00	8E-06
704	01/01/2000 00:18:00	1E-05
704	01/01/2000 00:19:00	1.1E-05
704	01/01/2000 00:20:00	1.1E-05
704	01/01/2000 00:21:00	1.2E-05
704	01/01/2000 00:22:00	1.4E-05
704	01/01/2000 00:23:00	1.5E-05
704	01/01/2000 00:24:00	1.5E-05
704	01/01/2000 00:25:00	1.5E-05
704	01/01/2000 00:26:00	1.5E-05
704	01/01/2000 00:27:00	1.5E-05
704	01/01/2000 00:28:00	1.5E-05
704	01/01/2000 00:29:00	1.5E-05
704	01/01/2000 00:30:00	1.5E-05
704	01/01/2000 00:31:00	1.8E-05
704	01/01/2000 00:32:00	2.1E-05
704	01/01/2000 00:33:00	2.2E-05
704	01/01/2000 00:34:00	2.3E-05
704	01/01/2000 00:35:00	2.4E-05
704	01/01/2000 00:36:00	2.4E-05
704	01/01/2000 00:37:00	2.4E-05
704	01/01/2000 00:38:00	2.4E-05
704	01/01/2000 00:39:00	2.4E-05
704	01/01/2000 00:40:00	2.4E-05
704	01/01/2000 00:41:00	0.00022
704	01/01/2000 00:42:00	0.000634
704	01/01/2000 00:43:00	0.001287
704	01/01/2000 00:44:00	0.002211
704	01/01/2000 00:45:00	0.003433
704	01/01/2000 00:46:00	0.004977
704	01/01/2000 00:47:00	0.006676
704	01/01/2000 00:48:00	0.008533
704	01/01/2000 00:49:00	0.010388
704	01/01/2000 00:50:00	0.012227
704	01/01/2000 00:51:00	0.016869
704	01/01/2000 00:52:00	0.024241
704	01/01/2000 00:53:00	0.031919
704	01/01/2000 00:54:00	0.036
704	01/01/2000 00:55:00	0.036
704	01/01/2000 00:56:00	0.036
704	01/01/2000 00:57:00	0.036
704	01/01/2000 00:58:00	0.036
704	01/01/2000 00:59:00	0.036
704	01/01/2000 01:00:00	0.036
704	01/01/2000 01:01:00	0.036
704	01/01/2000 01:02:00	0.036
704	01/01/2000 01:03:00	0.036
704	01/01/2000 01:04:00	0.036
704	01/01/2000 01:05:00	0.036
704	01/01/2000 01:06:00	0.036
704	01/01/2000 01:07:00	0.036
704	01/01/2000 01:08:00	0.036
704	01/01/2000 01:09:00	0.036
704	01/01/2000 01:10:00	0.036
704	01/01/2000 01:11:00	0.036
704	01/01/2000 01:12:00	0.036
704	01/01/2000 01:13:00	0.036
704	01/01/2000 01:14:00	0.036
704	01/01/2000 01:15:00	0.036
704	01/01/2000 01:16:00	0.036
704	01/01/2000 01:17:00	0.036
704	01/01/2000 01:18:00	0.036
704	01/01/2000 01:19:00	0.036
704	01/01/2000 01:20:00	0.036
704	01/01/2000 01:21:00	0.036
704	01/01/2000 01:22:00	0.036
704	01/01/2000 01:23:00	0.036
704	01/01/2000 01:24:00	0.035344
704	01/01/2000 01:25:00	0.034223
704	01/01/2000 01:26:00	0.033103
704	01/01/2000 01:27:00	0.032156
704	01/01/2000 01:28:00	0.030968
704	01/01/2000 01:29:00	0.02888
704	01/01/2000 01:30:00	0.027068
704	01/01/2000 01:31:00	0.025404
704	01/01/2000 01:32:00	0.023857
704	01/01/2000 01:33:00	0.022403
704	01/01/2000 01:34:00	0.021017
704	01/01/2000 01:35:00	0.019677
704	01/01/2000 01:36:00	0.018367
704	01/01/2000 01:37:00	0.017162
704	01/01/2000 01:38:00	0.016044
704	01/01/2000 01:39:00	0.015074
704	01/01/2000 01:40:00	0.014232
704	01/01/2000 01:41:00	0.013446
704	01/01/2000 01:42:00	0.012703
704	01/01/2000 01:43:00	0.011992
704	01/01/2000 01:44:00	0.011301
704	01/01/2000 01:45:00	0.01062
704	01/01/2000 01:46:00	0.009941
704	01/01/2000 01:47:00	0.009311
704	01/01/2000 01:48:00	0.008721
704	01/01/2000 01:49:00	0.008209
704	01/01/2000 01:50:00	0.007765
704	01/01/2000 01:51:00	0.007342
704	01/01/2000 01:52:00	0.006935
704	01/01/2000 01:53:00	0.006538
704	01/01/2000 01:54:00	0.006143
704	01/01/2000 01:55:00	0.005747
704	01/01/2000 01:56:00	0.005345
704	01/01/2000 01:57:00	0.004969
704	01/01/2000 01:58:00	0.004613
704	01/01/2000 01:59:00	0.004304
704	01/01/2000 02:00:00	0.004035
704	01/01/2000 02:01:00	0.003775
704	01/01/2000 02:02:00	0.003521
704	01/01/2000 02:03:00	0.003269
704	01/01/2000 02:04:00	0.003015
704	01/01/2000 02:05:00	0.002756
704	01/01/2000 02:06:00	0.002489
704	01/01/2000 02:07:00	0.002238
704	01/01/2000 02:08:00	0.002
704	01/01/2000 02:09:00	0.001792

704	01/01/2000 02:10:00	0.001612
704	01/01/2000 02:11:00	0.00145
704	01/01/2000 02:12:00	0.001304
704	01/01/2000 02:13:00	0.00117
704	01/01/2000 02:14:00	0.001048
704	01/01/2000 02:15:00	0.000934
704	01/01/2000 02:16:00	0.000827
704	01/01/2000 02:17:00	0.00073
704	01/01/2000 02:18:00	0.000641
704	01/01/2000 02:19:00	0.000564
704	01/01/2000 02:20:00	0.000495
704	01/01/2000 02:21:00	0.000435
704	01/01/2000 02:22:00	0.000382
704	01/01/2000 02:23:00	0.000336
704	01/01/2000 02:24:00	0.000296
704	01/01/2000 02:25:00	0.00026
704	01/01/2000 02:26:00	0.000229
704	01/01/2000 02:27:00	0.000202
704	01/01/2000 02:28:00	0.000178
704	01/01/2000 02:29:00	0.000157
704	01/01/2000 02:30:00	0.000139
704	01/01/2000 02:31:00	0.000123
704	01/01/2000 02:32:00	0.000109
704	01/01/2000 02:33:00	9.7E-05
704	01/01/2000 02:34:00	8.6E-05
704	01/01/2000 02:35:00	7.6E-05
704	01/01/2000 02:36:00	6.8E-05
704	01/01/2000 02:37:00	6.1E-05
704	01/01/2000 02:38:00	5.4E-05
704	01/01/2000 02:39:00	4.9E-05
704	01/01/2000 02:40:00	4.4E-05
704	01/01/2000 02:41:00	3.9E-05
704	01/01/2000 02:42:00	3.5E-05
704	01/01/2000 02:43:00	3.2E-05
704	01/01/2000 02:44:00	2.9E-05
704	01/01/2000 02:45:00	2.6E-05
704	01/01/2000 02:46:00	2.4E-05
704	01/01/2000 02:47:00	2.2E-05
704	01/01/2000 02:48:00	2E-05
704	01/01/2000 02:49:00	1.9E-05
704	01/01/2000 02:50:00	1.8E-05
704	01/01/2000 02:51:00	1.6E-05
704	01/01/2000 02:52:00	1.5E-05
704	01/01/2000 02:53:00	1.4E-05
704	01/01/2000 02:54:00	1.3E-05
704	01/01/2000 02:55:00	1.2E-05
704	01/01/2000 02:56:00	1.2E-05
704	01/01/2000 02:57:00	1.1E-05
704	01/01/2000 02:58:00	1.1E-05
704	01/01/2000 02:59:00	1E-05
704	01/01/2000 03:00:00	0
704	01/01/2000 03:01:00	0
704	01/01/2000 03:02:00	0
704	01/01/2000 03:03:00	0
704	01/01/2000 03:04:00	0
704	01/01/2000 03:05:00	0
704	01/01/2000 03:06:00	0
704	01/01/2000 03:07:00	0
704	01/01/2000 03:08:00	0
704	01/01/2000 03:09:00	0
704	01/01/2000 03:10:00	0
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704	01/01/2000 03:12:00	0
704	01/01/2000 03:13:00	0
704	01/01/2000 03:14:00	0
704	01/01/2000 03:15:00	0
704	01/01/2000 03:16:00	0
704	01/01/2000 03:17:00	0
704	01/01/2000 03:18:00	0
704	01/01/2000 03:19:00	0
704	01/01/2000 03:20:00	0
704	01/01/2000 03:21:00	0
704	01/01/2000 03:22:00	0
704	01/01/2000 03:23:00	0
704	01/01/2000 03:24:00	0
704	01/01/2000 03:25:00	0
704	01/01/2000 03:26:00	0
704	01/01/2000 03:27:00	0
704	01/01/2000 03:28:00	0
704	01/01/2000 03:29:00	0
704	01/01/2000 03:30:00	0
704	01/01/2000 03:31:00	0
704	01/01/2000 03:32:00	0
704	01/01/2000 03:33:00	0
704	01/01/2000 03:34:00	0
704	01/01/2000 03:35:00	0
704	01/01/2000 03:36:00	0
704	01/01/2000 03:37:00	0
704	01/01/2000 03:38:00	0
704	01/01/2000 03:39:00	0
704	01/01/2000 03:40:00	0
704	01/01/2000 03:41:00	0
704	01/01/2000 03:42:00	0
704	01/01/2000 03:43:00	0
704	01/01/2000 03:44:00	0
704	01/01/2000 03:45:00	0
704	01/01/2000 03:46:00	0
704	01/01/2000 03:47:00	0
704	01/01/2000 03:48:00	0
704	01/01/2000 03:49:00	0
704	01/01/2000 03:50:00	0
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704	01/01/2000 03:52:00	0
704	01/01/2000 03:53:00	0
704	01/01/2000 03:54:00	0
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704	01/01/2000 03:56:00	0
704	01/01/2000 03:57:00	0
704	01/01/2000 03:58:00	0
704	01/01/2000 03:59:00	0
704	01/01/2000 04:00:00	0
704	01/01/2000 04:01:00	0
704	01/01/2000 04:02:00	0
704	01/01/2000 04:03:00	0
704	01/01/2000 04:04:00	0
704	01/01/2000 04:05:00	0
704	01/01/2000 04:06:00	0
704	01/01/2000 04:07:00	0
704	01/01/2000 04:08:00	0
704	01/01/2000 04:09:00	0
704	01/01/2000 04:10:00	0
704	01/01/2000 04:11:00	0
704	01/01/2000 04:12:00	0
704	01/01/2000 04:13:00	0
704	01/01/2000 04:14:00	0
704	01/01/2000 04:15:00	0
704	01/01/2000 04:16:00	0

;Flow (m³/s)

705	01/01/2000 00:00:00	0
705	01/01/2000 00:01:00	0
705	01/01/2000 00:02:00	0
705	01/01/2000 00:03:00	0
705	01/01/2000 00:04:00	0
705	01/01/2000 00:05:00	0
705	01/01/2000 00:06:00	0
705	01/01/2000 00:07:00	0
705	01/01/2000 00:08:00	0
705	01/01/2000 00:09:00	0
705	01/01/2000 00:10:00	0
705	01/01/2000 00:11:00	0
705	01/01/2000 00:12:00	0
705	01/01/2000 00:13:00	0
705	01/01/2000 00:14:00	0
705	01/01/2000 00:15:00	0.00015
705	01/01/2000 00:16:00	0.000738
705	01/01/2000 00:17:00	0.001635
705	01/01/2000 00:18:00	0.00238
705	01/01/2000 00:19:00	0.002843
705	01/01/2000 00:20:00	0.003129
705	01/01/2000 00:21:00	0.003405
705	01/01/2000 00:22:00	0.003813
705	01/01/2000 00:23:00	0.004203
705	01/01/2000 00:24:00	0.004446
705	01/01/2000 00:25:00	0.004596
705	01/01/2000 00:26:00	0.004689
705	01/01/2000 00:27:00	0.004747
705	01/01/2000 00:28:00	0.004782
705	01/01/2000 00:29:00	0.004804
705	01/01/2000 00:30:00	0.004818
705	01/01/2000 00:31:00	0.005046
705	01/01/2000 00:32:00	0.005713
705	01/01/2000 00:33:00	0.006433
705	01/01/2000 00:34:00	0.006881
705	01/01/2000 00:35:00	0.007158
705	01/01/2000 00:36:00	0.00733
705	01/01/2000 00:37:00	0.007436
705	01/01/2000 00:38:00	0.007501
705	01/01/2000 00:39:00	0.007542
705	01/01/2000 00:40:00	0.007567
705	01/01/2000 00:41:00	0.008579
705	01/01/2000 00:42:00	0.011595
705	01/01/2000 00:43:00	0.014997
705	01/01/2000 00:44:00	0.017418
705	01/01/2000 00:45:00	0.019307
705	01/01/2000 00:46:00	0.020839
705	01/01/2000 00:47:00	0.022071
705	01/01/2000 00:48:00	0.023064
705	01/01/2000 00:49:00	0.023648
705	01/01/2000 00:50:00	0.024364
705	01/01/2000 00:51:00	0.028929
705	01/01/2000 00:52:00	0.032
705	01/01/2000 00:53:00	0.032
705	01/01/2000 00:54:00	0.032089
705	01/01/2000 00:55:00	0.032714
705	01/01/2000 00:56:00	0.033
705	01/01/2000 00:57:00	0.033
705	01/01/2000 00:58:00	0.033
705	01/01/2000 00:59:00	0.033
705	01/01/2000 01:00:00	0.034
705	01/01/2000 01:01:00	0.034
705	01/01/2000 01:02:00	0.034
705	01/01/2000 01:03:00	0.034
705	01/01/2000 01:04:00	0.034
705	01/01/2000 01:05:00	0.034
705	01/01/2000 01:06:00	0.034
705	01/01/2000 01:07:00	0.034
705	01/01/2000 01:08:00	0.034
705	01/01/2000 01:09:00	0.034
705	01/01/2000 01:10:00	0.034
705	01/01/2000 01:11:00	0.034
705	01/01/2000 01:12:00	0.034
705	01/01/2000 01:13:00	0.034
705	01/01/2000 01:14:00	0.034
705	01/01/2000 01:15:00	0.034
705	01/01/2000 01:16:00	0.034
705	01/01/2000 01:17:00	0.034
705	01/01/2000 01:18:00	0.034
705	01/01/2000 01:19:00	0.034
705	01/01/2000 01:20:00	0.034
705	01/01/2000 01:21:00	0.034
705	01/01/2000 01:22:00	0.034
705	01/01/2000 01:23:00	0.034
705	01/01/2000 01:24:00	0.033868
705	01/01/2000 01:25:00	0.033604
705	01/01/2000 01:26:00	0.033351
705	01/01/2000 01:27:00	0.033112
705	01/01/2000 01:28:00	0.033
705	01/01/2000 01:29:00	0.033
705	01/01/2000 01:30:00	0.033
705	01/01/2000 01:31:00	0.033
705	01/01/2000 01:32:00	0.033
705	01/01/2000 01:33:00	0.033
705	01/01/2000 01:34:00	0.033
705	01/01/2000 01:35:00	0.033
705	01/01/2000 01:36:00	0.033
705	01/01/2000 01:37:00	0.033
705	01/01/2000 01:38:00	0.033
705	01/01/2000 01:39:00	0.033
705	01/01/2000 01:40:00	0.033
705	01/01/2000 01:41:00	0.033
705	01/01/2000 01:42:00	0.033
705	01/01/2000 01:43:00	0.033
705	01/01/2000 01:44:00	0.033
705	01/01/2000 01:45:00	0.033
705	01/01/2000 01:46:00	0.032838
705	01/01/2000 01:47:00	0.032625
705	01/01/2000 01:48:00	0.032412
705	01/01/2000 01:49:00	0.0322
705	01/01/2000 01:50:00	0.032
705	01/01/2000 01:51:00	0.032
705	01/01/2000 01:52:00	0.032
705	01/01/2000 01:53:00	0.032
705	01/01/2000 01:54:00	0.032
705	01/01/2000 01:55:00	0.015035
705	01/01/2000 01:56:00	0.005797
705	01/01/2000 01:57:00	0.005597
705	01/01/2000 01:58:00	0.005494
705	01/01/2000 01:59:00	0.005416
705	01/01/2000 02:00:00	0.005355
705	01/01/2000 02:01:00	0.005252
705	01/01/2000 02:02:00	0.005047
705	01/01/2000 02:03:00	0.004821
705	01/01/2000 02:04:00	0.004642
705	01/01/2000 02:05:00	0.004489
705	01/01/2000 02:06:00	0.004361
705	01/01/2000 02:07:00	0.004265
705	01/01/2000 02:08:00	0.004192
705	01/01/2000 02:09:00	0.004136
705	01/01/2000 02:10:00	0.004093
705	01/01/2000 02:11:00	0.004022
705	01/01/2000 02:12:00	0.003884
705	01/01/2000 02:13:00	0.003739
705	01/01/2000 02:14:00	0.00364
705	01/01/2000 02:15:00	0.00357
705	01/01/2000 02:16:00	0.003519
705	01/01/2000 02:17:00	0.003482
705	01/01/2000 02:18:00	0.003456
705	01/01/2000 02:19:00	0.003437
705	01/01/2000 02:20:00	0.003423
705	01/01/2000 02:21:00	0.003385
705	01/01/2000 02:22:00	0.003293
705	01/01/2000 02:23:00	0.003196
705	01/01/2000 02:24:00	0.003135
705	01/01/2000 02:25:00	0.003096
705	01/01/2000 02:26:00	0.003071
705	01/01/2000 02:27:00	0.003056
705	01/01/2000 02:28:00	0.003045
705	01/01/2000 02:29:00	0.003039
705	01/01/2000 02:30:00	0.003034
705	01/01/2000 02:31:00	0.003009
705	01/01/2000 02:32:00	0.00294
705	01/01/2000 02:33:00	0.002866
705	01/01/2000 02:34:00	0.00282
705	01/01/2000 02:35:00	0.002791
705	01/01/2000 02:36:00	0.002774
705	01/01/2000 02:37:00	0.002763
705	01/01/2000 02:38:00	0.002756
705	01/01/2000 02:39:00	0.002751
705	01/01/2000 02:40:00	0.002749
705	01/01/2000 02:41:00	0.002729
705	01/01/2000 02:42:00	0.002673
705	01/01/2000 02:43:00	0.002613
705	01/01/2000 02:44:00	0.002576
705	01/01/2000 02:45:00	0.002553
705	01/01/2000 02:46:00	0.002539
705	01/01/2000 02:47:00	0.00253
705	01/01/2000 02:48:00	0.002524

705	01/01/2000 02:49:00	0.002521
705	01/01/2000 02:50:00	0.002519
705	01/01/2000 02:51:00	0.002502
705	01/01/2000 02:52:00	0.002456
705	01/01/2000 02:53:00	0.002406
705	01/01/2000 02:54:00	0.002375
705	01/01/2000 02:55:00	0.002356
705	01/01/2000 02:56:00	0.002344
705	01/01/2000 02:57:00	0.002336
705	01/01/2000 02:58:00	0.002332
705	01/01/2000 02:59:00	0.002329
705	01/01/2000 03:00:00	0.002327
705	01/01/2000 03:01:00	0.002141
705	01/01/2000 03:02:00	0.001585
705	01/01/2000 03:03:00	0.000982
705	01/01/2000 03:04:00	0.000608
705	01/01/2000 03:05:00	0.000376
705	01/01/2000 03:06:00	0.000233
705	01/01/2000 03:07:00	0.000144
705	01/01/2000 03:08:00	8.9E-05
705	01/01/2000 03:09:00	5.5E-05
705	01/01/2000 03:10:00	3.4E-05
705	01/01/2000 03:11:00	2.1E-05
705	01/01/2000 03:12:00	1.3E-05
705	01/01/2000 03:13:00	0
705	01/01/2000 03:14:00	0
705	01/01/2000 03:15:00	0
705	01/01/2000 03:16:00	0
705	01/01/2000 03:17:00	0
705	01/01/2000 03:18:00	0
705	01/01/2000 03:19:00	0
705	01/01/2000 03:20:00	0
705	01/01/2000 03:21:00	0
705	01/01/2000 03:22:00	0
705	01/01/2000 03:23:00	0
705	01/01/2000 03:24:00	0
705	01/01/2000 03:25:00	0
705	01/01/2000 03:26:00	0
705	01/01/2000 03:27:00	0
705	01/01/2000 03:28:00	0
705	01/01/2000 03:29:00	0
705	01/01/2000 03:30:00	0
705	01/01/2000 03:31:00	0
705	01/01/2000 03:32:00	0
705	01/01/2000 03:33:00	0
705	01/01/2000 03:34:00	0
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705	01/01/2000 03:36:00	0
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705	01/01/2000 03:39:00	0
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705	01/01/2000 03:45:00	0
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705	01/01/2000 03:47:00	0
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705	01/01/2000 03:49:00	0
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705	01/01/2000 03:57:00	0
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705	01/01/2000 03:59:00	0
705	01/01/2000 04:00:00	0
705	01/01/2000 04:01:00	0
705	01/01/2000 04:02:00	0
705	01/01/2000 04:03:00	0
705	01/01/2000 04:04:00	0
705	01/01/2000 04:05:00	0
705	01/01/2000 04:06:00	0
705	01/01/2000 04:07:00	0
705	01/01/2000 04:08:00	0
705	01/01/2000 04:09:00	0
705	01/01/2000 04:10:00	0
705	01/01/2000 04:11:00	0
705	01/01/2000 04:12:00	0
705	01/01/2000 04:13:00	0
705	01/01/2000 04:14:00	0
705	01/01/2000 04:15:00	0
705	01/01/2000 04:16:00	0
;Flow (m³/s)		
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710	01/01/2000 00:04:00	0
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710	01/01/2000 00:12:00	0
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710	01/01/2000 00:24:00	0.006074
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710	01/01/2000 00:29:00	0.006467
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710	01/01/2000 00:35:00	0.009742
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710	01/01/2000 01:00:00	0.055
710	01/01/2000 01:01:00	0.055
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710	01/01/2000 01:03:00	0.055
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710	01/01/2000 01:06:00	0.055
710	01/01/2000 01:07:00	0.055
710	01/01/2000 01:08:00	0.055
710	01/01/2000 01:09:00	0.055
710	01/01/2000 01:10:00	0.055
710	01/01/2000 01:11:00	0.055
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710	01/01/2000 01:13:00	0.055
710	01/01/2000 01:14:00	0.055
710	01/01/2000 01:15:00	0.055
710	01/01/2000 01:16:00	0.055
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710	01/01/2000 01:26:00	0.05169
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710	01/01/2000 01:29:00	0.050353
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710	01/01/2000 01:35:00	0.04866
710	01/01/2000 01:36:00	0.048387
710	01/01/2000 01:37:00	0.048157
710	01/01/2000 01:38:00	0.047962
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710	01/01/2000 01:45:00	0.046287
710	01/01/2000 01:46:00	0.04601
710	01/01/2000 01:47:00	0.044663
710	01/01/2000 01:48:00	0.028886
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710	01/01/2000 01:50:00	0.011743
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710	01/01/2000 01:59:00	0.007844
710	01/01/2000 02:00:00	0.007749
710	01/01/2000 02:01:00	0.007558
710	01/01/2000 02:02:00	0.007209
710	01/01/2000 02:03:00	0.006841
710	01/01/2000 02:04:00	0.00652
710	01/01/2000 02:05:00	0.006257
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710	01/01/2000 02:12:00	0.005284
710	01/01/2000 02:13:00	0.005079
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710	01/01/2000 02:18:00	0.004671
710	01/01/2000 02:19:00	0.004643
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710	01/01/2000 02:25:00	0.004157
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710	01/01/2000 03:07:00	0.000137
710	01/01/2000 03:08:00	8.5E-05
710	01/01/2000 03:09:00	5.2E-05
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710	01/01/2000 03:12:00	1.2E-05
710	01/01/2000 03:13:00	0
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710	01/01/2000 03:17:00	0
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710	01/01/2000 03:23:00	0
710	01/01/2000 03:24:00	0
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710	01/01/2000 03:26:00	0
710	01/01/2000 03:27:00	0

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710             01/01/2000 04:13:00   0
710             01/01/2000 04:14:00   0
710             01/01/2000 04:15:00   0
710             01/01/2000 04:16:00   0

;Flow (m³/s)
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711             01/01/2000 02:24:00   0.003967
711             01/01/2000 02:25:00   0.003932
711             01/01/2000 02:26:00   0.003912
711             01/01/2000 02:27:00   0.003901
711             01/01/2000 02:28:00   0.003895
711             01/01/2000 02:29:00   0.003892
711             01/01/2000 02:30:00   0.00389
711             01/01/2000 02:31:00   0.003851
711             01/01/2000 02:32:00   0.003742
711             01/01/2000 02:33:00   0.003639
711             01/01/2000 02:34:00   0.003589
711             01/01/2000 02:35:00   0.003561
711             01/01/2000 02:36:00   0.003546
711             01/01/2000 02:37:00   0.003538
711             01/01/2000 02:38:00   0.003533
711             01/01/2000 02:39:00   0.003531
711             01/01/2000 02:40:00   0.00353
711             01/01/2000 02:41:00   0.003498
711             01/01/2000 02:42:00   0.003408
711             01/01/2000 02:43:00   0.003325
711             01/01/2000 02:44:00   0.003284
711             01/01/2000 02:45:00   0.003261
711             01/01/2000 02:46:00   0.003249
711             01/01/2000 02:47:00   0.003242
711             01/01/2000 02:48:00   0.003238
711             01/01/2000 02:49:00   0.003236
711             01/01/2000 02:50:00   0.003235
711             01/01/2000 02:51:00   0.003209
711             01/01/2000 02:52:00   0.003134
711             01/01/2000 02:53:00   0.003064
711             01/01/2000 02:54:00   0.00303
711             01/01/2000 02:55:00   0.003011
711             01/01/2000 02:56:00   0.003001
711             01/01/2000 02:57:00   0.002995
711             01/01/2000 02:58:00   0.002992
711             01/01/2000 02:59:00   0.00299
711             01/01/2000 03:00:00   0.00299
711             01/01/2000 03:01:00   0.002673
711             01/01/2000 03:02:00   0.001769
711             01/01/2000 03:03:00   0.00092
711             01/01/2000 03:04:00   0.000507
711             01/01/2000 03:05:00   0.000275
711             01/01/2000 03:06:00   0.00015
711             01/01/2000 03:07:00   8.2E-05
711             01/01/2000 03:08:00   4.5E-05
711             01/01/2000 03:09:00   2.4E-05
711             01/01/2000 03:10:00   1.3E-05
711             01/01/2000 03:11:00   0
711             01/01/2000 03:12:00   0
711             01/01/2000 03:13:00   0
711             01/01/2000 03:14:00   0
711             01/01/2000 03:15:00   0
711             01/01/2000 03:16:00   0
711             01/01/2000 03:17:00   0
711             01/01/2000 03:18:00   0
711             01/01/2000 03:19:00   0
711             01/01/2000 03:20:00   0
711             01/01/2000 03:21:00   0
711             01/01/2000 03:22:00   0
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711             01/01/2000 03:37:00   0
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711             01/01/2000 03:39:00   0
711             01/01/2000 03:40:00   0
711             01/01/2000 03:41:00   0
711             01/01/2000 03:42:00   0
711             01/01/2000 03:43:00   0
711             01/01/2000 03:44:00   0
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711             01/01/2000 03:52:00   0
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711             01/01/2000 03:54:00   0
711             01/01/2000 03:55:00   0
711             01/01/2000 03:56:00   0
711             01/01/2000 03:57:00   0
711             01/01/2000 03:58:00   0
711             01/01/2000 03:59:00   0
711             01/01/2000 04:00:00   0
711             01/01/2000 04:01:00   0
711             01/01/2000 04:02:00   0
711             01/01/2000 04:03:00   0
711             01/01/2000 04:04:00   0
711             01/01/2000 04:05:00   0
711             01/01/2000 04:06:00   0
```

711	01/01/2000 04:07:00	0
711	01/01/2000 04:08:00	0
711	01/01/2000 04:09:00	0
711	01/01/2000 04:10:00	0
711	01/01/2000 04:11:00	0
711	01/01/2000 04:12:00	0
711	01/01/2000 04:13:00	0
711	01/01/2000 04:14:00	0
711	01/01/2000 04:15:00	0
711	01/01/2000 04:16:00	0

;Flow (m³/s)

712E	01/01/2000 00:00:00	0
712E	01/01/2000 00:01:00	0
712E	01/01/2000 00:02:00	0
712E	01/01/2000 00:03:00	0
712E	01/01/2000 00:04:00	0
712E	01/01/2000 00:05:00	0
712E	01/01/2000 00:06:00	0
712E	01/01/2000 00:07:00	0
712E	01/01/2000 00:08:00	0
712E	01/01/2000 00:09:00	0
712E	01/01/2000 00:10:00	0
712E	01/01/2000 00:11:00	0
712E	01/01/2000 00:12:00	0
712E	01/01/2000 00:13:00	0
712E	01/01/2000 00:14:00	0
712E	01/01/2000 00:15:00	0.000141
712E	01/01/2000 00:16:00	0.000689
712E	01/01/2000 00:17:00	0.001535
712E	01/01/2000 00:18:00	0.002257
712E	01/01/2000 00:19:00	0.002727
712E	01/01/2000 00:20:00	0.003032
712E	01/01/2000 00:21:00	0.003322
712E	01/01/2000 00:22:00	0.003728
712E	01/01/2000 00:23:00	0.004118
712E	01/01/2000 00:24:00	0.004372
712E	01/01/2000 00:25:00	0.004537
712E	01/01/2000 00:26:00	0.004644
712E	01/01/2000 00:27:00	0.004713
712E	01/01/2000 00:28:00	0.004758
712E	01/01/2000 00:29:00	0.004787
712E	01/01/2000 00:30:00	0.004806
712E	01/01/2000 00:31:00	0.005024
712E	01/01/2000 00:32:00	0.00565
712E	01/01/2000 00:33:00	0.006337
712E	01/01/2000 00:34:00	0.006784
712E	01/01/2000 00:35:00	0.007074
712E	01/01/2000 00:36:00	0.007262
712E	01/01/2000 00:37:00	0.007384
712E	01/01/2000 00:38:00	0.007464
712E	01/01/2000 00:39:00	0.007515
712E	01/01/2000 00:40:00	0.007548
712E	01/01/2000 00:41:00	0.008538
712E	01/01/2000 00:42:00	0.011422
712E	01/01/2000 00:43:00	0.014747
712E	01/01/2000 00:44:00	0.017256
712E	01/01/2000 00:45:00	0.019226
712E	01/01/2000 00:46:00	0.0209
712E	01/01/2000 00:47:00	0.022356
712E	01/01/2000 00:48:00	0.02361
712E	01/01/2000 00:49:00	0.024704
712E	01/01/2000 00:50:00	0.025409
712E	01/01/2000 00:51:00	0.030462
712E	01/01/2000 00:52:00	0.036474
712E	01/01/2000 00:53:00	0.038
712E	01/01/2000 00:54:00	0.0384
712E	01/01/2000 00:55:00	0.039
712E	01/01/2000 00:56:00	0.039
712E	01/01/2000 00:57:00	0.039
712E	01/01/2000 00:58:00	0.039
712E	01/01/2000 00:59:00	0.039
712E	01/01/2000 01:00:00	0.039
712E	01/01/2000 01:01:00	0.039371
712E	01/01/2000 01:02:00	0.039715
712E	01/01/2000 01:03:00	0.03988
712E	01/01/2000 01:04:00	0.039931
712E	01/01/2000 01:05:00	0.039907
712E	01/01/2000 01:06:00	0.039828
712E	01/01/2000 01:07:00	0.039715
712E	01/01/2000 01:08:00	0.039588
712E	01/01/2000 01:09:00	0.039458
712E	01/01/2000 01:10:00	0.039333
712E	01/01/2000 01:11:00	0.039209
712E	01/01/2000 01:12:00	0.039076
712E	01/01/2000 01:13:00	0.039
712E	01/01/2000 01:14:00	0.038385
712E	01/01/2000 01:15:00	0.037765
712E	01/01/2000 01:16:00	0.037277
712E	01/01/2000 01:17:00	0.036894
712E	01/01/2000 01:18:00	0.036593
712E	01/01/2000 01:19:00	0.036359
712E	01/01/2000 01:20:00	0.036176
712E	01/01/2000 01:21:00	0.035984
712E	01/01/2000 01:22:00	0.035775
712E	01/01/2000 01:23:00	0.035543
712E	01/01/2000 01:24:00	0.035281
712E	01/01/2000 01:25:00	0.035076
712E	01/01/2000 01:26:00	0.034915
712E	01/01/2000 01:27:00	0.034789
712E	01/01/2000 01:28:00	0.034692
712E	01/01/2000 01:29:00	0.034616
712E	01/01/2000 01:30:00	0.034558
712E	01/01/2000 01:31:00	0.034488
712E	01/01/2000 01:32:00	0.034406
712E	01/01/2000 01:33:00	0.034306
712E	01/01/2000 01:34:00	0.034189
712E	01/01/2000 01:35:00	0.034097
712E	01/01/2000 01:36:00	0.034026
712E	01/01/2000 01:37:00	0.03397
712E	01/01/2000 01:38:00	0.033917
712E	01/01/2000 01:39:00	0.033626
712E	01/01/2000 01:40:00	0.033344
712E	01/01/2000 01:41:00	0.033052
712E	01/01/2000 01:42:00	0.032789
712E	01/01/2000 01:43:00	0.032735
712E	01/01/2000 01:44:00	0.032669
712E	01/01/2000 01:45:00	0.027391
712E	01/01/2000 01:46:00	0.011054
712E	01/01/2000 01:47:00	0.008398
712E	01/01/2000 01:48:00	0.008162
712E	01/01/2000 01:49:00	0.007989
712E	01/01/2000 01:50:00	0.00785
712E	01/01/2000 01:51:00	0.007659
712E	01/01/2000 01:52:00	0.007337
712E	01/01/2000 01:53:00	0.006987
712E	01/01/2000 01:54:00	0.006696
712E	01/01/2000 01:55:00	0.006456
712E	01/01/2000 01:56:00	0.006245
712E	01/01/2000 01:57:00	0.006067
712E	01/01/2000 01:58:00	0.005926
712E	01/01/2000 01:59:00	0.005814
712E	01/01/2000 02:00:00	0.005725
712E	01/01/2000 02:01:00	0.005596
712E	01/01/2000 02:02:00	0.005373
712E	01/01/2000 02:03:00	0.005129
712E	01/01/2000 02:04:00	0.004926
712E	01/01/2000 02:05:00	0.004758
712E	01/01/2000 02:06:00	0.00461
712E	01/01/2000 02:07:00	0.004485
712E	01/01/2000 02:08:00	0.004386
712E	01/01/2000 02:09:00	0.004307
712E	01/01/2000 02:10:00	0.004244
712E	01/01/2000 02:11:00	0.004158
712E	01/01/2000 02:12:00	0.004011
712E	01/01/2000 02:13:00	0.003858
712E	01/01/2000 02:14:00	0.003747
712E	01/01/2000 02:15:00	0.003665
712E	01/01/2000 02:16:00	0.003602
712E	01/01/2000 02:17:00	0.003553
712E	01/01/2000 02:18:00	0.003517
712E	01/01/2000 02:19:00	0.003488
712E	01/01/2000 02:20:00	0.003466
712E	01/01/2000 02:21:00	0.003423
712E	01/01/2000 02:22:00	0.003332
712E	01/01/2000 02:23:00	0.003235
712E	01/01/2000 02:24:00	0.00317
712E	01/01/2000 02:25:00	0.003126
712E	01/01/2000 02:26:00	0.003097
712E	01/01/2000 02:27:00	0.003077
712E	01/01/2000 02:28:00	0.003063
712E	01/01/2000 02:29:00	0.003053
712E	01/01/2000 02:30:00	0.003046
712E	01/01/2000 02:31:00	0.00302
712E	01/01/2000 02:32:00	0.002954
712E	01/01/2000 02:33:00	0.002882
712E	01/01/2000 02:34:00	0.002836
712E	01/01/2000 02:35:00	0.002805
712E	01/01/2000 02:36:00	0.002785
712E	01/01/2000 02:37:00	0.002772
712E	01/01/2000 02:38:00	0.002763
712E	01/01/2000 02:39:00	0.002757
712E	01/01/2000 02:40:00	0.002753
712E	01/01/2000 02:41:00	0.002734
712E	01/01/2000 02:42:00	0.002681
712E	01/01/2000 02:43:00	0.002623
712E	01/01/2000 02:44:00	0.002586
712E	01/01/2000 02:45:00	0.002562
712E	01/01/2000 02:46:00	0.002546
712E	01/01/2000 02:47:00	0.002535
712E	01/01/2000 02:48:00	0.002529
712E	01/01/2000 02:49:00	0.002524
712E	01/01/2000 02:50:00	0.002521
712E	01/01/2000 02:51:00	0.002505
712E	01/01/2000 02:52:00	0.002462
712E	01/01/2000 02:53:00	0.002414
712E	01/01/2000 02:54:00	0.002383
712E	01/01/2000 02:55:00	0.002362
712E	01/01/2000 02:56:00	0.002349
712E	01/01/2000 02:57:00	0.002341
712E	01/01/2000 02:58:00	0.002335
712E	01/01/2000 02:59:00	0.002332
712E	01/01/2000 03:00:00	0.002329
712E	01/01/2000 03:01:00	0.002155
712E	01/01/2000 03:02:00	0.001635
712E	01/01/2000 03:03:00	0.001062
712E	01/01/2000 03:04:00	0.000689
712E	01/01/2000 03:05:00	0.000447
712E	01/01/2000 03:06:00	0.00029
712E	01/01/2000 03:07:00	0.000188
712E	01/01/2000 03:08:00	0.000122
712E	01/01/2000 03:09:00	7.9E-05
712E	01/01/2000 03:10:00	5.1E-05
712E	01/01/2000 03:11:00	3.3E-05
712E	01/01/2000 03:12:00	2.2E-05
712E	01/01/2000 03:13:00	1.4E-05
712E	01/01/2000 03:14:00	0
712E	01/01/2000 03:15:00	0
712E	01/01/2000 03:16:00	0
712E	01/01/2000 03:17:00	0
712E	01/01/2000 03:18:00	0
712E	01/01/2000 03:19:00	0
712E	01/01/2000 03:20:00	0
712E	01/01/2000 03:21:00	0
712E	01/01/2000 03:22:00	0
712E	01/01/2000 03:23:00	0
712E	01/01/2000 03:24:00	0
712E	01/01/2000 03:25:00	0
712E	01/01/2000 03:26:00	0
712E	01/01/2000 03:27:00	0
712E	01/01/2000 03:28:00	0
712E	01/01/2000 03:29:00	0
712E	01/01/2000 03:30:00	0
712E	01/01/2000 03:31:00	0
712E	01/01/2000 03:32:00	0
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712E	01/01/2000 03:36:00	0
712E	01/01/2000 03:37:00	0
712E	01/01/2000 03:38:00	0
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712E	01/01/2000 03:40:00	0
712E	01/01/2000 03:41:00	0
712E	01/01/2000 03:42:00	0
712E	01/01/2000 03:43:00	0
712E	01/01/2000 03:44:00	0
712E	01/01/2000 03:45:00	0
712E	01/01/2000 03:46:00	0
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712E	01/01/2000 03:48:00	0
712E	01/01/2000 03:49:00	0
712E	01/01/2000 03:50:00	0
712E	01/01/2000 03:51:00	0
712E	01/01/2000 03:52:00	0
712E	01/01/2000 03:53:00	0
712E	01/01/2000 03:54:00	0
712E	01/01/2000 03:55:00	0
712E	01/01/2000 03:56:00	0
712E	01/01/2000 03:57:00	0
712E	01/01/2000 03:58:00	0
712E	01/01/2000 03:59:00	0
712E	01/01/2000 04:00:00	0
712E	01/01/2000 04:01:00	0
712E	01/01/2000 04:02:00	0
712E	01/01/2000 04:03:00	0
712E	01/01/2000 04:04:00	0
712E	01/01/2000 04:05:00	0
712E	01/01/2000 04:06:00	0
712E	01/01/2000 04:07:00	0
712E	01/01/2000 04:08:00	0
712E	01/01/2000 04:09:00	0
712E	01/01/2000 04:10:00	0
712E	01/01/2000 04:11:00	0
712E	01/01/2000 04:12:00	0
712E	01/01/2000 04:13:00	0
712E	01/01/2000 04:14:00	0
712E	01/01/2000 04:15:00	0
712E	01/01/2000 04:16:00	0

;Flow (m³/s)

712N	01/01/2000 00:00:00	0
712N	01/01/2000 00:01:00	0
712N	01/01/2000 00:02:00	0
712N	01/01/2000 00:03:00	0
712N	01/01/2000 00:04:00	0
712N	01/01/2000 00:05:00	0
712N	01/01/2000 00:06:00	0
712N	01/01/2000 00:07:00	0
712N	01/01/2000 00:08:00	0
712N	01/01/2000 00:09:00	0
712N	01/01/2000 00:10:00	0
712N	01/01/2000 00:11:00	0
712N	01/01/2000 00:12:00	0
712N	01/01/2000 00:13:00	0
712N	01/01/2000 00:14:00	0
712N	01/01/2000 00:15:00	0.000273
712N	01/01/2000 00:16:00	0.001298
712N	01/01/2000 00:17:00	0.00272
712N	01/01/2000 00:18:00	0.003703
712N	01/01/2000 00:19:00	0.004185
712N	01/01/2000 00:20:00	0.004443
712N	01/01/2000 00:21:00	0.004757
712N	01/01/2000 00:22:00	0.005342
712N	01/01/2000 00:23:00	0.005854
712N	01/01/2000 00:24:00	0.006094
712N	01/01/2000 00:25:00	0.006223
712N	01/01/2000 00:26:00	0.006291

712N	01/01/2000 00:27:00	0.006326
712N	01/01/2000 00:28:00	0.006345
712N	01/01/2000 00:29:00	0.006355
712N	01/01/2000 00:30:00	0.00636
712N	01/01/2000 00:31:00	0.006762
712N	01/01/2000 00:32:00	0.007904
712N	01/01/2000 00:33:00	0.00896
712N	01/01/2000 00:34:00	0.009449
712N	01/01/2000 00:35:00	0.009715
712N	01/01/2000 00:36:00	0.009853
712N	01/01/2000 00:37:00	0.009926
712N	01/01/2000 00:38:00	0.009964
712N	01/01/2000 00:39:00	0.009984
712N	01/01/2000 00:40:00	0.009994
712N	01/01/2000 00:41:00	0.011913
712N	01/01/2000 00:42:00	0.017355
712N	01/01/2000 00:43:00	0.022847
712N	01/01/2000 00:44:00	0.026397
712N	01/01/2000 00:45:00	0.029244
712N	01/01/2000 00:46:00	0.031594
712N	01/01/2000 00:47:00	0.033602
712N	01/01/2000 00:48:00	0.035019
712N	01/01/2000 00:49:00	0.036586
712N	01/01/2000 00:50:00	0.038125
712N	01/01/2000 00:51:00	0.048356
712N	01/01/2000 00:52:00	0.052289
712N	01/01/2000 00:53:00	0.054638
712N	01/01/2000 00:54:00	0.055406
712N	01/01/2000 00:55:00	0.056
712N	01/01/2000 00:56:00	0.056463
712N	01/01/2000 00:57:00	0.057
712N	01/01/2000 00:58:00	0.057
712N	01/01/2000 00:59:00	0.057
712N	01/01/2000 01:00:00	0.057
712N	01/01/2000 01:01:00	0.057
712N	01/01/2000 01:02:00	0.057
712N	01/01/2000 01:03:00	0.057
712N	01/01/2000 01:04:00	0.057
712N	01/01/2000 01:05:00	0.057
712N	01/01/2000 01:06:00	0.057
712N	01/01/2000 01:07:00	0.057
712N	01/01/2000 01:08:00	0.057
712N	01/01/2000 01:09:00	0.057
712N	01/01/2000 01:10:00	0.057
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712N	01/01/2000 01:12:00	0.056903
712N	01/01/2000 01:13:00	0.056394
712N	01/01/2000 01:14:00	0.056
712N	01/01/2000 01:15:00	0.056
712N	01/01/2000 01:16:00	0.056
712N	01/01/2000 01:17:00	0.056
712N	01/01/2000 01:18:00	0.056
712N	01/01/2000 01:19:00	0.056
712N	01/01/2000 01:20:00	0.056
712N	01/01/2000 01:21:00	0.056
712N	01/01/2000 01:22:00	0.056
712N	01/01/2000 01:23:00	0.055823
712N	01/01/2000 01:24:00	0.054965
712N	01/01/2000 01:25:00	0.053918
712N	01/01/2000 01:26:00	0.052859
712N	01/01/2000 01:27:00	0.051925
712N	01/01/2000 01:28:00	0.051141
712N	01/01/2000 01:29:00	0.050517
712N	01/01/2000 01:30:00	0.049969
712N	01/01/2000 01:31:00	0.049447
712N	01/01/2000 01:32:00	0.048935
712N	01/01/2000 01:33:00	0.048425
712N	01/01/2000 01:34:00	0.041163
712N	01/01/2000 01:35:00	0.018237
712N	01/01/2000 01:36:00	0.017803
712N	01/01/2000 01:37:00	0.017126
712N	01/01/2000 01:38:00	0.016651
712N	01/01/2000 01:39:00	0.016274
712N	01/01/2000 01:40:00	0.015979
712N	01/01/2000 01:41:00	0.015499
712N	01/01/2000 01:42:00	0.014627
712N	01/01/2000 01:43:00	0.013741
712N	01/01/2000 01:44:00	0.013052
712N	01/01/2000 01:45:00	0.012474
712N	01/01/2000 01:46:00	0.012018
712N	01/01/2000 01:47:00	0.011669
712N	01/01/2000 01:48:00	0.0114
712N	01/01/2000 01:49:00	0.011191
712N	01/01/2000 01:50:00	0.011026
712N	01/01/2000 01:51:00	0.010733
712N	01/01/2000 01:52:00	0.010175
712N	01/01/2000 01:53:00	0.009602
712N	01/01/2000 01:54:00	0.009157
712N	01/01/2000 01:55:00	0.008782
712N	01/01/2000 01:56:00	0.008486
712N	01/01/2000 01:57:00	0.008259
712N	01/01/2000 01:58:00	0.008084
712N	01/01/2000 01:59:00	0.007948
712N	01/01/2000 02:00:00	0.00784
712N	01/01/2000 02:01:00	0.007638
712N	01/01/2000 02:02:00	0.007246
712N	01/01/2000 02:03:00	0.006843
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712N	01/01/2000 02:05:00	0.006266
712N	01/01/2000 02:06:00	0.006057
712N	01/01/2000 02:07:00	0.005896
712N	01/01/2000 02:08:00	0.005772
712N	01/01/2000 02:09:00	0.005674
712N	01/01/2000 02:10:00	0.005597
712N	01/01/2000 02:11:00	0.005466
712N	01/01/2000 02:12:00	0.005219
712N	01/01/2000 02:13:00	0.004987
712N	01/01/2000 02:14:00	0.004848
712N	01/01/2000 02:15:00	0.004749
712N	01/01/2000 02:16:00	0.004678
712N	01/01/2000 02:17:00	0.004628
712N	01/01/2000 02:18:00	0.00459
712N	01/01/2000 02:19:00	0.00456
712N	01/01/2000 02:20:00	0.004537
712N	01/01/2000 02:21:00	0.004469
712N	01/01/2000 02:22:00	0.00431
712N	01/01/2000 02:23:00	0.004165
712N	01/01/2000 02:24:00	0.004093
712N	01/01/2000 02:25:00	0.004052
712N	01/01/2000 02:26:00	0.004028
712N	01/01/2000 02:27:00	0.004013
712N	01/01/2000 02:28:00	0.004004
712N	01/01/2000 02:29:00	0.003998
712N	01/01/2000 02:30:00	0.003993
712N	01/01/2000 02:31:00	0.00395
712N	01/01/2000 02:32:00	0.003832
712N	01/01/2000 02:33:00	0.003723
712N	01/01/2000 02:34:00	0.003672
712N	01/01/2000 02:35:00	0.003644
712N	01/01/2000 02:36:00	0.003629
712N	01/01/2000 02:37:00	0.003621
712N	01/01/2000 02:38:00	0.003617
712N	01/01/2000 02:39:00	0.003614
712N	01/01/2000 02:40:00	0.003612
712N	01/01/2000 02:41:00	0.003579
712N	01/01/2000 02:42:00	0.003484
712N	01/01/2000 02:43:00	0.003396
712N	01/01/2000 02:44:00	0.003355
712N	01/01/2000 02:45:00	0.003333
712N	01/01/2000 02:46:00	0.003322
712N	01/01/2000 02:47:00	0.003315
712N	01/01/2000 02:48:00	0.003312
712N	01/01/2000 02:49:00	0.00331
712N	01/01/2000 02:50:00	0.003309
712N	01/01/2000 02:51:00	0.003281
712N	01/01/2000 02:52:00	0.003202
712N	01/01/2000 02:53:00	0.003129
712N	01/01/2000 02:54:00	0.003096
712N	01/01/2000 02:55:00	0.003077
712N	01/01/2000 02:56:00	0.003068
712N	01/01/2000 02:57:00	0.003063
712N	01/01/2000 02:58:00	0.00306
712N	01/01/2000 02:59:00	0.003059
712N	01/01/2000 03:00:00	0.003058
712N	01/01/2000 03:01:00	0.002722
712N	01/01/2000 03:02:00	0.001764
712N	01/01/2000 03:03:00	0.000878
712N	01/01/2000 03:04:00	0.000467
712N	01/01/2000 03:05:00	0.000244
712N	01/01/2000 03:06:00	0.000128
712N	01/01/2000 03:07:00	6.7E-05
712N	01/01/2000 03:08:00	3.5E-05
712N	01/01/2000 03:09:00	1.8E-05
712N	01/01/2000 03:10:00	0
712N	01/01/2000 03:11:00	0
712N	01/01/2000 03:12:00	0
712N	01/01/2000 03:13:00	0
712N	01/01/2000 03:14:00	0
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712N	01/01/2000 03:42:00	0
712N	01/01/2000 03:43:00	0
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712N	01/01/2000 03:46:00	0
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712N	01/01/2000 03:59:00	0
712N	01/01/2000 04:00:00	0
712N	01/01/2000 04:01:00	0
712N	01/01/2000 04:02:00	0
712N	01/01/2000 04:03:00	0
712N	01/01/2000 04:04:00	0
712N	01/01/2000 04:05:00	0
712N	01/01/2000 04:06:00	0
712N	01/01/2000 04:07:00	0
712N	01/01/2000 04:08:00	0
712N	01/01/2000 04:09:00	0
712N	01/01/2000 04:10:00	0
712N	01/01/2000 04:11:00	0
712N	01/01/2000 04:12:00	0
712N	01/01/2000 04:13:00	0
712N	01/01/2000 04:14:00	0
712N	01/01/2000 04:15:00	0
712N	01/01/2000 04:16:00	0

;Flow (m^3/s)

713N	01/01/2000 00:00:00	0
713N	01/01/2000 00:01:00	0
713N	01/01/2000 00:02:00	0
713N	01/01/2000 00:03:00	0
713N	01/01/2000 00:04:00	0
713N	01/01/2000 00:05:00	0
713N	01/01/2000 00:06:00	0
713N	01/01/2000 00:07:00	0
713N	01/01/2000 00:08:00	0
713N	01/01/2000 00:09:00	0
713N	01/01/2000 00:10:00	0
713N	01/01/2000 00:11:00	0
713N	01/01/2000 00:12:00	0
713N	01/01/2000 00:13:00	0
713N	01/01/2000 00:14:00	0
713N	01/01/2000 00:15:00	0.00042
713N	01/01/2000 00:16:00	0.001439
713N	01/01/2000 00:17:00	0.00235
713N	01/01/2000 00:18:00	0.002817
713N	01/01/2000 00:19:00	0.003051
713N	01/01/2000 00:20:00	0.003168
713N	01/01/2000 00:21:00	0.003503
713N	01/01/2000 00:22:00	0.003956
713N	01/01/2000 00:23:00	0.00419
713N	01/01/2000 00:24:00	0.004307
713N	01/01/2000 00:25:00	0.004366
713N	01/01/2000 00:26:00	0.004396
713N	01/01/2000 00:27:00	0.00441
713N	01/01/2000 00:28:00	0.004418
713N	01/01/2000 00:29:00	0.004421
713N	01/01/2000 00:30:00	0.004423
713N	01/01/2000 00:31:00	0.005038
713N	01/01/2000 00:32:00	0.005978
713N	01/01/2000 00:33:00	0.006466
713N	01/01/2000 00:34:00	0.006711
713N	01/01/2000 00:35:00	0.006833
713N	01/01/2000 00:36:00	0.006894
713N	01/01/2000 00:37:00	0.006925
713N	01/01/2000 00:38:00	0.00694
713N	01/01/2000 00:39:00	0.006948
713N	01/01/2000 00:40:00	0.006952
713N	01/01/2000 00:41:00	0.009641
713N	01/01/2000 00:42:00	0.013884
713N	01/01/2000 00:43:00	0.01641
713N	01/01/2000 00:44:00	0.018129
713N	01/01/2000 00:45:00	0.019436
713N	01/01/2000 00:46:00	0.020456
713N	01/01/2000 00:47:00	0.021312
713N	01/01/2000 00:48:00	0.022041
713N	01/01/2000 00:49:00	0.022463
713N	01/01/2000 00:50:00	0.023007
713N	01/01/2000 00:51:00	0.030023
713N	01/01/2000 00:52:00	0.030195
713N	01/01/2000 00:53:00	0.030448
713N	01/01/2000 00:54:00	0.030769
713N	01/01/2000 00:55:00	0.031
713N	01/01/2000 00:56:00	0.031
713N	01/01/2000 00:57:00	0.031
713N	01/01/2000 00:58:00	0.032
713N	01/01/2000 00:59:00	0.032
713N	01/01/2000 01:00:00	0.032
713N	01/01/2000 01:01:00	0.032
713N	01/01/2000 01:02:00	0.032
713N	01/01/2000 01:03:00	0.032
713N	01/01/2000 01:04:00	0.032
713N	01/01/2000 01:05:00	0.032

713N	01/01/2000 01:06:00	0.032
713N	01/01/2000 01:07:00	0.032
713N	01/01/2000 01:08:00	0.032
713N	01/01/2000 01:09:00	0.032
713N	01/01/2000 01:10:00	0.032
713N	01/01/2000 01:11:00	0.032
713N	01/01/2000 01:12:00	0.032
713N	01/01/2000 01:13:00	0.032
713N	01/01/2000 01:14:00	0.032
713N	01/01/2000 01:15:00	0.032
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713N	01/01/2000 01:17:00	0.032
713N	01/01/2000 01:18:00	0.031589
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713N	01/01/2000 01:24:00	0.031
713N	01/01/2000 01:25:00	0.031
713N	01/01/2000 01:26:00	0.031
713N	01/01/2000 01:27:00	0.031
713N	01/01/2000 01:28:00	0.031
713N	01/01/2000 01:29:00	0.031
713N	01/01/2000 01:30:00	0.031
713N	01/01/2000 01:31:00	0.031
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713N	01/01/2000 01:36:00	0.030756
713N	01/01/2000 01:37:00	0.030656
713N	01/01/2000 01:38:00	0.030556
713N	01/01/2000 01:39:00	0.030456
713N	01/01/2000 01:40:00	0.030356
713N	01/01/2000 01:41:00	0.030254
713N	01/01/2000 01:42:00	0.03015
713N	01/01/2000 01:43:00	0.030045
713N	01/01/2000 01:44:00	0.022544
713N	01/01/2000 01:45:00	0.007804
713N	01/01/2000 01:46:00	0.006816
713N	01/01/2000 01:47:00	0.006659
713N	01/01/2000 01:48:00	0.006557
713N	01/01/2000 01:49:00	0.006481
713N	01/01/2000 01:50:00	0.006423
713N	01/01/2000 01:51:00	0.006176
713N	01/01/2000 01:52:00	0.0061
713N	01/01/2000 01:53:00	0.005558
713N	01/01/2000 01:54:00	0.005356
713N	01/01/2000 01:55:00	0.005192
713N	01/01/2000 01:56:00	0.005073
713N	01/01/2000 01:57:00	0.004984
713N	01/01/2000 01:58:00	0.004918
713N	01/01/2000 01:59:00	0.004867
713N	01/01/2000 02:00:00	0.004828
713N	01/01/2000 02:01:00	0.004654
713N	01/01/2000 02:02:00	0.004394
713N	01/01/2000 02:03:00	0.004216
713N	01/01/2000 02:04:00	0.004072
713N	01/01/2000 02:05:00	0.003955
713N	01/01/2000 02:06:00	0.00387
713N	01/01/2000 02:07:00	0.003807
713N	01/01/2000 02:08:00	0.003759
713N	01/01/2000 02:09:00	0.003722
713N	01/01/2000 02:10:00	0.003694
713N	01/01/2000 02:11:00	0.00357
713N	01/01/2000 02:12:00	0.003395
713N	01/01/2000 02:13:00	0.003293
713N	01/01/2000 02:14:00	0.00323
713N	01/01/2000 02:15:00	0.003188
713N	01/01/2000 02:16:00	0.003161
713N	01/01/2000 02:17:00	0.003142
713N	01/01/2000 02:18:00	0.003129
713N	01/01/2000 02:19:00	0.003119
713N	01/01/2000 02:20:00	0.003111
713N	01/01/2000 02:21:00	0.003028
713N	01/01/2000 02:22:00	0.002905
713N	01/01/2000 02:23:00	0.00284
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713N	01/01/2000 02:25:00	0.002789
713N	01/01/2000 02:26:00	0.002779
713N	01/01/2000 02:27:00	0.002774
713N	01/01/2000 02:28:00	0.002771
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713N	01/01/2000 02:31:00	0.002705
713N	01/01/2000 02:32:00	0.002609
713N	01/01/2000 02:33:00	0.00256
713N	01/01/2000 02:34:00	0.002535
713N	01/01/2000 02:35:00	0.002522
713N	01/01/2000 02:36:00	0.002516
713N	01/01/2000 02:37:00	0.002512
713N	01/01/2000 02:38:00	0.002511
713N	01/01/2000 02:39:00	0.00251
713N	01/01/2000 02:40:00	0.002509
713N	01/01/2000 02:41:00	0.002458
713N	01/01/2000 02:42:00	0.002381
713N	01/01/2000 02:43:00	0.00234
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713N	01/01/2000 02:45:00	0.00231
713N	01/01/2000 02:46:00	0.002305
713N	01/01/2000 02:47:00	0.002302
713N	01/01/2000 02:48:00	0.002301
713N	01/01/2000 02:49:00	0.0023
713N	01/01/2000 02:50:00	0.0023
713N	01/01/2000 02:51:00	0.002257
713N	01/01/2000 02:52:00	0.002193
713N	01/01/2000 02:53:00	0.002159
713N	01/01/2000 02:54:00	0.002142
713N	01/01/2000 02:55:00	0.002134
713N	01/01/2000 02:56:00	0.002129
713N	01/01/2000 02:57:00	0.002127
713N	01/01/2000 02:58:00	0.002126
713N	01/01/2000 02:59:00	0.002126
713N	01/01/2000 03:00:00	0.002125
713N	01/01/2000 03:01:00	0.001609
713N	01/01/2000 03:02:00	0.000821
713N	01/01/2000 03:03:00	0.000411
713N	01/01/2000 03:04:00	0.000205
713N	01/01/2000 03:05:00	0.000103
713N	01/01/2000 03:06:00	5.1E-05
713N	01/01/2000 03:07:00	2.6E-05
713N	01/01/2000 03:08:00	1.3E-05
713N	01/01/2000 03:09:00	0
713N	01/01/2000 03:10:00	0
713N	01/01/2000 03:11:00	0
713N	01/01/2000 03:12:00	0
713N	01/01/2000 03:13:00	0
713N	01/01/2000 03:14:00	0
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713N	01/01/2000 03:35:00	0
713N	01/01/2000 03:36:00	0
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713N	01/01/2000 03:43:00	0
713N	01/01/2000 03:44:00	0
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713N	01/01/2000 03:46:00	0
713N	01/01/2000 03:47:00	0
713N	01/01/2000 03:48:00	0
713N	01/01/2000 03:49:00	0
713N	01/01/2000 03:50:00	0
713N	01/01/2000 03:51:00	0
713N	01/01/2000 03:52:00	0
713N	01/01/2000 03:53:00	0
713N	01/01/2000 03:54:00	0
713N	01/01/2000 03:55:00	0
713N	01/01/2000 03:56:00	0
713N	01/01/2000 03:57:00	0
713N	01/01/2000 03:58:00	0
713N	01/01/2000 03:59:00	0
713N	01/01/2000 04:00:00	0
713N	01/01/2000 04:01:00	0
713N	01/01/2000 04:02:00	0
713N	01/01/2000 04:03:00	0
713N	01/01/2000 04:04:00	0
713N	01/01/2000 04:05:00	0
713N	01/01/2000 04:06:00	0
713N	01/01/2000 04:07:00	0
713N	01/01/2000 04:08:00	0
713N	01/01/2000 04:09:00	0
713N	01/01/2000 04:10:00	0
713N	01/01/2000 04:11:00	0
713N	01/01/2000 04:12:00	0
713N	01/01/2000 04:13:00	0
713N	01/01/2000 04:14:00	0
713N	01/01/2000 04:15:00	0
713N	01/01/2000 04:16:00	0

;Flow (m³/s)

713S	01/01/2000 00:00:00	0
713S	01/01/2000 00:01:00	0
713S	01/01/2000 00:02:00	0
713S	01/01/2000 00:03:00	0
713S	01/01/2000 00:04:00	0
713S	01/01/2000 00:05:00	0
713S	01/01/2000 00:06:00	0
713S	01/01/2000 00:07:00	0
713S	01/01/2000 00:08:00	0
713S	01/01/2000 00:09:00	0
713S	01/01/2000 00:10:00	0
713S	01/01/2000 00:11:00	0
713S	01/01/2000 00:12:00	0
713S	01/01/2000 00:13:00	0
713S	01/01/2000 00:14:00	0
713S	01/01/2000 00:15:00	0.000141
713S	01/01/2000 00:16:00	0.000702
713S	01/01/2000 00:17:00	0.001559
713S	01/01/2000 00:18:00	0.002246
713S	01/01/2000 00:19:00	0.002632
713S	01/01/2000 00:20:00	0.00284
713S	01/01/2000 00:21:00	0.003044
713S	01/01/2000 00:22:00	0.00339
713S	01/01/2000 00:23:00	0.003729
713S	01/01/2000 00:24:00	0.003923
713S	01/01/2000 00:25:00	0.004028
713S	01/01/2000 00:26:00	0.004084
713S	01/01/2000 00:27:00	0.004114
713S	01/01/2000 00:28:00	0.00413
713S	01/01/2000 00:29:00	0.004138
713S	01/01/2000 00:30:00	0.004143
713S	01/01/2000 00:31:00	0.004352
713S	01/01/2000 00:32:00	0.004988
713S	01/01/2000 00:33:00	0.005672
713S	01/01/2000 00:34:00	0.006064
713S	01/01/2000 00:35:00	0.006276
713S	01/01/2000 00:36:00	0.00639
713S	01/01/2000 00:37:00	0.006451
713S	01/01/2000 00:38:00	0.006483
713S	01/01/2000 00:39:00	0.006501
713S	01/01/2000 00:40:00	0.00651
713S	01/01/2000 00:41:00	0.007473
713S	01/01/2000 00:42:00	0.010436
713S	01/01/2000 00:43:00	0.013817
713S	01/01/2000 00:44:00	0.016206
713S	01/01/2000 00:45:00	0.01794
713S	01/01/2000 00:46:00	0.019209
713S	01/01/2000 00:47:00	0.020123
713S	01/01/2000 00:48:00	0.020673
713S	01/01/2000 00:49:00	0.021307
713S	01/01/2000 00:50:00	0.021934
713S	01/01/2000 00:51:00	0.026314
713S	01/01/2000 00:52:00	0.028
713S	01/01/2000 00:53:00	0.028
713S	01/01/2000 00:54:00	0.028777
713S	01/01/2000 00:55:00	0.029
713S	01/01/2000 00:56:00	0.029
713S	01/01/2000 00:57:00	0.029
713S	01/01/2000 00:58:00	0.029
713S	01/01/2000 00:59:00	0.029156
713S	01/01/2000 01:00:00	0.029566
713S	01/01/2000 01:01:00	0.029782
713S	01/01/2000 01:02:00	0.029768
713S	01/01/2000 01:03:00	0.029585
713S	01/01/2000 01:04:00	0.029336
713S	01/01/2000 01:05:00	0.029076
713S	01/01/2000 01:06:00	0.029
713S	01/01/2000 01:07:00	0.029
713S	01/01/2000 01:08:00	0.029
713S	01/01/2000 01:09:00	0.029
713S	01/01/2000 01:10:00	0.029
713S	01/01/2000 01:11:00	0.029
713S	01/01/2000 01:12:00	0.029
713S	01/01/2000 01:13:00	0.029
713S	01/01/2000 01:14:00	0.029
713S	01/01/2000 01:15:00	0.029
713S	01/01/2000 01:16:00	0.029
713S	01/01/2000 01:17:00	0.029
713S	01/01/2000 01:18:00	0.029
713S	01/01/2000 01:19:00	0.029
713S	01/01/2000 01:20:00	0.029
713S	01/01/2000 01:21:00	0.029
713S	01/01/2000 01:22:00	0.029
713S	01/01/2000 01:23:00	0.029
713S	01/01/2000 01:24:00	0.029
713S	01/01/2000 01:25:00	0.029
713S	01/01/2000 01:26:00	0.029
713S	01/01/2000 01:27:00	0.029
713S	01/01/2000 01:28:00	0.029
713S	01/01/2000 01:29:00	0.0289
713S	01/01/2000 01:30:00	0.02868
713S	01/01/2000 01:31:00	0.028459
713S	01/01/2000 01:32:00	0.028232
713S	01/01/2000 01:33:00	0.028
713S	01/01/2000 01:34:00	0.028
713S	01/01/2000 01:35:00	0.028
713S	01/01/2000 01:36:00	0.028
713S	01/01/2000 01:37:00	0.024229
713S	01/01/2000 01:38:00	0.012151
713S	01/01/2000 01:39:00	0.008524
713S	01/01/2000 01:40:00	0.008179
713S	01/01/2000 01:41:00	0.007988
713S	01/01/2000 01:42:00	0.007587
713S	01/01/2000 01:43:00	0.007125
713S	01/01/2000 01:44:00	0.006755

713S	01/01/2000 01:45:00	0.00647
713S	01/01/2000 01:46:00	0.006275
713S	01/01/2000 01:47:00	0.006142
713S	01/01/2000 01:48:00	0.00605
713S	01/01/2000 01:49:00	0.005986
713S	01/01/2000 01:50:00	0.005941
713S	01/01/2000 01:51:00	0.005832
713S	01/01/2000 01:52:00	0.005568
713S	01/01/2000 01:53:00	0.005263
713S	01/01/2000 01:54:00	0.005018
713S	01/01/2000 01:55:00	0.004829
713S	01/01/2000 01:56:00	0.004699
713S	01/01/2000 01:57:00	0.00461
713S	01/01/2000 01:58:00	0.004548
713S	01/01/2000 01:59:00	0.004505
713S	01/01/2000 02:00:00	0.004474
713S	01/01/2000 02:01:00	0.004397
713S	01/01/2000 02:02:00	0.004209
713S	01/01/2000 02:03:00	0.003992
713S	01/01/2000 02:04:00	0.003817
713S	01/01/2000 02:05:00	0.003682
713S	01/01/2000 02:06:00	0.003589
713S	01/01/2000 02:07:00	0.003525
713S	01/01/2000 02:08:00	0.00348
713S	01/01/2000 02:09:00	0.003448
713S	01/01/2000 02:10:00	0.003426
713S	01/01/2000 02:11:00	0.003374
713S	01/01/2000 02:12:00	0.003254
713S	01/01/2000 02:13:00	0.003125
713S	01/01/2000 02:14:00	0.003041
713S	01/01/2000 02:15:00	0.002988
713S	01/01/2000 02:16:00	0.002956
713S	01/01/2000 02:17:00	0.002935
713S	01/01/2000 02:18:00	0.002922
713S	01/01/2000 02:19:00	0.002913
713S	01/01/2000 02:20:00	0.002907
713S	01/01/2000 02:21:00	0.002876
713S	01/01/2000 02:22:00	0.002793
713S	01/01/2000 02:23:00	0.002705
713S	01/01/2000 02:24:00	0.002654
713S	01/01/2000 02:25:00	0.002626
713S	01/01/2000 02:26:00	0.002611
713S	01/01/2000 02:27:00	0.002602
713S	01/01/2000 02:28:00	0.002598
713S	01/01/2000 02:29:00	0.002595
713S	01/01/2000 02:30:00	0.002594
713S	01/01/2000 02:31:00	0.002572
713S	01/01/2000 02:32:00	0.002508
713S	01/01/2000 02:33:00	0.002438
713S	01/01/2000 02:34:00	0.002398
713S	01/01/2000 02:35:00	0.002377
713S	01/01/2000 02:36:00	0.002365
713S	01/01/2000 02:37:00	0.002359
713S	01/01/2000 02:38:00	0.002356
713S	01/01/2000 02:39:00	0.002354
713S	01/01/2000 02:40:00	0.002353
713S	01/01/2000 02:41:00	0.002336
713S	01/01/2000 02:42:00	0.002283
713S	01/01/2000 02:43:00	0.002226
713S	01/01/2000 02:44:00	0.002194
713S	01/01/2000 02:45:00	0.002176
713S	01/01/2000 02:46:00	0.002167
713S	01/01/2000 02:47:00	0.002162
713S	01/01/2000 02:48:00	0.002159
713S	01/01/2000 02:49:00	0.002158
713S	01/01/2000 02:50:00	0.002157
713S	01/01/2000 02:51:00	0.002142
713S	01/01/2000 02:52:00	0.002098
713S	01/01/2000 02:53:00	0.002051
713S	01/01/2000 02:54:00	0.002024
713S	01/01/2000 02:55:00	0.002009
713S	01/01/2000 02:56:00	0.002001
713S	01/01/2000 02:57:00	0.001997
713S	01/01/2000 02:58:00	0.001995
713S	01/01/2000 02:59:00	0.001994
713S	01/01/2000 03:00:00	0.001993
713S	01/01/2000 03:01:00	0.001819
713S	01/01/2000 03:02:00	0.001286
713S	01/01/2000 03:03:00	0.000713
713S	01/01/2000 03:04:00	0.000383
713S	01/01/2000 03:05:00	0.000205
713S	01/01/2000 03:06:00	0.00011
713S	01/01/2000 03:07:00	5.9E-05
713S	01/01/2000 03:08:00	3.2E-05
713S	01/01/2000 03:09:00	1.7E-05
713S	01/01/2000 03:10:00	0
713S	01/01/2000 03:11:00	0
713S	01/01/2000 03:12:00	0
713S	01/01/2000 03:13:00	0
713S	01/01/2000 03:14:00	0
713S	01/01/2000 03:15:00	0
713S	01/01/2000 03:16:00	0
713S	01/01/2000 03:17:00	0
713S	01/01/2000 03:18:00	0
713S	01/01/2000 03:19:00	0
713S	01/01/2000 03:20:00	0
713S	01/01/2000 03:21:00	0
713S	01/01/2000 03:22:00	0
713S	01/01/2000 03:23:00	0
713S	01/01/2000 03:24:00	0
713S	01/01/2000 03:25:00	0
713S	01/01/2000 03:26:00	0
713S	01/01/2000 03:27:00	0
713S	01/01/2000 03:28:00	0
713S	01/01/2000 03:29:00	0
713S	01/01/2000 03:30:00	0
713S	01/01/2000 03:31:00	0
713S	01/01/2000 03:32:00	0
713S	01/01/2000 03:33:00	0
713S	01/01/2000 03:34:00	0
713S	01/01/2000 03:35:00	0
713S	01/01/2000 03:36:00	0
713S	01/01/2000 03:37:00	0
713S	01/01/2000 03:38:00	0
713S	01/01/2000 03:39:00	0
713S	01/01/2000 03:40:00	0
713S	01/01/2000 03:41:00	0
713S	01/01/2000 03:42:00	0
713S	01/01/2000 03:43:00	0
713S	01/01/2000 03:44:00	0
713S	01/01/2000 03:45:00	0
713S	01/01/2000 03:46:00	0
713S	01/01/2000 03:47:00	0
713S	01/01/2000 03:48:00	0
713S	01/01/2000 03:49:00	0
713S	01/01/2000 03:50:00	0
713S	01/01/2000 03:51:00	0
713S	01/01/2000 03:52:00	0
713S	01/01/2000 03:53:00	0
713S	01/01/2000 03:54:00	0
713S	01/01/2000 03:55:00	0
713S	01/01/2000 03:56:00	0
713S	01/01/2000 03:57:00	0
713S	01/01/2000 03:58:00	0
713S	01/01/2000 03:59:00	0
713S	01/01/2000 04:00:00	0
713S	01/01/2000 04:01:00	0
713S	01/01/2000 04:02:00	0
713S	01/01/2000 04:03:00	0
713S	01/01/2000 04:04:00	0
713S	01/01/2000 04:05:00	0
713S	01/01/2000 04:06:00	0
713S	01/01/2000 04:07:00	0
713S	01/01/2000 04:08:00	0
713S	01/01/2000 04:09:00	0
713S	01/01/2000 04:10:00	0
713S	01/01/2000 04:11:00	0
713S	01/01/2000 04:12:00	0
713S	01/01/2000 04:13:00	0
713S	01/01/2000 04:14:00	0
713S	01/01/2000 04:15:00	0
713S	01/01/2000 04:16:00	0
;Flow (m³/s)		
714	01/01/2000 00:00:00	0
714	01/01/2000 00:01:00	0
714	01/01/2000 00:02:00	0
714	01/01/2000 00:03:00	0
714	01/01/2000 00:04:00	0
714	01/01/2000 00:05:00	0
714	01/01/2000 00:06:00	0
714	01/01/2000 00:07:00	0
714	01/01/2000 00:08:00	0
714	01/01/2000 00:09:00	0
714	01/01/2000 00:10:00	0
714	01/01/2000 00:11:00	0
714	01/01/2000 00:12:00	0
714	01/01/2000 00:13:00	0
714	01/01/2000 00:14:00	0
714	01/01/2000 00:15:00	1E-06
714	01/01/2000 00:16:00	3E-06
714	01/01/2000 00:17:00	4E-06
714	01/01/2000 00:18:00	4E-06
714	01/01/2000 00:19:00	4E-06
714	01/01/2000 00:20:00	4E-06
714	01/01/2000 00:21:00	5E-06
714	01/01/2000 00:22:00	5E-06
714	01/01/2000 00:23:00	6E-06
714	01/01/2000 00:24:00	6E-06
714	01/01/2000 00:25:00	6E-06
714	01/01/2000 00:26:00	6E-06
714	01/01/2000 00:27:00	6E-06
714	01/01/2000 00:28:00	6E-06
714	01/01/2000 00:29:00	6E-06
714	01/01/2000 00:30:00	6E-06
714	01/01/2000 00:31:00	7E-06
714	01/01/2000 00:32:00	8E-06
714	01/01/2000 00:33:00	9E-06
714	01/01/2000 00:34:00	9E-06
714	01/01/2000 00:35:00	9E-06
714	01/01/2000 00:36:00	9E-06
714	01/01/2000 00:37:00	9E-06
714	01/01/2000 00:38:00	9E-06
714	01/01/2000 00:39:00	9E-06
714	01/01/2000 00:40:00	9E-06
714	01/01/2000 00:41:00	0.000148
714	01/01/2000 00:42:00	0.000436
714	01/01/2000 00:43:00	0.000898
714	01/01/2000 00:44:00	0.001553
714	01/01/2000 00:45:00	0.002421
714	01/01/2000 00:46:00	0.003274
714	01/01/2000 00:47:00	0.004105
714	01/01/2000 00:48:00	0.004911
714	01/01/2000 00:49:00	0.005687
714	01/01/2000 00:50:00	0.006431
714	01/01/2000 00:51:00	0.00915
714	01/01/2000 00:52:00	0.013
714	01/01/2000 00:53:00	0.013
714	01/01/2000 00:54:00	0.013
714	01/01/2000 00:55:00	0.013
714	01/01/2000 00:56:00	0.013
714	01/01/2000 00:57:00	0.013
714	01/01/2000 00:58:00	0.013
714	01/01/2000 00:59:00	0.013
714	01/01/2000 01:00:00	0.013
714	01/01/2000 01:01:00	0.013
714	01/01/2000 01:02:00	0.013
714	01/01/2000 01:03:00	0.013
714	01/01/2000 01:04:00	0.013
714	01/01/2000 01:05:00	0.013
714	01/01/2000 01:06:00	0.013
714	01/01/2000 01:07:00	0.013
714	01/01/2000 01:08:00	0.013
714	01/01/2000 01:09:00	0.013
714	01/01/2000 01:10:00	0.013
714	01/01/2000 01:11:00	0.013
714	01/01/2000 01:12:00	0.013
714	01/01/2000 01:13:00	0.013
714	01/01/2000 01:14:00	0.013
714	01/01/2000 01:15:00	0.013
714	01/01/2000 01:16:00	0.013
714	01/01/2000 01:17:00	0.013
714	01/01/2000 01:18:00	0.013
714	01/01/2000 01:19:00	0.013
714	01/01/2000 01:20:00	0.013
714	01/01/2000 01:21:00	0.013
714	01/01/2000 01:22:00	0.01292
714	01/01/2000 01:23:00	0.011963
714	01/01/2000 01:24:00	0.010985
714	01/01/2000 01:25:00	0.009966
714	01/01/2000 01:26:00	0.009132
714	01/01/2000 01:27:00	0.00845
714	01/01/2000 01:28:00	0.007894
714	01/01/2000 01:29:00	0.007441
714	01/01/2000 01:30:00	0.007072
714	01/01/2000 01:31:00	0.006708
714	01/01/2000 01:32:00	0.006338
714	01/01/2000 01:33:00	0.00595
714	01/01/2000 01:34:00	0.005538
714	01/01/2000 01:35:00	0.005092
714	01/01/2000 01:36:00	0.004728
714	01/01/2000 01:37:00	0.004431
714	01/01/2000 01:38:00	0.004189
714	01/01/2000 01:39:00	0.003992
714	01/01/2000 01:40:00	0.003833
714	01/01/2000 01:41:00	0.003665
714	01/01/2000 01:42:00	0.003485
714	01/01/2000 01:43:00	0.003287
714	01/01/2000 01:44:00	0.003068
714	01/01/2000 01:45:00	0.002824
714	01/01/2000 01:46:00	0.002625
714	01/01/2000 01:47:00	0.002462
714	01/01/2000 01:48:00	0.002329
714	01/01/2000 01:49:00	0.002221
714	01/01/2000 01:50:00	0.002133
714	01/01/2000 01:51:00	0.002035
714	01/01/2000 01:52:00	0.001927
714	01/01/2000 01:53:00	0.001805
714	01/01/2000 01:54:00	0.001666
714	01/01/2000 01:55:00	0.00151
714	01/01/2000 01:56:00	0.001383
714	01/01/2000 01:57:00	0.001278
714	01/01/2000 01:58:00	0.001192
714	01/01/2000 01:59:00	0.001123
714	01/01/2000 02:00:00	0.001066
714	01/01/2000 02:01:00	0.001001
714	01/01/2000 02:02:00	0.000928
714	01/01/2000 02:03:00	0.000843
714	01/01/2000 02:04:00	0.000747
714	01/01/2000 02:05:00	0.000637
714	01/01/2000 02:06:00	0.000547
714	01/01/2000 02:07:00	0.000473
714	01/01/2000 02:08:00	0.000412
714	01/01/2000 02:09:00	0.000362
714	01/01/2000 02:10:00	0.000322
714	01/01/2000 02:11:00	0.000285
714	01/01/2000 02:12:00	0.000251
714	01/01/2000 02:13:00	0.000218
714	01/01/2000 02:14:00	0.000187
714	01/01/2000 02:15:00	0.000155
714	01/01/2000 02:16:00	0.000129
714	01/01/2000 02:17:00	0.000107
714	01/01/2000 02:18:00	8.9E-05
714	01/01/2000 02:19:00	7.5E-05
714	01/01/2000 02:20:00	6.2E-05
714	01/01/2000 02:21:00	5.2E-05
714	01/01/2000 02:22:00	4.3E-05
714	01/01/2000 02:23:00	3.7E-05

714	01/01/2000 02:24:00	3.1E-05
714	01/01/2000 02:25:00	2.6E-05
714	01/01/2000 02:26:00	2.2E-05
714	01/01/2000 02:27:00	1.9E-05
714	01/01/2000 02:28:00	1.6E-05
714	01/01/2000 02:29:00	1.4E-05
714	01/01/2000 02:30:00	1.2E-05
714	01/01/2000 02:31:00	1E-05
714	01/01/2000 02:32:00	0
714	01/01/2000 02:33:00	0
714	01/01/2000 02:34:00	0
714	01/01/2000 02:35:00	0
714	01/01/2000 02:36:00	0
714	01/01/2000 02:37:00	0
714	01/01/2000 02:38:00	0
714	01/01/2000 02:39:00	0
714	01/01/2000 02:40:00	0
714	01/01/2000 02:41:00	0
714	01/01/2000 02:42:00	0
714	01/01/2000 02:43:00	0
714	01/01/2000 02:44:00	0
714	01/01/2000 02:45:00	0
714	01/01/2000 02:46:00	0
714	01/01/2000 02:47:00	0
714	01/01/2000 02:48:00	0
714	01/01/2000 02:49:00	0
714	01/01/2000 02:50:00	0
714	01/01/2000 02:51:00	0
714	01/01/2000 02:52:00	0
714	01/01/2000 02:53:00	0
714	01/01/2000 02:54:00	0
714	01/01/2000 02:55:00	0
714	01/01/2000 02:56:00	0
714	01/01/2000 02:57:00	0
714	01/01/2000 02:58:00	0
714	01/01/2000 02:59:00	0
714	01/01/2000 03:00:00	0
714	01/01/2000 03:01:00	0
714	01/01/2000 03:02:00	0
714	01/01/2000 03:03:00	0
714	01/01/2000 03:04:00	0
714	01/01/2000 03:05:00	0
714	01/01/2000 03:06:00	0
714	01/01/2000 03:07:00	0
714	01/01/2000 03:08:00	0
714	01/01/2000 03:09:00	0
714	01/01/2000 03:10:00	0
714	01/01/2000 03:11:00	0
714	01/01/2000 03:12:00	0
714	01/01/2000 03:13:00	0
714	01/01/2000 03:14:00	0
714	01/01/2000 03:15:00	0
714	01/01/2000 03:16:00	0
714	01/01/2000 03:17:00	0
714	01/01/2000 03:18:00	0
714	01/01/2000 03:19:00	0
714	01/01/2000 03:20:00	0
714	01/01/2000 03:21:00	0
714	01/01/2000 03:22:00	0
714	01/01/2000 03:23:00	0
714	01/01/2000 03:24:00	0
714	01/01/2000 03:25:00	0
714	01/01/2000 03:26:00	0
714	01/01/2000 03:27:00	0
714	01/01/2000 03:28:00	0
714	01/01/2000 03:29:00	0
714	01/01/2000 03:30:00	0
714	01/01/2000 03:31:00	0
714	01/01/2000 03:32:00	0
714	01/01/2000 03:33:00	0
714	01/01/2000 03:34:00	0
714	01/01/2000 03:35:00	0
714	01/01/2000 03:36:00	0
714	01/01/2000 03:37:00	0
714	01/01/2000 03:38:00	0
714	01/01/2000 03:39:00	0
714	01/01/2000 03:40:00	0
714	01/01/2000 03:41:00	0
714	01/01/2000 03:42:00	0
714	01/01/2000 03:43:00	0
714	01/01/2000 03:44:00	0
714	01/01/2000 03:45:00	0
714	01/01/2000 03:46:00	0
714	01/01/2000 03:47:00	0
714	01/01/2000 03:48:00	0
714	01/01/2000 03:49:00	0
714	01/01/2000 03:50:00	0
714	01/01/2000 03:51:00	0
714	01/01/2000 03:52:00	0
714	01/01/2000 03:53:00	0
714	01/01/2000 03:54:00	0
714	01/01/2000 03:55:00	0
714	01/01/2000 03:56:00	0
714	01/01/2000 03:57:00	0
714	01/01/2000 03:58:00	0
714	01/01/2000 03:59:00	0
714	01/01/2000 04:00:00	0
714	01/01/2000 04:01:00	0
714	01/01/2000 04:02:00	0
714	01/01/2000 04:03:00	0
714	01/01/2000 04:04:00	0
714	01/01/2000 04:05:00	0
714	01/01/2000 04:06:00	0
714	01/01/2000 04:07:00	0
714	01/01/2000 04:08:00	0
714	01/01/2000 04:09:00	0
714	01/01/2000 04:10:00	0
714	01/01/2000 04:11:00	0
714	01/01/2000 04:12:00	0
714	01/01/2000 04:13:00	0
714	01/01/2000 04:14:00	0
714	01/01/2000 04:15:00	0
714	01/01/2000 04:16:00	0

;Flow (m^3/s)

720	01/01/2000 00:00:00	0
720	01/01/2000 00:01:00	0
720	01/01/2000 00:02:00	0
720	01/01/2000 00:03:00	0
720	01/01/2000 00:04:00	0
720	01/01/2000 00:05:00	0
720	01/01/2000 00:06:00	0
720	01/01/2000 00:07:00	0
720	01/01/2000 00:08:00	0
720	01/01/2000 00:09:00	0
720	01/01/2000 00:10:00	0
720	01/01/2000 00:11:00	0
720	01/01/2000 00:12:00	0
720	01/01/2000 00:13:00	0
720	01/01/2000 00:14:00	0
720	01/01/2000 00:15:00	0.003969
720	01/01/2000 00:16:00	0.015634
720	01/01/2000 00:17:00	0.027937
720	01/01/2000 00:18:00	0.035413
720	01/01/2000 00:19:00	0.03991
720	01/01/2000 00:20:00	0.042644
720	01/01/2000 00:21:00	0.04691
720	01/01/2000 00:22:00	0.05325
720	01/01/2000 00:23:00	0.057167
720	01/01/2000 00:24:00	0.059488
720	01/01/2000 00:25:00	0.060922
720	01/01/2000 00:26:00	0.061773
720	01/01/2000 00:27:00	0.0623
720	01/01/2000 00:28:00	0.062613
720	01/01/2000 00:29:00	0.062808
720	01/01/2000 00:30:00	0.062923
720	01/01/2000 00:31:00	0.068804
720	01/01/2000 00:32:00	0.08069
720	01/01/2000 00:33:00	0.088067
720	01/01/2000 00:34:00	0.092411
720	01/01/2000 00:35:00	0.095107
720	01/01/2000 00:36:00	0.096699
720	01/01/2000 00:37:00	0.097689
720	01/01/2000 00:38:00	0.098275
720	01/01/2000 00:39:00	0.09864
720	01/01/2000 00:40:00	0.098855
720	01/01/2000 00:41:00	0.123998
720	01/01/2000 00:42:00	0.175179
720	01/01/2000 00:43:00	0.207755
720	01/01/2000 00:44:00	0.228174
720	01/01/2000 00:45:00	0.242028
720	01/01/2000 00:46:00	0.251597
720	01/01/2000 00:47:00	0.259188
720	01/01/2000 00:48:00	0.265402
720	01/01/2000 00:49:00	0.270925
720	01/01/2000 00:50:00	0.275944
720	01/01/2000 00:51:00	0.347076
720	01/01/2000 00:52:00	0.389741
720	01/01/2000 00:53:00	0.429016
720	01/01/2000 00:54:00	0.455158
720	01/01/2000 00:55:00	0.480213
720	01/01/2000 00:56:00	0.493819
720	01/01/2000 00:57:00	0.502557
720	01/01/2000 00:58:00	0.509476
720	01/01/2000 00:59:00	0.51807
720	01/01/2000 01:00:00	0.542284
720	01/01/2000 01:01:00	0.572752
720	01/01/2000 01:02:00	0.580279
720	01/01/2000 01:03:00	0.58378
720	01/01/2000 01:04:00	0.58586
720	01/01/2000 01:05:00	0.586526
720	01/01/2000 01:06:00	0.586523
720	01/01/2000 01:07:00	0.586241
720	01/01/2000 01:08:00	0.585846
720	01/01/2000 01:09:00	0.585425
720	01/01/2000 01:10:00	0.584885
720	01/01/2000 01:11:00	0.584344
720	01/01/2000 01:12:00	0.583776
720	01/01/2000 01:13:00	0.583341
720	01/01/2000 01:14:00	0.582575
720	01/01/2000 01:15:00	0.581378
720	01/01/2000 01:16:00	0.581
720	01/01/2000 01:17:00	0.580447
720	01/01/2000 01:18:00	0.579994
720	01/01/2000 01:19:00	0.579
720	01/01/2000 01:20:00	0.577561
720	01/01/2000 01:21:00	0.574652
720	01/01/2000 01:22:00	0.57175
720	01/01/2000 01:23:00	0.56271
720	01/01/2000 01:24:00	0.395
720	01/01/2000 01:25:00	0.417807
720	01/01/2000 01:26:00	0.396919
720	01/01/2000 01:27:00	0.406248
720	01/01/2000 01:28:00	0.396399
720	01/01/2000 01:29:00	0.399886
720	01/01/2000 01:30:00	0.394905
720	01/01/2000 01:31:00	0.341111
720	01/01/2000 01:32:00	0.302245
720	01/01/2000 01:33:00	0.316694
720	01/01/2000 01:34:00	0.3062
720	01/01/2000 01:35:00	0.308966
720	01/01/2000 01:36:00	0.306085
720	01/01/2000 01:37:00	0.306319
720	01/01/2000 01:38:00	0.305168
720	01/01/2000 01:39:00	0.304958
720	01/01/2000 01:40:00	0.304395
720	01/01/2000 01:41:00	0.303824
720	01/01/2000 01:42:00	0.302705
720	01/01/2000 01:43:00	0.301807
720	01/01/2000 01:44:00	0.301031
720	01/01/2000 01:45:00	0.300396
720	01/01/2000 01:46:00	0.2999
720	01/01/2000 01:47:00	0.29947
720	01/01/2000 01:48:00	0.299133
720	01/01/2000 01:49:00	0.29886
720	01/01/2000 01:50:00	0.298641
720	01/01/2000 01:51:00	0.298241
720	01/01/2000 01:52:00	0.297568
720	01/01/2000 01:53:00	0.296978
720	01/01/2000 01:54:00	0.296498
720	01/01/2000 01:55:00	0.296088
720	01/01/2000 01:56:00	0.295779
720	01/01/2000 01:57:00	0.063092
720	01/01/2000 01:58:00	0.062452
720	01/01/2000 01:59:00	0.061958
720	01/01/2000 02:00:00	0.061578
720	01/01/2000 02:01:00	0.059975
720	01/01/2000 02:02:00	0.057074
720	01/01/2000 02:03:00	0.055148
720	01/01/2000 02:04:00	0.053868
720	01/01/2000 02:05:00	0.052984
720	01/01/2000 02:06:00	0.052388
720	01/01/2000 02:07:00	0.051949
720	01/01/2000 02:08:00	0.051641
720	01/01/2000 02:09:00	0.051412
720	01/01/2000 02:10:00	0.051242
720	01/01/2000 02:11:00	0.050155
720	01/01/2000 02:12:00	0.048103
720	01/01/2000 02:13:00	0.04679
720	01/01/2000 02:14:00	0.04597
720	01/01/2000 02:15:00	0.045425
720	01/01/2000 02:16:00	0.045066
720	01/01/2000 02:17:00	0.044808
720	01/01/2000 02:18:00	0.044632
720	01/01/2000 02:19:00	0.044504
720	01/01/2000 02:20:00	0.044411
720	01/01/2000 02:21:00	0.043606
720	01/01/2000 02:22:00	0.042058
720	01/01/2000 02:23:00	0.041085
720	01/01/2000 02:24:00	0.040501
720	01/01/2000 02:25:00	0.040131
720	01/01/2000 02:26:00	0.039904
720	01/01/2000 02:27:00	0.039756
720	01/01/2000 02:28:00	0.039663
720	01/01/2000 02:29:00	0.039599
720	01/01/2000 02:30:00	0.039558
720	01/01/2000 02:31:00	0.038941
720	01/01/2000 02:32:00	0.037724
720	01/01/2000 02:33:00	0.036965
720	01/01/2000 02:34:00	0.036517
720	01/01/2000 02:35:00	0.036236
720	01/01/2000 02:36:00	0.036068
720	01/01/2000 02:37:00	0.035963
720	01/01/2000 02:38:00	0.035899
720	01/01/2000 02:39:00	0.035859
720	01/01/2000 02:40:00	0.035833
720	01/01/2000 02:41:00	0.035337
720	01/01/2000 02:42:00	0.034348
720	01/01/2000 02:43:00	0.033734
720	01/01/2000 02:44:00	0.033371
720	01/01/2000 02:45:00	0.033146
720	01/01/2000 02:46:00	0.033013
720	01/01/2000 02:47:00	0.032919
720	01/01/2000 02:48:00	0.032871
720	01/01/2000 02:49:00	0.03284
720	01/01/2000 02:50:00	0.032822
720	01/01/2000 02:51:00	0.032411
720	01/01/2000 02:52:00	0.031587
720	01/01/2000 02:53:00	0.031076
720	01/01/2000 02:54:00	0.030775
720	01/01/2000 02:55:00	0.030588
720	01/01/2000 02:56:00	0.030478
720	01/01/2000 02:57:00	0.030409
720	01/01/2000 02:58:00	0.030369
720	01/01/2000 02:59:00	0.030343
720	01/01/2000 03:00:00	0.030328
720	01/01/2000 03:01:00	0.025441
720	01/01/2000 03:02:00	0.015492

720	01/01/2000 03:03:00	0.009316
720	01/01/2000 03:04:00	0.00568
720	01/01/2000 03:05:00	0.003423
720	01/01/2000 03:06:00	0.00209
720	01/01/2000 03:07:00	0.001262
720	01/01/2000 03:08:00	0.000771
720	01/01/2000 03:09:00	0.000466
720	01/01/2000 03:10:00	0.000285
720	01/01/2000 03:11:00	0.000172
720	01/01/2000 03:12:00	0.000106
720	01/01/2000 03:13:00	6.4E-05
720	01/01/2000 03:14:00	3.9E-05
720	01/01/2000 03:15:00	2.4E-05
720	01/01/2000 03:16:00	1.5E-05
720	01/01/2000 03:17:00	0
720	01/01/2000 03:18:00	0
720	01/01/2000 03:19:00	0
720	01/01/2000 03:20:00	0
720	01/01/2000 03:21:00	0
720	01/01/2000 03:22:00	0
720	01/01/2000 03:23:00	0
720	01/01/2000 03:24:00	0
720	01/01/2000 03:25:00	0
720	01/01/2000 03:26:00	0
720	01/01/2000 03:27:00	0
720	01/01/2000 03:28:00	0
720	01/01/2000 03:29:00	0
720	01/01/2000 03:30:00	0
720	01/01/2000 03:31:00	0
720	01/01/2000 03:32:00	0
720	01/01/2000 03:33:00	0
720	01/01/2000 03:34:00	0
720	01/01/2000 03:35:00	0
720	01/01/2000 03:36:00	0
720	01/01/2000 03:37:00	0
720	01/01/2000 03:38:00	0
720	01/01/2000 03:39:00	0
720	01/01/2000 03:40:00	0
720	01/01/2000 03:41:00	0
720	01/01/2000 03:42:00	0
720	01/01/2000 03:43:00	0
720	01/01/2000 03:44:00	0
720	01/01/2000 03:45:00	0
720	01/01/2000 03:46:00	0
720	01/01/2000 03:47:00	0
720	01/01/2000 03:48:00	0
720	01/01/2000 03:49:00	0
720	01/01/2000 03:50:00	0
720	01/01/2000 03:51:00	0
720	01/01/2000 03:52:00	0
720	01/01/2000 03:53:00	0
720	01/01/2000 03:54:00	0
720	01/01/2000 03:55:00	0
720	01/01/2000 03:56:00	0
720	01/01/2000 03:57:00	0
720	01/01/2000 03:58:00	0
720	01/01/2000 03:59:00	0
720	01/01/2000 04:00:00	0
720	01/01/2000 04:01:00	0
720	01/01/2000 04:02:00	0
720	01/01/2000 04:03:00	0
720	01/01/2000 04:04:00	0
720	01/01/2000 04:05:00	0
720	01/01/2000 04:06:00	0
720	01/01/2000 04:07:00	0
720	01/01/2000 04:08:00	0
720	01/01/2000 04:09:00	0
720	01/01/2000 04:10:00	0
720	01/01/2000 04:11:00	0
720	01/01/2000 04:12:00	0
720	01/01/2000 04:13:00	0
720	01/01/2000 04:14:00	0
720	01/01/2000 04:15:00	0
720	01/01/2000 04:16:00	0
;Flow (m^3/s)		
721	01/01/2000 00:00:00	0
721	01/01/2000 00:01:00	0
721	01/01/2000 00:02:00	0
721	01/01/2000 00:03:00	0
721	01/01/2000 00:04:00	0
721	01/01/2000 00:05:00	0
721	01/01/2000 00:06:00	0
721	01/01/2000 00:07:00	0
721	01/01/2000 00:08:00	0
721	01/01/2000 00:09:00	0
721	01/01/2000 00:10:00	0
721	01/01/2000 00:11:00	0
721	01/01/2000 00:12:00	0
721	01/01/2000 00:13:00	0
721	01/01/2000 00:14:00	0
721	01/01/2000 00:15:00	0.000132
721	01/01/2000 00:16:00	0.000626
721	01/01/2000 00:17:00	0.001555
721	01/01/2000 00:18:00	0.002643
721	01/01/2000 00:19:00	0.003483
721	01/01/2000 00:20:00	0.004025
721	01/01/2000 00:21:00	0.004481
721	01/01/2000 00:22:00	0.004973
721	01/01/2000 00:23:00	0.005529
721	01/01/2000 00:24:00	0.006005
721	01/01/2000 00:25:00	0.006304
721	01/01/2000 00:26:00	0.006508
721	01/01/2000 00:27:00	0.006644
721	01/01/2000 00:28:00	0.006736
721	01/01/2000 00:29:00	0.006797
721	01/01/2000 00:30:00	0.006838
721	01/01/2000 00:31:00	0.007061
721	01/01/2000 00:32:00	0.007626
721	01/01/2000 00:33:00	0.008506
721	01/01/2000 00:34:00	0.009325
721	01/01/2000 00:35:00	0.009832
721	01/01/2000 00:36:00	0.010179
721	01/01/2000 00:37:00	0.01041
721	01/01/2000 00:38:00	0.010565
721	01/01/2000 00:39:00	0.010669
721	01/01/2000 00:40:00	0.010739
721	01/01/2000 00:41:00	0.011896
721	01/01/2000 00:42:00	0.01498
721	01/01/2000 00:43:00	0.019901
721	01/01/2000 00:44:00	0.025103
721	01/01/2000 00:45:00	0.029281
721	01/01/2000 00:46:00	0.032872
721	01/01/2000 00:47:00	0.036104
721	01/01/2000 00:48:00	0.039147
721	01/01/2000 00:49:00	0.041462
721	01/01/2000 00:50:00	0.043756
721	01/01/2000 00:51:00	0.051635
721	01/01/2000 00:52:00	0.059934
721	01/01/2000 00:53:00	0.06475
721	01/01/2000 00:54:00	0.070807
721	01/01/2000 00:55:00	0.078092
721	01/01/2000 00:56:00	0.086589
721	01/01/2000 00:57:00	0.096522
721	01/01/2000 00:58:00	0.10747
721	01/01/2000 00:59:00	0.116763
721	01/01/2000 01:00:00	0.124989
721	01/01/2000 01:01:00	0.132163
721	01/01/2000 01:02:00	0.136396
721	01/01/2000 01:03:00	0.138809
721	01/01/2000 01:04:00	0.139485
721	01/01/2000 01:05:00	0.138497
721	01/01/2000 01:06:00	0.135909
721	01/01/2000 01:07:00	0.131781
721	01/01/2000 01:08:00	0.126162
721	01/01/2000 01:09:00	0.121244
721	01/01/2000 01:10:00	0.116941
721	01/01/2000 01:11:00	0.112939
721	01/01/2000 01:12:00	0.109171
721	01/01/2000 01:13:00	0.105585
721	01/01/2000 01:14:00	0.10213
721	01/01/2000 01:15:00	0.098759
721	01/01/2000 01:16:00	0.095433
721	01/01/2000 01:17:00	0.092117
721	01/01/2000 01:18:00	0.088781
721	01/01/2000 01:19:00	0.085858
721	01/01/2000 01:20:00	0.083298
721	01/01/2000 01:21:00	0.080976
721	01/01/2000 01:22:00	0.078852
721	01/01/2000 01:23:00	0.076895
721	01/01/2000 01:24:00	0.075074
721	01/01/2000 01:25:00	0.073361
721	01/01/2000 01:26:00	0.071672
721	01/01/2000 01:27:00	0.069626
721	01/01/2000 01:28:00	0.067661
721	01/01/2000 01:29:00	0.066336
721	01/01/2000 01:30:00	0.065176
721	01/01/2000 01:31:00	0.06412
721	01/01/2000 01:32:00	0.063152
721	01/01/2000 01:33:00	0.062256
721	01/01/2000 01:34:00	0.061418
721	01/01/2000 01:35:00	0.060627
721	01/01/2000 01:36:00	0.059872
721	01/01/2000 01:37:00	0.059143
721	01/01/2000 01:38:00	0.058432
721	01/01/2000 01:39:00	0.057809
721	01/01/2000 01:40:00	0.057265
721	01/01/2000 01:41:00	0.056735
721	01/01/2000 01:42:00	0.056116
721	01/01/2000 01:43:00	0.055525
721	01/01/2000 01:44:00	0.054954
721	01/01/2000 01:45:00	0.054397
721	01/01/2000 01:46:00	0.053852
721	01/01/2000 01:47:00	0.053313
721	01/01/2000 01:48:00	0.05284
721	01/01/2000 01:49:00	0.05242
721	01/01/2000 01:50:00	0.05204
721	01/01/2000 01:51:00	0.051681
721	01/01/2000 01:52:00	0.051336
721	01/01/2000 01:53:00	0.051003
721	01/01/2000 01:54:00	0.050677
721	01/01/2000 01:55:00	0.050356
721	01/01/2000 01:56:00	0.050038
721	01/01/2000 01:57:00	0.04972
721	01/01/2000 01:58:00	0.037497
721	01/01/2000 01:59:00	0.006009
721	01/01/2000 02:00:00	0.011535
721	01/01/2000 02:01:00	0.010183
721	01/01/2000 02:02:00	0.01001
721	01/01/2000 02:03:00	0.009512
721	01/01/2000 02:04:00	0.009044
721	01/01/2000 02:05:00	0.008648
721	01/01/2000 02:06:00	0.008323
721	01/01/2000 02:07:00	0.008045
721	01/01/2000 02:08:00	0.007799
721	01/01/2000 02:09:00	0.007597
721	01/01/2000 02:10:00	0.00743
721	01/01/2000 02:11:00	0.007246
721	01/01/2000 02:12:00	0.007014
721	01/01/2000 02:13:00	0.006733
721	01/01/2000 02:14:00	0.006462
721	01/01/2000 02:15:00	0.006246
721	01/01/2000 02:16:00	0.006063
721	01/01/2000 02:17:00	0.005901
721	01/01/2000 02:18:00	0.005754
721	01/01/2000 02:19:00	0.005632
721	01/01/2000 02:20:00	0.00553
721	01/01/2000 02:21:00	0.005417
721	01/01/2000 02:22:00	0.005273
721	01/01/2000 02:23:00	0.005098
721	01/01/2000 02:24:00	0.004939
721	01/01/2000 02:25:00	0.004826
721	01/01/2000 02:26:00	0.004739
721	01/01/2000 02:27:00	0.00467
721	01/01/2000 02:28:00	0.004616
721	01/01/2000 02:29:00	0.004572
721	01/01/2000 02:30:00	0.004536
721	01/01/2000 02:31:00	0.004487
721	01/01/2000 02:32:00	0.004407
721	01/01/2000 02:33:00	0.004298
721	01/01/2000 02:34:00	0.004198
721	01/01/2000 02:35:00	0.004132
721	01/01/2000 02:36:00	0.004084
721	01/01/2000 02:37:00	0.004051
721	01/01/2000 02:38:00	0.004025
721	01/01/2000 02:39:00	0.004006
721	01/01/2000 02:40:00	0.003992
721	01/01/2000 02:41:00	0.003965
721	01/01/2000 02:42:00	0.003911
721	01/01/2000 02:43:00	0.003832
721	01/01/2000 02:44:00	0.003759
721	01/01/2000 02:45:00	0.003713
721	01/01/2000 02:46:00	0.00368
721	01/01/2000 02:47:00	0.003659
721	01/01/2000 02:48:00	0.003643
721	01/01/2000 02:49:00	0.003632
721	01/01/2000 02:50:00	0.003624
721	01/01/2000 02:51:00	0.003605
721	01/01/2000 02:52:00	0.003563
721	01/01/2000 02:53:00	0.0035
721	01/01/2000 02:54:00	0.003442
721	01/01/2000 02:55:00	0.003406
721	01/01/2000 02:56:00	0.00338
721	01/01/2000 02:57:00	0.003353
721	01/01/2000 02:58:00	0.003343
721	01/01/2000 02:59:00	0.003335
721	01/01/2000 03:00:00	0.00333
721	01/01/2000 03:01:00	0.003164
721	01/01/2000 03:02:00	0.002704
721	01/01/2000 03:03:00	0.001974
721	01/01/2000 03:04:00	0.001294
721	01/01/2000 03:05:00	0.000873
721	01/01/2000 03:06:00	0.000584
721	01/01/2000 03:07:00	0.000392
721	01/01/2000 03:08:00	0.000263
721	01/01/2000 03:09:00	0.000176
721	01/01/2000 03:10:00	0.000118
721	01/01/2000 03:11:00	7.9E-05
721	01/01/2000 03:12:00	5.3E-05
721	01/01/2000 03:13:00	3.6E-05
721	01/01/2000 03:14:00	2.4E-05
721	01/01/2000 03:15:00	1.6E-05
721	01/01/2000 03:16:00	1.1E-05
721	01/01/2000 03:17:00	0
721	01/01/2000 03:18:00	0
721	01/01/2000 03:19:00	0
721	01/01/2000 03:20:00	0
721	01/01/2000 03:21:00	0
721	01/01/2000 03:22:00	0
721	01/01/2000 03:23:00	0
721	01/01/2000 03:24:00	0
721	01/01/2000 03:25:00	0
721	01/01/2000 03:26:00	0
721	01/01/2000 03:27:00	0
721	01/01/2000 03:28:00	0
721	01/01/2000 03:29:00	0
721	01/01/2000 03:30:00	0
721	01/01/2000 03:31:00	0
721	01/01/2000 03:32:00	0
721	01/01/2000 03:33:00	0
721	01/01/2000 03:34:00	0
721	01/01/2000 03:35:00	0
721	01/01/2000 03:36:00	0
721	01/01/2000 03:37:00	0
721	01/01/2000 03:38:00	0
721	01/01/2000 03:39:00	0
721	01/01/2000 03:40:00	0
721	01/01/2000 03:41:00	0

721	01/01/2000 03:42:00	0
721	01/01/2000 03:43:00	0
721	01/01/2000 03:44:00	0
721	01/01/2000 03:45:00	0
721	01/01/2000 03:46:00	0
721	01/01/2000 03:47:00	0
721	01/01/2000 03:48:00	0
721	01/01/2000 03:49:00	0
721	01/01/2000 03:50:00	0
721	01/01/2000 03:51:00	0
721	01/01/2000 03:52:00	0
721	01/01/2000 03:53:00	0
721	01/01/2000 03:54:00	0
721	01/01/2000 03:55:00	0
721	01/01/2000 03:56:00	0
721	01/01/2000 03:57:00	0
721	01/01/2000 03:58:00	0
721	01/01/2000 03:59:00	0
721	01/01/2000 04:00:00	0
721	01/01/2000 04:01:00	0
721	01/01/2000 04:02:00	0
721	01/01/2000 04:03:00	0
721	01/01/2000 04:04:00	0
721	01/01/2000 04:05:00	0
721	01/01/2000 04:06:00	0
721	01/01/2000 04:07:00	0
721	01/01/2000 04:08:00	0
721	01/01/2000 04:09:00	0
721	01/01/2000 04:10:00	0
721	01/01/2000 04:11:00	0
721	01/01/2000 04:12:00	0
721	01/01/2000 04:13:00	0
721	01/01/2000 04:14:00	0
721	01/01/2000 04:15:00	0
721	01/01/2000 04:16:00	0

;Flow (m³/s)

722	01/01/2000 00:00:00	0
722	01/01/2000 00:01:00	0
722	01/01/2000 00:02:00	0
722	01/01/2000 00:03:00	0
722	01/01/2000 00:04:00	0
722	01/01/2000 00:05:00	0
722	01/01/2000 00:06:00	0
722	01/01/2000 00:07:00	0
722	01/01/2000 00:08:00	0
722	01/01/2000 00:09:00	0
722	01/01/2000 00:10:00	0
722	01/01/2000 00:11:00	0
722	01/01/2000 00:12:00	0
722	01/01/2000 00:13:00	0
722	01/01/2000 00:14:00	0
722	01/01/2000 00:15:00	8.5E-05
722	01/01/2000 00:16:00	0.000329
722	01/01/2000 00:17:00	0.000623
722	01/01/2000 00:18:00	0.000852
722	01/01/2000 00:19:00	0.001006
722	01/01/2000 00:20:00	0.001102
722	01/01/2000 00:21:00	0.001215
722	01/01/2000 00:22:00	0.001358
722	01/01/2000 00:23:00	0.001471
722	01/01/2000 00:24:00	0.001547
722	01/01/2000 00:25:00	0.001595
722	01/01/2000 00:26:00	0.001623
722	01/01/2000 00:27:00	0.001639
722	01/01/2000 00:28:00	0.001648
722	01/01/2000 00:29:00	0.001653
722	01/01/2000 00:30:00	0.001656
722	01/01/2000 00:31:00	0.001782
722	01/01/2000 00:32:00	0.002028
722	01/01/2000 00:33:00	0.002238
722	01/01/2000 00:34:00	0.002385
722	01/01/2000 00:35:00	0.002479
722	01/01/2000 00:36:00	0.002535
722	01/01/2000 00:37:00	0.002567
722	01/01/2000 00:38:00	0.002586
722	01/01/2000 00:39:00	0.002596
722	01/01/2000 00:40:00	0.002602
722	01/01/2000 00:41:00	0.003162
722	01/01/2000 00:42:00	0.004318
722	01/01/2000 00:43:00	0.005441
722	01/01/2000 00:44:00	0.006379
722	01/01/2000 00:45:00	0.007109
722	01/01/2000 00:46:00	0.007671
722	01/01/2000 00:47:00	0.008058
722	01/01/2000 00:48:00	0.008255
722	01/01/2000 00:49:00	0.008466
722	01/01/2000 00:50:00	0.00868
722	01/01/2000 00:51:00	0.010631
722	01/01/2000 00:52:00	0.011
722	01/01/2000 00:53:00	0.011
722	01/01/2000 00:54:00	0.011
722	01/01/2000 00:55:00	0.011
722	01/01/2000 00:56:00	0.011
722	01/01/2000 00:57:00	0.011
722	01/01/2000 00:58:00	0.011
722	01/01/2000 00:59:00	0.011
722	01/01/2000 01:00:00	0.011
722	01/01/2000 01:01:00	0.011
722	01/01/2000 01:02:00	0.011794
722	01/01/2000 01:03:00	0.012
722	01/01/2000 01:04:00	0.012
722	01/01/2000 01:05:00	0.012
722	01/01/2000 01:06:00	0.012
722	01/01/2000 01:07:00	0.012
722	01/01/2000 01:08:00	0.012
722	01/01/2000 01:09:00	0.012
722	01/01/2000 01:10:00	0.012
722	01/01/2000 01:11:00	0.012
722	01/01/2000 01:12:00	0.012
722	01/01/2000 01:13:00	0.012
722	01/01/2000 01:14:00	0.012
722	01/01/2000 01:15:00	0.012
722	01/01/2000 01:16:00	0.012
722	01/01/2000 01:17:00	0.012
722	01/01/2000 01:18:00	0.012
722	01/01/2000 01:19:00	0.012
722	01/01/2000 01:20:00	0.012
722	01/01/2000 01:21:00	0.012
722	01/01/2000 01:22:00	0.012
722	01/01/2000 01:23:00	0.012
722	01/01/2000 01:24:00	0.012
722	01/01/2000 01:25:00	0.012
722	01/01/2000 01:26:00	0.012
722	01/01/2000 01:27:00	0.012
722	01/01/2000 01:28:00	0.011975
722	01/01/2000 01:29:00	0.011764
722	01/01/2000 01:30:00	0.011556
722	01/01/2000 01:31:00	0.011353
722	01/01/2000 01:32:00	0.011162
722	01/01/2000 01:33:00	0.011
722	01/01/2000 01:34:00	0.011
722	01/01/2000 01:35:00	0.011
722	01/01/2000 01:36:00	0.011
722	01/01/2000 01:37:00	0.011
722	01/01/2000 01:38:00	0.011
722	01/01/2000 01:39:00	0.011
722	01/01/2000 01:40:00	0.011
722	01/01/2000 01:41:00	0.011
722	01/01/2000 01:42:00	0.011
722	01/01/2000 01:43:00	0.011
722	01/01/2000 01:44:00	0.011
722	01/01/2000 01:45:00	0.011
722	01/01/2000 01:46:00	0.011
722	01/01/2000 01:47:00	0.011
722	01/01/2000 01:48:00	0.011
722	01/01/2000 01:49:00	0.011
722	01/01/2000 01:50:00	0.011
722	01/01/2000 01:51:00	0.011
722	01/01/2000 01:52:00	0.011
722	01/01/2000 01:53:00	0.011
722	01/01/2000 01:54:00	0.011
722	01/01/2000 01:55:00	0.011
722	01/01/2000 01:56:00	0.011
722	01/01/2000 01:57:00	0.011
722	01/01/2000 01:58:00	0.011
722	01/01/2000 01:59:00	0.011
722	01/01/2000 02:00:00	0.011
722	01/01/2000 02:01:00	0.011
722	01/01/2000 02:02:00	0.011
722	01/01/2000 02:03:00	0.011
722	01/01/2000 02:04:00	0.011
722	01/01/2000 02:05:00	0.011
722	01/01/2000 02:06:00	0.011
722	01/01/2000 02:07:00	0.011
722	01/01/2000 02:08:00	0.011
722	01/01/2000 02:09:00	0.011
722	01/01/2000 02:10:00	0.011
722	01/01/2000 02:11:00	0.011
722	01/01/2000 02:12:00	0.011
722	01/01/2000 02:13:00	0.011
722	01/01/2000 02:14:00	0.011
722	01/01/2000 02:15:00	0.011
722	01/01/2000 02:16:00	0.011
722	01/01/2000 02:17:00	0.010705
722	01/01/2000 02:18:00	0.008215
722	01/01/2000 02:19:00	0.004818
722	01/01/2000 02:20:00	0.00295
722	01/01/2000 02:21:00	0.002019
722	01/01/2000 02:22:00	0.00154
722	01/01/2000 02:23:00	0.001294
722	01/01/2000 02:24:00	0.001168
722	01/01/2000 02:25:00	0.001104
722	01/01/2000 02:26:00	0.001071
722	01/01/2000 02:27:00	0.001054
722	01/01/2000 02:28:00	0.001046
722	01/01/2000 02:29:00	0.001041
722	01/01/2000 02:30:00	0.001039
722	01/01/2000 02:31:00	0.001025
722	01/01/2000 02:32:00	0.001
722	01/01/2000 02:33:00	0.000978
722	01/01/2000 02:34:00	0.000963
722	01/01/2000 02:35:00	0.000954
722	01/01/2000 02:36:00	0.000948
722	01/01/2000 02:37:00	0.000945
722	01/01/2000 02:38:00	0.000943
722	01/01/2000 02:39:00	0.000942
722	01/01/2000 02:40:00	0.000941
722	01/01/2000 02:41:00	0.000931
722	01/01/2000 02:42:00	0.00091
722	01/01/2000 02:43:00	0.000893
722	01/01/2000 02:44:00	0.000881
722	01/01/2000 02:45:00	0.000873
722	01/01/2000 02:46:00	0.000868
722	01/01/2000 02:47:00	0.000866
722	01/01/2000 02:48:00	0.000864
722	01/01/2000 02:49:00	0.000863
722	01/01/2000 02:50:00	0.000863
722	01/01/2000 02:51:00	0.000854
722	01/01/2000 02:52:00	0.000837
722	01/01/2000 02:53:00	0.000822
722	01/01/2000 02:54:00	0.000812
722	01/01/2000 02:55:00	0.000806
722	01/01/2000 02:56:00	0.000802
722	01/01/2000 02:57:00	0.0008
722	01/01/2000 02:58:00	0.000798
722	01/01/2000 02:59:00	0.000798
722	01/01/2000 03:00:00	0.000797
722	01/01/2000 03:01:00	0.000693
722	01/01/2000 03:02:00	0.000487
722	01/01/2000 03:03:00	0.00031
722	01/01/2000 03:04:00	0.000187
722	01/01/2000 03:05:00	0.000109
722	01/01/2000 03:06:00	6.2E-05
722	01/01/2000 03:07:00	3.4E-05
722	01/01/2000 03:08:00	1.9E-05
722	01/01/2000 03:09:00	1E-05
722	01/01/2000 03:10:00	0
722	01/01/2000 03:11:00	0
722	01/01/2000 03:12:00	0
722	01/01/2000 03:13:00	0
722	01/01/2000 03:14:00	0
722	01/01/2000 03:15:00	0
722	01/01/2000 03:16:00	0
722	01/01/2000 03:17:00	0
722	01/01/2000 03:18:00	0
722	01/01/2000 03:19:00	0
722	01/01/2000 03:20:00	0
722	01/01/2000 03:21:00	0
722	01/01/2000 03:22:00	0
722	01/01/2000 03:23:00	0
722	01/01/2000 03:24:00	0
722	01/01/2000 03:25:00	0
722	01/01/2000 03:26:00	0
722	01/01/2000 03:27:00	0
722	01/01/2000 03:28:00	0
722	01/01/2000 03:29:00	0
722	01/01/2000 03:30:00	0
722	01/01/2000 03:31:00	0
722	01/01/2000 03:32:00	0
722	01/01/2000 03:33:00	0
722	01/01/2000 03:34:00	0
722	01/01/2000 03:35:00	0
722	01/01/2000 03:36:00	0
722	01/01/2000 03:37:00	0
722	01/01/2000 03:38:00	0
722	01/01/2000 03:39:00	0
722	01/01/2000 03:40:00	0
722	01/01/2000 03:41:00	0
722	01/01/2000 03:42:00	0
722	01/01/2000 03:43:00	0
722	01/01/2000 03:44:00	0
722	01/01/2000 03:45:00	0
722	01/01/2000 03:46:00	0
722	01/01/2000 03:47:00	0
722	01/01/2000 03:48:00	0
722	01/01/2000 03:49:00	0
722	01/01/2000 03:50:00	0
722	01/01/2000 03:51:00	0
722	01/01/2000 03:52:00	0
722	01/01/2000 03:53:00	0
722	01/01/2000 03:54:00	0
722	01/01/2000 03:55:00	0
722	01/01/2000 03:56:00	0
722	01/01/2000 03:57:00	0
722	01/01/2000 03:58:00	0
722	01/01/2000 03:59:00	0
722	01/01/2000 04:00:00	0
722	01/01/2000 04:01:00	0
722	01/01/2000 04:02:00	0
722	01/01/2000 04:03:00	0
722	01/01/2000 04:04:00	0
722	01/01/2000 04:05:00	0
722	01/01/2000 04:06:00	0
722	01/01/2000 04:07:00	0
722	01/01/2000 04:08:00	0
722	01/01/2000 04:09:00	0
722	01/01/2000 04:10:00	0
722	01/01/2000 04:11:00	0
722	01/01/2000 04:12:00	0
722	01/01/2000 04:13:00	0
722	01/01/2000 04:14:00	0
722	01/01/2000 04:15:00	0
722	01/01/2000 04:16:00	0

;Flow (m³/s)

723E	01/01/2000 00:00:00	0
723E	01/01/2000 00:01:00	0

723E	01/01/2000 00:02:00	0
723E	01/01/2000 00:03:00	0
723E	01/01/2000 00:04:00	0
723E	01/01/2000 00:05:00	0
723E	01/01/2000 00:06:00	0
723E	01/01/2000 00:07:00	0
723E	01/01/2000 00:08:00	0
723E	01/01/2000 00:09:00	0
723E	01/01/2000 00:10:00	0
723E	01/01/2000 00:11:00	0
723E	01/01/2000 00:12:00	0
723E	01/01/2000 00:13:00	0
723E	01/01/2000 00:14:00	0
723E	01/01/2000 00:15:00	0.000418
723E	01/01/2000 00:16:00	0.00184
723E	01/01/2000 00:17:00	0.003536
723E	01/01/2000 00:18:00	0.004512
723E	01/01/2000 00:19:00	0.004987
723E	01/01/2000 00:20:00	0.005258
723E	01/01/2000 00:21:00	0.005668
723E	01/01/2000 00:22:00	0.006432
723E	01/01/2000 00:23:00	0.006966
723E	01/01/2000 00:24:00	0.007184
723E	01/01/2000 00:25:00	0.007331
723E	01/01/2000 00:26:00	0.007393
723E	01/01/2000 00:27:00	0.007433
723E	01/01/2000 00:28:00	0.007451
723E	01/01/2000 00:29:00	0.007462
723E	01/01/2000 00:30:00	0.007467
723E	01/01/2000 00:31:00	0.008082
723E	01/01/2000 00:32:00	0.009613
723E	01/01/2000 00:33:00	0.010719
723E	01/01/2000 00:34:00	0.011155
723E	01/01/2000 00:35:00	0.011459
723E	01/01/2000 00:36:00	0.011582
723E	01/01/2000 00:37:00	0.011666
723E	01/01/2000 00:38:00	0.011701
723E	01/01/2000 00:39:00	0.011724
723E	01/01/2000 00:40:00	0.011734
723E	01/01/2000 00:41:00	0.014811
723E	01/01/2000 00:42:00	0.022498
723E	01/01/2000 00:43:00	0.029103
723E	01/01/2000 00:44:00	0.033094
723E	01/01/2000 00:45:00	0.036471
723E	01/01/2000 00:46:00	0.039196
723E	01/01/2000 00:47:00	0.041808
723E	01/01/2000 00:48:00	0.04408
723E	01/01/2000 00:49:00	0.046159
723E	01/01/2000 00:50:00	0.048058
723E	01/01/2000 00:51:00	0.070759
723E	01/01/2000 00:52:00	0.108775
723E	01/01/2000 00:53:00	0.112928
723E	01/01/2000 00:54:00	0.118555
723E	01/01/2000 00:55:00	0.125512
723E	01/01/2000 00:56:00	0.129745
723E	01/01/2000 00:57:00	0.130572
723E	01/01/2000 00:58:00	0.131467
723E	01/01/2000 00:59:00	0.132411
723E	01/01/2000 01:00:00	0.133408
723E	01/01/2000 01:01:00	0.134262
723E	01/01/2000 01:02:00	0.134811
723E	01/01/2000 01:03:00	0.135198
723E	01/01/2000 01:04:00	0.135464
723E	01/01/2000 01:05:00	0.135645
723E	01/01/2000 01:06:00	0.135764
723E	01/01/2000 01:07:00	0.135829
723E	01/01/2000 01:08:00	0.135852
723E	01/01/2000 01:09:00	0.135842
723E	01/01/2000 01:10:00	0.135807
723E	01/01/2000 01:11:00	0.135741
723E	01/01/2000 01:12:00	0.135626
723E	01/01/2000 01:13:00	0.13546
723E	01/01/2000 01:14:00	0.135254
723E	01/01/2000 01:15:00	0.13502
723E	01/01/2000 01:16:00	0.132816
723E	01/01/2000 01:17:00	0.129967
723E	01/01/2000 01:18:00	0.127488
723E	01/01/2000 01:19:00	0.125315
723E	01/01/2000 01:20:00	0.123312
723E	01/01/2000 01:21:00	0.121464
723E	01/01/2000 01:22:00	0.119727
723E	01/01/2000 01:23:00	0.118073
723E	01/01/2000 01:24:00	0.116482
723E	01/01/2000 01:25:00	0.114936
723E	01/01/2000 01:26:00	0.113421
723E	01/01/2000 01:27:00	0.111903
723E	01/01/2000 01:28:00	0.110539
723E	01/01/2000 01:29:00	0.109307
723E	01/01/2000 01:30:00	0.108189
723E	01/01/2000 01:31:00	0.107128
723E	01/01/2000 01:32:00	0.106107
723E	01/01/2000 01:33:00	0.105405
723E	01/01/2000 01:34:00	0.022756
723E	01/01/2000 01:35:00	0.023844
723E	01/01/2000 01:36:00	0.021863
723E	01/01/2000 01:37:00	0.021661
723E	01/01/2000 01:38:00	0.020798
723E	01/01/2000 01:39:00	0.020464
723E	01/01/2000 01:40:00	0.020018
723E	01/01/2000 01:41:00	0.01934
723E	01/01/2000 01:42:00	0.01807
723E	01/01/2000 01:43:00	0.016919
723E	01/01/2000 01:44:00	0.016116
723E	01/01/2000 01:45:00	0.015505
723E	01/01/2000 01:46:00	0.015018
723E	01/01/2000 01:47:00	0.014605
723E	01/01/2000 01:48:00	0.014281
723E	01/01/2000 01:49:00	0.014024
723E	01/01/2000 01:50:00	0.013818
723E	01/01/2000 01:51:00	0.013382
723E	01/01/2000 01:52:00	0.012581
723E	01/01/2000 01:53:00	0.011837
723E	01/01/2000 01:54:00	0.011328
723E	01/01/2000 01:55:00	0.010937
723E	01/01/2000 01:56:00	0.010629
723E	01/01/2000 01:57:00	0.010364
723E	01/01/2000 01:58:00	0.010158
723E	01/01/2000 01:59:00	0.009995
723E	01/01/2000 02:00:00	0.009863
723E	01/01/2000 02:01:00	0.009566
723E	01/01/2000 02:02:00	0.009006
723E	01/01/2000 02:03:00	0.008483
723E	01/01/2000 02:04:00	0.008127
723E	01/01/2000 02:05:00	0.007853
723E	01/01/2000 02:06:00	0.007638
723E	01/01/2000 02:07:00	0.007453
723E	01/01/2000 02:08:00	0.007308
723E	01/01/2000 02:09:00	0.007192
723E	01/01/2000 02:10:00	0.0071
723E	01/01/2000 02:11:00	0.00691
723E	01/01/2000 02:12:00	0.006565
723E	01/01/2000 02:13:00	0.006282
723E	01/01/2000 02:14:00	0.006111
723E	01/01/2000 02:15:00	0.005969
723E	01/01/2000 02:16:00	0.00586
723E	01/01/2000 02:17:00	0.005756
723E	01/01/2000 02:18:00	0.005675
723E	01/01/2000 02:19:00	0.005609
723E	01/01/2000 02:20:00	0.005553
723E	01/01/2000 02:21:00	0.00543
723E	01/01/2000 02:22:00	0.005197
723E	01/01/2000 02:23:00	0.005023
723E	01/01/2000 02:24:00	0.004938
723E	01/01/2000 02:25:00	0.004875
723E	01/01/2000 02:26:00	0.004835
723E	01/01/2000 02:27:00	0.004804
723E	01/01/2000 02:28:00	0.004782
723E	01/01/2000 02:29:00	0.004763
723E	01/01/2000 02:30:00	0.004749
723E	01/01/2000 02:31:00	0.004675
723E	01/01/2000 02:32:00	0.004511
723E	01/01/2000 02:33:00	0.00439
723E	01/01/2000 02:34:00	0.00434
723E	01/01/2000 02:35:00	0.004303
723E	01/01/2000 02:36:00	0.004284
723E	01/01/2000 02:37:00	0.004272
723E	01/01/2000 02:38:00	0.004264
723E	01/01/2000 02:39:00	0.004259
723E	01/01/2000 02:40:00	0.004255
723E	01/01/2000 02:41:00	0.004202
723E	01/01/2000 02:42:00	0.004073
723E	01/01/2000 02:43:00	0.00398
723E	01/01/2000 02:44:00	0.003942
723E	01/01/2000 02:45:00	0.003916
723E	01/01/2000 02:46:00	0.003894
723E	01/01/2000 02:47:00	0.003887
723E	01/01/2000 02:48:00	0.003885
723E	01/01/2000 02:49:00	0.003883
723E	01/01/2000 02:50:00	0.003882
723E	01/01/2000 02:51:00	0.003839
723E	01/01/2000 02:52:00	0.003733
723E	01/01/2000 02:53:00	0.003657
723E	01/01/2000 02:54:00	0.003627
723E	01/01/2000 02:55:00	0.003606
723E	01/01/2000 02:56:00	0.003597
723E	01/01/2000 02:57:00	0.003592
723E	01/01/2000 02:58:00	0.003589
723E	01/01/2000 02:59:00	0.003588
723E	01/01/2000 03:00:00	0.003587
723E	01/01/2000 03:01:00	0.003073
723E	01/01/2000 03:02:00	0.001789
723E	01/01/2000 03:03:00	0.000862
723E	01/01/2000 03:04:00	0.000497
723E	01/01/2000 03:05:00	0.000241
723E	01/01/2000 03:06:00	0.000138
723E	01/01/2000 03:07:00	6.8E-05
723E	01/01/2000 03:08:00	3.8E-05
723E	01/01/2000 03:09:00	1.9E-05
723E	01/01/2000 03:10:00	1.1E-05
723E	01/01/2000 03:11:00	0
723E	01/01/2000 03:12:00	0
723E	01/01/2000 03:13:00	0
723E	01/01/2000 03:14:00	0
723E	01/01/2000 03:15:00	0
723E	01/01/2000 03:16:00	0
723E	01/01/2000 03:17:00	0
723E	01/01/2000 03:18:00	0
723E	01/01/2000 03:19:00	0
723E	01/01/2000 03:20:00	0
723E	01/01/2000 03:21:00	0
723E	01/01/2000 03:22:00	0
723E	01/01/2000 03:23:00	0
723E	01/01/2000 03:24:00	0
723E	01/01/2000 03:25:00	0
723E	01/01/2000 03:26:00	0
723E	01/01/2000 03:27:00	0
723E	01/01/2000 03:28:00	0
723E	01/01/2000 03:29:00	0
723E	01/01/2000 03:30:00	0
723E	01/01/2000 03:31:00	0
723E	01/01/2000 03:32:00	0
723E	01/01/2000 03:33:00	0
723E	01/01/2000 03:34:00	0
723E	01/01/2000 03:35:00	0
723E	01/01/2000 03:36:00	0
723E	01/01/2000 03:37:00	0
723E	01/01/2000 03:38:00	0
723E	01/01/2000 03:39:00	0
723E	01/01/2000 03:40:00	0
723E	01/01/2000 03:41:00	0
723E	01/01/2000 03:42:00	0
723E	01/01/2000 03:43:00	0
723E	01/01/2000 03:44:00	0
723E	01/01/2000 03:45:00	0
723E	01/01/2000 03:46:00	0
723E	01/01/2000 03:47:00	0
723E	01/01/2000 03:48:00	0
723E	01/01/2000 03:49:00	0
723E	01/01/2000 03:50:00	0
723E	01/01/2000 03:51:00	0
723E	01/01/2000 03:52:00	0
723E	01/01/2000 03:53:00	0
723E	01/01/2000 03:54:00	0
723E	01/01/2000 03:55:00	0
723E	01/01/2000 03:56:00	0
723E	01/01/2000 03:57:00	0
723E	01/01/2000 03:58:00	0
723E	01/01/2000 03:59:00	0
723E	01/01/2000 04:00:00	0
723E	01/01/2000 04:01:00	0
723E	01/01/2000 04:02:00	0
723E	01/01/2000 04:03:00	0
723E	01/01/2000 04:04:00	0
723E	01/01/2000 04:05:00	0
723E	01/01/2000 04:06:00	0
723E	01/01/2000 04:07:00	0
723E	01/01/2000 04:08:00	0
723E	01/01/2000 04:09:00	0
723E	01/01/2000 04:10:00	0
723E	01/01/2000 04:11:00	0
723E	01/01/2000 04:12:00	0
723E	01/01/2000 04:13:00	0
723E	01/01/2000 04:14:00	0
723E	01/01/2000 04:15:00	0
723E	01/01/2000 04:16:00	0

;Flow (m³/s)

723W	01/01/2000 00:00:00	0
723W	01/01/2000 00:01:00	0
723W	01/01/2000 00:02:00	0
723W	01/01/2000 00:03:00	0
723W	01/01/2000 00:04:00	0
723W	01/01/2000 00:05:00	0
723W	01/01/2000 00:06:00	0
723W	01/01/2000 00:07:00	0
723W	01/01/2000 00:08:00	0
723W	01/01/2000 00:09:00	0
723W	01/01/2000 00:10:00	0
723W	01/01/2000 00:11:00	0
723W	01/01/2000 00:12:00	0
723W	01/01/2000 00:13:00	0
723W	01/01/2000 00:14:00	0
723W	01/01/2000 00:15:00	0.000108
723W	01/01/2000 00:16:00	0.000544
723W	01/01/2000 00:17:00	0.001233
723W	01/01/2000 00:18:00	0.001815
723W	01/01/2000 00:19:00	0.002159
723W	01/01/2000 00:20:00	0.002348
723W	01/01/2000 00:21:00	0.00252
723W	01/01/2000 00:22:00	0.002799
723W	01/01/2000 00:23:00	0.003081
723W	01/01/2000 00:24:00	0.003252
723W	01/01/2000 00:25:00	0.003347
723W	01/01/2000 00:26:00	0.003398
723W	01/01/2000 00:27:00	0.003425
723W	01/01/2000 00:28:00	0.00344
723W	01/01/2000 00:29:00	0.003448
723W	01/01/2000 00:30:00	0.003452
723W	01/01/2000 00:31:00	0.003612
723W	01/01/2000 00:32:00	0.00411
723W	01/01/2000 00:33:00	0.004672
723W	01/01/2000 00:34:00	0.005018
723W	01/01/2000 00:35:00	0.005211
723W	01/01/2000 00:36:00	0.005314
723W	01/01/2000 00:37:00	0.00537
723W	01/01/2000 00:38:00	0.0054
723W	01/01/2000 00:39:00	0.005416
723W	01/01/2000 00:40:00	0.005424

723W	01/01/2000 00:41:00	0.006159
723W	01/01/2000 00:42:00	0.008479
723W	01/01/2000 00:43:00	0.011246
723W	01/01/2000 00:44:00	0.013301
723W	01/01/2000 00:45:00	0.014801
723W	01/01/2000 00:46:00	0.0159
723W	01/01/2000 00:47:00	0.01675
723W	01/01/2000 00:48:00	0.017245
723W	01/01/2000 00:49:00	0.017666
723W	01/01/2000 00:50:00	0.018132
723W	01/01/2000 00:51:00	0.021156
723W	01/01/2000 00:52:00	0.023097
723W	01/01/2000 00:53:00	0.023321
723W	01/01/2000 00:54:00	0.023634
723W	01/01/2000 00:55:00	0.024
723W	01/01/2000 00:56:00	0.024
723W	01/01/2000 00:57:00	0.024
723W	01/01/2000 00:58:00	0.024
723W	01/01/2000 00:59:00	0.024
723W	01/01/2000 01:00:00	0.024
723W	01/01/2000 01:01:00	0.024
723W	01/01/2000 01:02:00	0.024
723W	01/01/2000 01:03:00	0.024
723W	01/01/2000 01:04:00	0.024
723W	01/01/2000 01:05:00	0.024
723W	01/01/2000 01:06:00	0.024
723W	01/01/2000 01:07:00	0.024
723W	01/01/2000 01:08:00	0.024
723W	01/01/2000 01:09:00	0.024
723W	01/01/2000 01:10:00	0.024
723W	01/01/2000 01:11:00	0.024
723W	01/01/2000 01:12:00	0.024
723W	01/01/2000 01:13:00	0.024
723W	01/01/2000 01:14:00	0.024
723W	01/01/2000 01:15:00	0.024
723W	01/01/2000 01:16:00	0.024
723W	01/01/2000 01:17:00	0.024
723W	01/01/2000 01:18:00	0.024
723W	01/01/2000 01:19:00	0.024
723W	01/01/2000 01:20:00	0.024
723W	01/01/2000 01:21:00	0.024
723W	01/01/2000 01:22:00	0.024
723W	01/01/2000 01:23:00	0.024
723W	01/01/2000 01:24:00	0.024
723W	01/01/2000 01:25:00	0.024
723W	01/01/2000 01:26:00	0.024
723W	01/01/2000 01:27:00	0.024
723W	01/01/2000 01:28:00	0.024
723W	01/01/2000 01:29:00	0.024
723W	01/01/2000 01:30:00	0.024
723W	01/01/2000 01:31:00	0.024
723W	01/01/2000 01:32:00	0.024
723W	01/01/2000 01:33:00	0.024
723W	01/01/2000 01:34:00	0.024
723W	01/01/2000 01:35:00	0.024
723W	01/01/2000 01:36:00	0.024
723W	01/01/2000 01:37:00	0.024
723W	01/01/2000 01:38:00	0.023975
723W	01/01/2000 01:39:00	0.023874
723W	01/01/2000 01:40:00	0.023774
723W	01/01/2000 01:41:00	0.023673
723W	01/01/2000 01:42:00	0.023571
723W	01/01/2000 01:43:00	0.023468
723W	01/01/2000 01:44:00	0.023363
723W	01/01/2000 01:45:00	0.023258
723W	01/01/2000 01:46:00	0.023152
723W	01/01/2000 01:47:00	0.023046
723W	01/01/2000 01:48:00	0.018298
723W	01/01/2000 01:49:00	0.008146
723W	01/01/2000 01:50:00	0.00545
723W	01/01/2000 01:51:00	0.004945
723W	01/01/2000 01:52:00	0.004672
723W	01/01/2000 01:53:00	0.004412
723W	01/01/2000 01:54:00	0.004202
723W	01/01/2000 01:55:00	0.00404
723W	01/01/2000 01:56:00	0.003927
723W	01/01/2000 01:57:00	0.003849
723W	01/01/2000 01:58:00	0.003795
723W	01/01/2000 01:59:00	0.003757
723W	01/01/2000 02:00:00	0.003731
723W	01/01/2000 02:01:00	0.003669
723W	01/01/2000 02:02:00	0.003521
723W	01/01/2000 02:03:00	0.003344
723W	01/01/2000 02:04:00	0.003196
723W	01/01/2000 02:05:00	0.00308
723W	01/01/2000 02:06:00	0.002999
723W	01/01/2000 02:07:00	0.002943
723W	01/01/2000 02:08:00	0.002904
723W	01/01/2000 02:09:00	0.002876
723W	01/01/2000 02:10:00	0.002857
723W	01/01/2000 02:11:00	0.002816
723W	01/01/2000 02:12:00	0.00272
723W	01/01/2000 02:13:00	0.002614
723W	01/01/2000 02:14:00	0.002542
723W	01/01/2000 02:15:00	0.002495
723W	01/01/2000 02:16:00	0.002466
723W	01/01/2000 02:17:00	0.002447
723W	01/01/2000 02:18:00	0.002436
723W	01/01/2000 02:19:00	0.002428
723W	01/01/2000 02:20:00	0.002423
723W	01/01/2000 02:21:00	0.002399
723W	01/01/2000 02:22:00	0.002334
723W	01/01/2000 02:23:00	0.002261
723W	01/01/2000 02:24:00	0.002216
723W	01/01/2000 02:25:00	0.002191
723W	01/01/2000 02:26:00	0.002177
723W	01/01/2000 02:27:00	0.002169
723W	01/01/2000 02:28:00	0.002165
723W	01/01/2000 02:29:00	0.002163
723W	01/01/2000 02:30:00	0.002162
723W	01/01/2000 02:31:00	0.002145
723W	01/01/2000 02:32:00	0.002094
723W	01/01/2000 02:33:00	0.002037
723W	01/01/2000 02:34:00	0.002002
723W	01/01/2000 02:35:00	0.001983
723W	01/01/2000 02:36:00	0.001972
723W	01/01/2000 02:37:00	0.001966
723W	01/01/2000 02:38:00	0.001963
723W	01/01/2000 02:39:00	0.001962
723W	01/01/2000 02:40:00	0.001961
723W	01/01/2000 02:41:00	0.001947
723W	01/01/2000 02:42:00	0.001906
723W	01/01/2000 02:43:00	0.00186
723W	01/01/2000 02:44:00	0.001831
723W	01/01/2000 02:45:00	0.001815
723W	01/01/2000 02:46:00	0.001807
723W	01/01/2000 02:47:00	0.001802
723W	01/01/2000 02:48:00	0.001799
723W	01/01/2000 02:49:00	0.001798
723W	01/01/2000 02:50:00	0.001797
723W	01/01/2000 02:51:00	0.001786
723W	01/01/2000 02:52:00	0.001752
723W	01/01/2000 02:53:00	0.001713
723W	01/01/2000 02:54:00	0.001689
723W	01/01/2000 02:55:00	0.001676
723W	01/01/2000 02:56:00	0.001669
723W	01/01/2000 02:57:00	0.001665
723W	01/01/2000 02:58:00	0.001663
723W	01/01/2000 02:59:00	0.001662
723W	01/01/2000 03:00:00	0.001661
723W	01/01/2000 03:01:00	0.001528
723W	01/01/2000 03:02:00	0.001111
723W	01/01/2000 03:03:00	0.00064
723W	01/01/2000 03:04:00	0.000349
723W	01/01/2000 03:05:00	0.000187
723W	01/01/2000 03:06:00	0.0001
723W	01/01/2000 03:07:00	5.4E-05
723W	01/01/2000 03:08:00	2.9E-05
723W	01/01/2000 03:09:00	1.5E-05
723W	01/01/2000 03:10:00	0
723W	01/01/2000 03:11:00	0
723W	01/01/2000 03:12:00	0
723W	01/01/2000 03:13:00	0
723W	01/01/2000 03:14:00	0
723W	01/01/2000 03:15:00	0
723W	01/01/2000 03:16:00	0
723W	01/01/2000 03:17:00	0
723W	01/01/2000 03:18:00	0
723W	01/01/2000 03:19:00	0
723W	01/01/2000 03:20:00	0
723W	01/01/2000 03:21:00	0
723W	01/01/2000 03:22:00	0
723W	01/01/2000 03:23:00	0
723W	01/01/2000 03:24:00	0
723W	01/01/2000 03:25:00	0
723W	01/01/2000 03:26:00	0
723W	01/01/2000 03:27:00	0
723W	01/01/2000 03:28:00	0
723W	01/01/2000 03:29:00	0
723W	01/01/2000 03:30:00	0
723W	01/01/2000 03:31:00	0
723W	01/01/2000 03:32:00	0
723W	01/01/2000 03:33:00	0
723W	01/01/2000 03:34:00	0
723W	01/01/2000 03:35:00	0
723W	01/01/2000 03:36:00	0
723W	01/01/2000 03:37:00	0
723W	01/01/2000 03:38:00	0
723W	01/01/2000 03:39:00	0
723W	01/01/2000 03:40:00	0
723W	01/01/2000 03:41:00	0
723W	01/01/2000 03:42:00	0
723W	01/01/2000 03:43:00	0
723W	01/01/2000 03:44:00	0
723W	01/01/2000 03:45:00	0
723W	01/01/2000 03:46:00	0
723W	01/01/2000 03:47:00	0
723W	01/01/2000 03:48:00	0
723W	01/01/2000 03:49:00	0
723W	01/01/2000 03:50:00	0
723W	01/01/2000 03:51:00	0
723W	01/01/2000 03:52:00	0
723W	01/01/2000 03:53:00	0
723W	01/01/2000 03:54:00	0
723W	01/01/2000 03:55:00	0
723W	01/01/2000 03:56:00	0
723W	01/01/2000 03:57:00	0
723W	01/01/2000 03:58:00	0
723W	01/01/2000 03:59:00	0
723W	01/01/2000 04:00:00	0
723W	01/01/2000 04:01:00	0
723W	01/01/2000 04:02:00	0
723W	01/01/2000 04:03:00	0
723W	01/01/2000 04:04:00	0
723W	01/01/2000 04:05:00	0
723W	01/01/2000 04:06:00	0
723W	01/01/2000 04:07:00	0
723W	01/01/2000 04:08:00	0
723W	01/01/2000 04:09:00	0
723W	01/01/2000 04:10:00	0
723W	01/01/2000 04:11:00	0
723W	01/01/2000 04:12:00	0
723W	01/01/2000 04:13:00	0
723W	01/01/2000 04:14:00	0
723W	01/01/2000 04:15:00	0
723W	01/01/2000 04:16:00	0

;Flow (m³/s)

724	01/01/2000 00:00:00	0
724	01/01/2000 00:01:00	0
724	01/01/2000 00:02:00	0
724	01/01/2000 00:03:00	0
724	01/01/2000 00:04:00	0
724	01/01/2000 00:05:00	0
724	01/01/2000 00:06:00	0
724	01/01/2000 00:07:00	0
724	01/01/2000 00:08:00	0
724	01/01/2000 00:09:00	0
724	01/01/2000 00:10:00	0
724	01/01/2000 00:11:00	0
724	01/01/2000 00:12:00	0
724	01/01/2000 00:13:00	0
724	01/01/2000 00:14:00	0
724	01/01/2000 00:15:00	0.000309
724	01/01/2000 00:16:00	0.000699
724	01/01/2000 00:17:00	0.000842
724	01/01/2000 00:18:00	0.000894
724	01/01/2000 00:19:00	0.000913
724	01/01/2000 00:20:00	0.00092
724	01/01/2000 00:21:00	0.001126
724	01/01/2000 00:22:00	0.001201
724	01/01/2000 00:23:00	0.001229
724	01/01/2000 00:24:00	0.001239
724	01/01/2000 00:25:00	0.001242
724	01/01/2000 00:26:00	0.001244
724	01/01/2000 00:27:00	0.001244
724	01/01/2000 00:28:00	0.001244
724	01/01/2000 00:29:00	0.001244
724	01/01/2000 00:30:00	0.001244
724	01/01/2000 00:31:00	0.001696
724	01/01/2000 00:32:00	0.001861
724	01/01/2000 00:33:00	0.001922
724	01/01/2000 00:34:00	0.001944
724	01/01/2000 00:35:00	0.001952
724	01/01/2000 00:36:00	0.001955
724	01/01/2000 00:37:00	0.001956
724	01/01/2000 00:38:00	0.001956
724	01/01/2000 00:39:00	0.001956
724	01/01/2000 00:40:00	0.001956
724	01/01/2000 00:41:00	0.003925
724	01/01/2000 00:42:00	0.004731
724	01/01/2000 00:43:00	0.005158
724	01/01/2000 00:44:00	0.005495
724	01/01/2000 00:45:00	0.00576
724	01/01/2000 00:46:00	0.00599
724	01/01/2000 00:47:00	0.006199
724	01/01/2000 00:48:00	0.006394
724	01/01/2000 00:49:00	0.006576
724	01/01/2000 00:50:00	0.006746
724	01/01/2000 00:51:00	0.018366
724	01/01/2000 00:52:00	0.023905
724	01/01/2000 00:53:00	0.027684
724	01/01/2000 00:54:00	0.031284
724	01/01/2000 00:55:00	0.033884
724	01/01/2000 00:56:00	0.035843
724	01/01/2000 00:57:00	0.037353
724	01/01/2000 00:58:00	0.038532
724	01/01/2000 00:59:00	0.039459
724	01/01/2000 01:00:00	0.04
724	01/01/2000 01:01:00	0.030427
724	01/01/2000 01:02:00	0.026025
724	01/01/2000 01:03:00	0.023111
724	01/01/2000 01:04:00	0.02028
724	01/01/2000 01:05:00	0.018287
724	01/01/2000 01:06:00	0.01682
724	01/01/2000 01:07:00	0.015716
724	01/01/2000 01:08:00	0.014877
724	01/01/2000 01:09:00	0.014238
724	01/01/2000 01:10:00	0.01375
724	01/01/2000 01:11:00	0.011157
724	01/01/2000 01:12:00	0.009831
724	01/01/2000 01:13:00	0.008913
724	01/01/2000 01:14:00	0.008081
724	01/01/2000 01:15:00	0.007482
724	01/01/2000 01:16:00	0.007038
724	01/01/2000 01:17:00	0.006703
724	01/01/2000 01:18:00	0.006449
724	01/01/2000 01:19:00	0.006257

724	01/01/2000 01:20:00	0.006111
724	01/01/2000 01:21:00	0.005248
724	01/01/2000 01:22:00	0.004811
724	01/01/2000 01:23:00	0.004511
724	01/01/2000 01:24:00	0.004239
724	01/01/2000 01:25:00	0.004044
724	01/01/2000 01:26:00	0.003901
724	01/01/2000 01:27:00	0.003794
724	01/01/2000 01:28:00	0.003713
724	01/01/2000 01:29:00	0.003653
724	01/01/2000 01:30:00	0.003608
724	01/01/2000 01:31:00	0.0032
724	01/01/2000 01:32:00	0.003
724	01/01/2000 01:33:00	0.002864
724	01/01/2000 01:34:00	0.002739
724	01/01/2000 01:35:00	0.00265
724	01/01/2000 01:36:00	0.002585
724	01/01/2000 01:37:00	0.002536
724	01/01/2000 01:38:00	0.0025
724	01/01/2000 01:39:00	0.002473
724	01/01/2000 01:40:00	0.002454
724	01/01/2000 01:41:00	0.002217
724	01/01/2000 01:42:00	0.002102
724	01/01/2000 01:43:00	0.002024
724	01/01/2000 01:44:00	0.001951
724	01/01/2000 01:45:00	0.0019
724	01/01/2000 01:46:00	0.001862
724	01/01/2000 01:47:00	0.001834
724	01/01/2000 01:48:00	0.001813
724	01/01/2000 01:49:00	0.001798
724	01/01/2000 01:50:00	0.001786
724	01/01/2000 01:51:00	0.00163
724	01/01/2000 01:52:00	0.001554
724	01/01/2000 01:53:00	0.001503
724	01/01/2000 01:54:00	0.001455
724	01/01/2000 01:55:00	0.001421
724	01/01/2000 01:56:00	0.001396
724	01/01/2000 01:57:00	0.001377
724	01/01/2000 01:58:00	0.001363
724	01/01/2000 01:59:00	0.001352
724	01/01/2000 02:00:00	0.001344
724	01/01/2000 02:01:00	0.001234
724	01/01/2000 02:02:00	0.00118
724	01/01/2000 02:03:00	0.001143
724	01/01/2000 02:04:00	0.001109
724	01/01/2000 02:05:00	0.001085
724	01/01/2000 02:06:00	0.001067
724	01/01/2000 02:07:00	0.001053
724	01/01/2000 02:08:00	0.001043
724	01/01/2000 02:09:00	0.001035
724	01/01/2000 02:10:00	0.001029
724	01/01/2000 02:11:00	0.00095
724	01/01/2000 02:12:00	0.000918
724	01/01/2000 02:13:00	0.000902
724	01/01/2000 02:14:00	0.000892
724	01/01/2000 02:15:00	0.000885
724	01/01/2000 02:16:00	0.000881
724	01/01/2000 02:17:00	0.000878
724	01/01/2000 02:18:00	0.000875
724	01/01/2000 02:19:00	0.000874
724	01/01/2000 02:20:00	0.000872
724	01/01/2000 02:21:00	0.000814
724	01/01/2000 02:22:00	0.000792
724	01/01/2000 02:23:00	0.000784
724	01/01/2000 02:24:00	0.000781
724	01/01/2000 02:25:00	0.000779
724	01/01/2000 02:26:00	0.000779
724	01/01/2000 02:27:00	0.000778
724	01/01/2000 02:28:00	0.000778
724	01/01/2000 02:29:00	0.000778
724	01/01/2000 02:30:00	0.000778
724	01/01/2000 02:31:00	0.000732
724	01/01/2000 02:32:00	0.000715
724	01/01/2000 02:33:00	0.000709
724	01/01/2000 02:34:00	0.000707
724	01/01/2000 02:35:00	0.000706
724	01/01/2000 02:36:00	0.000706
724	01/01/2000 02:37:00	0.000706
724	01/01/2000 02:38:00	0.000706
724	01/01/2000 02:39:00	0.000706
724	01/01/2000 02:40:00	0.000706
724	01/01/2000 02:41:00	0.000668
724	01/01/2000 02:42:00	0.000655
724	01/01/2000 02:43:00	0.00065
724	01/01/2000 02:44:00	0.000648
724	01/01/2000 02:45:00	0.000647
724	01/01/2000 02:46:00	0.000647
724	01/01/2000 02:47:00	0.000647
724	01/01/2000 02:48:00	0.000647
724	01/01/2000 02:49:00	0.000647
724	01/01/2000 02:50:00	0.000647
724	01/01/2000 02:51:00	0.000616
724	01/01/2000 02:52:00	0.000604
724	01/01/2000 02:53:00	0.0006
724	01/01/2000 02:54:00	0.000599
724	01/01/2000 02:55:00	0.000598
724	01/01/2000 02:56:00	0.000598
724	01/01/2000 02:57:00	0.000598
724	01/01/2000 02:58:00	0.000598
724	01/01/2000 02:59:00	0.000598
724	01/01/2000 03:00:00	0.000598
724	01/01/2000 03:01:00	0.000218
724	01/01/2000 03:02:00	8E-05
724	01/01/2000 03:03:00	2.9E-05
724	01/01/2000 03:04:00	1.1E-05
724	01/01/2000 03:05:00	0
724	01/01/2000 03:06:00	0
724	01/01/2000 03:07:00	0
724	01/01/2000 03:08:00	0
724	01/01/2000 03:09:00	0
724	01/01/2000 03:10:00	0
724	01/01/2000 03:11:00	0
724	01/01/2000 03:12:00	0
724	01/01/2000 03:13:00	0
724	01/01/2000 03:14:00	0
724	01/01/2000 03:15:00	0
724	01/01/2000 03:16:00	0
724	01/01/2000 03:17:00	0
724	01/01/2000 03:18:00	0
724	01/01/2000 03:19:00	0
724	01/01/2000 03:20:00	0
724	01/01/2000 03:21:00	0
724	01/01/2000 03:22:00	0
724	01/01/2000 03:23:00	0
724	01/01/2000 03:24:00	0
724	01/01/2000 03:25:00	0
724	01/01/2000 03:26:00	0
724	01/01/2000 03:27:00	0
724	01/01/2000 03:28:00	0
724	01/01/2000 03:29:00	0
724	01/01/2000 03:30:00	0
724	01/01/2000 03:31:00	0
724	01/01/2000 03:32:00	0
724	01/01/2000 03:33:00	0
724	01/01/2000 03:34:00	0
724	01/01/2000 03:35:00	0
724	01/01/2000 03:36:00	0
724	01/01/2000 03:37:00	0
724	01/01/2000 03:38:00	0
724	01/01/2000 03:39:00	0
724	01/01/2000 03:40:00	0
724	01/01/2000 03:41:00	0
724	01/01/2000 03:42:00	0
724	01/01/2000 03:43:00	0
724	01/01/2000 03:44:00	0
724	01/01/2000 03:45:00	0
724	01/01/2000 03:46:00	0
724	01/01/2000 03:47:00	0
724	01/01/2000 03:48:00	0
724	01/01/2000 03:49:00	0
724	01/01/2000 03:50:00	0
724	01/01/2000 03:51:00	0
724	01/01/2000 03:52:00	0
724	01/01/2000 03:53:00	0
724	01/01/2000 03:54:00	0
724	01/01/2000 03:55:00	0
724	01/01/2000 03:56:00	0
724	01/01/2000 03:57:00	0
724	01/01/2000 03:58:00	0
724	01/01/2000 03:59:00	0
724	01/01/2000 04:00:00	0
724	01/01/2000 04:01:00	0
724	01/01/2000 04:02:00	0
724	01/01/2000 04:03:00	0
724	01/01/2000 04:04:00	0
724	01/01/2000 04:05:00	0
724	01/01/2000 04:06:00	0
724	01/01/2000 04:07:00	0
724	01/01/2000 04:08:00	0
724	01/01/2000 04:09:00	0
724	01/01/2000 04:10:00	0
724	01/01/2000 04:11:00	0
724	01/01/2000 04:12:00	0
724	01/01/2000 04:13:00	0
724	01/01/2000 04:14:00	0
724	01/01/2000 04:15:00	0
724	01/01/2000 04:16:00	0

;Flow (m³/s)

730	01/01/2000 00:00:00	0
730	01/01/2000 00:01:00	0
730	01/01/2000 00:02:00	0
730	01/01/2000 00:03:00	0
730	01/01/2000 00:04:00	0
730	01/01/2000 00:05:00	0
730	01/01/2000 00:06:00	0
730	01/01/2000 00:07:00	0
730	01/01/2000 00:08:00	0
730	01/01/2000 00:09:00	0
730	01/01/2000 00:10:00	0
730	01/01/2000 00:11:00	0
730	01/01/2000 00:12:00	0
730	01/01/2000 00:13:00	0
730	01/01/2000 00:14:00	0
730	01/01/2000 00:15:00	8.5E-05
730	01/01/2000 00:16:00	0.000434
730	01/01/2000 00:17:00	0.001006
730	01/01/2000 00:18:00	0.001525
730	01/01/2000 00:19:00	0.001867
730	01/01/2000 00:20:00	0.002073
730	01/01/2000 00:21:00	0.00225
730	01/01/2000 00:22:00	0.0025
730	01/01/2000 00:23:00	0.002756
730	01/01/2000 00:24:00	0.002929
730	01/01/2000 00:25:00	0.003033
730	01/01/2000 00:26:00	0.003095
730	01/01/2000 00:27:00	0.003131
730	01/01/2000 00:28:00	0.003152
730	01/01/2000 00:29:00	0.003164
730	01/01/2000 00:30:00	0.003171
730	01/01/2000 00:31:00	0.003299
730	01/01/2000 00:32:00	0.0037
730	01/01/2000 00:33:00	0.00418
730	01/01/2000 00:34:00	0.004511
730	01/01/2000 00:35:00	0.004714
730	01/01/2000 00:36:00	0.004834
730	01/01/2000 00:37:00	0.004903
730	01/01/2000 00:38:00	0.004944
730	01/01/2000 00:39:00	0.004967
730	01/01/2000 00:40:00	0.004981
730	01/01/2000 00:41:00	0.005595
730	01/01/2000 00:42:00	0.007565
730	01/01/2000 00:43:00	0.01011
730	01/01/2000 00:44:00	0.012161
730	01/01/2000 00:45:00	0.013656
730	01/01/2000 00:46:00	0.014756
730	01/01/2000 00:47:00	0.015354
730	01/01/2000 00:48:00	0.015869
730	01/01/2000 00:49:00	0.016395
730	01/01/2000 00:50:00	0.016897
730	01/01/2000 00:51:00	0.019809
730	01/01/2000 00:52:00	0.021
730	01/01/2000 00:53:00	0.021
730	01/01/2000 00:54:00	0.021
730	01/01/2000 00:55:00	0.021331
730	01/01/2000 00:56:00	0.022
730	01/01/2000 00:57:00	0.022
730	01/01/2000 00:58:00	0.022
730	01/01/2000 00:59:00	0.022
730	01/01/2000 01:00:00	0.022
730	01/01/2000 01:01:00	0.022
730	01/01/2000 01:02:00	0.022
730	01/01/2000 01:03:00	0.022
730	01/01/2000 01:04:00	0.022
730	01/01/2000 01:05:00	0.022
730	01/01/2000 01:06:00	0.022161
730	01/01/2000 01:07:00	0.022313
730	01/01/2000 01:08:00	0.022405
730	01/01/2000 01:09:00	0.022431
730	01/01/2000 01:10:00	0.022401
730	01/01/2000 01:11:00	0.022331
730	01/01/2000 01:12:00	0.022231
730	01/01/2000 01:13:00	0.022112
730	01/01/2000 01:14:00	0.022
730	01/01/2000 01:15:00	0.022
730	01/01/2000 01:16:00	0.022
730	01/01/2000 01:17:00	0.022
730	01/01/2000 01:18:00	0.022
730	01/01/2000 01:19:00	0.022
730	01/01/2000 01:20:00	0.022
730	01/01/2000 01:21:00	0.022
730	01/01/2000 01:22:00	0.022
730	01/01/2000 01:23:00	0.022
730	01/01/2000 01:24:00	0.022
730	01/01/2000 01:25:00	0.022
730	01/01/2000 01:26:00	0.022
730	01/01/2000 01:27:00	0.022
730	01/01/2000 01:28:00	0.022
730	01/01/2000 01:29:00	0.022
730	01/01/2000 01:30:00	0.022
730	01/01/2000 01:31:00	0.022
730	01/01/2000 01:32:00	0.022
730	01/01/2000 01:33:00	0.022
730	01/01/2000 01:34:00	0.022
730	01/01/2000 01:35:00	0.022
730	01/01/2000 01:36:00	0.022
730	01/01/2000 01:37:00	0.022
730	01/01/2000 01:38:00	0.022
730	01/01/2000 01:39:00	0.022
730	01/01/2000 01:40:00	0.022
730	01/01/2000 01:41:00	0.022
730	01/01/2000 01:42:00	0.022
730	01/01/2000 01:43:00	0.022
730	01/01/2000 01:44:00	0.021917
730	01/01/2000 01:45:00	0.021771
730	01/01/2000 01:46:00	0.021626
730	01/01/2000 01:47:00	0.021481
730	01/01/2000 01:48:00	0.021337
730	01/01/2000 01:49:00	0.021194
730	01/01/2000 01:50:00	0.021051
730	01/01/2000 01:51:00	0.021
730	01/01/2000 01:52:00	0.021
730	01/01/2000 01:53:00	0.021
730	01/01/2000 01:54:00	0.021
730	01/01/2000 01:55:00	0.021
730	01/01/2000 01:56:00	0.021
730	01/01/2000 01:57:00	0.021
730	01/01/2000 01:58:00	0.021

730	01/01/2000 01:59:00	0.021
730	01/01/2000 02:00:00	0.020262
730	01/01/2000 02:01:00	0.010688
730	01/01/2000 02:02:00	0.004827
730	01/01/2000 02:03:00	0.003408
730	01/01/2000 02:04:00	0.00299
730	01/01/2000 02:05:00	0.002827
730	01/01/2000 02:06:00	0.002742
730	01/01/2000 02:07:00	0.002691
730	01/01/2000 02:08:00	0.002657
730	01/01/2000 02:09:00	0.002634
730	01/01/2000 02:10:00	0.002618
730	01/01/2000 02:11:00	0.002585
730	01/01/2000 02:12:00	0.002507
730	01/01/2000 02:13:00	0.002414
730	01/01/2000 02:14:00	0.002344
730	01/01/2000 02:15:00	0.002299
730	01/01/2000 02:16:00	0.00227
730	01/01/2000 02:17:00	0.002252
730	01/01/2000 02:18:00	0.00224
730	01/01/2000 02:19:00	0.002233
730	01/01/2000 02:20:00	0.002228
730	01/01/2000 02:21:00	0.002208
730	01/01/2000 02:22:00	0.002156
730	01/01/2000 02:23:00	0.002094
730	01/01/2000 02:24:00	0.002051
730	01/01/2000 02:25:00	0.002025
730	01/01/2000 02:26:00	0.002009
730	01/01/2000 02:27:00	0.002
730	01/01/2000 02:28:00	0.001995
730	01/01/2000 02:29:00	0.001992
730	01/01/2000 02:30:00	0.00199
730	01/01/2000 02:31:00	0.001976
730	01/01/2000 02:32:00	0.001935
730	01/01/2000 02:33:00	0.001886
730	01/01/2000 02:34:00	0.001853
730	01/01/2000 02:35:00	0.001832
730	01/01/2000 02:36:00	0.00182
730	01/01/2000 02:37:00	0.001813
730	01/01/2000 02:38:00	0.001809
730	01/01/2000 02:39:00	0.001806
730	01/01/2000 02:40:00	0.001805
730	01/01/2000 02:41:00	0.001794
730	01/01/2000 02:42:00	0.001761
730	01/01/2000 02:43:00	0.001721
730	01/01/2000 02:44:00	0.001693
730	01/01/2000 02:45:00	0.001677
730	01/01/2000 02:46:00	0.001667
730	01/01/2000 02:47:00	0.001661
730	01/01/2000 02:48:00	0.001657
730	01/01/2000 02:49:00	0.001656
730	01/01/2000 02:50:00	0.001654
730	01/01/2000 02:51:00	0.001645
730	01/01/2000 02:52:00	0.001617
730	01/01/2000 02:53:00	0.001584
730	01/01/2000 02:54:00	0.001561
730	01/01/2000 02:55:00	0.001547
730	01/01/2000 02:56:00	0.001539
730	01/01/2000 02:57:00	0.001534
730	01/01/2000 02:58:00	0.001531
730	01/01/2000 02:59:00	0.00153
730	01/01/2000 03:00:00	0.001529
730	01/01/2000 03:01:00	0.001424
730	01/01/2000 03:02:00	0.001089
730	01/01/2000 03:03:00	0.000687
730	01/01/2000 03:04:00	0.000409
730	01/01/2000 03:05:00	0.000239
730	01/01/2000 03:06:00	0.000139
730	01/01/2000 03:07:00	8E-05
730	01/01/2000 03:08:00	4.6E-05
730	01/01/2000 03:09:00	2.7E-05
730	01/01/2000 03:10:00	1.6E-05
730	01/01/2000 03:11:00	0
730	01/01/2000 03:12:00	0
730	01/01/2000 03:13:00	0
730	01/01/2000 03:14:00	0
730	01/01/2000 03:15:00	0
730	01/01/2000 03:16:00	0
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730	01/01/2000 03:26:00	0
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730	01/01/2000 03:58:00	0
730	01/01/2000 03:59:00	0
730	01/01/2000 04:00:00	0
730	01/01/2000 04:01:00	0
730	01/01/2000 04:02:00	0
730	01/01/2000 04:03:00	0
730	01/01/2000 04:04:00	0
730	01/01/2000 04:05:00	0
730	01/01/2000 04:06:00	0
730	01/01/2000 04:07:00	0
730	01/01/2000 04:08:00	0
730	01/01/2000 04:09:00	0
730	01/01/2000 04:10:00	0
730	01/01/2000 04:11:00	0
730	01/01/2000 04:12:00	0
730	01/01/2000 04:13:00	0
730	01/01/2000 04:14:00	0
730	01/01/2000 04:15:00	0
730	01/01/2000 04:16:00	0

;Flow (m^3/s)

731	01/01/2000 00:00:00	0
731	01/01/2000 00:01:00	0
731	01/01/2000 00:02:00	0
731	01/01/2000 00:03:00	0
731	01/01/2000 00:04:00	0
731	01/01/2000 00:05:00	0
731	01/01/2000 00:06:00	0
731	01/01/2000 00:07:00	0
731	01/01/2000 00:08:00	0
731	01/01/2000 00:09:00	0
731	01/01/2000 00:10:00	0
731	01/01/2000 00:11:00	0
731	01/01/2000 00:12:00	0
731	01/01/2000 00:13:00	0
731	01/01/2000 00:14:00	0
731	01/01/2000 00:15:00	0.000148
731	01/01/2000 00:16:00	0.000721
731	01/01/2000 00:17:00	0.001598
731	01/01/2000 00:18:00	0.002335
731	01/01/2000 00:19:00	0.002801
731	01/01/2000 00:20:00	0.003096
731	01/01/2000 00:21:00	0.003379
731	01/01/2000 00:22:00	0.003786
731	01/01/2000 00:23:00	0.004177
731	01/01/2000 00:24:00	0.004424
731	01/01/2000 00:25:00	0.00458
731	01/01/2000 00:26:00	0.004679
731	01/01/2000 00:27:00	0.004741
731	01/01/2000 00:28:00	0.00478
731	01/01/2000 00:29:00	0.004805
731	01/01/2000 00:30:00	0.004821
731	01/01/2000 00:31:00	0.005047
731	01/01/2000 00:32:00	0.005698
731	01/01/2000 00:33:00	0.006405
731	01/01/2000 00:34:00	0.006853
731	01/01/2000 00:35:00	0.007136
731	01/01/2000 00:36:00	0.007314
731	01/01/2000 00:37:00	0.007427
731	01/01/2000 00:38:00	0.007498
731	01/01/2000 00:39:00	0.007543
731	01/01/2000 00:40:00	0.007571
731	01/01/2000 00:41:00	0.008754
731	01/01/2000 00:42:00	0.012063
731	01/01/2000 00:43:00	0.01596
731	01/01/2000 00:44:00	0.019133
731	01/01/2000 00:45:00	0.022004
731	01/01/2000 00:46:00	0.024857
731	01/01/2000 00:47:00	0.027403
731	01/01/2000 00:48:00	0.029674
731	01/01/2000 00:49:00	0.031735
731	01/01/2000 00:50:00	0.033335
731	01/01/2000 00:51:00	0.04055
731	01/01/2000 00:52:00	0.049696
731	01/01/2000 00:53:00	0.051
731	01/01/2000 00:54:00	0.051
731	01/01/2000 00:55:00	0.051564
731	01/01/2000 00:56:00	0.052
731	01/01/2000 00:57:00	0.052
731	01/01/2000 00:58:00	0.052
731	01/01/2000 00:59:00	0.052361
731	01/01/2000 01:00:00	0.053
731	01/01/2000 01:01:00	0.053
731	01/01/2000 01:02:00	0.053
731	01/01/2000 01:03:00	0.053
731	01/01/2000 01:04:00	0.053
731	01/01/2000 01:05:00	0.053
731	01/01/2000 01:06:00	0.053
731	01/01/2000 01:07:00	0.053
731	01/01/2000 01:08:00	0.053079
731	01/01/2000 01:09:00	0.053173
731	01/01/2000 01:10:00	0.053212
731	01/01/2000 01:11:00	0.0532
731	01/01/2000 01:12:00	0.053144
731	01/01/2000 01:13:00	0.053055
731	01/01/2000 01:14:00	0.053
731	01/01/2000 01:15:00	0.053
731	01/01/2000 01:16:00	0.053
731	01/01/2000 01:17:00	0.053
731	01/01/2000 01:18:00	0.053
731	01/01/2000 01:19:00	0.053
731	01/01/2000 01:20:00	0.053
731	01/01/2000 01:21:00	0.053
731	01/01/2000 01:22:00	0.053
731	01/01/2000 01:23:00	0.053
731	01/01/2000 01:24:00	0.051864
731	01/01/2000 01:25:00	0.050499
731	01/01/2000 01:26:00	0.04913
731	01/01/2000 01:27:00	0.047981
731	01/01/2000 01:28:00	0.047017
731	01/01/2000 01:29:00	0.04621
731	01/01/2000 01:30:00	0.045405
731	01/01/2000 01:31:00	0.044518
731	01/01/2000 01:32:00	0.043675
731	01/01/2000 01:33:00	0.042861
731	01/01/2000 01:34:00	0.042147
731	01/01/2000 01:35:00	0.041561
731	01/01/2000 01:36:00	0.040959
731	01/01/2000 01:37:00	0.040454
731	01/01/2000 01:38:00	0.040031
731	01/01/2000 01:39:00	0.039677
731	01/01/2000 01:40:00	0.039381
731	01/01/2000 01:41:00	0.039096
731	01/01/2000 01:42:00	0.038815
731	01/01/2000 01:43:00	0.038532
731	01/01/2000 01:44:00	0.03824
731	01/01/2000 01:45:00	0.037936
731	01/01/2000 01:46:00	0.037608
731	01/01/2000 01:47:00	0.037117
731	01/01/2000 01:48:00	0.036671
731	01/01/2000 01:49:00	0.036262
731	01/01/2000 01:50:00	0.035885
731	01/01/2000 01:51:00	0.035613
731	01/01/2000 01:52:00	0.035453
731	01/01/2000 01:53:00	0.035287
731	01/01/2000 01:54:00	0.035111
731	01/01/2000 01:55:00	0.028429
731	01/01/2000 01:56:00	0.01034
731	01/01/2000 01:57:00	0.008386
731	01/01/2000 01:58:00	0.008109
731	01/01/2000 01:59:00	0.00789
731	01/01/2000 02:00:00	0.00771
731	01/01/2000 02:01:00	0.007491
731	01/01/2000 02:02:00	0.007175
731	01/01/2000 02:03:00	0.006839
731	01/01/2000 02:04:00	0.006547
731	01/01/2000 02:05:00	0.006275
731	01/01/2000 02:06:00	0.00601
731	01/01/2000 02:07:00	0.005785
731	01/01/2000 02:08:00	0.005601
731	01/01/2000 02:09:00	0.005449
731	01/01/2000 02:10:00	0.005324
731	01/01/2000 02:11:00	0.00517
731	01/01/2000 02:12:00	0.00495
731	01/01/2000 02:13:00	0.004719
731	01/01/2000 02:14:00	0.004527
731	01/01/2000 02:15:00	0.004357
731	01/01/2000 02:16:00	0.004197
731	01/01/2000 02:17:00	0.004066
731	01/01/2000 02:18:00	0.00396
731	01/01/2000 02:19:00	0.003873
731	01/01/2000 02:20:00	0.003801
731	01/01/2000 02:21:00	0.003713
731	01/01/2000 02:22:00	0.003581
731	01/01/2000 02:23:00	0.003448
731	01/01/2000 02:24:00	0.003353
731	01/01/2000 02:25:00	0.003283
731	01/01/2000 02:26:00	0.003231
731	01/01/2000 02:27:00	0.003191
731	01/01/2000 02:28:00	0.003161
731	01/01/2000 02:29:00	0.003137
731	01/01/2000 02:30:00	0.003118
731	01/01/2000 02:31:00	0.003081
731	01/01/2000 02:32:00	0.003003
731	01/01/2000 02:33:00	0.002922
731	01/01/2000 02:34:00	0.002869
731	01/01/2000 02:35:00	0.002833
731	01/01/2000 02:36:00	0.002809
731	01/01/2000 02:37:00	0.002793

731	01/01/2000 02:38:00	0.002782
731	01/01/2000 02:39:00	0.002774
731	01/01/2000 02:40:00	0.002768
731	01/01/2000 02:41:00	0.002746
731	01/01/2000 02:42:00	0.00269
731	01/01/2000 02:43:00	0.002629
731	01/01/2000 02:44:00	0.002591
731	01/01/2000 02:45:00	0.002566
731	01/01/2000 02:46:00	0.00255
731	01/01/2000 02:47:00	0.00254
731	01/01/2000 02:48:00	0.002533
731	01/01/2000 02:49:00	0.002529
731	01/01/2000 02:50:00	0.002526
731	01/01/2000 02:51:00	0.002509
731	01/01/2000 02:52:00	0.002463
731	01/01/2000 02:53:00	0.002414
731	01/01/2000 02:54:00	0.002383
731	01/01/2000 02:55:00	0.002363
731	01/01/2000 02:56:00	0.00235
731	01/01/2000 02:57:00	0.002342
731	01/01/2000 02:58:00	0.002337
731	01/01/2000 02:59:00	0.002334
731	01/01/2000 03:00:00	0.002332
731	01/01/2000 03:01:00	0.002149
731	01/01/2000 03:02:00	0.001607
731	01/01/2000 03:03:00	0.001016
731	01/01/2000 03:04:00	0.000641
731	01/01/2000 03:05:00	0.000404
731	01/01/2000 03:06:00	0.000255
731	01/01/2000 03:07:00	0.000161
731	01/01/2000 03:08:00	0.000102
731	01/01/2000 03:09:00	6.4E-05
731	01/01/2000 03:10:00	4E-05
731	01/01/2000 03:11:00	2.6E-05
731	01/01/2000 03:12:00	1.6E-05
731	01/01/2000 03:13:00	1E-05
731	01/01/2000 03:14:00	0
731	01/01/2000 03:15:00	0
731	01/01/2000 03:16:00	0
731	01/01/2000 03:17:00	0
731	01/01/2000 03:18:00	0
731	01/01/2000 03:19:00	0
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731	01/01/2000 03:25:00	0
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731	01/01/2000 03:28:00	0
731	01/01/2000 03:29:00	0
731	01/01/2000 03:30:00	0
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731	01/01/2000 03:32:00	0
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731	01/01/2000 03:34:00	0
731	01/01/2000 03:35:00	0
731	01/01/2000 03:36:00	0
731	01/01/2000 03:37:00	0
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731	01/01/2000 03:39:00	0
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731	01/01/2000 03:42:00	0
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731	01/01/2000 03:54:00	0
731	01/01/2000 03:55:00	0
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731	01/01/2000 04:01:00	0
731	01/01/2000 04:02:00	0
731	01/01/2000 04:03:00	0
731	01/01/2000 04:04:00	0
731	01/01/2000 04:05:00	0
731	01/01/2000 04:06:00	0
731	01/01/2000 04:07:00	0
731	01/01/2000 04:08:00	0
731	01/01/2000 04:09:00	0
731	01/01/2000 04:10:00	0
731	01/01/2000 04:11:00	0
731	01/01/2000 04:12:00	0
731	01/01/2000 04:13:00	0
731	01/01/2000 04:14:00	0
731	01/01/2000 04:15:00	0
731	01/01/2000 04:16:00	0

;Flow (m^3/s)

732	01/01/2000 00:00:00	0
732	01/01/2000 00:01:00	0
732	01/01/2000 00:02:00	0
732	01/01/2000 00:03:00	0
732	01/01/2000 00:04:00	0
732	01/01/2000 00:05:00	0
732	01/01/2000 00:06:00	0
732	01/01/2000 00:07:00	0
732	01/01/2000 00:08:00	0
732	01/01/2000 00:09:00	0
732	01/01/2000 00:10:00	0
732	01/01/2000 00:11:00	0
732	01/01/2000 00:12:00	0
732	01/01/2000 00:13:00	0
732	01/01/2000 00:14:00	0
732	01/01/2000 00:15:00	0.000186
732	01/01/2000 00:16:00	0.000815
732	01/01/2000 00:17:00	0.001613
732	01/01/2000 00:18:00	0.002168
732	01/01/2000 00:19:00	0.002517
732	01/01/2000 00:20:00	0.002752
732	01/01/2000 00:21:00	0.003025
732	01/01/2000 00:22:00	0.00343
732	01/01/2000 00:23:00	0.003747
732	01/01/2000 00:24:00	0.003929
732	01/01/2000 00:25:00	0.004061
732	01/01/2000 00:26:00	0.004141
732	01/01/2000 00:27:00	0.004196
732	01/01/2000 00:28:00	0.004231
732	01/01/2000 00:29:00	0.004254
732	01/01/2000 00:30:00	0.00427
732	01/01/2000 00:31:00	0.004552
732	01/01/2000 00:32:00	0.005233
732	01/01/2000 00:33:00	0.005798
732	01/01/2000 00:34:00	0.00611
732	01/01/2000 00:35:00	0.006344
732	01/01/2000 00:36:00	0.006482
732	01/01/2000 00:37:00	0.006579
732	01/01/2000 00:38:00	0.00664
732	01/01/2000 00:39:00	0.006681
732	01/01/2000 00:40:00	0.006707
732	01/01/2000 00:41:00	0.008572
732	01/01/2000 00:42:00	0.012971
732	01/01/2000 00:43:00	0.017752
732	01/01/2000 00:44:00	0.02242
732	01/01/2000 00:45:00	0.027036
732	01/01/2000 00:46:00	0.030864
732	01/01/2000 00:47:00	0.034223
732	01/01/2000 00:48:00	0.03715
732	01/01/2000 00:49:00	0.039762
732	01/01/2000 00:50:00	0.042102
732	01/01/2000 00:51:00	0.0579
732	01/01/2000 00:52:00	0.090339
732	01/01/2000 00:53:00	0.12616
732	01/01/2000 00:54:00	0.138183
732	01/01/2000 00:55:00	0.138667
732	01/01/2000 00:56:00	0.139293
732	01/01/2000 00:57:00	0.141
732	01/01/2000 00:58:00	0.141372
732	01/01/2000 00:59:00	0.142
732	01/01/2000 01:00:00	0.143
732	01/01/2000 01:01:00	0.143
732	01/01/2000 01:02:00	0.143
732	01/01/2000 01:03:00	0.143251
732	01/01/2000 01:04:00	0.144
732	01/01/2000 01:05:00	0.144
732	01/01/2000 01:06:00	0.144
732	01/01/2000 01:07:00	0.144218
732	01/01/2000 01:08:00	0.144436
732	01/01/2000 01:09:00	0.144187
732	01/01/2000 01:10:00	0.142735
732	01/01/2000 01:11:00	0.141122
732	01/01/2000 01:12:00	0.139261
732	01/01/2000 01:13:00	0.137088
732	01/01/2000 01:14:00	0.13456
732	01/01/2000 01:15:00	0.132544
732	01/01/2000 01:16:00	0.130931
732	01/01/2000 01:17:00	0.129633
732	01/01/2000 01:18:00	0.128644
732	01/01/2000 01:19:00	0.128009
732	01/01/2000 01:20:00	0.127527
732	01/01/2000 01:21:00	0.126461
732	01/01/2000 01:22:00	0.124688
732	01/01/2000 01:23:00	0.121658
732	01/01/2000 01:24:00	0.119369
732	01/01/2000 01:25:00	0.117427
732	01/01/2000 01:26:00	0.115902
732	01/01/2000 01:27:00	0.114706
732	01/01/2000 01:28:00	0.113772
732	01/01/2000 01:29:00	0.11282
732	01/01/2000 01:30:00	0.111583
732	01/01/2000 01:31:00	0.110858
732	01/01/2000 01:32:00	0.110034
732	01/01/2000 01:33:00	0.10893
732	01/01/2000 01:34:00	0.107705
732	01/01/2000 01:35:00	0.106623
732	01/01/2000 01:36:00	0.105636
732	01/01/2000 01:37:00	0.103817
732	01/01/2000 01:38:00	0.102845
732	01/01/2000 01:39:00	0.101874
732	01/01/2000 01:40:00	0.026743
732	01/01/2000 01:41:00	0.014589
732	01/01/2000 01:42:00	0.018439
732	01/01/2000 01:43:00	0.014785
732	01/01/2000 01:44:00	0.014749
732	01/01/2000 01:45:00	0.01305
732	01/01/2000 01:46:00	0.012601
732	01/01/2000 01:47:00	0.012032
732	01/01/2000 01:48:00	0.01175
732	01/01/2000 01:49:00	0.01146
732	01/01/2000 01:50:00	0.011277
732	01/01/2000 01:51:00	0.010944
732	01/01/2000 01:52:00	0.01043
732	01/01/2000 01:53:00	0.009874
732	01/01/2000 01:54:00	0.009317
732	01/01/2000 01:55:00	0.008804
732	01/01/2000 01:56:00	0.008424
732	01/01/2000 01:57:00	0.008127
732	01/01/2000 01:58:00	0.007902
732	01/01/2000 01:59:00	0.007728
732	01/01/2000 02:00:00	0.007596
732	01/01/2000 02:01:00	0.00737
732	01/01/2000 02:02:00	0.007005
732	01/01/2000 02:03:00	0.006613
732	01/01/2000 02:04:00	0.006218
732	01/01/2000 02:05:00	0.005853
732	01/01/2000 02:06:00	0.005581
732	01/01/2000 02:07:00	0.005369
732	01/01/2000 02:08:00	0.005208
732	01/01/2000 02:09:00	0.005083
732	01/01/2000 02:10:00	0.004986
732	01/01/2000 02:11:00	0.004829
732	01/01/2000 02:12:00	0.004582
732	01/01/2000 02:13:00	0.004327
732	01/01/2000 02:14:00	0.004081
732	01/01/2000 02:15:00	0.003852
732	01/01/2000 02:16:00	0.003681
732	01/01/2000 02:17:00	0.003547
732	01/01/2000 02:18:00	0.003444
732	01/01/2000 02:19:00	0.003365
732	01/01/2000 02:20:00	0.003303
732	01/01/2000 02:21:00	0.003218
732	01/01/2000 02:22:00	0.003089
732	01/01/2000 02:23:00	0.002981
732	01/01/2000 02:24:00	0.002909
732	01/01/2000 02:25:00	0.00285
732	01/01/2000 02:26:00	0.00281
732	01/01/2000 02:27:00	0.002779
732	01/01/2000 02:28:00	0.002757
732	01/01/2000 02:29:00	0.002739
732	01/01/2000 02:30:00	0.002727
732	01/01/2000 02:31:00	0.002682
732	01/01/2000 02:32:00	0.002608
732	01/01/2000 02:33:00	0.002547
732	01/01/2000 02:34:00	0.002503
732	01/01/2000 02:35:00	0.002478
732	01/01/2000 02:36:00	0.002463
732	01/01/2000 02:37:00	0.002452
732	01/01/2000 02:38:00	0.002446
732	01/01/2000 02:39:00	0.002441
732	01/01/2000 02:40:00	0.002438
732	01/01/2000 02:41:00	0.002414
732	01/01/2000 02:42:00	0.002357
732	01/01/2000 02:43:00	0.00231
732	01/01/2000 02:44:00	0.002284
732	01/01/2000 02:45:00	0.002264
732	01/01/2000 02:46:00	0.002253
732	01/01/2000 02:47:00	0.002244
732	01/01/2000 02:48:00	0.002239
732	01/01/2000 02:49:00	0.002236
732	01/01/2000 02:50:00	0.002234
732	01/01/2000 02:51:00	0.002214
732	01/01/2000 02:52:00	0.002166
732	01/01/2000 02:53:00	0.002127
732	01/01/2000 02:54:00	0.002105
732	01/01/2000 02:55:00	0.002089
732	01/01/2000 02:56:00	0.002079
732	01/01/2000 02:57:00	0.002072
732	01/01/2000 02:58:00	0.002068
732	01/01/2000 02:59:00	0.002065
732	01/01/2000 03:00:00	0.002064
732	01/01/2000 03:01:00	0.001837
732	01/01/2000 03:02:00	0.00127
732	01/01/2000 03:03:00	0.000799
732	01/01/2000 03:04:00	0.000539
732	01/01/2000 03:05:00	0.000345
732	01/01/2000 03:06:00	0.00023
732	01/01/2000 03:07:00	0.000149
732	01/01/2000 03:08:00	9.8E-05
732	01/01/2000 03:09:00	6.4E-05
732	01/01/2000 03:10:00	4.2E-05
732	01/01/2000 03:11:00	2.7E-05
732	01/01/2000 03:12:00	1.8E-05
732	01/01/2000 03:13:00	1.2E-05
732	01/01/2000 03:14:00	0
732	01/01/2000 03:15:00	0
732	01/01/2000 03:16:00	0

732	01/01/2000 03:17:00	0
732	01/01/2000 03:18:00	0
732	01/01/2000 03:19:00	0
732	01/01/2000 03:20:00	0
732	01/01/2000 03:21:00	0
732	01/01/2000 03:22:00	0
732	01/01/2000 03:23:00	0
732	01/01/2000 03:24:00	0
732	01/01/2000 03:25:00	0
732	01/01/2000 03:26:00	0
732	01/01/2000 03:27:00	0
732	01/01/2000 03:28:00	0
732	01/01/2000 03:29:00	0
732	01/01/2000 03:30:00	0
732	01/01/2000 03:31:00	0
732	01/01/2000 03:32:00	0
732	01/01/2000 03:33:00	0
732	01/01/2000 03:34:00	0
732	01/01/2000 03:35:00	0
732	01/01/2000 03:36:00	0
732	01/01/2000 03:37:00	0
732	01/01/2000 03:38:00	0
732	01/01/2000 03:39:00	0
732	01/01/2000 03:40:00	0
732	01/01/2000 03:41:00	0
732	01/01/2000 03:42:00	0
732	01/01/2000 03:43:00	0
732	01/01/2000 03:44:00	0
732	01/01/2000 03:45:00	0
732	01/01/2000 03:46:00	0
732	01/01/2000 03:47:00	0
732	01/01/2000 03:48:00	0
732	01/01/2000 03:49:00	0
732	01/01/2000 03:50:00	0
732	01/01/2000 03:51:00	0
732	01/01/2000 03:52:00	0
732	01/01/2000 03:53:00	0
732	01/01/2000 03:54:00	0
732	01/01/2000 03:55:00	0
732	01/01/2000 03:56:00	0
732	01/01/2000 03:57:00	0
732	01/01/2000 03:58:00	0
732	01/01/2000 03:59:00	0
732	01/01/2000 04:00:00	0
732	01/01/2000 04:01:00	0
732	01/01/2000 04:02:00	0
732	01/01/2000 04:03:00	0
732	01/01/2000 04:04:00	0
732	01/01/2000 04:05:00	0
732	01/01/2000 04:06:00	0
732	01/01/2000 04:07:00	0
732	01/01/2000 04:08:00	0
732	01/01/2000 04:09:00	0
732	01/01/2000 04:10:00	0
732	01/01/2000 04:11:00	0
732	01/01/2000 04:12:00	0
732	01/01/2000 04:13:00	0
732	01/01/2000 04:14:00	0
732	01/01/2000 04:15:00	0
732	01/01/2000 04:16:00	0

;Flow (m³/s)

741	01/01/2000 00:00:00	0
741	01/01/2000 00:01:00	0
741	01/01/2000 00:02:00	0
741	01/01/2000 00:03:00	0
741	01/01/2000 00:04:00	0
741	01/01/2000 00:05:00	0
741	01/01/2000 00:06:00	0
741	01/01/2000 00:07:00	0
741	01/01/2000 00:08:00	0
741	01/01/2000 00:09:00	0
741	01/01/2000 00:10:00	0
741	01/01/2000 00:11:00	0
741	01/01/2000 00:12:00	0
741	01/01/2000 00:13:00	0
741	01/01/2000 00:14:00	0
741	01/01/2000 00:15:00	0.000168
741	01/01/2000 00:16:00	0.000833
741	01/01/2000 00:17:00	0.00185
741	01/01/2000 00:18:00	0.002677
741	01/01/2000 00:19:00	0.003161
741	01/01/2000 00:20:00	0.003436
741	01/01/2000 00:21:00	0.003703
741	01/01/2000 00:22:00	0.004131
741	01/01/2000 00:23:00	0.004547
741	01/01/2000 00:24:00	0.004792
741	01/01/2000 00:25:00	0.004932
741	01/01/2000 00:26:00	0.005012
741	01/01/2000 00:27:00	0.005057
741	01/01/2000 00:28:00	0.005083
741	01/01/2000 00:29:00	0.005097
741	01/01/2000 00:30:00	0.005105
741	01/01/2000 00:31:00	0.005356
741	01/01/2000 00:32:00	0.00611
741	01/01/2000 00:33:00	0.006923
741	01/01/2000 00:34:00	0.007406
741	01/01/2000 00:35:00	0.007681
741	01/01/2000 00:36:00	0.007837
741	01/01/2000 00:37:00	0.007926
741	01/01/2000 00:38:00	0.007976
741	01/01/2000 00:39:00	0.008005
741	01/01/2000 00:40:00	0.008021
741	01/01/2000 00:41:00	0.009177
741	01/01/2000 00:42:00	0.012701
741	01/01/2000 00:43:00	0.016744
741	01/01/2000 00:44:00	0.019682
741	01/01/2000 00:45:00	0.021526
741	01/01/2000 00:46:00	0.022704
741	01/01/2000 00:47:00	0.023924
741	01/01/2000 00:48:00	0.02504
741	01/01/2000 00:49:00	0.026027
741	01/01/2000 00:50:00	0.026901
741	01/01/2000 00:51:00	0.029
741	01/01/2000 00:52:00	0.029
741	01/01/2000 00:53:00	0.029172
741	01/01/2000 00:54:00	0.03
741	01/01/2000 00:55:00	0.03
741	01/01/2000 00:56:00	0.03
741	01/01/2000 00:57:00	0.030319
741	01/01/2000 00:58:00	0.031
741	01/01/2000 00:59:00	0.031
741	01/01/2000 01:00:00	0.031
741	01/01/2000 01:01:00	0.031
741	01/01/2000 01:02:00	0.031
741	01/01/2000 01:03:00	0.031
741	01/01/2000 01:04:00	0.030664
741	01/01/2000 01:05:00	0.030313
741	01/01/2000 01:06:00	0.030025
741	01/01/2000 01:07:00	0.03
741	01/01/2000 01:08:00	0.03
741	01/01/2000 01:09:00	0.03
741	01/01/2000 01:10:00	0.03
741	01/01/2000 01:11:00	0.03
741	01/01/2000 01:12:00	0.03
741	01/01/2000 01:13:00	0.03
741	01/01/2000 01:14:00	0.03
741	01/01/2000 01:15:00	0.03
741	01/01/2000 01:16:00	0.03
741	01/01/2000 01:17:00	0.03
741	01/01/2000 01:18:00	0.03
741	01/01/2000 01:19:00	0.03
741	01/01/2000 01:20:00	0.03
741	01/01/2000 01:21:00	0.03
741	01/01/2000 01:22:00	0.03
741	01/01/2000 01:23:00	0.03
741	01/01/2000 01:24:00	0.03
741	01/01/2000 01:25:00	0.03
741	01/01/2000 01:26:00	0.03
741	01/01/2000 01:27:00	0.03
741	01/01/2000 01:28:00	0.03
741	01/01/2000 01:29:00	0.03
741	01/01/2000 01:30:00	0.029893
741	01/01/2000 01:31:00	0.029722
741	01/01/2000 01:32:00	0.029543
741	01/01/2000 01:33:00	0.029355
741	01/01/2000 01:34:00	0.029161
741	01/01/2000 01:35:00	0.029
741	01/01/2000 01:36:00	0.029
741	01/01/2000 01:37:00	0.029
741	01/01/2000 01:38:00	0.029
741	01/01/2000 01:39:00	0.029
741	01/01/2000 01:40:00	0.018512
741	01/01/2000 01:41:00	0.010309
741	01/01/2000 01:42:00	0.009406
741	01/01/2000 01:43:00	0.008827
741	01/01/2000 01:44:00	0.008369
741	01/01/2000 01:45:00	0.008012
741	01/01/2000 01:46:00	0.007766
741	01/01/2000 01:47:00	0.007596
741	01/01/2000 01:48:00	0.007477
741	01/01/2000 01:49:00	0.007394
741	01/01/2000 01:50:00	0.007336
741	01/01/2000 01:51:00	0.007201
741	01/01/2000 01:52:00	0.006884
741	01/01/2000 01:53:00	0.006516
741	01/01/2000 01:54:00	0.006214
741	01/01/2000 01:55:00	0.005977
741	01/01/2000 01:56:00	0.005813
741	01/01/2000 01:57:00	0.005699
741	01/01/2000 01:58:00	0.00562
741	01/01/2000 01:59:00	0.005564
741	01/01/2000 02:00:00	0.005524
741	01/01/2000 02:01:00	0.005429
741	01/01/2000 02:02:00	0.005203
741	01/01/2000 02:03:00	0.004941
741	01/01/2000 02:04:00	0.004726
741	01/01/2000 02:05:00	0.004556
741	01/01/2000 02:06:00	0.004439
741	01/01/2000 02:07:00	0.004357
741	01/01/2000 02:08:00	0.004299
741	01/01/2000 02:09:00	0.004259
741	01/01/2000 02:10:00	0.004229
741	01/01/2000 02:11:00	0.004166
741	01/01/2000 02:12:00	0.004022
741	01/01/2000 02:13:00	0.003867
741	01/01/2000 02:14:00	0.003764
741	01/01/2000 02:15:00	0.003696
741	01/01/2000 02:16:00	0.003653
741	01/01/2000 02:17:00	0.003626
741	01/01/2000 02:18:00	0.003607
741	01/01/2000 02:19:00	0.003595
741	01/01/2000 02:20:00	0.003587
741	01/01/2000 02:21:00	0.00355
741	01/01/2000 02:22:00	0.003451
741	01/01/2000 02:23:00	0.003346
741	01/01/2000 02:24:00	0.003283
741	01/01/2000 02:25:00	0.003247
741	01/01/2000 02:26:00	0.003226
741	01/01/2000 02:27:00	0.003214
741	01/01/2000 02:28:00	0.003207
741	01/01/2000 02:29:00	0.003203
741	01/01/2000 02:30:00	0.0032
741	01/01/2000 02:31:00	0.003174
741	01/01/2000 02:32:00	0.003097
741	01/01/2000 02:33:00	0.003015
741	01/01/2000 02:34:00	0.002966
741	01/01/2000 02:35:00	0.002938
741	01/01/2000 02:36:00	0.002922
741	01/01/2000 02:37:00	0.002913
741	01/01/2000 02:38:00	0.002908
741	01/01/2000 02:39:00	0.002905
741	01/01/2000 02:40:00	0.002903
741	01/01/2000 02:41:00	0.002882
741	01/01/2000 02:42:00	0.002819
741	01/01/2000 02:43:00	0.002752
741	01/01/2000 02:44:00	0.002712
741	01/01/2000 02:45:00	0.002689
741	01/01/2000 02:46:00	0.002676
741	01/01/2000 02:47:00	0.002669
741	01/01/2000 02:48:00	0.002665
741	01/01/2000 02:49:00	0.002662
741	01/01/2000 02:50:00	0.002661
741	01/01/2000 02:51:00	0.002643
741	01/01/2000 02:52:00	0.002591
741	01/01/2000 02:53:00	0.002535
741	01/01/2000 02:54:00	0.002501
741	01/01/2000 02:55:00	0.002482
741	01/01/2000 02:56:00	0.002471
741	01/01/2000 02:57:00	0.002465
741	01/01/2000 02:58:00	0.002462
741	01/01/2000 02:59:00	0.00246
741	01/01/2000 03:00:00	0.002459
741	01/01/2000 03:01:00	0.002251
741	01/01/2000 03:02:00	0.00162
741	01/01/2000 03:03:00	0.000938
741	01/01/2000 03:04:00	0.000534
741	01/01/2000 03:05:00	0.000303
741	01/01/2000 03:06:00	0.000172
741	01/01/2000 03:07:00	9.8E-05
741	01/01/2000 03:08:00	5.6E-05
741	01/01/2000 03:09:00	3.2E-05
741	01/01/2000 03:10:00	1.8E-05
741	01/01/2000 03:11:00	1E-05
741	01/01/2000 03:12:00	0
741	01/01/2000 03:13:00	0
741	01/01/2000 03:14:00	0
741	01/01/2000 03:15:00	0
741	01/01/2000 03:16:00	0
741	01/01/2000 03:17:00	0
741	01/01/2000 03:18:00	0
741	01/01/2000 03:19:00	0
741	01/01/2000 03:20:00	0
741	01/01/2000 03:21:00	0
741	01/01/2000 03:22:00	0
741	01/01/2000 03:23:00	0
741	01/01/2000 03:24:00	0
741	01/01/2000 03:25:00	0
741	01/01/2000 03:26:00	0
741	01/01/2000 03:27:00	0
741	01/01/2000 03:28:00	0
741	01/01/2000 03:29:00	0
741	01/01/2000 03:30:00	0
741	01/01/2000 03:31:00	0
741	01/01/2000 03:32:00	0
741	01/01/2000 03:33:00	0
741	01/01/2000 03:34:00	0
741	01/01/2000 03:35:00	0
741	01/01/2000 03:36:00	0
741	01/01/2000 03:37:00	0
741	01/01/2000 03:38:00	0
741	01/01/2000 03:39:00	0
741	01/01/2000 03:40:00	0
741	01/01/2000 03:41:00	0
741	01/01/2000 03:42:00	0
741	01/01/2000 03:43:00	0
741	01/01/2000 03:44:00	0
741	01/01/2000 03:45:00	0
741	01/01/2000 03:46:00	0
741	01/01/2000 03:47:00	0
741	01/01/2000 03:48:00	0
741	01/01/2000 03:49:00	0
741	01/01/2000 03:50:00	0
741	01/01/2000 03:51:00	0
741	01/01/2000 03:52:00	0
741	01/01/2000 03:53:00	0
741	01/01/2000 03:54:00	0
741	01/01/2000 03:55:00	0

741	01/01/2000 03:56:00	0
741	01/01/2000 03:57:00	0
741	01/01/2000 03:58:00	0
741	01/01/2000 03:59:00	0
741	01/01/2000 04:00:00	0
741	01/01/2000 04:01:00	0
741	01/01/2000 04:02:00	0
741	01/01/2000 04:03:00	0
741	01/01/2000 04:04:00	0
741	01/01/2000 04:05:00	0
741	01/01/2000 04:06:00	0
741	01/01/2000 04:07:00	0
741	01/01/2000 04:08:00	0
741	01/01/2000 04:09:00	0
741	01/01/2000 04:10:00	0
741	01/01/2000 04:11:00	0
741	01/01/2000 04:12:00	0
741	01/01/2000 04:13:00	0
741	01/01/2000 04:14:00	0
741	01/01/2000 04:15:00	0
741	01/01/2000 04:16:00	0

;Flow (m³/s)

742	01/01/2000 00:00:00	0
742	01/01/2000 00:01:00	0
742	01/01/2000 00:02:00	0
742	01/01/2000 00:03:00	0
742	01/01/2000 00:04:00	0
742	01/01/2000 00:05:00	0
742	01/01/2000 00:06:00	0
742	01/01/2000 00:07:00	0
742	01/01/2000 00:08:00	0
742	01/01/2000 00:09:00	0
742	01/01/2000 00:10:00	0
742	01/01/2000 00:11:00	0
742	01/01/2000 00:12:00	0
742	01/01/2000 00:13:00	0
742	01/01/2000 00:14:00	0
742	01/01/2000 00:15:00	0.000177
742	01/01/2000 00:16:00	0.000783
742	01/01/2000 00:17:00	0.001543
742	01/01/2000 00:18:00	0.00204
742	01/01/2000 00:19:00	0.002323
742	01/01/2000 00:20:00	0.002503
742	01/01/2000 00:21:00	0.002724
742	01/01/2000 00:22:00	0.003085
742	01/01/2000 00:23:00	0.003359
742	01/01/2000 00:24:00	0.003498
742	01/01/2000 00:25:00	0.003595
742	01/01/2000 00:26:00	0.003648
742	01/01/2000 00:27:00	0.003682
742	01/01/2000 00:28:00	0.003702
742	01/01/2000 00:29:00	0.003715
742	01/01/2000 00:30:00	0.003722
742	01/01/2000 00:31:00	0.003986
742	01/01/2000 00:32:00	0.004643
742	01/01/2000 00:33:00	0.005167
742	01/01/2000 00:34:00	0.005425
742	01/01/2000 00:35:00	0.005609
742	01/01/2000 00:36:00	0.005707
742	01/01/2000 00:37:00	0.005773
742	01/01/2000 00:38:00	0.00581
742	01/01/2000 00:39:00	0.005834
742	01/01/2000 00:40:00	0.005847
742	01/01/2000 00:41:00	0.007028
742	01/01/2000 00:42:00	0.01001
742	01/01/2000 00:43:00	0.012551
742	01/01/2000 00:44:00	0.014108
742	01/01/2000 00:45:00	0.015509
742	01/01/2000 00:46:00	0.016573
742	01/01/2000 00:47:00	0.017453
742	01/01/2000 00:48:00	0.018196
742	01/01/2000 00:49:00	0.018851
742	01/01/2000 00:50:00	0.019438
742	01/01/2000 00:51:00	0.027212
742	01/01/2000 00:52:00	0.046006
742	01/01/2000 00:53:00	0.063024
742	01/01/2000 00:54:00	0.072721
742	01/01/2000 00:55:00	0.084934
742	01/01/2000 00:56:00	0.090185
742	01/01/2000 00:57:00	0.090803
742	01/01/2000 00:58:00	0.092176
742	01/01/2000 00:59:00	0.093928
742	01/01/2000 01:00:00	0.094223
742	01/01/2000 01:01:00	0.095
742	01/01/2000 01:02:00	0.095
742	01/01/2000 01:03:00	0.095279
742	01/01/2000 01:04:00	0.096
742	01/01/2000 01:05:00	0.096
742	01/01/2000 01:06:00	0.096
742	01/01/2000 01:07:00	0.096048
742	01/01/2000 01:08:00	0.096258
742	01/01/2000 01:09:00	0.096468
742	01/01/2000 01:10:00	0.096662
742	01/01/2000 01:11:00	0.096815
742	01/01/2000 01:12:00	0.096901
742	01/01/2000 01:13:00	0.096911
742	01/01/2000 01:14:00	0.096846
742	01/01/2000 01:15:00	0.096714
742	01/01/2000 01:16:00	0.096533
742	01/01/2000 01:17:00	0.096319
742	01/01/2000 01:18:00	0.096086
742	01/01/2000 01:19:00	0.096
742	01/01/2000 01:20:00	0.096
742	01/01/2000 01:21:00	0.095995
742	01/01/2000 01:22:00	0.095044
742	01/01/2000 01:23:00	0.095
742	01/01/2000 01:24:00	0.095
742	01/01/2000 01:25:00	0.095
742	01/01/2000 01:26:00	0.094651
742	01/01/2000 01:27:00	0.094046
742	01/01/2000 01:28:00	0.094
742	01/01/2000 01:29:00	0.094
742	01/01/2000 01:30:00	0.093
742	01/01/2000 01:31:00	0.092317
742	01/01/2000 01:32:00	0.091
742	01/01/2000 01:33:00	0.090373
742	01/01/2000 01:34:00	0.034502
742	01/01/2000 01:35:00	0
742	01/01/2000 01:36:00	0.012269
742	01/01/2000 01:37:00	0.006082
742	01/01/2000 01:38:00	0.0087
742	01/01/2000 01:39:00	0.007239
742	01/01/2000 01:40:00	0.007756
742	01/01/2000 01:41:00	0.00724
742	01/01/2000 01:42:00	0.006962
742	01/01/2000 01:43:00	0.006528
742	01/01/2000 01:44:00	0.006295
742	01/01/2000 01:45:00	0.006031
742	01/01/2000 01:46:00	0.005848
742	01/01/2000 01:47:00	0.005706
742	01/01/2000 01:48:00	0.005602
742	01/01/2000 01:49:00	0.005522
742	01/01/2000 01:50:00	0.005462
742	01/01/2000 01:51:00	0.005323
742	01/01/2000 01:52:00	0.005053
742	01/01/2000 01:53:00	0.004813
742	01/01/2000 01:54:00	0.004641
742	01/01/2000 01:55:00	0.004478
742	01/01/2000 01:56:00	0.004354
742	01/01/2000 01:57:00	0.004263
742	01/01/2000 01:58:00	0.004194
742	01/01/2000 01:59:00	0.004141
742	01/01/2000 02:00:00	0.004101
742	01/01/2000 02:01:00	0.004004
742	01/01/2000 02:02:00	0.003813
742	01/01/2000 02:03:00	0.003643
742	01/01/2000 02:04:00	0.003522
742	01/01/2000 02:05:00	0.003406
742	01/01/2000 02:06:00	0.003317
742	01/01/2000 02:07:00	0.003253
742	01/01/2000 02:08:00	0.003203
742	01/01/2000 02:09:00	0.003165
742	01/01/2000 02:10:00	0.003136
742	01/01/2000 02:11:00	0.00307
742	01/01/2000 02:12:00	0.002942
742	01/01/2000 02:13:00	0.002837
742	01/01/2000 02:14:00	0.002776
742	01/01/2000 02:15:00	0.002727
742	01/01/2000 02:16:00	0.002694
742	01/01/2000 02:17:00	0.002671
742	01/01/2000 02:18:00	0.002654
742	01/01/2000 02:19:00	0.002642
742	01/01/2000 02:20:00	0.002633
742	01/01/2000 02:21:00	0.002594
742	01/01/2000 02:22:00	0.002506
742	01/01/2000 02:23:00	0.002436
742	01/01/2000 02:24:00	0.0024
742	01/01/2000 02:25:00	0.002375
742	01/01/2000 02:26:00	0.00236
742	01/01/2000 02:27:00	0.002351
742	01/01/2000 02:28:00	0.002345
742	01/01/2000 02:29:00	0.002341
742	01/01/2000 02:30:00	0.002338
742	01/01/2000 02:31:00	0.00231
742	01/01/2000 02:32:00	0.002243
742	01/01/2000 02:33:00	0.00219
742	01/01/2000 02:34:00	0.002163
742	01/01/2000 02:35:00	0.002144
742	01/01/2000 02:36:00	0.002134
742	01/01/2000 02:37:00	0.002127
742	01/01/2000 02:38:00	0.002123
742	01/01/2000 02:39:00	0.002121
742	01/01/2000 02:40:00	0.002119
742	01/01/2000 02:41:00	0.002097
742	01/01/2000 02:42:00	0.002042
742	01/01/2000 02:43:00	0.001999
742	01/01/2000 02:44:00	0.001977
742	01/01/2000 02:45:00	0.001962
742	01/01/2000 02:46:00	0.001954
742	01/01/2000 02:47:00	0.001948
742	01/01/2000 02:48:00	0.001945
742	01/01/2000 02:49:00	0.001943
742	01/01/2000 02:50:00	0.001942
742	01/01/2000 02:51:00	0.001924
742	01/01/2000 02:52:00	0.001878
742	01/01/2000 02:53:00	0.001842
742	01/01/2000 02:54:00	0.001824
742	01/01/2000 02:55:00	0.001811
742	01/01/2000 02:56:00	0.001804
742	01/01/2000 02:57:00	0.0018
742	01/01/2000 02:58:00	0.001797
742	01/01/2000 02:59:00	0.001796
742	01/01/2000 03:00:00	0.001795
742	01/01/2000 03:01:00	0.001577
742	01/01/2000 03:02:00	0.001026
742	01/01/2000 03:03:00	0.000587
742	01/01/2000 03:04:00	0.000372
742	01/01/2000 03:05:00	0.000217
742	01/01/2000 03:06:00	0.000135
742	01/01/2000 03:07:00	8E-05
742	01/01/2000 03:08:00	4.9E-05
742	01/01/2000 03:09:00	2.9E-05
742	01/01/2000 03:10:00	1.8E-05
742	01/01/2000 03:11:00	1.1E-05
742	01/01/2000 03:12:00	0
742	01/01/2000 03:13:00	0
742	01/01/2000 03:14:00	0
742	01/01/2000 03:15:00	0
742	01/01/2000 03:16:00	0
742	01/01/2000 03:17:00	0
742	01/01/2000 03:18:00	0
742	01/01/2000 03:19:00	0
742	01/01/2000 03:20:00	0
742	01/01/2000 03:21:00	0
742	01/01/2000 03:22:00	0
742	01/01/2000 03:23:00	0
742	01/01/2000 03:24:00	0
742	01/01/2000 03:25:00	0
742	01/01/2000 03:26:00	0
742	01/01/2000 03:27:00	0
742	01/01/2000 03:28:00	0
742	01/01/2000 03:29:00	0
742	01/01/2000 03:30:00	0
742	01/01/2000 03:31:00	0
742	01/01/2000 03:32:00	0
742	01/01/2000 03:33:00	0
742	01/01/2000 03:34:00	0
742	01/01/2000 03:35:00	0
742	01/01/2000 03:36:00	0
742	01/01/2000 03:37:00	0
742	01/01/2000 03:38:00	0
742	01/01/2000 03:39:00	0
742	01/01/2000 03:40:00	0
742	01/01/2000 03:41:00	0
742	01/01/2000 03:42:00	0
742	01/01/2000 03:43:00	0
742	01/01/2000 03:44:00	0
742	01/01/2000 03:45:00	0
742	01/01/2000 03:46:00	0
742	01/01/2000 03:47:00	0
742	01/01/2000 03:48:00	0
742	01/01/2000 03:49:00	0
742	01/01/2000 03:50:00	0
742	01/01/2000 03:51:00	0
742	01/01/2000 03:52:00	0
742	01/01/2000 03:53:00	0
742	01/01/2000 03:54:00	0
742	01/01/2000 03:55:00	0
742	01/01/2000 03:56:00	0
742	01/01/2000 03:57:00	0
742	01/01/2000 03:58:00	0
742	01/01/2000 03:59:00	0
742	01/01/2000 04:00:00	0
742	01/01/2000 04:01:00	0
742	01/01/2000 04:02:00	0
742	01/01/2000 04:03:00	0
742	01/01/2000 04:04:00	0
742	01/01/2000 04:05:00	0
742	01/01/2000 04:06:00	0
742	01/01/2000 04:07:00	0
742	01/01/2000 04:08:00	0
742	01/01/2000 04:09:00	0
742	01/01/2000 04:10:00	0
742	01/01/2000 04:11:00	0
742	01/01/2000 04:12:00	0
742	01/01/2000 04:13:00	0
742	01/01/2000 04:14:00	0
742	01/01/2000 04:15:00	0
742	01/01/2000 04:16:00	0

;Flow (m³/s)

743E	01/01/2000 00:00:00	0
743E	01/01/2000 00:01:00	0
743E	01/01/2000 00:02:00	0
743E	01/01/2000 00:03:00	0
743E	01/01/2000 00:04:00	0
743E	01/01/2000 00:05:00	0
743E	01/01/2000 00:06:00	0
743E	01/01/2000 00:07:00	0
743E	01/01/2000 00:08:00	0
743E	01/01/2000 00:09:00	0
743E	01/01/2000 00:10:00	0
743E	01/01/2000 00:11:00	0
743E	01/01/2000 00:12:00	0
743E	01/01/2000 00:13:00	0
743E	01/01/2000 00:14:00	0
743E	01/01/2000 00:15:00	0.000336

743E	01/01/2000 00:16:00	0.001444
743E	01/01/2000 00:17:00	0.002779
743E	01/01/2000 00:18:00	0.003642
743E	01/01/2000 00:19:00	0.00416
743E	01/01/2000 00:20:00	0.004494
743E	01/01/2000 00:21:00	0.004917
743E	01/01/2000 00:22:00	0.005577
743E	01/01/2000 00:23:00	0.006057
743E	01/01/2000 00:24:00	0.006315
743E	01/01/2000 00:25:00	0.0065
743E	01/01/2000 00:26:00	0.0066
743E	01/01/2000 00:27:00	0.006671
743E	01/01/2000 00:28:00	0.006711
743E	01/01/2000 00:29:00	0.006738
743E	01/01/2000 00:30:00	0.006753
743E	01/01/2000 00:31:00	0.007256
743E	01/01/2000 00:32:00	0.008441
743E	01/01/2000 00:33:00	0.009337
743E	01/01/2000 00:34:00	0.009801
743E	01/01/2000 00:35:00	0.010145
743E	01/01/2000 00:36:00	0.010327
743E	01/01/2000 00:37:00	0.010459
743E	01/01/2000 00:38:00	0.01053
743E	01/01/2000 00:39:00	0.010581
743E	01/01/2000 00:40:00	0.010608
743E	01/01/2000 00:41:00	0.012986
743E	01/01/2000 00:42:00	0.018638
743E	01/01/2000 00:43:00	0.023431
743E	01/01/2000 00:44:00	0.02682
743E	01/01/2000 00:45:00	0.030148
743E	01/01/2000 00:46:00	0.033
743E	01/01/2000 00:47:00	0.035499
743E	01/01/2000 00:48:00	0.03766
743E	01/01/2000 00:49:00	0.039621
743E	01/01/2000 00:50:00	0.041393
743E	01/01/2000 00:51:00	0.058023
743E	01/01/2000 00:52:00	0.095039
743E	01/01/2000 00:53:00	0.124281
743E	01/01/2000 00:54:00	0.152
743E	01/01/2000 00:55:00	0.152
743E	01/01/2000 00:56:00	0.152346
743E	01/01/2000 00:57:00	0.153208
743E	01/01/2000 00:58:00	0.154326
743E	01/01/2000 00:59:00	0.155651
743E	01/01/2000 01:00:00	0.156819
743E	01/01/2000 01:01:00	0.157925
743E	01/01/2000 01:02:00	0.15893
743E	01/01/2000 01:03:00	0.159889
743E	01/01/2000 01:04:00	0.16066
743E	01/01/2000 01:05:00	0.161225
743E	01/01/2000 01:06:00	0.161593
743E	01/01/2000 01:07:00	0.161784
743E	01/01/2000 01:08:00	0.161829
743E	01/01/2000 01:09:00	0.161759
743E	01/01/2000 01:10:00	0.161601
743E	01/01/2000 01:11:00	0.161364
743E	01/01/2000 01:12:00	0.161034
743E	01/01/2000 01:13:00	0.160611
743E	01/01/2000 01:14:00	0.159525
743E	01/01/2000 01:15:00	0.156766
743E	01/01/2000 01:16:00	0.153904
743E	01/01/2000 01:17:00	0.151454
743E	01/01/2000 01:18:00	0.149296
743E	01/01/2000 01:19:00	0.147385
743E	01/01/2000 01:20:00	0.145685
743E	01/01/2000 01:21:00	0.144077
743E	01/01/2000 01:22:00	0.142338
743E	01/01/2000 01:23:00	0.140591
743E	01/01/2000 01:24:00	0.138861
743E	01/01/2000 01:25:00	0.137136
743E	01/01/2000 01:26:00	0.135527
743E	01/01/2000 01:27:00	0.059056
743E	01/01/2000 01:28:00	0.013274
743E	01/01/2000 01:29:00	0.038463
743E	01/01/2000 01:30:00	0.022032
743E	01/01/2000 01:31:00	0.030046
743E	01/01/2000 01:32:00	0.022874
743E	01/01/2000 01:33:00	0.02459
743E	01/01/2000 01:34:00	0.021466
743E	01/01/2000 01:35:00	0.021421
743E	01/01/2000 01:36:00	0.01977
743E	01/01/2000 01:37:00	0.019397
743E	01/01/2000 01:38:00	0.018554
743E	01/01/2000 01:39:00	0.01821
743E	01/01/2000 01:40:00	0.017742
743E	01/01/2000 01:41:00	0.017192
743E	01/01/2000 01:42:00	0.016227
743E	01/01/2000 01:43:00	0.01542
743E	01/01/2000 01:44:00	0.014746
743E	01/01/2000 01:45:00	0.014101
743E	01/01/2000 01:46:00	0.013551
743E	01/01/2000 01:47:00	0.013127
743E	01/01/2000 01:48:00	0.012789
743E	01/01/2000 01:49:00	0.012523
743E	01/01/2000 01:50:00	0.012309
743E	01/01/2000 01:51:00	0.011947
743E	01/01/2000 01:52:00	0.011354
743E	01/01/2000 01:53:00	0.010829
743E	01/01/2000 01:54:00	0.010406
743E	01/01/2000 01:55:00	0.009988
743E	01/01/2000 01:56:00	0.009637
743E	01/01/2000 01:57:00	0.009363
743E	01/01/2000 01:58:00	0.009146
743E	01/01/2000 01:59:00	0.008973
743E	01/01/2000 02:00:00	0.008835
743E	01/01/2000 02:01:00	0.008588
743E	01/01/2000 02:02:00	0.008174
743E	01/01/2000 02:03:00	0.007808
743E	01/01/2000 02:04:00	0.007512
743E	01/01/2000 02:05:00	0.007219
743E	01/01/2000 02:06:00	0.006972
743E	01/01/2000 02:07:00	0.006779
743E	01/01/2000 02:08:00	0.006626
743E	01/01/2000 02:09:00	0.006504
743E	01/01/2000 02:10:00	0.006406
743E	01/01/2000 02:11:00	0.006236
743E	01/01/2000 02:12:00	0.005956
743E	01/01/2000 02:13:00	0.005724
743E	01/01/2000 02:14:00	0.005558
743E	01/01/2000 02:15:00	0.005407
743E	01/01/2000 02:16:00	0.005283
743E	01/01/2000 02:17:00	0.005183
743E	01/01/2000 02:18:00	0.005106
743E	01/01/2000 02:19:00	0.005044
743E	01/01/2000 02:20:00	0.004994
743E	01/01/2000 02:21:00	0.004891
743E	01/01/2000 02:22:00	0.004708
743E	01/01/2000 02:23:00	0.004566
743E	01/01/2000 02:24:00	0.004483
743E	01/01/2000 02:25:00	0.004418
743E	01/01/2000 02:26:00	0.004376
743E	01/01/2000 02:27:00	0.004344
743E	01/01/2000 02:28:00	0.004321
743E	01/01/2000 02:29:00	0.004304
743E	01/01/2000 02:30:00	0.004291
743E	01/01/2000 02:31:00	0.004231
743E	01/01/2000 02:32:00	0.004104
743E	01/01/2000 02:33:00	0.004007
743E	01/01/2000 02:34:00	0.003956
743E	01/01/2000 02:35:00	0.003917
743E	01/01/2000 02:36:00	0.003895
743E	01/01/2000 02:37:00	0.003879
743E	01/01/2000 02:38:00	0.003869
743E	01/01/2000 02:39:00	0.003862
743E	01/01/2000 02:40:00	0.003858
743E	01/01/2000 02:41:00	0.003814
743E	01/01/2000 02:42:00	0.003714
743E	01/01/2000 02:43:00	0.003639
743E	01/01/2000 02:44:00	0.003599
743E	01/01/2000 02:45:00	0.00357
743E	01/01/2000 02:46:00	0.003554
743E	01/01/2000 02:47:00	0.003543
743E	01/01/2000 02:48:00	0.003537
743E	01/01/2000 02:49:00	0.003532
743E	01/01/2000 02:50:00	0.003529
743E	01/01/2000 02:51:00	0.003494
743E	01/01/2000 02:52:00	0.003411
743E	01/01/2000 02:53:00	0.003349
743E	01/01/2000 02:54:00	0.003317
743E	01/01/2000 02:55:00	0.003293
743E	01/01/2000 02:56:00	0.00328
743E	01/01/2000 02:57:00	0.003271
743E	01/01/2000 02:58:00	0.003266
743E	01/01/2000 02:59:00	0.003262
743E	01/01/2000 03:00:00	0.00326
743E	01/01/2000 03:01:00	0.002846
743E	01/01/2000 03:02:00	0.001854
743E	01/01/2000 03:03:00	0.001105
743E	01/01/2000 03:04:00	0.000717
743E	01/01/2000 03:05:00	0.000429
743E	01/01/2000 03:06:00	0.000277
743E	01/01/2000 03:07:00	0.000167
743E	01/01/2000 03:08:00	0.000107
743E	01/01/2000 03:09:00	6.5E-05
743E	01/01/2000 03:10:00	4.2E-05
743E	01/01/2000 03:11:00	2.5E-05
743E	01/01/2000 03:12:00	1.6E-05
743E	01/01/2000 03:13:00	0
743E	01/01/2000 03:14:00	0
743E	01/01/2000 03:15:00	0
743E	01/01/2000 03:16:00	0
743E	01/01/2000 03:17:00	0
743E	01/01/2000 03:18:00	0
743E	01/01/2000 03:19:00	0
743E	01/01/2000 03:20:00	0
743E	01/01/2000 03:21:00	0
743E	01/01/2000 03:22:00	0
743E	01/01/2000 03:23:00	0
743E	01/01/2000 03:24:00	0
743E	01/01/2000 03:25:00	0
743E	01/01/2000 03:26:00	0
743E	01/01/2000 03:27:00	0
743E	01/01/2000 03:28:00	0
743E	01/01/2000 03:29:00	0
743E	01/01/2000 03:30:00	0
743E	01/01/2000 03:31:00	0
743E	01/01/2000 03:32:00	0
743E	01/01/2000 03:33:00	0
743E	01/01/2000 03:34:00	0
743E	01/01/2000 03:35:00	0
743E	01/01/2000 03:36:00	0
743E	01/01/2000 03:37:00	0
743E	01/01/2000 03:38:00	0
743E	01/01/2000 03:39:00	0
743E	01/01/2000 03:40:00	0
743E	01/01/2000 03:41:00	0
743E	01/01/2000 03:42:00	0
743E	01/01/2000 03:43:00	0
743E	01/01/2000 03:44:00	0
743E	01/01/2000 03:45:00	0
743E	01/01/2000 03:46:00	0
743E	01/01/2000 03:47:00	0
743E	01/01/2000 03:48:00	0
743E	01/01/2000 03:49:00	0
743E	01/01/2000 03:50:00	0
743E	01/01/2000 03:51:00	0
743E	01/01/2000 03:52:00	0
743E	01/01/2000 03:53:00	0
743E	01/01/2000 03:54:00	0
743E	01/01/2000 03:55:00	0
743E	01/01/2000 03:56:00	0
743E	01/01/2000 03:57:00	0
743E	01/01/2000 03:58:00	0
743E	01/01/2000 03:59:00	0
743E	01/01/2000 04:00:00	0
743E	01/01/2000 04:01:00	0
743E	01/01/2000 04:02:00	0
743E	01/01/2000 04:03:00	0
743E	01/01/2000 04:04:00	0
743E	01/01/2000 04:05:00	0
743E	01/01/2000 04:06:00	0
743E	01/01/2000 04:07:00	0
743E	01/01/2000 04:08:00	0
743E	01/01/2000 04:09:00	0
743E	01/01/2000 04:10:00	0
743E	01/01/2000 04:11:00	0
743E	01/01/2000 04:12:00	0
743E	01/01/2000 04:13:00	0
743E	01/01/2000 04:14:00	0
743E	01/01/2000 04:15:00	0
743E	01/01/2000 04:16:00	0

;Flow (m³/s)

744	01/01/2000 00:00:00	0
744	01/01/2000 00:01:00	0
744	01/01/2000 00:02:00	0
744	01/01/2000 00:03:00	0
744	01/01/2000 00:04:00	0
744	01/01/2000 00:05:00	0
744	01/01/2000 00:06:00	0
744	01/01/2000 00:07:00	0
744	01/01/2000 00:08:00	0
744	01/01/2000 00:09:00	0
744	01/01/2000 00:10:00	0
744	01/01/2000 00:11:00	0
744	01/01/2000 00:12:00	0
744	01/01/2000 00:13:00	0
744	01/01/2000 00:14:00	0
744	01/01/2000 00:15:00	2E-06
744	01/01/2000 00:16:00	4E-06
744	01/01/2000 00:17:00	5E-06
744	01/01/2000 00:18:00	5E-06
744	01/01/2000 00:19:00	5E-06
744	01/01/2000 00:20:00	6E-06
744	01/01/2000 00:21:00	7E-06
744	01/01/2000 00:22:00	7E-06
744	01/01/2000 00:23:00	7E-06
744	01/01/2000 00:24:00	8E-06
744	01/01/2000 00:25:00	8E-06
744	01/01/2000 00:26:00	8E-06
744	01/01/2000 00:27:00	8E-06
744	01/01/2000 00:28:00	8E-06
744	01/01/2000 00:29:00	8E-06
744	01/01/2000 00:30:00	8E-06
744	01/01/2000 00:31:00	1E-05
744	01/01/2000 00:32:00	1.1E-05
744	01/01/2000 00:33:00	1.1E-05
744	01/01/2000 00:34:00	1.2E-05
744	01/01/2000 00:35:00	1.2E-05
744	01/01/2000 00:36:00	1.2E-05
744	01/01/2000 00:37:00	1.2E-05
744	01/01/2000 00:38:00	1.2E-05
744	01/01/2000 00:39:00	1.2E-05
744	01/01/2000 00:40:00	1.2E-05
744	01/01/2000 00:41:00	0.000174
744	01/01/2000 00:42:00	0.000498
744	01/01/2000 00:43:00	0.000997
744	01/01/2000 00:44:00	0.001686
744	01/01/2000 00:45:00	0.002574
744	01/01/2000 00:46:00	0.003673
744	01/01/2000 00:47:00	0.004992
744	01/01/2000 00:48:00	0.006239
744	01/01/2000 00:49:00	0.007418
744	01/01/2000 00:50:00	0.00853
744	01/01/2000 00:51:00	0.011069
744	01/01/2000 00:52:00	0.014959
744	01/01/2000 00:53:00	0.020216
744	01/01/2000 00:54:00	0.026849

744	01/01/2000 00:55:00	0.034865
744	01/01/2000 00:56:00	0.039
744	01/01/2000 00:57:00	0.039
744	01/01/2000 00:58:00	0.039
744	01/01/2000 00:59:00	0.039
744	01/01/2000 01:00:00	0.039
744	01/01/2000 01:01:00	0.039
744	01/01/2000 01:02:00	0.039
744	01/01/2000 01:03:00	0.039
744	01/01/2000 01:04:00	0.039
744	01/01/2000 01:05:00	0.039
744	01/01/2000 01:06:00	0.039
744	01/01/2000 01:07:00	0.039
744	01/01/2000 01:08:00	0.039
744	01/01/2000 01:09:00	0.039
744	01/01/2000 01:10:00	0.039
744	01/01/2000 01:11:00	0.039
744	01/01/2000 01:12:00	0.039
744	01/01/2000 01:13:00	0.039
744	01/01/2000 01:14:00	0.039
744	01/01/2000 01:15:00	0.039
744	01/01/2000 01:16:00	0.037745
744	01/01/2000 01:17:00	0.03444
744	01/01/2000 01:18:00	0.031604
744	01/01/2000 01:19:00	0.029172
744	01/01/2000 01:20:00	0.027086
744	01/01/2000 01:21:00	0.025201
744	01/01/2000 01:22:00	0.02348
744	01/01/2000 01:23:00	0.021885
744	01/01/2000 01:24:00	0.020385
744	01/01/2000 01:25:00	0.018954
744	01/01/2000 01:26:00	0.017568
744	01/01/2000 01:27:00	0.016207
744	01/01/2000 01:28:00	0.015041
744	01/01/2000 01:29:00	0.014042
744	01/01/2000 01:30:00	0.013186
744	01/01/2000 01:31:00	0.012405
744	01/01/2000 01:32:00	0.011684
744	01/01/2000 01:33:00	0.011008
744	01/01/2000 01:34:00	0.010363
744	01/01/2000 01:35:00	0.009739
744	01/01/2000 01:36:00	0.009125
744	01/01/2000 01:37:00	0.008514
744	01/01/2000 01:38:00	0.00799
744	01/01/2000 01:39:00	0.007542
744	01/01/2000 01:40:00	0.007159
744	01/01/2000 01:41:00	0.006802
744	01/01/2000 01:42:00	0.006465
744	01/01/2000 01:43:00	0.006142
744	01/01/2000 01:44:00	0.005827
744	01/01/2000 01:45:00	0.005513
744	01/01/2000 01:46:00	0.005198
744	01/01/2000 01:47:00	0.004877
744	01/01/2000 01:48:00	0.004602
744	01/01/2000 01:49:00	0.004366
744	01/01/2000 01:50:00	0.004165
744	01/01/2000 01:51:00	0.003973
744	01/01/2000 01:52:00	0.003789
744	01/01/2000 01:53:00	0.003607
744	01/01/2000 01:54:00	0.003426
744	01/01/2000 01:55:00	0.003242
744	01/01/2000 01:56:00	0.003053
744	01/01/2000 01:57:00	0.002857
744	01/01/2000 01:58:00	0.002689
744	01/01/2000 01:59:00	0.002545
744	01/01/2000 02:00:00	0.002421
744	01/01/2000 02:01:00	0.002302
744	01/01/2000 02:02:00	0.002185
744	01/01/2000 02:03:00	0.002068
744	01/01/2000 02:04:00	0.001949
744	01/01/2000 02:05:00	0.001826
744	01/01/2000 02:06:00	0.001698
744	01/01/2000 02:07:00	0.001565
744	01/01/2000 02:08:00	0.00145
744	01/01/2000 02:09:00	0.001352
744	01/01/2000 02:10:00	0.001267
744	01/01/2000 02:11:00	0.001184
744	01/01/2000 02:12:00	0.001102
744	01/01/2000 02:13:00	0.001019
744	01/01/2000 02:14:00	0.000935
744	01/01/2000 02:15:00	0.000847
744	01/01/2000 02:16:00	0.000754
744	01/01/2000 02:17:00	0.000657
744	01/01/2000 02:18:00	0.000573
744	01/01/2000 02:19:00	0.000502
744	01/01/2000 02:20:00	0.00044
744	01/01/2000 02:21:00	0.000385
744	01/01/2000 02:22:00	0.000338
744	01/01/2000 02:23:00	0.000297
744	01/01/2000 02:24:00	0.00026
744	01/01/2000 02:25:00	0.000227
744	01/01/2000 02:26:00	0.000198
744	01/01/2000 02:27:00	0.000171
744	01/01/2000 02:28:00	0.000148
744	01/01/2000 02:29:00	0.000128
744	01/01/2000 02:30:00	0.000111
744	01/01/2000 02:31:00	9.6E-05
744	01/01/2000 02:32:00	8.4E-05
744	01/01/2000 02:33:00	7.3E-05
744	01/01/2000 02:34:00	6.3E-05
744	01/01/2000 02:35:00	5.5E-05
744	01/01/2000 02:36:00	4.8E-05
744	01/01/2000 02:37:00	4.2E-05
744	01/01/2000 02:38:00	3.7E-05
744	01/01/2000 02:39:00	3.2E-05
744	01/01/2000 02:40:00	2.8E-05
744	01/01/2000 02:41:00	2.5E-05
744	01/01/2000 02:42:00	2.2E-05
744	01/01/2000 02:43:00	1.9E-05
744	01/01/2000 02:44:00	1.7E-05
744	01/01/2000 02:45:00	1.5E-05
744	01/01/2000 02:46:00	1.4E-05
744	01/01/2000 02:47:00	1.2E-05
744	01/01/2000 02:48:00	1.1E-05
744	01/01/2000 02:49:00	1E-05
744	01/01/2000 02:50:00	0
744	01/01/2000 02:51:00	0
744	01/01/2000 02:52:00	0
744	01/01/2000 02:53:00	0
744	01/01/2000 02:54:00	0
744	01/01/2000 02:55:00	0
744	01/01/2000 02:56:00	0
744	01/01/2000 02:57:00	0
744	01/01/2000 02:58:00	0
744	01/01/2000 02:59:00	0
744	01/01/2000 03:00:00	0
744	01/01/2000 03:01:00	0
744	01/01/2000 03:02:00	0
744	01/01/2000 03:03:00	0
744	01/01/2000 03:04:00	0
744	01/01/2000 03:05:00	0
744	01/01/2000 03:06:00	0
744	01/01/2000 03:07:00	0
744	01/01/2000 03:08:00	0
744	01/01/2000 03:09:00	0
744	01/01/2000 03:10:00	0
744	01/01/2000 03:11:00	0
744	01/01/2000 03:12:00	0
744	01/01/2000 03:13:00	0
744	01/01/2000 03:14:00	0
744	01/01/2000 03:15:00	0
744	01/01/2000 03:16:00	0
744	01/01/2000 03:17:00	0
744	01/01/2000 03:18:00	0
744	01/01/2000 03:19:00	0
744	01/01/2000 03:20:00	0
744	01/01/2000 03:21:00	0
744	01/01/2000 03:22:00	0
744	01/01/2000 03:23:00	0
744	01/01/2000 03:24:00	0
744	01/01/2000 03:25:00	0
744	01/01/2000 03:26:00	0
744	01/01/2000 03:27:00	0
744	01/01/2000 03:28:00	0
744	01/01/2000 03:29:00	0
744	01/01/2000 03:30:00	0
744	01/01/2000 03:31:00	0
744	01/01/2000 03:32:00	0
744	01/01/2000 03:33:00	0
744	01/01/2000 03:34:00	0
744	01/01/2000 03:35:00	0
744	01/01/2000 03:36:00	0
744	01/01/2000 03:37:00	0
744	01/01/2000 03:38:00	0
744	01/01/2000 03:39:00	0
744	01/01/2000 03:40:00	0
744	01/01/2000 03:41:00	0
744	01/01/2000 03:42:00	0
744	01/01/2000 03:43:00	0
744	01/01/2000 03:44:00	0
744	01/01/2000 03:45:00	0
744	01/01/2000 03:46:00	0
744	01/01/2000 03:47:00	0
744	01/01/2000 03:48:00	0
744	01/01/2000 03:49:00	0
744	01/01/2000 03:50:00	0
744	01/01/2000 03:51:00	0
744	01/01/2000 03:52:00	0
744	01/01/2000 03:53:00	0
744	01/01/2000 03:54:00	0
744	01/01/2000 03:55:00	0
744	01/01/2000 03:56:00	0
744	01/01/2000 03:57:00	0
744	01/01/2000 03:58:00	0
744	01/01/2000 03:59:00	0
744	01/01/2000 04:00:00	0
744	01/01/2000 04:01:00	0
744	01/01/2000 04:02:00	0
744	01/01/2000 04:03:00	0
744	01/01/2000 04:04:00	0
744	01/01/2000 04:05:00	0
744	01/01/2000 04:06:00	0
744	01/01/2000 04:07:00	0
744	01/01/2000 04:08:00	0
744	01/01/2000 04:09:00	0
744	01/01/2000 04:10:00	0
744	01/01/2000 04:11:00	0
744	01/01/2000 04:12:00	0
744	01/01/2000 04:13:00	0
744	01/01/2000 04:14:00	0
744	01/01/2000 04:15:00	0
744	01/01/2000 04:16:00	0

;Flow (m³/s)

746	01/01/2000 00:00:00	0
746	01/01/2000 00:01:00	0
746	01/01/2000 00:02:00	0
746	01/01/2000 00:03:00	0
746	01/01/2000 00:04:00	0
746	01/01/2000 00:05:00	0
746	01/01/2000 00:06:00	0
746	01/01/2000 00:07:00	0
746	01/01/2000 00:08:00	0
746	01/01/2000 00:09:00	0
746	01/01/2000 00:10:00	0
746	01/01/2000 00:11:00	0
746	01/01/2000 00:12:00	0
746	01/01/2000 00:13:00	0
746	01/01/2000 00:14:00	0
746	01/01/2000 00:15:00	8.4E-05
746	01/01/2000 00:16:00	0.000442
746	01/01/2000 00:17:00	0.00106
746	01/01/2000 00:18:00	0.001665
746	01/01/2000 00:19:00	0.002098
746	01/01/2000 00:20:00	0.002374
746	01/01/2000 00:21:00	0.002597
746	01/01/2000 00:22:00	0.002882
746	01/01/2000 00:23:00	0.003178
746	01/01/2000 00:24:00	0.003394
746	01/01/2000 00:25:00	0.003533
746	01/01/2000 00:26:00	0.003617
746	01/01/2000 00:27:00	0.003667
746	01/01/2000 00:28:00	0.003696
746	01/01/2000 00:29:00	0.003712
746	01/01/2000 00:30:00	0.003721
746	01/01/2000 00:31:00	0.00385
746	01/01/2000 00:32:00	0.004266
746	01/01/2000 00:33:00	0.0048
746	01/01/2000 00:34:00	0.005208
746	01/01/2000 00:35:00	0.005476
746	01/01/2000 00:36:00	0.00564
746	01/01/2000 00:37:00	0.005737
746	01/01/2000 00:38:00	0.005794
746	01/01/2000 00:39:00	0.005826
746	01/01/2000 00:40:00	0.005845
746	01/01/2000 00:41:00	0.006406
746	01/01/2000 00:42:00	0.008267
746	01/01/2000 00:43:00	0.01073
746	01/01/2000 00:44:00	0.011923
746	01/01/2000 00:45:00	0.013028
746	01/01/2000 00:46:00	0.01411
746	01/01/2000 00:47:00	0.015
746	01/01/2000 00:48:00	0.015
746	01/01/2000 00:49:00	0.015
746	01/01/2000 00:50:00	0.015
746	01/01/2000 00:51:00	0.015
746	01/01/2000 00:52:00	0.015
746	01/01/2000 00:53:00	0.015
746	01/01/2000 00:54:00	0.015
746	01/01/2000 00:55:00	0.015
746	01/01/2000 00:56:00	0.015
746	01/01/2000 00:57:00	0.015
746	01/01/2000 00:58:00	0.015
746	01/01/2000 00:59:00	0.01517
746	01/01/2000 01:00:00	0.015387
746	01/01/2000 01:01:00	0.0156
746	01/01/2000 01:02:00	0.015785
746	01/01/2000 01:03:00	0.015939
746	01/01/2000 01:04:00	0.016
746	01/01/2000 01:05:00	0.016
746	01/01/2000 01:06:00	0.016
746	01/01/2000 01:07:00	0.016
746	01/01/2000 01:08:00	0.016
746	01/01/2000 01:09:00	0.016
746	01/01/2000 01:10:00	0.016
746	01/01/2000 01:11:00	0.016
746	01/01/2000 01:12:00	0.016
746	01/01/2000 01:13:00	0.016
746	01/01/2000 01:14:00	0.016
746	01/01/2000 01:15:00	0.016
746	01/01/2000 01:16:00	0.016
746	01/01/2000 01:17:00	0.016
746	01/01/2000 01:18:00	0.016
746	01/01/2000 01:19:00	0.016
746	01/01/2000 01:20:00	0.016
746	01/01/2000 01:21:00	0.016
746	01/01/2000 01:22:00	0.016
746	01/01/2000 01:23:00	0.016
746	01/01/2000 01:24:00	0.016
746	01/01/2000 01:25:00	0.016
746	01/01/2000 01:26:00	0.016
746	01/01/2000 01:27:00	0.016
746	01/01/2000 01:28:00	0.016
746	01/01/2000 01:29:00	0.016
746	01/01/2000 01:30:00	0.016
746	01/01/2000 01:31:00	0.016
746	01/01/2000 01:32:00	0.016
746	01/01/2000 01:33:00	0.016

746	01/01/2000 01:34:00	0.016
746	01/01/2000 01:35:00	0.016
746	01/01/2000 01:36:00	0.016
746	01/01/2000 01:37:00	0.016
746	01/01/2000 01:38:00	0.016
746	01/01/2000 01:39:00	0.016
746	01/01/2000 01:40:00	0.016
746	01/01/2000 01:41:00	0.016
746	01/01/2000 01:42:00	0.016
746	01/01/2000 01:43:00	0.016
746	01/01/2000 01:44:00	0.016
746	01/01/2000 01:45:00	0.016
746	01/01/2000 01:46:00	0.016
746	01/01/2000 01:47:00	0.016
746	01/01/2000 01:48:00	0.016
746	01/01/2000 01:49:00	0.016
746	01/01/2000 01:50:00	0.016
746	01/01/2000 01:51:00	0.016
746	01/01/2000 01:52:00	0.016
746	01/01/2000 01:53:00	0.016
746	01/01/2000 01:54:00	0.016
746	01/01/2000 01:55:00	0.016
746	01/01/2000 01:56:00	0.016
746	01/01/2000 01:57:00	0.016
746	01/01/2000 01:58:00	0.016
746	01/01/2000 01:59:00	0.016
746	01/01/2000 02:00:00	0.016
746	01/01/2000 02:01:00	0.016
746	01/01/2000 02:02:00	0.016
746	01/01/2000 02:03:00	0.016
746	01/01/2000 02:04:00	0.016
746	01/01/2000 02:05:00	0.016
746	01/01/2000 02:06:00	0.016
746	01/01/2000 02:07:00	0.016
746	01/01/2000 02:08:00	0.016
746	01/01/2000 02:09:00	0.015975
746	01/01/2000 02:10:00	0.015946
746	01/01/2000 02:11:00	0.015918
746	01/01/2000 02:12:00	0.015889
746	01/01/2000 02:13:00	0.015859
746	01/01/2000 02:14:00	0.01583
746	01/01/2000 02:15:00	0.015801
746	01/01/2000 02:16:00	0.015771
746	01/01/2000 02:17:00	0.015742
746	01/01/2000 02:18:00	0.015713
746	01/01/2000 02:19:00	0.015683
746	01/01/2000 02:20:00	0.015654
746	01/01/2000 02:21:00	0.015625
746	01/01/2000 02:22:00	0.015595
746	01/01/2000 02:23:00	0.015566
746	01/01/2000 02:24:00	0.015536
746	01/01/2000 02:25:00	0.015507
746	01/01/2000 02:26:00	0.015477
746	01/01/2000 02:27:00	0.015448
746	01/01/2000 02:28:00	0.015419
746	01/01/2000 02:29:00	0.015389
746	01/01/2000 02:30:00	0.01536
746	01/01/2000 02:31:00	0.015331
746	01/01/2000 02:32:00	0.015301
746	01/01/2000 02:33:00	0.015272
746	01/01/2000 02:34:00	0.015242
746	01/01/2000 02:35:00	0.015213
746	01/01/2000 02:36:00	0.015184
746	01/01/2000 02:37:00	0.015154
746	01/01/2000 02:38:00	0.015125
746	01/01/2000 02:39:00	0.015096
746	01/01/2000 02:40:00	0.015067
746	01/01/2000 02:41:00	0.015038
746	01/01/2000 02:42:00	0.015009
746	01/01/2000 02:43:00	0.015
746	01/01/2000 02:44:00	0.015
746	01/01/2000 02:45:00	0.015
746	01/01/2000 02:46:00	0.015
746	01/01/2000 02:47:00	0.015
746	01/01/2000 02:48:00	0.015
746	01/01/2000 02:49:00	0.015
746	01/01/2000 02:50:00	0.015
746	01/01/2000 02:51:00	0.015
746	01/01/2000 02:52:00	0.015
746	01/01/2000 02:53:00	0.015
746	01/01/2000 02:54:00	0.015
746	01/01/2000 02:55:00	0.015
746	01/01/2000 02:56:00	0.015
746	01/01/2000 02:57:00	0.015
746	01/01/2000 02:58:00	0.015
746	01/01/2000 02:59:00	0.015
746	01/01/2000 03:00:00	0.015
746	01/01/2000 03:01:00	0.015
746	01/01/2000 03:02:00	0.015
746	01/01/2000 03:03:00	0.015
746	01/01/2000 03:04:00	0.015
746	01/01/2000 03:05:00	0.015
746	01/01/2000 03:06:00	0.015
746	01/01/2000 03:07:00	0.015
746	01/01/2000 03:08:00	0.015
746	01/01/2000 03:09:00	0.015
746	01/01/2000 03:10:00	0.015
746	01/01/2000 03:11:00	0.015
746	01/01/2000 03:12:00	0.015
746	01/01/2000 03:13:00	0.015
746	01/01/2000 03:14:00	0.015
746	01/01/2000 03:15:00	0.015
746	01/01/2000 03:16:00	0.015
746	01/01/2000 03:17:00	0.015
746	01/01/2000 03:18:00	0.009304
746	01/01/2000 03:19:00	0.003342
746	01/01/2000 03:20:00	0.001201
746	01/01/2000 03:21:00	0.000431
746	01/01/2000 03:22:00	0.000155
746	01/01/2000 03:23:00	5.6E-05
746	01/01/2000 03:24:00	2E-05
746	01/01/2000 03:25:00	0
746	01/01/2000 03:26:00	0
746	01/01/2000 03:27:00	0
746	01/01/2000 03:28:00	0
746	01/01/2000 03:29:00	0
746	01/01/2000 03:30:00	0
746	01/01/2000 03:31:00	0
746	01/01/2000 03:32:00	0
746	01/01/2000 03:33:00	0
746	01/01/2000 03:34:00	0
746	01/01/2000 03:35:00	0
746	01/01/2000 03:36:00	0
746	01/01/2000 03:37:00	0
746	01/01/2000 03:38:00	0
746	01/01/2000 03:39:00	0
746	01/01/2000 03:40:00	0
746	01/01/2000 03:41:00	0
746	01/01/2000 03:42:00	0
746	01/01/2000 03:43:00	0
746	01/01/2000 03:44:00	0
746	01/01/2000 03:45:00	0
746	01/01/2000 03:46:00	0
746	01/01/2000 03:47:00	0
746	01/01/2000 03:48:00	0
746	01/01/2000 03:49:00	0
746	01/01/2000 03:50:00	0
746	01/01/2000 03:51:00	0
746	01/01/2000 03:52:00	0
746	01/01/2000 03:53:00	0
746	01/01/2000 03:54:00	0
746	01/01/2000 03:55:00	0
746	01/01/2000 03:56:00	0
746	01/01/2000 03:57:00	0
746	01/01/2000 03:58:00	0
746	01/01/2000 03:59:00	0
746	01/01/2000 04:00:00	0
746	01/01/2000 04:01:00	0
746	01/01/2000 04:02:00	0
746	01/01/2000 04:03:00	0
746	01/01/2000 04:04:00	0
746	01/01/2000 04:05:00	0
746	01/01/2000 04:06:00	0
746	01/01/2000 04:07:00	0
746	01/01/2000 04:08:00	0
746	01/01/2000 04:09:00	0
746	01/01/2000 04:10:00	0
746	01/01/2000 04:11:00	0
746	01/01/2000 04:12:00	0
746	01/01/2000 04:13:00	0
746	01/01/2000 04:14:00	0
746	01/01/2000 04:15:00	0
746	01/01/2000 04:16:00	0

;Flow (m³/s)		
748E	01/01/2000 00:00:00	0
748E	01/01/2000 00:01:00	0
748E	01/01/2000 00:02:00	0
748E	01/01/2000 00:03:00	0
748E	01/01/2000 00:04:00	0
748E	01/01/2000 00:05:00	0
748E	01/01/2000 00:06:00	0
748E	01/01/2000 00:07:00	0
748E	01/01/2000 00:08:00	0
748E	01/01/2000 00:09:00	0
748E	01/01/2000 00:10:00	0
748E	01/01/2000 00:11:00	0
748E	01/01/2000 00:12:00	0
748E	01/01/2000 00:13:00	0
748E	01/01/2000 00:14:00	0
748E	01/01/2000 00:15:00	0.000309
748E	01/01/2000 00:16:00	0.001396
748E	01/01/2000 00:17:00	0.002818
748E	01/01/2000 00:18:00	0.0038
748E	01/01/2000 00:19:00	0.004373
748E	01/01/2000 00:20:00	0.004742
748E	01/01/2000 00:21:00	0.00517
748E	01/01/2000 00:22:00	0.005845
748E	01/01/2000 00:23:00	0.006389
748E	01/01/2000 00:24:00	0.00668
748E	01/01/2000 00:25:00	0.006878
748E	01/01/2000 00:26:00	0.006995
748E	01/01/2000 00:27:00	0.00707
748E	01/01/2000 00:28:00	0.007115
748E	01/01/2000 00:29:00	0.007144
748E	01/01/2000 00:30:00	0.007161
748E	01/01/2000 00:31:00	0.007625
748E	01/01/2000 00:32:00	0.008816
748E	01/01/2000 00:33:00	0.009835
748E	01/01/2000 00:34:00	0.010362
748E	01/01/2000 00:35:00	0.01073
748E	01/01/2000 00:36:00	0.010942
748E	01/01/2000 00:37:00	0.011081
748E	01/01/2000 00:38:00	0.011164
748E	01/01/2000 00:39:00	0.011217
748E	01/01/2000 00:40:00	0.011249
748E	01/01/2000 00:41:00	0.01331
748E	01/01/2000 00:42:00	0.018687
748E	01/01/2000 00:43:00	0.023559
748E	01/01/2000 00:44:00	0.026595
748E	01/01/2000 00:45:00	0.029232
748E	01/01/2000 00:46:00	0.031291
748E	01/01/2000 00:47:00	0.032972
748E	01/01/2000 00:48:00	0.034403
748E	01/01/2000 00:49:00	0.035662
748E	01/01/2000 00:50:00	0.036796
748E	01/01/2000 00:51:00	0.050368
748E	01/01/2000 00:52:00	0.071
748E	01/01/2000 00:53:00	0.071
748E	01/01/2000 00:54:00	0.071171
748E	01/01/2000 00:55:00	0.071541
748E	01/01/2000 00:56:00	0.071991
748E	01/01/2000 00:57:00	0.072502
748E	01/01/2000 00:58:00	0.073057
748E	01/01/2000 00:59:00	0.073626
748E	01/01/2000 01:00:00	0.074222
748E	01/01/2000 01:01:00	0.074805
748E	01/01/2000 01:02:00	0.075315
748E	01/01/2000 01:03:00	0.075723
748E	01/01/2000 01:04:00	0.076045
748E	01/01/2000 01:05:00	0.076293
748E	01/01/2000 01:06:00	0.076477
748E	01/01/2000 01:07:00	0.076616
748E	01/01/2000 01:08:00	0.076719
748E	01/01/2000 01:09:00	0.076795
748E	01/01/2000 01:10:00	0.076851
748E	01/01/2000 01:11:00	0.076882
748E	01/01/2000 01:12:00	0.076877
748E	01/01/2000 01:13:00	0.076835
748E	01/01/2000 01:14:00	0.076764
748E	01/01/2000 01:15:00	0.076669
748E	01/01/2000 01:16:00	0.076553
748E	01/01/2000 01:17:00	0.076423
748E	01/01/2000 01:18:00	0.07628
748E	01/01/2000 01:19:00	0.076129
748E	01/01/2000 01:20:00	0.07597
748E	01/01/2000 01:21:00	0.075804
748E	01/01/2000 01:22:00	0.075626
748E	01/01/2000 01:23:00	0.075435
748E	01/01/2000 01:24:00	0.075235
748E	01/01/2000 01:25:00	0.075028
748E	01/01/2000 01:26:00	0.074821
748E	01/01/2000 01:27:00	0.074612
748E	01/01/2000 01:28:00	0.074399
748E	01/01/2000 01:29:00	0.074184
748E	01/01/2000 01:30:00	0.073967
748E	01/01/2000 01:31:00	0.073748
748E	01/01/2000 01:32:00	0.073525
748E	01/01/2000 01:33:00	0.073297
748E	01/01/2000 01:34:00	0.073065
748E	01/01/2000 01:35:00	0.072823
748E	01/01/2000 01:36:00	0.072576
748E	01/01/2000 01:37:00	0.072328
748E	01/01/2000 01:38:00	0.072079
748E	01/01/2000 01:39:00	0.07183
748E	01/01/2000 01:40:00	0.07158
748E	01/01/2000 01:41:00	0.07133
748E	01/01/2000 01:42:00	0.071078
748E	01/01/2000 01:43:00	0.071
748E	01/01/2000 01:44:00	0.030096
748E	01/01/2000 01:45:00	0.00515
748E	01/01/2000 01:46:00	0.014073
748E	01/01/2000 01:47:00	0.010244
748E	01/01/2000 01:48:00	0.011367
748E	01/01/2000 01:49:00	0.010679
748E	01/01/2000 01:50:00	0.010737
748E	01/01/2000 01:51:00	0.010393
748E	01/01/2000 01:52:00	0.009913
748E	01/01/2000 01:53:00	0.009431
748E	01/01/2000 01:54:00	0.009094
748E	01/01/2000 01:55:00	0.008778
748E	01/01/2000 01:56:00	0.00853
748E	01/01/2000 01:57:00	0.008343
748E	01/01/2000 01:58:00	0.008198
748E	01/01/2000 01:59:00	0.008085
748E	01/01/2000 02:00:00	0.007996
748E	01/01/2000 02:01:00	0.007811
748E	01/01/2000 02:02:00	0.007454
748E	01/01/2000 02:03:00	0.007123
748E	01/01/2000 02:04:00	0.006883
748E	01/01/2000 02:05:00	0.006662
748E	01/01/2000 02:06:00	0.006486
748E	01/01/2000 02:07:00	0.006355
748E	01/01/2000 02:08:00	0.006251
748E	01/01/2000 02:09:00	0.006171
748E	01/01/2000 02:10:00	0.006107
748E	01/01/2000 02:11:00	0.00598
748E	01/01/2000 02:12:00	0.00574

748E	01/01/2000 02:13:00	0.005531
748E	01/01/2000 02:14:00	0.005405
748E	01/01/2000 02:15:00	0.005305
748E	01/01/2000 02:16:00	0.005234
748E	01/01/2000 02:17:00	0.005184
748E	01/01/2000 02:18:00	0.005146
748E	01/01/2000 02:19:00	0.005118
748E	01/01/2000 02:20:00	0.005097
748E	01/01/2000 02:21:00	0.005023
748E	01/01/2000 02:22:00	0.004861
748E	01/01/2000 02:23:00	0.004722
748E	01/01/2000 02:24:00	0.004648
748E	01/01/2000 02:25:00	0.004595
748E	01/01/2000 02:26:00	0.004563
748E	01/01/2000 02:27:00	0.004541
748E	01/01/2000 02:28:00	0.004527
748E	01/01/2000 02:29:00	0.004517
748E	01/01/2000 02:30:00	0.00451
748E	01/01/2000 02:31:00	0.00446
748E	01/01/2000 02:32:00	0.004337
748E	01/01/2000 02:33:00	0.004232
748E	01/01/2000 02:34:00	0.004178
748E	01/01/2000 02:35:00	0.004139
748E	01/01/2000 02:36:00	0.004117
748E	01/01/2000 02:37:00	0.004102
748E	01/01/2000 02:38:00	0.004093
748E	01/01/2000 02:39:00	0.004087
748E	01/01/2000 02:40:00	0.004084
748E	01/01/2000 02:41:00	0.004044
748E	01/01/2000 02:42:00	0.003945
748E	01/01/2000 02:43:00	0.00386
748E	01/01/2000 02:44:00	0.003816
748E	01/01/2000 02:45:00	0.003785
748E	01/01/2000 02:46:00	0.003767
748E	01/01/2000 02:47:00	0.003756
748E	01/01/2000 02:48:00	0.003749
748E	01/01/2000 02:49:00	0.003744
748E	01/01/2000 02:50:00	0.003742
748E	01/01/2000 02:51:00	0.003709
748E	01/01/2000 02:52:00	0.003626
748E	01/01/2000 02:53:00	0.003555
748E	01/01/2000 02:54:00	0.003519
748E	01/01/2000 02:55:00	0.003493
748E	01/01/2000 02:56:00	0.003478
748E	01/01/2000 02:57:00	0.003469
748E	01/01/2000 02:58:00	0.003463
748E	01/01/2000 02:59:00	0.003459
748E	01/01/2000 03:00:00	0.003457
748E	01/01/2000 03:01:00	0.003076
748E	01/01/2000 03:02:00	0.00208
748E	01/01/2000 03:03:00	0.001227
748E	01/01/2000 03:04:00	0.000787
748E	01/01/2000 03:05:00	0.000479
748E	01/01/2000 03:06:00	0.000301
748E	01/01/2000 03:07:00	0.000186
748E	01/01/2000 03:08:00	0.000116
748E	01/01/2000 03:09:00	7.2E-05
748E	01/01/2000 03:10:00	4.5E-05
748E	01/01/2000 03:11:00	2.8E-05
748E	01/01/2000 03:12:00	1.7E-05
748E	01/01/2000 03:13:00	1.1E-05
748E	01/01/2000 03:14:00	0
748E	01/01/2000 03:15:00	0
748E	01/01/2000 03:16:00	0
748E	01/01/2000 03:17:00	0
748E	01/01/2000 03:18:00	0
748E	01/01/2000 03:19:00	0
748E	01/01/2000 03:20:00	0
748E	01/01/2000 03:21:00	0
748E	01/01/2000 03:22:00	0
748E	01/01/2000 03:23:00	0
748E	01/01/2000 03:24:00	0
748E	01/01/2000 03:25:00	0
748E	01/01/2000 03:26:00	0
748E	01/01/2000 03:27:00	0
748E	01/01/2000 03:28:00	0
748E	01/01/2000 03:29:00	0
748E	01/01/2000 03:30:00	0
748E	01/01/2000 03:31:00	0
748E	01/01/2000 03:32:00	0
748E	01/01/2000 03:33:00	0
748E	01/01/2000 03:34:00	0
748E	01/01/2000 03:35:00	0
748E	01/01/2000 03:36:00	0
748E	01/01/2000 03:37:00	0
748E	01/01/2000 03:38:00	0
748E	01/01/2000 03:39:00	0
748E	01/01/2000 03:40:00	0
748E	01/01/2000 03:41:00	0
748E	01/01/2000 03:42:00	0
748E	01/01/2000 03:43:00	0
748E	01/01/2000 03:44:00	0
748E	01/01/2000 03:45:00	0
748E	01/01/2000 03:46:00	0
748E	01/01/2000 03:47:00	0
748E	01/01/2000 03:48:00	0
748E	01/01/2000 03:49:00	0
748E	01/01/2000 03:50:00	0
748E	01/01/2000 03:51:00	0
748E	01/01/2000 03:52:00	0
748E	01/01/2000 03:53:00	0
748E	01/01/2000 03:54:00	0
748E	01/01/2000 03:55:00	0
748E	01/01/2000 03:56:00	0
748E	01/01/2000 03:57:00	0
748E	01/01/2000 03:58:00	0
748E	01/01/2000 03:59:00	0
748E	01/01/2000 04:00:00	0
748E	01/01/2000 04:01:00	0
748E	01/01/2000 04:02:00	0
748E	01/01/2000 04:03:00	0
748E	01/01/2000 04:04:00	0
748E	01/01/2000 04:05:00	0
748E	01/01/2000 04:06:00	0
748E	01/01/2000 04:07:00	0
748E	01/01/2000 04:08:00	0
748E	01/01/2000 04:09:00	0
748E	01/01/2000 04:10:00	0
748E	01/01/2000 04:11:00	0
748E	01/01/2000 04:12:00	0
748E	01/01/2000 04:13:00	0
748E	01/01/2000 04:14:00	0
748E	01/01/2000 04:15:00	0
748E	01/01/2000 04:16:00	0

;Flow (m^3/s)

750E	01/01/2000 00:00:00	0
750E	01/01/2000 00:01:00	0
750E	01/01/2000 00:02:00	0
750E	01/01/2000 00:03:00	0
750E	01/01/2000 00:04:00	0
750E	01/01/2000 00:05:00	0
750E	01/01/2000 00:06:00	0
750E	01/01/2000 00:07:00	0
750E	01/01/2000 00:08:00	0
750E	01/01/2000 00:09:00	0
750E	01/01/2000 00:10:00	0
750E	01/01/2000 00:11:00	0
750E	01/01/2000 00:12:00	0
750E	01/01/2000 00:13:00	0
750E	01/01/2000 00:14:00	0
750E	01/01/2000 00:15:00	0.000156
750E	01/01/2000 00:16:00	0.000578
750E	01/01/2000 00:17:00	0.001041
750E	01/01/2000 00:18:00	0.001354
750E	01/01/2000 00:19:00	0.001537
750E	01/01/2000 00:20:00	0.001639
750E	01/01/2000 00:21:00	0.001794
750E	01/01/2000 00:22:00	0.002009
750E	01/01/2000 00:23:00	0.00216
750E	01/01/2000 00:24:00	0.002251
750E	01/01/2000 00:25:00	0.002301
750E	01/01/2000 00:26:00	0.002327
750E	01/01/2000 00:27:00	0.002341
750E	01/01/2000 00:28:00	0.002348
750E	01/01/2000 00:29:00	0.002352
750E	01/01/2000 00:30:00	0.002354
750E	01/01/2000 00:31:00	0.002582
750E	01/01/2000 00:32:00	0.002997
750E	01/01/2000 00:33:00	0.003301
750E	01/01/2000 00:34:00	0.003485
750E	01/01/2000 00:35:00	0.003588
750E	01/01/2000 00:36:00	0.003644
750E	01/01/2000 00:37:00	0.003673
750E	01/01/2000 00:38:00	0.003688
750E	01/01/2000 00:39:00	0.003695
750E	01/01/2000 00:40:00	0.003699
750E	01/01/2000 00:41:00	0.004841
750E	01/01/2000 00:42:00	0.007009
750E	01/01/2000 00:43:00	0.00899
750E	01/01/2000 00:44:00	0.01077
750E	01/01/2000 00:45:00	0.012483
750E	01/01/2000 00:46:00	0.013957
750E	01/01/2000 00:47:00	0.015261
750E	01/01/2000 00:48:00	0.016442
750E	01/01/2000 00:49:00	0.017509
750E	01/01/2000 00:50:00	0.018362
750E	01/01/2000 00:51:00	0.02386
750E	01/01/2000 00:52:00	0.028
750E	01/01/2000 00:53:00	0.028
750E	01/01/2000 00:54:00	0.028
750E	01/01/2000 00:55:00	0.028
750E	01/01/2000 00:56:00	0.029
750E	01/01/2000 00:57:00	0.029
750E	01/01/2000 00:58:00	0.029
750E	01/01/2000 00:59:00	0.029
750E	01/01/2000 01:00:00	0.029
750E	01/01/2000 01:01:00	0.029
750E	01/01/2000 01:02:00	0.029
750E	01/01/2000 01:03:00	0.029
750E	01/01/2000 01:04:00	0.029
750E	01/01/2000 01:05:00	0.029
750E	01/01/2000 01:06:00	0.029
750E	01/01/2000 01:07:00	0.029
750E	01/01/2000 01:08:00	0.029
750E	01/01/2000 01:09:00	0.029
750E	01/01/2000 01:10:00	0.029
750E	01/01/2000 01:11:00	0.029
750E	01/01/2000 01:12:00	0.029
750E	01/01/2000 01:13:00	0.029
750E	01/01/2000 01:14:00	0.029
750E	01/01/2000 01:15:00	0.029
750E	01/01/2000 01:16:00	0.029
750E	01/01/2000 01:17:00	0.029
750E	01/01/2000 01:18:00	0.029
750E	01/01/2000 01:19:00	0.029
750E	01/01/2000 01:20:00	0.029
750E	01/01/2000 01:21:00	0.029
750E	01/01/2000 01:22:00	0.02857
750E	01/01/2000 01:23:00	0.027728
750E	01/01/2000 01:24:00	0.026873
750E	01/01/2000 01:25:00	0.025989
750E	01/01/2000 01:26:00	0.025258
750E	01/01/2000 01:27:00	0.024656
750E	01/01/2000 01:28:00	0.024051
750E	01/01/2000 01:29:00	0.023348
750E	01/01/2000 01:30:00	0.022726
750E	01/01/2000 01:31:00	0.022106
750E	01/01/2000 01:32:00	0.021754
750E	01/01/2000 01:33:00	0.021411
750E	01/01/2000 01:34:00	0.021049
750E	01/01/2000 01:35:00	0.020662
750E	01/01/2000 01:36:00	0.020343
750E	01/01/2000 01:37:00	0.02008
750E	01/01/2000 01:38:00	0.019864
750E	01/01/2000 01:39:00	0.019686
750E	01/01/2000 01:40:00	0.019541
750E	01/01/2000 01:41:00	0.019389
750E	01/01/2000 01:42:00	0.019229
750E	01/01/2000 01:43:00	0.019055
750E	01/01/2000 01:44:00	0.018864
750E	01/01/2000 01:45:00	0.018654
750E	01/01/2000 01:46:00	0.015939
750E	01/01/2000 01:47:00	0.010269
750E	01/01/2000 01:48:00	0.007107
750E	01/01/2000 01:49:00	0.006009
750E	01/01/2000 01:50:00	0.005589
750E	01/01/2000 01:51:00	0.005306
750E	01/01/2000 01:52:00	0.005015
750E	01/01/2000 01:53:00	0.004756
750E	01/01/2000 01:54:00	0.004514
750E	01/01/2000 01:55:00	0.004281
750E	01/01/2000 01:56:00	0.004097
750E	01/01/2000 01:57:00	0.003951
750E	01/01/2000 01:58:00	0.003836
750E	01/01/2000 01:59:00	0.003745
750E	01/01/2000 02:00:00	0.003673
750E	01/01/2000 02:01:00	0.003546
750E	01/01/2000 02:02:00	0.003366
750E	01/01/2000 02:03:00	0.003192
750E	01/01/2000 02:04:00	0.003024
750E	01/01/2000 02:05:00	0.002861
750E	01/01/2000 02:06:00	0.002731
750E	01/01/2000 02:07:00	0.002628
750E	01/01/2000 02:08:00	0.002546
750E	01/01/2000 02:09:00	0.002481
750E	01/01/2000 02:10:00	0.002429
750E	01/01/2000 02:11:00	0.002342
750E	01/01/2000 02:12:00	0.002225
750E	01/01/2000 02:13:00	0.002121
750E	01/01/2000 02:14:00	0.002033
750E	01/01/2000 02:15:00	0.001956
750E	01/01/2000 02:16:00	0.001895
750E	01/01/2000 02:17:00	0.001847
750E	01/01/2000 02:18:00	0.00181
750E	01/01/2000 02:19:00	0.00178
750E	01/01/2000 02:20:00	0.001755
750E	01/01/2000 02:21:00	0.001706
750E	01/01/2000 02:22:00	0.001638
750E	01/01/2000 02:23:00	0.001586
750E	01/01/2000 02:24:00	0.001552
750E	01/01/2000 02:25:00	0.001529
750E	01/01/2000 02:26:00	0.001516
750E	01/01/2000 02:27:00	0.001505
750E	01/01/2000 02:28:00	0.001498
750E	01/01/2000 02:29:00	0.001493
750E	01/01/2000 02:30:00	0.001489
750E	01/01/2000 02:31:00	0.001463
750E	01/01/2000 02:32:00	0.001419
750E	01/01/2000 02:33:00	0.001386
750E	01/01/2000 02:34:00	0.001365
750E	01/01/2000 02:35:00	0.001345
750E	01/01/2000 02:36:00	0.001339
750E	01/01/2000 02:37:00	0.001336
750E	01/01/2000 02:38:00	0.001334
750E	01/01/2000 02:39:00	0.001334
750E	01/01/2000 02:40:00	0.001333
750E	01/01/2000 02:41:00	0.001314
750E	01/01/2000 02:42:00	0.00128
750E	01/01/2000 02:43:00	0.001255
750E	01/01/2000 02:44:00	0.00124
750E	01/01/2000 02:45:00	0.001231
750E	01/01/2000 02:46:00	0.001227
750E	01/01/2000 02:47:00	0.001224
750E	01/01/2000 02:48:00	0.001223
750E	01/01/2000 02:49:00	0.001222
750E	01/01/2000 02:50:00	0.001222
750E	01/01/2000 02:51:00	0.001206

750E	01/01/2000 02:52:00	0.001178
750E	01/01/2000 02:53:00	0.001157
750E	01/01/2000 02:54:00	0.001144
750E	01/01/2000 02:55:00	0.001137
750E	01/01/2000 02:56:00	0.001133
750E	01/01/2000 02:57:00	0.001131
750E	01/01/2000 02:58:00	0.00113
750E	01/01/2000 02:59:00	0.00113
750E	01/01/2000 03:00:00	0.001129
750E	01/01/2000 03:01:00	0.000939
750E	01/01/2000 03:02:00	0.000592
750E	01/01/2000 03:03:00	0.000337
750E	01/01/2000 03:04:00	0.000182
750E	01/01/2000 03:05:00	9.6E-05
750E	01/01/2000 03:06:00	4.9E-05
750E	01/01/2000 03:07:00	2.5E-05
750E	01/01/2000 03:08:00	1.3E-05
750E	01/01/2000 03:09:00	0
750E	01/01/2000 03:10:00	0
750E	01/01/2000 03:11:00	0
750E	01/01/2000 03:12:00	0
750E	01/01/2000 03:13:00	0
750E	01/01/2000 03:14:00	0
750E	01/01/2000 03:15:00	0
750E	01/01/2000 03:16:00	0
750E	01/01/2000 03:17:00	0
750E	01/01/2000 03:18:00	0
750E	01/01/2000 03:19:00	0
750E	01/01/2000 03:20:00	0
750E	01/01/2000 03:21:00	0
750E	01/01/2000 03:22:00	0
750E	01/01/2000 03:23:00	0
750E	01/01/2000 03:24:00	0
750E	01/01/2000 03:25:00	0
750E	01/01/2000 03:26:00	0
750E	01/01/2000 03:27:00	0
750E	01/01/2000 03:28:00	0
750E	01/01/2000 03:29:00	0
750E	01/01/2000 03:30:00	0
750E	01/01/2000 03:31:00	0
750E	01/01/2000 03:32:00	0
750E	01/01/2000 03:33:00	0
750E	01/01/2000 03:34:00	0
750E	01/01/2000 03:35:00	0
750E	01/01/2000 03:36:00	0
750E	01/01/2000 03:37:00	0
750E	01/01/2000 03:38:00	0
750E	01/01/2000 03:39:00	0
750E	01/01/2000 03:40:00	0
750E	01/01/2000 03:41:00	0
750E	01/01/2000 03:42:00	0
750E	01/01/2000 03:43:00	0
750E	01/01/2000 03:44:00	0
750E	01/01/2000 03:45:00	0
750E	01/01/2000 03:46:00	0
750E	01/01/2000 03:47:00	0
750E	01/01/2000 03:48:00	0
750E	01/01/2000 03:49:00	0
750E	01/01/2000 03:50:00	0
750E	01/01/2000 03:51:00	0
750E	01/01/2000 03:52:00	0
750E	01/01/2000 03:53:00	0
750E	01/01/2000 03:54:00	0
750E	01/01/2000 03:55:00	0
750E	01/01/2000 03:56:00	0
750E	01/01/2000 03:57:00	0
750E	01/01/2000 03:58:00	0
750E	01/01/2000 03:59:00	0
750E	01/01/2000 04:00:00	0
750E	01/01/2000 04:01:00	0
750E	01/01/2000 04:02:00	0
750E	01/01/2000 04:03:00	0
750E	01/01/2000 04:04:00	0
750E	01/01/2000 04:05:00	0
750E	01/01/2000 04:06:00	0
750E	01/01/2000 04:07:00	0
750E	01/01/2000 04:08:00	0
750E	01/01/2000 04:09:00	0
750E	01/01/2000 04:10:00	0
750E	01/01/2000 04:11:00	0
750E	01/01/2000 04:12:00	0
750E	01/01/2000 04:13:00	0
750E	01/01/2000 04:14:00	0
750E	01/01/2000 04:15:00	0
750E	01/01/2000 04:16:00	0

;Flow (m^3/s)		
750S	01/01/2000 00:00:00	0
750S	01/01/2000 00:01:00	0
750S	01/01/2000 00:02:00	0
750S	01/01/2000 00:03:00	0
750S	01/01/2000 00:04:00	0
750S	01/01/2000 00:05:00	0
750S	01/01/2000 00:06:00	0
750S	01/01/2000 00:07:00	0
750S	01/01/2000 00:08:00	0
750S	01/01/2000 00:09:00	0
750S	01/01/2000 00:10:00	0
750S	01/01/2000 00:11:00	0
750S	01/01/2000 00:12:00	0
750S	01/01/2000 00:13:00	0
750S	01/01/2000 00:14:00	0
750S	01/01/2000 00:15:00	0.000345
750S	01/01/2000 00:16:00	0.000935
750S	01/01/2000 00:17:00	0.001229
750S	01/01/2000 00:18:00	0.001337
750S	01/01/2000 00:19:00	0.001398
750S	01/01/2000 00:20:00	0.001417
750S	01/01/2000 00:21:00	0.001657
750S	01/01/2000 00:22:00	0.001845
750S	01/01/2000 00:23:00	0.001876
750S	01/01/2000 00:24:00	0.001922
750S	01/01/2000 00:25:00	0.001922
750S	01/01/2000 00:26:00	0.001935
750S	01/01/2000 00:27:00	0.001932
750S	01/01/2000 00:28:00	0.001936
750S	01/01/2000 00:29:00	0.001935
750S	01/01/2000 00:30:00	0.001936
750S	01/01/2000 00:31:00	0.00244
750S	01/01/2000 00:32:00	0.00285
750S	01/01/2000 00:33:00	0.002912
750S	01/01/2000 00:34:00	0.003017
750S	01/01/2000 00:35:00	0.003024
750S	01/01/2000 00:36:00	0.003076
750S	01/01/2000 00:37:00	0.003113
750S	01/01/2000 00:38:00	0.003189
750S	01/01/2000 00:39:00	0.003282
750S	01/01/2000 00:40:00	0.003412
750S	01/01/2000 00:41:00	0.005807
750S	01/01/2000 00:42:00	0.008018
750S	01/01/2000 00:43:00	0.009005
750S	01/01/2000 00:44:00	0.010453
750S	01/01/2000 00:45:00	0.011665
750S	01/01/2000 00:46:00	0.013174
750S	01/01/2000 00:47:00	0.014724
750S	01/01/2000 00:48:00	0.0165
750S	01/01/2000 00:49:00	0.018383
750S	01/01/2000 00:50:00	0.02043
750S	01/01/2000 00:51:00	0.036165
750S	01/01/2000 00:52:00	0.052752
750S	01/01/2000 00:53:00	0.064583
750S	01/01/2000 00:54:00	0.078637
750S	01/01/2000 00:55:00	0.082557
750S	01/01/2000 00:56:00	0.086147
750S	01/01/2000 00:57:00	0.088447
750S	01/01/2000 00:58:00	0.090508
750S	01/01/2000 00:59:00	0.097989
750S	01/01/2000 01:00:00	0.127489
750S	01/01/2000 01:01:00	0.160652
750S	01/01/2000 01:02:00	0.175765
750S	01/01/2000 01:03:00	0.177954
750S	01/01/2000 01:04:00	0.181
750S	01/01/2000 01:05:00	0.182185
750S	01/01/2000 01:06:00	0.18315
750S	01/01/2000 01:07:00	0.183805
750S	01/01/2000 01:08:00	0.184166
750S	01/01/2000 01:09:00	0.184418
750S	01/01/2000 01:10:00	0.184654
750S	01/01/2000 01:11:00	0.184857
750S	01/01/2000 01:12:00	0.185004
750S	01/01/2000 01:13:00	0.185082
750S	01/01/2000 01:14:00	0.18507
750S	01/01/2000 01:15:00	0.184974
750S	01/01/2000 01:16:00	0.184815
750S	01/01/2000 01:17:00	0.184603
750S	01/01/2000 01:18:00	0.184355
750S	01/01/2000 01:19:00	0.184092
750S	01/01/2000 01:20:00	0.183704
750S	01/01/2000 01:21:00	0.18325
750S	01/01/2000 01:22:00	0.183
750S	01/01/2000 01:23:00	0.182397
750S	01/01/2000 01:24:00	0.182
750S	01/01/2000 01:25:00	0.181088
750S	01/01/2000 01:26:00	0.179894
750S	01/01/2000 01:27:00	0.177142
750S	01/01/2000 01:28:00	0.087851
750S	01/01/2000 01:29:00	0.031
750S	01/01/2000 01:30:00	0.04698
750S	01/01/2000 01:31:00	0.031
750S	01/01/2000 01:32:00	0.038975
750S	01/01/2000 01:33:00	0.033515
750S	01/01/2000 01:34:00	0.036583
750S	01/01/2000 01:35:00	0.034368
750S	01/01/2000 01:36:00	0.035551
750S	01/01/2000 01:37:00	0.034657
750S	01/01/2000 01:38:00	0.035106
750S	01/01/2000 01:39:00	0.03474
750S	01/01/2000 01:40:00	0.034907
750S	01/01/2000 01:41:00	0.034505
750S	01/01/2000 01:42:00	0.034335
750S	01/01/2000 01:43:00	0.034182
750S	01/01/2000 01:44:00	0.034072
750S	01/01/2000 01:45:00	0.033974
750S	01/01/2000 01:46:00	0.033916
750S	01/01/2000 01:47:00	0.033865
750S	01/01/2000 01:48:00	0.033832
750S	01/01/2000 01:49:00	0.033804
750S	01/01/2000 01:50:00	0.033785
750S	01/01/2000 01:51:00	0.033604
750S	01/01/2000 01:52:00	0.033441
750S	01/01/2000 01:53:00	0.033372
750S	01/01/2000 01:54:00	0.033279
750S	01/01/2000 01:55:00	0.033227
750S	01/01/2000 01:56:00	0.033181
750S	01/01/2000 01:57:00	0.034259
750S	01/01/2000 01:58:00	0.037775
750S	01/01/2000 01:59:00	0.038091
750S	01/01/2000 02:00:00	0.036765
750S	01/01/2000 02:01:00	0.036432
750S	01/01/2000 02:02:00	0.035468
750S	01/01/2000 02:03:00	0.035001
750S	01/01/2000 02:04:00	0.034255
750S	01/01/2000 02:05:00	0.033716
750S	01/01/2000 02:06:00	0.033091
750S	01/01/2000 02:07:00	0.032686
750S	01/01/2000 02:08:00	0.032601
750S	01/01/2000 02:09:00	0.032631
750S	01/01/2000 02:10:00	0.032594
750S	01/01/2000 02:11:00	0.03252
750S	01/01/2000 02:12:00	0.032433
750S	01/01/2000 02:13:00	0.032421
750S	01/01/2000 02:14:00	0.03239
750S	01/01/2000 02:15:00	0.032384
750S	01/01/2000 02:16:00	0.032372
750S	01/01/2000 02:17:00	0.032369
750S	01/01/2000 02:18:00	0.032363
750S	01/01/2000 02:19:00	0.032361
750S	01/01/2000 02:20:00	0.032357
750S	01/01/2000 02:21:00	0.032292
750S	01/01/2000 02:22:00	0.032239
750S	01/01/2000 02:23:00	0.03223
750S	01/01/2000 02:24:00	0.032216
750S	01/01/2000 02:25:00	0.032216
750S	01/01/2000 02:26:00	0.032212
750S	01/01/2000 02:27:00	0.032212
750S	01/01/2000 02:28:00	0.03221
750S	01/01/2000 02:29:00	0.032211
750S	01/01/2000 02:30:00	0.03221
750S	01/01/2000 02:31:00	0.032159
750S	01/01/2000 02:32:00	0.032117
750S	01/01/2000 02:33:00	0.032111
750S	01/01/2000 02:34:00	0.032101
750S	01/01/2000 02:35:00	0.032101
750S	01/01/2000 02:36:00	0.032098
750S	01/01/2000 02:37:00	0.032098
750S	01/01/2000 02:38:00	0.032098
750S	01/01/2000 02:39:00	0.032098
750S	01/01/2000 02:40:00	0.032098
750S	01/01/2000 02:41:00	0.032056
750S	01/01/2000 02:42:00	0.032022
750S	01/01/2000 02:43:00	0.032017
750S	01/01/2000 02:44:00	0.032008
750S	01/01/2000 02:45:00	0.032009
750S	01/01/2000 02:46:00	0.032006
750S	01/01/2000 02:47:00	0.032007
750S	01/01/2000 02:48:00	0.032006
750S	01/01/2000 02:49:00	0.032006
750S	01/01/2000 02:50:00	0.032006
750S	01/01/2000 02:51:00	0.031971
750S	01/01/2000 02:52:00	0.031943
750S	01/01/2000 02:53:00	0.031939
750S	01/01/2000 02:54:00	0.031932
750S	01/01/2000 02:55:00	0.031932
750S	01/01/2000 02:56:00	0.03193
750S	01/01/2000 02:57:00	0.03193
750S	01/01/2000 02:58:00	0.03193
750S	01/01/2000 02:59:00	0.03193
750S	01/01/2000 03:00:00	0.03193
750S	01/01/2000 03:01:00	0.031506
750S	01/01/2000 03:02:00	0.031162
750S	01/01/2000 03:03:00	0.03111
750S	01/01/2000 03:04:00	0.031024
750S	01/01/2000 03:05:00	0.031026
750S	01/01/2000 03:06:00	0.031002
750S	01/01/2000 03:07:00	0.031007
750S	01/01/2000 03:08:00	0.031
750S	01/01/2000 03:09:00	0.031002
750S	01/01/2000 03:10:00	0.031
750S	01/01/2000 03:11:00	0.031
750S	01/01/2000 03:12:00	0.031
750S	01/01/2000 03:13:00	0.031
750S	01/01/2000 03:14:00	0.031
750S	01/01/2000 03:15:00	0.031
750S	01/01/2000 03:16:00	0.031
750S	01/01/2000 03:17:00	0.031
750S	01/01/2000 03:18:00	0.031
750S	01/01/2000 03:19:00	0.031
750S	01/01/2000 03:20:00	0.031
750S	01/01/2000 03:21:00	0.031
750S	01/01/2000 03:22:00	0.031
750S	01/01/2000 03:23:00	0.031
750S	01/01/2000 03:24:00	0.031
750S	01/01/2000 03:25:00	0.031
750S	01/01/2000 03:26:00	0.031
750S	01/01/2000 03:27:00	0.031
750S	01/01/2000 03:28:00	0.031
750S	01/01/2000 03:29:00	0.031
750S	01/01/2000 03:30:00	0.031

750S	01/01/2000 03:31:00	0.031
750S	01/01/2000 03:32:00	0.031
750S	01/01/2000 03:33:00	0.031
750S	01/01/2000 03:34:00	0.031
750S	01/01/2000 03:35:00	0.031
750S	01/01/2000 03:36:00	0.031
750S	01/01/2000 03:37:00	0.031
750S	01/01/2000 03:38:00	0.031
750S	01/01/2000 03:39:00	0.031
750S	01/01/2000 03:40:00	0.031
750S	01/01/2000 03:41:00	0.031
750S	01/01/2000 03:42:00	0.031
750S	01/01/2000 03:43:00	0.031
750S	01/01/2000 03:44:00	0.031
750S	01/01/2000 03:45:00	0.031
750S	01/01/2000 03:46:00	0.031
750S	01/01/2000 03:47:00	0.031
750S	01/01/2000 03:48:00	0.031
750S	01/01/2000 03:49:00	0.031
750S	01/01/2000 03:50:00	0.031
750S	01/01/2000 03:51:00	0.031
750S	01/01/2000 03:52:00	0.031
750S	01/01/2000 03:53:00	0.031
750S	01/01/2000 03:54:00	0.031
750S	01/01/2000 03:55:00	0.031
750S	01/01/2000 03:56:00	0.031
750S	01/01/2000 03:57:00	0.031
750S	01/01/2000 03:58:00	0.031
750S	01/01/2000 03:59:00	0.031
750S	01/01/2000 04:00:00	0.031
750S	01/01/2000 04:01:00	0.031
750S	01/01/2000 04:02:00	0.031
750S	01/01/2000 04:03:00	0.031
750S	01/01/2000 04:04:00	0.031
750S	01/01/2000 04:05:00	0.031
750S	01/01/2000 04:06:00	0.031
750S	01/01/2000 04:07:00	0.031
750S	01/01/2000 04:08:00	0.031
750S	01/01/2000 04:09:00	0.031
750S	01/01/2000 04:10:00	0.031
750S	01/01/2000 04:11:00	0.031
750S	01/01/2000 04:12:00	0.031
750S	01/01/2000 04:13:00	0.031
750S	01/01/2000 04:14:00	0.031
750S	01/01/2000 04:15:00	0.031
750S	01/01/2000 04:16:00	0.031

;Flow (m³/s)

751	01/01/2000 00:00:00	0
751	01/01/2000 00:01:00	0
751	01/01/2000 00:02:00	0
751	01/01/2000 00:03:00	0
751	01/01/2000 00:04:00	0
751	01/01/2000 00:05:00	0
751	01/01/2000 00:06:00	0
751	01/01/2000 00:07:00	0
751	01/01/2000 00:08:00	0
751	01/01/2000 00:09:00	0
751	01/01/2000 00:10:00	0
751	01/01/2000 00:11:00	0
751	01/01/2000 00:12:00	0
751	01/01/2000 00:13:00	0
751	01/01/2000 00:14:00	0
751	01/01/2000 00:15:00	1E-06
751	01/01/2000 00:16:00	5E-06
751	01/01/2000 00:17:00	8E-06
751	01/01/2000 00:18:00	1E-05
751	01/01/2000 00:19:00	1.1E-05
751	01/01/2000 00:20:00	1.2E-05
751	01/01/2000 00:21:00	1.3E-05
751	01/01/2000 00:22:00	1.4E-05
751	01/01/2000 00:23:00	1.5E-05
751	01/01/2000 00:24:00	1.6E-05
751	01/01/2000 00:25:00	1.6E-05
751	01/01/2000 00:26:00	1.6E-05
751	01/01/2000 00:27:00	1.6E-05
751	01/01/2000 00:28:00	1.6E-05
751	01/01/2000 00:29:00	1.6E-05
751	01/01/2000 00:30:00	1.6E-05
751	01/01/2000 00:31:00	1.8E-05
751	01/01/2000 00:32:00	2.2E-05
751	01/01/2000 00:33:00	2.3E-05
751	01/01/2000 00:34:00	2.5E-05
751	01/01/2000 00:35:00	2.5E-05
751	01/01/2000 00:36:00	2.5E-05
751	01/01/2000 00:37:00	2.6E-05
751	01/01/2000 00:38:00	2.6E-05
751	01/01/2000 00:39:00	2.6E-05
751	01/01/2000 00:40:00	2.6E-05
751	01/01/2000 00:41:00	0.000358
751	01/01/2000 00:42:00	0.001079
751	01/01/2000 00:43:00	0.002225
751	01/01/2000 00:44:00	0.00385
751	01/01/2000 00:45:00	0.005999
751	01/01/2000 00:46:00	0.008338
751	01/01/2000 00:47:00	0.010646
751	01/01/2000 00:48:00	0.012904
751	01/01/2000 00:49:00	0.015099
751	01/01/2000 00:50:00	0.017223
751	01/01/2000 00:51:00	0.024177
751	01/01/2000 00:52:00	0.034672
751	01/01/2000 00:53:00	0.038
751	01/01/2000 00:54:00	0.038
751	01/01/2000 00:55:00	0.038
751	01/01/2000 00:56:00	0.038
751	01/01/2000 00:57:00	0.038
751	01/01/2000 00:58:00	0.038
751	01/01/2000 00:59:00	0.038
751	01/01/2000 01:00:00	0.038
751	01/01/2000 01:01:00	0.038
751	01/01/2000 01:02:00	0.038
751	01/01/2000 01:03:00	0.038
751	01/01/2000 01:04:00	0.038
751	01/01/2000 01:05:00	0.038
751	01/01/2000 01:06:00	0.038
751	01/01/2000 01:07:00	0.038
751	01/01/2000 01:08:00	0.038
751	01/01/2000 01:09:00	0.038
751	01/01/2000 01:10:00	0.038
751	01/01/2000 01:11:00	0.038
751	01/01/2000 01:12:00	0.038
751	01/01/2000 01:13:00	0.038
751	01/01/2000 01:14:00	0.038
751	01/01/2000 01:15:00	0.038
751	01/01/2000 01:16:00	0.038
751	01/01/2000 01:17:00	0.038
751	01/01/2000 01:18:00	0.038
751	01/01/2000 01:19:00	0.038
751	01/01/2000 01:20:00	0.038
751	01/01/2000 01:21:00	0.038
751	01/01/2000 01:22:00	0.038
751	01/01/2000 01:23:00	0.036595
751	01/01/2000 01:24:00	0.03496
751	01/01/2000 01:25:00	0.03199
751	01/01/2000 01:26:00	0.029308
751	01/01/2000 01:27:00	0.027072
751	01/01/2000 01:28:00	0.025209
751	01/01/2000 01:29:00	0.023658
751	01/01/2000 01:30:00	0.022368
751	01/01/2000 01:31:00	0.021137
751	01/01/2000 01:32:00	0.019929
751	01/01/2000 01:33:00	0.018716
751	01/01/2000 01:34:00	0.017472
751	01/01/2000 01:35:00	0.016177
751	01/01/2000 01:36:00	0.014998
751	01/01/2000 01:37:00	0.014015
751	01/01/2000 01:38:00	0.013197
751	01/01/2000 01:39:00	0.012518
751	01/01/2000 01:40:00	0.011954
751	01/01/2000 01:41:00	0.011391
751	01/01/2000 01:42:00	0.010814
751	01/01/2000 01:43:00	0.01021
751	01/01/2000 01:44:00	0.009569
751	01/01/2000 01:45:00	0.008881
751	01/01/2000 01:46:00	0.008247
751	01/01/2000 01:47:00	0.007719
751	01/01/2000 01:48:00	0.007279
751	01/01/2000 01:49:00	0.006914
751	01/01/2000 01:50:00	0.00661
751	01/01/2000 01:51:00	0.006294
751	01/01/2000 01:52:00	0.005959
751	01/01/2000 01:53:00	0.005598
751	01/01/2000 01:54:00	0.005205
751	01/01/2000 01:55:00	0.004774
751	01/01/2000 01:56:00	0.004376
751	01/01/2000 01:57:00	0.004043
751	01/01/2000 01:58:00	0.003765
751	01/01/2000 01:59:00	0.003533
751	01/01/2000 02:00:00	0.003341
751	01/01/2000 02:01:00	0.003135
751	01/01/2000 02:02:00	0.002912
751	01/01/2000 02:03:00	0.002667
751	01/01/2000 02:04:00	0.002398
751	01/01/2000 02:05:00	0.002099
751	01/01/2000 02:06:00	0.001821
751	01/01/2000 02:07:00	0.001589
751	01/01/2000 02:08:00	0.001394
751	01/01/2000 02:09:00	0.001232
751	01/01/2000 02:10:00	0.001096
751	01/01/2000 02:11:00	0.000975
751	01/01/2000 02:12:00	0.000863
751	01/01/2000 02:13:00	0.000759
751	01/01/2000 02:14:00	0.00066
751	01/01/2000 02:15:00	0.000564
751	01/01/2000 02:16:00	0.000477
751	01/01/2000 02:17:00	0.000404
751	01/01/2000 02:18:00	0.000343
751	01/01/2000 02:19:00	0.000291
751	01/01/2000 02:20:00	0.000247
751	01/01/2000 02:21:00	0.00021
751	01/01/2000 02:22:00	0.000179
751	01/01/2000 02:23:00	0.000153
751	01/01/2000 02:24:00	0.00013
751	01/01/2000 02:25:00	0.000112
751	01/01/2000 02:26:00	9.6E-05
751	01/01/2000 02:27:00	8.3E-05
751	01/01/2000 02:28:00	7.1E-05
751	01/01/2000 02:29:00	6.2E-05
751	01/01/2000 02:30:00	5.4E-05
751	01/01/2000 02:31:00	4.7E-05
751	01/01/2000 02:32:00	4.1E-05
751	01/01/2000 02:33:00	3.6E-05
751	01/01/2000 02:34:00	3.2E-05
751	01/01/2000 02:35:00	2.8E-05
751	01/01/2000 02:36:00	2.5E-05
751	01/01/2000 02:37:00	2.3E-05
751	01/01/2000 02:38:00	2.1E-05
751	01/01/2000 02:39:00	1.9E-05
751	01/01/2000 02:40:00	1.7E-05
751	01/01/2000 02:41:00	1.6E-05
751	01/01/2000 02:42:00	1.5E-05
751	01/01/2000 02:43:00	1.4E-05
751	01/01/2000 02:44:00	1.3E-05
751	01/01/2000 02:45:00	1.2E-05
751	01/01/2000 02:46:00	1.1E-05
751	01/01/2000 02:47:00	1.1E-05
751	01/01/2000 02:48:00	1.1E-05
751	01/01/2000 02:49:00	1E-05
751	01/01/2000 02:50:00	0
751	01/01/2000 02:51:00	0
751	01/01/2000 02:52:00	0
751	01/01/2000 02:53:00	0
751	01/01/2000 02:54:00	0
751	01/01/2000 02:55:00	0
751	01/01/2000 02:56:00	0
751	01/01/2000 02:57:00	0
751	01/01/2000 02:58:00	0
751	01/01/2000 02:59:00	0
751	01/01/2000 03:00:00	0
751	01/01/2000 03:01:00	0
751	01/01/2000 03:02:00	0
751	01/01/2000 03:03:00	0
751	01/01/2000 03:04:00	0
751	01/01/2000 03:05:00	0
751	01/01/2000 03:06:00	0
751	01/01/2000 03:07:00	0
751	01/01/2000 03:08:00	0
751	01/01/2000 03:09:00	0
751	01/01/2000 03:10:00	0
751	01/01/2000 03:11:00	0
751	01/01/2000 03:12:00	0
751	01/01/2000 03:13:00	0
751	01/01/2000 03:14:00	0
751	01/01/2000 03:15:00	0
751	01/01/2000 03:16:00	0
751	01/01/2000 03:17:00	0
751	01/01/2000 03:18:00	0
751	01/01/2000 03:19:00	0
751	01/01/2000 03:20:00	0
751	01/01/2000 03:21:00	0
751	01/01/2000 03:22:00	0
751	01/01/2000 03:23:00	0
751	01/01/2000 03:24:00	0
751	01/01/2000 03:25:00	0
751	01/01/2000 03:26:00	0
751	01/01/2000 03:27:00	0
751	01/01/2000 03:28:00	0
751	01/01/2000 03:29:00	0
751	01/01/2000 03:30:00	0
751	01/01/2000 03:31:00	0
751	01/01/2000 03:32:00	0
751	01/01/2000 03:33:00	0
751	01/01/2000 03:34:00	0
751	01/01/2000 03:35:00	0
751	01/01/2000 03:36:00	0
751	01/01/2000 03:37:00	0
751	01/01/2000 03:38:00	0
751	01/01/2000 03:39:00	0
751	01/01/2000 03:40:00	0
751	01/01/2000 03:41:00	0
751	01/01/2000 03:42:00	0
751	01/01/2000 03:43:00	0
751	01/01/2000 03:44:00	0
751	01/01/2000 03:45:00	0
751	01/01/2000 03:46:00	0
751	01/01/2000 03:47:00	0
751	01/01/2000 03:48:00	0
751	01/01/2000 03:49:00	0
751	01/01/2000 03:50:00	0
751	01/01/2000 03:51:00	0
751	01/01/2000 03:52:00	0
751	01/01/2000 03:53:00	0
751	01/01/2000 03:54:00	0
751	01/01/2000 03:55:00	0
751	01/01/2000 03:56:00	0
751	01/01/2000 03:57:00	0
751	01/01/2000 03:58:00	0
751	01/01/2000 03:59:00	0
751	01/01/2000 04:00:00	0
751	01/01/2000 04:01:00	0
751	01/01/2000 04:02:00	0
751	01/01/2000 04:03:00	0
751	01/01/2000 04:04:00	0
751	01/01/2000 04:05:00	0
751	01/01/2000 04:06:00	0
751	01/01/2000 04:07:00	0
751	01/01/2000 04:08:00	0
751	01/01/2000 04:09:00	0

751	01/01/2000 04:10:00	0
751	01/01/2000 04:11:00	0
751	01/01/2000 04:12:00	0
751	01/01/2000 04:13:00	0
751	01/01/2000 04:14:00	0
751	01/01/2000 04:15:00	0
751	01/01/2000 04:16:00	0

;Flow (m^3/s)

752	01/01/2000 00:00:00	0
752	01/01/2000 00:01:00	0
752	01/01/2000 00:02:00	0
752	01/01/2000 00:03:00	0
752	01/01/2000 00:04:00	0
752	01/01/2000 00:05:00	0
752	01/01/2000 00:06:00	0
752	01/01/2000 00:07:00	0
752	01/01/2000 00:08:00	0
752	01/01/2000 00:09:00	0
752	01/01/2000 00:10:00	0
752	01/01/2000 00:11:00	0
752	01/01/2000 00:12:00	0
752	01/01/2000 00:13:00	0
752	01/01/2000 00:14:00	0
752	01/01/2000 00:15:00	0.000158
752	01/01/2000 00:16:00	0.000686
752	01/01/2000 00:17:00	0.001313
752	01/01/2000 00:18:00	0.001688
752	01/01/2000 00:19:00	0.001888
752	01/01/2000 00:20:00	0.002007
752	01/01/2000 00:21:00	0.002175
752	01/01/2000 00:22:00	0.002467
752	01/01/2000 00:23:00	0.002672
752	01/01/2000 00:24:00	0.002765
752	01/01/2000 00:25:00	0.00283
752	01/01/2000 00:26:00	0.00286
752	01/01/2000 00:27:00	0.00288
752	01/01/2000 00:28:00	0.00289
752	01/01/2000 00:29:00	0.002896
752	01/01/2000 00:30:00	0.002899
752	01/01/2000 00:31:00	0.003132
752	01/01/2000 00:32:00	0.003698
752	01/01/2000 00:33:00	0.004109
752	01/01/2000 00:34:00	0.004289
752	01/01/2000 00:35:00	0.004419
752	01/01/2000 00:36:00	0.004477
752	01/01/2000 00:37:00	0.004518
752	01/01/2000 00:38:00	0.004537
752	01/01/2000 00:39:00	0.00455
752	01/01/2000 00:40:00	0.004556
752	01/01/2000 00:41:00	0.005622
752	01/01/2000 00:42:00	0.008237
752	01/01/2000 00:43:00	0.010323
752	01/01/2000 00:44:00	0.011591
752	01/01/2000 00:45:00	0.012663
752	01/01/2000 00:46:00	0.013389
752	01/01/2000 00:47:00	0.014033
752	01/01/2000 00:48:00	0.014553
752	01/01/2000 00:49:00	0.01503
752	01/01/2000 00:50:00	0.015453
752	01/01/2000 00:51:00	0.022554
752	01/01/2000 00:52:00	0.040327
752	01/01/2000 00:53:00	0.065561
752	01/01/2000 00:54:00	0.093948
752	01/01/2000 00:55:00	0.114334
752	01/01/2000 00:56:00	0.115548
752	01/01/2000 00:57:00	0.118172
752	01/01/2000 00:58:00	0.119387
752	01/01/2000 00:59:00	0.12
752	01/01/2000 01:00:00	0.120393
752	01/01/2000 01:01:00	0.120673
752	01/01/2000 01:02:00	0.120713
752	01/01/2000 01:03:00	0.120601
752	01/01/2000 01:04:00	0.120431
752	01/01/2000 01:05:00	0.120346
752	01/01/2000 01:06:00	0.12048
752	01/01/2000 01:07:00	0.120808
752	01/01/2000 01:08:00	0.12111
752	01/01/2000 01:09:00	0.121313
752	01/01/2000 01:10:00	0.121502
752	01/01/2000 01:11:00	0.121672
752	01/01/2000 01:12:00	0.121805
752	01/01/2000 01:13:00	0.121881
752	01/01/2000 01:14:00	0.121889
752	01/01/2000 01:15:00	0.121822
752	01/01/2000 01:16:00	0.121687
752	01/01/2000 01:17:00	0.121494
752	01/01/2000 01:18:00	0.12126
752	01/01/2000 01:19:00	0.121
752	01/01/2000 01:20:00	0.120539
752	01/01/2000 01:21:00	0.120073
752	01/01/2000 01:22:00	0.12
752	01/01/2000 01:23:00	0.119847
752	01/01/2000 01:24:00	0.119
752	01/01/2000 01:25:00	0.118734
752	01/01/2000 01:26:00	0.117201
752	01/01/2000 01:27:00	0.115
752	01/01/2000 01:28:00	0.046411
752	01/01/2000 01:29:00	0
752	01/01/2000 01:30:00	0.01345
752	01/01/2000 01:31:00	0.005606
752	01/01/2000 01:32:00	0.00914
752	01/01/2000 01:33:00	0.006317
752	01/01/2000 01:34:00	0.007199
752	01/01/2000 01:35:00	0.006185
752	01/01/2000 01:36:00	0.006371
752	01/01/2000 01:37:00	0.005996
752	01/01/2000 01:38:00	0.006002
752	01/01/2000 01:39:00	0.005849
752	01/01/2000 01:40:00	0.005821
752	01/01/2000 01:41:00	0.005622
752	01/01/2000 01:42:00	0.005278
752	01/01/2000 01:43:00	0.004968
752	01/01/2000 01:44:00	0.00475
752	01/01/2000 01:45:00	0.004567
752	01/01/2000 01:46:00	0.004453
752	01/01/2000 01:47:00	0.004361
752	01/01/2000 01:48:00	0.004297
752	01/01/2000 01:49:00	0.004247
752	01/01/2000 01:50:00	0.004211
752	01/01/2000 01:51:00	0.004096
752	01/01/2000 01:52:00	0.003864
752	01/01/2000 01:53:00	0.003666
752	01/01/2000 01:54:00	0.00352
752	01/01/2000 01:55:00	0.003402
752	01/01/2000 01:56:00	0.003326
752	01/01/2000 01:57:00	0.003265
752	01/01/2000 01:58:00	0.003223
752	01/01/2000 01:59:00	0.00319
752	01/01/2000 02:00:00	0.003165
752	01/01/2000 02:01:00	0.003085
752	01/01/2000 02:02:00	0.00292
752	01/01/2000 02:03:00	0.002779
752	01/01/2000 02:04:00	0.002676
752	01/01/2000 02:05:00	0.002592
752	01/01/2000 02:06:00	0.002537
752	01/01/2000 02:07:00	0.002494
752	01/01/2000 02:08:00	0.002464
752	01/01/2000 02:09:00	0.002439
752	01/01/2000 02:10:00	0.002422
752	01/01/2000 02:11:00	0.002368
752	01/01/2000 02:12:00	0.002261
752	01/01/2000 02:13:00	0.002179
752	01/01/2000 02:14:00	0.002134
752	01/01/2000 02:15:00	0.002099
752	01/01/2000 02:16:00	0.00208
752	01/01/2000 02:17:00	0.002064
752	01/01/2000 02:18:00	0.002055
752	01/01/2000 02:19:00	0.002047
752	01/01/2000 02:20:00	0.002042
752	01/01/2000 02:21:00	0.002009
752	01/01/2000 02:22:00	0.001935
752	01/01/2000 02:23:00	0.00188
752	01/01/2000 02:24:00	0.001856
752	01/01/2000 02:25:00	0.001838
752	01/01/2000 02:26:00	0.00183
752	01/01/2000 02:27:00	0.001824
752	01/01/2000 02:28:00	0.00182
752	01/01/2000 02:29:00	0.001818
752	01/01/2000 02:30:00	0.001817
752	01/01/2000 02:31:00	0.001793
752	01/01/2000 02:32:00	0.001735
752	01/01/2000 02:33:00	0.001693
752	01/01/2000 02:34:00	0.001675
752	01/01/2000 02:35:00	0.001662
752	01/01/2000 02:36:00	0.001656
752	01/01/2000 02:37:00	0.001651
752	01/01/2000 02:38:00	0.001649
752	01/01/2000 02:39:00	0.001648
752	01/01/2000 02:40:00	0.001647
752	01/01/2000 02:41:00	0.001628
752	01/01/2000 02:42:00	0.001581
752	01/01/2000 02:43:00	0.001547
752	01/01/2000 02:44:00	0.001532
752	01/01/2000 02:45:00	0.001521
752	01/01/2000 02:46:00	0.001516
752	01/01/2000 02:47:00	0.001513
752	01/01/2000 02:48:00	0.001511
752	01/01/2000 02:49:00	0.00151
752	01/01/2000 02:50:00	0.00151
752	01/01/2000 02:51:00	0.001494
752	01/01/2000 02:52:00	0.001455
752	01/01/2000 02:53:00	0.001426
752	01/01/2000 02:54:00	0.001414
752	01/01/2000 02:55:00	0.001405
752	01/01/2000 02:56:00	0.001401
752	01/01/2000 02:57:00	0.001398
752	01/01/2000 02:58:00	0.001397
752	01/01/2000 02:59:00	0.001396
752	01/01/2000 03:00:00	0.001395
752	01/01/2000 03:01:00	0.001201
752	01/01/2000 03:02:00	0.000727
752	01/01/2000 03:03:00	0.000382
752	01/01/2000 03:04:00	0.000231
752	01/01/2000 03:05:00	0.000122
752	01/01/2000 03:06:00	7.3E-05
752	01/01/2000 03:07:00	3.9E-05
752	01/01/2000 03:08:00	2.3E-05
752	01/01/2000 03:09:00	1.2E-05
752	01/01/2000 03:10:00	0
752	01/01/2000 03:11:00	0
752	01/01/2000 03:12:00	0
752	01/01/2000 03:13:00	0
752	01/01/2000 03:14:00	0
752	01/01/2000 03:15:00	0
752	01/01/2000 03:16:00	0
752	01/01/2000 03:17:00	0
752	01/01/2000 03:18:00	0
752	01/01/2000 03:19:00	0
752	01/01/2000 03:20:00	0
752	01/01/2000 03:21:00	0
752	01/01/2000 03:22:00	0
752	01/01/2000 03:23:00	0
752	01/01/2000 03:24:00	0
752	01/01/2000 03:25:00	0
752	01/01/2000 03:26:00	0
752	01/01/2000 03:27:00	0
752	01/01/2000 03:28:00	0
752	01/01/2000 03:29:00	0
752	01/01/2000 03:30:00	0
752	01/01/2000 03:31:00	0
752	01/01/2000 03:32:00	0
752	01/01/2000 03:33:00	0
752	01/01/2000 03:34:00	0
752	01/01/2000 03:35:00	0
752	01/01/2000 03:36:00	0
752	01/01/2000 03:37:00	0
752	01/01/2000 03:38:00	0
752	01/01/2000 03:39:00	0
752	01/01/2000 03:40:00	0
752	01/01/2000 03:41:00	0
752	01/01/2000 03:42:00	0
752	01/01/2000 03:43:00	0
752	01/01/2000 03:44:00	0
752	01/01/2000 03:45:00	0
752	01/01/2000 03:46:00	0
752	01/01/2000 03:47:00	0
752	01/01/2000 03:48:00	0
752	01/01/2000 03:49:00	0
752	01/01/2000 03:50:00	0
752	01/01/2000 03:51:00	0
752	01/01/2000 03:52:00	0
752	01/01/2000 03:53:00	0
752	01/01/2000 03:54:00	0
752	01/01/2000 03:55:00	0
752	01/01/2000 03:56:00	0
752	01/01/2000 03:57:00	0
752	01/01/2000 03:58:00	0
752	01/01/2000 03:59:00	0
752	01/01/2000 04:00:00	0
752	01/01/2000 04:01:00	0
752	01/01/2000 04:02:00	0
752	01/01/2000 04:03:00	0
752	01/01/2000 04:04:00	0
752	01/01/2000 04:05:00	0
752	01/01/2000 04:06:00	0
752	01/01/2000 04:07:00	0
752	01/01/2000 04:08:00	0
752	01/01/2000 04:09:00	0
752	01/01/2000 04:10:00	0
752	01/01/2000 04:11:00	0
752	01/01/2000 04:12:00	0
752	01/01/2000 04:13:00	0
752	01/01/2000 04:14:00	0
752	01/01/2000 04:15:00	0
752	01/01/2000 04:16:00	0

;Flow (m^3/s)

753	01/01/2000 00:00:00	0
753	01/01/2000 00:01:00	0
753	01/01/2000 00:02:00	0
753	01/01/2000 00:03:00	0
753	01/01/2000 00:04:00	0
753	01/01/2000 00:05:00	0
753	01/01/2000 00:06:00	0
753	01/01/2000 00:07:00	0
753	01/01/2000 00:08:00	0
753	01/01/2000 00:09:00	0
753	01/01/2000 00:10:00	0
753	01/01/2000 00:11:00	0
753	01/01/2000 00:12:00	0
753	01/01/2000 00:13:00	0
753	01/01/2000 00:14:00	0
753	01/01/2000 00:15:00	2E-06
753	01/01/2000 00:16:00	5E-06
753	01/01/2000 00:17:00	7E-06
753	01/01/2000 00:18:00	7E-06
753	01/01/2000 00:19:00	7E-06
753	01/01/2000 00:20:00	7E-06
753	01/01/2000 00:21:00	9E-06
753	01/01/2000 00:22:00	1E-05
753	01/01/2000 00:23:00	1E-05
753	01/01/2000 00:24:00	1E-05
753	01/01/2000 00:25:00	1E-05
753	01/01/2000 00:26:00	1E-05
753	01/01/2000 00:27:00	1E-05
753	01/01/2000 00:28:00	1E-05
753	01/01/2000 00:29:00	1E-05

753	01/01/2000 00:30:00	1E-05
753	01/01/2000 00:31:00	1.4E-05
753	01/01/2000 00:32:00	1.5E-05
753	01/01/2000 00:33:00	1.6E-05
753	01/01/2000 00:34:00	1.6E-05
753	01/01/2000 00:35:00	1.6E-05
753	01/01/2000 00:36:00	1.6E-05
753	01/01/2000 00:37:00	1.6E-05
753	01/01/2000 00:38:00	1.6E-05
753	01/01/2000 00:39:00	1.6E-05
753	01/01/2000 00:40:00	1.6E-05
753	01/01/2000 00:41:00	0.000404
753	01/01/2000 00:42:00	0.001222
753	01/01/2000 00:43:00	0.002534
753	01/01/2000 00:44:00	0.004399
753	01/01/2000 00:45:00	0.006173
753	01/01/2000 00:46:00	0.007857
753	01/01/2000 00:47:00	0.009449
753	01/01/2000 00:48:00	0.010953
753	01/01/2000 00:49:00	0.012369
753	01/01/2000 00:50:00	0.013701
753	01/01/2000 00:51:00	0.02
753	01/01/2000 00:52:00	0.02
753	01/01/2000 00:53:00	0.02
753	01/01/2000 00:54:00	0.02
753	01/01/2000 00:55:00	0.02
753	01/01/2000 00:56:00	0.02
753	01/01/2000 00:57:00	0.02
753	01/01/2000 00:58:00	0.02
753	01/01/2000 00:59:00	0.02
753	01/01/2000 01:00:00	0.02
753	01/01/2000 01:01:00	0.02
753	01/01/2000 01:02:00	0.02
753	01/01/2000 01:03:00	0.02
753	01/01/2000 01:04:00	0.02
753	01/01/2000 01:05:00	0.02
753	01/01/2000 01:06:00	0.02
753	01/01/2000 01:07:00	0.02
753	01/01/2000 01:08:00	0.02
753	01/01/2000 01:09:00	0.02
753	01/01/2000 01:10:00	0.02
753	01/01/2000 01:11:00	0.02
753	01/01/2000 01:12:00	0.02
753	01/01/2000 01:13:00	0.02
753	01/01/2000 01:14:00	0.02
753	01/01/2000 01:15:00	0.02
753	01/01/2000 01:16:00	0.02
753	01/01/2000 01:17:00	0.02
753	01/01/2000 01:18:00	0.02
753	01/01/2000 01:19:00	0.02
753	01/01/2000 01:20:00	0.02
753	01/01/2000 01:21:00	0.02
753	01/01/2000 01:22:00	0.019475
753	01/01/2000 01:23:00	0.017835
753	01/01/2000 01:24:00	0.015963
753	01/01/2000 01:25:00	0.014514
753	01/01/2000 01:26:00	0.013394
753	01/01/2000 01:27:00	0.012533
753	01/01/2000 01:28:00	0.011873
753	01/01/2000 01:29:00	0.011369
753	01/01/2000 01:30:00	0.010988
753	01/01/2000 01:31:00	0.010516
753	01/01/2000 01:32:00	0.009937
753	01/01/2000 01:33:00	0.009233
753	01/01/2000 01:34:00	0.00839
753	01/01/2000 01:35:00	0.007738
753	01/01/2000 01:36:00	0.007235
753	01/01/2000 01:37:00	0.00685
753	01/01/2000 01:38:00	0.006555
753	01/01/2000 01:39:00	0.00633
753	01/01/2000 01:40:00	0.006161
753	01/01/2000 01:41:00	0.005925
753	01/01/2000 01:42:00	0.005614
753	01/01/2000 01:43:00	0.00522
753	01/01/2000 01:44:00	0.004737
753	01/01/2000 01:45:00	0.004364
753	01/01/2000 01:46:00	0.004075
753	01/01/2000 01:47:00	0.003852
753	01/01/2000 01:48:00	0.003682
753	01/01/2000 01:49:00	0.003552
753	01/01/2000 01:50:00	0.003454
753	01/01/2000 01:51:00	0.003307
753	01/01/2000 01:52:00	0.003107
753	01/01/2000 01:53:00	0.002851
753	01/01/2000 01:54:00	0.002534
753	01/01/2000 01:55:00	0.002287
753	01/01/2000 01:56:00	0.002096
753	01/01/2000 01:57:00	0.001948
753	01/01/2000 01:58:00	0.001834
753	01/01/2000 01:59:00	0.001746
753	01/01/2000 02:00:00	0.001679
753	01/01/2000 02:01:00	0.001577
753	01/01/2000 02:02:00	0.001435
753	01/01/2000 02:03:00	0.001253
753	01/01/2000 02:04:00	0.001027
753	01/01/2000 02:05:00	0.000851
753	01/01/2000 02:06:00	0.000714
753	01/01/2000 02:07:00	0.000607
753	01/01/2000 02:08:00	0.000524
753	01/01/2000 02:09:00	0.00046
753	01/01/2000 02:10:00	0.000411
753	01/01/2000 02:11:00	0.000363
753	01/01/2000 02:12:00	0.000315
753	01/01/2000 02:13:00	0.000264
753	01/01/2000 02:14:00	0.000209
753	01/01/2000 02:15:00	0.000165
753	01/01/2000 02:16:00	0.000131
753	01/01/2000 02:17:00	0.000105
753	01/01/2000 02:18:00	8.4E-05
753	01/01/2000 02:19:00	6.7E-05
753	01/01/2000 02:20:00	5.4E-05
753	01/01/2000 02:21:00	4.4E-05
753	01/01/2000 02:22:00	3.5E-05
753	01/01/2000 02:23:00	2.9E-05
753	01/01/2000 02:24:00	2.4E-05
753	01/01/2000 02:25:00	2E-05
753	01/01/2000 02:26:00	1.7E-05
753	01/01/2000 02:27:00	1.5E-05
753	01/01/2000 02:28:00	1.3E-05
753	01/01/2000 02:29:00	1.2E-05
753	01/01/2000 02:30:00	1E-05
753	01/01/2000 02:31:00	0
753	01/01/2000 02:32:00	0
753	01/01/2000 02:33:00	0
753	01/01/2000 02:34:00	0
753	01/01/2000 02:35:00	0
753	01/01/2000 02:36:00	0
753	01/01/2000 02:37:00	0
753	01/01/2000 02:38:00	0
753	01/01/2000 02:39:00	0
753	01/01/2000 02:40:00	0
753	01/01/2000 02:41:00	0
753	01/01/2000 02:42:00	0
753	01/01/2000 02:43:00	0
753	01/01/2000 02:44:00	0
753	01/01/2000 02:45:00	0
753	01/01/2000 02:46:00	0
753	01/01/2000 02:47:00	0
753	01/01/2000 02:48:00	0
753	01/01/2000 02:49:00	0
753	01/01/2000 02:50:00	0
753	01/01/2000 02:51:00	0
753	01/01/2000 02:52:00	0
753	01/01/2000 02:53:00	0
753	01/01/2000 02:54:00	0
753	01/01/2000 02:55:00	0
753	01/01/2000 02:56:00	0
753	01/01/2000 02:57:00	0
753	01/01/2000 02:58:00	0
753	01/01/2000 02:59:00	0
753	01/01/2000 03:00:00	0
753	01/01/2000 03:01:00	0
753	01/01/2000 03:02:00	0
753	01/01/2000 03:03:00	0
753	01/01/2000 03:04:00	0
753	01/01/2000 03:05:00	0
753	01/01/2000 03:06:00	0
753	01/01/2000 03:07:00	0
753	01/01/2000 03:08:00	0
753	01/01/2000 03:09:00	0
753	01/01/2000 03:10:00	0
753	01/01/2000 03:11:00	0
753	01/01/2000 03:12:00	0
753	01/01/2000 03:13:00	0
753	01/01/2000 03:14:00	0
753	01/01/2000 03:15:00	0
753	01/01/2000 03:16:00	0
753	01/01/2000 03:17:00	0
753	01/01/2000 03:18:00	0
753	01/01/2000 03:19:00	0
753	01/01/2000 03:20:00	0
753	01/01/2000 03:21:00	0
753	01/01/2000 03:22:00	0
753	01/01/2000 03:23:00	0
753	01/01/2000 03:24:00	0
753	01/01/2000 03:25:00	0
753	01/01/2000 03:26:00	0
753	01/01/2000 03:27:00	0
753	01/01/2000 03:28:00	0
753	01/01/2000 03:29:00	0
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753	01/01/2000 03:34:00	0
753	01/01/2000 03:35:00	0
753	01/01/2000 03:36:00	0
753	01/01/2000 03:37:00	0
753	01/01/2000 03:38:00	0
753	01/01/2000 03:39:00	0
753	01/01/2000 03:40:00	0
753	01/01/2000 03:41:00	0
753	01/01/2000 03:42:00	0
753	01/01/2000 03:43:00	0
753	01/01/2000 03:44:00	0
753	01/01/2000 03:45:00	0
753	01/01/2000 03:46:00	0
753	01/01/2000 03:47:00	0
753	01/01/2000 03:48:00	0
753	01/01/2000 03:49:00	0
753	01/01/2000 03:50:00	0
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753	01/01/2000 03:52:00	0
753	01/01/2000 03:53:00	0
753	01/01/2000 03:54:00	0
753	01/01/2000 03:55:00	0
753	01/01/2000 03:56:00	0
753	01/01/2000 03:57:00	0
753	01/01/2000 03:58:00	0
753	01/01/2000 03:59:00	0
753	01/01/2000 04:00:00	0
753	01/01/2000 04:01:00	0
753	01/01/2000 04:02:00	0
753	01/01/2000 04:03:00	0
753	01/01/2000 04:04:00	0
753	01/01/2000 04:05:00	0
753	01/01/2000 04:06:00	0
753	01/01/2000 04:07:00	0
753	01/01/2000 04:08:00	0
753	01/01/2000 04:09:00	0
753	01/01/2000 04:10:00	0
753	01/01/2000 04:11:00	0
753	01/01/2000 04:12:00	0
753	01/01/2000 04:13:00	0
753	01/01/2000 04:14:00	0
753	01/01/2000 04:15:00	0
753	01/01/2000 04:16:00	0

;Flow (m³/s)

755	01/01/2000 00:00:00	0
755	01/01/2000 00:01:00	0
755	01/01/2000 00:02:00	0
755	01/01/2000 00:03:00	0
755	01/01/2000 00:04:00	0
755	01/01/2000 00:05:00	0
755	01/01/2000 00:06:00	0
755	01/01/2000 00:07:00	0
755	01/01/2000 00:08:00	0
755	01/01/2000 00:09:00	0
755	01/01/2000 00:10:00	0
755	01/01/2000 00:11:00	0
755	01/01/2000 00:12:00	0
755	01/01/2000 00:13:00	0
755	01/01/2000 00:14:00	0
755	01/01/2000 00:15:00	0.001325
755	01/01/2000 00:16:00	0.006024
755	01/01/2000 00:17:00	0.013468
755	01/01/2000 00:18:00	0.01605
755	01/01/2000 00:19:00	0.018519
755	01/01/2000 00:20:00	0.019171
755	01/01/2000 00:21:00	0.021187
755	01/01/2000 00:22:00	0.023837
755	01/01/2000 00:23:00	0.025828
755	01/01/2000 00:24:00	0.026585
755	01/01/2000 00:25:00	0.027275
755	01/01/2000 00:26:00	0.027472
755	01/01/2000 00:27:00	0.027722
755	01/01/2000 00:28:00	0.027762
755	01/01/2000 00:29:00	0.027857
755	01/01/2000 00:30:00	0.027858
755	01/01/2000 00:31:00	0.029646
755	01/01/2000 00:32:00	0.034354
755	01/01/2000 00:33:00	0.03866
755	01/01/2000 00:34:00	0.040917
755	01/01/2000 00:35:00	0.042004
755	01/01/2000 00:36:00	0.042021
755	01/01/2000 00:37:00	0.042047
755	01/01/2000 00:38:00	0.042078
755	01/01/2000 00:39:00	0.042111
755	01/01/2000 00:40:00	0.042145
755	01/01/2000 00:41:00	0.042303
755	01/01/2000 00:42:00	0.042833
755	01/01/2000 00:43:00	0.043186
755	01/01/2000 00:44:00	0.043467
755	01/01/2000 00:45:00	0.043778
755	01/01/2000 00:46:00	0.044104
755	01/01/2000 00:47:00	0.044439
755	01/01/2000 00:48:00	0.044777
755	01/01/2000 00:49:00	0.045018
755	01/01/2000 00:50:00	0.045071
755	01/01/2000 00:51:00	0.045152
755	01/01/2000 00:52:00	0.045319
755	01/01/2000 00:53:00	0.045584
755	01/01/2000 00:54:00	0.045917
755	01/01/2000 00:55:00	0.046147
755	01/01/2000 00:56:00	0.046357
755	01/01/2000 00:57:00	0.046593
755	01/01/2000 00:58:00	0.046871
755	01/01/2000 00:59:00	0.047275
755	01/01/2000 01:00:00	0.047827
755	01/01/2000 01:01:00	0.048473
755	01/01/2000 01:02:00	0.049056
755	01/01/2000 01:03:00	0.049303
755	01/01/2000 01:04:00	0.049557
755	01/01/2000 01:05:00	0.04982
755	01/01/2000 01:06:00	0.050069
755	01/01/2000 01:07:00	0.050279
755	01/01/2000 01:08:00	0.050492

755	01/01/2000 01:09:00	0.050703
755	01/01/2000 01:10:00	0.050911
755	01/01/2000 01:11:00	0.05118
755	01/01/2000 01:12:00	0.051487
755	01/01/2000 01:13:00	0.051778
755	01/01/2000 01:14:00	0.052051
755	01/01/2000 01:15:00	0.052304
755	01/01/2000 01:16:00	0.052535
755	01/01/2000 01:17:00	0.05274
755	01/01/2000 01:18:00	0.052919
755	01/01/2000 01:19:00	0.05303
755	01/01/2000 01:20:00	0.053085
755	01/01/2000 01:21:00	0.053128
755	01/01/2000 01:22:00	0.05316
755	01/01/2000 01:23:00	0.053184
755	01/01/2000 01:24:00	0.053202
755	01/01/2000 01:25:00	0.053215
755	01/01/2000 01:26:00	0.053224
755	01/01/2000 01:27:00	0.053232
755	01/01/2000 01:28:00	0.053237
755	01/01/2000 01:29:00	0.053242
755	01/01/2000 01:30:00	0.053245
755	01/01/2000 01:31:00	0.053247
755	01/01/2000 01:32:00	0.053248
755	01/01/2000 01:33:00	0.053248
755	01/01/2000 01:34:00	0.053248
755	01/01/2000 01:35:00	0.053247
755	01/01/2000 01:36:00	0.053246
755	01/01/2000 01:37:00	0.053245
755	01/01/2000 01:38:00	0.053243
755	01/01/2000 01:39:00	0.053242
755	01/01/2000 01:40:00	0.053241
755	01/01/2000 01:41:00	0.053239
755	01/01/2000 01:42:00	0.053238
755	01/01/2000 01:43:00	0.053236
755	01/01/2000 01:44:00	0.053234
755	01/01/2000 01:45:00	0.053232
755	01/01/2000 01:46:00	0.05323
755	01/01/2000 01:47:00	0.053228
755	01/01/2000 01:48:00	0.053226
755	01/01/2000 01:49:00	0.053224
755	01/01/2000 01:50:00	0.053222
755	01/01/2000 01:51:00	0.05322
755	01/01/2000 01:52:00	0.053217
755	01/01/2000 01:53:00	0.053215
755	01/01/2000 01:54:00	0.053213
755	01/01/2000 01:55:00	0.05321
755	01/01/2000 01:56:00	0.053208
755	01/01/2000 01:57:00	0.053205
755	01/01/2000 01:58:00	0.053203
755	01/01/2000 01:59:00	0.0532
755	01/01/2000 02:00:00	0.053198
755	01/01/2000 02:01:00	0.053195
755	01/01/2000 02:02:00	0.053192
755	01/01/2000 02:03:00	0.05319
755	01/01/2000 02:04:00	0.053187
755	01/01/2000 02:05:00	0.053184
755	01/01/2000 02:06:00	0.053181
755	01/01/2000 02:07:00	0.053178
755	01/01/2000 02:08:00	0.053176
755	01/01/2000 02:09:00	0.053173
755	01/01/2000 02:10:00	0.05317
755	01/01/2000 02:11:00	0.053167
755	01/01/2000 02:12:00	0.053164
755	01/01/2000 02:13:00	0.053161
755	01/01/2000 02:14:00	0.053158
755	01/01/2000 02:15:00	0.053155
755	01/01/2000 02:16:00	0.053152
755	01/01/2000 02:17:00	0.053149
755	01/01/2000 02:18:00	0.053146
755	01/01/2000 02:19:00	0.053143
755	01/01/2000 02:20:00	0.05314
755	01/01/2000 02:21:00	0.053137
755	01/01/2000 02:22:00	0.053134
755	01/01/2000 02:23:00	0.053131
755	01/01/2000 02:24:00	0.053127
755	01/01/2000 02:25:00	0.053124
755	01/01/2000 02:26:00	0.053121
755	01/01/2000 02:27:00	0.053118
755	01/01/2000 02:28:00	0.053114
755	01/01/2000 02:29:00	0.053111
755	01/01/2000 02:30:00	0.053108
755	01/01/2000 02:31:00	0.053105
755	01/01/2000 02:32:00	0.053101
755	01/01/2000 02:33:00	0.053098
755	01/01/2000 02:34:00	0.053095
755	01/01/2000 02:35:00	0.053091
755	01/01/2000 02:36:00	0.053088
755	01/01/2000 02:37:00	0.053085
755	01/01/2000 02:38:00	0.053081
755	01/01/2000 02:39:00	0.053078
755	01/01/2000 02:40:00	0.053074
755	01/01/2000 02:41:00	0.053071
755	01/01/2000 02:42:00	0.053068
755	01/01/2000 02:43:00	0.053064
755	01/01/2000 02:44:00	0.053061
755	01/01/2000 02:45:00	0.053057
755	01/01/2000 02:46:00	0.053054
755	01/01/2000 02:47:00	0.05305
755	01/01/2000 02:48:00	0.053047
755	01/01/2000 02:49:00	0.053043
755	01/01/2000 02:50:00	0.05304
755	01/01/2000 02:51:00	0.053036
755	01/01/2000 02:52:00	0.053033
755	01/01/2000 02:53:00	0.053029
755	01/01/2000 02:54:00	0.053025
755	01/01/2000 02:55:00	0.053022
755	01/01/2000 02:56:00	0.053018
755	01/01/2000 02:57:00	0.053015
755	01/01/2000 02:58:00	0.053011
755	01/01/2000 02:59:00	0.053007
755	01/01/2000 03:00:00	0.053004
755	01/01/2000 03:01:00	0.053
755	01/01/2000 03:02:00	0.052991
755	01/01/2000 03:03:00	0.052981
755	01/01/2000 03:04:00	0.05297
755	01/01/2000 03:05:00	0.05296
755	01/01/2000 03:06:00	0.052949
755	01/01/2000 03:07:00	0.052938
755	01/01/2000 03:08:00	0.052927
755	01/01/2000 03:09:00	0.052916
755	01/01/2000 03:10:00	0.052905
755	01/01/2000 03:11:00	0.052894
755	01/01/2000 03:12:00	0.052883
755	01/01/2000 03:13:00	0.052872
755	01/01/2000 03:14:00	0.052861
755	01/01/2000 03:15:00	0.05285
755	01/01/2000 03:16:00	0.052839
755	01/01/2000 03:17:00	0.052828
755	01/01/2000 03:18:00	0.052817
755	01/01/2000 03:19:00	0.052806
755	01/01/2000 03:20:00	0.052795
755	01/01/2000 03:21:00	0.052784
755	01/01/2000 03:22:00	0.052773
755	01/01/2000 03:23:00	0.052762
755	01/01/2000 03:24:00	0.052751
755	01/01/2000 03:25:00	0.05274
755	01/01/2000 03:26:00	0.052729
755	01/01/2000 03:27:00	0.052718
755	01/01/2000 03:28:00	0.052707
755	01/01/2000 03:29:00	0.052696
755	01/01/2000 03:30:00	0.052685
755	01/01/2000 03:31:00	0.052674
755	01/01/2000 03:32:00	0.052663
755	01/01/2000 03:33:00	0.052652
755	01/01/2000 03:34:00	0.052641
755	01/01/2000 03:35:00	0.05263
755	01/01/2000 03:36:00	0.052619
755	01/01/2000 03:37:00	0.052608
755	01/01/2000 03:38:00	0.052597
755	01/01/2000 03:39:00	0.052586
755	01/01/2000 03:40:00	0.052575
755	01/01/2000 03:41:00	0.052564
755	01/01/2000 03:42:00	0.052553
755	01/01/2000 03:43:00	0.052542
755	01/01/2000 03:44:00	0.052531
755	01/01/2000 03:45:00	0.05252
755	01/01/2000 03:46:00	0.052509
755	01/01/2000 03:47:00	0.052499
755	01/01/2000 03:48:00	0.052488
755	01/01/2000 03:49:00	0.052477
755	01/01/2000 03:50:00	0.052466
755	01/01/2000 03:51:00	0.052455
755	01/01/2000 03:52:00	0.052444
755	01/01/2000 03:53:00	0.052433
755	01/01/2000 03:54:00	0.052422
755	01/01/2000 03:55:00	0.052411
755	01/01/2000 03:56:00	0.0524
755	01/01/2000 03:57:00	0.052389
755	01/01/2000 03:58:00	0.052378
755	01/01/2000 03:59:00	0.052367
755	01/01/2000 04:00:00	0.052357
755	01/01/2000 04:01:00	0.052346
755	01/01/2000 04:02:00	0.052335
755	01/01/2000 04:03:00	0.052324
755	01/01/2000 04:04:00	0.052313
755	01/01/2000 04:05:00	0.052302
755	01/01/2000 04:06:00	0.052291
755	01/01/2000 04:07:00	0.05228
755	01/01/2000 04:08:00	0.052269
755	01/01/2000 04:09:00	0.052258
755	01/01/2000 04:10:00	0.052248
755	01/01/2000 04:11:00	0.052237
755	01/01/2000 04:12:00	0.052226
755	01/01/2000 04:13:00	0.052215
755	01/01/2000 04:14:00	0.052204
755	01/01/2000 04:15:00	0.052193
755	01/01/2000 04:16:00	0.052182

;Flow (m³/s)

760	01/01/2000 00:00:00	0
760	01/01/2000 00:01:00	0
760	01/01/2000 00:02:00	0
760	01/01/2000 00:03:00	0
760	01/01/2000 00:04:00	0
760	01/01/2000 00:05:00	0
760	01/01/2000 00:06:00	0
760	01/01/2000 00:07:00	0
760	01/01/2000 00:08:00	0
760	01/01/2000 00:09:00	0
760	01/01/2000 00:10:00	0
760	01/01/2000 00:11:00	0
760	01/01/2000 00:12:00	0
760	01/01/2000 00:13:00	0
760	01/01/2000 00:14:00	0
760	01/01/2000 00:15:00	0.000287
760	01/01/2000 00:16:00	0.001173
760	01/01/2000 00:17:00	0.002305
760	01/01/2000 00:18:00	0.003167
760	01/01/2000 00:19:00	0.003686
760	01/01/2000 00:20:00	0.003975
760	01/01/2000 00:21:00	0.004322
760	01/01/2000 00:22:00	0.004822
760	01/01/2000 00:23:00	0.00524
760	01/01/2000 00:24:00	0.005498
760	01/01/2000 00:25:00	0.005643
760	01/01/2000 00:26:00	0.005722
760	01/01/2000 00:27:00	0.005765
760	01/01/2000 00:28:00	0.005788
760	01/01/2000 00:29:00	0.005801
760	01/01/2000 00:30:00	0.005807
760	01/01/2000 00:31:00	0.006231
760	01/01/2000 00:32:00	0.007152
760	01/01/2000 00:33:00	0.007981
760	01/01/2000 00:34:00	0.008499
760	01/01/2000 00:35:00	0.008793
760	01/01/2000 00:36:00	0.008953
760	01/01/2000 00:37:00	0.00904
760	01/01/2000 00:38:00	0.009086
760	01/01/2000 00:39:00	0.009111
760	01/01/2000 00:40:00	0.009125
760	01/01/2000 00:41:00	0.011146
760	01/01/2000 00:42:00	0.015627
760	01/01/2000 00:43:00	0.020124
760	01/01/2000 00:44:00	0.023761
760	01/01/2000 00:45:00	0.026951
760	01/01/2000 00:46:00	0.029693
760	01/01/2000 00:47:00	0.032098
760	01/01/2000 00:48:00	0.034271
760	01/01/2000 00:49:00	0.036241
760	01/01/2000 00:50:00	0.037791
760	01/01/2000 00:51:00	0.047578
760	01/01/2000 00:52:00	0.056
760	01/01/2000 00:53:00	0.056
760	01/01/2000 00:54:00	0.056
760	01/01/2000 00:55:00	0.0565
760	01/01/2000 00:56:00	0.057068
760	01/01/2000 00:57:00	0.057819
760	01/01/2000 00:58:00	0.058
760	01/01/2000 00:59:00	0.058
760	01/01/2000 01:00:00	0.058
760	01/01/2000 01:01:00	0.058
760	01/01/2000 01:02:00	0.058
760	01/01/2000 01:03:00	0.058124
760	01/01/2000 01:04:00	0.058184
760	01/01/2000 01:05:00	0.058189
760	01/01/2000 01:06:00	0.058162
760	01/01/2000 01:07:00	0.05812
760	01/01/2000 01:08:00	0.058074
760	01/01/2000 01:09:00	0.058028
760	01/01/2000 01:10:00	0.058
760	01/01/2000 01:11:00	0.058
760	01/01/2000 01:12:00	0.058
760	01/01/2000 01:13:00	0.058
760	01/01/2000 01:14:00	0.058
760	01/01/2000 01:15:00	0.058
760	01/01/2000 01:16:00	0.058
760	01/01/2000 01:17:00	0.058
760	01/01/2000 01:18:00	0.058
760	01/01/2000 01:19:00	0.058
760	01/01/2000 01:20:00	0.058
760	01/01/2000 01:21:00	0.058
760	01/01/2000 01:22:00	0.057743
760	01/01/2000 01:23:00	0.056502
760	01/01/2000 01:24:00	0.055233
760	01/01/2000 01:25:00	0.05391
760	01/01/2000 01:26:00	0.052829
760	01/01/2000 01:27:00	0.051946
760	01/01/2000 01:28:00	0.051226
760	01/01/2000 01:29:00	0.05064
760	01/01/2000 01:30:00	0.050165
760	01/01/2000 01:31:00	0.049695
760	01/01/2000 01:32:00	0.049157
760	01/01/2000 01:33:00	0.048478
760	01/01/2000 01:34:00	0.047764
760	01/01/2000 01:35:00	0.047005
760	01/01/2000 01:36:00	0.046353
760	01/01/2000 01:37:00	0.045787
760	01/01/2000 01:38:00	0.04543
760	01/01/2000 01:39:00	0.045176
760	01/01/2000 01:40:00	0.04497
760	01/01/2000 01:41:00	0.044754
760	01/01/2000 01:42:00	0.04452
760	01/01/2000 01:43:00	0.044264
760	01/01/2000 01:44:00	0.043979
760	01/01/2000 01:45:00	0.041292
760	01/01/2000 01:46:00	0.0341
760	01/01/2000 01:47:00	0.029782

760	01/01/2000 01:48:00	0.028432
760	01/01/2000 01:49:00	0.027871
760	01/01/2000 01:50:00	0.027539
760	01/01/2000 01:51:00	0.027158
760	01/01/2000 01:52:00	0.026702
760	01/01/2000 01:53:00	0.026273
760	01/01/2000 01:54:00	0.025861
760	01/01/2000 01:55:00	0.025444
760	01/01/2000 01:56:00	0.025079
760	01/01/2000 01:57:00	0.024834
760	01/01/2000 01:58:00	0.024669
760	01/01/2000 01:59:00	0.024537
760	01/01/2000 02:00:00	0.024431
760	01/01/2000 02:01:00	0.024255
760	01/01/2000 02:02:00	0.024016
760	01/01/2000 02:03:00	0.023792
760	01/01/2000 02:04:00	0.023579
760	01/01/2000 02:05:00	0.023362
760	01/01/2000 02:06:00	0.023181
760	01/01/2000 02:07:00	0.023035
760	01/01/2000 02:08:00	0.022918
760	01/01/2000 02:09:00	0.022823
760	01/01/2000 02:10:00	0.022747
760	01/01/2000 02:11:00	0.022633
760	01/01/2000 02:12:00	0.02091
760	01/01/2000 02:13:00	0.011472
760	01/01/2000 02:14:00	0.006038
760	01/01/2000 02:15:00	0.004771
760	01/01/2000 02:16:00	0.004434
760	01/01/2000 02:17:00	0.004314
760	01/01/2000 02:18:00	0.004253
760	01/01/2000 02:19:00	0.004212
760	01/01/2000 02:20:00	0.004181
760	01/01/2000 02:21:00	0.004104
760	01/01/2000 02:22:00	0.003968
760	01/01/2000 02:23:00	0.003848
760	01/01/2000 02:24:00	0.00377
760	01/01/2000 02:25:00	0.003723
760	01/01/2000 02:26:00	0.003694
760	01/01/2000 02:27:00	0.003676
760	01/01/2000 02:28:00	0.003665
760	01/01/2000 02:29:00	0.003657
760	01/01/2000 02:30:00	0.003652
760	01/01/2000 02:31:00	0.003605
760	01/01/2000 02:32:00	0.003509
760	01/01/2000 02:33:00	0.003423
760	01/01/2000 02:34:00	0.003369
760	01/01/2000 02:35:00	0.003338
760	01/01/2000 02:36:00	0.003321
760	01/01/2000 02:37:00	0.003311
760	01/01/2000 02:38:00	0.003306
760	01/01/2000 02:39:00	0.003302
760	01/01/2000 02:40:00	0.003301
760	01/01/2000 02:41:00	0.003265
760	01/01/2000 02:42:00	0.003188
760	01/01/2000 02:43:00	0.003119
760	01/01/2000 02:44:00	0.003076
760	01/01/2000 02:45:00	0.003052
760	01/01/2000 02:46:00	0.003038
760	01/01/2000 02:47:00	0.003031
760	01/01/2000 02:48:00	0.003027
760	01/01/2000 02:49:00	0.003025
760	01/01/2000 02:50:00	0.003024
760	01/01/2000 02:51:00	0.002994
760	01/01/2000 02:52:00	0.00293
760	01/01/2000 02:53:00	0.002873
760	01/01/2000 02:54:00	0.002837
760	01/01/2000 02:55:00	0.002817
760	01/01/2000 02:56:00	0.002806
760	01/01/2000 02:57:00	0.0028
760	01/01/2000 02:58:00	0.002797
760	01/01/2000 02:59:00	0.002795
760	01/01/2000 03:00:00	0.002794
760	01/01/2000 03:01:00	0.002441
760	01/01/2000 03:02:00	0.001668
760	01/01/2000 03:03:00	0.000973
760	01/01/2000 03:04:00	0.000538
760	01/01/2000 03:05:00	0.000292
760	01/01/2000 03:06:00	0.000157
760	01/01/2000 03:07:00	8.5E-05
760	01/01/2000 03:08:00	4.5E-05
760	01/01/2000 03:09:00	2.4E-05
760	01/01/2000 03:10:00	1.3E-05
760	01/01/2000 03:11:00	0
760	01/01/2000 03:12:00	0
760	01/01/2000 03:13:00	0
760	01/01/2000 03:14:00	0
760	01/01/2000 03:15:00	0
760	01/01/2000 03:16:00	0
760	01/01/2000 03:17:00	0
760	01/01/2000 03:18:00	0
760	01/01/2000 03:19:00	0
760	01/01/2000 03:20:00	0
760	01/01/2000 03:21:00	0
760	01/01/2000 03:22:00	0
760	01/01/2000 03:23:00	0
760	01/01/2000 03:24:00	0
760	01/01/2000 03:25:00	0
760	01/01/2000 03:26:00	0
760	01/01/2000 03:27:00	0
760	01/01/2000 03:28:00	0
760	01/01/2000 03:29:00	0
760	01/01/2000 03:30:00	0
760	01/01/2000 03:31:00	0
760	01/01/2000 03:32:00	0
760	01/01/2000 03:33:00	0
760	01/01/2000 03:34:00	0
760	01/01/2000 03:35:00	0
760	01/01/2000 03:36:00	0
760	01/01/2000 03:37:00	0
760	01/01/2000 03:38:00	0
760	01/01/2000 03:39:00	0
760	01/01/2000 03:40:00	0
760	01/01/2000 03:41:00	0
760	01/01/2000 03:42:00	0
760	01/01/2000 03:43:00	0
760	01/01/2000 03:44:00	0
760	01/01/2000 03:45:00	0
760	01/01/2000 03:46:00	0
760	01/01/2000 03:47:00	0
760	01/01/2000 03:48:00	0
760	01/01/2000 03:49:00	0
760	01/01/2000 03:50:00	0
760	01/01/2000 03:51:00	0
760	01/01/2000 03:52:00	0
760	01/01/2000 03:53:00	0
760	01/01/2000 03:54:00	0
760	01/01/2000 03:55:00	0
760	01/01/2000 03:56:00	0
760	01/01/2000 03:57:00	0
760	01/01/2000 03:58:00	0
760	01/01/2000 03:59:00	0
760	01/01/2000 04:00:00	0
760	01/01/2000 04:01:00	0
760	01/01/2000 04:02:00	0
760	01/01/2000 04:03:00	0
760	01/01/2000 04:04:00	0
760	01/01/2000 04:05:00	0
760	01/01/2000 04:06:00	0
760	01/01/2000 04:07:00	0
760	01/01/2000 04:08:00	0
760	01/01/2000 04:09:00	0
760	01/01/2000 04:10:00	0
760	01/01/2000 04:11:00	0
760	01/01/2000 04:12:00	0
760	01/01/2000 04:13:00	0
760	01/01/2000 04:14:00	0
760	01/01/2000 04:15:00	0
760	01/01/2000 04:16:00	0

;Flow (m³/s)		
761	01/01/2000 00:00:00	0
761	01/01/2000 00:01:00	0
761	01/01/2000 00:02:00	0
761	01/01/2000 00:03:00	0
761	01/01/2000 00:04:00	0
761	01/01/2000 00:05:00	0
761	01/01/2000 00:06:00	0
761	01/01/2000 00:07:00	0
761	01/01/2000 00:08:00	0
761	01/01/2000 00:09:00	0
761	01/01/2000 00:10:00	0
761	01/01/2000 00:11:00	0
761	01/01/2000 00:12:00	0
761	01/01/2000 00:13:00	0
761	01/01/2000 00:14:00	0
761	01/01/2000 00:15:00	6.5E-05
761	01/01/2000 00:16:00	0.00033
761	01/01/2000 00:17:00	0.000767
761	01/01/2000 00:18:00	0.001169
761	01/01/2000 00:19:00	0.001437
761	01/01/2000 00:20:00	0.001603
761	01/01/2000 00:21:00	0.001745
761	01/01/2000 00:22:00	0.001941
761	01/01/2000 00:23:00	0.002141
761	01/01/2000 00:24:00	0.002278
761	01/01/2000 00:25:00	0.002363
761	01/01/2000 00:26:00	0.002414
761	01/01/2000 00:27:00	0.002445
761	01/01/2000 00:28:00	0.002463
761	01/01/2000 00:29:00	0.002473
761	01/01/2000 00:30:00	0.00248
761	01/01/2000 00:31:00	0.002578
761	01/01/2000 00:32:00	0.002884
761	01/01/2000 00:33:00	0.003252
761	01/01/2000 00:34:00	0.00351
761	01/01/2000 00:35:00	0.003672
761	01/01/2000 00:36:00	0.00377
761	01/01/2000 00:37:00	0.003828
761	01/01/2000 00:38:00	0.003862
761	01/01/2000 00:39:00	0.003883
761	01/01/2000 00:40:00	0.003895
761	01/01/2000 00:41:00	0.004328
761	01/01/2000 00:42:00	0.005708
761	01/01/2000 00:43:00	0.007429
761	01/01/2000 00:44:00	0.008772
761	01/01/2000 00:45:00	0.009803
761	01/01/2000 00:46:00	0.010619
761	01/01/2000 00:47:00	0.01127
761	01/01/2000 00:48:00	0.011809
761	01/01/2000 00:49:00	0.012273
761	01/01/2000 00:50:00	0.012686
761	01/01/2000 00:51:00	0.015319
761	01/01/2000 00:52:00	0.01997
761	01/01/2000 00:53:00	0.02
761	01/01/2000 00:54:00	0.02
761	01/01/2000 00:55:00	0.02
761	01/01/2000 00:56:00	0.020164
761	01/01/2000 00:57:00	0.020426
761	01/01/2000 00:58:00	0.020708
761	01/01/2000 00:59:00	0.021
761	01/01/2000 01:00:00	0.021
761	01/01/2000 01:01:00	0.021
761	01/01/2000 01:02:00	0.021
761	01/01/2000 01:03:00	0.021
761	01/01/2000 01:04:00	0.021
761	01/01/2000 01:05:00	0.021
761	01/01/2000 01:06:00	0.021
761	01/01/2000 01:07:00	0.021
761	01/01/2000 01:08:00	0.021
761	01/01/2000 01:09:00	0.021
761	01/01/2000 01:10:00	0.021
761	01/01/2000 01:11:00	0.021
761	01/01/2000 01:12:00	0.021
761	01/01/2000 01:13:00	0.021
761	01/01/2000 01:14:00	0.021
761	01/01/2000 01:15:00	0.021
761	01/01/2000 01:16:00	0.021
761	01/01/2000 01:17:00	0.021
761	01/01/2000 01:18:00	0.021
761	01/01/2000 01:19:00	0.021
761	01/01/2000 01:20:00	0.021
761	01/01/2000 01:21:00	0.021
761	01/01/2000 01:22:00	0.021
761	01/01/2000 01:23:00	0.021
761	01/01/2000 01:24:00	0.021
761	01/01/2000 01:25:00	0.021
761	01/01/2000 01:26:00	0.021
761	01/01/2000 01:27:00	0.021
761	01/01/2000 01:28:00	0.021
761	01/01/2000 01:29:00	0.021
761	01/01/2000 01:30:00	0.021
761	01/01/2000 01:31:00	0.021
761	01/01/2000 01:32:00	0.021
761	01/01/2000 01:33:00	0.021
761	01/01/2000 01:34:00	0.021
761	01/01/2000 01:35:00	0.021
761	01/01/2000 01:36:00	0.021
761	01/01/2000 01:37:00	0.021
761	01/01/2000 01:38:00	0.021
761	01/01/2000 01:39:00	0.021
761	01/01/2000 01:40:00	0.021
761	01/01/2000 01:41:00	0.021
761	01/01/2000 01:42:00	0.021
761	01/01/2000 01:43:00	0.021
761	01/01/2000 01:44:00	0.021
761	01/01/2000 01:45:00	0.021
761	01/01/2000 01:46:00	0.021
761	01/01/2000 01:47:00	0.021
761	01/01/2000 01:48:00	0.020908
761	01/01/2000 01:49:00	0.020812
761	01/01/2000 01:50:00	0.020716
761	01/01/2000 01:51:00	0.020621
761	01/01/2000 01:52:00	0.020524
761	01/01/2000 01:53:00	0.020428
761	01/01/2000 01:54:00	0.020331
761	01/01/2000 01:55:00	0.020234
761	01/01/2000 01:56:00	0.020138
761	01/01/2000 01:57:00	0.020041
761	01/01/2000 01:58:00	0.02
761	01/01/2000 01:59:00	0.02
761	01/01/2000 02:00:00	0.02
761	01/01/2000 02:01:00	0.02
761	01/01/2000 02:02:00	0.02
761	01/01/2000 02:03:00	0.019262
761	01/01/2000 02:04:00	0.010315
761	01/01/2000 02:05:00	0.004041
761	01/01/2000 02:06:00	0.002627
761	01/01/2000 02:07:00	0.002282
761	01/01/2000 02:08:00	0.002179
761	01/01/2000 02:09:00	0.002135
761	01/01/2000 02:10:00	0.002109
761	01/01/2000 02:11:00	0.002074
761	01/01/2000 02:12:00	0.002008
761	01/01/2000 02:13:00	0.001934
761	01/01/2000 02:14:00	0.001879
761	01/01/2000 02:15:00	0.00184
761	01/01/2000 02:16:00	0.001812
761	01/01/2000 02:17:00	0.001792
761	01/01/2000 02:18:00	0.001778
761	01/01/2000 02:19:00	0.001768
761	01/01/2000 02:20:00	0.001761
761	01/01/2000 02:21:00	0.001743
761	01/01/2000 02:22:00	0.001701
761	01/01/2000 02:23:00	0.001651
761	01/01/2000 02:24:00	0.001616
761	01/01/2000 02:25:00	0.001594
761	01/01/2000 02:26:00	0.00158

761	01/01/2000 02:27:00	0.001571
761	01/01/2000 02:28:00	0.001566
761	01/01/2000 02:29:00	0.001562
761	01/01/2000 02:30:00	0.00156
761	01/01/2000 02:31:00	0.001549
761	01/01/2000 02:32:00	0.001517
761	01/01/2000 02:33:00	0.00148
761	01/01/2000 02:34:00	0.001453
761	01/01/2000 02:35:00	0.001436
761	01/01/2000 02:36:00	0.001426
761	01/01/2000 02:37:00	0.00142
761	01/01/2000 02:38:00	0.001417
761	01/01/2000 02:39:00	0.001415
761	01/01/2000 02:40:00	0.001413
761	01/01/2000 02:41:00	0.001405
761	01/01/2000 02:42:00	0.001379
761	01/01/2000 02:43:00	0.001349
761	01/01/2000 02:44:00	0.001327
761	01/01/2000 02:45:00	0.001314
761	01/01/2000 02:46:00	0.001305
761	01/01/2000 02:47:00	0.001301
761	01/01/2000 02:48:00	0.001298
761	01/01/2000 02:49:00	0.001296
761	01/01/2000 02:50:00	0.001295
761	01/01/2000 02:51:00	0.001288
761	01/01/2000 02:52:00	0.001267
761	01/01/2000 02:53:00	0.001241
761	01/01/2000 02:54:00	0.001223
761	01/01/2000 02:55:00	0.001212
761	01/01/2000 02:56:00	0.001205
761	01/01/2000 02:57:00	0.001201
761	01/01/2000 02:58:00	0.001199
761	01/01/2000 02:59:00	0.001197
761	01/01/2000 03:00:00	0.001197
761	01/01/2000 03:01:00	0.001117
761	01/01/2000 03:02:00	0.000861
761	01/01/2000 03:03:00	0.000553
761	01/01/2000 03:04:00	0.000337
761	01/01/2000 03:05:00	0.000202
761	01/01/2000 03:06:00	0.00012
761	01/01/2000 03:07:00	7.1E-05
761	01/01/2000 03:08:00	4.2E-05
761	01/01/2000 03:09:00	2.5E-05
761	01/01/2000 03:10:00	1.5E-05
761	01/01/2000 03:11:00	0
761	01/01/2000 03:12:00	0
761	01/01/2000 03:13:00	0
761	01/01/2000 03:14:00	0
761	01/01/2000 03:15:00	0
761	01/01/2000 03:16:00	0
761	01/01/2000 03:17:00	0
761	01/01/2000 03:18:00	0
761	01/01/2000 03:19:00	0
761	01/01/2000 03:20:00	0
761	01/01/2000 03:21:00	0
761	01/01/2000 03:22:00	0
761	01/01/2000 03:23:00	0
761	01/01/2000 03:24:00	0
761	01/01/2000 03:25:00	0
761	01/01/2000 03:26:00	0
761	01/01/2000 03:27:00	0
761	01/01/2000 03:28:00	0
761	01/01/2000 03:29:00	0
761	01/01/2000 03:30:00	0
761	01/01/2000 03:31:00	0
761	01/01/2000 03:32:00	0
761	01/01/2000 03:33:00	0
761	01/01/2000 03:34:00	0
761	01/01/2000 03:35:00	0
761	01/01/2000 03:36:00	0
761	01/01/2000 03:37:00	0
761	01/01/2000 03:38:00	0
761	01/01/2000 03:39:00	0
761	01/01/2000 03:40:00	0
761	01/01/2000 03:41:00	0
761	01/01/2000 03:42:00	0
761	01/01/2000 03:43:00	0
761	01/01/2000 03:44:00	0
761	01/01/2000 03:45:00	0
761	01/01/2000 03:46:00	0
761	01/01/2000 03:47:00	0
761	01/01/2000 03:48:00	0
761	01/01/2000 03:49:00	0
761	01/01/2000 03:50:00	0
761	01/01/2000 03:51:00	0
761	01/01/2000 03:52:00	0
761	01/01/2000 03:53:00	0
761	01/01/2000 03:54:00	0
761	01/01/2000 03:55:00	0
761	01/01/2000 03:56:00	0
761	01/01/2000 03:57:00	0
761	01/01/2000 03:58:00	0
761	01/01/2000 03:59:00	0
761	01/01/2000 04:00:00	0
761	01/01/2000 04:01:00	0
761	01/01/2000 04:02:00	0
761	01/01/2000 04:03:00	0
761	01/01/2000 04:04:00	0
761	01/01/2000 04:05:00	0
761	01/01/2000 04:06:00	0
761	01/01/2000 04:07:00	0
761	01/01/2000 04:08:00	0
761	01/01/2000 04:09:00	0
761	01/01/2000 04:10:00	0
761	01/01/2000 04:11:00	0
761	01/01/2000 04:12:00	0
761	01/01/2000 04:13:00	0
761	01/01/2000 04:14:00	0
761	01/01/2000 04:15:00	0
761	01/01/2000 04:16:00	0

;Flow (m³/s)

770	01/01/2000 00:00:00	0
770	01/01/2000 00:01:00	0
770	01/01/2000 00:02:00	0
770	01/01/2000 00:03:00	0
770	01/01/2000 00:04:00	0
770	01/01/2000 00:05:00	0
770	01/01/2000 00:06:00	0
770	01/01/2000 00:07:00	0
770	01/01/2000 00:08:00	0
770	01/01/2000 00:09:00	0
770	01/01/2000 00:10:00	0
770	01/01/2000 00:11:00	0
770	01/01/2000 00:12:00	0
770	01/01/2000 00:13:00	0
770	01/01/2000 00:14:00	0
770	01/01/2000 00:15:00	0.000299
770	01/01/2000 00:16:00	0.001385
770	01/01/2000 00:17:00	0.00285
770	01/01/2000 00:18:00	0.00386
770	01/01/2000 00:19:00	0.004397
770	01/01/2000 00:20:00	0.004716
770	01/01/2000 00:21:00	0.005094
770	01/01/2000 00:22:00	0.005736
770	01/01/2000 00:23:00	0.006278
770	01/01/2000 00:24:00	0.006545
770	01/01/2000 00:25:00	0.006709
770	01/01/2000 00:26:00	0.0068
770	01/01/2000 00:27:00	0.006854
770	01/01/2000 00:28:00	0.006884
770	01/01/2000 00:29:00	0.006901
770	01/01/2000 00:30:00	0.006911
770	01/01/2000 00:31:00	0.007355
770	01/01/2000 00:32:00	0.008554
770	01/01/2000 00:33:00	0.009624
770	01/01/2000 00:34:00	0.010142
770	01/01/2000 00:35:00	0.010463
770	01/01/2000 00:36:00	0.010642
770	01/01/2000 00:37:00	0.010746
770	01/01/2000 00:38:00	0.010805
770	01/01/2000 00:39:00	0.010839
770	01/01/2000 00:40:00	0.010859
770	01/01/2000 00:41:00	0.012972
770	01/01/2000 00:42:00	0.018669
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770	01/01/2000 00:45:00	0.031204
770	01/01/2000 00:46:00	0.034237
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770	01/01/2000 00:48:00	0.039814
770	01/01/2000 00:49:00	0.04234
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770	01/01/2000 00:51:00	0.057996
770	01/01/2000 00:52:00	0.071554
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770	01/01/2000 00:58:00	0.08
770	01/01/2000 00:59:00	0.08
770	01/01/2000 01:00:00	0.080485
770	01/01/2000 01:01:00	0.081
770	01/01/2000 01:02:00	0.081
770	01/01/2000 01:03:00	0.081
770	01/01/2000 01:04:00	0.081
770	01/01/2000 01:05:00	0.081
770	01/01/2000 01:06:00	0.081
770	01/01/2000 01:07:00	0.081
770	01/01/2000 01:08:00	0.081
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770	01/01/2000 01:17:00	0.080146
770	01/01/2000 01:18:00	0.08
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770	01/01/2000 01:33:00	0.071799
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770	01/01/2000 01:38:00	0.066259
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770	01/01/2000 01:43:00	0.021187
770	01/01/2000 01:44:00	0.019477
770	01/01/2000 01:45:00	0.018737
770	01/01/2000 01:46:00	0.017862
770	01/01/2000 01:47:00	0.017138
770	01/01/2000 01:48:00	0.016524
770	01/01/2000 01:49:00	0.016017
770	01/01/2000 01:50:00	0.015592
770	01/01/2000 01:51:00	0.015054
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770	01/01/2000 01:55:00	0.012363
770	01/01/2000 01:56:00	0.01185
770	01/01/2000 01:57:00	0.011394
770	01/01/2000 01:58:00	0.011015
770	01/01/2000 01:59:00	0.0107
770	01/01/2000 02:00:00	0.010437
770	01/01/2000 02:01:00	0.010087
770	01/01/2000 02:02:00	0.009563
770	01/01/2000 02:03:00	0.009053
770	01/01/2000 02:04:00	0.008644
770	01/01/2000 02:05:00	0.008258
770	01/01/2000 02:06:00	0.007906
770	01/01/2000 02:07:00	0.007592
770	01/01/2000 02:08:00	0.007331
770	01/01/2000 02:09:00	0.007114
770	01/01/2000 02:10:00	0.006933
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770	01/01/2000 02:12:00	0.006365
770	01/01/2000 02:13:00	0.00606
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770	01/01/2000 02:15:00	0.005686
770	01/01/2000 02:16:00	0.00555
770	01/01/2000 02:17:00	0.005437
770	01/01/2000 02:18:00	0.005345
770	01/01/2000 02:19:00	0.005269
770	01/01/2000 02:20:00	0.005205
770	01/01/2000 02:21:00	0.005096
770	01/01/2000 02:22:00	0.0049
770	01/01/2000 02:23:00	0.004727
770	01/01/2000 02:24:00	0.004628
770	01/01/2000 02:25:00	0.00456
770	01/01/2000 02:26:00	0.004512
770	01/01/2000 02:27:00	0.004478
770	01/01/2000 02:28:00	0.004453
770	01/01/2000 02:29:00	0.004433
770	01/01/2000 02:30:00	0.004417
770	01/01/2000 02:31:00	0.004359
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770	01/01/2000 02:33:00	0.00411
770	01/01/2000 02:34:00	0.00405
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770	01/01/2000 02:36:00	0.003987
770	01/01/2000 02:37:00	0.003973
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770	01/01/2000 02:39:00	0.003955
770	01/01/2000 02:40:00	0.003949
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770	01/01/2000 02:42:00	0.003808
770	01/01/2000 02:43:00	0.003717
770	01/01/2000 02:44:00	0.003672
770	01/01/2000 02:45:00	0.003644
770	01/01/2000 02:46:00	0.003628
770	01/01/2000 02:47:00	0.003618
770	01/01/2000 02:48:00	0.003612
770	01/01/2000 02:49:00	0.003608
770	01/01/2000 02:50:00	0.003607
770	01/01/2000 02:51:00	0.003575
770	01/01/2000 02:52:00	0.003491
770	01/01/2000 02:53:00	0.003417
770	01/01/2000 02:54:00	0.00338
770	01/01/2000 02:55:00	0.003358
770	01/01/2000 02:56:00	0.003344
770	01/01/2000 02:57:00	0.003337
770	01/01/2000 02:58:00	0.003333
770	01/01/2000 02:59:00	0.003331
770	01/01/2000 03:00:00	0.003328
770	01/01/2000 03:01:00	0.002961
770	01/01/2000 03:02:00	0.001956
770	01/01/2000 03:03:00	0.001058
770	01/01/2000 03:04:00	0.000624
770	01/01/2000 03:05:00	0.000354

770	01/01/2000 03:06:00	0.000205
770	01/01/2000 03:07:00	0.000117
770	01/01/2000 03:08:00	6.7E-05
770	01/01/2000 03:09:00	3.8E-05
770	01/01/2000 03:10:00	2.2E-05
770	01/01/2000 03:11:00	1.3E-05
770	01/01/2000 03:12:00	0
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770	01/01/2000 03:15:00	0
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770	01/01/2000 04:01:00	0
770	01/01/2000 04:02:00	0
770	01/01/2000 04:03:00	0
770	01/01/2000 04:04:00	0
770	01/01/2000 04:05:00	0
770	01/01/2000 04:06:00	0
770	01/01/2000 04:07:00	0
770	01/01/2000 04:08:00	0
770	01/01/2000 04:09:00	0
770	01/01/2000 04:10:00	0
770	01/01/2000 04:11:00	0
770	01/01/2000 04:12:00	0
770	01/01/2000 04:13:00	0
770	01/01/2000 04:14:00	0
770	01/01/2000 04:15:00	0
770	01/01/2000 04:16:00	0

;Flow (m^3/s)

773	01/01/2000 00:00:00	0
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773	01/01/2000 00:02:00	0
773	01/01/2000 00:03:00	0
773	01/01/2000 00:04:00	0
773	01/01/2000 00:05:00	0
773	01/01/2000 00:06:00	0
773	01/01/2000 00:07:00	0
773	01/01/2000 00:08:00	0
773	01/01/2000 00:09:00	0
773	01/01/2000 00:10:00	0
773	01/01/2000 00:11:00	0
773	01/01/2000 00:12:00	0
773	01/01/2000 00:13:00	0
773	01/01/2000 00:14:00	0
773	01/01/2000 00:15:00	0.000116
773	01/01/2000 00:16:00	0.000583
773	01/01/2000 00:17:00	0.001311
773	01/01/2000 00:18:00	0.001914
773	01/01/2000 00:19:00	0.002263
773	01/01/2000 00:20:00	0.002452
773	01/01/2000 00:21:00	0.00263
773	01/01/2000 00:22:00	0.002923
773	01/01/2000 00:23:00	0.003217
773	01/01/2000 00:24:00	0.003391
773	01/01/2000 00:25:00	0.003486
773	01/01/2000 00:26:00	0.003537
773	01/01/2000 00:27:00	0.003564
773	01/01/2000 00:28:00	0.003579
773	01/01/2000 00:29:00	0.003586
773	01/01/2000 00:30:00	0.003591
773	01/01/2000 00:31:00	0.003762
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773	01/01/2000 00:33:00	0.004883
773	01/01/2000 00:34:00	0.005236
773	01/01/2000 00:35:00	0.005429
773	01/01/2000 00:36:00	0.005533
773	01/01/2000 00:37:00	0.005588
773	01/01/2000 00:38:00	0.005618
773	01/01/2000 00:39:00	0.005633
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773	01/01/2000 00:41:00	0.006426
773	01/01/2000 00:42:00	0.008877
773	01/01/2000 00:43:00	0.011737
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773	01/01/2000 00:45:00	0.015251
773	01/01/2000 00:46:00	0.016324
773	01/01/2000 00:47:00	0.017162
773	01/01/2000 00:48:00	0.017859
773	01/01/2000 00:49:00	0.018247
773	01/01/2000 00:50:00	0.018638
773	01/01/2000 00:51:00	0.02168
773	01/01/2000 00:52:00	0.024
773	01/01/2000 00:53:00	0.024
773	01/01/2000 00:54:00	0.024448
773	01/01/2000 00:55:00	0.025
773	01/01/2000 00:56:00	0.025
773	01/01/2000 00:57:00	0.025
773	01/01/2000 00:58:00	0.025
773	01/01/2000 00:59:00	0.025656
773	01/01/2000 01:00:00	0.026
773	01/01/2000 01:01:00	0.026
773	01/01/2000 01:02:00	0.026
773	01/01/2000 01:03:00	0.026
773	01/01/2000 01:04:00	0.026
773	01/01/2000 01:05:00	0.026
773	01/01/2000 01:06:00	0.026
773	01/01/2000 01:07:00	0.026
773	01/01/2000 01:08:00	0.026
773	01/01/2000 01:09:00	0.026
773	01/01/2000 01:10:00	0.026
773	01/01/2000 01:11:00	0.026
773	01/01/2000 01:12:00	0.026
773	01/01/2000 01:13:00	0.026
773	01/01/2000 01:14:00	0.026
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773	01/01/2000 01:21:00	0.025118
773	01/01/2000 01:22:00	0.025
773	01/01/2000 01:23:00	0.025
773	01/01/2000 01:24:00	0.025
773	01/01/2000 01:25:00	0.025
773	01/01/2000 01:26:00	0.025
773	01/01/2000 01:27:00	0.025
773	01/01/2000 01:28:00	0.025
773	01/01/2000 01:29:00	0.025
773	01/01/2000 01:30:00	0.025
773	01/01/2000 01:31:00	0.025
773	01/01/2000 01:32:00	0.025
773	01/01/2000 01:33:00	0.025
773	01/01/2000 01:34:00	0.025
773	01/01/2000 01:35:00	0.025
773	01/01/2000 01:36:00	0.025
773	01/01/2000 01:37:00	0.025
773	01/01/2000 01:38:00	0.025
773	01/01/2000 01:39:00	0.025
773	01/01/2000 01:40:00	0.025
773	01/01/2000 01:41:00	0.025
773	01/01/2000 01:42:00	0.025
773	01/01/2000 01:43:00	0.025
773	01/01/2000 01:44:00	0.025
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773	01/01/2000 01:46:00	0.024646
773	01/01/2000 01:47:00	0.024463
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773	01/01/2000 01:51:00	0.024
773	01/01/2000 01:52:00	0.024
773	01/01/2000 01:53:00	0.024
773	01/01/2000 01:54:00	0.014561
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773	01/01/2000 02:02:00	0.003688
773	01/01/2000 02:03:00	0.003503
773	01/01/2000 02:04:00	0.003353
773	01/01/2000 02:05:00	0.003237
773	01/01/2000 02:06:00	0.003155
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773	01/01/2000 02:18:00	0.002543
773	01/01/2000 02:19:00	0.002534
773	01/01/2000 02:20:00	0.002527
773	01/01/2000 02:21:00	0.002501
773	01/01/2000 02:22:00	0.00243
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773	01/01/2000 02:24:00	0.002306
773	01/01/2000 02:25:00	0.00228
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773	01/01/2000 02:36:00	0.002051
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773	01/01/2000 02:43:00	0.001932
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773	01/01/2000 02:45:00	0.001887
773	01/01/2000 02:46:00	0.001878
773	01/01/2000 02:47:00	0.001874
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773	01/01/2000 02:49:00	0.00187
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773	01/01/2000 02:55:00	0.001742
773	01/01/2000 02:56:00	0.001735
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773	01/01/2000 02:59:00	0.001728
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773	01/01/2000 03:03:00	0.000645
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773	01/01/2000 03:05:00	0.000186
773	01/01/2000 03:06:00	9.9E-05
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773	01/01/2000 03:08:00	2.8E-05
773	01/01/2000 03:09:00	1.5E-05
773	01/01/2000 03:10:00	0
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773	01/01/2000 03:12:00	0
773	01/01/2000 03:13:00	0
773	01/01/2000 03:14:00	0
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773	01/01/2000 03:31:00	0
773	01/01/2000 03:32:00	0
773	01/01/2000 03:33:00	0
773	01/01/2000 03:34:00	0
773	01/01/2000 03:35:00	0
773	01/01/2000 03:36:00	0
773	01/01/2000 03:37:00	0
773	01/01/2000 03:38:00	0
773	01/01/2000 03:39:00	0
773	01/01/2000 03:40:00	0
773	01/01/2000 03:41:00	0
773	01/01/2000 03:42:00	0
773	01/01/2000 03:43:00	0
773	01/01/2000 03:44:00	0

773	01/01/2000 03:45:00	0
773	01/01/2000 03:46:00	0
773	01/01/2000 03:47:00	0
773	01/01/2000 03:48:00	0
773	01/01/2000 03:49:00	0
773	01/01/2000 03:50:00	0
773	01/01/2000 03:51:00	0
773	01/01/2000 03:52:00	0
773	01/01/2000 03:53:00	0
773	01/01/2000 03:54:00	0
773	01/01/2000 03:55:00	0
773	01/01/2000 03:56:00	0
773	01/01/2000 03:57:00	0
773	01/01/2000 03:58:00	0
773	01/01/2000 03:59:00	0
773	01/01/2000 04:00:00	0
773	01/01/2000 04:01:00	0
773	01/01/2000 04:02:00	0
773	01/01/2000 04:03:00	0
773	01/01/2000 04:04:00	0
773	01/01/2000 04:05:00	0
773	01/01/2000 04:06:00	0
773	01/01/2000 04:07:00	0
773	01/01/2000 04:08:00	0
773	01/01/2000 04:09:00	0
773	01/01/2000 04:10:00	0
773	01/01/2000 04:11:00	0
773	01/01/2000 04:12:00	0
773	01/01/2000 04:13:00	0
773	01/01/2000 04:14:00	0
773	01/01/2000 04:15:00	0
773	01/01/2000 04:16:00	0

;Flow (m³/s)

774	01/01/2000 00:00:00	0
774	01/01/2000 00:01:00	0
774	01/01/2000 00:02:00	0
774	01/01/2000 00:03:00	0
774	01/01/2000 00:04:00	0
774	01/01/2000 00:05:00	0
774	01/01/2000 00:06:00	0
774	01/01/2000 00:07:00	0
774	01/01/2000 00:08:00	0
774	01/01/2000 00:09:00	0
774	01/01/2000 00:10:00	0
774	01/01/2000 00:11:00	0
774	01/01/2000 00:12:00	0
774	01/01/2000 00:13:00	0
774	01/01/2000 00:14:00	0
774	01/01/2000 00:15:00	0.000201
774	01/01/2000 00:16:00	0.000973
774	01/01/2000 00:17:00	0.002099
774	01/01/2000 00:18:00	0.002951
774	01/01/2000 00:19:00	0.003415
774	01/01/2000 00:20:00	0.003675
774	01/01/2000 00:21:00	0.003954
774	01/01/2000 00:22:00	0.004425
774	01/01/2000 00:23:00	0.004861
774	01/01/2000 00:24:00	0.005096
774	01/01/2000 00:25:00	0.005228
774	01/01/2000 00:26:00	0.005302
774	01/01/2000 00:27:00	0.005343
774	01/01/2000 00:28:00	0.005366
774	01/01/2000 00:29:00	0.005379
774	01/01/2000 00:30:00	0.005386
774	01/01/2000 00:31:00	0.005684
774	01/01/2000 00:32:00	0.006552
774	01/01/2000 00:33:00	0.007422
774	01/01/2000 00:34:00	0.007887
774	01/01/2000 00:35:00	0.008149
774	01/01/2000 00:36:00	0.008295
774	01/01/2000 00:37:00	0.008377
774	01/01/2000 00:38:00	0.008422
774	01/01/2000 00:39:00	0.008448
774	01/01/2000 00:40:00	0.008462
774	01/01/2000 00:41:00	0.009838
774	01/01/2000 00:42:00	0.013842
774	01/01/2000 00:43:00	0.018092
774	01/01/2000 00:44:00	0.020885
774	01/01/2000 00:45:00	0.023098
774	01/01/2000 00:46:00	0.024908
774	01/01/2000 00:47:00	0.026406
774	01/01/2000 00:48:00	0.027714
774	01/01/2000 00:49:00	0.028569
774	01/01/2000 00:50:00	0.029568
774	01/01/2000 00:51:00	0.036374
774	01/01/2000 00:52:00	0.040873
774	01/01/2000 00:53:00	0.042611
774	01/01/2000 00:54:00	0.043
774	01/01/2000 00:55:00	0.043499
774	01/01/2000 00:56:00	0.044
774	01/01/2000 00:57:00	0.044
774	01/01/2000 00:58:00	0.044
774	01/01/2000 00:59:00	0.044
774	01/01/2000 01:00:00	0.044
774	01/01/2000 01:01:00	0.044
774	01/01/2000 01:02:00	0.044
774	01/01/2000 01:03:00	0.044
774	01/01/2000 01:04:00	0.044
774	01/01/2000 01:05:00	0.044
774	01/01/2000 01:06:00	0.044
774	01/01/2000 01:07:00	0.044
774	01/01/2000 01:08:00	0.044
774	01/01/2000 01:09:00	0.044
774	01/01/2000 01:10:00	0.044
774	01/01/2000 01:11:00	0.044
774	01/01/2000 01:12:00	0.044
774	01/01/2000 01:13:00	0.044
774	01/01/2000 01:14:00	0.04381
774	01/01/2000 01:15:00	0.043362
774	01/01/2000 01:16:00	0.043
774	01/01/2000 01:17:00	0.043
774	01/01/2000 01:18:00	0.042945
774	01/01/2000 01:19:00	0.0425
774	01/01/2000 01:20:00	0.042137
774	01/01/2000 01:21:00	0.041796
774	01/01/2000 01:22:00	0.041465
774	01/01/2000 01:23:00	0.041135
774	01/01/2000 01:24:00	0.040796
774	01/01/2000 01:25:00	0.040441
774	01/01/2000 01:26:00	0.040152
774	01/01/2000 01:27:00	0.039596
774	01/01/2000 01:28:00	0.039049
774	01/01/2000 01:29:00	0.038571
774	01/01/2000 01:30:00	0.038446
774	01/01/2000 01:31:00	0.037553
774	01/01/2000 01:32:00	0.021553
774	01/01/2000 01:33:00	0.015822
774	01/01/2000 01:34:00	0.015178
774	01/01/2000 01:35:00	0.014387
774	01/01/2000 01:36:00	0.013755
774	01/01/2000 01:37:00	0.013275
774	01/01/2000 01:38:00	0.012903
774	01/01/2000 01:39:00	0.012614
774	01/01/2000 01:40:00	0.012387
774	01/01/2000 01:41:00	0.012038
774	01/01/2000 01:42:00	0.011408
774	01/01/2000 01:43:00	0.010755
774	01/01/2000 01:44:00	0.01026
774	01/01/2000 01:45:00	0.009823
774	01/01/2000 01:46:00	0.009468
774	01/01/2000 01:47:00	0.009199
774	01/01/2000 01:48:00	0.008991
774	01/01/2000 01:49:00	0.00883
774	01/01/2000 01:50:00	0.008703
774	01/01/2000 01:51:00	0.00849
774	01/01/2000 01:52:00	0.008089
774	01/01/2000 01:53:00	0.007667
774	01/01/2000 01:54:00	0.007347
774	01/01/2000 01:55:00	0.007066
774	01/01/2000 01:56:00	0.006835
774	01/01/2000 01:57:00	0.006662
774	01/01/2000 01:58:00	0.006527
774	01/01/2000 01:59:00	0.006421
774	01/01/2000 02:00:00	0.006339
774	01/01/2000 02:01:00	0.006193
774	01/01/2000 02:02:00	0.005911
774	01/01/2000 02:03:00	0.005615
774	01/01/2000 02:04:00	0.005389
774	01/01/2000 02:05:00	0.005189
774	01/01/2000 02:06:00	0.005027
774	01/01/2000 02:07:00	0.004903
774	01/01/2000 02:08:00	0.004807
774	01/01/2000 02:09:00	0.004732
774	01/01/2000 02:10:00	0.004672
774	01/01/2000 02:11:00	0.004574
774	01/01/2000 02:12:00	0.004388
774	01/01/2000 02:13:00	0.004205
774	01/01/2000 02:14:00	0.004089
774	01/01/2000 02:15:00	0.004006
774	01/01/2000 02:16:00	0.003947
774	01/01/2000 02:17:00	0.003906
774	01/01/2000 02:18:00	0.003875
774	01/01/2000 02:19:00	0.003852
774	01/01/2000 02:20:00	0.003834
774	01/01/2000 02:21:00	0.003782
774	01/01/2000 02:22:00	0.003661
774	01/01/2000 02:23:00	0.003543
774	01/01/2000 02:24:00	0.003477
774	01/01/2000 02:25:00	0.00343
774	01/01/2000 02:26:00	0.003408
774	01/01/2000 02:27:00	0.003395
774	01/01/2000 02:28:00	0.003387
774	01/01/2000 02:29:00	0.003382
774	01/01/2000 02:30:00	0.003378
774	01/01/2000 02:31:00	0.003346
774	01/01/2000 02:32:00	0.003257
774	01/01/2000 02:33:00	0.003168
774	01/01/2000 02:34:00	0.003121
774	01/01/2000 02:35:00	0.003093
774	01/01/2000 02:36:00	0.003078
774	01/01/2000 02:37:00	0.00307
774	01/01/2000 02:38:00	0.003065
774	01/01/2000 02:39:00	0.003062
774	01/01/2000 02:40:00	0.00306
774	01/01/2000 02:41:00	0.003035
774	01/01/2000 02:42:00	0.002963
774	01/01/2000 02:43:00	0.002891
774	01/01/2000 02:44:00	0.002852
774	01/01/2000 02:45:00	0.00283
774	01/01/2000 02:46:00	0.002818
774	01/01/2000 02:47:00	0.002811
774	01/01/2000 02:48:00	0.002808
774	01/01/2000 02:49:00	0.002806
774	01/01/2000 02:50:00	0.002804
774	01/01/2000 02:51:00	0.002783
774	01/01/2000 02:52:00	0.002723
774	01/01/2000 02:53:00	0.002663
774	01/01/2000 02:54:00	0.002631
774	01/01/2000 02:55:00	0.002613
774	01/01/2000 02:56:00	0.002603
774	01/01/2000 02:57:00	0.002597
774	01/01/2000 02:58:00	0.002594
774	01/01/2000 02:59:00	0.002592
774	01/01/2000 03:00:00	0.002591
774	01/01/2000 03:01:00	0.002344
774	01/01/2000 03:02:00	0.001617
774	01/01/2000 03:03:00	0.000887
774	01/01/2000 03:04:00	0.000497
774	01/01/2000 03:05:00	0.000278
774	01/01/2000 03:06:00	0.000155
774	01/01/2000 03:07:00	8.7E-05
774	01/01/2000 03:08:00	4.9E-05
774	01/01/2000 03:09:00	2.7E-05
774	01/01/2000 03:10:00	1.5E-05
774	01/01/2000 03:11:00	0
774	01/01/2000 03:12:00	0
774	01/01/2000 03:13:00	0
774	01/01/2000 03:14:00	0
774	01/01/2000 03:15:00	0
774	01/01/2000 03:16:00	0
774	01/01/2000 03:17:00	0
774	01/01/2000 03:18:00	0
774	01/01/2000 03:19:00	0
774	01/01/2000 03:20:00	0
774	01/01/2000 03:21:00	0
774	01/01/2000 03:22:00	0
774	01/01/2000 03:23:00	0
774	01/01/2000 03:24:00	0
774	01/01/2000 03:25:00	0
774	01/01/2000 03:26:00	0
774	01/01/2000 03:27:00	0
774	01/01/2000 03:28:00	0
774	01/01/2000 03:29:00	0
774	01/01/2000 03:30:00	0
774	01/01/2000 03:31:00	0
774	01/01/2000 03:32:00	0
774	01/01/2000 03:33:00	0
774	01/01/2000 03:34:00	0
774	01/01/2000 03:35:00	0
774	01/01/2000 03:36:00	0
774	01/01/2000 03:37:00	0
774	01/01/2000 03:38:00	0
774	01/01/2000 03:39:00	0
774	01/01/2000 03:40:00	0
774	01/01/2000 03:41:00	0
774	01/01/2000 03:42:00	0
774	01/01/2000 03:43:00	0
774	01/01/2000 03:44:00	0
774	01/01/2000 03:45:00	0
774	01/01/2000 03:46:00	0
774	01/01/2000 03:47:00	0
774	01/01/2000 03:48:00	0
774	01/01/2000 03:49:00	0
774	01/01/2000 03:50:00	0
774	01/01/2000 03:51:00	0
774	01/01/2000 03:52:00	0
774	01/01/2000 03:53:00	0
774	01/01/2000 03:54:00	0
774	01/01/2000 03:55:00	0
774	01/01/2000 03:56:00	0
774	01/01/2000 03:57:00	0
774	01/01/2000 03:58:00	0
774	01/01/2000 03:59:00	0
774	01/01/2000 04:00:00	0
774	01/01/2000 04:01:00	0
774	01/01/2000 04:02:00	0
774	01/01/2000 04:03:00	0
774	01/01/2000 04:04:00	0
774	01/01/2000 04:05:00	0
774	01/01/2000 04:06:00	0
774	01/01/2000 04:07:00	0
774	01/01/2000 04:08:00	0
774	01/01/2000 04:09:00	0
774	01/01/2000 04:10:00	0
774	01/01/2000 04:11:00	0
774	01/01/2000 04:12:00	0
774	01/01/2000 04:13:00	0
774	01/01/2000 04:14:00	0
774	01/01/2000 04:15:00	0
774	01/01/2000 04:16:00	0

;Flow (m³/s)

780	01/01/2000 00:00:00	0
780	01/01/2000 00:01:00	0
780	01/01/2000 00:02:00	0
780	01/01/2000 00:03:00	0
780	01/01/2000 00:04:00	0

780	01/01/2000 00:05:00	0
780	01/01/2000 00:06:00	0
780	01/01/2000 00:07:00	0
780	01/01/2000 00:08:00	0
780	01/01/2000 00:09:00	0
780	01/01/2000 00:10:00	0
780	01/01/2000 00:11:00	0
780	01/01/2000 00:12:00	0
780	01/01/2000 00:13:00	0
780	01/01/2000 00:14:00	0
780	01/01/2000 00:15:00	0.000112
780	01/01/2000 00:16:00	0.000559
780	01/01/2000 00:17:00	0.001263
780	01/01/2000 00:18:00	0.001879
780	01/01/2000 00:19:00	0.002282
780	01/01/2000 00:20:00	0.002537
780	01/01/2000 00:21:00	0.002773
780	01/01/2000 00:22:00	0.003103
780	01/01/2000 00:23:00	0.003427
780	01/01/2000 00:24:00	0.003641
780	01/01/2000 00:25:00	0.003776
780	01/01/2000 00:26:00	0.003862
780	01/01/2000 00:27:00	0.003917
780	01/01/2000 00:28:00	0.003951
780	01/01/2000 00:29:00	0.003973
780	01/01/2000 00:30:00	0.003986
780	01/01/2000 00:31:00	0.00416
780	01/01/2000 00:32:00	0.004671
780	01/01/2000 00:33:00	0.00525
780	01/01/2000 00:34:00	0.005636
780	01/01/2000 00:35:00	0.005881
780	01/01/2000 00:36:00	0.006036
780	01/01/2000 00:37:00	0.006135
780	01/01/2000 00:38:00	0.006197
780	01/01/2000 00:39:00	0.006236
780	01/01/2000 00:40:00	0.006261
780	01/01/2000 00:41:00	0.007019
780	01/01/2000 00:42:00	0.009323
780	01/01/2000 00:43:00	0.012039
780	01/01/2000 00:44:00	0.014073
780	01/01/2000 00:45:00	0.015661
780	01/01/2000 00:46:00	0.016947
780	01/01/2000 00:47:00	0.017985
780	01/01/2000 00:48:00	0.018855
780	01/01/2000 00:49:00	0.019607
780	01/01/2000 00:50:00	0.020163
780	01/01/2000 00:51:00	0.023287
780	01/01/2000 00:52:00	0.027
780	01/01/2000 00:53:00	0.027
780	01/01/2000 00:54:00	0.027
780	01/01/2000 00:55:00	0.027235
780	01/01/2000 00:56:00	0.027597
780	01/01/2000 00:57:00	0.027999
780	01/01/2000 00:58:00	0.028
780	01/01/2000 00:59:00	0.028
780	01/01/2000 01:00:00	0.028
780	01/01/2000 01:01:00	0.028
780	01/01/2000 01:02:00	0.028
780	01/01/2000 01:03:00	0.028
780	01/01/2000 01:04:00	0.028
780	01/01/2000 01:05:00	0.028
780	01/01/2000 01:06:00	0.028
780	01/01/2000 01:07:00	0.028
780	01/01/2000 01:08:00	0.028
780	01/01/2000 01:09:00	0.028
780	01/01/2000 01:10:00	0.028
780	01/01/2000 01:11:00	0.028
780	01/01/2000 01:12:00	0.028
780	01/01/2000 01:13:00	0.028
780	01/01/2000 01:14:00	0.028
780	01/01/2000 01:15:00	0.028
780	01/01/2000 01:16:00	0.028
780	01/01/2000 01:17:00	0.028
780	01/01/2000 01:18:00	0.028
780	01/01/2000 01:19:00	0.028
780	01/01/2000 01:20:00	0.028
780	01/01/2000 01:21:00	0.028
780	01/01/2000 01:22:00	0.028
780	01/01/2000 01:23:00	0.028
780	01/01/2000 01:24:00	0.028
780	01/01/2000 01:25:00	0.028
780	01/01/2000 01:26:00	0.028
780	01/01/2000 01:27:00	0.028
780	01/01/2000 01:28:00	0.028
780	01/01/2000 01:29:00	0.028
780	01/01/2000 01:30:00	0.028
780	01/01/2000 01:31:00	0.028
780	01/01/2000 01:32:00	0.028
780	01/01/2000 01:33:00	0.028
780	01/01/2000 01:34:00	0.028
780	01/01/2000 01:35:00	0.028
780	01/01/2000 01:36:00	0.028
780	01/01/2000 01:37:00	0.027999
780	01/01/2000 01:38:00	0.027899
780	01/01/2000 01:39:00	0.027798
780	01/01/2000 01:40:00	0.027696
780	01/01/2000 01:41:00	0.027595
780	01/01/2000 01:42:00	0.027491
780	01/01/2000 01:43:00	0.027386
780	01/01/2000 01:44:00	0.02728
780	01/01/2000 01:45:00	0.027173
780	01/01/2000 01:46:00	0.027065
780	01/01/2000 01:47:00	0.027
780	01/01/2000 01:48:00	0.027
780	01/01/2000 01:49:00	0.027
780	01/01/2000 01:50:00	0.027
780	01/01/2000 01:51:00	0.027
780	01/01/2000 01:52:00	0.021805
780	01/01/2000 01:53:00	0.007856
780	01/01/2000 01:54:00	0.005339
780	01/01/2000 01:55:00	0.004978
780	01/01/2000 01:56:00	0.004812
780	01/01/2000 01:57:00	0.004693
780	01/01/2000 01:58:00	0.004603
780	01/01/2000 01:59:00	0.004532
780	01/01/2000 02:00:00	0.004477
780	01/01/2000 02:01:00	0.004392
780	01/01/2000 02:02:00	0.004228
780	01/01/2000 02:03:00	0.004044
780	01/01/2000 02:04:00	0.003893
780	01/01/2000 02:05:00	0.003764
780	01/01/2000 02:06:00	0.003656
780	01/01/2000 02:07:00	0.003573
780	01/01/2000 02:08:00	0.003508
780	01/01/2000 02:09:00	0.003458
780	01/01/2000 02:10:00	0.003419
780	01/01/2000 02:11:00	0.00336
780	01/01/2000 02:12:00	0.00325
780	01/01/2000 02:13:00	0.003131
780	01/01/2000 02:14:00	0.003045
780	01/01/2000 02:15:00	0.002982
780	01/01/2000 02:16:00	0.002936
780	01/01/2000 02:17:00	0.002903
780	01/01/2000 02:18:00	0.002879
780	01/01/2000 02:19:00	0.002861
780	01/01/2000 02:20:00	0.002847
780	01/01/2000 02:21:00	0.002816
780	01/01/2000 02:22:00	0.002744
780	01/01/2000 02:23:00	0.002665
780	01/01/2000 02:24:00	0.002611
780	01/01/2000 02:25:00	0.002576
780	01/01/2000 02:26:00	0.002554
780	01/01/2000 02:27:00	0.002539
780	01/01/2000 02:28:00	0.002529
780	01/01/2000 02:29:00	0.002522
780	01/01/2000 02:30:00	0.002517
780	01/01/2000 02:31:00	0.002498
780	01/01/2000 02:32:00	0.002444
780	01/01/2000 02:33:00	0.002385
780	01/01/2000 02:34:00	0.002345
780	01/01/2000 02:35:00	0.002319
780	01/01/2000 02:36:00	0.002303
780	01/01/2000 02:37:00	0.002292
780	01/01/2000 02:38:00	0.002286
780	01/01/2000 02:39:00	0.002282
780	01/01/2000 02:40:00	0.002279
780	01/01/2000 02:41:00	0.002263
780	01/01/2000 02:42:00	0.002221
780	01/01/2000 02:43:00	0.002172
780	01/01/2000 02:44:00	0.00214
780	01/01/2000 02:45:00	0.00212
780	01/01/2000 02:46:00	0.002107
780	01/01/2000 02:47:00	0.002098
780	01/01/2000 02:48:00	0.002093
780	01/01/2000 02:49:00	0.00209
780	01/01/2000 02:50:00	0.002088
780	01/01/2000 02:51:00	0.002075
780	01/01/2000 02:52:00	0.002039
780	01/01/2000 02:53:00	0.001999
780	01/01/2000 02:54:00	0.001972
780	01/01/2000 02:55:00	0.001955
780	01/01/2000 02:56:00	0.001944
780	01/01/2000 02:57:00	0.001938
780	01/01/2000 02:58:00	0.001933
780	01/01/2000 02:59:00	0.001931
780	01/01/2000 03:00:00	0.001929
780	01/01/2000 03:01:00	0.00179
780	01/01/2000 03:02:00	0.001364
780	01/01/2000 03:03:00	0.000881
780	01/01/2000 03:04:00	0.000558
780	01/01/2000 03:05:00	0.000353
780	01/01/2000 03:06:00	0.000223
780	01/01/2000 03:07:00	0.000141
780	01/01/2000 03:08:00	8.9E-05
780	01/01/2000 03:09:00	5.6E-05
780	01/01/2000 03:10:00	3.6E-05
780	01/01/2000 03:11:00	2.3E-05
780	01/01/2000 03:12:00	1.4E-05
780	01/01/2000 03:13:00	0
780	01/01/2000 03:14:00	0
780	01/01/2000 03:15:00	0
780	01/01/2000 03:16:00	0
780	01/01/2000 03:17:00	0
780	01/01/2000 03:18:00	0
780	01/01/2000 03:19:00	0
780	01/01/2000 03:20:00	0
780	01/01/2000 03:21:00	0
780	01/01/2000 03:22:00	0
780	01/01/2000 03:23:00	0
780	01/01/2000 03:24:00	0
780	01/01/2000 03:25:00	0
780	01/01/2000 03:26:00	0
780	01/01/2000 03:27:00	0
780	01/01/2000 03:28:00	0
780	01/01/2000 03:29:00	0
780	01/01/2000 03:30:00	0
780	01/01/2000 03:31:00	0
780	01/01/2000 03:32:00	0
780	01/01/2000 03:33:00	0
780	01/01/2000 03:34:00	0
780	01/01/2000 03:35:00	0
780	01/01/2000 03:36:00	0
780	01/01/2000 03:37:00	0
780	01/01/2000 03:38:00	0
780	01/01/2000 03:39:00	0
780	01/01/2000 03:40:00	0
780	01/01/2000 03:41:00	0
780	01/01/2000 03:42:00	0
780	01/01/2000 03:43:00	0
780	01/01/2000 03:44:00	0
780	01/01/2000 03:45:00	0
780	01/01/2000 03:46:00	0
780	01/01/2000 03:47:00	0
780	01/01/2000 03:48:00	0
780	01/01/2000 03:49:00	0
780	01/01/2000 03:50:00	0
780	01/01/2000 03:51:00	0
780	01/01/2000 03:52:00	0
780	01/01/2000 03:53:00	0
780	01/01/2000 03:54:00	0
780	01/01/2000 03:55:00	0
780	01/01/2000 03:56:00	0
780	01/01/2000 03:57:00	0
780	01/01/2000 03:58:00	0
780	01/01/2000 03:59:00	0
780	01/01/2000 04:00:00	0
780	01/01/2000 04:01:00	0
780	01/01/2000 04:02:00	0
780	01/01/2000 04:03:00	0
780	01/01/2000 04:04:00	0
780	01/01/2000 04:05:00	0
780	01/01/2000 04:06:00	0
780	01/01/2000 04:07:00	0
780	01/01/2000 04:08:00	0
780	01/01/2000 04:09:00	0
780	01/01/2000 04:10:00	0
780	01/01/2000 04:11:00	0
780	01/01/2000 04:12:00	0
780	01/01/2000 04:13:00	0
780	01/01/2000 04:14:00	0
780	01/01/2000 04:15:00	0
780	01/01/2000 04:16:00	0

;Flow (m³/s)

781	01/01/2000 00:00:00	0
781	01/01/2000 00:01:00	0
781	01/01/2000 00:02:00	0
781	01/01/2000 00:03:00	0
781	01/01/2000 00:04:00	0
781	01/01/2000 00:05:00	0
781	01/01/2000 00:06:00	0
781	01/01/2000 00:07:00	0
781	01/01/2000 00:08:00	0
781	01/01/2000 00:09:00	0
781	01/01/2000 00:10:00	0
781	01/01/2000 00:11:00	0
781	01/01/2000 00:12:00	0
781	01/01/2000 00:13:00	0
781	01/01/2000 00:14:00	0
781	01/01/2000 00:15:00	6.3E-05
781	01/01/2000 00:16:00	0.000324
781	01/01/2000 00:17:00	0.000765
781	01/01/2000 00:18:00	0.00119
781	01/01/2000 00:19:00	0.001495
781	01/01/2000 00:20:00	0.001697
781	01/01/2000 00:21:00	0.001869
781	01/01/2000 00:22:00	0.002086
781	01/01/2000 00:23:00	0.002308
781	01/01/2000 00:24:00	0.002469
781	01/01/2000 00:25:00	0.002577
781	01/01/2000 00:26:00	0.002646
781	01/01/2000 00:27:00	0.00269
781	01/01/2000 00:28:00	0.002718
781	01/01/2000 00:29:00	0.002735
781	01/01/2000 00:30:00	0.002746
781	01/01/2000 00:31:00	0.002846
781	01/01/2000 00:32:00	0.003149
781	01/01/2000 00:33:00	0.003528
781	01/01/2000 00:34:00	0.003814
781	01/01/2000 00:35:00	0.004006
781	01/01/2000 00:36:00	0.00413
781	01/01/2000 00:37:00	0.00421
781	01/01/2000 00:38:00	0.00426
781	01/01/2000 00:39:00	0.004292
781	01/01/2000 00:40:00	0.004312
781	01/01/2000 00:41:00	0.004742
781	01/01/2000 00:42:00	0.006107
781	01/01/2000 00:43:00	0.007871

781	01/01/2000 00:44:00	0.009334
781	01/01/2000 00:45:00	0.010503
781	01/01/2000 00:46:00	0.011447
781	01/01/2000 00:47:00	0.012209
781	01/01/2000 00:48:00	0.012842
781	01/01/2000 00:49:00	0.013385
781	01/01/2000 00:50:00	0.013863
781	01/01/2000 00:51:00	0.015524
781	01/01/2000 00:52:00	0.019
781	01/01/2000 00:53:00	0.019
781	01/01/2000 00:54:00	0.019
781	01/01/2000 00:55:00	0.019029
781	01/01/2000 00:56:00	0.019303
781	01/01/2000 00:57:00	0.019608
781	01/01/2000 00:58:00	0.019936
781	01/01/2000 00:59:00	0.02
781	01/01/2000 01:00:00	0.02
781	01/01/2000 01:01:00	0.02
781	01/01/2000 01:02:00	0.02
781	01/01/2000 01:03:00	0.02
781	01/01/2000 01:04:00	0.02
781	01/01/2000 01:05:00	0.02
781	01/01/2000 01:06:00	0.02
781	01/01/2000 01:07:00	0.02
781	01/01/2000 01:08:00	0.02
781	01/01/2000 01:09:00	0.02
781	01/01/2000 01:10:00	0.02
781	01/01/2000 01:11:00	0.02
781	01/01/2000 01:12:00	0.02
781	01/01/2000 01:13:00	0.02
781	01/01/2000 01:14:00	0.02
781	01/01/2000 01:15:00	0.02
781	01/01/2000 01:16:00	0.02
781	01/01/2000 01:17:00	0.02
781	01/01/2000 01:18:00	0.02
781	01/01/2000 01:19:00	0.02
781	01/01/2000 01:20:00	0.02
781	01/01/2000 01:21:00	0.02
781	01/01/2000 01:22:00	0.02
781	01/01/2000 01:23:00	0.02
781	01/01/2000 01:24:00	0.02
781	01/01/2000 01:25:00	0.02
781	01/01/2000 01:26:00	0.02
781	01/01/2000 01:27:00	0.02
781	01/01/2000 01:28:00	0.02
781	01/01/2000 01:29:00	0.02
781	01/01/2000 01:30:00	0.02
781	01/01/2000 01:31:00	0.02
781	01/01/2000 01:32:00	0.02
781	01/01/2000 01:33:00	0.02
781	01/01/2000 01:34:00	0.02
781	01/01/2000 01:35:00	0.02
781	01/01/2000 01:36:00	0.02
781	01/01/2000 01:37:00	0.02
781	01/01/2000 01:38:00	0.02
781	01/01/2000 01:39:00	0.02
781	01/01/2000 01:40:00	0.02
781	01/01/2000 01:41:00	0.02
781	01/01/2000 01:42:00	0.019952
781	01/01/2000 01:43:00	0.019866
781	01/01/2000 01:44:00	0.019779
781	01/01/2000 01:45:00	0.019692
781	01/01/2000 01:46:00	0.019605
781	01/01/2000 01:47:00	0.019517
781	01/01/2000 01:48:00	0.019429
781	01/01/2000 01:49:00	0.019341
781	01/01/2000 01:50:00	0.019254
781	01/01/2000 01:51:00	0.019166
781	01/01/2000 01:52:00	0.019078
781	01/01/2000 01:53:00	0.019
781	01/01/2000 01:54:00	0.019
781	01/01/2000 01:55:00	0.019
781	01/01/2000 01:56:00	0.019
781	01/01/2000 01:57:00	0.019
781	01/01/2000 01:58:00	0.019
781	01/01/2000 01:59:00	0.017919
781	01/01/2000 02:00:00	0.010223
781	01/01/2000 02:01:00	0.004823
781	01/01/2000 02:02:00	0.003386
781	01/01/2000 02:03:00	0.00293
781	01/01/2000 02:04:00	0.00274
781	01/01/2000 02:05:00	0.002626
781	01/01/2000 02:06:00	0.002543
781	01/01/2000 02:07:00	0.00248
781	01/01/2000 02:08:00	0.002432
781	01/01/2000 02:09:00	0.002394
781	01/01/2000 02:10:00	0.002365
781	01/01/2000 02:11:00	0.002327
781	01/01/2000 02:12:00	0.002258
781	01/01/2000 02:13:00	0.002179
781	01/01/2000 02:14:00	0.002116
781	01/01/2000 02:15:00	0.002069
781	01/01/2000 02:16:00	0.002034
781	01/01/2000 02:17:00	0.002009
781	01/01/2000 02:18:00	0.00199
781	01/01/2000 02:19:00	0.001976
781	01/01/2000 02:20:00	0.001966
781	01/01/2000 02:21:00	0.001947
781	01/01/2000 02:22:00	0.001903
781	01/01/2000 02:23:00	0.001851
781	01/01/2000 02:24:00	0.001811
781	01/01/2000 02:25:00	0.001784
781	01/01/2000 02:26:00	0.001766
781	01/01/2000 02:27:00	0.001754
781	01/01/2000 02:28:00	0.001746
781	01/01/2000 02:29:00	0.001741
781	01/01/2000 02:30:00	0.001737
781	01/01/2000 02:31:00	0.001725
781	01/01/2000 02:32:00	0.001693
781	01/01/2000 02:33:00	0.001654
781	01/01/2000 02:34:00	0.001624
781	01/01/2000 02:35:00	0.001605
781	01/01/2000 02:36:00	0.001592
781	01/01/2000 02:37:00	0.001583
781	01/01/2000 02:38:00	0.001578
781	01/01/2000 02:39:00	0.001574
781	01/01/2000 02:40:00	0.001572
781	01/01/2000 02:41:00	0.001563
781	01/01/2000 02:42:00	0.001537
781	01/01/2000 02:43:00	0.001506
781	01/01/2000 02:44:00	0.001482
781	01/01/2000 02:45:00	0.001466
781	01/01/2000 02:46:00	0.001456
781	01/01/2000 02:47:00	0.001449
781	01/01/2000 02:48:00	0.001445
781	01/01/2000 02:49:00	0.001442
781	01/01/2000 02:50:00	0.00144
781	01/01/2000 02:51:00	0.001433
781	01/01/2000 02:52:00	0.001411
781	01/01/2000 02:53:00	0.001385
781	01/01/2000 02:54:00	0.001365
781	01/01/2000 02:55:00	0.001352
781	01/01/2000 02:56:00	0.001343
781	01/01/2000 02:57:00	0.001338
781	01/01/2000 02:58:00	0.001334
781	01/01/2000 02:59:00	0.001332
781	01/01/2000 03:00:00	0.001331
781	01/01/2000 03:01:00	0.001252
781	01/01/2000 03:02:00	0.001
781	01/01/2000 03:03:00	0.000685
781	01/01/2000 03:04:00	0.000446
781	01/01/2000 03:05:00	0.000285
781	01/01/2000 03:06:00	0.000181
781	01/01/2000 03:07:00	0.000115
781	01/01/2000 03:08:00	7.3E-05
781	01/01/2000 03:09:00	4.6E-05
781	01/01/2000 03:10:00	2.9E-05
781	01/01/2000 03:11:00	1.8E-05
781	01/01/2000 03:12:00	1.2E-05
781	01/01/2000 03:13:00	0
781	01/01/2000 03:14:00	0
781	01/01/2000 03:15:00	0
781	01/01/2000 03:16:00	0
781	01/01/2000 03:17:00	0
781	01/01/2000 03:18:00	0
781	01/01/2000 03:19:00	0
781	01/01/2000 03:20:00	0
781	01/01/2000 03:21:00	0
781	01/01/2000 03:22:00	0
781	01/01/2000 03:23:00	0
781	01/01/2000 03:24:00	0
781	01/01/2000 03:25:00	0
781	01/01/2000 03:26:00	0
781	01/01/2000 03:27:00	0
781	01/01/2000 03:28:00	0
781	01/01/2000 03:29:00	0
781	01/01/2000 03:30:00	0
781	01/01/2000 03:31:00	0
781	01/01/2000 03:32:00	0
781	01/01/2000 03:33:00	0
781	01/01/2000 03:34:00	0
781	01/01/2000 03:35:00	0
781	01/01/2000 03:36:00	0
781	01/01/2000 03:37:00	0
781	01/01/2000 03:38:00	0
781	01/01/2000 03:39:00	0
781	01/01/2000 03:40:00	0
781	01/01/2000 03:41:00	0
781	01/01/2000 03:42:00	0
781	01/01/2000 03:43:00	0
781	01/01/2000 03:44:00	0
781	01/01/2000 03:45:00	0
781	01/01/2000 03:46:00	0
781	01/01/2000 03:47:00	0
781	01/01/2000 03:48:00	0
781	01/01/2000 03:49:00	0
781	01/01/2000 03:50:00	0
781	01/01/2000 03:51:00	0
781	01/01/2000 03:52:00	0
781	01/01/2000 03:53:00	0
781	01/01/2000 03:54:00	0
781	01/01/2000 03:55:00	0
781	01/01/2000 03:56:00	0
781	01/01/2000 03:57:00	0
781	01/01/2000 03:58:00	0
781	01/01/2000 03:59:00	0
781	01/01/2000 04:00:00	0
781	01/01/2000 04:01:00	0
781	01/01/2000 04:02:00	0
781	01/01/2000 04:03:00	0
781	01/01/2000 04:04:00	0
781	01/01/2000 04:05:00	0
781	01/01/2000 04:06:00	0
781	01/01/2000 04:07:00	0
781	01/01/2000 04:08:00	0
781	01/01/2000 04:09:00	0
781	01/01/2000 04:10:00	0
781	01/01/2000 04:11:00	0
781	01/01/2000 04:12:00	0
781	01/01/2000 04:13:00	0
781	01/01/2000 04:14:00	0
781	01/01/2000 04:15:00	0
781	01/01/2000 04:16:00	0

;Flow (m³/s)

783	01/01/2000 00:00:00	0
783	01/01/2000 00:01:00	0
783	01/01/2000 00:02:00	0
783	01/01/2000 00:03:00	0
783	01/01/2000 00:04:00	0
783	01/01/2000 00:05:00	0
783	01/01/2000 00:06:00	0
783	01/01/2000 00:07:00	0
783	01/01/2000 00:08:00	0
783	01/01/2000 00:09:00	0
783	01/01/2000 00:10:00	0
783	01/01/2000 00:11:00	0
783	01/01/2000 00:12:00	0
783	01/01/2000 00:13:00	0
783	01/01/2000 00:14:00	0
783	01/01/2000 00:15:00	9.3E-05
783	01/01/2000 00:16:00	0.000455
783	01/01/2000 00:17:00	0.001013
783	01/01/2000 00:18:00	0.001489
783	01/01/2000 00:19:00	0.001798
783	01/01/2000 00:20:00	0.001997
783	01/01/2000 00:21:00	0.002187
783	01/01/2000 00:22:00	0.002454
783	01/01/2000 00:23:00	0.002711
783	01/01/2000 00:24:00	0.002877
783	01/01/2000 00:25:00	0.002984
783	01/01/2000 00:26:00	0.003054
783	01/01/2000 00:27:00	0.003098
783	01/01/2000 00:28:00	0.003127
783	01/01/2000 00:29:00	0.003146
783	01/01/2000 00:30:00	0.003158
783	01/01/2000 00:31:00	0.003302
783	01/01/2000 00:32:00	0.003715
783	01/01/2000 00:33:00	0.004168
783	01/01/2000 00:34:00	0.004462
783	01/01/2000 00:35:00	0.004652
783	01/01/2000 00:36:00	0.004775
783	01/01/2000 00:37:00	0.004854
783	01/01/2000 00:38:00	0.004906
783	01/01/2000 00:39:00	0.004939
783	01/01/2000 00:40:00	0.00496
783	01/01/2000 00:41:00	0.005588
783	01/01/2000 00:42:00	0.007451
783	01/01/2000 00:43:00	0.009582
783	01/01/2000 00:44:00	0.011146
783	01/01/2000 00:45:00	0.012389
783	01/01/2000 00:46:00	0.013405
783	01/01/2000 00:47:00	0.014229
783	01/01/2000 00:48:00	0.014922
783	01/01/2000 00:49:00	0.015523
783	01/01/2000 00:50:00	0.016057
783	01/01/2000 00:51:00	0.02033
783	01/01/2000 00:52:00	0.028732
783	01/01/2000 00:53:00	0.031
783	01/01/2000 00:54:00	0.031
783	01/01/2000 00:55:00	0.031
783	01/01/2000 00:56:00	0.031
783	01/01/2000 00:57:00	0.031
783	01/01/2000 00:58:00	0.031123
783	01/01/2000 00:59:00	0.031302
783	01/01/2000 01:00:00	0.031492
783	01/01/2000 01:01:00	0.031686
783	01/01/2000 01:02:00	0.031869
783	01/01/2000 01:03:00	0.032
783	01/01/2000 01:04:00	0.032
783	01/01/2000 01:05:00	0.032
783	01/01/2000 01:06:00	0.032103
783	01/01/2000 01:07:00	0.032383
783	01/01/2000 01:08:00	0.032726
783	01/01/2000 01:09:00	0.033
783	01/01/2000 01:10:00	0.033
783	01/01/2000 01:11:00	0.033
783	01/01/2000 01:12:00	0.033
783	01/01/2000 01:13:00	0.033
783	01/01/2000 01:14:00	0.033
783	01/01/2000 01:15:00	0.033
783	01/01/2000 01:16:00	0.033
783	01/01/2000 01:17:00	0.033
783	01/01/2000 01:18:00	0.033
783	01/01/2000 01:19:00	0.033
783	01/01/2000 01:20:00	0.033
783	01/01/2000 01:21:00	0.033
783	01/01/2000 01:22:00	0.033

783	01/01/2000 01:23:00	0.033
783	01/01/2000 01:24:00	0.033
783	01/01/2000 01:25:00	0.033
783	01/01/2000 01:26:00	0.033
783	01/01/2000 01:27:00	0.033
783	01/01/2000 01:28:00	0.032969
783	01/01/2000 01:29:00	0.032829
783	01/01/2000 01:30:00	0.032688
783	01/01/2000 01:31:00	0.032546
783	01/01/2000 01:32:00	0.032403
783	01/01/2000 01:33:00	0.03226
783	01/01/2000 01:34:00	0.032143
783	01/01/2000 01:35:00	0.032078
783	01/01/2000 01:36:00	0.032011
783	01/01/2000 01:37:00	0.032
783	01/01/2000 01:38:00	0.032
783	01/01/2000 01:39:00	0.032
783	01/01/2000 01:40:00	0.032
783	01/01/2000 01:41:00	0.032
783	01/01/2000 01:42:00	0.032
783	01/01/2000 01:43:00	0.031935
783	01/01/2000 01:44:00	0.031857
783	01/01/2000 01:45:00	0.031779
783	01/01/2000 01:46:00	0.0317
783	01/01/2000 01:47:00	0.031622
783	01/01/2000 01:48:00	0.031543
783	01/01/2000 01:49:00	0.031464
783	01/01/2000 01:50:00	0.031385
783	01/01/2000 01:51:00	0.031306
783	01/01/2000 01:52:00	0.031227
783	01/01/2000 01:53:00	0.031147
783	01/01/2000 01:54:00	0.031067
783	01/01/2000 01:55:00	0.031
783	01/01/2000 01:56:00	0.031
783	01/01/2000 01:57:00	0.031
783	01/01/2000 01:58:00	0.031
783	01/01/2000 01:59:00	0.031
783	01/01/2000 02:00:00	0.031
783	01/01/2000 02:01:00	0.031
783	01/01/2000 02:02:00	0.025846
783	01/01/2000 02:03:00	0.005077
783	01/01/2000 02:04:00	0.003105
783	01/01/2000 02:05:00	0.002989
783	01/01/2000 02:06:00	0.002904
783	01/01/2000 02:07:00	0.002838
783	01/01/2000 02:08:00	0.002787
783	01/01/2000 02:09:00	0.002747
783	01/01/2000 02:10:00	0.002715
783	01/01/2000 02:11:00	0.002667
783	01/01/2000 02:12:00	0.002578
783	01/01/2000 02:13:00	0.002485
783	01/01/2000 02:14:00	0.002418
783	01/01/2000 02:15:00	0.002369
783	01/01/2000 02:16:00	0.002332
783	01/01/2000 02:17:00	0.002306
783	01/01/2000 02:18:00	0.002286
783	01/01/2000 02:19:00	0.002272
783	01/01/2000 02:20:00	0.00226
783	01/01/2000 02:21:00	0.002234
783	01/01/2000 02:22:00	0.002176
783	01/01/2000 02:23:00	0.002114
783	01/01/2000 02:24:00	0.002073
783	01/01/2000 02:25:00	0.002046
783	01/01/2000 02:26:00	0.002028
783	01/01/2000 02:27:00	0.002015
783	01/01/2000 02:28:00	0.002007
783	01/01/2000 02:29:00	0.002002
783	01/01/2000 02:30:00	0.001998
783	01/01/2000 02:31:00	0.001981
783	01/01/2000 02:32:00	0.001938
783	01/01/2000 02:33:00	0.001891
783	01/01/2000 02:34:00	0.001861
783	01/01/2000 02:35:00	0.001841
783	01/01/2000 02:36:00	0.001828
783	01/01/2000 02:37:00	0.001819
783	01/01/2000 02:38:00	0.001814
783	01/01/2000 02:39:00	0.00181
783	01/01/2000 02:40:00	0.001808
783	01/01/2000 02:41:00	0.001795
783	01/01/2000 02:42:00	0.00176
783	01/01/2000 02:43:00	0.001723
783	01/01/2000 02:44:00	0.001698
783	01/01/2000 02:45:00	0.001682
783	01/01/2000 02:46:00	0.001672
783	01/01/2000 02:47:00	0.001665
783	01/01/2000 02:48:00	0.001661
783	01/01/2000 02:49:00	0.001658
783	01/01/2000 02:50:00	0.001656
783	01/01/2000 02:51:00	0.001646
783	01/01/2000 02:52:00	0.001617
783	01/01/2000 02:53:00	0.001585
783	01/01/2000 02:54:00	0.001565
783	01/01/2000 02:55:00	0.001552
783	01/01/2000 02:56:00	0.001543
783	01/01/2000 02:57:00	0.001538
783	01/01/2000 02:58:00	0.001534
783	01/01/2000 02:59:00	0.001532
783	01/01/2000 03:00:00	0.00153
783	01/01/2000 03:01:00	0.001415
783	01/01/2000 03:02:00	0.001072
783	01/01/2000 03:03:00	0.000694
783	01/01/2000 03:04:00	0.000448
783	01/01/2000 03:05:00	0.00029
783	01/01/2000 03:06:00	0.000187
783	01/01/2000 03:07:00	0.000121
783	01/01/2000 03:08:00	7.8E-05
783	01/01/2000 03:09:00	5E-05
783	01/01/2000 03:10:00	3.3E-05
783	01/01/2000 03:11:00	2.1E-05
783	01/01/2000 03:12:00	1.4E-05
783	01/01/2000 03:13:00	0
783	01/01/2000 03:14:00	0
783	01/01/2000 03:15:00	0
783	01/01/2000 03:16:00	0
783	01/01/2000 03:17:00	0
783	01/01/2000 03:18:00	0
783	01/01/2000 03:19:00	0
783	01/01/2000 03:20:00	0
783	01/01/2000 03:21:00	0
783	01/01/2000 03:22:00	0
783	01/01/2000 03:23:00	0
783	01/01/2000 03:24:00	0
783	01/01/2000 03:25:00	0
783	01/01/2000 03:26:00	0
783	01/01/2000 03:27:00	0
783	01/01/2000 03:28:00	0
783	01/01/2000 03:29:00	0
783	01/01/2000 03:30:00	0
783	01/01/2000 03:31:00	0
783	01/01/2000 03:32:00	0
783	01/01/2000 03:33:00	0
783	01/01/2000 03:34:00	0
783	01/01/2000 03:35:00	0
783	01/01/2000 03:36:00	0
783	01/01/2000 03:37:00	0
783	01/01/2000 03:38:00	0
783	01/01/2000 03:39:00	0
783	01/01/2000 03:40:00	0
783	01/01/2000 03:41:00	0
783	01/01/2000 03:42:00	0
783	01/01/2000 03:43:00	0
783	01/01/2000 03:44:00	0
783	01/01/2000 03:45:00	0
783	01/01/2000 03:46:00	0
783	01/01/2000 03:47:00	0
783	01/01/2000 03:48:00	0
783	01/01/2000 03:49:00	0
783	01/01/2000 03:50:00	0
783	01/01/2000 03:51:00	0
783	01/01/2000 03:52:00	0
783	01/01/2000 03:53:00	0
783	01/01/2000 03:54:00	0
783	01/01/2000 03:55:00	0
783	01/01/2000 03:56:00	0
783	01/01/2000 03:57:00	0
783	01/01/2000 03:58:00	0
783	01/01/2000 03:59:00	0
783	01/01/2000 04:00:00	0
783	01/01/2000 04:01:00	0
783	01/01/2000 04:02:00	0
783	01/01/2000 04:03:00	0
783	01/01/2000 04:04:00	0
783	01/01/2000 04:05:00	0
783	01/01/2000 04:06:00	0
783	01/01/2000 04:07:00	0
783	01/01/2000 04:08:00	0
783	01/01/2000 04:09:00	0
783	01/01/2000 04:10:00	0
783	01/01/2000 04:11:00	0
783	01/01/2000 04:12:00	0
783	01/01/2000 04:13:00	0
783	01/01/2000 04:14:00	0
783	01/01/2000 04:15:00	0
783	01/01/2000 04:16:00	0

;Flow (m³/s)

790	01/01/2000 00:00:00	0
790	01/01/2000 00:01:00	0
790	01/01/2000 00:02:00	0
790	01/01/2000 00:03:00	0
790	01/01/2000 00:04:00	0
790	01/01/2000 00:05:00	0
790	01/01/2000 00:06:00	0
790	01/01/2000 00:07:00	0
790	01/01/2000 00:08:00	0
790	01/01/2000 00:09:00	0
790	01/01/2000 00:10:00	0
790	01/01/2000 00:11:00	0
790	01/01/2000 00:12:00	0
790	01/01/2000 00:13:00	0
790	01/01/2000 00:14:00	0
790	01/01/2000 00:15:00	0.000271
790	01/01/2000 00:16:00	0.0013
790	01/01/2000 00:17:00	0.00309
790	01/01/2000 00:18:00	0.004954
790	01/01/2000 00:19:00	0.00629
790	01/01/2000 00:20:00	0.007139
790	01/01/2000 00:21:00	0.007884
790	01/01/2000 00:22:00	0.008772
790	01/01/2000 00:23:00	0.009735
790	01/01/2000 00:24:00	0.010486
790	01/01/2000 00:25:00	0.010952
790	01/01/2000 00:26:00	0.011267
790	01/01/2000 00:27:00	0.011475
790	01/01/2000 00:28:00	0.011613
790	01/01/2000 00:29:00	0.011706
790	01/01/2000 00:30:00	0.011769
790	01/01/2000 00:31:00	0.012209
790	01/01/2000 00:32:00	0.013385
790	01/01/2000 00:33:00	0.014992
790	01/01/2000 00:34:00	0.016304
790	01/01/2000 00:35:00	0.017101
790	01/01/2000 00:36:00	0.017641
790	01/01/2000 00:37:00	0.017992
790	01/01/2000 00:38:00	0.018227
790	01/01/2000 00:39:00	0.018383
790	01/01/2000 00:40:00	0.018488
790	01/01/2000 00:41:00	0.020559
790	01/01/2000 00:42:00	0.026323
790	01/01/2000 00:43:00	0.034528
790	01/01/2000 00:44:00	0.042166
790	01/01/2000 00:45:00	0.048247
790	01/01/2000 00:46:00	0.053558
790	01/01/2000 00:47:00	0.058217
790	01/01/2000 00:48:00	0.062194
790	01/01/2000 00:49:00	0.06566
790	01/01/2000 00:50:00	0.068498
790	01/01/2000 00:51:00	0.08109
790	01/01/2000 00:52:00	0.096663
790	01/01/2000 00:53:00	0.100251
790	01/01/2000 00:54:00	0.101561
790	01/01/2000 00:55:00	0.102515
790	01/01/2000 00:56:00	0.103
790	01/01/2000 00:57:00	0.103941
790	01/01/2000 00:58:00	0.104
790	01/01/2000 00:59:00	0.104176
790	01/01/2000 01:00:00	0.105316
790	01/01/2000 01:01:00	0.105605
790	01/01/2000 01:02:00	0.105734
790	01/01/2000 01:03:00	0.105715
790	01/01/2000 01:04:00	0.105593
790	01/01/2000 01:05:00	0.105422
790	01/01/2000 01:06:00	0.105243
790	01/01/2000 01:07:00	0.105081
790	01/01/2000 01:08:00	0.105
790	01/01/2000 01:09:00	0.105
790	01/01/2000 01:10:00	0.105
790	01/01/2000 01:11:00	0.105
790	01/01/2000 01:12:00	0.105
790	01/01/2000 01:13:00	0.105
790	01/01/2000 01:14:00	0.104993
790	01/01/2000 01:15:00	0.104737
790	01/01/2000 01:16:00	0.104459
790	01/01/2000 01:17:00	0.104178
790	01/01/2000 01:18:00	0.103979
790	01/01/2000 01:19:00	0.103705
790	01/01/2000 01:20:00	0.103441
790	01/01/2000 01:21:00	0.103187
790	01/01/2000 01:22:00	0.103
790	01/01/2000 01:23:00	0.103
790	01/01/2000 01:24:00	0.103
790	01/01/2000 01:25:00	0.103
790	01/01/2000 01:26:00	0.103
790	01/01/2000 01:27:00	0.101311
790	01/01/2000 01:28:00	0.099595
790	01/01/2000 01:29:00	0.098082
790	01/01/2000 01:30:00	0.096749
790	01/01/2000 01:31:00	0.095606
790	01/01/2000 01:32:00	0.094723
790	01/01/2000 01:33:00	0.093893
790	01/01/2000 01:34:00	0.092664
790	01/01/2000 01:35:00	0.091331
790	01/01/2000 01:36:00	0.090571
790	01/01/2000 01:37:00	0.05605
790	01/01/2000 01:38:00	0.050739
790	01/01/2000 01:39:00	0.050868
790	01/01/2000 01:40:00	0.049744
790	01/01/2000 01:41:00	0.048971
790	01/01/2000 01:42:00	0.047913
790	01/01/2000 01:43:00	0.046718
790	01/01/2000 01:44:00	0.045539
790	01/01/2000 01:45:00	0.044501
790	01/01/2000 01:46:00	0.043566
790	01/01/2000 01:47:00	0.042758
790	01/01/2000 01:48:00	0.042098
790	01/01/2000 01:49:00	0.04156
790	01/01/2000 01:50:00	0.041119
790	01/01/2000 01:51:00	0.040583
790	01/01/2000 01:52:00	0.039881
790	01/01/2000 01:53:00	0.039054
790	01/01/2000 01:54:00	0.038234
790	01/01/2000 01:55:00	0.037497
790	01/01/2000 01:56:00	0.036822
790	01/01/2000 01:57:00	0.036225
790	01/01/2000 01:58:00	0.035722
790	01/01/2000 01:59:00	0.035296
790	01/01/2000 02:00:00	0.034931
790	01/01/2000 02:01:00	0.034528

790	01/01/2000 02:02:00	0.034026
790	01/01/2000 02:03:00	0.022292
790	01/01/2000 02:04:00	0.014546
790	01/01/2000 02:05:00	0.012866
790	01/01/2000 02:06:00	0.012199
790	01/01/2000 02:07:00	0.011758
790	01/01/2000 02:08:00	0.011421
790	01/01/2000 02:09:00	0.011153
790	01/01/2000 02:10:00	0.010936
790	01/01/2000 02:11:00	0.010687
790	01/01/2000 02:12:00	0.010337
790	01/01/2000 02:13:00	0.009931
790	01/01/2000 02:14:00	0.009581
790	01/01/2000 02:15:00	0.009323
790	01/01/2000 02:16:00	0.009119
790	01/01/2000 02:17:00	0.00896
790	01/01/2000 02:18:00	0.008835
790	01/01/2000 02:19:00	0.008738
790	01/01/2000 02:20:00	0.00866
790	01/01/2000 02:21:00	0.008547
790	01/01/2000 02:22:00	0.008352
790	01/01/2000 02:23:00	0.00811
790	01/01/2000 02:24:00	0.007912
790	01/01/2000 02:25:00	0.007784
790	01/01/2000 02:26:00	0.007693
790	01/01/2000 02:27:00	0.00763
790	01/01/2000 02:28:00	0.007584
790	01/01/2000 02:29:00	0.007551
790	01/01/2000 02:30:00	0.007527
790	01/01/2000 02:31:00	0.007468
790	01/01/2000 02:32:00	0.007338
790	01/01/2000 02:33:00	0.007166
790	01/01/2000 02:34:00	0.007027
790	01/01/2000 02:35:00	0.00694
790	01/01/2000 02:36:00	0.006881
790	01/01/2000 02:37:00	0.006841
790	01/01/2000 02:38:00	0.006814
790	01/01/2000 02:39:00	0.006796
790	01/01/2000 02:40:00	0.006783
790	01/01/2000 02:41:00	0.006741
790	01/01/2000 02:42:00	0.006639
790	01/01/2000 02:43:00	0.006504
790	01/01/2000 02:44:00	0.006393
790	01/01/2000 02:45:00	0.006325
790	01/01/2000 02:46:00	0.006279
790	01/01/2000 02:47:00	0.006249
790	01/01/2000 02:48:00	0.006229
790	01/01/2000 02:49:00	0.006216
790	01/01/2000 02:50:00	0.006206
790	01/01/2000 02:51:00	0.006173
790	01/01/2000 02:52:00	0.006089
790	01/01/2000 02:53:00	0.005977
790	01/01/2000 02:54:00	0.005885
790	01/01/2000 02:55:00	0.005829
790	01/01/2000 02:56:00	0.005791
790	01/01/2000 02:57:00	0.005767
790	01/01/2000 02:58:00	0.00575
790	01/01/2000 02:59:00	0.005739
790	01/01/2000 03:00:00	0.005732
790	01/01/2000 03:01:00	0.005393
790	01/01/2000 03:02:00	0.004426
790	01/01/2000 03:03:00	0.003091
790	01/01/2000 03:04:00	0.001998
790	01/01/2000 03:05:00	0.001336
790	01/01/2000 03:06:00	0.000887
790	01/01/2000 03:07:00	0.000595
790	01/01/2000 03:08:00	0.0004
790	01/01/2000 03:09:00	0.00027
790	01/01/2000 03:10:00	0.000183
790	01/01/2000 03:11:00	0.000124
790	01/01/2000 03:12:00	8.5E-05
790	01/01/2000 03:13:00	5.8E-05
790	01/01/2000 03:14:00	3.9E-05
790	01/01/2000 03:15:00	2.7E-05
790	01/01/2000 03:16:00	1.8E-05
790	01/01/2000 03:17:00	1.3E-05
790	01/01/2000 03:18:00	0
790	01/01/2000 03:19:00	0
790	01/01/2000 03:20:00	0
790	01/01/2000 03:21:00	0
790	01/01/2000 03:22:00	0
790	01/01/2000 03:23:00	0
790	01/01/2000 03:24:00	0
790	01/01/2000 03:25:00	0
790	01/01/2000 03:26:00	0
790	01/01/2000 03:27:00	0
790	01/01/2000 03:28:00	0
790	01/01/2000 03:29:00	0
790	01/01/2000 03:30:00	0
790	01/01/2000 03:31:00	0
790	01/01/2000 03:32:00	0
790	01/01/2000 03:33:00	0
790	01/01/2000 03:34:00	0
790	01/01/2000 03:35:00	0
790	01/01/2000 03:36:00	0
790	01/01/2000 03:37:00	0
790	01/01/2000 03:38:00	0
790	01/01/2000 03:39:00	0
790	01/01/2000 03:40:00	0
790	01/01/2000 03:41:00	0
790	01/01/2000 03:42:00	0
790	01/01/2000 03:43:00	0
790	01/01/2000 03:44:00	0
790	01/01/2000 03:45:00	0
790	01/01/2000 03:46:00	0
790	01/01/2000 03:47:00	0
790	01/01/2000 03:48:00	0
790	01/01/2000 03:49:00	0
790	01/01/2000 03:50:00	0
790	01/01/2000 03:51:00	0
790	01/01/2000 03:52:00	0
790	01/01/2000 03:53:00	0
790	01/01/2000 03:54:00	0
790	01/01/2000 03:55:00	0
790	01/01/2000 03:56:00	0
790	01/01/2000 03:57:00	0
790	01/01/2000 03:58:00	0
790	01/01/2000 03:59:00	0
790	01/01/2000 04:00:00	0
790	01/01/2000 04:01:00	0
790	01/01/2000 04:02:00	0
790	01/01/2000 04:03:00	0
790	01/01/2000 04:04:00	0
790	01/01/2000 04:05:00	0
790	01/01/2000 04:06:00	0
790	01/01/2000 04:07:00	0
790	01/01/2000 04:08:00	0
790	01/01/2000 04:09:00	0
790	01/01/2000 04:10:00	0
790	01/01/2000 04:11:00	0
790	01/01/2000 04:12:00	0
790	01/01/2000 04:13:00	0
790	01/01/2000 04:14:00	0
790	01/01/2000 04:15:00	0
790	01/01/2000 04:16:00	0

;Flow (m³/s)

800	01/01/2000 00:00:00	0
800	01/01/2000 00:01:00	0
800	01/01/2000 00:02:00	0
800	01/01/2000 00:03:00	0
800	01/01/2000 00:04:00	0
800	01/01/2000 00:05:00	0
800	01/01/2000 00:06:00	0
800	01/01/2000 00:07:00	0
800	01/01/2000 00:08:00	0
800	01/01/2000 00:09:00	0
800	01/01/2000 00:10:00	0
800	01/01/2000 00:11:00	0
800	01/01/2000 00:12:00	0
800	01/01/2000 00:13:00	0
800	01/01/2000 00:14:00	0
800	01/01/2000 00:15:00	0.000163
800	01/01/2000 00:16:00	0.000806
800	01/01/2000 00:17:00	0.001795
800	01/01/2000 00:18:00	0.002613
800	01/01/2000 00:19:00	0.003106
800	01/01/2000 00:20:00	0.003395
800	01/01/2000 00:21:00	0.003672
800	01/01/2000 00:22:00	0.004099
800	01/01/2000 00:23:00	0.004514
800	01/01/2000 00:24:00	0.004767
800	01/01/2000 00:25:00	0.004916
800	01/01/2000 00:26:00	0.005003
800	01/01/2000 00:27:00	0.005054
800	01/01/2000 00:28:00	0.005084
800	01/01/2000 00:29:00	0.005101
800	01/01/2000 00:30:00	0.005112
800	01/01/2000 00:31:00	0.005356
800	01/01/2000 00:32:00	0.006086
800	01/01/2000 00:33:00	0.006881
800	01/01/2000 00:34:00	0.007367
800	01/01/2000 00:35:00	0.007652
800	01/01/2000 00:36:00	0.007821
800	01/01/2000 00:37:00	0.007919
800	01/01/2000 00:38:00	0.007976
800	01/01/2000 00:39:00	0.00801
800	01/01/2000 00:40:00	0.00803
800	01/01/2000 00:41:00	0.00928
800	01/01/2000 00:42:00	0.012964
800	01/01/2000 00:43:00	0.017349
800	01/01/2000 00:44:00	0.020899
800	01/01/2000 00:45:00	0.023721
800	01/01/2000 00:46:00	0.025914
800	01/01/2000 00:47:00	0.028437
800	01/01/2000 00:48:00	0.030876
800	01/01/2000 00:49:00	0.033183
800	01/01/2000 00:50:00	0.035358
800	01/01/2000 00:51:00	0.0409
800	01/01/2000 00:52:00	0.046278
800	01/01/2000 00:53:00	0.053148
800	01/01/2000 00:54:00	0.05393
800	01/01/2000 00:55:00	0.054
800	01/01/2000 00:56:00	0.055
800	01/01/2000 00:57:00	0.055
800	01/01/2000 00:58:00	0.055
800	01/01/2000 00:59:00	0.055
800	01/01/2000 01:00:00	0.055
800	01/01/2000 01:01:00	0.055
800	01/01/2000 01:02:00	0.055
800	01/01/2000 01:03:00	0.055
800	01/01/2000 01:04:00	0.055
800	01/01/2000 01:05:00	0.055
800	01/01/2000 01:06:00	0.055
800	01/01/2000 01:07:00	0.055
800	01/01/2000 01:08:00	0.055
800	01/01/2000 01:09:00	0.055
800	01/01/2000 01:10:00	0.055
800	01/01/2000 01:11:00	0.055
800	01/01/2000 01:12:00	0.055
800	01/01/2000 01:13:00	0.055
800	01/01/2000 01:14:00	0.055
800	01/01/2000 01:15:00	0.055
800	01/01/2000 01:16:00	0.055
800	01/01/2000 01:17:00	0.055
800	01/01/2000 01:18:00	0.055
800	01/01/2000 01:19:00	0.055
800	01/01/2000 01:20:00	0.055
800	01/01/2000 01:21:00	0.055
800	01/01/2000 01:22:00	0.054754
800	01/01/2000 01:23:00	0.054458
800	01/01/2000 01:24:00	0.054164
800	01/01/2000 01:25:00	0.053898
800	01/01/2000 01:26:00	0.052087
800	01/01/2000 01:27:00	0.050307
800	01/01/2000 01:28:00	0.048785
800	01/01/2000 01:29:00	0.047486
800	01/01/2000 01:30:00	0.046376
800	01/01/2000 01:31:00	0.045366
800	01/01/2000 01:32:00	0.044433
800	01/01/2000 01:33:00	0.043557
800	01/01/2000 01:34:00	0.042721
800	01/01/2000 01:35:00	0.041911
800	01/01/2000 01:36:00	0.041011
800	01/01/2000 01:37:00	0.040055
800	01/01/2000 01:38:00	0.039214
800	01/01/2000 01:39:00	0.038474
800	01/01/2000 01:40:00	0.037819
800	01/01/2000 01:41:00	0.037199
800	01/01/2000 01:42:00	0.036669
800	01/01/2000 01:43:00	0.036251
800	01/01/2000 01:44:00	0.035843
800	01/01/2000 01:45:00	0.035436
800	01/01/2000 01:46:00	0.026781
800	01/01/2000 01:47:00	0.013943
800	01/01/2000 01:48:00	0.012814
800	01/01/2000 01:49:00	0.012384
800	01/01/2000 01:50:00	0.012057
800	01/01/2000 01:51:00	0.011673
800	01/01/2000 01:52:00	0.011121
800	01/01/2000 01:53:00	0.010524
800	01/01/2000 01:54:00	0.009988
800	01/01/2000 01:55:00	0.009511
800	01/01/2000 01:56:00	0.009097
800	01/01/2000 01:57:00	0.008722
800	01/01/2000 01:58:00	0.008418
800	01/01/2000 01:59:00	0.008169
800	01/01/2000 02:00:00	0.007964
800	01/01/2000 02:01:00	0.007713
800	01/01/2000 02:02:00	0.007339
800	01/01/2000 02:03:00	0.006929
800	01/01/2000 02:04:00	0.00656
800	01/01/2000 02:05:00	0.00623
800	01/01/2000 02:06:00	0.005942
800	01/01/2000 02:07:00	0.005682
800	01/01/2000 02:08:00	0.00547
800	01/01/2000 02:09:00	0.005296
800	01/01/2000 02:10:00	0.005153
800	01/01/2000 02:11:00	0.004991
800	01/01/2000 02:12:00	0.004761
800	01/01/2000 02:13:00	0.004529
800	01/01/2000 02:14:00	0.004352
800	01/01/2000 02:15:00	0.004214
800	01/01/2000 02:16:00	0.004105
800	01/01/2000 02:17:00	0.004015
800	01/01/2000 02:18:00	0.003944
800	01/01/2000 02:19:00	0.003885
800	01/01/2000 02:20:00	0.003837
800	01/01/2000 02:21:00	0.003766
800	01/01/2000 02:22:00	0.003642
800	01/01/2000 02:23:00	0.003513
800	01/01/2000 02:24:00	0.003429
800	01/01/2000 02:25:00	0.003373
800	01/01/2000 02:26:00	0.003334
800	01/01/2000 02:27:00	0.003308
800	01/01/2000 02:28:00	0.003288
800	01/01/2000 02:29:00	0.003273
800	01/01/2000 02:30:00	0.003261
800	01/01/2000 02:31:00	0.003228
800	01/01/2000 02:32:00	0.003146
800	01/01/2000 02:33:00	0.003061
800	01/01/2000 02:34:00	0.003006
800	01/01/2000 02:35:00	0.002973
800	01/01/2000 02:36:00	0.002952
800	01/01/2000 02:37:00	0.002939
800	01/01/2000 02:38:00	0.002931
800	01/01/2000 02:39:00	0.002925
800	01/01/2000 02:40:00	0.002921

800	01/01/2000 02:41:00	0.002899
800	01/01/2000 02:42:00	0.002836
800	01/01/2000 02:43:00	0.002769
800	01/01/2000 02:44:00	0.002728
800	01/01/2000 02:45:00	0.002704
800	01/01/2000 02:46:00	0.002679
800	01/01/2000 02:47:00	0.002671
800	01/01/2000 02:48:00	0.002666
800	01/01/2000 02:49:00	0.002663
800	01/01/2000 02:50:00	0.002661
800	01/01/2000 02:51:00	0.002644
800	01/01/2000 02:52:00	0.002593
800	01/01/2000 02:53:00	0.002539
800	01/01/2000 02:54:00	0.002505
800	01/01/2000 02:55:00	0.002485
800	01/01/2000 02:56:00	0.002474
800	01/01/2000 02:57:00	0.002467
800	01/01/2000 02:58:00	0.002463
800	01/01/2000 02:59:00	0.00246
800	01/01/2000 03:00:00	0.002459
800	01/01/2000 03:01:00	0.002259
800	01/01/2000 03:02:00	0.00165
800	01/01/2000 03:03:00	0.000985
800	01/01/2000 03:04:00	0.000579
800	01/01/2000 03:05:00	0.00034
800	01/01/2000 03:06:00	0.000199
800	01/01/2000 03:07:00	0.000117
800	01/01/2000 03:08:00	6.9E-05
800	01/01/2000 03:09:00	4E-05
800	01/01/2000 03:10:00	2.4E-05
800	01/01/2000 03:11:00	1.4E-05
800	01/01/2000 03:12:00	0
800	01/01/2000 03:13:00	0
800	01/01/2000 03:14:00	0
800	01/01/2000 03:15:00	0
800	01/01/2000 03:16:00	0
800	01/01/2000 03:17:00	0
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800	01/01/2000 03:19:00	0
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800	01/01/2000 03:22:00	0
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800	01/01/2000 03:24:00	0
800	01/01/2000 03:25:00	0
800	01/01/2000 03:26:00	0
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800	01/01/2000 03:34:00	0
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800	01/01/2000 03:36:00	0
800	01/01/2000 03:37:00	0
800	01/01/2000 03:38:00	0
800	01/01/2000 03:39:00	0
800	01/01/2000 03:40:00	0
800	01/01/2000 03:41:00	0
800	01/01/2000 03:42:00	0
800	01/01/2000 03:43:00	0
800	01/01/2000 03:44:00	0
800	01/01/2000 03:45:00	0
800	01/01/2000 03:46:00	0
800	01/01/2000 03:47:00	0
800	01/01/2000 03:48:00	0
800	01/01/2000 03:49:00	0
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800	01/01/2000 03:52:00	0
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800	01/01/2000 03:54:00	0
800	01/01/2000 03:55:00	0
800	01/01/2000 03:56:00	0
800	01/01/2000 03:57:00	0
800	01/01/2000 03:58:00	0
800	01/01/2000 03:59:00	0
800	01/01/2000 04:00:00	0
800	01/01/2000 04:01:00	0
800	01/01/2000 04:02:00	0
800	01/01/2000 04:03:00	0
800	01/01/2000 04:04:00	0
800	01/01/2000 04:05:00	0
800	01/01/2000 04:06:00	0
800	01/01/2000 04:07:00	0
800	01/01/2000 04:08:00	0
800	01/01/2000 04:09:00	0
800	01/01/2000 04:10:00	0
800	01/01/2000 04:11:00	0
800	01/01/2000 04:12:00	0
800	01/01/2000 04:13:00	0
800	01/01/2000 04:14:00	0
800	01/01/2000 04:15:00	0
800	01/01/2000 04:16:00	0

;Flow (m^3/s)

801	01/01/2000 00:00:00	0
801	01/01/2000 00:01:00	0
801	01/01/2000 00:02:00	0
801	01/01/2000 00:03:00	0
801	01/01/2000 00:04:00	0
801	01/01/2000 00:05:00	0
801	01/01/2000 00:06:00	0
801	01/01/2000 00:07:00	0
801	01/01/2000 00:08:00	0
801	01/01/2000 00:09:00	0
801	01/01/2000 00:10:00	0
801	01/01/2000 00:11:00	0
801	01/01/2000 00:12:00	0
801	01/01/2000 00:13:00	0
801	01/01/2000 00:14:00	0
801	01/01/2000 00:15:00	0.000195
801	01/01/2000 00:16:00	0.000935
801	01/01/2000 00:17:00	0.002024
801	01/01/2000 00:18:00	0.002891
801	01/01/2000 00:19:00	0.003419
801	01/01/2000 00:20:00	0.003752
801	01/01/2000 00:21:00	0.00409
801	01/01/2000 00:22:00	0.004594
801	01/01/2000 00:23:00	0.00506
801	01/01/2000 00:24:00	0.005339
801	01/01/2000 00:25:00	0.005515
801	01/01/2000 00:26:00	0.005626
801	01/01/2000 00:27:00	0.005695
801	01/01/2000 00:28:00	0.005739
801	01/01/2000 00:29:00	0.005767
801	01/01/2000 00:30:00	0.005784
801	01/01/2000 00:31:00	0.00608
801	01/01/2000 00:32:00	0.006914
801	01/01/2000 00:33:00	0.007768
801	01/01/2000 00:34:00	0.008274
801	01/01/2000 00:35:00	0.008595
801	01/01/2000 00:36:00	0.008797
801	01/01/2000 00:37:00	0.008923
801	01/01/2000 00:38:00	0.009003
801	01/01/2000 00:39:00	0.009053
801	01/01/2000 00:40:00	0.009084
801	01/01/2000 00:41:00	0.010526
801	01/01/2000 00:42:00	0.014577
801	01/01/2000 00:43:00	0.019081
801	01/01/2000 00:44:00	0.022514
801	01/01/2000 00:45:00	0.025601
801	01/01/2000 00:46:00	0.02826
801	01/01/2000 00:47:00	0.030538
801	01/01/2000 00:48:00	0.032553
801	01/01/2000 00:49:00	0.034059
801	01/01/2000 00:50:00	0.035619
801	01/01/2000 00:51:00	0.044292
801	01/01/2000 00:52:00	0.052089
801	01/01/2000 00:53:00	0.052301
801	01/01/2000 00:54:00	0.052606
801	01/01/2000 00:55:00	0.052992
801	01/01/2000 00:56:00	0.053
801	01/01/2000 00:57:00	0.054
801	01/01/2000 00:58:00	0.054
801	01/01/2000 00:59:00	0.054
801	01/01/2000 01:00:00	0.054
801	01/01/2000 01:01:00	0.054348
801	01/01/2000 01:02:00	0.054742
801	01/01/2000 01:03:00	0.054902
801	01/01/2000 01:04:00	0.054915
801	01/01/2000 01:05:00	0.054831
801	01/01/2000 01:06:00	0.054688
801	01/01/2000 01:07:00	0.054523
801	01/01/2000 01:08:00	0.054356
801	01/01/2000 01:09:00	0.054199
801	01/01/2000 01:10:00	0.054056
801	01/01/2000 01:11:00	0.054
801	01/01/2000 01:12:00	0.054
801	01/01/2000 01:13:00	0.054
801	01/01/2000 01:14:00	0.054
801	01/01/2000 01:15:00	0.054
801	01/01/2000 01:16:00	0.054
801	01/01/2000 01:17:00	0.054
801	01/01/2000 01:18:00	0.054
801	01/01/2000 01:19:00	0.054
801	01/01/2000 01:20:00	0.054
801	01/01/2000 01:21:00	0.053985
801	01/01/2000 01:22:00	0.05309
801	01/01/2000 01:23:00	0.052195
801	01/01/2000 01:24:00	0.051276
801	01/01/2000 01:25:00	0.050315
801	01/01/2000 01:26:00	0.049533
801	01/01/2000 01:27:00	0.048896
801	01/01/2000 01:28:00	0.048379
801	01/01/2000 01:29:00	0.047961
801	01/01/2000 01:30:00	0.047622
801	01/01/2000 01:31:00	0.047286
801	01/01/2000 01:32:00	0.046906
801	01/01/2000 01:33:00	0.045581
801	01/01/2000 01:34:00	0.045193
801	01/01/2000 01:35:00	0.044773
801	01/01/2000 01:36:00	0.044431
801	01/01/2000 01:37:00	0.044153
801	01/01/2000 01:38:00	0.043899
801	01/01/2000 01:39:00	0.043594
801	01/01/2000 01:40:00	0.043324
801	01/01/2000 01:41:00	0.043045
801	01/01/2000 01:42:00	0.042751
801	01/01/2000 01:43:00	0.042438
801	01/01/2000 01:44:00	0.042101
801	01/01/2000 01:45:00	0.04174
801	01/01/2000 01:46:00	0.034357
801	01/01/2000 01:47:00	0.01132
801	01/01/2000 01:48:00	0.01098
801	01/01/2000 01:49:00	0.010742
801	01/01/2000 01:50:00	0.010554
801	01/01/2000 01:51:00	0.010279
801	01/01/2000 01:52:00	0.009816
801	01/01/2000 01:53:00	0.009318
801	01/01/2000 01:54:00	0.008892
801	01/01/2000 01:55:00	0.008485
801	01/01/2000 01:56:00	0.008151
801	01/01/2000 01:57:00	0.007894
801	01/01/2000 01:58:00	0.007693
801	01/01/2000 01:59:00	0.007537
801	01/01/2000 02:00:00	0.007413
801	01/01/2000 02:01:00	0.007226
801	01/01/2000 02:02:00	0.006902
801	01/01/2000 02:03:00	0.006552
801	01/01/2000 02:04:00	0.006251
801	01/01/2000 02:05:00	0.005963
801	01/01/2000 02:06:00	0.005726
801	01/01/2000 02:07:00	0.005543
801	01/01/2000 02:08:00	0.005401
801	01/01/2000 02:09:00	0.005288
801	01/01/2000 02:10:00	0.005199
801	01/01/2000 02:11:00	0.005078
801	01/01/2000 02:12:00	0.004876
801	01/01/2000 02:13:00	0.004675
801	01/01/2000 02:14:00	0.004532
801	01/01/2000 02:15:00	0.004419
801	01/01/2000 02:16:00	0.004335
801	01/01/2000 02:17:00	0.004272
801	01/01/2000 02:18:00	0.004225
801	01/01/2000 02:19:00	0.004189
801	01/01/2000 02:20:00	0.004161
801	01/01/2000 02:21:00	0.004103
801	01/01/2000 02:22:00	0.003982
801	01/01/2000 02:23:00	0.003861
801	01/01/2000 02:24:00	0.003786
801	01/01/2000 02:25:00	0.003737
801	01/01/2000 02:26:00	0.003705
801	01/01/2000 02:27:00	0.003683
801	01/01/2000 02:28:00	0.003669
801	01/01/2000 02:29:00	0.003659
801	01/01/2000 02:30:00	0.003652
801	01/01/2000 02:31:00	0.003618
801	01/01/2000 02:32:00	0.003531
801	01/01/2000 02:33:00	0.003442
801	01/01/2000 02:34:00	0.003389
801	01/01/2000 02:35:00	0.003356
801	01/01/2000 02:36:00	0.003334
801	01/01/2000 02:37:00	0.003321
801	01/01/2000 02:38:00	0.003312
801	01/01/2000 02:39:00	0.003306
801	01/01/2000 02:40:00	0.003303
801	01/01/2000 02:41:00	0.003277
801	01/01/2000 02:42:00	0.003207
801	01/01/2000 02:43:00	0.003136
801	01/01/2000 02:44:00	0.003094
801	01/01/2000 02:45:00	0.003067
801	01/01/2000 02:46:00	0.00305
801	01/01/2000 02:47:00	0.003039
801	01/01/2000 02:48:00	0.003033
801	01/01/2000 02:49:00	0.003028
801	01/01/2000 02:50:00	0.003026
801	01/01/2000 02:51:00	0.003004
801	01/01/2000 02:52:00	0.002946
801	01/01/2000 02:53:00	0.002887
801	01/01/2000 02:54:00	0.002852
801	01/01/2000 02:55:00	0.002829
801	01/01/2000 02:56:00	0.002815
801	01/01/2000 02:57:00	0.002807
801	01/01/2000 02:58:00	0.002801
801	01/01/2000 02:59:00	0.002798
801	01/01/2000 03:00:00	0.002795
801	01/01/2000 03:01:00	0.002554
801	01/01/2000 03:02:00	0.001859
801	01/01/2000 03:03:00	0.001145
801	01/01/2000 03:04:00	0.000722
801	01/01/2000 03:05:00	0.000453
801	01/01/2000 03:06:00	0.000285
801	01/01/2000 03:07:00	0.000179
801	01/01/2000 03:08:00	0.000112
801	01/01/2000 03:09:00	7.1E-05
801	01/01/2000 03:10:00	4.4E-05
801	01/01/2000 03:11:00	2.8E-05
801	01/01/2000 03:12:00	1.8E-05
801	01/01/2000 03:13:00	1.1E-05
801	01/01/2000 03:14:00	0
801	01/01/2000 03:15:00	0
801	01/01/2000 03:16:00	0
801	01/01/2000 03:17:00	0
801	01/01/2000 03:18:00	0
801	01/01/2000 03:19:00	0

801	01/01/2000 03:20:00	0
801	01/01/2000 03:21:00	0
801	01/01/2000 03:22:00	0
801	01/01/2000 03:23:00	0
801	01/01/2000 03:24:00	0
801	01/01/2000 03:25:00	0
801	01/01/2000 03:26:00	0
801	01/01/2000 03:27:00	0
801	01/01/2000 03:28:00	0
801	01/01/2000 03:29:00	0
801	01/01/2000 03:30:00	0
801	01/01/2000 03:31:00	0
801	01/01/2000 03:32:00	0
801	01/01/2000 03:33:00	0
801	01/01/2000 03:34:00	0
801	01/01/2000 03:35:00	0
801	01/01/2000 03:36:00	0
801	01/01/2000 03:37:00	0
801	01/01/2000 03:38:00	0
801	01/01/2000 03:39:00	0
801	01/01/2000 03:40:00	0
801	01/01/2000 03:41:00	0
801	01/01/2000 03:42:00	0
801	01/01/2000 03:43:00	0
801	01/01/2000 03:44:00	0
801	01/01/2000 03:45:00	0
801	01/01/2000 03:46:00	0
801	01/01/2000 03:47:00	0
801	01/01/2000 03:48:00	0
801	01/01/2000 03:49:00	0
801	01/01/2000 03:50:00	0
801	01/01/2000 03:51:00	0
801	01/01/2000 03:52:00	0
801	01/01/2000 03:53:00	0
801	01/01/2000 03:54:00	0
801	01/01/2000 03:55:00	0
801	01/01/2000 03:56:00	0
801	01/01/2000 03:57:00	0
801	01/01/2000 03:58:00	0
801	01/01/2000 03:59:00	0
801	01/01/2000 04:00:00	0
801	01/01/2000 04:01:00	0
801	01/01/2000 04:02:00	0
801	01/01/2000 04:03:00	0
801	01/01/2000 04:04:00	0
801	01/01/2000 04:05:00	0
801	01/01/2000 04:06:00	0
801	01/01/2000 04:07:00	0
801	01/01/2000 04:08:00	0
801	01/01/2000 04:09:00	0
801	01/01/2000 04:10:00	0
801	01/01/2000 04:11:00	0
801	01/01/2000 04:12:00	0
801	01/01/2000 04:13:00	0
801	01/01/2000 04:14:00	0
801	01/01/2000 04:15:00	0
801	01/01/2000 04:16:00	0

;Flow (m^3/s)

810	01/01/2000 00:00:00	0
810	01/01/2000 00:01:00	0
810	01/01/2000 00:02:00	0
810	01/01/2000 00:03:00	0
810	01/01/2000 00:04:00	0
810	01/01/2000 00:05:00	0
810	01/01/2000 00:06:00	0
810	01/01/2000 00:07:00	0
810	01/01/2000 00:08:00	0
810	01/01/2000 00:09:00	0
810	01/01/2000 00:10:00	0
810	01/01/2000 00:11:00	0
810	01/01/2000 00:12:00	0
810	01/01/2000 00:13:00	0
810	01/01/2000 00:14:00	0
810	01/01/2000 00:15:00	0.000188
810	01/01/2000 00:16:00	0.000902
810	01/01/2000 00:17:00	0.00196
810	01/01/2000 00:18:00	0.002815
810	01/01/2000 00:19:00	0.003348
810	01/01/2000 00:20:00	0.003693
810	01/01/2000 00:21:00	0.004037
810	01/01/2000 00:22:00	0.004539
810	01/01/2000 00:23:00	0.005004
810	01/01/2000 00:24:00	0.00529
810	01/01/2000 00:25:00	0.005475
810	01/01/2000 00:26:00	0.005594
810	01/01/2000 00:27:00	0.00567
810	01/01/2000 00:28:00	0.005719
810	01/01/2000 00:29:00	0.005751
810	01/01/2000 00:30:00	0.005771
810	01/01/2000 00:31:00	0.006059
810	01/01/2000 00:32:00	0.006866
810	01/01/2000 00:33:00	0.007701
810	01/01/2000 00:34:00	0.008209
810	01/01/2000 00:35:00	0.008538
810	01/01/2000 00:36:00	0.008749
810	01/01/2000 00:37:00	0.008885
810	01/01/2000 00:38:00	0.008972
810	01/01/2000 00:39:00	0.009028
810	01/01/2000 00:40:00	0.009064
810	01/01/2000 00:41:00	0.010373
810	01/01/2000 00:42:00	0.014148
810	01/01/2000 00:43:00	0.018325
810	01/01/2000 00:44:00	0.021426
810	01/01/2000 00:45:00	0.023894
810	01/01/2000 00:46:00	0.025799
810	01/01/2000 00:47:00	0.027336
810	01/01/2000 00:48:00	0.028402
810	01/01/2000 00:49:00	0.02927
810	01/01/2000 00:50:00	0.030215
810	01/01/2000 00:51:00	0.036517
810	01/01/2000 00:52:00	0.039
810	01/01/2000 00:53:00	0.039
810	01/01/2000 00:54:00	0.039454
810	01/01/2000 00:55:00	0.040205
810	01/01/2000 00:56:00	0.041
810	01/01/2000 00:57:00	0.041
810	01/01/2000 00:58:00	0.041
810	01/01/2000 00:59:00	0.041
810	01/01/2000 01:00:00	0.041
810	01/01/2000 01:01:00	0.041
810	01/01/2000 01:02:00	0.041096
810	01/01/2000 01:03:00	0.041107
810	01/01/2000 01:04:00	0.041054
810	01/01/2000 01:05:00	0.041
810	01/01/2000 01:06:00	0.041
810	01/01/2000 01:07:00	0.041
810	01/01/2000 01:08:00	0.041
810	01/01/2000 01:09:00	0.041
810	01/01/2000 01:10:00	0.041
810	01/01/2000 01:11:00	0.041
810	01/01/2000 01:12:00	0.041
810	01/01/2000 01:13:00	0.041
810	01/01/2000 01:14:00	0.041
810	01/01/2000 01:15:00	0.041
810	01/01/2000 01:16:00	0.041
810	01/01/2000 01:17:00	0.041
810	01/01/2000 01:18:00	0.041
810	01/01/2000 01:19:00	0.041
810	01/01/2000 01:20:00	0.041
810	01/01/2000 01:21:00	0.041
810	01/01/2000 01:22:00	0.041
810	01/01/2000 01:23:00	0.041
810	01/01/2000 01:24:00	0.041
810	01/01/2000 01:25:00	0.041
810	01/01/2000 01:26:00	0.041
810	01/01/2000 01:27:00	0.041
810	01/01/2000 01:28:00	0.041
810	01/01/2000 01:29:00	0.040817
810	01/01/2000 01:30:00	0.040602
810	01/01/2000 01:31:00	0.040383
810	01/01/2000 01:32:00	0.040157
810	01/01/2000 01:33:00	0.039939
810	01/01/2000 01:34:00	0.039749
810	01/01/2000 01:35:00	0.039555
810	01/01/2000 01:36:00	0.039359
810	01/01/2000 01:37:00	0.039161
810	01/01/2000 01:38:00	0.039
810	01/01/2000 01:39:00	0.039
810	01/01/2000 01:40:00	0.039
810	01/01/2000 01:41:00	0.039
810	01/01/2000 01:42:00	0.017168
810	01/01/2000 01:43:00	0.009614
810	01/01/2000 01:44:00	0.009744
810	01/01/2000 01:45:00	0.009279
810	01/01/2000 01:46:00	0.008993
810	01/01/2000 01:47:00	0.008779
810	01/01/2000 01:48:00	0.008623
810	01/01/2000 01:49:00	0.008508
810	01/01/2000 01:50:00	0.008424
810	01/01/2000 01:51:00	0.008255
810	01/01/2000 01:52:00	0.007898
810	01/01/2000 01:53:00	0.007502
810	01/01/2000 01:54:00	0.007172
810	01/01/2000 01:55:00	0.006904
810	01/01/2000 01:56:00	0.006711
810	01/01/2000 01:57:00	0.00657
810	01/01/2000 01:58:00	0.006466
810	01/01/2000 01:59:00	0.00639
810	01/01/2000 02:00:00	0.006333
810	01/01/2000 02:01:00	0.006214
810	01/01/2000 02:02:00	0.005962
810	01/01/2000 02:03:00	0.005681
810	01/01/2000 02:04:00	0.005446
810	01/01/2000 02:05:00	0.005255
810	01/01/2000 02:06:00	0.005118
810	01/01/2000 02:07:00	0.005017
810	01/01/2000 02:08:00	0.004942
810	01/01/2000 02:09:00	0.004886
810	01/01/2000 02:10:00	0.004845
810	01/01/2000 02:11:00	0.004767
810	01/01/2000 02:12:00	0.004606
810	01/01/2000 02:13:00	0.00444
810	01/01/2000 02:14:00	0.004327
810	01/01/2000 02:15:00	0.004245
810	01/01/2000 02:16:00	0.004189
810	01/01/2000 02:17:00	0.00415
810	01/01/2000 02:18:00	0.004123
810	01/01/2000 02:19:00	0.004103
810	01/01/2000 02:20:00	0.004089
810	01/01/2000 02:21:00	0.004044
810	01/01/2000 02:22:00	0.003935
810	01/01/2000 02:23:00	0.003825
810	01/01/2000 02:24:00	0.003757
810	01/01/2000 02:25:00	0.003713
810	01/01/2000 02:26:00	0.003684
810	01/01/2000 02:27:00	0.003665
810	01/01/2000 02:28:00	0.003653
810	01/01/2000 02:29:00	0.003645
810	01/01/2000 02:30:00	0.003639
810	01/01/2000 02:31:00	0.003608
810	01/01/2000 02:32:00	0.003525
810	01/01/2000 02:33:00	0.00344
810	01/01/2000 02:34:00	0.003388
810	01/01/2000 02:35:00	0.003354
810	01/01/2000 02:36:00	0.003332
810	01/01/2000 02:37:00	0.003318
810	01/01/2000 02:38:00	0.003309
810	01/01/2000 02:39:00	0.003303
810	01/01/2000 02:40:00	0.0033
810	01/01/2000 02:41:00	0.003274
810	01/01/2000 02:42:00	0.003207
810	01/01/2000 02:43:00	0.003137
810	01/01/2000 02:44:00	0.003095
810	01/01/2000 02:45:00	0.003068
810	01/01/2000 02:46:00	0.00305
810	01/01/2000 02:47:00	0.003039
810	01/01/2000 02:48:00	0.003031
810	01/01/2000 02:49:00	0.003027
810	01/01/2000 02:50:00	0.003024
810	01/01/2000 02:51:00	0.003003
810	01/01/2000 02:52:00	0.002947
810	01/01/2000 02:53:00	0.002889
810	01/01/2000 02:54:00	0.002853
810	01/01/2000 02:55:00	0.00283
810	01/01/2000 02:56:00	0.002816
810	01/01/2000 02:57:00	0.002806
810	01/01/2000 02:58:00	0.0028
810	01/01/2000 02:59:00	0.002796
810	01/01/2000 03:00:00	0.002794
810	01/01/2000 03:01:00	0.002562
810	01/01/2000 03:02:00	0.00189
810	01/01/2000 03:03:00	0.001192
810	01/01/2000 03:04:00	0.000768
810	01/01/2000 03:05:00	0.000494
810	01/01/2000 03:06:00	0.000317
810	01/01/2000 03:07:00	0.000204
810	01/01/2000 03:08:00	0.000131
810	01/01/2000 03:09:00	8.4E-05
810	01/01/2000 03:10:00	5.4E-05
810	01/01/2000 03:11:00	3.5E-05
810	01/01/2000 03:12:00	2.2E-05
810	01/01/2000 03:13:00	1.4E-05
810	01/01/2000 03:14:00	0
810	01/01/2000 03:15:00	0
810	01/01/2000 03:16:00	0
810	01/01/2000 03:17:00	0
810	01/01/2000 03:18:00	0
810	01/01/2000 03:19:00	0
810	01/01/2000 03:20:00	0
810	01/01/2000 03:21:00	0
810	01/01/2000 03:22:00	0
810	01/01/2000 03:23:00	0
810	01/01/2000 03:24:00	0
810	01/01/2000 03:25:00	0
810	01/01/2000 03:26:00	0
810	01/01/2000 03:27:00	0
810	01/01/2000 03:28:00	0
810	01/01/2000 03:29:00	0
810	01/01/2000 03:30:00	0
810	01/01/2000 03:31:00	0
810	01/01/2000 03:32:00	0
810	01/01/2000 03:33:00	0
810	01/01/2000 03:34:00	0
810	01/01/2000 03:35:00	0
810	01/01/2000 03:36:00	0
810	01/01/2000 03:37:00	0
810	01/01/2000 03:38:00	0
810	01/01/2000 03:39:00	0
810	01/01/2000 03:40:00	0
810	01/01/2000 03:41:00	0
810	01/01/2000 03:42:00	0
810	01/01/2000 03:43:00	0
810	01/01/2000 03:44:00	0
810	01/01/2000 03:45:00	0
810	01/01/2000 03:46:00	0
810	01/01/2000 03:47:00	0
810	01/01/2000 03:48:00	0
810	01/01/2000 03:49:00	0
810	01/01/2000 03:50:00	0
810	01/01/2000 03:51:00	0
810	01/01/2000 03:52:00	0
810	01/01/2000 03:53:00	0
810	01/01/2000 03:54:00	0
810	01/01/2000 03:55:00	0
810	01/01/2000 03:56:00	0
810	01/01/2000 03:57:00	0
810	01/01/2000 03:58:00	0

810	01/01/2000	03:59:00	0
810	01/01/2000	04:00:00	0
810	01/01/2000	04:01:00	0
810	01/01/2000	04:02:00	0
810	01/01/2000	04:03:00	0
810	01/01/2000	04:04:00	0
810	01/01/2000	04:05:00	0
810	01/01/2000	04:06:00	0
810	01/01/2000	04:07:00	0
810	01/01/2000	04:08:00	0
810	01/01/2000	04:09:00	0
810	01/01/2000	04:10:00	0
810	01/01/2000	04:11:00	0
810	01/01/2000	04:12:00	0
810	01/01/2000	04:13:00	0
810	01/01/2000	04:14:00	0
810	01/01/2000	04:15:00	0
810	01/01/2000	04:16:00	0

;Rainfall (mm/hr)

CHI_3hr_100	01/01/2000	00:00:00	5.339
CHI_3hr_100	01/01/2000	00:10:00	6.376
CHI_3hr_100	01/01/2000	00:20:00	7.977
CHI_3hr_100	01/01/2000	00:30:00	10.797
CHI_3hr_100	01/01/2000	00:40:00	17.136
CHI_3hr_100	01/01/2000	00:50:00	45.128
CHI_3hr_100	01/01/2000	01:00:00	178.107
CHI_3hr_100	01/01/2000	01:10:00	51.056
CHI_3hr_100	01/01/2000	01:20:00	26.163
CHI_3hr_100	01/01/2000	01:30:00	17.571
CHI_3hr_100	01/01/2000	01:40:00	13.277
CHI_3hr_100	01/01/2000	01:50:00	10.712
CHI_3hr_100	01/01/2000	02:00:00	9.008
CHI_3hr_100	01/01/2000	02:10:00	7.793
CHI_3hr_100	01/01/2000	02:20:00	6.883
CHI_3hr_100	01/01/2000	02:30:00	6.174
CHI_3hr_100	01/01/2000	02:40:00	5.607
CHI_3hr_100	01/01/2000	02:50:00	5.142
CHI_3hr_100	01/01/2000	03:00:00	0
CHI_3hr_100CC	01/01/2000	00:00:00	6.406801
CHI_3hr_100CC	01/01/2000	00:10:00	7.6512
CHI_3hr_100CC	01/01/2000	00:20:00	9.572401
CHI_3hr_100CC	01/01/2000	00:30:00	12.9564
CHI_3hr_100CC	01/01/2000	00:40:00	20.5632
CHI_3hr_100CC	01/01/2000	00:50:00	54.1536
CHI_3hr_100CC	01/01/2000	01:00:00	213.7284
CHI_3hr_100CC	01/01/2000	01:10:00	61.2672
CHI_3hr_100CC	01/01/2000	01:20:00	31.3956
CHI_3hr_100CC	01/01/2000	01:30:00	21.0852
CHI_3hr_100CC	01/01/2000	01:40:00	15.9324
CHI_3hr_100CC	01/01/2000	01:50:00	12.8544
CHI_3hr_100CC	01/01/2000	02:00:00	10.8096
CHI_3hr_100CC	01/01/2000	02:10:00	9.351601
CHI_3hr_100CC	01/01/2000	02:20:00	8.259601
CHI_3hr_100CC	01/01/2000	02:30:00	7.4088
CHI_3hr_100CC	01/01/2000	02:40:00	6.7284
CHI_3hr_100CC	01/01/2000	02:50:00	6.170401
CHI_3hr_100CC	01/01/2000	03:00:00	0
CHI_3hr_2	01/01/2000	00:00:00	2.491
CHI_3hr_2	01/01/2000	00:10:00	2.966
CHI_3hr_2	01/01/2000	00:20:00	3.696
CHI_3hr_2	01/01/2000	00:30:00	4.976
CHI_3hr_2	01/01/2000	00:40:00	7.828
CHI_3hr_2	01/01/2000	00:50:00	19.966
CHI_3hr_2	01/01/2000	01:00:00	76.805
CHI_3hr_2	01/01/2000	01:10:00	22.777
CHI_3hr_2	01/01/2000	01:20:00	11.852
CHI_3hr_2	01/01/2000	01:30:00	8.025
CHI_3hr_2	01/01/2000	01:40:00	6.096
CHI_3hr_2	01/01/2000	01:50:00	4.938
CHI_3hr_2	01/01/2000	02:00:00	4.165
CHI_3hr_2	01/01/2000	02:10:00	3.613
CHI_3hr_2	01/01/2000	02:20:00	3.197
CHI_3hr_2	01/01/2000	02:30:00	2.873
CHI_3hr_2	01/01/2000	02:40:00	2.613
CHI_3hr_2	01/01/2000	02:50:00	2.4
CHI_3hr_2	01/01/2000	03:00:00	0
CHI_3hr_5	01/01/2000	00:00:00	3.256
CHI_3hr_5	01/01/2000	00:10:00	3.881
CHI_3hr_5	01/01/2000	00:20:00	4.844
CHI_3hr_5	01/01/2000	00:30:00	6.532
CHI_3hr_5	01/01/2000	00:40:00	10.308
CHI_3hr_5	01/01/2000	00:50:00	26.792
CHI_3hr_5	01/01/2000	01:00:00	103.93
CHI_3hr_5	01/01/2000	01:10:00	30.286
CHI_3hr_5	01/01/2000	01:20:00	15.655
CHI_3hr_5	01/01/2000	01:30:00	10.568
CHI_3hr_5	01/01/2000	01:40:00	8.013
CHI_3hr_5	01/01/2000	01:50:00	6.482
CHI_3hr_5	01/01/2000	02:00:00	5.462
CHI_3hr_5	01/01/2000	02:10:00	4.733
CHI_3hr_5	01/01/2000	02:20:00	4.186
CHI_3hr_5	01/01/2000	02:30:00	3.76
CHI_3hr_5	01/01/2000	02:40:00	3.418
CHI_3hr_5	01/01/2000	02:50:00	3.137
CHI_3hr_5	01/01/2000	03:00:00	0

;Rainfall (mm/hr)

CHI3_10	1/1/2000	0:00:00	3.755
CHI3_10	1/1/2000	0:10:00	4.478
CHI3_10	1/1/2000	0:20:00	5.593
CHI3_10	1/1/2000	0:30:00	7.551
CHI3_10	1/1/2000	0:40:00	11.936
CHI3_10	1/1/2000	0:50:00	30.856
CHI3_10	1/1/2000	1:00:00	122.142
CHI3_10	1/1/2000	1:10:00	35.237
CHI3_10	1/1/2000	1:20:00	18.159
CHI3_10	1/1/2000	1:30:00	12.238
CHI3_10	1/1/2000	1:40:00	9.269
CHI3_10	1/1/2000	1:50:00	7.492
CHI3_10	1/1/2000	2:00:00	6.309
CHI3_10	1/1/2000	2:10:00	5.465
CHI3_10	1/1/2000	2:20:00	4.831
CHI3_10	1/1/2000	2:30:00	4.338
CHI3_10	1/1/2000	2:40:00	3.942
CHI3_10	1/1/2000	2:50:00	3.617
CHI3_10	1/1/2000	3:00:00	0
CHI3_25	1/1/2000	0:00:00	4.358
CHI3_25	1/1/2000	0:10:00	5.202
CHI3_25	1/1/2000	0:20:00	6.506
CHI3_25	1/1/2000	0:30:00	8.801
CHI3_25	1/1/2000	0:40:00	13.954
CHI3_25	1/1/2000	0:50:00	36.302
CHI3_25	1/1/2000	1:00:00	144.693
CHI3_25	1/1/2000	1:10:00	41.479
CHI3_25	1/1/2000	1:20:00	21.286
CHI3_25	1/1/2000	1:30:00	14.308
CHI3_25	1/1/2000	1:40:00	10.818
CHI3_25	1/1/2000	1:50:00	8.732
CHI3_25	1/1/2000	2:00:00	7.345
CHI3_25	1/1/2000	2:10:00	6.356
CHI3_25	1/1/2000	2:20:00	5.615
CHI3_25	1/1/2000	2:30:00	5.038
CHI3_25	1/1/2000	2:40:00	4.576
CHI3_25	1/1/2000	2:50:00	4.197
CHI3_25	1/1/2000	3:00:00	0

;Flow (m^3/s)

MAJQP	01/01/2000	00:00:00	0
MAJQP	01/01/2000	00:01:00	0
MAJQP	01/01/2000	00:02:00	0
MAJQP	01/01/2000	00:03:00	0
MAJQP	01/01/2000	00:04:00	0
MAJQP	01/01/2000	00:05:00	0
MAJQP	01/01/2000	00:06:00	0
MAJQP	01/01/2000	00:07:00	0
MAJQP	01/01/2000	00:08:00	0
MAJQP	01/01/2000	00:09:00	0
MAJQP	01/01/2000	00:10:00	0
MAJQP	01/01/2000	00:11:00	0
MAJQP	01/01/2000	00:12:00	0
MAJQP	01/01/2000	00:13:00	0
MAJQP	01/01/2000	00:14:00	0
MAJQP	01/01/2000	00:15:00	0.001957
MAJQP	01/01/2000	00:16:00	0.00763
MAJQP	01/01/2000	00:17:00	0.013353
MAJQP	01/01/2000	00:18:00	0.016574
MAJQP	01/01/2000	00:19:00	0.018387
MAJQP	01/01/2000	00:20:00	0.019407
MAJQP	01/01/2000	00:21:00	0.021271
MAJQP	01/01/2000	00:22:00	0.024173
MAJQP	01/01/2000	00:23:00	0.025807
MAJQP	01/01/2000	00:24:00	0.026726
MAJQP	01/01/2000	00:25:00	0.027244
MAJQP	01/01/2000	00:26:00	0.027535
MAJQP	01/01/2000	00:27:00	0.027699
MAJQP	01/01/2000	00:28:00	0.027791
MAJQP	01/01/2000	00:29:00	0.027843
MAJQP	01/01/2000	00:30:00	0.027872
MAJQP	01/01/2000	00:31:00	0.030752
MAJQP	01/01/2000	00:32:00	0.036488
MAJQP	01/01/2000	00:33:00	0.039716
MAJQP	01/01/2000	00:34:00	0.041533
MAJQP	01/01/2000	00:35:00	0.042555
MAJQP	01/01/2000	00:36:00	0.043131
MAJQP	01/01/2000	00:37:00	0.043455
MAJQP	01/01/2000	00:38:00	0.043637
MAJQP	01/01/2000	00:39:00	0.043739
MAJQP	01/01/2000	00:40:00	0.043797
MAJQP	01/01/2000	00:41:00	0.055996
MAJQP	01/01/2000	00:42:00	0.080347
MAJQP	01/01/2000	00:43:00	0.094051
MAJQP	01/01/2000	00:44:00	0.101763
MAJQP	01/01/2000	00:45:00	0.106104
MAJQP	01/01/2000	00:46:00	0.108547
MAJQP	01/01/2000	00:47:00	0.109921
MAJQP	01/01/2000	00:48:00	0.110695
MAJQP	01/01/2000	00:49:00	0.11113
MAJQP	01/01/2000	00:50:00	0.111375
MAJQP	01/01/2000	00:51:00	0.180113
MAJQP	01/01/2000	00:52:00	0.328534
MAJQP	01/01/2000	00:53:00	0.424726
MAJQP	01/01/2000	00:54:00	0.500342
MAJQP	01/01/2000	00:55:00	0.554161
MAJQP	01/01/2000	00:56:00	0.611254
MAJQP	01/01/2000	00:57:00	0.691283
MAJQP	01/01/2000	00:58:00	0.828673
MAJQP	01/01/2000	00:59:00	1.058295
MAJQP	01/01/2000	01:00:00	1.308882
MAJQP	01/01/2000	01:01:00	1.446347
MAJQP	01/01/2000	01:02:00	1.464704
MAJQP	01/01/2000	01:03:00	1.504863
MAJQP	01/01/2000	01:04:00	1.551953
MAJQP	01/01/2000	01:05:00	1.601015
MAJQP	01/01/2000	01:06:00	1.648556
MAJQP	01/01/2000	01:07:00	1.675547
MAJQP	01/01/2000	01:08:00	1.678464
MAJQP	01/01/2000	01:09:00	1.656868
MAJQP	01/01/2000	01:10:00	1.622276
MAJQP	01/01/2000	01:11:00	1.56695
MAJQP	01/01/2000	01:12:00	1.487957
MAJQP	01/01/2000	01:13:00	1.407011
MAJQP	01/01/2000	01:14:00	1.316775
MAJQP	01/01/2000	01:15:00	1.216383
MAJQP	01/01/2000	01:16:00	1.10147
MAJQP	01/01/2000	01:17:00	0.975044
MAJQP	01/01/2000	01:18:00	0.842841
MAJQP	01/01/2000	01:19:00	0.710783
MAJQP	01/01/2000	01:20:00	0.587985
MAJQP	01/01/2000	01:21:00	0.464858
MAJQP	01/01/2000	01:22:00	0.359599
MAJQP	01/01/2000	01:23:00	0.278572
MAJQP	01/01/2000	01:24:00	0.21567
MAJQP	01/01/2000	01:25:00	0.17189
MAJQP	01/01/2000	01:26:00	0.144553
MAJQP	01/01/2000	01:27:00	0.123351
MAJQP	01/01/2000	01:28:00	0.106704
MAJQP	01/01/2000	01:29:00	0.092202
MAJQP	01/01/2000	01:30:00	0.08217
MAJQP	01/01/2000	01:31:00	0.070324
MAJQP	01/01/2000	01:32:00	0.05908
MAJQP	01/01/2000	01:33:00	0.051504
MAJQP	01/01/2000	01:34:00	0.045762
MAJQP	01/01/2000	01:35:00	0.043341
MAJQP	01/01/2000	01:36:00	0.041772
MAJQP	01/01/2000	01:37:00	0.040395
MAJQP	01/01/2000	01:38:00	0.039152
MAJQP	01/01/2000	01:39:00	0.038656
MAJQP	01/01/2000	01:40:00	0.038361
MAJQP	01/01/2000	01:41:00	0.036767
MAJQP	01/01/2000	01:42:00	0.033864
MAJQP	01/01/2000	01:43:00	0.032315
MAJQP	01/01/2000	01:44:00	0.031473
MAJQP	01/01/2000	01:45:00	0.030999
MAJQP	01/01/2000	01:46:00	0.030731
MAJQP	01/01/2000	01:47:00	0.030581
MAJQP	01/01/2000	01:48:00	0.030495
MAJQP	01/01/2000	01:49:00	0.030447
MAJQP	01/01/2000	01:50:00	0.03042
MAJQP	01/01/2000	01:51:00	0.02953
MAJQP	01/01/2000	01:52:00	0.027772
MAJQP	01/01/2000	01:53:00	0.026783
MAJQP	01/01/2000	01:54:00	0.026227
MAJQP	01/01/2000	01:55:00	0.025913
MAJQP	01/01/2000	01:56:00	0.025737
MAJQP	01/01/2000	01:57:00	0.025637
MAJQP	01/01/2000	01:58:00	0.025581
MAJQP	01/01/2000	01:59:00	0.02555
MAJQP	01/01/2000	02:00:00	0.025532
MAJQP	01/01/2000	02:01:00	0.0249
MAJQP	01/01/2000	02:02:00	0.023652
MAJQP	01/01/2000	02:03:00	0.022949
MAJQP	01/01/2000	02:04:00	0.022553
MAJQP	01/01/2000	02:05:00	0.022331
MAJQP	01/01/2000	02:06:00	0.022205
MAJQP	01/01/2000	02:07:00	0.022135
MAJQP	01/01/2000	02:08:00	0.022095
MAJQP	01/01/2000	02:09:00	0.022073
MAJQP	01/01/2000	02:10:00	0.02206
MAJQP	01/01/2000	02:11:00	0.021588
MAJQP	01/01/2000	02:12:00	0.020653
MAJQP	01/01/2000	02:13:00	0.020127
MAJQP	01/01/2000	02:14:00	0.019831
MAJQP	01/01/2000	02:15:00	0.019665
MAJQP	01/01/2000	02:16:00	0.019571
MAJQP	01/01/2000	02:17:00	0.019518
MAJQP	01/01/2000	02:18:00	0.019489
MAJQP	01/01/2000	02:19:00	0.019472
MAJQP	01/01/2000	02:20:00	0.019463
MAJQP	01/01/2000	02:21:00	0.019096
MAJQP	01/01/2000	02:22:00	0.018371
MAJQP	01/01/2000	02:23:00	0.017962
MAJQP	01/01/2000	02:24:00	0.017733
MAJQP	01/01/2000	02:25:00	0.017603
MAJQP	01/01/2000	02:26:00	0.017531
MAJQP	01/01/2000	02:27:00	0.01749
MAJQP	01/01/2000	02:28:00	0.017467
MAJQP	01/01/2000	02:29:00	0.017454
MAJQP	01/01/2000	02:30:00	0.017446
MAJQP	01/01/2000	02:31:00	0.017153
MAJQP	01/01/2000	02:32:00	0.016572
MAJQP	01/01/2000	02:33:00	0.016245
MAJQP	01/01/2000	02:34:00	0.016061
MAJQP	01/01/2000	02:35:00	0.015957

```
MAJQP           01/01/2000 02:36:00   0.015899
MAJQP           01/01/2000 02:37:00   0.015866
MAJQP           01/01/2000 02:38:00   0.015848
MAJQP           01/01/2000 02:39:00   0.015837
MAJQP           01/01/2000 02:40:00   0.015831
MAJQP           01/01/2000 02:41:00   0.015592
MAJQP           01/01/2000 02:42:00   0.015117
MAJQP           01/01/2000 02:43:00   0.014849
MAJQP           01/01/2000 02:44:00   0.014699
MAJQP           01/01/2000 02:45:00   0.014614
MAJQP           01/01/2000 02:46:00   0.014567
MAJQP           01/01/2000 02:47:00   0.01454
MAJQP           01/01/2000 02:48:00   0.014525
MAJQP           01/01/2000 02:49:00   0.014516
MAJQP           01/01/2000 02:50:00   0.014511
MAJQP           01/01/2000 02:51:00   0.014311
MAJQP           01/01/2000 02:52:00   0.013915
MAJQP           01/01/2000 02:53:00   0.013691
MAJQP           01/01/2000 02:54:00   0.013566
MAJQP           01/01/2000 02:55:00   0.013495
MAJQP           01/01/2000 02:56:00   0.013455
MAJQP           01/01/2000 02:57:00   0.013433
MAJQP           01/01/2000 02:58:00   0.01342
MAJQP           01/01/2000 02:59:00   0.013413
MAJQP           01/01/2000 03:00:00   0.013409
MAJQP           01/01/2000 03:01:00   0.011002
MAJQP           01/01/2000 03:02:00   0.006192
MAJQP           01/01/2000 03:03:00   0.003485
MAJQP           01/01/2000 03:04:00   0.001961
MAJQP           01/01/2000 03:05:00   0.001104
MAJQP           01/01/2000 03:06:00   0.000621
MAJQP           01/01/2000 03:07:00   0.00035
MAJQP           01/01/2000 03:08:00   0.000197
MAJQP           01/01/2000 03:09:00   0.000111
MAJQP           01/01/2000 03:10:00   6.2E-05
MAJQP           01/01/2000 03:11:00   3.5E-05
MAJQP           01/01/2000 03:12:00   2E-05
MAJQP           01/01/2000 03:13:00   1.1E-05
MAJQP           01/01/2000 03:14:00   0
MAJQP           01/01/2000 03:15:00   0
MAJQP           01/01/2000 03:16:00   0
MAJQP           01/01/2000 03:17:00   0
MAJQP           01/01/2000 03:18:00   0
MAJQP           01/01/2000 03:19:00   0
MAJQP           01/01/2000 03:20:00   0
MAJQP           01/01/2000 03:21:00   0
MAJQP           01/01/2000 03:22:00   0
MAJQP           01/01/2000 03:23:00   0
MAJQP           01/01/2000 03:24:00   0
MAJQP           01/01/2000 03:25:00   0
MAJQP           01/01/2000 03:26:00   0
MAJQP           01/01/2000 03:27:00   0
MAJQP           01/01/2000 03:28:00   0
MAJQP           01/01/2000 03:29:00   0
MAJQP           01/01/2000 03:30:00   0
MAJQP           01/01/2000 03:31:00   0
MAJQP           01/01/2000 03:32:00   0
MAJQP           01/01/2000 03:33:00   0
MAJQP           01/01/2000 03:34:00   0
MAJQP           01/01/2000 03:35:00   0
MAJQP           01/01/2000 03:36:00   0
MAJQP           01/01/2000 03:37:00   0
MAJQP           01/01/2000 03:38:00   0
MAJQP           01/01/2000 03:39:00   0
MAJQP           01/01/2000 03:40:00   0
MAJQP           01/01/2000 03:41:00   0
MAJQP           01/01/2000 03:42:00   0
MAJQP           01/01/2000 03:43:00   0
MAJQP           01/01/2000 03:44:00   0
MAJQP           01/01/2000 03:45:00   0
MAJQP           01/01/2000 03:46:00   0
MAJQP           01/01/2000 03:47:00   0
MAJQP           01/01/2000 03:48:00   0
MAJQP           01/01/2000 03:49:00   0
MAJQP           01/01/2000 03:50:00   0
MAJQP           01/01/2000 03:51:00   0
MAJQP           01/01/2000 03:52:00   0
MAJQP           01/01/2000 03:53:00   0
MAJQP           01/01/2000 03:54:00   0
MAJQP           01/01/2000 03:55:00   0
MAJQP           01/01/2000 03:56:00   0
MAJQP           01/01/2000 03:57:00   0
MAJQP           01/01/2000 03:58:00   0
MAJQP           01/01/2000 03:59:00   0
MAJQP           01/01/2000 04:00:00   0
MAJQP           01/01/2000 04:01:00   0
MAJQP           01/01/2000 04:02:00   0
MAJQP           01/01/2000 04:03:00   0
MAJQP           01/01/2000 04:04:00   0
MAJQP           01/01/2000 04:05:00   0
MAJQP           01/01/2000 04:06:00   0
MAJQP           01/01/2000 04:07:00   0
MAJQP           01/01/2000 04:08:00   0
MAJQP           01/01/2000 04:09:00   0
MAJQP           01/01/2000 04:10:00   0
MAJQP           01/01/2000 04:11:00   0
MAJQP           01/01/2000 04:12:00   0
MAJQP           01/01/2000 04:13:00   0
MAJQP           01/01/2000 04:14:00   0
MAJQP           01/01/2000 04:15:00   0
MAJQP           01/01/2000 04:16:00   0

;Flow (m³/s)
MAS23           01/01/2000 00:00:00   0
MAS23           01/01/2000 00:01:00   0
MAS23           01/01/2000 00:02:00   0
MAS23           01/01/2000 00:03:00   0
MAS23           01/01/2000 00:04:00   0
MAS23           01/01/2000 00:05:00   0
MAS23           01/01/2000 00:06:00   0
MAS23           01/01/2000 00:07:00   0
MAS23           01/01/2000 00:08:00   0
MAS23           01/01/2000 00:09:00   0
MAS23           01/01/2000 00:10:00   0
MAS23           01/01/2000 00:11:00   0
MAS23           01/01/2000 00:12:00   0
MAS23           01/01/2000 00:13:00   0
MAS23           01/01/2000 00:14:00   0
MAS23           01/01/2000 00:15:00   0
MAS23           01/01/2000 00:16:00   0
MAS23           01/01/2000 00:17:00   0
MAS23           01/01/2000 00:18:00   0
MAS23           01/01/2000 00:19:00   0
MAS23           01/01/2000 00:20:00   0
MAS23           01/01/2000 00:21:00   0
MAS23           01/01/2000 00:22:00   0
MAS23           01/01/2000 00:23:00   0
MAS23           01/01/2000 00:24:00   0
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MAS23           01/01/2000 00:26:00   0
MAS23           01/01/2000 00:27:00   0
MAS23           01/01/2000 00:28:00   0
MAS23           01/01/2000 00:29:00   0
MAS23           01/01/2000 00:30:00   0
MAS23           01/01/2000 00:31:00   0
MAS23           01/01/2000 00:32:00   0
MAS23           01/01/2000 00:33:00   0
MAS23           01/01/2000 00:34:00   0
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MAS23           01/01/2000 00:38:00   0
MAS23           01/01/2000 00:39:00   0
MAS23           01/01/2000 00:40:00   0
MAS23           01/01/2000 00:41:00   0
MAS23           01/01/2000 00:42:00   0
MAS23           01/01/2000 00:43:00   0
MAS23           01/01/2000 00:44:00   0
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MAS23           01/01/2000 00:48:00   0
MAS23           01/01/2000 00:49:00   0
MAS23           01/01/2000 00:50:00   0
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MAS23           01/01/2000 00:52:00   0
MAS23           01/01/2000 00:53:00   0
MAS23           01/01/2000 00:54:00   0
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MAS23           01/01/2000 00:57:00   0
MAS23           01/01/2000 00:58:00   0
MAS23           01/01/2000 00:59:00   0
MAS23           01/01/2000 01:00:00   0.000192
MAS23           01/01/2000 01:01:00   0
MAS23           01/01/2000 01:02:00   0
MAS23           01/01/2000 01:03:00   0
MAS23           01/01/2000 01:04:00   0
MAS23           01/01/2000 01:05:00   0
MAS23           01/01/2000 01:06:00   0
MAS23           01/01/2000 01:07:00   0
MAS23           01/01/2000 01:08:00   0
MAS23           01/01/2000 01:09:00   0
MAS23           01/01/2000 01:10:00   0
MAS23           01/01/2000 01:11:00   0
MAS23           01/01/2000 01:12:00   0
MAS23           01/01/2000 01:13:00   0
MAS23           01/01/2000 01:14:00   0
MAS23           01/01/2000 01:15:00   0
MAS23           01/01/2000 01:16:00   0
MAS23           01/01/2000 01:17:00   0
MAS23           01/01/2000 01:18:00   0
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MAS23           01/01/2000 01:20:00   0
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MAS23           01/01/2000 01:22:00   0
MAS23           01/01/2000 01:23:00   0
MAS23           01/01/2000 01:24:00   0
MAS23           01/01/2000 01:25:00   0
MAS23           01/01/2000 01:26:00   0
MAS23           01/01/2000 01:27:00   0
MAS23           01/01/2000 01:28:00   0
MAS23           01/01/2000 01:29:00   0
MAS23           01/01/2000 01:30:00   0
MAS23           01/01/2000 01:31:00   0
MAS23           01/01/2000 01:32:00   0
MAS23           01/01/2000 01:33:00   0
MAS23           01/01/2000 01:34:00   0
MAS23           01/01/2000 01:35:00   0
MAS23           01/01/2000 01:36:00   0
MAS23           01/01/2000 01:37:00   0
MAS23           01/01/2000 01:38:00   0
MAS23           01/01/2000 01:39:00   0
MAS23           01/01/2000 01:40:00   0
MAS23           01/01/2000 01:41:00   0
MAS23           01/01/2000 01:42:00   0
MAS23           01/01/2000 01:43:00   0
MAS23           01/01/2000 01:44:00   0
MAS23           01/01/2000 01:45:00   0
MAS23           01/01/2000 01:46:00   0
MAS23           01/01/2000 01:47:00   0
MAS23           01/01/2000 01:48:00   0
MAS23           01/01/2000 01:49:00   0
MAS23           01/01/2000 01:50:00   0
MAS23           01/01/2000 01:51:00   0
MAS23           01/01/2000 01:52:00   0
MAS23           01/01/2000 01:53:00   0
MAS23           01/01/2000 01:54:00   0
MAS23           01/01/2000 01:55:00   0
MAS23           01/01/2000 01:56:00   0
MAS23           01/01/2000 01:57:00   0
MAS23           01/01/2000 01:58:00   0
MAS23           01/01/2000 01:59:00   0
MAS23           01/01/2000 02:00:00   0
MAS23           01/01/2000 02:01:00   0
MAS23           01/01/2000 02:02:00   0
MAS23           01/01/2000 02:03:00   0
MAS23           01/01/2000 02:04:00   0
MAS23           01/01/2000 02:05:00   0
MAS23           01/01/2000 02:06:00   0
MAS23           01/01/2000 02:07:00   0
MAS23           01/01/2000 02:08:00   0
MAS23           01/01/2000 02:09:00   0
MAS23           01/01/2000 02:10:00   0
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MAS23           01/01/2000 02:17:00   0
MAS23           01/01/2000 02:18:00   0
MAS23           01/01/2000 02:19:00   0
MAS23           01/01/2000 02:20:00   0
MAS23           01/01/2000 02:21:00   0
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MAS28	01/01/2000 03:41:00	0
MAS28	01/01/2000 03:42:00	0
MAS28	01/01/2000 03:43:00	0
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MAS28	01/01/2000 03:45:00	0
MAS28	01/01/2000 03:46:00	0
MAS28	01/01/2000 03:47:00	0
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OTT_CHI3_10	07/23/2009 00:10:00	4.478
OTT_CHI3_10	07/23/2009 00:20:00	5.593
OTT_CHI3_10	07/23/2009 00:30:00	7.551
OTT_CHI3_10	07/23/2009 00:40:00	11.936
OTT_CHI3_10	07/23/2009 00:50:00	31.164
OTT_CHI3_10	07/23/2009 01:00:00	121.834
OTT_CHI3_10	07/23/2009 01:10:00	35.237
OTT_CHI3_10	07/23/2009 01:20:00	18.159
OTT_CHI3_10	07/23/2009 01:30:00	12.238
OTT_CHI3_10	07/23/2009 01:40:00	9.269
OTT_CHI3_10	07/23/2009 01:50:00	7.492
OTT_CHI3_10	07/23/2009 02:00:00	6.309
OTT_CHI3_10	07/23/2009 02:10:00	5.465
OTT_CHI3_10	07/23/2009 02:20:00	4.831
OTT_CHI3_10	07/23/2009 02:30:00	4.338
OTT_CHI3_10	07/23/2009 02:40:00	3.942
OTT_CHI3_10	07/23/2009 02:50:00	3.617
OTT_CHI3_10	07/23/2009 03:00:00	0
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SCS_24h_100	01/01/2000 00:15:00	1.135
SCS_24h_100	01/01/2000 00:30:00	1.135
SCS_24h_100	01/01/2000 00:45:00	1.135
SCS_24h_100	01/01/2000 01:00:00	1.135
SCS_24h_100	01/01/2000 01:15:00	1.135
SCS_24h_100	01/01/2000 01:30:00	1.135
SCS_24h_100	01/01/2000 01:45:00	1.135
SCS_24h_100	01/01/2000 02:00:00	1.342
SCS_24h_100	01/01/2000 02:15:00	1.342
SCS_24h_100	01/01/2000 02:30:00	1.342
SCS_24h_100	01/01/2000 02:45:00	1.342
SCS_24h_100	01/01/2000 03:00:00	1.342
SCS_24h_100	01/01/2000 03:15:00	1.342
SCS_24h_100	01/01/2000 03:30:00	1.342
SCS_24h_100	01/01/2000 03:45:00	1.342
SCS_24h_100	01/01/2000 04:00:00	1.651
SCS_24h_100	01/01/2000 04:15:00	1.651
SCS_24h_100	01/01/2000 04:30:00	1.651
SCS_24h_100	01/01/2000 04:45:00	1.651
SCS_24h_100	01/01/2000 05:00:00	1.651
SCS_24h_100	01/01/2000 05:15:00	1.651
SCS_24h_100	01/01/2000 05:30:00	1.651
SCS_24h_100	01/01/2000 05:45:00	1.651
SCS_24h_100	01/01/2000 06:00:00	1.858
SCS_24h_100	01/01/2000 06:15:00	1.858
SCS_24h_100	01/01/2000 06:30:00	1.858
SCS_24h_100	01/01/2000 06:45:00	1.858
SCS_24h_100	01/01/2000 07:00:00	2.27
SCS_24h_100	01/01/2000 07:15:00	2.27
SCS_24h_100	01/01/2000 07:30:00	2.27
SCS_24h_100	01/01/2000 07:45:00	2.27
SCS_24h_100	01/01/2000 08:00:00	2.683
SCS_24h_100	01/01/2000 08:15:00	2.683
SCS_24h_100	01/01/2000 08:30:00	2.89
SCS_24h_100	01/01/2000 08:45:00	2.89
SCS_24h_100	01/01/2000 09:00:00	3.302
SCS_24h_100	01/01/2000 09:15:00	3.302
SCS_24h_100	01/01/2000 09:30:00	3.715
SCS_24h_100	01/01/2000 09:45:00	3.715
SCS_24h_100	01/01/2000 10:00:00	4.747
SCS_24h_100	01/01/2000 10:15:00	4.747
SCS_24h_100	01/01/2000 10:30:00	6.398
SCS_24h_100	01/01/2000 10:45:00	6.398
SCS_24h_100	01/01/2000 11:00:00	9.907
SCS_24h_100	01/01/2000 11:15:00	9.907
SCS_24h_100	01/01/2000 11:30:00	30.547
SCS_24h_100	01/01/2000 11:45:00	126.317
SCS_24h_100	01/01/2000 12:00:00	14.861
SCS_24h_100	01/01/2000 12:15:00	14.861
SCS_24h_100	01/01/2000 12:30:00	7.637
SCS_24h_100	01/01/2000 12:45:00	7.637
SCS_24h_100	01/01/2000 13:00:00	5.573
SCS_24h_100	01/01/2000 13:15:00	5.573
SCS_24h_100	01/01/2000 13:30:00	4.334
SCS_24h_100	01/01/2000 13:45:00	4.334
SCS_24h_100	01/01/2000 14:00:00	3.096
SCS_24h_100	01/01/2000 14:15:00	3.096
SCS_24h_100	01/01/2000 14:30:00	3.096
SCS_24h_100	01/01/2000 14:45:00	3.096
SCS_24h_100	01/01/2000 15:00:00	3.096
SCS_24h_100	01/01/2000 15:15:00	3.096
SCS_24h_100	01/01/2000 15:30:00	3.096
SCS_24h_100	01/01/2000 15:45:00	3.096
SCS_24h_100	01/01/2000 16:00:00	1.858
SCS_24h_100	01/01/2000 16:15:00	1.858
SCS_24h_100	01/01/2000 16:30:00	1.858
SCS_24h_100	01/01/2000 16:45:00	1.858
SCS_24h_100	01/01/2000 17:00:00	1.858
SCS_24h_100	01/01/2000 17:15:00	1.858
SCS_24h_100	01/01/2000 17:30:00	1.858
SCS_24h_100	01/01/2000 17:45:00	1.858
SCS_24h_100	01/01/2000 18:00:00	1.858
SCS_24h_100	01/01/2000 18:15:00	1.858
SCS_24h_100	01/01/2000 18:30:00	1.858
SCS_24h_100	01/01/2000 18:45:00	1.858
SCS_24h_100	01/01/2000 19:00:00	1.858
SCS_24h_100	01/01/2000 19:15:00	1.858
SCS_24h_100	01/01/2000 19:30:00	1.858
SCS_24h_100	01/01/2000 19:45:00	1.858
SCS_24h_100	01/01/2000 20:00:00	1.238
SCS_24h_100	01/01/2000 20:15:00	1.238
SCS_24h_100	01/01/2000 20:30:00	1.238
SCS_24h_100	01/01/2000 20:45:00	1.238
SCS_24h_100	01/01/2000 21:00:00	1.238
SCS_24h_100	01/01/2000 21:15:00	1.238
SCS_24h_100	01/01/2000 21:30:00	1.238
SCS_24h_100	01/01/2000 21:45:00	1.238
SCS_24h_100	01/01/2000 22:00:00	1.238
SCS_24h_100	01/01/2000 22:15:00	1.238
SCS_24h_100	01/01/2000 22:30:00	1.238
SCS_24h_100	01/01/2000 22:45:00	1.238
SCS_24h_100	01/01/2000 23:00:00	1.238
SCS_24h_100	01/01/2000 23:15:00	1.238
SCS_24h_100	01/01/2000 23:30:00	1.238
SCS_24h_100	01/01/2000 23:45:00	1.238
SCS_24h_100	01/02/2000 00:00:00	0
SCS_24h_100CC	01/01/2000 00:00:00	1.362
SCS_24h_100CC	01/01/2000 00:15:00	1.362
SCS_24h_100CC	01/01/2000 00:30:00	1.362
SCS_24h_100CC	01/01/2000 00:45:00	1.362
SCS_24h_100CC	01/01/2000 01:00:00	1.362
SCS_24h_100CC	01/01/2000 01:15:00	1.362
SCS_24h_100CC	01/01/2000 01:30:00	1.362
SCS_24h_100CC	01/01/2000 01:45:00	1.362
SCS_24h_100CC	01/01/2000 02:00:00	1.6104
SCS_24h_100CC	01/01/2000 02:15:00	1.6104
SCS_24h_100CC	01/01/2000 02:30:00	1.6104
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SCS_24h_100CC	01/01/2000 03:00:00	1.6104
SCS_24h_100CC	01/01/2000 03:15:00	1.6104
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SCS_24h_100CC	01/01/2000 04:30:00	1.9812
SCS_24h_100CC	01/01/2000 04:45:00	1.9812
SCS_24h_100CC	01/01/2000 05:00:00	1.9812
SCS_24h_100CC	01/01/2000 05:15:00	1.9812
SCS_24h_100CC	01/01/2000 05:30:00	1.9812
SCS_24h_100CC	01/01/2000 05:45:00	1.9812
SCS_24h_100CC	01/01/2000 06:00:00	2.2296
SCS_24h_100CC	01/01/2000 06:15:00	2.2296
SCS_24h_100CC	01/01/2000 06:30:00	2.2296
SCS_24h_100CC	01/01/2000 06:45:00	2.2296
SCS_24h_100CC	01/01/2000 07:00:00	2.724
SCS_24h_100CC	01/01/2000 07:15:00	2.724
SCS_24h_100CC	01/01/2000 07:30:00	2.724
SCS_24h_100CC	01/01/2000 07:45:00	2.724
SCS_24h_100CC	01/01/2000 08:00:00	3.2196
SCS_24h_100CC	01/01/2000 08:15:00	3.2196
SCS_24h_100CC	01/01/2000 08:30:00	3.468
SCS_24h_100CC	01/01/2000 08:45:00	3.468
SCS_24h_100CC	01/01/2000 09:00:00	3.9624
SCS_24h_100CC	01/01/2000 09:15:00	3.9624
SCS_24h_100CC	01/01/2000 09:30:00	4.458
SCS_24h_100CC	01/01/2000 09:45:00	4.458
SCS_24h_100CC	01/01/2000 10:00:00	5.696401
SCS_24h_100CC	01/01/2000 10:15:00	5.696401
SCS_24h_100CC	01/01/2000 10:30:00	7.6776
SCS_24h_100CC	01/01/2000 10:45:00	7.6776
SCS_24h_100CC	01/01/2000 11:00:00	11.8884
SCS_24h_100CC	01/01/2000 11:15:00	11.8884
SCS_24h_100CC	01/01/2000 11:30:00	36.6564
SCS_24h_100CC	01/01/2000 11:45:00	151.5804
SCS_24h_100CC	01/01/2000 12:00:00	17.8332
SCS_24h_100CC	01/01/2000 12:15:00	17.8332
SCS_24h_100CC	01/01/2000 12:30:00	9.1644
SCS_24h_100CC	01/01/2000 12:45:00	9.1644
SCS_24h_100CC	01/01/2000 13:00:00	6.6876
SCS_24h_100CC	01/01/2000 13:15:00	6.6876
SCS_24h_100CC	01/01/2000 13:30:00	5.2008
SCS_24h_100CC	01/01/2000 13:45:00	5.2008
SCS_24h_100CC	01/01/2000 14:00:00	3.7152
SCS_24h_100CC	01/01/2000 14:15:00	3.7152
SCS_24h_100CC	01/01/2000 14:30:00	3.7152
SCS_24h_100CC	01/01/2000 14:45:00	3.7152
SCS_24h_100CC	01/01/2000 15:00:00	3.7152
SCS_24h_100CC	01/01/2000 15:15:00	3.7152
SCS_24h_100CC	01/01/2000 15:30:00	3.7152
SCS_24h_100CC	01/01/2000 15:45:00	3.7152
SCS_24h_100CC	01/01/2000 16:00:00	2.2296
SCS_24h_100CC	01/01/2000 16:15:00	2.2296
SCS_24h_100CC	01/01/2000 16:30:00	2.2296
SCS_24h_100CC	01/01/2000 16:45:00	2.2296
SCS_24h_100CC	01/01/2000 17:00:00	2.2296
SCS_24h_100CC	01/01/2000 17:15:00	2.2296
SCS_24h_100CC	01/01/2000 17:30:00	2.2296
SCS_24h_100CC	01/01/2000 17:45:00	2.2296
SCS_24h_100CC	01/01/2000 18:00:00	2.2296
SCS_24h_100CC	01/01/2000 18:15:00	2.2296
SCS_24h_100CC	01/01/2000 18:30:00	2.2296
SCS_24h_100CC	01/01/2000 18:45:00	2.2296
SCS_24h_100CC	01/01/2000 19:00:00	2.2296
SCS_24h_100CC	01/01/2000 19:15:00	2.2296
SCS_24h_100CC	01/01/2000 19:30:00	2.2296
SCS_24h_100CC	01/01/2000 19:45:00	2.2296
SCS_24h_100CC	01/01/2000 20:00:00	1.4856
SCS_24h_100CC	01/01/2000 20:15:00	1.4856
SCS_24h_100CC	01/01/2000 20:30:00	1.4856
SCS_24h_100CC	01/01/2000 20:45:00	1.4856
SCS_24h_100CC	01/01/2000 21:00:00	1.4856
SCS_24h_100CC	01/01/2000 21:15:00	1.4856
SCS_24h_100CC	01/01/2000 21:30:00	1.4856
SCS_24h_100CC	01/01/2000 21:45:00	1.4856
SCS_24h_100CC	01/01/2000 22:00:00	1.4856
SCS_24h_100CC	01/01/2000 22:15:00	1.4856
SCS_24h_100CC	01/01/2000 22:30:00	1.4856
SCS_24h_100CC	01/01/2000 22:45:00	1.4856
SCS_24h_100CC	01/01/2000 23:00:00	1.4856
SCS_24h_100CC	01/01/2000 23:15:00	1.4856
SCS_24h_100CC	01/01/2000 23:30:00	1.4856
SCS_24h_100CC	01/01/2000 23:45:00	1.4856
SCS_24h_100CC	01/02/2000 00:00:00	0
;Rainfall (mm/hr)		
SCS_24h_2	07/23/2009 00:00:00	0.528
SCS_24h_2	07/23/2009 00:15:00	0.528
SCS_24h_2	07/23/2009 00:30:00	0.528
SCS_24h_2	07/23/2009 00:45:00	0.528
SCS_24h_2	07/23/2009 01:00:00	0.528
SCS_24h_2	07/23/2009 01:15:00	0.528
SCS_24h_2	07/23/2009 01:30:00	0.528
SCS_24h_2	07/23/2009 01:45:00	0.528
SCS_24h_2	07/23/2009 02:00:00	0.624
SCS_24h_2	07/23/2009 02:15:00	0.624
SCS_24h_2	07/23/2009 02:30:00	0.624
SCS_24h_2	07/23/2009 02:45:00	0.624
SCS_24h_2	07/23/2009 03:00:00	0.624
SCS_24h_2	07/23/2009 03:15:00	0.624
SCS_24h_2	07/23/2009 03:30:00	0.624
SCS_24h_2	07/23/2009 03:45:00	0.624
SCS_24h_2	07/23/2009 04:00:00	0.768
SCS_24h_2	07/23/2009 04:15:00	0.768
SCS_24h_2	07/23/2009 04:30:00	0.768
SCS_24h_2	07/23/2009 04:45:00	0.768
SCS_24h_2	07/23/2009 05:00:00	0.768
SCS_24h_2	07/23/2009 05:15:00	0.768
SCS_24h_2	07/23/2009 05:30:00	0.768
SCS_24h_2	07/23/2009 05:45:00	0.768
SCS_24h_2	07/23/2009 06:00:00	0.864
SCS_24h_2	07/23/2009 06:15:00	0.864
SCS_24h_2	07/23/2009 06:30:00	0.864
SCS_24h_2	07/23/2009 06:45:00	0.864
SCS_24h_2	07/23/2009 07:00:00	1.056
SCS_24h_2	07/23/2009 07:15:00	1.056
SCS_24h_2	07/23/2009 07:30:00	1.056
SCS_24h_2	07/23/2009 07:45:00	1.056
SCS_24h_2	07/23/2009 08:00:00	1.248
SCS_24h_2	07/23/2009 08:15:00	1.248
SCS_24h_2	07/23/2009 08:30:00	1.344
SCS_24h_2	07/23/2009 08:45:00	1.344
SCS_24h_2	07/23/2009 09:00:00	1.536
SCS_24h_2	07/23/2009 09:15:00	1.536
SCS_24h_2	07/23/2009 09:30:00	1.728
SCS_24h_2	07/23/2009 09:45:00	1.728
SCS_24h_2	07/23/2009 10:00:00	2.208
SCS_24h_2	07/23/2009 10:15:00	2.208
SCS_24h_2	07/23/2009 10:30:00	2.976
SCS_24h_2	07/23/2009 10:45:00	2.976
SCS_24h_2	07/23/2009 11:00:00	4.608
SCS_24h_2	07/23/2009 11:15:00	4.608
SCS_24h_2	07/23/2009 11:30:00	14.208

```
SCS_24h_2       07/23/2009 11:45:00   58.752
SCS_24h_2       07/23/2009 12:00:00   6.912
SCS_24h_2       07/23/2009 12:15:00   6.912
SCS_24h_2       07/23/2009 12:30:00   3.552
SCS_24h_2       07/23/2009 12:45:00   3.552
SCS_24h_2       07/23/2009 13:00:00   2.592
SCS_24h_2       07/23/2009 13:15:00   2.592
SCS_24h_2       07/23/2009 13:30:00   2.016
SCS_24h_2       07/23/2009 13:45:00   2.016
SCS_24h_2       07/23/2009 14:00:00   1.44
SCS_24h_2       07/23/2009 14:15:00   1.44
SCS_24h_2       07/23/2009 14:30:00   1.44
SCS_24h_2       07/23/2009 14:45:00   1.44
SCS_24h_2       07/23/2009 15:00:00   1.44
SCS_24h_2       07/23/2009 15:15:00   1.44
SCS_24h_2       07/23/2009 15:30:00   1.44
SCS_24h_2       07/23/2009 15:45:00   1.44
SCS_24h_2       07/23/2009 16:00:00   0.864
SCS_24h_2       07/23/2009 16:15:00   0.864
SCS_24h_2       07/23/2009 16:30:00   0.864
SCS_24h_2       07/23/2009 16:45:00   0.864
SCS_24h_2       07/23/2009 17:00:00   0.864
SCS_24h_2       07/23/2009 17:15:00   0.864
SCS_24h_2       07/23/2009 17:30:00   0.864
SCS_24h_2       07/23/2009 17:45:00   0.864
SCS_24h_2       07/23/2009 18:00:00   0.864
SCS_24h_2       07/23/2009 18:15:00   0.864
SCS_24h_2       07/23/2009 18:30:00   0.864
SCS_24h_2       07/23/2009 18:45:00   0.864
SCS_24h_2       07/23/2009 19:00:00   0.864
SCS_24h_2       07/23/2009 19:15:00   0.864
SCS_24h_2       07/23/2009 19:30:00   0.864
SCS_24h_2       07/23/2009 19:45:00   0.864
SCS_24h_2       07/23/2009 20:00:00   0.576
SCS_24h_2       07/23/2009 20:15:00   0.576
SCS_24h_2       07/23/2009 20:30:00   0.576
SCS_24h_2       07/23/2009 20:45:00   0.576
SCS_24h_2       07/23/2009 21:00:00   0.576
SCS_24h_2       07/23/2009 21:15:00   0.576
SCS_24h_2       07/23/2009 21:30:00   0.576
SCS_24h_2       07/23/2009 21:45:00   0.576
SCS_24h_2       07/23/2009 22:00:00   0.576
SCS_24h_2       07/23/2009 22:15:00   0.576
SCS_24h_2       07/23/2009 22:30:00   0.576
SCS_24h_2       07/23/2009 22:45:00   0.576
SCS_24h_2       07/23/2009 23:00:00   0.576
SCS_24h_2       07/23/2009 23:15:00   0.576
SCS_24h_2       07/23/2009 23:30:00   0.576
SCS_24h_2       07/23/2009 23:45:00   0.576
SCS_24h_2       07/24/2009 00:00:00   0

SCS_24h_5       01/01/2000 00:00:00   0.686
SCS_24h_5       01/01/2000 00:15:00   0.686
SCS_24h_5       01/01/2000 00:30:00   0.686
SCS_24h_5       01/01/2000 00:45:00   0.686
SCS_24h_5       01/01/2000 01:00:00   0.686
SCS_24h_5       01/01/2000 01:15:00   0.686
SCS_24h_5       01/01/2000 01:30:00   0.686
SCS_24h_5       01/01/2000 01:45:00   0.686
SCS_24h_5       01/01/2000 02:00:00   0.811
SCS_24h_5       01/01/2000 02:15:00   0.811
SCS_24h_5       01/01/2000 02:30:00   0.811
SCS_24h_5       01/01/2000 02:45:00   0.811
SCS_24h_5       01/01/2000 03:00:00   0.811
SCS_24h_5       01/01/2000 03:15:00   0.811
SCS_24h_5       01/01/2000 03:30:00   0.811
SCS_24h_5       01/01/2000 03:45:00   0.811
SCS_24h_5       01/01/2000 04:00:00   0.998
SCS_24h_5       01/01/2000 04:15:00   0.998
SCS_24h_5       01/01/2000 04:30:00   0.998
SCS_24h_5       01/01/2000 04:45:00   0.998
SCS_24h_5       01/01/2000 05:00:00   0.998
SCS_24h_5       01/01/2000 05:15:00   0.998
SCS_24h_5       01/01/2000 05:30:00   0.998
SCS_24h_5       01/01/2000 05:45:00   0.998
SCS_24h_5       01/01/2000 06:00:00   1.123
SCS_24h_5       01/01/2000 06:15:00   1.123
SCS_24h_5       01/01/2000 06:30:00   1.123
SCS_24h_5       01/01/2000 06:45:00   1.123
SCS_24h_5       01/01/2000 07:00:00   1.373
SCS_24h_5       01/01/2000 07:15:00   1.373
SCS_24h_5       01/01/2000 07:30:00   1.373
SCS_24h_5       01/01/2000 07:45:00   1.373
SCS_24h_5       01/01/2000 08:00:00   1.622
SCS_24h_5       01/01/2000 08:15:00   1.622
SCS_24h_5       01/01/2000 08:30:00   1.747
SCS_24h_5       01/01/2000 08:45:00   1.747
SCS_24h_5       01/01/2000 09:00:00   1.997
SCS_24h_5       01/01/2000 09:15:00   1.997
SCS_24h_5       01/01/2000 09:30:00   2.246
SCS_24h_5       01/01/2000 09:45:00   2.246
SCS_24h_5       01/01/2000 10:00:00   2.87
SCS_24h_5       01/01/2000 10:15:00   2.87
SCS_24h_5       01/01/2000 10:30:00   3.869
SCS_24h_5       01/01/2000 10:45:00   3.869
SCS_24h_5       01/01/2000 11:00:00   5.99
SCS_24h_5       01/01/2000 11:15:00   5.99
SCS_24h_5       01/01/2000 11:30:00   18.47
SCS_24h_5       01/01/2000 11:45:00   76.378
SCS_24h_5       01/01/2000 12:00:00   8.986
SCS_24h_5       01/01/2000 12:15:00   8.986
SCS_24h_5       01/01/2000 12:30:00   4.618
SCS_24h_5       01/01/2000 12:45:00   4.618
SCS_24h_5       01/01/2000 13:00:00   3.37
SCS_24h_5       01/01/2000 13:15:00   3.37
SCS_24h_5       01/01/2000 13:30:00   2.621
SCS_24h_5       01/01/2000 13:45:00   2.621
SCS_24h_5       01/01/2000 14:00:00   1.872
SCS_24h_5       01/01/2000 14:15:00   1.872
SCS_24h_5       01/01/2000 14:30:00   1.872
SCS_24h_5       01/01/2000 14:45:00   1.872
SCS_24h_5       01/01/2000 15:00:00   1.872
SCS_24h_5       01/01/2000 15:15:00   1.872
SCS_24h_5       01/01/2000 15:30:00   1.872
SCS_24h_5       01/01/2000 15:45:00   1.872
SCS_24h_5       01/01/2000 16:00:00   1.123
SCS_24h_5       01/01/2000 16:15:00   1.123
SCS_24h_5       01/01/2000 16:30:00   1.123
SCS_24h_5       01/01/2000 16:45:00   1.123
SCS_24h_5       01/01/2000 17:00:00   1.123
SCS_24h_5       01/01/2000 17:15:00   1.123
SCS_24h_5       01/01/2000 17:30:00   1.123
SCS_24h_5       01/01/2000 17:45:00   1.123
SCS_24h_5       01/01/2000 18:00:00   1.123
SCS_24h_5       01/01/2000 18:15:00   1.123
SCS_24h_5       01/01/2000 18:30:00   1.123
SCS_24h_5       01/01/2000 18:45:00   1.123
SCS_24h_5       01/01/2000 19:00:00   1.123
SCS_24h_5       01/01/2000 19:15:00   1.123
SCS_24h_5       01/01/2000 19:30:00   1.123
SCS_24h_5       01/01/2000 19:45:00   1.123
SCS_24h_5       01/01/2000 20:00:00   0.749
SCS_24h_5       01/01/2000 20:15:00   0.749
SCS_24h_5       01/01/2000 20:30:00   0.749
SCS_24h_5       01/01/2000 20:45:00   0.749
SCS_24h_5       01/01/2000 21:00:00   0.749
SCS_24h_5       01/01/2000 21:15:00   0.749
SCS_24h_5       01/01/2000 21:30:00   0.749
SCS_24h_5       01/01/2000 21:45:00   0.749
SCS_24h_5       01/01/2000 22:00:00   0.749
SCS_24h_5       01/01/2000 22:15:00   0.749
SCS_24h_5       01/01/2000 22:30:00   0.749
SCS_24h_5       01/01/2000 22:45:00   0.749
SCS_24h_5       01/01/2000 23:00:00   0.749
SCS_24h_5       01/01/2000 23:15:00   0.749
SCS_24h_5       01/01/2000 23:30:00   0.749
SCS_24h_5       01/01/2000 23:45:00   0.749
SCS_24h_5       01/02/2000 00:00:00   0
```

```
[REPORT]
;;Reporting Options
INPUT     YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       ST4_108A_(P-Stm) EES_Manhole
Node       500_(C-STRM)     Manhole
Node       502_(C-STRM)     Manhole
Node       503_(C-STRM)     Manhole
Node       504_(C-STRM)     Manhole
Node       505_(C-STRM)     Manhole
Node       506_(C-STRM)     Manhole
Node       507_(C-STRM)     Manhole
Node       508_(C-STRM)     Manhole
Node       509_(C-STRM)     Manhole
Node       510_(C-STRM)     Manhole
Node       511_(C-STRM)     Manhole
Node       512_(C-STRM)     Manhole
Node       513_(C-STRM)     Manhole
Node       514_(C-STRM)     Manhole
Node       515_(C-STRM)     Manhole
Node       516_(C-STRM)     Manhole
Node       517_(C-STRM)     Manhole
Node       518_(C-STRM)     Manhole
Node       519_(C-STRM)     Manhole
Node       520_(C-STRM)     Manhole
Node       522_(C-STRM)     Manhole
Node       525_(C-STRM)     Manhole
Node       528_(C-STRM)     Manhole
Node       532_(C-STRM)     Manhole
Node       536_(C-STRM)     Manhole
Node       540_(C-STRM)     Manhole
Node       541_(C-STRM)     Manhole
Node       551_(C-STRM)     Manhole
Node       552_(C-STRM)     Manhole
Node       553_(C-STRM)     Manhole
Node       554_(C-STRM)     Manhole
Node       555_(C-STRM)     Manhole
Node       556_(C-STRM)     Manhole
Node       601_(C-STRM)     Manhole
Node       602_(C-STRM)     Manhole
Node       603_(C-STRM)     Manhole
Node       604_(C-STRM)     Manhole
Node       605_(C-STRM)     Manhole
Node       606_(C-STRM)     Manhole
Node       619_(C-STRM)     Manhole
Node       622_(C-STRM)     Manhole
Node       626_(C-STRM)     Manhole
Node       627_(C-STRM)     Manhole
Node       629_(C-STRM)     Manhole
Node       630_(C-STRM)     Manhole
Node       630A_(C-STRM)    Manhole
Node       645_(C-STRM)     Manhole
Node       647_(C-STRM)     Manhole
Node       650_(C-STRM)     Manhole
Node       651_(C-STRM)     Manhole
Node       MTD_(C-STRM)     Manhole
Node       OVERFLOW_(C-STRM) Manhole
Node       POND_(C-STRM)    Dry_Pond
Link       BDR-C1           RY_Swale
Link       BDR-C2           Storm_Sewer
Link       BDR-C3           Storm_Sewer
Link       BDR-C4           Storm_Sewer
Link       C1_1             Street
Link       C1_17            Street
Link       C1_3             Street
Link       C1_30            Street
Link       C1_4             Street
Link       C14_1            Street
Link       C14_2            Street
Link       C14_4            Street
Link       C14_5            Street
Link       C15_1            Street
Link       C15_2            Street
Link       C2               Street
Link       C20_1            Street
Link       C20_2            Street
Link       C20_3            Street
Link       C20_4            Street
Link       C20_5            Street
Link       C20_7            Street
Link       C23_5            Street
Link       C23_7            Street
Link       C3               Street
Link       C4               Street
Link       C4_1             Street
Link       C4_2             Street
Link       C4_3             Street
Link       C4_4             Street
Link       C4_5             Street
Link       C4_7             Street
Link       C5               Street
Link       C5_1             RY_Swale
Link       C5_10            RY_Swale
Link       C5_11            RY_Swale
Link       C5_12            RY_Swale
Link       C5_13            RY_Swale
Link       C5_14            RY_Swale
Link       C5_15            RY_Swale
Link       C5_16            RY_Swale
Link       C5_17            RY_Swale
Link       C5_19            RY_Swale
Link       C5_2             RY_Swale
Link       C5_20            RY_Swale
Link       C5_21            RY_Swale
Link       C5_23            RY_Swale
Link       C5_3             RY_Swale
Link       C5_4             RY_Swale
Link       C5_5             RY_Swale
Link       C5_6             RY_Swale
Link       C5_7             RY_Swale
Link       C5_8             RY_Swale
Link       C5_9             RY_Swale
Link       C6               Street
Link       C7               Street
Link       C9_1             Street
Link       C9_11            Street
Link       C9_2             Street
Link       C9_5             Street
Link       C9_6             Street
Link       C9_7             Street
Link       C-STRM-1_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-1_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-1_(C-STRM) Storm_Sewer
Link       C-STRM-100_(C-STRM) Storm_Sewer
Link       C-STRM-101_(C-STRM) Storm_Sewer
Link       C-STRM-102_(C-STRM) Storm_Sewer
Link       C-STRM-103_(C-STRM) Storm_Sewer
Link       C-STRM-104_(C-STRM) Storm_Sewer
Link       C-STRM-105_(C-STRM) Storm_Sewer
Link       C-STRM-2_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-2_(C-STRM) Storm_Sewer
Link       C-STRM-20_(C-STRM) Storm_Sewer
Link       C-STRM-21_(C-STRM) Storm_Sewer
Link       C-STRM-22_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-22_(C-STRM) Storm_Sewer
Link       C-STRM-26_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-26_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(2)_(C-STRM) Storm_Sewer
Link       C-STRM-3_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-33_(C-STRM) Storm_Sewer
```

```
Link       C-STRM-34_(1)_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-34_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-35_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-35_(C-STRM) Storm_Sewer
Link       C-STRM-4_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-4_(C-STRM) Storm_Sewer
Link       C-STRM-49_(C-STRM) Storm_Sewer
Link       C-STRM-50_(C-STRM) Storm_Sewer
Link       C-STRM-51_(C-STRM) Storm_Sewer
Link       C-STRM-52_(C-STRM) Storm_Sewer
Link       C-STRM-53_(C-STRM) Storm_Sewer
Link       C-STRM-57_(C-STRM) Storm_Sewer
Link       C-STRM-62_(C-STRM) Storm_Sewer
Link       C-STRM-63_(C-STRM) Storm_Sewer
Link       C-STRM-64_(C-STRM) Storm_Sewer
Link       C-STRM-74_(C-STRM) Storm_Sewer
Link       C-STRM-75_(C-STRM) Storm_Sewer
Link       C-STRM-76_(C-STRM) Storm_Sewer
Link       C-STRM-77_(C-STRM) Storm_Sewer
Link       C-STRM-78_(C-STRM) Storm_Sewer
Link       C-STRM-79_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-79_(C-STRM) Storm_Sewer
Link       C-STRM-8_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-8_(C-STRM) Storm_Sewer
Link       C-STRM-80_(C-STRM) Storm_Sewer
Link       C-STRM-81_(C-STRM) Storm_Sewer
Link       C-STRM-82_(C-STRM) Storm_Sewer
Link       C-STRM-83_(1)_(C-STRM) Storm_Sewer
Link       C-STRM-84_(C-STRM) Storm_Sewer
Link       CVR-C2             Storm_Sewer
Link       CVR-C3             Storm_Sewer
Link       CVR-C4             Storm_Sewer
Link       ST4-Pipe_-_(99)_(P-Stm) Storm_Sewer

[MAP]
DIMENSIONS       363434.49435     5009839.55145    365087.03865     5011228.00555
UNITS            Meters

[COORDINATES]
;;Node            X-Coord            Y-Coord
;;--------------- ------------------ ------------------
EXD_1              363523.116         5010675.315
EXD_10             364038.851         5010051.889
EXD_11             364016.337         5010040.163
EXD_12             363990.217         5010022.204
EXD_13             363545.642         5010624.076
EXD_14             364841.56          5010481.409
EXD_15             364717.597         5010413.683
EXD_16             364697.312         5010402.112
EXD_17             364604.456         5010349.047
EXD_18             364517.007         5010299.017
EXD_19             364420.804         5010243.977
EXD_2              363588.037         5010528.766
EXD_20             364409.655         5010237.617
EXD_21             364402.726         5010233.644
EXD_22             364344.695         5010200.434
EXD_23             364255.625         5010149.475
EXD_24             364165.921         5010098.154
EXD_25             364117.912         5010070.687
EXD_26             364105.512         5010063.593
EXD_27             363999.596         5010002.997
EXD_3              363626.696         5010441.857
EXD_4              363651.753         5010385.539
EXD_5              363658.48          5010370.423
EXD_6              363666.539         5010352.286
EXD_7              363709.017         5010256.795
EXD_8              363778.647         5010106.839
EXD_9              363787.705         5010093.248
J10                364247.385         5010323.091
J11                364286.855         5010345.797
J12                364349.244         5010381.71
J13                364411.648         5010417.805
J17                363531.156         5010658.126
J19                363995.184         5010318.827
J20                364000.312         5010377.594
J21                363999.193         5010429.343
J22                363987.73          5010505.7
J23                363966.088         5010576.248
J24                363990.083         5010589.935
J25                364214.239         5010527.758
J26                364167.64          5010608.364
J28                363675.681         5010762.717
J29                363843.098         5010829.951
J32                364131.728         5010670.484
J36                364187.041         5010427.855
J39                364251.791         5010462.799
J40                364290.486         5010483.682
J41                364379.195         5010473.997
J43                364353.873         5010517.891
J44                364381.226         5010532.652
J46                364442.4           5010567.06
J47                364523.272         5010613.702
J48                364338.273         5010606.938
J51                364295.32          5010681.224
J52                364434.208         5010843.371
J53                364403.026         5010825.579
J56                364293.659         5011089.835
J57                364110.049         5011030.083
J58                364128.526         5010994.585
J59                364157.602         5010923.619
J6                 363672.188         5010760.904
J61                364259.289         5010743.561
J62                364194.14          5010706.384
J74                364629.157         5010413.533
J9                 364185.116         5010287.047
OF1                364625.851         5010285.612
OF2                364312.059         5011164.894
OF3                364012.194         5009977.198
ST4_108A_(P-Stm)   364663.668         5010439.317
500_(C-STRM)       364422.96          5010478.18
500A_(C-STRM)      364419.596         5010510.993
502_(C-STRM)       364354.897         5010520.148
503_(C-STRM)       364379.13          5010533.226
504_(C-STRM)       364337.329         5010605.557
505_(C-STRM)       364295.528         5010677.889
506_(C-STRM)       364258.738         5010741.522
507_(C-STRM)       364234.325         5010783.742
508_(C-STRM)       364211.549         5010823.131
509_(C-STRM)       364188.774         5010862.521
510_(C-STRM)       364160.669         5010910.599
511_(C-STRM)       364155.768         5010924.293
512_(C-STRM)       364140.786         5010966.152
513_(C-STRM)       364127.885         5010992.484
514_(C-STRM)       364210.306         5011040.025
515_(C-STRM)       364292.72          5011087.562
516_(C-STRM)       364035.519         5010939.207
517_(C-STRM)       363943.721         5010886.258
518_(C-STRM)       363851.347         5010832.977
519_(C-STRM)       363756.631         5010810.077
520_(C-STRM)       363673.294         5010762.717
522_(C-STRM)       363595.501         5010717.988
525_(C-STRM)       364412.671         5010418.959
528_(C-STRM)       364347.719         5010381.47
532_(C-STRM)       364287.958         5010346.978
536_(C-STRM)       364245.952         5010322.735
540_(C-STRM)       364183.592         5010286.747
541_(C-STRM)       364159.735         5010328.102
551_(C-STRM)       364301.421         5010491.288
552_(C-STRM)       364248.399         5010462.673
553_(C-STRM)       364184.971         5010428.442
554_(C-STRM)       364122.253         5010393.065
555_(C-STRM)       364056.943         5010355.796
556_(C-STRM)       363991.633         5010318.528
601_(C-STRM)       364482.093         5010591.684
602_(C-STRM)       364441.661         5010568.335
603_(C-STRM)       364375.544         5010534.353
604_(C-STRM)       364335.269         5010606.125
605_(C-STRM)       364293.479         5010678.437
606_(C-STRM)       364255.934         5010743.374
619_(C-STRM)       364194.692         5010708.426
622_(C-STRM)       364129.69          5010671.012
626_(C-STRM)       363928.288         5010723.928
627_(C-STRM)       363958.963         5010656.807
629_(C-STRM)       364058.927         5010630.79
630_(C-STRM)       363988.165         5010590.568
630A_(C-STRM)      363964.389         5010577.003
631_(C-STRM)       363949.092         5010568.276
645_(C-STRM)       363986.018         5010506.45
647_(C-STRM)       364006.024         5010434.968
650_(C-STRM)       363998.837         5010378.48
651_(C-STRM)       363994.073         5010321.647
682_(C-STRM)       363998.21          5010225.034
MTD_(C-STRM)       364371.05          5010491.118
OVERFLOW_(C-STRM)  364404.398         5010510.356
POND_(C-STRM)      364498.36          5010563.548
S_525-MTD          364442.852         5010366.719
S_528-525          364377.751         5010329.41
S_532-528          364327.674         5010277.712
S_536-532          364286.321         5010255.089
S_540-536          364224.351         5010221.325
S_541-540          364099.803         5010293.902
S_604-603          364274.24          5010570.714
S_605-604          364367.074         5010720.438
S_619-606          364159.029         5010770.115
S_622-619          364165.586         5010608.919
S_622-619_2        364091.116         5010729.979
S_627-630          363937.463         5010644.576
S_629-622          364065.613         5010613.513
SU2                363932.758         5010747.839
SU5                364389.89          5010564.614

[VERTICES]
;;Link            X-Coord            Y-Coord
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C1_3               363773.977         5010814.786
C1_3               363775.084         5010815.399
C1_3               363776.211         5010815.973
C1_3               363777.357         5010816.509
C1_3               363778.52          5010817.005
C1_3               363779.7           5010817.461
C1_3               363780.895         5010817.876
C1_3               363782.103         5010818.251
C1_3               363783.323         5010818.583
C1_3               363784.554         5010818.874
C1_3               363785.795         5010819.123
C1_3               363787.043         5010819.329
C1_3               363788.297         5010819.493
C1_3               363789.556         5010819.613
C1_3               363790.819         5010819.69
C1_3               363792.083         5010819.724
C1_3               363793.348         5010819.715
C1_3               363816.075         5010819.162
C1_3               363818.222         5010819.146
C1_3               363820.465         5010819.624
C1_30              364208.363         5010537.922
C1_4               364220.378         5010517.137
C14_1              364000.022         5010369.727
C14_1              363998.978         5010352.709
C14_1              363997.365         5010335.736
C14_2              363971.222         5010562.422
C14_2              363975.957         5010548.454
C14_2              363980.287         5010534.356
C14_2              363984.21          5010520.139
C14_2              363987.122         5010508.318
C14_4              363989.773         5010496.436
C14_4              363992.991         5010479.793
C14_4              363995.623         5010463.049
C14_4              363997.668         5010446.222
C14_4              363998.869         5010433.561
C14_5              363999.731         5010420.873
C14_5              364000.263         5010408.535
C14_5              364000.516         5010396.188
C14_5              364000.44          5010382.954
C15_1              364091.674         5010973.328
C15_1              364106.149         5010981.677
C15_2              364153.343         5011008.899
C2                 364379.611         5010478.064
C2                 364371.338         5010493.496
C2                 364403.395         5010511.633
C20_2              364161.53          5010912.645
C20_2              364250.238         5010759.198
C20_3              364141.663         5010968.153
C20_4              364268.256         5010728.031
C20_7              364353.098         5010581.365
C4_1               363980.427         5010584.43
C4_2               364183.673         5010700.411
C4_2               364142.063         5010676.667
C4_3               364001.387         5010596.379
C4_3               364121.452         5010664.336
C4_4               364246.209         5010736.097
C4_4               364204.518         5010712.307
C4_5               364392.579         5010819.617
C4_5               364272.265         5010750.966
C4_7               364413.424         5010831.512
C5_7               363789.039         5010091.265
C5_7               363802.192         5010079.471
C5_7               363813.669         5010072.537
C5_7               363825.679         5010066.691
C5_7               363840.94          5010061.958
C5_7               363864.357         5010056.76
C5_7               363876.87          5010055.251
C5_7               363887.195         5010055.348
C5_7               363901.318         5010056.021
C5_7               363914.863         5010060.481
C5_7               363932.176         5010068.767
C5_7               363946.777         5010076.486
C5_7               363960.84          5010083.659
C5_7               363974.923         5010088.665
C5_7               363987.416         5010089.323
C5_7               363998.838         5010088.346
C5_7               364010.29          5010084.12
C5_7               364017.938         5010079.859
C5_7               364028.369         5010068.582
C5_8               363763.947         5010133.327
C5_8               363771.398         5010118.164
C5_9               364014.514         5010039.222
C5_9               364006.956         5010033.735
C9_2               364203.937         5010436.973
C9_2               364227.099         5010449.473
C9_5               364267.326         5010471.183
C9_7               364357.17          5010519.67
CVR-C3             363779.67          5010105.251
W1                 364422.438         5010519.126
W1                 364490.621         5010563.365
OR2                364507.263         5010561.68
OR2                364628.084         5010422.226
W10                364278.556         5010259.873
W10                364245.514         5010315.841
W11                364326.966         5010286.527
W11                364295.391         5010343.218
W12                364378.56          5010332.831
W12                364350.949         5010380.737
W13                364438.641         5010367.932
W13                364411.204         5010414.652
W14                364068.136         5010615.627
W14                364062.778         5010628.889
W14                364128.281         5010666.128
W2                 364493.036         5010516.107
W3                 363941.169         5010641.577
W3                 363956.781         5010650.944
W3                 363981.315         5010597.639
W4                 364097.441         5010729.963
W4                 364131.629         5010676.287
W5                 364158.361         5010766.362
W5                 364191.297         5010709.352
W6                 364363.635         5010720.716
W6                 364298.364         5010684.164
W7                 364272.282         5010559.5
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W8	364109.836	5010289.219
W8	364157.657	5010317.978
W8	364180.294	5010281.944
W9	364222.049	5010230.214
W9	364186.874	5010285.932
C-STRM-71_(C-STRM)	363964.562	5010283.999
C-STRM-71_(C-STRM)	363980.033	5010313.635
OL12	364291.059	5010484.71
OL12	364300.789	5010489.899
OL15	363669.35	5010760.933
OL16	363845.444	5010829.746

[POLYGONS]

;;Subcatchment	X-Coord	Y-Coord
A15	364037.764	5010035.039
A15	364004.509	5010016.614
A15	363986.262	5010006.695
A15	363832.867	5009921.509
A15	363832.016	5009921.929
A15	363829.759	5009925.311
A15	363774.763	5010048.268
A15	363761.116	5010080.924
A15	363756.121	5010092.248
A15	363750.912	5010105.316
A15	363746.492	5010114.767
A15	363744.889	5010116.794
A15	363743.59	5010117.42
A15	363738.867	5010118.859
A15	363735.867	5010120.327
A15	363733.237	5010123.005
A15	363730.673	5010126.942
A15	363725.151	5010137.44
A15	363723.376	5010142.141
A15	363722.656	5010146.055
A15	363722.879	5010150.559
A15	363722.223	5010154.636
A15	363720.917	5010158.654
A15	363717.434	5010165.582
A15	363710.007	5010176.356
A15	363706.885	5010182.126
A15	363703.912	5010189.807
A15	363700.208	5010201.529
A15	363690.505	5010223.458
A15	363684.649	5010233.154
A15	363664.318	5010273.477
A15	363661.822	5010279.156
A15	363656.05	5010295.612
A15	363648.019	5010315.664
A15	363638.733	5010333.232
A15	363627.151	5010356.813
A15	363612.034	5010382.803
A15	363593.462	5010425.992
A15	363587.264	5010440.039
A15	363582.618	5010453.255
A15	363578.389	5010460.527
A15	363572.058	5010472.903
A15	363570.17	5010477.437
A15	363568.142	5010485.967
A15	363565.388	5010491.879
A15	363560.73	5010500.656
A15	363557.915	5010504.972
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A15	363554.528	5010516.833
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A15	363548.442	5010537.752
A15	363546.206	5010542.645
A15	363539.414	5010553.926
A15	363536.391	5010561.16
A15	363535.157	5010566.868
A15	363535.83	5010578.386
A15	363535.08	5010584.947
A15	363532.989	5010593.502
A15	363527.545	5010606.492
A15	363531.32	5010608.002
A15	363534.158	5010609.413
A15	363537.862	5010610.458
A15	363540.849	5010611.885
A15	363568.656	5010548.877
A15	363576.911	5010530.82
A15	363584.377	5010513.469
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A15	363599.329	5010479.331
A15	363607.597	5010461.436
A15	363617.678	5010437.861
A15	363625.78	5010420.178
A15	363634.141	5010400.778
A15	363641.86	5010383.842
A15	363646.031	5010374.165
A15	363666.132	5010328.378
A15	363675.105	5010308.38
A15	363699.137	5010253.377
A15	363706.096	5010238.127
A15	363732.551	5010177.973
A15	363742.127	5010156.786
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A15	363757.96	5010120.307
A15	363768.347	5010102.317
A15	363776.11	5010092.148
A15	363781.126	5010086.653
A15	363792.639	5010075.548
A15	363795.347	5010073.155
A15	363802.742	5010067.553
A15	363811.457	5010061.928
A15	363819.874	5010057.3
A15	363828.418	5010053.362
A15	363832.143	5010051.981
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A15	363926.1	5010053.927
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A18	364150.62	5010079.587
A18	364117.153	5010060.501
A19	364411.564	5010228.509
A19	364402.544	5010244.433
A19	364705.012	5010418.059
A19	364766.81	5010313.871
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A19	364818.235	5010234.711
A19	364806.13	5010226.482
A19	364746.471	5010291.981
A19	364731.528	5010311.029
A19	364727.495	5010316.605
A19	364694.52	5010380.779
A19	364691.028	5010386.945
A19	364686.916	5010388.687
A19	364660.781	5010374.906
A19	364602.37	5010340.308
A19	364557.544	5010314.916
A19	364510.443	5010286.293
A19	364475.17	5010265.017
A19	364436.354	5010243.894
A19	364411.564	5010228.509
A20	364917.818	5010540.216
A20	364919.096	5010523.53
A20	364915.033	5010508.607
A20	364905.906	5010498.575
A20	364901.516	5010481.438
A20	364906.66	5010445.431
A20	364912.849	5010434.467
A20	364924.508	5010430.583
A20	364933.013	5010431.942
A20	364933.685	5010431.378
A20	364934.376	5010430.837
A20	364935.085	5010430.32
A20	364935.811	5010429.827
A20	364936.554	5010429.359
A20	364937.312	5010428.917
A20	364938.085	5010428.501
A20	364938.871	5010428.112
A20	364939.67	5010427.749
A20	364940.482	5010427.414
A20	364941.304	5010427.107
A20	364942.136	5010426.828
A20	364942.977	5010426.578
A20	364943.826	5010426.356
A20	364944.682	5010426.163
A20	364945.545	5010426
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S5	363847.545	5010063.216
S5	363843.716	5010064.282
S5	363839.926	5010065.481
S5	363836.18	5010066.809
S5	363832.482	5010068.266
S5	363828.837	5010069.85
S5	363825.249	5010071.559
S5	363821.722	5010073.392
S5	363818.26	5010075.345
S5	363814.868	5010077.416
S5	363811.55	5010079.604
S5	363808.309	5010081.905
S5	363805.15	5010084.316
S5	363802.075	5010086.836
S5	363799.09	5010089.46
S5	363796.198	5010092.185
S5	363793.401	5010095.009

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S5                363790.703          5010097.928
S5                363788.109          5010100.939
S5                363785.619          5010104.037
S5                363783.238          5010107.22
S5                363783.656          5010107.616
S5                363784.06           5010108.025
S5                363784.449          5010108.449
S5                363784.823          5010108.886
S5                363785.182          5010109.335
S5                363785.526          5010109.797
S5                363785.853          5010110.27
S5                363786.163          5010110.754
S5                363786.457          5010111.249
S5                363786.733          5010111.754
S5                363786.991          5010112.268
S5                363787.232          5010112.79
S5                363787.454          5010113.321
S5                363787.658          5010113.859
S5                363787.843          5010114.403
S5                363788.009          5010114.954
S5                363788.156          5010115.51
S5                363788.284          5010116.071
S5                363788.392          5010116.636
S5                363788.48           5010117.204
S5                363788.549          5010117.776
S5                363788.598          5010118.349
S5                363788.627          5010118.923
S5                363788.636          5010119.498
S5                363788.625          5010120.074
S5                363788.594          5010120.648
S5                363788.543          5010121.221
S5                363788.473          5010121.792
S5                363788.383          5010122.36
S5                363788.273          5010122.925
S5                363788.143          5010123.485
S5                363787.995          5010124.041
S5                363787.827          5010124.591
S5                363787.64           5010125.135
S5                363787.435          5010125.672
S5                363787.211          5010126.202
S5                363786.969          5010126.724
S5                363786.708          5010127.237
S5                363786.431          5010127.741
S5                363786.136          5010128.235
S5                363785.824          5010128.718
S5                363785.495          5010129.19
S5                363785.151          5010129.651
S5                363784.79           5010130.099
S5                363784.414          5010130.535
S5                363784.024          5010130.957
S5                363994.647          5010253.029
S6                364429.798          5010851.217
S6                364417.982          5010844.474
S6                364301.877          5011048.398
S6                364303.152          5011049.134
S6                364296.407          5011060.828
S6                364300.154          5011078.574
S6                364429.798          5010851.217
S7                364379.087          5010517.862
S7                364391.565          5010524.596
S7                364410.371          5010534.745
S7                364529.321          5010603.324
S7                364644.753          5010403.592
S7                364494.568          5010317.776
S7                364379.087          5010517.862
S8                364517.322          5010624.109
S8                364398.973          5010555.866
S8                364387.353          5010553.493
S8                364378.472          5010561.358
S8                364325.76           5010652.538
S8                364489.722          5010746.104
S8                364503.482          5010721.973
S8                364471.467          5010703.429
S8                364517.322          5010624.109

;;Storage Node   X-Coord             Y-Coord
;;--------------- ------------------ ------------------

[SYMBOLS]
;;Gage            X-Coord             Y-Coord
;;--------------- ------------------ ------------------
```

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                    Data       Recording
  Name                Data Source                   Type       Interval
  ------------------------------------------------------------------------
  24SCS100            24SCS100                      INTENSITY  15 min.
  6SCS050             6SCS050                       INTENSITY  15 min.
  Rainfall            SCS_24h_2                     INTENSITY  15 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------
---------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall             EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall             EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall             EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall             EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall             EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall             S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall             J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall             J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall             J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall             J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall             S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall             S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall             S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall             S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall             SU2
  S12                  0.44    334.74     71.43    2.0000 Rainfall             J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall             J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall             J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall             J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall             J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall             J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall             J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall             J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall             S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall             EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall             EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall             S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall             S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall             S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall             S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall             S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall             J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall             S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall             J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall             J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall             S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall             J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall             EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall             OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall             SU5


  ************
  Node Summary
  ************
                                    Invert      Max.    Ponded    External
  Name                Type           Elev.     Depth      Area    Inflow
  ------------------------------------------------------------------------
  EXD_1               JUNCTION      104.39      1.51       0.0
  EXD_10              JUNCTION       98.65      1.20       0.0
  EXD_11              JUNCTION       98.50      1.20       0.0
  EXD_12              JUNCTION       98.31      1.20       0.0
  EXD_13              JUNCTION      104.32      1.10       0.0
  EXD_14              JUNCTION      102.49      0.80       0.0
  EXD_15              JUNCTION      100.27      0.80       0.0
  EXD_16              JUNCTION      100.20      0.80       0.0
  EXD_17              JUNCTION       99.89      0.80       0.0
  EXD_18              JUNCTION       99.40      0.84       0.0
  EXD_19              JUNCTION       99.19      0.88       0.0
  EXD_2               JUNCTION      103.47      1.93       0.0
  EXD_20              JUNCTION       99.19      0.88       0.0
  EXD_21              JUNCTION       99.18      0.88       0.0
  EXD_22              JUNCTION       99.14      0.88       0.0
  EXD_23              JUNCTION       98.75      1.14       0.0
  EXD_24              JUNCTION       98.67      1.14       0.0
  EXD_25              JUNCTION       98.52      1.13       0.0
  EXD_26              JUNCTION       98.48      1.13       0.0
  EXD_27              JUNCTION       98.17      1.20       0.0
  EXD_3               JUNCTION      103.19      1.41       0.0
  EXD_4               JUNCTION      102.64      1.20       0.0
  EXD_5               JUNCTION      102.50      1.20       0.0
  EXD_6               JUNCTION      102.32      1.08       0.0
  EXD_7               JUNCTION      101.50      1.06       0.0
  EXD_8               JUNCTION      100.48      1.06       0.0
  EXD_9               JUNCTION      100.39      1.06       0.0
  J10                 JUNCTION      103.60      0.50       0.0
  J11                 JUNCTION      103.50      0.50       0.0
```

J12	JUNCTION	103.40	0.50	0.0
J13	JUNCTION	103.30	0.50	0.0
J17	JUNCTION	104.37	1.04	0.0
J19	JUNCTION	105.40	0.50	0.0
J20	JUNCTION	105.45	0.50	0.0
J21	JUNCTION	105.55	0.50	0.0
J22	JUNCTION	105.70	0.50	0.0
J23	JUNCTION	106.00	0.50	0.0
J24	JUNCTION	106.20	0.50	0.0
J25	JUNCTION	105.30	0.50	0.0
J26	JUNCTION	105.70	0.50	0.0
J28	JUNCTION	109.00	0.50	0.0
J29	JUNCTION	108.80	0.50	0.0
J32	JUNCTION	106.00	0.50	0.0
J36	JUNCTION	104.70	0.50	0.0
J39	JUNCTION	104.60	0.50	0.0
J40	JUNCTION	104.45	0.50	0.0
J41	JUNCTION	103.20	0.50	0.0
J43	JUNCTION	104.20	0.50	0.0
J44	JUNCTION	104.50	0.50	0.0
J46	JUNCTION	104.60	0.50	0.0
J47	JUNCTION	105.10	0.50	0.0
J48	JUNCTION	105.75	0.50	0.0
J51	JUNCTION	106.75	0.50	0.0
J52	JUNCTION	109.75	0.50	0.0
J53	JUNCTION	109.00	0.50	0.0
J56	JUNCTION	109.10	0.50	0.0
J57	JUNCTION	108.47	0.50	0.0
J58	JUNCTION	108.40	0.50	0.0
J59	JUNCTION	108.00	0.50	0.0
J6	JUNCTION	109.83	0.30	0.0
J61	JUNCTION	107.00	0.50	0.0
J62	JUNCTION	106.50	0.50	0.0
J74	JUNCTION	98.45	0.90	0.0
J9	JUNCTION	103.70	0.50	0.0
OF1	OUTFALL	100.80	0.00	0.0
OF2	OUTFALL	0.00	0.00	0.0
OF3	OUTFALL	98.00	1.06	0.0
ST4_108A_(P-Stm)	OUTFALL	98.02	1.19	0.0
500_(C-STRM)	STORAGE	100.31	2.84	0.0
500A_(C-STRM)	STORAGE	100.10	1.00	0.0
502_(C-STRM)	STORAGE	100.54	3.70	0.0
503_(C-STRM)	STORAGE	100.59	3.92	0.0
504_(C-STRM)	STORAGE	103.04	2.70	0.0
505_(C-STRM)	STORAGE	103.45	3.26	0.0
506_(C-STRM)	STORAGE	103.82	3.16	0.0
507_(C-STRM)	STORAGE	104.14	3.10	0.0
508_(C-STRM)	STORAGE	104.37	3.12	0.0
509_(C-STRM)	STORAGE	104.60	3.14	0.0
510_(C-STRM)	STORAGE	104.85	3.09	0.0
511_(C-STRM)	STORAGE	104.91	3.08	0.0
512_(C-STRM)	STORAGE	105.11	3.12	0.0
513_(C-STRM)	STORAGE	105.24	3.14	0.0
514_(C-STRM)	STORAGE	105.59	3.16	0.0
515_(C-STRM)	STORAGE	105.85	3.24	0.0
516_(C-STRM)	STORAGE	105.46	3.06	0.0
517_(C-STRM)	STORAGE	105.62	3.03	0.0
518_(C-STRM)	STORAGE	105.85	2.92	0.0
519_(C-STRM)	STORAGE	106.08	2.82	0.0
520_(C-STRM)	STORAGE	106.34	2.66	0.0
522_(C-STRM)	STORAGE	104.31	3.00	0.0
525_(C-STRM)	STORAGE	100.61	2.69	0.0
528_(C-STRM)	STORAGE	100.72	2.68	0.0
532_(C-STRM)	STORAGE	100.83	2.67	0.0
536_(C-STRM)	STORAGE	100.98	2.63	0.0
540_(C-STRM)	STORAGE	100.86	2.85	0.0
541_(C-STRM)	STORAGE	100.93	2.89	0.0
551_(C-STRM)	STORAGE	100.65	3.78	0.0
552_(C-STRM)	STORAGE	100.74	3.88	0.0
553_(C-STRM)	STORAGE	100.93	3.78	0.0
554_(C-STRM)	STORAGE	101.05	3.89	0.0
555_(C-STRM)	STORAGE	101.25	3.93	0.0
556_(C-STRM)	STORAGE	101.37	3.89	0.0
601_(C-STRM)	STORAGE	100.45	4.43	0.0
602_(C-STRM)	STORAGE	100.52	4.11	0.0
603_(C-STRM)	STORAGE	100.63	3.89	0.0
604_(C-STRM)	STORAGE	100.88	4.87	0.0
605_(C-STRM)	STORAGE	101.09	5.63	0.0
606_(C-STRM)	STORAGE	101.24	5.75	0.0
619_(C-STRM)	STORAGE	101.38	5.14	0.0
622_(C-STRM)	STORAGE	101.53	4.49	0.0
626_(C-STRM)	STORAGE	103.94	3.33	0.0
627_(C-STRM)	STORAGE	103.13	3.58	0.0
629_(C-STRM)	STORAGE	101.65	4.46	0.0
630_(C-STRM)	STORAGE	102.08	4.12	0.0
630A_(C-STRM)	STORAGE	102.12	3.90	0.0
631_(C-STRM)	STORAGE	106.00	0.50	0.0
645_(C-STRM)	STORAGE	102.03	3.69	0.0
647_(C-STRM)	STORAGE	102.14	3.40	0.0
650_(C-STRM)	STORAGE	102.22	3.19	0.0
651_(C-STRM)	STORAGE	102.31	3.03	0.0
682_(C-STRM)	STORAGE	105.40	0.50	0.0
MTD_(C-STRM)	STORAGE	100.37	3.19	0.0
OVERFLOW_(C-STRM)	STORAGE	100.18	2.76	0.0
POND_(C-STRM)	STORAGE	98.45	2.65	0.0 Yes
S_525-MTD	STORAGE	103.30	0.50	0.0
S_528-525	STORAGE	103.41	0.50	0.0
S_532-528	STORAGE	103.50	0.50	0.0
S_536-532	STORAGE	103.60	0.50	0.0
S_540-536	STORAGE	103.71	0.50	0.0
S_541-540	STORAGE	103.81	0.50	0.0
S_604-603	STORAGE	105.50	0.50	0.0
S_605-604	STORAGE	106.71	0.50	0.0
S_619-606	STORAGE	106.50	0.50	0.0
S_622-619	STORAGE	106.70	0.50	0.0
S_622-619_2	STORAGE	106.50	0.50	0.0
S_627-630	STORAGE	106.70	0.50	0.0
S_629-622	STORAGE	106.01	0.50	0.0
SU2	STORAGE	106.75	0.50	0.0
SU5	STORAGE	104.18	0.50	0.0

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
BDR-C1	EXD_15	EXD_16	CONDUIT	17.7	0.3844	0.0250
BDR-C2	EXD_20	EXD_21	CONDUIT	7.9	0.0632	0.0130
BDR-C3	EXD_25	EXD_26	CONDUIT	14.2	0.2683	0.0130
BDR-C4	EXD_12	EXD_27	CONDUIT	23.0	0.6077	0.0130
C1_1	J32	J26	CONDUIT	71.8	0.4181	0.0130
C1_17	J6	EXD_1	CONDUIT	171.9	2.4608	0.0130
C1_3	J28	J29	CONDUIT	183.6	0.1090	0.0130
C1_30	J26	J25	CONDUIT	93.1	0.4296	0.0130
C1_4	J25	J39	CONDUIT	75.0	0.9329	0.0130
C14_1	J20	J19	CONDUIT	59.0	0.0847	0.0130
C14_2	J23	J22	CONDUIT	73.9	0.4062	0.0130
C14_4	J22	J21	CONDUIT	77.3	0.1941	0.0130
C14_5	J21	J20	CONDUIT	51.8	0.1931	0.0130
C15_1	J29	J58	CONDUIT	329.5	0.1214	0.0130
C15_2	J56	J58	CONDUIT	190.6	0.3672	0.0130
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679	0.0100
C20_1	J57	J58	CONDUIT	40.0	0.1749	0.0130
C20_2	J59	J61	CONDUIT	207.0	0.4831	0.0130
C20_3	J58	J59	CONDUIT	76.8	0.5207	0.0130
C20_4	J61	J51	CONDUIT	72.0	0.3472	0.0130
C20_5	J51	J48	CONDUIT	85.8	1.1654	0.0130
C20_7	J48	J44	CONDUIT	85.8	1.4568	0.0130
C23_5	J13	J41	CONDUIT	64.4	0.1553	0.0130
C23_7	J43	J41	CONDUIT	50.7	1.9737	0.0130
C3	J9	J10	CONDUIT	72.0	0.1390	0.0100
C4	J10	J11	CONDUIT	45.5	0.2196	0.0100
C4_1	J24	J23	CONDUIT	27.6	0.7240	0.0130
C4_2	J62	J32	CONDUIT	72.0	0.6944	0.0130
C4_3	J24	J32	CONDUIT	163.0	0.1227	0.0130
C4_4	J61	J62	CONDUIT	75.0	0.6666	0.0130
C4_5	J53	J61	CONDUIT	165.5	1.2085	0.0130
C4_7	J52	J53	CONDUIT	35.9	2.0894	0.0130
C5	J11	J12	CONDUIT	72.0	0.1388	0.0100
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054	0.0250
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866	0.0250
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893	0.0250
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098	0.0250
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876	0.0250
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550	0.0250
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893	0.0250
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781	0.0250
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645	0.0250
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558	0.0250
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933	0.0250
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645	0.0250
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626	0.0250
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299	0.0250
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195	0.0250
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880	0.0250
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893	0.0250
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871	0.0250
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091	0.0250
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095	0.0250
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087	0.0250
C6	J12	J13	CONDUIT	71.9	0.1390	0.0100
C7	J46	J44	CONDUIT	70.2	0.1425	0.0130
C9_1	J19	J36	CONDUIT	220.7	0.3172	0.0130
C9_11	J47	J46	CONDUIT	93.4	0.5355	0.0130
C9_2	J36	J39	CONDUIT	45.5	0.2197	0.0130
C9_5	J39	J40	CONDUIT	44.0	0.3411	0.0130
C9_6	J40	J43	CONDUIT	72.0	0.3471	0.0130
C9_7	J44	J43	CONDUIT	31.1	0.9652	0.0130
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998	0.0130
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500	0.0130
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500	0.0130
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007	0.0130
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531	0.0130
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996	0.0100
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493	0.0130
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495	0.0130
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504	0.0130
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498	0.0130
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502	0.0130
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000	0.0130
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001	0.0130
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499	0.0130
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499	0.0130
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596	0.0130
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610	0.0130
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT	73.5	0.5007	0.0130
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	0.5003	0.0130
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	0.4989	0.0130
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011	0.0130
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489	0.0130
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538	0.0130
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508	0.0130
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	0.1596	0.0130
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596	0.0130
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596	0.0130

C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.38
C-STRM-1_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.33
C-STRM-1_(C-STRM)	CIRCULAR	0.60	0.28	0.15	0.60	1	0.24
C-STRM-100_(C-STRM)	CIRCULAR	0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM)	CIRCULAR	0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.56
C-STRM-2_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM)	CIRCULAR	0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM)	CIRCULAR	0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	4.45
C-STRM-22_(C-STRM)	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.34
C-STRM-26_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.79
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.59
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.59
C-STRM-3_(1)_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.60
C-STRM-3_(1)_(2)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.56
C-STRM-3_(1)_(C-STRM)	CIRCULAR	0.68	0.36	0.17	0.68	1	0.57
C-STRM-33_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM)	CIRCULAR	0.53	0.22	0.13	0.53	1	0.17
C-STRM-34_(1)_(C-STRM)	CIRCULAR	0.53	0.22	0.13	0.53	1	0.17
C-STRM-35_(1)_(C-STRM)	CIRCULAR	0.60	0.28	0.15	0.60	1	0.25
C-STRM-35_(C-STRM)	CIRCULAR	0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.86
C-STRM-4_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM)	CIRCULAR	0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM)	CIRCULAR	0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM)	CIRCULAR	0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM)	CIRCULAR	0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	6.30
C-STRM-79_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM)	CIRCULAR	0.53	0.22	0.13	0.53	1	0.19
C-STRM-8_(C-STRM)	CIRCULAR	0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM)	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
C-STRM-84_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm)	CIRCULAR	0.90	0.64	0.23	0.90	1	0.96
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

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Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3429	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120

0.0186 0.0260 0.0341 0.0428 0.0523
0.0626 0.0736 0.0854 0.0979 0.1110
0.1249 0.1397 0.1578 0.1780 0.1990
0.2203 0.2420 0.2642 0.2867 0.3095
0.3327 0.3562 0.3798 0.4037 0.4277
0.4520 0.4765 0.5012 0.5261 0.5512
0.5765 0.6020 0.6278 0.6540 0.6807
0.7080 0.7357 0.7640 0.7931 0.8231
0.8541 0.8865 0.9207 0.9573 1.0000

Hrad:
0.0256 0.0511 0.0767 0.1022 0.1074
0.1357 0.1722 0.2069 0.2401 0.2711
0.3004 0.3302 0.3603 0.3898 0.4189
0.4476 0.4415 0.4190 0.4388 0.4798
0.5199 0.5592 0.5977 0.6356 0.6728
0.7128 0.7535 0.7938 0.8334 0.8726
0.9113 0.9495 0.9872 1.0245 1.0613
1.0977 1.1337 1.1646 1.1879 1.2112
1.2344 1.2576 1.2751 1.2829 1.2917
1.2903 1.2812 1.2529 1.2104 1.0000

Width:
0.0187 0.0374 0.0561 0.0748 0.1175
0.1437 0.1580 0.1723 0.1866 0.2018
0.2178 0.2330 0.2475 0.2621 0.2767
0.2912 0.3305 0.3942 0.4243 0.4322
0.4400 0.4479 0.4557 0.4636 0.4714
0.4767 0.4810 0.4853 0.4895 0.4938
0.4981 0.5023 0.5066 0.5109 0.5152
0.5194 0.5237 0.5304 0.5408 0.5513
0.5617 0.5722 0.5855 0.6041 0.6226
0.6472 0.6774 0.7214 0.7794 1.0000

Transect Barnsdale_UPST3
Area:
0.0027 0.0069 0.0125 0.0193 0.0272
0.0363 0.0466 0.0579 0.0700 0.0826
0.0959 0.1097 0.1240 0.1388 0.1542
0.1700 0.1863 0.2031 0.2203 0.2379
0.2560 0.2741 0.2941 0.3141 0.3347
0.3558 0.3771 0.3985 0.4201 0.4418
0.4636 0.4856 0.5078 0.5301 0.5527
0.5758 0.5993 0.6232 0.6476 0.6725
0.6978 0.7237 0.7501 0.7771 0.8071
0.8402 0.8745 0.9118 0.9532 1.0000

Hrad:
0.0392 0.0744 0.1058 0.1366 0.1672
0.1959 0.2240 0.2580 0.2951 0.3310
0.3684 0.4055 0.4418 0.4773 0.5121
0.5462 0.5798 0.6159 0.6517 0.6870
0.7143 0.7404 0.7665 0.7925 0.8185
0.8566 0.8974 0.9376 0.9773 1.0164
1.0550 1.0931 1.1307 1.1674 1.1903
1.2133 1.2361 1.2590 1.2818 1.3028
1.3220 1.3414 1.3608 1.3804 1.2136
1.2174 1.2098 1.1515 1.0615 1.0000

Width:
0.0725 0.0983 0.1241 0.1486 0.1712
0.1949 0.2186 0.2358 0.2487 0.2616
0.2724 0.2826 0.2929 0.3031 0.3133
0.3235 0.3337 0.3419 0.3500 0.3580
0.3702 0.3830 0.3958 0.4086 0.4214
0.4264 0.4294 0.4323 0.4353 0.4382
0.4412 0.4442 0.4471 0.4503 0.4593
0.4683 0.4773 0.4863 0.4953 0.5050
0.5156 0.5261 0.5367 0.5473 0.6537
0.6785 0.7115 0.7829 0.8936 1.0000

Transect Barnsdale_UPST4
Area:
0.0019 0.0059 0.0112 0.0176 0.0253
0.0342 0.0443 0.0558 0.0685 0.0822
0.0971 0.1134 0.1308 0.1486 0.1667
0.1851 0.2037 0.2227 0.2420 0.2614
0.2810 0.3009 0.3209 0.3410 0.3614
0.3820 0.4028 0.4237 0.4448 0.4662
0.4877 0.5313 0.5534 0.5759 0.5989
0.5987 0.6218 0.6452 0.6689 0.6930
0.7173 0.7420 0.7676 0.7942 0.8219
0.8514 0.8839 0.9202 0.9581 1.0000

Hrad:
0.0280 0.0647 0.0967 0.1263 0.1549
0.1817 0.2078 0.2337 0.2601 0.2914
0.3149 0.3726 0.4140 0.4543 0.4941
0.4937 0.5323 0.5700 0.6090 0.6481
0.6864 0.7241 0.7612 0.7976 0.8335
0.8688 0.9036 0.9379 0.9716 1.0049
1.0377 1.0701 1.1011 1.1277 1.1541
1.1801 1.2060 1.2316 1.2570 1.2823
1.3073 1.3203 1.3149 1.3115 1.2912
1.2608 1.1459 1.1371 1.1279 1.0000

Width:
0.0734 0.0994 0.1255 0.1515 0.1772
0.2041 0.2314 0.2587 0.2854 0.3056
0.3340 0.3624 0.3786 0.3849 0.3912
0.3975 0.4038 0.4101 0.4147 0.4188
0.4228 0.4269 0.4309 0.4350 0.4390
0.4430 0.4471 0.4511 0.4552 0.4592
0.4633 0.4673 0.4719 0.4786 0.4852
0.4919 0.4986 0.5052 0.5119 0.5186
0.5252 0.5375 0.5591 0.5808 0.6126
0.6529 0.7560 0.7953 0.8372 1.0000

Transect Barnsdale_UPST5
Area:
0.0011 0.0046 0.0104 0.0185 0.0278
0.0383 0.0495 0.0612 0.0736 0.0865
0.1000 0.1141 0.1288 0.1443 0.1606
0.1778 0.1959 0.2143 0.2330 0.2518
0.2709 0.2903 0.3099 0.3296 0.3497
0.3699 0.3904 0.4111 0.4319 0.4530
0.4743 0.4958 0.5175 0.5395 0.5616
0.5839 0.6064 0.6292 0.6521 0.6753
0.6991 0.7235 0.7484 0.7740 0.8019
0.8364 0.8742 0.9142 0.9560 1.0000

Hrad:
0.0248 0.0493 0.0735 0.1040 0.1389
0.1735 0.2124 0.2498 0.2859 0.3209
0.3550 0.3881 0.4187 0.4434 0.4680
0.4924 0.5212 0.5606 0.5992 0.6372
0.6745 0.7111 0.7472 0.7827 0.8176
0.8520 0.8860 0.9202 0.9539 0.9872
1.0201 1.0525 1.0845 1.1162 1.1474
1.1784 1.2090 1.2392 1.2691 1.2876
1.2994 1.3117 1.3244 1.3163 1.1702
1.0461 1.0307 1.0260 1.0309 1.0000

Width:
0.0497 0.0999 0.1518 0.1903 0.2141
0.2355 0.2481 0.2607 0.2733 0.2859
0.2985 0.3111 0.3252 0.3438 0.3625
0.3813 0.3961 0.4010 0.4059 0.4108
0.4157 0.4206 0.4255 0.4303 0.4352
0.4401 0.4450 0.4494 0.4538 0.4583
0.4627 0.4672 0.4716 0.4761 0.4805
0.4850 0.4894 0.4938 0.4983 0.5078
0.5204 0.5330 0.5457 0.5684 0.6711
0.7919 0.8423 0.8866 0.9238 1.0000

Transect Barnsdale_UPST6
Area:
0.0014 0.0054 0.0102 0.0156 0.0217
0.0284 0.0356 0.0434 0.0517 0.0605
0.0698 0.0796 0.0899 0.1007 0.1121
0.1243 0.1373 0.1512 0.1656 0.1807
0.1962 0.2123 0.2291 0.2483 0.2703
0.2945 0.3189 0.3434 0.3680 0.3929
0.4178 0.4430 0.4687 0.4947 0.5212
0.5482 0.5760 0.6046 0.6335 0.6626
0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000

Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000

Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000

Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000

Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3010 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6339 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000

Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7026 0.7280 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000

Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000

Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000

Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1208 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000

Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123

0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000
Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2667 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6872 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000
Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000
Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000
Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2169 0.2333 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6153 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000
Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000
Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268
0.1395 0.1522 0.1648 0.1775 0.1902
0.2029 0.2156 0.2283 0.2409 0.2536
0.2663 0.2790 0.2917 0.3043 0.3170
0.3491 0.3812 0.4132 0.4453 0.4774
0.5095 0.5415 0.5736 0.6057 0.6378
0.6698 0.7019 0.7340 0.7661 0.7981
0.8255 0.8448 0.8642 0.8836 0.9030
0.9224 0.9418 0.9612 0.9806 1.0000

Transect ROW_16.5m_PH3
Area:
0.0004 0.0017 0.0039 0.0069 0.0107
0.0154 0.0210 0.0275 0.0347 0.0429
0.0519 0.0618 0.0725 0.0841 0.0965
0.1098 0.1240 0.1390 0.1548 0.1716
0.1892 0.2076 0.2269 0.2471 0.2677
0.2884 0.3090 0.3297 0.3510 0.3731
0.3962 0.4201 0.4449 0.4705 0.4971
0.5245 0.5527 0.5819 0.6119 0.6428
0.6746 0.7073 0.7408 0.7752 0.8105
0.8466 0.8837 0.9216 0.9603 1.0000
Hrad:
0.0173 0.0347 0.0520 0.0694 0.0867
0.1041 0.1214 0.1388 0.1561 0.1735
0.1908 0.2082 0.2255 0.2429 0.2602
0.2776 0.2949 0.3123 0.3296 0.3470
0.3643 0.3817 0.3990 0.4164 0.4493
0.4834 0.5173 0.5513 0.5844 0.6155
0.6499 0.6778 0.6990 0.7239 0.7475
0.7699 0.7913 0.8116 0.8310 0.8496
0.8673 0.8843 0.9007 0.9164 0.9316
0.9462 0.9603 0.9739 0.9872 1.0000
Width:
0.0214 0.0428 0.0642 0.0856 0.1070
0.1284 0.1498 0.1712 0.1926 0.2140
0.2354 0.2568 0.2782 0.2996 0.3210
0.3424 0.3638 0.3852 0.4066 0.4280
0.4494 0.4708 0.4922 0.5136 0.5152
0.5152 0.5152 0.5200 0.5418 0.5636
0.5855 0.6073 0.6291 0.6509 0.6727
0.6945 0.7164 0.7382 0.7600 0.7818
0.8036 0.8255 0.8473 0.8691 0.8909
0.9127 0.9345 0.9564 0.9782 1.0000

Transect ROW_18m
Area:
0.0004 0.0016 0.0036 0.0064 0.0100
0.0144 0.0196 0.0255 0.0323 0.0399
0.0483 0.0575 0.0675 0.0782 0.0898
0.1022 0.1154 0.1293 0.1441 0.1597
0.1760 0.1932 0.2112 0.2299 0.2495
0.2698 0.2906 0.3114 0.3321 0.3529
0.3742 0.3967 0.4204 0.4452 0.4712
0.4983 0.5266 0.5560 0.5867 0.6184
0.6514 0.6855 0.7207 0.7571 0.7947
0.8335 0.8734 0.9144 0.9566 1.0000
Hrad:
0.0183 0.0366 0.0549 0.0732 0.0915
0.1098 0.1281 0.1464 0.1647 0.1829
0.2012 0.2195 0.2378 0.2561 0.2744
0.2927 0.3110 0.3293 0.3476 0.3659
0.3842 0.4025 0.4208 0.4391 0.4574
0.4757 0.5117 0.5476 0.5834 0.6192
0.6542 0.6864 0.7162 0.7437 0.7692
0.7927 0.8145 0.8348 0.8537 0.8713
0.8877 0.9031 0.9176 0.9313 0.9442
0.9565 0.9681 0.9792 0.9898 1.0000
Width:
0.0182 0.0363 0.0545 0.0726 0.0908
0.1090 0.1271 0.1453 0.1635 0.1816
0.1998 0.2179 0.2361 0.2543 0.2724
0.2906 0.3088 0.3269 0.3451 0.3632
0.3814 0.3996 0.4177 0.4359 0.4541
0.4722 0.4722 0.4722 0.4722 0.4722
0.4986 0.5250 0.5514 0.5778 0.6042
0.6306 0.6569 0.6833 0.7097 0.7361
0.7625 0.7889 0.8153 0.8417 0.8681
0.8944 0.9208 0.9472 0.9736 1.0000

Transect ROW_18m_MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0793 0.0991
0.1189 0.1387 0.1585 0.1783 0.1982
0.2180 0.2378 0.2576 0.2774 0.2972
0.3166 0.3340 0.3498 0.3646 0.3786
0.3921 0.4053 0.4183 0.4311 0.4439
0.4566 0.4770 0.5054 0.5332 0.5603
0.5869 0.6122 0.6360 0.6586 0.6807
0.7040 0.7271 0.7499 0.7723 0.7944
0.8163 0.8378 0.8591 0.8800 0.9007
0.9211 0.9412 0.9611 0.9807 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_MB_2
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0395 0.0593 0.0791 0.0989
0.1186 0.1384 0.1582 0.1780 0.1977
0.2175 0.2373 0.2571 0.2768 0.2966
0.3160 0.3298 0.3431 0.3638 0.3778
0.3913 0.4045 0.4174 0.4302 0.4430
0.4557 0.4760 0.5044 0.5321 0.5592
0.5857 0.6109 0.6347 0.6572 0.6793
0.7027 0.7258 0.7486 0.7711 0.7933
0.8152 0.8368 0.8581 0.8792 0.9000
0.9205 0.9408 0.9608 0.9805 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_Mountable
Area:
0.0003 0.0011 0.0026 0.0046 0.0072
0.0103 0.0140 0.0183 0.0232 0.0286

0.0346 0.0412 0.0484 0.0561 0.0644
0.0733 0.0827 0.0928 0.1034 0.1145
0.1263 0.1386 0.1515 0.1650 0.1799
0.1964 0.2143 0.2337 0.2546 0.2770
0.3009 0.3263 0.3532 0.3816 0.4115
0.4429 0.4758 0.5102 0.5459 0.5826
0.6202 0.6587 0.6981 0.7385 0.7797
0.8219 0.8651 0.9091 0.9541 1.0000

Hrad:

0.0235 0.0471 0.0706 0.0942 0.1177
0.1413 0.1648 0.1884 0.2119 0.2355
0.2590 0.2826 0.3061 0.3297 0.3532
0.3768 0.4003 0.4238 0.4474 0.4709
0.4945 0.5180 0.5416 0.5650 0.5852
0.6022 0.6168 0.6296 0.6410 0.6515
0.6613 0.6707 0.6799 0.6889 0.6979
0.7069 0.7161 0.7253 0.7478 0.7737
0.7989 0.8234 0.8474 0.8707 0.8935
0.9157 0.9375 0.9588 0.9796 1.0000

Width:

0.0124 0.0247 0.0371 0.0494 0.0618
0.0741 0.0865 0.0988 0.1112 0.1235
0.1359 0.1482 0.1606 0.1729 0.1853
0.1976 0.2100 0.2223 0.2347 0.2470
0.2594 0.2717 0.2841 0.3058 0.3381
0.3704 0.4027 0.4349 0.4672 0.4995
0.5318 0.5641 0.5964 0.6287 0.6610
0.6933 0.7255 0.7578 0.7807 0.8006
0.8206 0.8405 0.8604 0.8804 0.9003
0.9202 0.9402 0.9601 0.9801 1.0000

Transect ROW_18m_PH3

Area:

0.0004 0.0017 0.0038 0.0068 0.0107
0.0154 0.0209 0.0273 0.0346 0.0427
0.0516 0.0614 0.0721 0.0836 0.0960
0.1092 0.1233 0.1382 0.1540 0.1707
0.1882 0.2065 0.2256 0.2447 0.2638
0.2830 0.3026 0.3232 0.3447 0.3670
0.3903 0.4144 0.4394 0.4653 0.4921
0.5197 0.5483 0.5777 0.6080 0.6392
0.6713 0.7043 0.7382 0.7729 0.8085
0.8451 0.8825 0.9208 0.9599 1.0000

Hrad:

0.0179 0.0359 0.0538 0.0717 0.0896
0.1076 0.1255 0.1434 0.1613 0.1793
0.1972 0.2151 0.2330 0.2510 0.2689
0.2868 0.3047 0.3227 0.3406 0.3585
0.3764 0.3944 0.4225 0.4577 0.4928
0.5279 0.5621 0.5942 0.6243 0.6525
0.6791 0.7042 0.7279 0.7504 0.7716
0.7918 0.8110 0.8292 0.8467 0.8634
0.8794 0.8948 0.9095 0.9238 0.9375
0.9508 0.9636 0.9761 0.9882 1.0000

Width:

0.0211 0.0421 0.0632 0.0843 0.1053
0.1264 0.1475 0.1685 0.1896 0.2107
0.2318 0.2528 0.2739 0.2950 0.3160
0.3371 0.3582 0.3792 0.4003 0.4214
0.4424 0.4635 0.4722 0.4722 0.4722
0.4752 0.4971 0.5190 0.5408 0.5627
0.5846 0.6064 0.6283 0.6502 0.6720
0.6939 0.7158 0.7376 0.7595 0.7813
0.8032 0.8251 0.8469 0.8688 0.8907
0.9125 0.9344 0.9563 0.9781 1.0000

Transect ROW_22m

Area:

0.0003 0.0014 0.0031 0.0055 0.0086
0.0124 0.0169 0.0221 0.0280 0.0346
0.0418 0.0498 0.0584 0.0678 0.0778
0.0885 0.0999 0.1120 0.1248 0.1383
0.1525 0.1674 0.1829 0.1992 0.2161
0.2337 0.2521 0.2711 0.2908 0.3119
0.3348 0.3594 0.3857 0.4133 0.4420
0.4717 0.5025 0.5343 0.5673 0.6013
0.6363 0.6725 0.7097 0.7479 0.7873
0.8277 0.8692 0.9117 0.9553 1.0000

Hrad:

0.0200 0.0399 0.0599 0.0798 0.0998
0.1198 0.1397 0.1597 0.1796 0.1996
0.2196 0.2395 0.2595 0.2794 0.2994
0.3194 0.3393 0.3593 0.3792 0.3992
0.4192 0.4391 0.4591 0.4790 0.4990
0.5190 0.5389 0.5589 0.5789 0.5976
0.6138 0.6280 0.6465 0.6764 0.7046
0.7312 0.7565 0.7804 0.8033 0.8250
0.8458 0.8656 0.8847 0.9030 0.9206
0.9376 0.9539 0.9698 0.9851 1.0000

Width:

0.0153 0.0306 0.0459 0.0612 0.0765
0.0918 0.1071 0.1224 0.1376 0.1529
0.1682 0.1835 0.1988 0.2141 0.2294
0.2447 0.2600 0.2753 0.2906 0.3059
0.3212 0.3365 0.3518 0.3671 0.3824
0.3976 0.4129 0.4282 0.4472 0.4861
0.5250 0.5640 0.5982 0.6218 0.6455
0.6691 0.6927 0.7164 0.7400 0.7636
0.7873 0.8109 0.8345 0.8582 0.8818
0.9055 0.9291 0.9527 0.9764 1.0000

Transect ROW_24m

Area:

0.0004 0.0017 0.0039 0.0069 0.0107
0.0155 0.0211 0.0275 0.0348 0.0430
0.0520 0.0619 0.0726 0.0843 0.0967
0.1100 0.1234 0.1369 0.1503 0.1637
0.1772 0.1906 0.2040 0.2176 0.2324
0.2484 0.2655 0.2840 0.3036 0.3245
0.3466 0.3699 0.3945 0.4203 0.4473
0.4756 0.5050 0.5357 0.5677 0.6008
0.6352 0.6708 0.7077 0.7458 0.7851
0.8256 0.8674 0.9103 0.9546 1.0000

Hrad:

0.0217 0.0434 0.0652 0.0869 0.1086
0.1303 0.1520 0.1737 0.1955 0.2172
0.2389 0.2606 0.2823 0.3041 0.3258
0.3554 0.3981 0.4407 0.4831 0.5253
0.5674 0.6094 0.6512 0.6926 0.7297
0.7620 0.7900 0.8143 0.8353 0.8535
0.8693 0.8830 0.8951 0.9057 0.9151
0.9235 0.9311 0.9381 0.9445 0.9505
0.9561 0.9614 0.9666 0.9716 0.9764
0.9812 0.9859 0.9906 0.9953 1.0000

Width:

0.0187 0.0373 0.0560 0.0747 0.0933
0.1120 0.1307 0.1493 0.1680 0.1867
0.2053 0.2240 0.2427 0.2613 0.2800
0.2917 0.2917 0.2917 0.2917 0.2917
0.2917 0.2917 0.2917 0.3067 0.3333
0.3600 0.3867 0.4133 0.4400 0.4667
0.4933 0.5200 0.5467 0.5733 0.6000
0.6267 0.6533 0.6800 0.7067 0.7333
0.7600 0.7867 0.8133 0.8400 0.8667
0.8933 0.9200 0.9467 0.9733 1.0000

Transect ROW_24m_1

Area:

0.0002 0.0009 0.0020 0.0036 0.0057
0.0081 0.0111 0.0145 0.0183 0.0227
0.0279 0.0340 0.0410 0.0489 0.0577
0.0675 0.0781 0.0897 0.1021 0.1158
0.1311 0.1479 0.1664 0.1857 0.2058
0.2265 0.2480 0.2700 0.2929 0.3171
0.3426 0.3694 0.3976 0.4272 0.4579
0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023
0.8405 0.8794 0.9189 0.9591 1.0000

Hrad:

0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000

Width:

0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking

Area:

0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000

Hrad:

0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000

Width:

0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m

Area:

0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000

Hrad:

0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5599 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000

Width:

0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1

Area:

0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7086 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000

Hrad:

0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000

Width:

0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2

Area:

0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1883 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000

Hrad:

0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476

```
            1.0094     1.0241     1.0243     1.0266     1.0000
Width:
            0.0422     0.0543     0.0664     0.0785     0.0905
            0.1024     0.1141     0.1261     0.1385     0.1508
            0.1631     0.1781     0.1939     0.2117     0.2302
            0.2467     0.2633     0.2781     0.2924     0.3107
            0.3356     0.3615     0.3904     0.4208     0.4502
            0.4893     0.5205     0.5353     0.5411     0.5466
            0.5522     0.5577     0.5632     0.5687     0.5793
            0.5947     0.6089     0.6182     0.6274     0.6366
            0.6500     0.6718     0.6936     0.7162     0.7558
            0.8227     0.8489     0.8887     0.9286     1.0000

Transect Upstream3
Area:
            0.0006     0.0023     0.0050     0.0083     0.0121
            0.0165     0.0214     0.0269     0.0329     0.0397
            0.0479     0.0574     0.0681     0.0800     0.0928
            0.1066     0.1213     0.1370     0.1537     0.1724
            0.1916     0.2112     0.2310     0.2512     0.2719
            0.2933     0.3154     0.3379     0.3607     0.3838
            0.4072     0.4308     0.4548     0.4792     0.5043
            0.5302     0.5566     0.5834     0.6106     0.6382
            0.6665     0.6955     0.7273     0.7625     0.7988
            0.8362     0.8744     0.9141     0.9558     1.0000
Hrad:
            0.0253     0.0506     0.0845     0.1172     0.1476
            0.1766     0.2047     0.2322     0.2591     0.2672
            0.2667     0.2864     0.3020     0.3243     0.3504
            0.3762     0.4018     0.4273     0.4351     0.4545
            0.4946     0.5339     0.5724     0.6101     0.6377
            0.6626     0.7293     0.7664     0.8029     0.8029
            0.8390     0.8745     0.9096     0.9307     0.9485
            0.9716     1.0018     1.0317     1.0613     1.0906
            1.1067     1.1229     1.0191     1.0199     1.0379
            1.0594     1.0820     1.0709     1.0785     1.0000
Width:
            0.0239     0.0478     0.0617     0.0733     0.0849
            0.0965     0.1081     0.1196     0.1312     0.1535
            0.1863     0.2081     0.2344     0.2566     0.2757
            0.2950     0.3144     0.3339     0.3682     0.3946
            0.4014     0.4082     0.4149     0.4217     0.4354
            0.4510     0.4634     0.4693     0.4752     0.4811
            0.4870     0.4929     0.4988     0.5128     0.5290
            0.5420     0.5507     0.5594     0.5681     0.5768
            0.5931     0.6096     0.7080     0.7423     0.7640
            0.7831     0.8014     0.8479     0.8809     1.0000

Transect Upstream4
Area:
            0.0018     0.0046     0.0083     0.0128     0.0180
            0.0238     0.0302     0.0371     0.0448     0.0547
            0.0662     0.0782     0.0907     0.1038     0.1174
            0.1319     0.1472     0.1638     0.1825     0.2018
            0.2212     0.2408     0.2608     0.2810     0.3017
            0.3227     0.3453     0.3685     0.3919     0.4155
            0.4393     0.4633     0.4875     0.5118     0.5364
            0.5615     0.5871     0.6133     0.6408     0.6690
            0.6977     0.7269     0.7568     0.7876     0.8192
            0.8516     0.8851     0.9205     0.9583     1.0000
Hrad:
            0.0356     0.0671     0.0952     0.1219     0.1526
            0.1825     0.2111     0.2388     0.2457     0.2281
            0.2626     0.2959     0.3290     0.3614     0.3872
            0.4105     0.4302     0.4402     0.4405     0.4805
            0.5198     0.5573     0.5905     0.6232     0.6553
            0.6869     0.6742     0.7110     0.7474     0.7833
            0.8187     0.8537     0.8883     0.9224     0.9509
            0.9733     0.9956     1.0049     1.0036     1.0287
            1.0536     1.0784     1.0896     1.1008     1.1169
            1.1330     1.1274     1.1025     1.0707     1.0000
Width:
            0.0541     0.0732     0.0923     0.1110     0.1246
            0.1374     0.1502     0.1630     0.1916     0.2527
            0.2652     0.2777     0.2895     0.3012     0.3179
            0.3368     0.3586     0.3902     0.4339     0.4377
            0.4416     0.4466     0.4547     0.4628     0.4709
            0.4791     0.5224     0.5268     0.5312     0.5356
            0.5400     0.5444     0.5488     0.5532     0.5611
            0.5729     0.5847     0.6049     0.6332     0.6440
            0.6548     0.6656     0.6857     0.7062     0.7236
            0.7412     0.7753     0.8268     0.8894     1.0000

Transect Upstream5
Area:
            0.0012     0.0039     0.0075     0.0122     0.0185
            0.0256     0.0332     0.0413     0.0500     0.0592
            0.0689     0.0792     0.0900     0.1012     0.1130
            0.1251     0.1375     0.1502     0.1632     0.1765
            0.1902     0.2041     0.2184     0.2330     0.2480
            0.2635     0.2798     0.2968     0.3145     0.3331
            0.3525     0.3727     0.3942     0.4178     0.4431
            0.4698     0.4988     0.5309     0.5639     0.5984
            0.6349     0.6722     0.7101     0.7485     0.7872
            0.8265     0.8666     0.9084     0.9530     1.0000
Hrad:
            0.0281     0.0626     0.0927     0.1114     0.1369
            0.1752     0.2115     0.2463     0.2799     0.3124
            0.3424     0.3749     0.4068     0.4379     0.4694
            0.5056     0.5411     0.5759     0.6102     0.6439
            0.6771     0.7099     0.7421     0.7699     0.7956
            0.8104     0.8232     0.8370     0.8495     0.8616
            0.8746     0.8886     0.8484     0.8428     0.8418
            0.8363     0.8155     0.8068     0.8309     0.8203
            0.8187     0.8801     0.9176     0.9547     0.9913
            1.0230     1.0475     1.0267     1.0168     1.0000
Width:
            0.0449     0.0640     0.0831     0.1124     0.1386
            0.1495     0.1603     0.1712     0.1820     0.1929
            0.2048     0.2146     0.2243     0.2341     0.2433
            0.2496     0.2559     0.2622     0.2684     0.2747
            0.2810     0.2873     0.2936     0.3016     0.3105
            0.3241     0.3390     0.3539     0.3698     0.3865
            0.4032     0.4199     0.4663     0.4984     0.5298
            0.5663     0.6178     0.6645     0.6844     0.7354
            0.7522     0.7679     0.7768     0.7857     0.7946
            0.8074     0.8259     0.8838     0.9366     1.0000

Transect Upstream6
Area:
            0.0020     0.0057     0.0101     0.0154     0.0216
            0.0285     0.0362     0.0446     0.0534     0.0628
            0.0726     0.0829     0.0939     0.1054     0.1174
            0.1299     0.1429     0.1564     0.1705     0.1850
            0.2000     0.2153     0.2310     0.2472     0.2637
            0.2808     0.2986     0.3172     0.3364     0.3564
            0.3786     0.4016     0.4255     0.4503     0.4760
            0.5026     0.5304     0.5593     0.5897     0.6214
            0.6541     0.6875     0.7215     0.7561     0.7915
            0.8280     0.8671     0.9077     0.9506     1.0000
Hrad:
            0.0333     0.0728     0.1080     0.1404     0.1714
            0.2022     0.2321     0.2687     0.3047     0.3396
            0.3717     0.4020     0.4318     0.4612     0.4948
            0.5246     0.5534     0.5820     0.6106     0.6442
            0.6773     0.7100     0.7423     0.7742     0.8057
            0.8224     0.8398     0.8578     0.8777     0.8995
            0.8582     0.8792     0.8979     0.9152     0.9365
            0.9490     0.9612     0.9727     0.9697     0.9916
            1.0145     1.0496     1.0816     1.1092     1.1367
            1.1540     1.1196     1.1309     1.0883     1.0000
Width:
            0.0616     0.0785     0.0947     0.1108     0.1267
            0.1418     0.1569     0.1666     0.1758     0.1850
            0.1952     0.2062     0.2171     0.2280     0.2365
            0.2466     0.2570     0.2674     0.2776     0.2853
            0.2930     0.3007     0.3084     0.3161     0.3238
            0.3379     0.3520     0.3661     0.3797     0.4163
            0.4379     0.4535     0.4707     0.4888     0.5050
            0.5264     0.5485     0.5718     0.6051     0.6237
            0.6417     0.6518     0.6637     0.6783     0.6930
            0.7329     0.7718     0.8002     0.8718     1.0000


***************
Analysis Options
***************
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date ..... 07/23/2009 00:00:00
Ending Date ..... 07/25/2009 00:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:01:00
Wet Time Step ..... 00:01:00
Dry Time Step ..... 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Number of Threads ..... 18
Head Tolerance ..... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation .....          4.009        48.000
Evaporation Loss .....             0.000         0.000
Infiltration Loss .....            2.009        24.047
Surface Runoff .....               1.911        22.875
Final Storage .....                0.091         1.092
Continuity Error (%) .....       -0.030


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .....           0.000         0.000
Wet Weather Inflow .....           1.911        19.108
Groundwater Inflow .....           0.000         0.000
RDII Inflow .....                  0.000         0.000
External Inflow .....             0.000         0.000
External Outflow .....            1.771        17.710
Flooding Loss .....                0.000         0.000
Evaporation Loss .....             0.000         0.000
Exfiltration Loss .....            0.139         1.388
Initial Stored Volume ....         0.000         0.000
Final Stored Volume .....          0.001         0.013
Continuity Error (%) .....       -0.017


*************************
Highest Continuity Errors
*************************
Node J51 (47.91%)
Node J39 (32.46%)
Node J32 (27.62%)
Node J25 (24.19%)
Node J26 (23.04%)


***************************
Time-Step Critical Elements
***************************
None


********************************
Highest Flow Instability Indexes
********************************
Link C-STRM-44_(1)_(C-STRM) (12)
Link C-STRM-97_(1)_(C-STRM) (11)
Link C-STRM-98_(1)_(C-STRM) (11)
Link C-STRM-83_(C-STRM) (7)
Link OL5 (5)


********************************
Most Frequent Nonconverging Nodes
********************************
Convergence obtained at all time steps.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.33 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.00
Time Step Frequencies       :
    1.000 -  0.871 sec      :   100.00 %
    0.871 -  0.758 sec      :     0.00 %
    0.758 -  0.660 sec      :     0.00 %
    0.660 -  0.574 sec      :     0.00 %
    0.574 -  0.500 sec      :     0.00 %


***************************
Subcatchment Runoff Summary
***************************

  ---------------------------------------------------------------------------------------------------------------
                                  Total      Total      Total      Total      Imperv       Perv
Total      Total     Peak  Runoff Precip     Runon       Evap      Infil     Runoff     Runoff
Runoff     Runoff    Runoff   Coeff
  Subcatchment                    mm         mm         mm         mm         mm         mm
mm     10^6 ltr      CMS
  ---------------------------------------------------------------------------------------------------------------
  A15                           48.00       0.00       0.00      36.69       8.80       1.60
8.64       0.30     0.05   0.180
  A18                           48.00       0.00       0.00      30.67      18.18       2.19
16.73       0.10     0.05   0.349
  A19                           48.00       0.00       0.00      38.21      10.37       1.15
9.45       0.10     0.05   0.197
  A20                           48.00       0.00       0.00      41.45       3.89       2.15
5.26       0.25     0.05   0.110
  NULL3                         48.00       0.00       0.00      11.66      38.71       4.09
35.06       0.20     0.09   0.731
  S1                            48.00       0.00       0.00      27.06      30.83      10.67
19.93       1.30     0.90   0.415
  S1_1                          48.00       0.00       0.00      16.57      33.19       3.80
30.35       0.04     0.02   0.632
  S1_2                          48.00       0.00       0.00      16.52      33.20       3.84
30.40       0.04     0.02   0.633
  S1_4                          48.00       0.00       0.00      16.60      33.19       3.76
30.31       0.06     0.03   0.632
  S1_5                          48.00       0.00       0.00      16.57      33.19       3.79
30.35       0.03     0.02   0.632
  S10_1                         48.00       0.00       0.00      27.72      29.86      10.34
19.29       0.36     0.25   0.402
  S10_2                         48.00       0.00       0.00      27.72      29.86      10.34
19.29       0.41     0.29   0.402
```

S10_4			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.14	0.10	0.402					
S10_5			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.24	0.17	0.402					
S11			48.00	0.00	0.00	47.53	0.00	0.47
0.47	0.02	0.02	0.010					
S12			48.00	0.00	0.00	16.61	33.19	3.75
30.30	0.13	0.07	0.631					
S14_1			48.00	0.00	0.00	16.66	33.19	3.70
30.25	0.18	0.09	0.630					
S14_3			48.00	0.00	0.00	16.81	33.18	3.55
30.10	0.32	0.15	0.627					
S14_4			48.00	0.00	0.00	16.68	33.19	3.68
30.23	0.09	0.04	0.630					
S14_5			48.00	0.00	0.00	16.78	33.18	3.58
30.13	0.51	0.25	0.628					
S14_6			48.00	0.00	0.00	16.70	33.19	3.66
30.21	0.09	0.04	0.629					
S14_7			48.00	0.00	0.00	16.73	33.19	3.63
30.18	0.35	0.17	0.629					
S14_8			48.00	0.00	0.00	16.71	33.19	3.65
30.20	0.10	0.05	0.629					
S15			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.32	0.22	0.402					
S16			48.00	0.00	0.00	0.00	46.32	0.00
46.32	0.68	0.11	0.965					
S17			48.00	0.00	0.00	47.80	1.55	0.15
0.15	0.01	0.01	0.003					
S18_2			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.65	0.45	0.402					
S18_3			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.32	0.22	0.402					
S18_4			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.17	0.12	0.402					
S18_5			48.00	0.00	0.00	25.48	33.18	11.47
21.42	0.39	0.27	0.446					
S18_6			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.16	0.11	0.402					
S19			48.00	0.00	0.00	16.76	33.18	3.60
30.15	0.32	0.15	0.628					
S2			48.00	0.00	0.00	26.90	31.06	10.75
20.07	0.75	0.52	0.418					
S20_1			48.00	0.00	0.00	16.58	33.19	3.78
30.33	0.15	0.07	0.632					
S20_2			48.00	0.00	0.00	16.47	33.20	3.91
30.47	0.07	0.03	0.635					
S3			48.00	0.00	0.00	27.72	29.86	10.34
19.29	0.48	0.33	0.402					
S32			48.00	0.00	0.00	16.61	33.19	3.76
30.31	0.13	0.06	0.631					
S36			48.00	0.00	0.00	0.00	46.32	0.00
46.32	0.84	0.14	0.965					
S4			48.00	0.00	0.00	6.73	39.79	0.12
39.92	5.28	1.65	0.832					
S5			48.00	0.00	0.00	6.64	39.80	0.22
40.02	1.28	0.45	0.834					
S6			48.00	0.00	0.00	22.51	26.55	3.38
24.62	0.08	0.05	0.513					
S7			48.00	0.00	0.00	6.67	39.80	0.19
39.99	1.59	0.55	0.833					
S8			48.00	0.00	0.00	42.47	16.59	4.97
4.97	0.10	0.05	0.104					

508_(C-STRM)	STORAGE	0.31	0.88	105.25	0	12:01	0.88
509_(C-STRM)	STORAGE	0.31	0.88	105.48	0	12:01	0.88
510_(C-STRM)	STORAGE	0.31	0.80	105.64	0	12:00	0.80
511_(C-STRM)	STORAGE	0.31	0.80	105.71	0	12:00	0.80
512_(C-STRM)	STORAGE	0.31	0.76	105.88	0	12:00	0.76
513_(C-STRM)	STORAGE	0.31	0.76	106.00	0	12:00	0.76
514_(C-STRM)	STORAGE	0.23	0.42	106.01	0	12:01	0.42
515_(C-STRM)	STORAGE	0.00	0.00	105.85	0	00:00	0.00
516_(C-STRM)	STORAGE	0.31	0.82	106.28	0	12:01	0.82
517_(C-STRM)	STORAGE	0.31	0.87	106.49	0	12:00	0.87
518_(C-STRM)	STORAGE	0.32	0.90	106.75	0	12:00	0.90
519_(C-STRM)	STORAGE	0.30	0.71	106.78	0	12:00	0.70
520_(C-STRM)	STORAGE	0.30	0.58	106.92	0	12:00	0.58
522_(C-STRM)	STORAGE	0.30	0.55	104.85	0	12:00	0.55
525_(C-STRM)	STORAGE	0.06	1.25	101.86	0	12:02	1.25
528_(C-STRM)	STORAGE	0.04	1.36	102.08	0	12:02	1.35
532_(C-STRM)	STORAGE	0.03	1.39	102.22	0	12:02	1.38
536_(C-STRM)	STORAGE	0.04	1.37	102.34	0	12:02	1.36
540_(C-STRM)	STORAGE	0.31	1.60	102.46	0	12:02	1.59
541_(C-STRM)	STORAGE	0.30	1.59	102.52	0	12:02	1.58
551_(C-STRM)	STORAGE	0.31	1.03	101.67	0	12:02	1.02
552_(C-STRM)	STORAGE	0.30	0.94	101.68	0	12:02	0.93
553_(C-STRM)	STORAGE	0.31	0.77	101.70	0	12:01	0.77
554_(C-STRM)	STORAGE	0.30	0.68	101.73	0	12:02	0.67
555_(C-STRM)	STORAGE	0.30	0.67	101.92	0	12:00	0.67
556_(C-STRM)	STORAGE	0.30	0.69	102.06	0	12:00	0.69
601_(C-STRM)	STORAGE	0.07	1.03	101.48	0	12:03	1.03
602_(C-STRM)	STORAGE	0.08	1.41	101.93	0	12:03	1.41
603_(C-STRM)	STORAGE	0.07	1.40	102.03	0	12:03	1.40
604_(C-STRM)	STORAGE	0.06	1.43	102.31	0	12:02	1.43
605_(C-STRM)	STORAGE	0.07	1.29	102.38	0	12:02	1.29
606_(C-STRM)	STORAGE	0.07	1.32	102.55	0	12:02	1.32
619_(C-STRM)	STORAGE	0.07	1.34	102.72	0	12:01	1.34
622_(C-STRM)	STORAGE	0.07	1.23	102.76	0	12:01	1.23
626_(C-STRM)	STORAGE	0.23	0.38	104.32	0	12:02	0.38
627_(C-STRM)	STORAGE	0.23	0.52	103.65	0	12:01	0.52
629_(C-STRM)	STORAGE	0.07	1.14	102.79	0	12:01	1.14
630_(C-STRM)	STORAGE	0.08	0.91	102.99	0	12:00	0.91
630A_(C-STRM)	STORAGE	0.07	0.93	103.05	0	12:00	0.93
631_TC-STRM)	STORAGE	0.00	0.01	106.01	0	12:00	0.01
645_(C-STRM)	STORAGE	0.33	1.14	103.17	0	12:00	1.13
647_(C-STRM)	STORAGE	0.32	1.10	103.24	0	12:00	1.10
650_(C-STRM)	STORAGE	0.32	1.06	103.29	0	12:00	1.06
651_(C-STRM)	STORAGE	0.32	1.01	103.32	0	12:00	1.00
682_(C-STRM)	STORAGE	0.00	0.01	105.41	0	12:00	0.01
MTD_(C-STRM)	STORAGE	0.14	1.17	101.54	0	12:02	1.17
OVERFLOW_(C-STRM)	STORAGE	0.22	0.75	100.93	0	12:08	0.75
POND_(C-STRM)	STORAGE	0.43	1.33	99.78	0	13:16	1.33
S_525-MTD	STORAGE	0.00	0.01	103.31	0	12:00	0.01
S_528-525	STORAGE	0.00	0.01	103.42	0	12:00	0.01
S_532-528	STORAGE	0.00	0.01	103.51	0	12:00	0.01
S_536-532	STORAGE	0.00	0.01	103.62	0	12:00	0.01
S_540-536	STORAGE	0.00	0.01	103.72	0	12:00	0.01
S_541-540	STORAGE	0.00	0.02	103.83	0	12:01	0.02
S_604-603	STORAGE	0.00	0.01	105.51	0	12:00	0.01
S_605-604	STORAGE	0.00	0.01	106.73	0	12:00	0.01
S_619-606	STORAGE	0.00	0.01	106.51	0	12:00	0.01
S_622-619	STORAGE	0.00	0.04	105.74	0	12:02	0.04
S_622-619_2	STORAGE	0.00	0.01	106.51	0	12:00	0.01
S_627-630	STORAGE	0.00	0.01	106.71	0	12:00	0.01
S_629-622	STORAGE	0.00	0.01	106.03	0	12:01	0.01
SU2	STORAGE	0.00	0.00	106.75	0	12:01	0.00
SU5	STORAGE	0.00	0.00	104.18	0	12:03	0.00

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.11	104.50	0 12:00	0.11
EXD_10	JUNCTION	0.03	0.22	98.87	0 12:03	0.22
EXD_11	JUNCTION	0.02	0.17	98.67	0 12:04	0.17
EXD_12	JUNCTION	0.03	0.24	98.55	0 12:03	0.24
EXD_13	JUNCTION	0.01	0.12	104.44	0 12:01	0.12
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.03	0.24	100.50	0 12:00	0.24
EXD_16	JUNCTION	0.02	0.13	100.33	0 12:00	0.13
EXD_17	JUNCTION	0.03	0.14	100.03	0 12:01	0.14
EXD_18	JUNCTION	0.01	0.11	99.51	0 12:06	0.11
EXD_19	JUNCTION	0.03	0.20	99.40	0 12:06	0.20
EXD_2	JUNCTION	0.03	0.20	103.66	0 12:03	0.20
EXD_20	JUNCTION	0.03	0.21	99.40	0 12:05	0.21
EXD_21	JUNCTION	0.03	0.18	99.37	0 12:05	0.18
EXD_22	JUNCTION	0.02	0.11	99.25	0 12:09	0.11
EXD_23	JUNCTION	0.03	0.17	98.92	0 12:14	0.17
EXD_24	JUNCTION	0.01	0.09	98.76	0 12:18	0.09
EXD_25	JUNCTION	0.03	0.17	98.69	0 12:20	0.17
EXD_26	JUNCTION	0.01	0.10	98.58	0 12:23	0.10
EXD_27	JUNCTION	0.04	0.22	98.38	0 12:00	0.21
EXD_3	JUNCTION	0.01	0.10	103.29	0 12:05	0.10
EXD_4	JUNCTION	0.01	0.09	102.74	0 12:06	0.09
EXD_5	JUNCTION	0.01	0.14	102.63	0 12:06	0.14
EXD_6	JUNCTION	0.01	0.11	102.43	0 12:07	0.11
EXD_7	JUNCTION	0.01	0.09	101.58	0 12:11	0.09
EXD_8	JUNCTION	0.01	0.14	100.63	0 12:17	0.14
EXD_9	JUNCTION	0.01	0.07	100.46	0 12:22	0.07
J10	JUNCTION	0.00	0.00	103.60	0 00:00	0.00
J11	JUNCTION	0.00	0.00	103.50	0 00:00	0.00
J12	JUNCTION	0.00	0.00	103.40	0 00:00	0.00
J13	JUNCTION	0.00	0.00	103.30	0 00:00	0.00
J17	JUNCTION	0.01	0.10	104.48	0 12:00	0.10
J19	JUNCTION	0.00	0.01	105.41	0 12:00	0.01
J20	JUNCTION	0.00	0.00	105.45	0 12:00	0.00
J21	JUNCTION	0.00	0.01	105.56	0 12:00	0.01
J22	JUNCTION	0.00	0.00	105.70	0 12:00	0.00
J23	JUNCTION	0.00	0.00	106.00	0 00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0 00:00	0.00
J25	JUNCTION	0.00	0.00	105.30	1 06:10	0.00
J26	JUNCTION	0.00	0.00	105.70	0 21:53	0.00
J28	JUNCTION	0.00	0.01	109.01	0 12:00	0.01
J29	JUNCTION	0.00	0.01	108.81	0 12:00	0.01
J32	JUNCTION	0.00	0.00	106.00	0 15:15	0.00
J36	JUNCTION	0.00	0.01	104.71	0 12:00	0.01
J39	JUNCTION	0.00	0.00	104.60	0 12:01	0.00
J40	JUNCTION	0.00	0.01	104.46	0 12:00	0.01
J41	JUNCTION	0.00	0.00	103.20	0 12:36	0.00
J43	JUNCTION	0.00	0.01	104.21	0 12:00	0.01
J44	JUNCTION	0.00	0.01	104.51	0 12:00	0.01
J46	JUNCTION	0.00	0.01	104.61	0 12:00	0.01
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.01	105.76	0 12:00	0.01
J51	JUNCTION	0.00	0.00	106.75	0 12:03	0.00
J52	JUNCTION	0.00	0.00	109.15	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0 00:00	0.00
J58	JUNCTION	0.00	0.01	108.41	0 12:00	0.01
J59	JUNCTION	0.00	0.01	108.01	0 12:00	0.01
J6	JUNCTION	0.00	0.01	109.84	0 12:00	0.01
J61	JUNCTION	0.00	0.01	107.21	0 12:00	0.01
J62	JUNCTION	0.00	0.00	106.50	0 12:02	0.00
J74	JUNCTION	0.17	0.37	98.82	0 13:16	0.37
J9	JUNCTION	0.00	0.00	103.70	0 00:00	0.00
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.02	0.18	98.18	0 12:00	0.18
ST4_108A_(P-Stm)	OUTFALL	0.00	0.00	98.02	0 00:00	0.00
500_(C-STRM)	STORAGE	0.23	0.39	100.70	0 12:08	0.39
500A_(C-STRM)	STORAGE	0.24	0.82	100.92	0 12:09	0.82
502_TC-STRM)	STORAGE	0.08	1.10	101.64	0 12:02	1.09
503_(C-STRM)	STORAGE	0.07	1.12	101.70	0 12:02	1.12
504_(C-STRM)	STORAGE	0.31	0.88	103.91	0 12:01	0.87
505_(C-STRM)	STORAGE	0.31	0.87	104.32	0 12:00	0.87
506_(C-STRM)	STORAGE	0.31	0.88	104.70	0 12:00	0.88
507_(C-STRM)	STORAGE	0.31	0.86	105.00	0 12:01	0.86

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.065	0 12:00	0	0.132	0.000
EXD_10	JUNCTION	0.248	0.251	0 12:00	1.52	1.66	-0.061
EXD_11	JUNCTION	0.000	0.226	0 12:03	0	1.66	0.005
EXD_12	JUNCTION	0.052	0.270	0 12:03	0.299	1.96	0.003
EXD_13	JUNCTION	0.000	0.064	0 12:00	0	0.132	-0.198
EXD_14	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.053	0.053	0 12:00	0.254	0.254	-0.003
EXD_16	JUNCTION	0.000	0.048	0 12:00	0	0.254	-0.044
EXD_17	JUNCTION	0.000	0.048	0 12:00	0	0.255	-0.147
EXD_18	JUNCTION	0.000	0.048	0 12:02	0	0.255	0.245
EXD_19	JUNCTION	0.000	0.043	0 12:06	0	0.258	0.005
EXD_2	JUNCTION	0.000	0.061	0 12:01	0	0.132	0.324
EXD_20	JUNCTION	0.048	0.059	0 12:00	0.105	0.362	-0.004
EXD_21	JUNCTION	0.000	0.057	0 12:00	0	0.359	-0.037
EXD_22	JUNCTION	0.000	0.057	0 12:07	0	0.359	-0.045
EXD_23	JUNCTION	0.000	0.056	0 12:09	0	0.359	0.226
EXD_24	JUNCTION	0.000	0.053	0 12:15	0	0.358	0.146
EXD_25	JUNCTION	0.049	0.061	0 12:00	0.0992	0.457	-0.027
EXD_26	JUNCTION	0.000	0.062	0 12:20	0	0.457	0.055
EXD_27	JUNCTION	0.089	0.377	0 12:00	0.198	2.62	0.011
EXD_3	JUNCTION	0.000	0.055	0 12:04	0	0.132	0.083
EXD_4	JUNCTION	0.000	0.054	0 12:05	0	0.132	0.045
EXD_5	JUNCTION	0.000	0.053	0 12:06	0	0.131	0.003
EXD_6	JUNCTION	0.000	0.053	0 12:06	0	0.131	-0.251
EXD_7	JUNCTION	0.009	0.059	0 12:08	0.00926	0.141	-0.177
EXD_8	JUNCTION	0.000	0.053	0 12:11	0	0.141	0.661
EXD_9	JUNCTION	0.000	0.044	0 12:17	0	0.14	1.190
J10	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J11	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J12	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J13	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J17	JUNCTION	0.000	0.065	0 12:00	0	0.132	0.033
J19	JUNCTION	0.172	0.172	0 12:00	0.355	0.355	-0.519
J20	JUNCTION	0.016	0.016	0 12:00	0.0328	0.0329	0.075

J21	JUNCTION	0.029	0.029	0	12:00	0.0579	0.0579	- 0.054
J22	JUNCTION	0.018	0.018	0	12:00	0.0355	0.0355	- 0.247
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.000	0	23:36	0	4.46e-05	31.908
J26	JUNCTION	0.000	0.000	0	16:52	0	5.8e-05	29.946
J28	JUNCTION	0.089	0.089	0	12:00	0.181	0.181	- 0.217
J29	JUNCTION	0.245	0.245	0	12:00	0.508	0.508	- 0.595
J32	JUNCTION	0.000	0.000	0	12:02	0	8.01e-05	38.154
J36	JUNCTION	0.034	0.035	0	12:00	0.0691	0.0692	- 0.030
J39	JUNCTION	0.000	0.000	0	12:00	0	9.72e-05	48.071
J40	JUNCTION	0.075	0.075	0	12:00	0.151	0.151	- 0.053
J41	JUNCTION	0.000	0.000	0	12:01	0	0.000191	0.052
J43	JUNCTION	0.000	0.000	0	12:00	0	0.000221	15.860
J44	JUNCTION	0.044	0.045	0	12:00	0.0898	0.0901	- 0.047
J46	JUNCTION	0.062	0.062	0	12:00	0.126	0.126	- 0.166
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.050	0.050	0	12:00	0.102	0.102	- 0.052
J51	JUNCTION	0.000	0.000	0	12:00	0	6.2e-05	91.979
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.153	0.153	0	12:00	0.32	0.32	- 0.554
J59	JUNCTION	0.043	0.043	0	12:00	0.0873	0.0874	- 0.137
J6	JUNCTION	0.065	0.065	0	12:00	0.132	0.132	- 0.216
J61	JUNCTION	0.173	0.173	0	12:00	0.355	0.355	- 0.100
J62	JUNCTION	0.000	0.000	0	12:00	0	8.92e-05	11.329
J74	JUNCTION	0.000	0.249	0	13:15	0	15	0.000
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.046	0.046	0	12:00	0.0842	0.0842	0.000
OF3	OUTFALL	0.000	0.364	0	12:00	0	2.62	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.249	0	13:16	0	15	0.000
500_(C-STRM)	STORAGE	0.000	0.039	0	12:08	0	0.047	- 0.015
500A_(C-STRM)	STORAGE	0.000	1.926	0	12:03	0	4.24	0.166
502_(C-STRM)	STORAGE	0.000	0.837	0	12:00	0	2.28	0.027
503_(C-STRM)	STORAGE	0.000	0.680	0	12:01	0	1.74	- 0.006
504_(C-STRM)	STORAGE	0.000	0.667	0	12:00	0	1.64	- 0.127
505_(C-STRM)	STORAGE	0.000	0.595	0	12:00	0	1.45	- 0.083
506_(C-STRM)	STORAGE	0.000	0.603	0	12:00	0	1.45	0.332
507_(C-STRM)	STORAGE	0.000	0.463	0	12:01	0	1.09	- 0.531
508_(C-STRM)	STORAGE	0.000	0.466	0	12:01	0	1.09	- 0.003
509_(C-STRM)	STORAGE	0.000	0.471	0	12:00	0	1.09	- 0.029
510_(C-STRM)	STORAGE	0.000	0.473	0	12:00	0	1.09	- 0.044
511_(C-STRM)	STORAGE	0.000	0.475	0	12:00	0	1.09	0.044
512_(C-STRM)	STORAGE	0.000	0.439	0	12:00	0	1	- 0.133
513_(C-STRM)	STORAGE	0.000	0.453	0	12:00	0	1.02	1.063
514_(C-STRM)	STORAGE	0.000	0.009	0	11:58	0	0.00248	- 17.601
515_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0	0.000 ltr
516_(C-STRM)	STORAGE	0.000	0.311	0	12:00	0	0.684	- 1.124
517_(C-STRM)	STORAGE	0.000	0.316	0	12:00	0	0.686	0.240
518_(C-STRM)	STORAGE	0.000	0.323	0	12:00	0	0.692	0.695
519_(C-STRM)	STORAGE	0.000	0.089	0	12:00	0	0.179	- 1.174
520_(C-STRM)	STORAGE	0.000	0.089	0	12:00	0	0.181	1.325
522_(C-STRM)	STORAGE	0.000	0.065	0	12:00	0	0.132	0.030
525_(C-STRM)	STORAGE	0.000	1.127	0	12:01	0	2.01	0.057
528_(C-STRM)	STORAGE	0.000	0.951	0	12:01	0	1.69	- 0.034
532_(C-STRM)	STORAGE	0.000	0.769	0	12:01	0	1.37	- 0.218
536_(C-STRM)	STORAGE	0.000	0.688	0	12:01	0	1.21	0.101
540_(C-STRM)	STORAGE	0.000	0.467	0	12:01	0	0.815	0.008
541_(C-STRM)	STORAGE	0.000	0.368	0	11:56	0	0.646	- 0.033
551_(C-STRM)	STORAGE	0.000	0.228	0	11:57	0	0.548	0.733
552_(C-STRM)	STORAGE	0.000	0.176	0	11:59	0	0.395	- 0.775
553_(C-STRM)	STORAGE	0.000	0.186	0	12:00	0	0.398	0.713
554_(C-STRM)	STORAGE	0.000	0.157	0	12:00	0	0.327	- 0.661
555_(C-STRM)	STORAGE	0.000	0.158	0	12:00	0	0.328	0.230
556_(C-STRM)	STORAGE	0.000	0.159	0	12:00	0	0.329	0.106
601_(C-STRM)	STORAGE	0.000	3.876	0	12:03	0	9.13	- 0.000
602_(C-STRM)	STORAGE	0.000	3.877	0	12:03	0	9.13	0.000
603_(C-STRM)	STORAGE	0.000	3.871	0	12:02	0	9	0.002
604_(C-STRM)	STORAGE	0.000	3.887	0	12:02	0	9	- 0.001
605_(C-STRM)	STORAGE	0.000	3.655	0	12:02	0	8.7	- 0.002
606_(C-STRM)	STORAGE	0.000	2.944	0	12:01	0	7.89	0.002
619_(C-STRM)	STORAGE	0.000	2.979	0	12:01	0	7.89	0.001
622_(C-STRM)	STORAGE	0.000	2.813	0	12:00	0	7.67	0.001
626_(C-STRM)	STORAGE	0.000	0.018	0	12:01	0	0.0156	- 1.940
627_(C-STRM)	STORAGE	0.000	0.104	0	12:00	0	0.0975	0.411
629_(C-STRM)	STORAGE	0.000	2.306	0	12:00	0	6.94	- 0.076
630_(C-STRM)	STORAGE	0.000	2.191	0	12:00	0	6.81	0.201
630A_(C-STRM)	STORAGE	0.000	2.105	0	12:00	0	6.72	0.070
631_(C-STRM)	STORAGE	1.651	1.651	0	12:00	5.28	5.28	- 0.093
645_(C-STRM)	STORAGE	0.000	0.483	0	11:59	0	1.43	- 0.073
647_(C-STRM)	STORAGE	0.000	0.480	0	12:00	0	1.4	- 0.208
650_(C-STRM)	STORAGE	0.000	0.468	0	12:00	0	1.34	- 0.227
651_(C-STRM)	STORAGE	0.000	0.460	0	12:00	0	1.3	0.068
682_(C-STRM)	STORAGE	0.449	0.449	0	12:00	1.28	1.28	- 0.053
MTD_(C-STRM)	STORAGE	0.000	1.937	0	12:02	0	4.28	- 0.123
OVERFLOW_(C-STRM)	STORAGE	0.000	1.936	0	12:02	0	4.29	- 0.003
POND_(C-STRM)	STORAGE	0.550	4.501	0	12:07	1.59	15	- 0.044
S_525-MTD	STORAGE	0.220	0.220	0	12:00	0.316	0.316	0.144
S_528-525	STORAGE	0.222	0.222	0	12:00	0.32	0.32	0.131
S_532-528	STORAGE	0.113	0.113	0	12:00	0.162	0.162	0.134
S_536-532	STORAGE	0.267	0.267	0	12:00	0.392	0.392	0.037
S_540-536	STORAGE	0.118	0.118	0	12:00	0.169	0.169	0.015
S_541-540	STORAGE	0.450	0.450	0	12:00	0.647	0.647	0.048
S_604-603	STORAGE	0.333	0.333	0	12:00	0.478	0.478	0.000
S_605-604	STORAGE	0.900	0.900	0	12:00	1.3	1.3	0.000
S_619-606	STORAGE	0.248	0.248	0	12:00	0.356	0.356	0.000
S_622-619	STORAGE	0.516	0.516	0	12:00	0.747	0.747	0.000
S_622-619_2	STORAGE	0.285	0.285	0	12:00	0.41	0.41	0.000
S_627-630	STORAGE	0.098	0.098	0	12:00	0.14	0.14	0.000
S_629-622	STORAGE	0.169	0.169	0	12:00	0.243	0.243	0.000
SU2	STORAGE	0.021	0.021	0	12:00	0.0156	0.0156	- 0.011
SU5	STORAGE	0.048	0.048	0	12:02	0.0954	0.0954	- 0.001

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	8.0	0.0	0.0	0.000	13.8	0	12:08	0.039
500A_(C-STRM)	0.479	22.7	0.0	0.0	1.698	80.3	0	12:09	1.305
502_(C-STRM)	0.000	2.2	0.0	0.0	0.001	29.7	0	12:02	0.826
503_(C-STRM)	0.000	1.7	0.0	0.0	0.001	28.5	0	12:02	0.677
504_(C-STRM)	0.000	11.5	0.0	0.0	0.001	32.5	0	12:01	0.657
505_(C-STRM)	0.000	9.5	0.0	0.0	0.001	26.6	0	12:00	0.588
506_(C-STRM)	0.000	9.9	0.0	0.0	0.001	27.9	0	12:00	0.595
507_(C-STRM)	0.000	9.8	0.0	0.0	0.001	27.7	0	12:01	0.464
508_(C-STRM)	0.000	9.8	0.0	0.0	0.001	28.1	0	12:01	0.463
509_(C-STRM)	0.000	9.7	0.0	0.0	0.001	28.1	0	12:01	0.466
510_(C-STRM)	0.000	9.9	0.0	0.0	0.001	25.8	0	12:00	0.471
511_(C-STRM)	0.000	10.0	0.0	0.0	0.001	26.0	0	12:00	0.473
512_(C-STRM)	0.000	9.8	0.0	0.0	0.001	24.5	0	12:00	0.437
513_(C-STRM)	0.000	9.8	0.0	0.0	0.001	24.2	0	12:00	0.446
514_(C-STRM)	0.000	7.2	0.0	0.0	0.000	13.5	0	12:01	0.015
515_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0	00:00	0.000
516_(C-STRM)	0.000	10.0	0.0	0.0	0.001	26.8	0	12:01	0.307
517_(C-STRM)	0.000	10.3	0.0	0.0	0.001	28.8	0	12:00	0.311
518_(C-STRM)	0.000	10.9	0.0	0.0	0.001	30.8	0	12:00	0.316
519_(C-STRM)	0.000	10.6	0.0	0.0	0.001	25.1	0	12:00	0.105
520_(C-STRM)	0.000	11.3	0.0	0.0	0.001	21.7	0	12:00	0.089
522_(C-STRM)	0.000	9.9	0.0	0.0	0.001	18.2	0	12:00	0.064
525_(C-STRM)	0.000	2.2	0.0	0.0	0.001	46.6	0	12:02	1.124
528_(C-STRM)	0.000	1.4	0.0	0.0	0.002	50.7	0	12:02	0.949
532_(C-STRM)	0.000	1.2	0.0	0.0	0.002	52.2	0	12:02	0.766
536_(C-STRM)	0.000	1.3	0.0	0.0	0.002	52.1	0	12:02	0.672
540_(C-STRM)	0.000	10.9	0.0	0.0	0.002	56.2	0	12:02	0.478
541_(C-STRM)	0.000	10.5	0.0	0.0	0.002	54.8	0	12:02	0.382

551_(C-STRM)	0.000	8.3	0.0	0.0	0.001	27.1	0	12:02
0.207								
552_(C-STRM)	0.000	7.7	0.0	0.0	0.001	24.2	0	12:02
0.155								
553_(C-STRM)	0.000	8.1	0.0	0.0	0.001	20.3	0	12:01
0.176								
554_(C-STRM)	0.000	7.7	0.0	0.0	0.001	17.4	0	12:02
0.152								
555_(C-STRM)	0.000	7.8	0.0	0.0	0.001	17.1	0	12:00
0.157								
556_(C-STRM)	0.000	7.8	0.0	0.0	0.001	17.8	0	12:00
0.158								
601_(C-STRM)	0.000	1.6	0.0	0.0	0.001	23.2	0	12:03
3.877								
602_(C-STRM)	0.000	1.9	0.0	0.0	0.002	34.4	0	12:03
3.876								
603_(C-STRM)	0.000	1.9	0.0	0.0	0.002	35.9	0	12:03
3.861								
604_(C-STRM)	0.000	1.3	0.0	0.0	0.002	29.3	0	12:02
3.871								
605_(C-STRM)	0.000	1.2	0.0	0.0	0.001	22.9	0	12:02
3.636								
606_(C-STRM)	0.000	1.2	0.0	0.0	0.001	22.9	0	12:02
2.912								
619_(C-STRM)	0.000	1.4	0.0	0.0	0.002	26.2	0	12:01
2.944								
622_(C-STRM)	0.000	1.5	0.0	0.0	0.001	27.5	0	12:01
2.771								
626_(C-STRM)	0.000	6.8	0.0	0.0	0.000	11.3	0	12:02
0.018								
627_(C-STRM)	0.000	6.4	0.0	0.0	0.001	14.6	0	12:01
0.100								
629_(C-STRM)	0.000	1.6	0.0	0.0	0.001	25.6	0	12:01
2.262								
630_(C-STRM)	0.000	1.9	0.0	0.0	0.001	22.2	0	12:00
2.172								
630A_(C-STRM)	0.000	1.9	0.0	0.0	0.001	23.9	0	12:00
2.096								
631_(C-STRM)	0.001	0.0	0.0	0.0	0.034	1.3	0	12:00
1.638								
645_(C-STRM)	0.000	8.9	0.0	0.0	0.001	30.8	0	12:00
0.496								
647_(C-STRM)	0.000	9.4	0.0	0.0	0.001	32.3	0	12:00
0.468								
650_(C-STRM)	0.000	10.0	0.0	0.0	0.001	33.3	0	12:00
0.452								
651_(C-STRM)	0.000	10.5	0.0	0.0	0.001	33.3	0	12:00
0.451								
682_(C-STRM)	0.000	0.0	0.0	0.0	0.013	1.7	0	12:00
0.447								
MTD_(C-STRM)	0.000	4.4	0.0	0.0	0.001	36.6	0	12:02
1.936								
OVERFLOW_(C-STRM)	0.000	7.9	0.0	0.0	0.001	27.3	0	12:08
1.936								
POND_(C-STRM)	1.335	3.7	0.0	0.0	7.319	20.2	0	13:16
0.249								
S_525-MTD	0.000	0.0	0.0	0.0	0.013	2.2	0	12:00
0.203								
S_528-525	0.000	0.0	0.0	0.0	0.013	2.2	0	12:00
0.205								
S_532-528	0.000	0.0	0.0	0.0	0.007	2.2	0	12:00
0.104								
S_536-532	0.000	0.0	0.0	0.0	0.011	2.7	0	12:00
0.246								
S_540-536	0.000	0.0	0.0	0.0	0.005	2.3	0	12:00
0.110								
S_541-540	0.000	0.0	0.0	0.0	0.039	3.3	0	12:01
0.368								
S_604-603	0.000	0.0	0.0	36.5	0.019	2.2	0	12:00
0.308								
S_605-604	0.000	0.0	0.0	37.9	0.063	2.7	0	12:00
0.786								
S_619-606	0.000	0.0	0.0	36.6	0.009	2.0	0	12:00
0.243								
S_622-619	0.000	0.0	0.0	38.5	0.093	7.2	0	12:02
0.328								
S_622-619_2	0.000	0.0	0.0	36.6	0.012	2.5	0	12:00
0.261								
S_627-630	0.000	0.0	0.0	41.5	0.005	1.8	0	12:00
0.095								
S_629-622	0.000	0.0	0.0	38.9	0.013	3.0	0	12:01
0.143								
SU2	0.000	0.0	0.0	0.0	0.001	0.3	0	12:01
0.018								
SU5	0.000	0.0	0.0	0.0	0.003	0.5	0	12:03
0.048								

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	44.56	0.001	0.046	0.084
OF3	93.53	0.016	0.364	2.616
ST4_108A_(P-Stm)	92.55	0.094	0.249	15.010
System	57.66	0.111	0.589	17.710

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.048	0	12:00	0.86	0.72	0.46
BDR-C2	CONDUIT	0.057	0	12:00	0.96	1.08	0.49
BDR-C3	CONDUIT	0.062	0	12:20	1.54	0.32	0.26
BDR-C4	CONDUIT	0.270	0	12:03	1.83	0.09	0.19
C1_1	CHANNEL	0.000	0	16:52	0.00	0.00	0.00
C1_17	CHANNEL	0.000	0	12:00	0.29	0.02	0.02
C1_3	CHANNEL	0.000	0	12:00	0.06	0.00	0.02
C1_30	CHANNEL	0.000	0	23:36	0.00	0.00	0.00
C1_4	CHANNEL	0.000	1	06:10	0.00	0.00	0.00
C14_1	CHANNEL	0.000	0	12:00	0.03	0.00	0.02
C14_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C14_4	CHANNEL	0.000	0	12:00	0.02	0.00	0.03
C14_5	CHANNEL	0.000	0	12:00	0.08	0.00	0.03
C15_1	CHANNEL	0.000	0	12:00	0.06	0.00	0.02
C15_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C2	CONDUIT	0.000	0	12:36	0.00	0.00	0.00
C20_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C20_2	CHANNEL	0.000	0	12:00	0.12	0.00	0.02
C20_3	CHANNEL	0.000	0	12:00	0.12	0.00	0.02
C20_4	CHANNEL	0.000	0	12:00	0.18	0.00	0.01
C20_5	CHANNEL	0.000	0	12:03	0.02	0.00	0.01
C20_7	CHANNEL	0.000	0	12:00	0.21	0.00	0.02
C23_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C23_7	CHANNEL	0.000	0	12:01	0.45	0.00	0.01
C3	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C4	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C4_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.000	0	12:02	0.00	0.00	0.01
C4_3	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C4_4	CHANNEL	0.000	0	12:00	0.22	0.00	0.02
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C5_1	CHANNEL	0.065	0	12:00	0.26	0.01	0.10
C5_10	CHANNEL	0.048	0	12:00	0.39	0.01	0.17
C5_11	CHANNEL	0.043	0	12:06	0.17	0.02	0.19
C5_12	CHANNEL	0.364	0	12:00	0.93	0.03	0.19
C5_13	CHANNEL	0.048	0	12:02	0.47	0.01	0.16
C5_14	CHANNEL	0.044	0	12:08	0.13	0.03	0.23
C5_15	CHANNEL	0.056	0	12:09	0.29	0.02	0.17
C5_16	CHANNEL	0.053	0	12:15	0.31	0.01	0.12
C5_17	CHANNEL	0.052	0	12:18	0.19	0.01	0.11
C5_19	CHANNEL	0.057	0	12:07	0.31	0.04	0.16
C5_2	CHANNEL	0.055	0	12:04	0.47	0.01	0.14
C5_20	CHANNEL	0.056	0	12:23	0.17	0.01	0.13
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.15
C5_23	CHANNEL	0.064	0	12:00	0.24	0.01	0.11
C5_3	CHANNEL	0.061	0	12:01	0.42	0.00	0.14
C5_4	CHANNEL	0.053	0	12:06	0.43	0.00	0.10
C5_5	CHANNEL	0.053	0	12:08	0.55	0.00	0.09
C5_6	CHANNEL	0.054	0	12:05	0.59	0.00	0.08
C5_7	CHANNEL	0.038	0	12:22	0.17	0.00	0.13
C5_8	CHANNEL	0.053	0	12:11	0.37	0.00	0.11
C5_9	CHANNEL	0.226	0	12:04	0.54	0.02	0.20
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C7	CHANNEL	0.000	0	12:00	0.07	0.00	0.02
C9_1	CHANNEL	0.000	0	12:00	0.10	0.00	0.02
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C9_2	CHANNEL	0.000	0	12:00	0.16	0.00	0.01
C9_5	CHANNEL	0.000	0	12:01	0.02	0.00	0.01
C9_6	CHANNEL	0.000	0	12:00	0.16	0.00	0.02
C9_7	CHANNEL	0.000	0	12:00	0.25	0.00	0.02
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.307	0	12:01	1.14	0.82	0.72
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.311	0	12:00	1.01	0.95	0.81
C-STRM-1_(C-STRM)	CONDUIT	0.316	0	12:00	1.17	1.33	0.91
C-STRM-100_(C-STRM)	CONDUIT	0.039	0	12:08	0.91	0.09	0.21
C-STRM-101_(C-STRM)	CONDUIT	0.038	0	12:08	1.45	0.05	0.15
C-STRM-102_(C-STRM)	CONDUIT	1.926	0	12:03	4.08	0.77	0.75
C-STRM-103_(C-STRM)	CONDUIT	0.452	0	12:00	1.02	0.81	0.95
C-STRM-104_(C-STRM)	CONDUIT	0.468	0	12:01	0.90	0.84	0.99
C-STRM-105_(C-STRM)	CONDUIT	0.496	0	12:01	0.94	0.89	1.00
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.437	0	12:00	1.60	0.78	0.72
C-STRM-2_(C-STRM)	CONDUIT	0.439	0	12:00	1.68	0.78	0.68
C-STRM-20_(C-STRM)	CONDUIT	0.018	0	12:02	0.87	0.06	0.25
C-STRM-21_(C-STRM)	CONDUIT	0.100	0	12:01	1.21	0.33	0.41
C-STRM-22_(1)_(C-STRM)	CONDUIT	2.262	0	12:00	1.38	0.51	0.66
C-STRM-22_(C-STRM)	CONDUIT	2.172	0	12:00	2.14	0.79	0.58
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.207	0	11:56	1.02	0.62	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.155	0	11:57	0.69	0.46	0.97
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.595	0	12:00	1.65	0.75	
0.76							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.464	0	12:02	1.64	0.78	0.77
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.463	0	12:01	1.44	0.78	0.84
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.466	0	12:01	1.43	0.78	0.86
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.471	0	12:00	1.55	0.84	0.80
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.473	0	12:00	1.67	0.83	0.74
C-STRM-33_(C-STRM)	CONDUIT	0.451	0	12:00	1.07	0.81	0.89
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.157	0	12:00	1.12	0.91	0.62
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.158	0	12:00	0.94	0.92	0.73
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.176	0	11:59	1.07	0.72	0.86
C-STRM-35_(C-STRM)	CONDUIT	0.152	0	12:00	0.84	0.62	0.70
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.657	0	12:01	1.96	0.76	0.71
C-STRM-4_(C-STRM)	CONDUIT	0.588	0	12:01	1.63	0.75	0.76
C-STRM-49_(C-STRM)	CONDUIT	0.382	0	12:04	0.78	0.68	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.478	0	12:04	0.89	0.86	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.672	0	12:02	1.06	0.96	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.766	0	12:02	1.03	0.88	1.00
C-STRM-53_(C-STRM)	CONDUIT	0.949	0	12:02	1.27	1.09	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.677	0	12:01	0.91	0.77	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.089	0	12:00	0.92	0.70	0.67
C-STRM-63_(C-STRM)	CONDUIT	0.105	0	12:01	0.61	0.63	0.88
C-STRM-64_(C-STRM)	CONDUIT	0.064	0	12:00	0.99	0.73	0.57
C-STRM-74_(C-STRM)	CONDUIT	2.944	0	12:01	1.48	0.57	0.74
C-STRM-75_(C-STRM)	CONDUIT	2.912	0	12:02	1.49	0.57	0.72
C-STRM-76_(C-STRM)	CONDUIT	1.124	0	12:02	1.51	1.12	1.00
C-STRM-77_(C-STRM)	CONDUIT	1.936	0	12:02	2.52	1.00	0.86
C-STRM-78_(C-STRM)	CONDUIT	0.826	0	12:00	1.22	0.67	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	3.871	0	12:02	1.81	0.61	0.78
C-STRM-79_(C-STRM)	CONDUIT	3.636	0	12:02	1.78	0.63	0.76
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.015	0	12:02	0.23	0.08	0.40
C-STRM-8_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.05
C-STRM-80_(C-STRM)	CONDUIT	3.861	0	12:03	1.81	0.87	0.78
C-STRM-81_(C-STRM)	CONDUIT	3.876	0	12:03	2.11	0.87	0.68
C-STRM-82_(C-STRM)	CONDUIT	3.877	0	12:03	2.67	0.87	0.55
C-STRM-83_(1)_(C-STRM)	CONDUIT	2.096	0	12:00	1.88	0.77	0.61
C-STRM-84_(C-STRM)	CONDUIT	2.771	0	12:01	1.48	0.54	0.72
CVR-C2	CONDUIT	0.053	0	12:06	1.55	0.20	0.27
CVR-C3	CONDUIT	0.044	0	12:17	1.73	0.27	0.27
CVR-C4	CONDUIT	0.226	0	12:03	1.87	0.07	0.16
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	0.249	0	13:16	1.19	0.26	0.37
W1	CHANNEL	1.279	0	12:10	0.72	0.00	0.03
OR1	ORIFICE	0.249	0	13:15			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.249	0	11:58			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	11:58			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	11:57			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	11:53			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	11:56			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	11:58			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	12:00			
C-STRM-71_(C-STRM)	DUMMY	0.447	0	12:00			
C-STRM-83_(C-STRM)	DUMMY	1.638	0	12:00			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	11:57			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	11:58			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	11:58			
OL1	DUMMY	0.089	0	12:00			
OL10	DUMMY	0.026	0	06:43			
OL11	DUMMY	0.034	0	12:00			
OL12	DUMMY	0.075	0	12:00			
OL13	DUMMY	0.062	0	12:00			
OL14	DUMMY	0.089	0	12:00			
OL15	DUMMY	0.065	0	12:00			
OL16	DUMMY	0.245	0	12:00			
OL17	DUMMY	0.153	0	12:00			
OL18	DUMMY	0.043	0	12:00			
OL19	DUMMY	0.173	0	12:00			
OL2	DUMMY	0.018	0	12:01			
OL20	DUMMY	0.050	0	12:00			
OL21	DUMMY	0.044	0	12:00			
OL22	DUMMY	0.048	0	12:03			
OL3	DUMMY	0.134	0	11:56			
OL4	DUMMY	0.110	0	11:58			
OL5	DUMMY	0.018	0	12:00			
OL6	DUMMY	0.029	0	12:00			
OL7	DUMMY	0.016	0	12:00			
OL8	DUMMY	0.013	0	12:00			
OL9	DUMMY	0.159	0	12:00			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.46	0.00
BDR-C2	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.34	0.00

BDR-C3	1.00	0.06	0.00	0.00	0.40	0.54	0.00	0.00	0.00	0.00
BDR-C4	1.00	0.06	0.00	0.00	0.71	0.23	0.00	0.00	0.87	0.00
C1_1	1.00	0.25	0.00	0.00	0.62	0.13	0.00	0.00	0.59	0.00
C1_17	1.00	0.55	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00
C1_3	1.00	0.53	0.02	0.00	0.45	0.00	0.00	0.00	0.75	0.00
C1_30	1.00	0.28	0.00	0.00	0.23	0.49	0.00	0.00	0.12	0.00
C1_4	1.00	0.25	0.17	0.00	0.58	0.00	0.00	0.00	0.57	0.00
C14_1	1.00	0.54	0.03	0.00	0.43	0.00	0.00	0.00	0.76	0.00
C14_2	1.00	0.59	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.55	0.04	0.00	0.41	0.01	0.00	0.00	0.76	0.00
C14_5	1.00	0.55	0.00	0.00	0.43	0.01	0.00	0.00	0.00	0.00
C15_1	1.00	0.52	0.02	0.00	0.46	0.00	0.00	0.00	0.75	0.00
C15_2	1.00	0.54	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2_	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00
C20_1	1.00	0.54	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.55	0.01	0.00	0.43	0.01	0.00	0.00	0.02	0.00
C20_3	1.00	0.54	0.01	0.00	0.44	0.01	0.00	0.00	0.01	0.00
C20_4	1.00	0.06	0.49	0.00	0.44	0.01	0.00	0.00	0.75	0.00
C20_5	1.00	0.06	0.18	0.00	0.67	0.08	0.00	0.00	0.01	0.00
C20_7	1.00	0.55	0.01	0.00	0.43	0.02	0.00	0.00	0.01	0.00
C23_5	1.00	0.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C23_7	1.00	0.24	0.00	0.00	0.67	0.09	0.00	0.00	0.00	0.00
C3_	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.24	0.00	0.00	0.70	0.05	0.00	0.00	0.70	0.00
C4_3	1.00	0.25	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.06	0.49	0.00	0.44	0.01	0.00	0.00	0.75	0.00
C4_5	1.00	0.55	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_1	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.61	0.00
C5_10	1.00	0.06	0.00	0.00	0.93	0.01	0.00	0.00	0.92	0.00
C5_11	1.00	0.06	0.01	0.00	0.93	0.00	0.00	0.00	0.93	0.00
C5_12	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.07	0.00	0.00	0.54	0.39	0.00	0.00	0.00	0.00
C5_14	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.33	0.00
C5_15	1.00	0.07	0.00	0.00	0.92	0.02	0.00	0.00	0.89	0.00
C5_16	1.00	0.08	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.06	0.04	0.00	0.90	0.00	0.00	0.00	0.90	0.00
C5_19	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.38	0.00
C5_2	1.00	0.08	0.00	0.00	0.66	0.25	0.00	0.00	0.00	0.00
C5_20	1.00	0.06	0.01	0.00	0.94	0.00	0.00	0.00	0.94	0.00
C5_21	1.00	0.06	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.07	0.00	0.00	0.83	0.11	0.00	0.00	0.41	0.00
C5_3	1.00	0.07	0.00	0.00	0.92	0.01	0.00	0.00	0.90	0.00
C5_4	1.00	0.10	0.00	0.00	0.90	0.00	0.00	0.00	0.89	0.00
C5_5	1.00	0.11	0.00	0.00	0.88	0.01	0.00	0.00	0.01	0.00
C5_6	1.00	0.09	0.00	0.00	0.91	0.00	0.00	0.00	0.65	0.00
C5_7	1.00	0.06	0.08	0.00	0.86	0.00	0.00	0.00	0.86	0.00
C5_8	1.00	0.12	0.00	0.00	0.88	0.00	0.00	0.00	0.85	0.00
C5_9	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.93	0.00
C6_	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7_	1.00	0.55	0.00	0.00	0.45	0.00	0.00	0.00	0.75	0.00
C9_1	1.00	0.54	0.00	0.00	0.45	0.01	0.00	0.00	0.01	0.00
C9_11	1.00	0.55	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.06	0.50	0.00	0.43	0.01	0.00	0.00	0.75	0.00
C9_5	1.00	0.06	0.19	0.00	0.26	0.49	0.00	0.00	0.01	0.00
C9_6	1.00	0.06	0.49	0.00	0.44	0.01	0.00	0.00	0.75	0.00
C9_7	1.00	0.06	0.49	0.00	0.44	0.01	0.00	0.00	0.75	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	1.00	0.06	0.01	0.00	0.93	0.00	0.00	0.00	0.11	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.01	0.21	0.00
C-STRM-1_(C-STRM)	1.00	0.06	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.25	0.66	0.00	0.06	0.00	0.00	0.03	0.66	0.00
C-STRM-101_(C-STRM)	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
C-STRM-102_(C-STRM)	1.00	0.06	0.00	0.00	0.75	0.19	0.00	0.00	0.06	0.00
C-STRM-103_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.78	0.00
C-STRM-104_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.91	0.00
C-STRM-105_(C-STRM)	1.00	0.07	0.00	0.00	0.09	0.00	0.00	0.84	0.01	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.82	0.00
C-STRM-2_(C-STRM)	1.00	0.06	0.00	0.00	0.93	0.00	0.00	0.01	0.38	0.00
C-STRM-20_(C-STRM)	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
C-STRM-21_(C-STRM)	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.06	0.03	0.00	0.91	0.00	0.00	0.00	0.91	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.90	0.02	0.00	0.01	0.40	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.08	0.00	0.00	0.01	0.00	0.00	0.92	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.08	0.00	0.00	0.92	0.00	0.00	0.00	0.50	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.92	0.00	0.00	0.01	0.38	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.12	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.92	0.00	0.00	0.01	0.42	0.00
C-STRM-33_(C-STRM)	1.00	0.06	0.00	0.00	0.93	0.00	0.00	0.00	0.72	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.06	0.04	0.00	0.89	0.00	0.00	0.01	0.92	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.01	0.00	0.00	0.92	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.07	0.02	0.00	0.91	0.00	0.00	0.00	0.92	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.07	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.07	0.01	0.00	0.91	0.02	0.00	0.00	0.51	0.00
C-STRM-49_(C-STRM)	1.00	0.07	0.26	0.00	0.67	0.00	0.00	0.00	0.89	0.00
C-STRM-50_(C-STRM)	1.00	0.07	0.00	0.00	0.02	0.00	0.00	0.91	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.06	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.80	0.00
C-STRM-53_(C-STRM)	1.00	0.06	0.14	0.00	0.80	0.00	0.00	0.00	0.73	0.00
C-STRM-57_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.48	0.00
C-STRM-62_(C-STRM)	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.07	0.00	0.00	0.03	0.00	0.00	0.90	0.01	0.00
C-STRM-64_(C-STRM)	1.00	0.07	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.49	0.00
C-STRM-75_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.06	0.00	0.00	0.36	0.00	0.00	0.58	0.11	0.00
C-STRM-77_(C-STRM)	1.00	0.06	0.00	0.00	0.85	0.09	0.00	0.00	0.34	0.00
C-STRM-78_(C-STRM)	1.00	0.06	0.00	0.00	0.36	0.00	0.00	0.58	0.05	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.87	0.00
C-STRM-79_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.24	0.00	0.00	0.01	0.00	0.00	0.74	0.00	0.00
C-STRM-8_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.06	0.01	0.00	0.94	0.00	0.00	0.00	0.90	0.00
C-STRM-81_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.48	0.00
C-STRM-82_(C-STRM)	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.54	0.00
C-STRM-84_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.88	0.00
CVR-C2	1.00	0.10	0.00	0.00	0.73	0.17	0.00	0.00	0.82	0.00
CVR-C3	1.00	0.12	0.00	0.00	0.38	0.49	0.00	0.00	0.01	0.00
CVR-C4	1.00	0.06	0.00	0.00	0.42	0.52	0.00	0.00	0.11	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
W1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00

Analysis ended on: Thu Apr 9 12:05:35 2026
Total elapsed time: 00:00:13

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
BDR-C2	0.01	0.01	0.01	0.20	0.01
C-STRM-1_(C-STRM)	0.01	0.01	0.01	0.15	0.01
C-STRM-104_(C-STRM)	0.01	0.01	0.02	0.01	0.01
C-STRM-105_(C-STRM)	0.01	0.02	0.01	0.01	0.01
C-STRM-26_(1)_(C-STRM)	0.07	0.07	0.11	0.01	0.01
C-STRM-26_(C-STRM)	0.01	0.01	0.07	0.01	0.01
C-STRM-49_(C-STRM)	0.14	0.14	0.15	0.01	0.01
C-STRM-50_(C-STRM)	0.15	0.15	0.16	0.01	0.05
C-STRM-51_(C-STRM)	0.15	0.16	0.15	0.01	0.14
C-STRM-52_(C-STRM)	0.15	0.15	0.16	0.01	0.12
C-STRM-53_(C-STRM)	0.15	0.16	0.15	0.09	0.15
C-STRM-57_(C-STRM)	0.12	0.12	0.12	0.01	0.12
C-STRM-76_(C-STRM)	0.12	0.15	0.12	0.11	0.12
C-STRM-77_(C-STRM)	0.01	0.12	0.01	0.01	0.01
C-STRM-78_(C-STRM)	0.12	0.12	0.12	0.01	0.07

Analysis begun on: Thu Apr 9 12:05:22 2026

Post-Development 1:5 year 24-hour SCS Event

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

WARNING 03: negative offset ignored for Link C1_17
WARNING 04: minimum elevation drop used for Conduit W1
WARNING 03: negative offset ignored for Link OL1
WARNING 03: negative offset ignored for Link OL13
WARNING 03: negative offset ignored for Link OL15
WARNING 02: maximum depth increased for Node EXD_1
WARNING 02: maximum depth increased for Node EXD_10
WARNING 02: maximum depth increased for Node EXD_11
WARNING 02: maximum depth increased for Node EXD_12
WARNING 02: maximum depth increased for Node EXD_13
WARNING 02: maximum depth increased for Node EXD_14
WARNING 02: maximum depth increased for Node EXD_15
WARNING 02: maximum depth increased for Node EXD_16
WARNING 02: maximum depth increased for Node EXD_17
WARNING 02: maximum depth increased for Node EXD_18
WARNING 02: maximum depth increased for Node EXD_19
WARNING 02: maximum depth increased for Node EXD_20
WARNING 02: maximum depth increased for Node EXD_21
WARNING 02: maximum depth increased for Node EXD_22
WARNING 02: maximum depth increased for Node EXD_23
WARNING 02: maximum depth increased for Node EXD_24
WARNING 02: maximum depth increased for Node EXD_25
WARNING 02: maximum depth increased for Node EXD_26
WARNING 02: maximum depth increased for Node EXD_27
WARNING 02: maximum depth increased for Node EXD_5
WARNING 02: maximum depth increased for Node EXD_7
WARNING 02: maximum depth increased for Node EXD_8
WARNING 02: maximum depth increased for Node EXD_9
WARNING 02: maximum depth increased for Node J17
WARNING 02: maximum depth increased for Node J74

*************
Element Count
*************
Number of rain gages ...... 3
Number of subcatchments ... 43
Number of nodes ........... 139
Number of links ........... 170
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
Name                 Data Source          Data Type    Recording Interval
-------------------- -------------------- ---------- ------------------
24SCS100             24SCS100             INTENSITY   15 min.
6SCS050              6SCS050              INTENSITY   15 min.
Rainfall             SCS_24h_5            INTENSITY   15 min.


********************
Subcatchment Summary
********************
Name                 Area     Width   %Imperv   %Slope Rain Gage            Outlet
-------------------- -------- ------- --------- ------- -------------------- ----------
A15                     3.46    13.10     18.98    0.5000 Rainfall             EXD_12
A18                     0.59   338.21     39.12    0.5000 Rainfall             EXD_25
A19                     1.11   332.78     22.32    0.5000 Rainfall             EXD_20
A20                     4.83   279.76      8.37    1.5000 Rainfall             EXD_15
NULL3                   0.57   312.75     83.33    1.4500 Rainfall             EXD_27
S1                      6.52  1467.98     66.38    2.0000 Rainfall             S_605-604
S1_1                    0.12   118.05     71.43    2.0000 Rainfall             J19
S1_2                    0.12   147.72     71.43    2.0000 Rainfall             J22
S1_4                    0.19   154.58     71.43    2.0000 Rainfall             J21
S1_5                    0.11   103.57     71.43    2.0000 Rainfall             J20
S10_1                   1.84   414.84     64.29    2.0000 Rainfall             S_619-606
S10_2                   2.12   478.11     64.29    2.0000 Rainfall             S_622-
619_2
S10_4                   0.73   163.42     64.29    2.0000 Rainfall             S_627-630
S10_5                   1.26   283.52     64.29    2.0000 Rainfall             S_629-622
S11                     3.30   287.00      0.00    2.0000 Rainfall             SU2
S12                     0.44   334.74     71.43    2.0000 Rainfall             J6
S14_1                   0.60   367.10     71.43    2.0000 Rainfall             J28
S14_3                   1.06   381.29     71.43    2.0000 Rainfall             J58
S14_4                   0.30   171.63     71.43    2.0000 Rainfall             J44
S14_5                   1.69   659.05     71.43    2.0000 Rainfall             J29
S14_6                   0.29   153.64     71.43    2.0000 Rainfall             J59
S14_7                   1.17   557.97     71.43    2.0000 Rainfall             J61
S14_8                   0.34   171.63     71.43    2.0000 Rainfall             J48
S15                     1.64   368.26     64.29    2.0000 Rainfall             S_525-MTD
S16                     1.47    16.60    100.00    0.5000 Rainfall             EXD_10
S17                     6.26   202.00      3.33    0.5000 Rainfall             EXD_7
S18_2                   3.35   754.05     64.29    2.0000 Rainfall             S_541-540
S18_3                   1.66   372.76     64.29    2.0000 Rainfall             S_528-525
S18_4                   0.88   197.06     64.29    2.0000 Rainfall             S_540-536
S18_5                   1.83   412.02     71.43    2.0000 Rainfall             S_536-532
S18_6                   0.84   188.96     64.29    2.0000 Rainfall             S_532-528
S19                     1.05   441.38     71.43    2.0000 Rainfall             J19
S2                      3.72   837.17     66.87    2.0000 Rainfall             S_622-619
S20_1                   0.50   441.34     71.43    2.0000 Rainfall             J40
S20_2                   0.23   441.34     71.43    2.0000 Rainfall             J36
S3                      2.48   557.29     64.29    2.0000 Rainfall             S_604-603
S32                     0.41   327.12     71.43    2.0000 Rainfall             J46
S36                     1.82    21.00    100.00    0.5000 Rainfall             EXD_10
S4                     13.22   348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
S5                      3.19   291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
S6                      0.34   260.95     57.14    2.0000 Rainfall             OF2
S7                      3.99   402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
S8                      1.92   119.90     35.71    2.0000 Rainfall             SU5


************
Node Summary
************
Name                 Type            Invert Elev.   Max. Depth   Ponded Area   External Inflow
-------------------- --------------- ------------ ------------ ------------ ----------
EXD_1                JUNCTION             104.39         1.51          0.0
EXD_10               JUNCTION              98.65         1.20          0.0
EXD_11               JUNCTION              98.50         1.20          0.0
EXD_12               JUNCTION              98.31         1.20          0.0
EXD_13               JUNCTION             104.32         1.10          0.0
EXD_14               JUNCTION             102.49         0.80          0.0
EXD_15               JUNCTION             100.27         0.80          0.0
EXD_16               JUNCTION             100.20         0.80          0.0
EXD_17               JUNCTION              99.89         0.80          0.0
EXD_18               JUNCTION              99.40         0.84          0.0
EXD_19               JUNCTION              99.19         0.88          0.0
EXD_2                JUNCTION             103.47         1.93          0.0
EXD_20               JUNCTION              99.19         0.88          0.0
EXD_21               JUNCTION              99.18         0.88          0.0
EXD_22               JUNCTION              99.14         0.88          0.0
EXD_23               JUNCTION              98.75         1.14          0.0
EXD_24               JUNCTION              98.67         1.14          0.0
EXD_25               JUNCTION              98.52         1.13          0.0
EXD_26               JUNCTION              98.48         1.13          0.0
EXD_27               JUNCTION              98.17         1.20          0.0
EXD_3                JUNCTION             103.19         1.41          0.0
EXD_4                JUNCTION             102.64         1.20          0.0
EXD_5                JUNCTION             102.50         1.20          0.0
EXD_6                JUNCTION             102.32         1.08          0.0
EXD_7                JUNCTION             101.50         1.06          0.0
EXD_8                JUNCTION             100.48         1.06          0.0
EXD_9                JUNCTION             100.39         1.06          0.0
J10                  JUNCTION             103.60         0.50          0.0
J11                  JUNCTION             103.50         0.50          0.0
J12                  JUNCTION             103.40         0.50          0.0
J13                  JUNCTION             103.30         0.50          0.0
J17                  JUNCTION             104.37         1.04          0.0
J19                  JUNCTION             105.40         0.50          0.0
J20                  JUNCTION             105.45         0.50          0.0
J21                  JUNCTION             105.55         0.50          0.0
J22                  JUNCTION             105.70         0.50          0.0
J23                  JUNCTION             106.00         0.50          0.0
J24                  JUNCTION             106.20         0.50          0.0
J25                  JUNCTION             105.30         0.50          0.0
J26                  JUNCTION             105.70         0.50          0.0
J28                  JUNCTION             109.00         0.50          0.0
J29                  JUNCTION             108.80         0.50          0.0
J32                  JUNCTION             106.00         0.50          0.0
J36                  JUNCTION             104.70         0.50          0.0
J39                  JUNCTION             104.60         0.50          0.0
J40                  JUNCTION             104.45         0.50          0.0
J41                  JUNCTION             103.20         0.50          0.0
J43                  JUNCTION             104.20         0.50          0.0
J44                  JUNCTION             104.50         0.50          0.0
J46                  JUNCTION             104.60         0.50          0.0
J47                  JUNCTION             105.10         0.50          0.0
J48                  JUNCTION             105.75         0.50          0.0
J51                  JUNCTION             106.75         0.50          0.0
J52                  JUNCTION             109.75         0.50          0.0
J53                  JUNCTION             109.00         0.50          0.0
J56                  JUNCTION             109.10         0.50          0.0
J57                  JUNCTION             108.47         0.50          0.0
J58                  JUNCTION             108.40         0.50          0.0
J59                  JUNCTION             108.00         0.50          0.0
J6                   JUNCTION             109.83         0.30          0.0
J61                  JUNCTION             107.00         0.50          0.0
J62                  JUNCTION             106.50         0.50          0.0
J74                  JUNCTION              98.45         0.90          0.0
J9                   JUNCTION             103.70         0.50          0.0
OF1                  OUTFALL              100.80         0.00          0.0
OF2                  OUTFALL                0.00         0.00          0.0
OF3                  OUTFALL               98.00         1.06          0.0
ST4_108A_(P-Stm)     OUTFALL               98.02         1.19          0.0
500_(C-STRM)         STORAGE              100.31         2.84          0.0
500A_(C-STRM)        STORAGE              100.10         1.00          0.0
502_(C-STRM)         STORAGE              100.54         3.70          0.0
503_(C-STRM)         STORAGE              100.59         3.92          0.0
504_(C-STRM)         STORAGE              103.04         2.70          0.0
505_(C-STRM)         STORAGE              103.45         3.26          0.0
506_(C-STRM)         STORAGE              103.82         3.16          0.0
507_(C-STRM)         STORAGE              104.14         3.10          0.0
508_(C-STRM)         STORAGE              104.37         3.12          0.0
509_(C-STRM)         STORAGE              104.60         3.14          0.0
510_(C-STRM)         STORAGE              104.85         3.09          0.0
511_(C-STRM)         STORAGE              104.91         3.08          0.0
512_(C-STRM)         STORAGE              105.11         3.12          0.0
513_(C-STRM)         STORAGE              105.24         3.14          0.0
514_(C-STRM)         STORAGE              105.59         3.16          0.0
515_(C-STRM)         STORAGE              105.85         3.24          0.0
516_(C-STRM)         STORAGE              105.46         3.06          0.0
517_(C-STRM)         STORAGE              105.62         3.03          0.0
518_(C-STRM)         STORAGE              105.85         2.92          0.0
519_(C-STRM)         STORAGE              106.08         2.82          0.0
520_(C-STRM)         STORAGE              106.34         2.66          0.0
522_(C-STRM)         STORAGE              104.31         3.00          0.0
525_(C-STRM)         STORAGE              100.61         2.69          0.0
528_(C-STRM)         STORAGE              100.72         2.68          0.0
532_(C-STRM)         STORAGE              100.83         2.67          0.0
536_(C-STRM)         STORAGE              100.98         2.63          0.0
540_(C-STRM)         STORAGE              100.86         2.85          0.0
541_(C-STRM)         STORAGE              100.93         2.89          0.0
551_(C-STRM)         STORAGE              100.65         3.78          0.0
552_(C-STRM)         STORAGE              100.74         3.88          0.0
553_(C-STRM)         STORAGE              100.93         3.78          0.0
554_(C-STRM)         STORAGE              101.05         3.89          0.0
555_(C-STRM)         STORAGE              101.25         3.93          0.0
556_(C-STRM)         STORAGE              101.37         3.89          0.0
601_(C-STRM)         STORAGE              100.45         4.43          0.0
602_(C-STRM)         STORAGE              100.52         4.11          0.0
603_(C-STRM)         STORAGE              100.63         3.89          0.0
604_(C-STRM)         STORAGE              100.88         4.87          0.0
605_(C-STRM)         STORAGE              101.09         5.63          0.0
606_(C-STRM)         STORAGE              101.24         5.75          0.0
619_(C-STRM)         STORAGE              101.38         5.14          0.0
622_(C-STRM)         STORAGE              101.53         4.49          0.0
626_(C-STRM)         STORAGE              103.94         3.33          0.0
627_(C-STRM)         STORAGE              103.13         3.58          0.0
629_(C-STRM)         STORAGE              101.65         4.46          0.0
630_(C-STRM)         STORAGE              102.08         4.12          0.0
630A_(C-STRM)        STORAGE              102.12         3.90          0.0
631_(C-STRM)         STORAGE              106.00         0.50          0.0
645_(C-STRM)         STORAGE              102.03         3.69          0.0
647_(C-STRM)         STORAGE              102.14         3.40          0.0
650_(C-STRM)         STORAGE              102.22         3.19          0.0
651_(C-STRM)         STORAGE              102.31         3.03          0.0
682_(C-STRM)         STORAGE              105.40         3.19          0.0
MTD_(C-STRM)         STORAGE              100.37         3.19          0.0
OVERFLOW_(C-STRM)    STORAGE              100.18         2.76          0.0
POND_(C-STRM)        STORAGE               98.45         2.65          0.0    Yes
S_525-MTD            STORAGE              103.30         0.50          0.0
S_528-525            STORAGE              103.41         0.50          0.0
S_532-528            STORAGE              103.50         0.50          0.0
S_536-532            STORAGE              103.60         0.50          0.0
S_540-536            STORAGE              103.71         0.50          0.0
S_541-540            STORAGE              103.81         0.50          0.0
S_604-603            STORAGE              105.50         0.50          0.0
S_605-604            STORAGE              106.71         0.50          0.0
S_619-606            STORAGE              106.50         0.50          0.0
S_622-619            STORAGE              105.70         0.50          0.0
S_622-619_2          STORAGE              106.50         0.50          0.0
S_627-630            STORAGE              106.70         0.50          0.0
S_629-622            STORAGE              106.01         0.50          0.0
SU2                  STORAGE              106.75         0.50          0.0
SU5                  STORAGE              104.18         0.50          0.0


************
Link Summary
************
Name                 From Node       To Node         Type            Length    %Slope   Roughness
-------------------- --------------- --------------- ---------- ---------- ---------- ----------
BDR-C1               EXD_15          EXD_16          CONDUIT           17.7    0.3844     0.0250
BDR-C2               EXD_20          EXD_21          CONDUIT            7.9    0.0632     0.0130
BDR-C3               EXD_25          EXD_26          CONDUIT           14.2    0.2683     0.0130
BDR-C4               EXD_12          EXD_27          CONDUIT           23.0    0.6077     0.0130
C1_1                 J32             J26             CONDUIT           71.8    0.4181     0.0130
C1_17                J6              EXD_1           CONDUIT          171.9    2.4608     0.0130
C1_3                 J28             J29             CONDUIT          183.6    0.1090     0.0130
C1_30                J26             J25             CONDUIT           93.1    0.4296     0.0130
C1_4                 J25             J39             CONDUIT           75.0    0.9329     0.0130
C14_1                J20             J19             CONDUIT           59.0    0.0847     0.0130
C14_2                J23             J22             CONDUIT           73.9    0.4062     0.0130
C14_4                J22             J21             CONDUIT           77.3    0.1941     0.0130
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C14_5	J21	J20	CONDUIT	51.8	0.1931
0.0130					
C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61

C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-100_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-101_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-102_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-103_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-104_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-105_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-200_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-201_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-22_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
4.45							
C-STRM-22_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
C-STRM-26_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.34							
C-STRM-26_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR				0.60	0.28	0.15	0.60
0.25							
C-STRM-35_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-4_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
C-STRM-4_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-49_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-50_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-51_(C-STRM) CIRCULAR			0.90	0.64	0.23	0.90	1
C-STRM-52_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-53_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-57_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-62_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-63_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-64_(C-STRM) CIRCULAR			0.38	0.11	0.09	0.38	1
C-STRM-74_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-75_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-76_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-77_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-78_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-79_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
6.30							
C-STRM-79_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-8_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
C-STRM-8_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-80_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-81_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-82_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-83_(1)_(C-STRM) CIRCULAR				1.50	1.77	0.38	1.50
2.74							
C-STRM-84_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
CVR-C2	CIRCULAR		0.45	0.16	0.11	0.45	1
CVR-C3	CIRCULAR		0.40	0.13	0.10	0.40	1
CVR-C4	CIRCULAR		1.20	1.13	0.30	1.20	1
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR				0.90	0.64	0.23	0.90
0.96							
W1	Pond_SpillWay		3.89	318.30	4.06	128.79	1

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4738	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6219	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4985	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8858	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807

0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929
0.4178	0.4430	0.4687	0.4947	0.5212
0.5482	0.5760	0.6046	0.6335	0.6626
0.6921	0.7218	0.7518	0.7820	0.8133
0.8461	0.8801	0.9163	0.9564	1.0000

Hrad:

0.0226	0.0600	0.0982	0.1332	0.1659
0.1974	0.2291	0.2613	0.2925	0.3228
0.3524	0.3813	0.4096	0.4373	0.4557
0.4729	0.4908	0.5133	0.5388	0.5667
0.5954	0.6238	0.6186	0.5790	0.5404
0.5828	0.6246	0.6659	0.7067	0.7469
0.7867	0.8189	0.8502	0.8811	0.9116
0.9331	0.9497	0.9763	1.0109	1.0452
1.0791	1.1126	1.1458	1.1787	1.1574
1.1642	1.1570	1.1256	1.0602	1.0000

Width:

0.0656	0.0958	0.1094	0.1231	0.1368
0.1501	0.1622	0.1729	0.1837	0.1944
0.2052	0.2159	0.2267	0.2377	0.2539
0.2715	0.2891	0.3043	0.3175	0.3291
0.3399	0.3507	0.3819	0.4435	0.5186
0.5219	0.5251	0.5284	0.5317	0.5350
0.5382	0.5558	0.5468	0.5647	0.5737
0.5886	0.6068	0.6185	0.6243	0.6301
0.6359	0.6417	0.6475	0.6534	0.6932
0.7170	0.7512	0.8061	0.8978	1.0000

Transect Barnsdale_UPST7

Area:

0.0031	0.0077	0.0135	0.0206	0.0292
0.0385	0.0485	0.0590	0.0699	0.0811
0.0928	0.1047	0.1170	0.1297	0.1427
0.1561	0.1700	0.1843	0.1992	0.2145
0.2304	0.2467	0.2636	0.2810	0.3005
0.3224	0.3464	0.3708	0.3955	0.4204
0.4456	0.4710	0.4972	0.5239	0.5510
0.5784	0.6060	0.6340	0.6622	0.6907
0.7195	0.7487	0.7782	0.8081	0.8383
0.8691	0.9003	0.9322	0.9647	1.0000

Hrad:

0.0323	0.0624	0.0905	0.1084	0.1375
0.1686	0.1997	0.2314	0.2650	0.2977
0.3296	0.3608	0.3913	0.4212	0.4493
0.4751	0.5005	0.5247	0.5476	0.5703
0.5929	0.6154	0.6378	0.6601	0.5891
0.5938	0.5928	0.6266	0.6599	0.6927
0.7252	0.7501	0.7705	0.7948	0.8255
0.8559	0.8860	0.9157	0.9452	0.9727
1.0000	1.0270	1.0538	1.0784	1.1003
1.1221	1.1420	1.1557	1.1624	1.0000

Width:

0.0999	0.1304	0.1570	0.1994	0.2229
0.2396	0.2541	0.2664	0.2751	0.2837
0.2923	0.3010	0.3096	0.3183	0.3279
0.3390	0.3501	0.3618	0.3745	0.3872
0.3998	0.4124	0.4251	0.4377	0.5266
0.5610	0.6032	0.6092	0.6153	0.6213
0.6274	0.6399	0.6563	0.6692	0.6761
0.6830	0.6899	0.6967	0.7036	0.7118
0.7199	0.7281	0.7362	0.7458	0.7573
0.7688	0.7817	0.7991	0.8220	1.0000

Transect GBR

Area:

0.0002	0.0008	0.0018	0.0032	0.0051
0.0073	0.0099	0.0130	0.0164	0.0203
0.0245	0.0292	0.0343	0.0401	0.0532
0.0756	0.1002	0.1249	0.1496	0.1742
0.1989	0.2235	0.2482	0.2729	0.2975
0.3222	0.3468	0.3715	0.3962	0.4209
0.4460	0.4715	0.4974	0.5237	0.5505
0.5776	0.6051	0.6331	0.6614	0.6902
0.7193	0.7489	0.7789	0.8092	0.8400
0.8712	0.9028	0.9348	0.9672	1.0000

Hrad:

0.0148	0.0296	0.0444	0.0592	0.0741
0.0889	0.1037	0.1185	0.1333	0.1481
0.1629	0.1777	0.1925	0.1451	0.0889
0.0921	0.1222	0.1522	0.1821	0.2121
0.2420	0.2720	0.3019	0.3318	0.3616
0.3915	0.4213	0.4809	0.5106	0.5403
0.5398	0.5684	0.5963	0.6237	0.6505
0.6768	0.7026	0.7280	0.7529	0.7773
0.8013	0.8249	0.8480	0.8708	0.8932
0.9153	0.9369	0.9583	0.9793	1.0000

Width:

0.0123	0.0246	0.0369	0.0492	0.0614
0.0737	0.0860	0.0983	0.1106	0.1229
0.1352	0.1475	0.1598	0.2496	0.5446
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7542
0.7665	0.7788	0.7911	0.8034	0.8157
0.8280	0.8402	0.8525	0.8648	0.8771
0.8894	0.9017	0.9140	0.9263	0.9386
0.9508	0.9631	0.9754	0.9877	1.0000

Transect Pond_SpillWay

Area:

0.0040	0.0088	0.0142	0.0204	0.0274
0.0350	0.0434	0.0524	0.0622	0.0728
0.0840	0.0960	0.1087	0.1221	0.1362
0.1511	0.1666	0.1829	0.2000	0.2177
0.2362	0.2554	0.2753	0.2959	0.3173
0.3393	0.3621	0.3856	0.4099	0.4348
0.4600	0.4855	0.5113	0.5375	0.5640
0.5908	0.6180	0.6454	0.6732	0.7013
0.7297	0.7585	0.7875	0.8169	0.8466
0.8767	0.9070	0.9377	0.9687	1.0000

Hrad:

0.0187	0.0367	0.0543	0.0716	0.0888
0.1059	0.1230	0.1400	0.1570	0.1740
0.1910	0.2080	0.2251	0.2421	0.2592
0.2763	0.2935	0.3106	0.3278	0.3450
0.3622	0.3795	0.3967	0.4140	0.4313
0.4486	0.4660	0.4833	0.5007	0.5241
0.5500	0.5758	0.6013	0.6266	0.6517
0.6766	0.7013	0.7257	0.7498	0.7737
0.7974	0.8209	0.8441	0.8670	0.8898
0.9123	0.9345	0.9566	0.9784	1.0000

Width:

0.1394	0.1623	0.1853	0.2082	0.2311
0.2541	0.2770	0.2999	0.3229	0.3458
0.3687	0.3917	0.4146	0.4375	0.4605
0.4834	0.5063	0.5293	0.5522	0.5751
0.5981	0.6210	0.6439	0.6669	0.6898
0.7127	0.7357	0.7586	0.7815	0.7956
0.8059	0.8161	0.8263	0.8365	0.8467
0.8569	0.8672	0.8774	0.8876	0.8978
0.9080	0.9183	0.9285	0.9387	0.9489
0.9591	0.9693	0.9796	0.9898	1.0000

Transect ROW_14m

Area:

0.0004	0.0017	0.0038	0.0067	0.0104
0.0150	0.0204	0.0267	0.0338	0.0417
0.0504	0.0600	0.0704	0.0817	0.0938
0.1067	0.1204	0.1350	0.1504	0.1667
0.1838	0.2017	0.2204	0.2400	0.2605
0.2817	0.3038	0.3267	0.3502	0.3738
0.3973	0.4209	0.4446	0.4692	0.4952
0.5225	0.5510	0.5808	0.6118	0.6439
0.6767	0.7100	0.7440	0.7787	0.8140
0.8499	0.8865	0.9237	0.9615	1.0000

Hrad:

0.0169	0.0338	0.0507	0.0677	0.0846
0.1015	0.1184	0.1353	0.1522	0.1692
0.1861	0.2030	0.2199	0.2368	0.2537
0.2707	0.2876	0.3045	0.3214	0.3383
0.3552	0.3722	0.3891	0.4060	0.4229
0.4398	0.4567	0.4736	0.5027	0.5359
0.5691	0.6022	0.6353	0.6667	0.6957
0.7226	0.7474	0.7704	0.7918	0.8123
0.8326	0.8526	0.8721	0.8914	0.9103
0.9289	0.9471	0.9651	0.9827	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6200	0.6529	0.6857
0.7186	0.7514	0.7843	0.8171	0.8357
0.8521	0.8686	0.8850	0.9014	0.9179
0.9343	0.9507	0.9671	0.9836	1.0000

Transect ROW_14m_Mountable

Area:

0.0003	0.0012	0.0028	0.0049	0.0077
0.0111	0.0151	0.0197	0.0249	0.0307
0.0372	0.0442	0.0519	0.0602	0.0691
0.0787	0.0888	0.0996	0.1109	0.1229
0.1355	0.1487	0.1625	0.1770	0.1923
0.2092	0.2277	0.2477	0.2693	0.2924
0.3170	0.3433	0.3711	0.4004	0.4310
0.4626	0.4954	0.5293	0.5642	0.6002
0.6373	0.6755	0.7144	0.7538	0.7936
0.8340	0.8748	0.9160	0.9578	1.0000

Hrad:

0.0222	0.0445	0.0667	0.0889	0.1111
0.1334	0.1556	0.1778	0.2001	0.2223
0.2445	0.2667	0.2890	0.3112	0.3334
0.3556	0.3779	0.4001	0.4223	0.4446
0.4668	0.4890	0.5112	0.5335	0.5550
0.5833	0.5891	0.6029	0.6151	0.6263
0.6367	0.6465	0.6559	0.6653	0.6759
0.6872	0.6992	0.7116	0.7245	0.7378
0.7514	0.7663	0.7966	0.8266	0.8563
0.8856	0.9147	0.9434	0.9719	1.0000

Width:

0.0145	0.0290	0.0434	0.0579	0.0724
0.0869	0.1013	0.1158	0.1303	0.1448
0.1593	0.1737	0.1882	0.2027	0.2172
0.2316	0.2461	0.2606	0.2751	0.2896
0.3040	0.3185	0.3330	0.3475	0.3798
0.4164	0.4530	0.4897	0.5263	0.5629
0.5995	0.6362	0.6728	0.7080	0.7335
0.7591	0.7846	0.8102	0.8357	0.8613
0.8868	0.9114	0.9225	0.9336	0.9446
0.9557	0.9668	0.9779	0.9889	1.0000

Transect ROW_14m_PH3

Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0153	0.0209	0.0273	0.0345	0.0426
0.0516	0.0614	0.0721	0.0836	0.0959
0.1091	0.1229	0.1381	0.1539	0.1705
0.1880	0.2064	0.2255	0.2456	0.2665
0.2882	0.3108	0.3343	0.3583	0.3824
0.4065	0.4306	0.4548	0.4797	0.5055
0.5322	0.5598	0.5883	0.6176	0.6479
0.6791	0.7112	0.7441	0.7780	0.8127
0.8484	0.8850	0.9224	0.9608	1.0000

Hrad:

0.0166	0.0332	0.0498	0.0664	0.0830
0.0997	0.1163	0.1329	0.1495	0.1661
0.1827	0.1993	0.2159	0.2325	0.2491
0.2657	0.2823	0.2990	0.3156	0.3322
0.3488	0.3654	0.3820	0.3986	0.4152
0.4318	0.4484	0.4650	0.4935	0.5262
0.5588	0.5913	0.6238	0.6553	0.6853
0.7137	0.7407	0.7664	0.7909	0.8143
0.8366	0.8579	0.8783	0.8979	0.9166
0.9346	0.9519	0.9685	0.9845	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6160	0.6386	0.6612
0.6838	0.7063	0.7289	0.7515	0.7741
0.7967	0.8193	0.8419	0.8645	0.8871
0.9096	0.9322	0.9548	0.9774	1.0000

Transect ROW_14m-MB_1

Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0407	0.0484	0.0568	0.0659	0.0757
0.0861	0.0972	0.1089	0.1214	0.1345
0.1483	0.1631	0.1791	0.1963	0.2146
0.2342	0.2549	0.2768	0.2999	0.3242
0.3497	0.3764	0.4043	0.4333	0.4635
0.4949	0.5273	0.5601	0.5935	0.6274
0.6618	0.6967	0.7326	0.7693	0.8064
0.8441	0.8823	0.9210	0.9603	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0792	0.0990
0.1188	0.1386	0.1584	0.1782	0.1980
0.2178	0.2376	0.2574	0.2772	0.2971
0.3169	0.3367	0.3565	0.3763	0.3961
0.4159	0.4347	0.4520	0.4681	0.4834
0.4979	0.5119	0.5256	0.5389	0.5521
0.5650	0.5779	0.5907	0.6035	0.6162
0.6289	0.6560	0.6844	0.7123	0.7397
0.7667	0.7933	0.8190	0.8459	0.8726
0.8988	0.9247	0.9501	0.9752	1.0000

Width:

0.0168	0.0336	0.0504	0.0673	0.0841
0.1009	0.1177	0.1345	0.1513	0.1681
0.1849	0.2018	0.2186	0.2354	0.2522
0.2690	0.2858	0.3026	0.3195	0.3363
0.3552	0.3849	0.4146	0.4442	0.4739
0.5036	0.5332	0.5629	0.5926	0.6223
0.6519	0.6816	0.7113	0.7409	0.7706
0.8003	0.8150	0.8279	0.8407	0.8536
0.8664	0.8836	0.9093	0.9229	0.9357
0.9486	0.9614	0.9743	0.9871	1.0000

Transect ROW_16.5m_Mountable

Area:

0.0003	0.0012	0.0027	0.0048	0.0074
0.0107	0.0145	0.0190	0.0240	0.0297
0.0359	0.0428	0.0502	0.0582	0.0668
0.0760	0.0858	0.0962	0.1072	0.1188
0.1309	0.1437	0.1571	0.1710	0.1856
0.2012	0.2183	0.2369	0.2570	0.2786
0.3037	0.3263	0.3524	0.3800	0.4091
0.4397	0.4719	0.5055	0.5406	0.5772
0.6153	0.6544	0.6944	0.7354	0.7772
0.8199	0.8636	0.9082	0.9536	1.0000

Hrad:

0.0233	0.0465	0.0698	0.0931	0.1163
0.1396	0.1628	0.1861	0.2094	0.2326
0.2559	0.2792	0.3024	0.3257	0.3489
0.3722	0.3955	0.4187	0.4420	0.4653
0.4885	0.5118	0.5350	0.5583	0.5816
0.6036	0.6224	0.6386	0.6529	0.6657
0.6773	0.6882	0.6985	0.7084	0.7180
0.7275	0.7370	0.7464	0.7559	0.7655
0.7817	0.8084	0.8343	0.8597	0.8844
0.9085	0.9321	0.9552	0.9779	1.0000

Width:

0.0127	0.0254	0.0380	0.0507	0.0634
0.0761	0.0888	0.1014	0.1141	0.1268
0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5621	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0999	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8831	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058

```
            0.2265    0.2480    0.2700    0.2929    0.3171
            0.3426    0.3694    0.3976    0.4272    0.4579
            0.4893    0.5214    0.5541    0.5875    0.6216
            0.6564    0.6919    0.7280    0.7648    0.8023
            0.8405    0.8794    0.9189    0.9591    1.0000
Hrad:
            0.0217    0.0433    0.0650    0.0866    0.1083
            0.1299    0.1516    0.1732    0.1949    0.2158
            0.2334    0.2493    0.2650    0.2808    0.2970
            0.3137    0.3309    0.3485    0.3666    0.3838
            0.3990    0.4128    0.4110    0.4455    0.4784
            0.5099    0.5402    0.5694    0.5973    0.6230
            0.6462    0.6674    0.6867    0.7046    0.7237
            0.7433    0.7628    0.7822    0.8014    0.8205
            0.8393    0.8580    0.8765    0.8948    0.9128
            0.9307    0.9483    0.9657    0.9830    1.0000
Width:
            0.0110    0.0219    0.0329    0.0439    0.0549
            0.0658    0.0768    0.0878    0.0987    0.1153
            0.1372    0.1592    0.1811    0.2031    0.2250
            0.2469    0.2689    0.2908    0.3130    0.3514
            0.3898    0.4282    0.4619    0.4783    0.4948
            0.5112    0.5277    0.5442    0.5692    0.6021
            0.6350    0.6679    0.7008    0.7337    0.7531
            0.7696    0.7860    0.8025    0.8190    0.8354
            0.8519    0.8683    0.8848    0.9013    0.9177
            0.9342    0.9506    0.9671    0.9835    1.0000

Transect ROW_24m_Parking
Area:
            0.0004    0.0014    0.0032    0.0056    0.0088
            0.0126    0.0172    0.0225    0.0285    0.0351
            0.0425    0.0506    0.0594    0.0689    0.0790
            0.0899    0.1015    0.1138    0.1268    0.1410
            0.1566    0.1735    0.1918    0.2107    0.2304
            0.2507    0.2716    0.2933    0.3156    0.3391
            0.3638    0.3900    0.4174    0.4462    0.4758
            0.5061    0.5371    0.5687    0.6010    0.6339
            0.6675    0.7018    0.7367    0.7724    0.8086
            0.8456    0.8832    0.9215    0.9604    1.0000
Hrad:
            0.0204    0.0408    0.0612    0.0816    0.1020
            0.1224    0.1428    0.1632    0.1836    0.2040
            0.2244    0.2448    0.2652    0.2856    0.3060
            0.3264    0.3469    0.3673    0.3877    0.4065
            0.4232    0.4385    0.4621    0.4937    0.5239
            0.5528    0.5805    0.6070    0.6326    0.6563
            0.6776    0.6968    0.7143    0.7308    0.7488
            0.7668    0.7846    0.8023    0.8198    0.8372
            0.8543    0.8713    0.8880    0.9046    0.9210
            0.9372    0.9532    0.9690    0.9846    1.0000
Width:
            0.0176    0.0352    0.0528    0.0704    0.0880
            0.1056    0.1231    0.1407    0.1583    0.1759
            0.1935    0.2111    0.2287    0.2463    0.2639
            0.2815    0.2991    0.3167    0.3384    0.3727
            0.4069    0.4412    0.4667    0.4833    0.5000
            0.5167    0.5333    0.5500    0.5708    0.6042
            0.6375    0.6708    0.7042    0.7333    0.7500
            0.7667    0.7833    0.8000    0.8167    0.8333
            0.8500    0.8667    0.8833    0.9000    0.9167
            0.9333    0.9500    0.9667    0.9833    1.0000

Transect ROW_26m
Area:
            0.0003    0.0013    0.0030    0.0053    0.0083
            0.0120    0.0164    0.0214    0.0270    0.0334
            0.0404    0.0481    0.0564    0.0654    0.0751
            0.0854    0.0964    0.1081    0.1205    0.1335
            0.1472    0.1615    0.1765    0.1922    0.2086
            0.2261    0.2453    0.2663    0.2888    0.3123
            0.3369    0.3625    0.3892    0.4168    0.4456
            0.4753    0.5061    0.5379    0.5707    0.6046
            0.6395    0.6754    0.7124    0.7504    0.7894
            0.8295    0.8705    0.9127    0.9558    1.0000
Hrad:
            0.0209    0.0418    0.0627    0.0836    0.1045
            0.1254    0.1463    0.1672    0.1880    0.2089
            0.2298    0.2507    0.2716    0.2925    0.3134
            0.3343    0.3552    0.3761    0.3970    0.4179
            0.4388    0.4597    0.4806    0.5015    0.5223
            0.5421    0.5589    0.5735    0.5992    0.6295
            0.6579    0.6846    0.7097    0.7334    0.7558
            0.7771    0.7974    0.8167    0.8352    0.8529
            0.8699    0.8863    0.9021    0.9173    0.9321
            0.9464    0.9604    0.9739    0.9871    1.0000
Width:
            0.0149    0.0299    0.0448    0.0597    0.0747
            0.0896    0.1045    0.1195    0.1344    0.1493
            0.1643    0.1792    0.1941    0.2090    0.2240
            0.2389    0.2538    0.2688    0.2837    0.2986
            0.3136    0.3285    0.3434    0.3584    0.3733
            0.4113    0.4493    0.4873    0.5154    0.5385
            0.5615    0.5846    0.6077    0.6308    0.6538
            0.6769    0.7000    0.7231    0.7462    0.7692
            0.7923    0.8154    0.8385    0.8615    0.8846
            0.9077    0.9308    0.9538    0.9769    1.0000

Transect Upstream1
Area:
            0.0025    0.0106    0.0203    0.0306    0.0413
            0.0526    0.0643    0.0765    0.0889    0.1016
            0.1146    0.1277    0.1411    0.1547    0.1685
            0.1826    0.1968    0.2113    0.2260    0.2410
            0.2562    0.2715    0.2875    0.3036    0.3201
            0.3370    0.3541    0.3718    0.3916    0.4132
            0.4352    0.4574    0.4798    0.5024    0.5256
            0.5499    0.5749    0.6004    0.6263    0.6529
            0.6803    0.7086    0.7388    0.7719    0.8061
            0.8411    0.8773    0.9158    0.9566    1.0000
Hrad:
            0.0236    0.0542    0.0978    0.1394    0.1791
            0.2172    0.2558    0.2953    0.3343    0.3743
            0.4135    0.4519    0.4897    0.5268    0.5632
            0.5991    0.6344    0.6691    0.7034    0.7372
            0.7686    0.7966    0.8243    0.8517    0.8789
            0.9059    0.9305    0.9395    0.8568    0.8707
            0.9044    0.9376    0.9705    1.0029    1.0032
            1.0093    1.0327    1.0560    1.0792    1.0918
            1.1023    1.1020    1.0403    1.0362    1.0565
            1.0711    1.0710    1.0500    1.0287    1.0000
Width:
            0.1112    0.2068    0.2183    0.2299    0.2414
            0.2530    0.2625    0.2696    0.2763    0.2812
            0.2861    0.2910    0.2959    0.3008    0.3057
            0.3106    0.3155    0.3204    0.3253    0.3301
            0.3360    0.3434    0.3508    0.3582    0.3656
            0.3731    0.3815    0.3971    0.4616    0.4787
            0.4839    0.4890    0.4941    0.4992    0.5218
            0.5423    0.5531    0.5639    0.5747    0.5916
            0.6102    0.6359    0.7052    0.7403    0.7577
            0.7795    0.8137    0.8682    0.9276    1.0000

Transect Upstream2
Area:
            0.0010    0.0033    0.0061    0.0095    0.0135
            0.0180    0.0231    0.0287    0.0349    0.0417
            0.0491    0.0571    0.0658    0.0753    0.0857
            0.0969    0.1089    0.1216    0.1350    0.1491
            0.1643    0.1807    0.1983    0.2174    0.2378
            0.2598    0.2837    0.3085    0.3337    0.3593
            0.3851    0.4112    0.4375    0.4641    0.4910
            0.5185    0.5468    0.5756    0.6049    0.6346
            0.6647    0.6958    0.7278    0.7609    0.7954
            0.8324    0.8717    0.9124    0.9551    1.0000
Hrad:
            0.0245    0.0622    0.0947    0.1245    0.1527
            0.1802    0.2071    0.2329    0.2579    0.2827
            0.3074    0.3275    0.3469    0.3639    0.3812
            0.4022    0.4237    0.4479    0.4730    0.4917
            0.5021    0.5129    0.5218    0.5312    0.5437
            0.5471    0.5612    0.5918    0.6316    0.6711
            0.7100    0.7484    0.7864    0.8238    0.8538
            0.8769    0.9017    0.9331    0.9642    0.9950
            1.0193    1.0315    1.0445    1.0569    1.0476
            1.0094    1.0241    1.0243    1.0266    1.0000
Width:
            0.0422    0.0543    0.0664    0.0785    0.0905
            0.1024    0.1141    0.1261    0.1385    0.1508
            0.1631    0.1781    0.1939    0.2117    0.2302
            0.2467    0.2633    0.2781    0.2924    0.3107
            0.3356    0.3615    0.3904    0.4208    0.4502
            0.4893    0.5205    0.5353    0.5411    0.5466
            0.5522    0.5577    0.5632    0.5687    0.5793
            0.5947    0.6089    0.6182    0.6274    0.6366
            0.6500    0.6718    0.6936    0.7162    0.7558
            0.8227    0.8489    0.8887    0.9286    1.0000

Transect Upstream3
Area:
            0.0006    0.0023    0.0050    0.0083    0.0121
            0.0165    0.0214    0.0269    0.0329    0.0397
            0.0479    0.0574    0.0681    0.0800    0.0928
            0.1066    0.1211    0.1370    0.1537    0.1724
            0.1916    0.2112    0.2310    0.2512    0.2719
            0.2933    0.3154    0.3379    0.3607    0.3838
            0.4072    0.4308    0.4548    0.4792    0.5043
            0.5302    0.5566    0.5834    0.6106    0.6382
            0.6665    0.6955    0.7273    0.7625    0.7988
            0.8362    0.8744    0.9141    0.9558    1.0000
Hrad:
            0.0253    0.0506    0.0845    0.1172    0.1476
            0.1766    0.2047    0.2322    0.2591    0.2672
            0.2667    0.2864    0.3020    0.3243    0.3504
            0.3762    0.4018    0.4273    0.4351    0.4545
            0.4946    0.5339    0.5724    0.6101    0.6377
            0.6626    0.6916    0.7293    0.7664    0.8029
            0.8590    0.8716    0.9096    0.9307    0.9485
            0.9716    1.0018    1.0317    1.0613    1.0906
            1.1067    1.1229    1.0191    1.0199    1.0379
            1.0594    1.0820    1.0709    1.0785    1.0000
Width:
            0.0239    0.0478    0.0617    0.0733    0.0849
            0.0965    0.1081    0.1196    0.1312    0.1535
            0.1863    0.2081    0.2344    0.2566    0.2757
            0.2950    0.3144    0.3339    0.3682    0.3946
            0.4014    0.4082    0.4149    0.4217    0.4354
            0.4510    0.4634    0.4693    0.4752    0.4811
            0.4870    0.4929    0.4988    0.5128    0.5290
            0.5420    0.5507    0.5594    0.5681    0.5768
            0.5931    0.6096    0.7080    0.7423    0.7640
            0.7831    0.8014    0.8479    0.8809    1.0000

Transect Upstream4
Area:
            0.0018    0.0046    0.0083    0.0128    0.0180
            0.0238    0.0302    0.0371    0.0448    0.0547
            0.0662    0.0782    0.0907    0.1038    0.1174
            0.1319    0.1472    0.1638    0.1825    0.2018
            0.2212    0.2408    0.2608    0.2810    0.3017
            0.3227    0.3453    0.3685    0.3919    0.4155
            0.4393    0.4633    0.4875    0.5118    0.5364
            0.5615    0.5871    0.6133    0.6408    0.6690
            0.6977    0.7269    0.7568    0.7876    0.8192
            0.8516    0.8851    0.9205    0.9583    1.0000
Hrad:
            0.0356    0.0671    0.0952    0.1219    0.1526
            0.1825    0.2111    0.2388    0.2457    0.2281
            0.2626    0.2959    0.3290    0.3614    0.3872
            0.4105    0.4302    0.4402    0.4405    0.4805
            0.5198    0.5573    0.5905    0.6232    0.6553
            0.6869    0.6742    0.7110    0.7474    0.7833
            0.8187    0.8537    0.8883    0.9224    0.9509
            0.9733    0.9956    1.0049    1.0036    1.0287
            1.0536    1.0784    1.0896    1.1008    1.1169
            1.1330    1.1274    1.1025    1.0707    1.0000
Width:
            0.0541    0.0732    0.0923    0.1110    0.1246
            0.1374    0.1502    0.1630    0.1916    0.2527
            0.2652    0.2777    0.2895    0.3012    0.3179
            0.3368    0.3586    0.3902    0.4339    0.4377
            0.4416    0.4466    0.4547    0.4628    0.4709
            0.4791    0.5224    0.5268    0.5312    0.5356
            0.5400    0.5444    0.5488    0.5532    0.5611
            0.5729    0.5847    0.6049    0.6332    0.6440
            0.6548    0.6656    0.6857    0.7062    0.7236
            0.7412    0.7753    0.8268    0.8894    1.0000

Transect Upstream5
Area:
            0.0012    0.0039    0.0075    0.0122    0.0185
            0.0256    0.0332    0.0413    0.0500    0.0592
            0.0689    0.0792    0.0900    0.1012    0.1130
            0.1251    0.1375    0.1502    0.1632    0.1765
            0.1902    0.2041    0.2184    0.2330    0.2480
            0.2635    0.2798    0.2968    0.3145    0.3331
            0.3525    0.3727    0.3942    0.4178    0.4431
            0.4698    0.4988    0.5309    0.5639    0.5984
            0.6349    0.6722    0.7101    0.7485    0.7872
            0.8265    0.8666    0.9084    0.9530    1.0000
Hrad:
            0.0281    0.0626    0.0927    0.1114    0.1369
            0.1752    0.2115    0.2463    0.2799    0.3124
            0.3424    0.3738    0.4068    0.4379    0.4694
            0.5056    0.5411    0.5759    0.6102    0.6439
            0.6771    0.7099    0.7421    0.7699    0.7956
            0.8104    0.8232    0.8370    0.8495    0.8616
            0.8746    0.8886    0.8484    0.8428    0.8418
            0.8363    0.8155    0.8068    0.8309    0.8203
            0.8497    0.8801    0.9176    0.9547    0.9913
            1.0230    1.0475    1.0267    1.0168    1.0000
Width:
            0.0449    0.0640    0.0831    0.1124    0.1386
            0.1495    0.1603    0.1712    0.1820    0.1929
            0.2048    0.2146    0.2243    0.2341    0.2433
            0.2496    0.2559    0.2622    0.2684    0.2747
            0.2810    0.2873    0.2936    0.3016    0.3105
            0.3241    0.3390    0.3539    0.3698    0.3865
            0.4032    0.4199    0.4663    0.4984    0.5298
            0.5663    0.6178    0.6645    0.6844    0.7354
            0.7522    0.7679    0.7768    0.7857    0.7946
            0.8074    0.8259    0.8838    0.9366    1.0000

Transect Upstream6
Area:
            0.0020    0.0057    0.0101    0.0154    0.0216
            0.0285    0.0362    0.0446    0.0534    0.0628
            0.0726    0.0829    0.0939    0.1054    0.1174
            0.1299    0.1429    0.1564    0.1705    0.1850
            0.2000    0.2153    0.2310    0.2472    0.2637
            0.2808    0.2986    0.3172    0.3364    0.3564
            0.3786    0.4016    0.4255    0.4503    0.4760
            0.5026    0.5304    0.5593    0.5897    0.6214
            0.6541    0.6875    0.7215    0.7561    0.7915
            0.8280    0.8671    0.9077    0.9506    1.0000
Hrad:
            0.0333    0.0728    0.1080    0.1404    0.1714
            0.2022    0.2321    0.2687    0.3047    0.3396
            0.3717    0.4020    0.4318    0.4612    0.4948
            0.5246    0.5534    0.5820    0.6106    0.6442
            0.6773    0.7100    0.7423    0.7742    0.8057
            0.8224    0.8398    0.8578    0.8777    0.8995
            0.8582    0.8792    0.8979    0.9152    0.9365
            0.9490    0.9612    0.9727    0.9697    0.9916
            1.0145    1.0496    1.0816    1.1092    1.1367
            1.1540    1.1196    1.1309    1.0883    1.0000
Width:
            0.0616    0.0785    0.0947    0.1108    0.1267
```

0.1418	0.1569	0.1666	0.1758	0.1850
0.1952	0.2062	0.2171	0.2280	0.2365
0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/03/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	5.212	62.398
Evaporation Loss	0.000	0.000
Infiltration Loss	2.464	29.495
Surface Runoff	2.653	31.757
Final Storage	0.097	1.166
Continuity Error (%)	-0.032	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	2.653	26.526
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.018	0.183
External Outflow	2.498	24.983
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.172	1.717
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.001	0.013
Continuity Error (%)	-0.016	

****
Highest Continuity Errors
****
Node J51 (20.10%)
Node J39 (10.21%)
Node J62 (10.01%)
Node J32 (9.60%)
Node J43 (9.43%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (7)
Link OL10 (5)
Link C-STRM-71_(C-STRM) (4)
Link OL9 (3)
Link OL16 (3)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****
Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.99 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.00 %
0.660 - 0.574 sec	:	0.00 %
0.574 - 0.500 sec	:	0.01 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	62.40	0.00	0.00	44.12	11.53	4.58	13.81	0.48	0.07	0.221
A18	62.40	0.00	0.00	36.41	23.81	6.35	25.40	0.15	0.08	0.407
A19	62.40	0.00	0.00	46.19	13.59	5.00	15.87	0.18	0.09	0.254
A20	62.40	0.00	0.00	50.81	5.09	6.23	10.30	0.50	0.07	0.165
NULL3	62.40	0.00	0.00	14.24	50.72	6.31	46.89	0.26	0.12	0.751
S1	62.40	0.00	0.00	33.11	40.40	16.16	28.28	1.85	1.24	0.453
S1_1	62.40	0.00	0.00	19.77	43.49	6.78	41.57	0.05	0.02	0.666
S1_2	62.40	0.00	0.00	19.75	43.49	6.81	41.60	0.05	0.02	0.667
S1_4	62.40	0.00	0.00	19.79	43.49	6.76	41.55	0.08	0.04	0.666
S1_5	62.40	0.00	0.00	19.77	43.49	6.78	41.57	0.04	0.02	0.666
S10_1	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.51	0.35	0.441
S10_2	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.58	0.40	0.441
S10_4	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.20	0.14	0.441
S10_5	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.35	0.24	0.441
S11	62.40	0.00	0.00	58.99	0.00	3.41	3.41	0.11	0.07	0.055
S12	62.40	0.00	0.00	19.79	43.49	6.75	41.54	0.18	0.09	0.666
S14_1	62.40	0.00	0.00	19.82	43.48	6.72	41.50	0.25	0.12	0.665
S14_3	62.40	0.00	0.00	19.94	43.48	6.59	41.37	0.44	0.21	0.663
S14_4	62.40	0.00	0.00	19.83	43.48	6.71	41.49	0.12	0.06	0.665
S14_5	62.40	0.00	0.00	19.92	43.48	6.62	41.40	0.70	0.34	0.663
S14_6	62.40	0.00	0.00	19.85	43.48	6.69	41.47	0.12	0.06	0.665
S14_7	62.40	0.00	0.00	19.87	43.48	6.67	41.45	0.49	0.23	0.664
S14_8	62.40	0.00	0.00	19.86	43.48	6.68	41.46	0.14	0.07	0.665
S15	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.45	0.31	0.441
S16	62.40	0.00	0.00	0.00	60.71	0.00	60.71	0.89	0.16	0.973
S17	62.40	0.00	0.00	61.17	2.03	1.18	1.18	0.07	0.03	0.019
S18_2	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.92	0.63	0.441
S18_3	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.46	0.31	0.441
S18_4	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.24	0.16	0.441
S18_5	62.40	0.00	0.00	31.08	43.47	17.19	30.23	0.55	0.36	0.485
S18_6	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.23	0.16	0.441
S19	62.40	0.00	0.00	19.90	43.48	6.64	41.42	0.44	0.21	0.664
S2	62.40	0.00	0.00	32.91	40.70	16.26	28.47	1.06	0.71	0.456
S20_1	62.40	0.00	0.00	19.78	43.49	6.77	41.56	0.21	0.10	0.666
S20_2	62.40	0.00	0.00	19.72	43.49	6.84	41.63	0.09	0.05	0.667
S3	62.40	0.00	0.00	33.92	39.12	15.76	27.50	0.68	0.46	0.441
S32	62.40	0.00	0.00	19.79	43.49	6.76	41.54	0.17	0.08	0.666
S36	62.40	0.00	0.00	0.00	60.72	0.00	60.72	1.10	0.20	0.973
S4	62.40	0.00	0.00	8.20	52.14	0.71	52.85	6.99	2.26	0.847
S5	62.40	0.00	0.00	7.94	52.15	0.97	53.12	1.69	0.61	0.851
S6	62.40	0.00	0.00	26.66	34.79	7.06	34.89	0.12	0.07	0.559
S7	62.40	0.00	0.00	8.01	52.14	0.91	53.05	2.11	0.75	0.850
S8	62.40	0.00	0.00	50.45	21.73	11.39	11.39	0.22	0.10	0.183

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.13	104.52	0 12:00	0.13
EXD_10	JUNCTION	0.04	0.26	98.92	0 12:03	0.26
EXD_11	JUNCTION	0.03	0.20	98.70	0 12:03	0.20
EXD_12	JUNCTION	0.04	0.29	98.59	0 12:03	0.29
EXD_13	JUNCTION	0.01	0.14	104.46	0 12:01	0.14
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.04	0.27	100.54	0 12:00	0.27
EXD_16	JUNCTION	0.03	0.15	100.35	0 12:00	0.15
EXD_17	JUNCTION	0.04	0.15	100.04	0 12:01	0.15
EXD_18	JUNCTION	0.02	0.13	99.53	0 12:05	0.13
EXD_19	JUNCTION	0.04	0.26	99.45	0 12:03	0.26
EXD_2	JUNCTION	0.03	0.22	103.69	0 12:02	0.22
EXD_20	JUNCTION	0.04	0.26	99.45	0 12:03	0.26
EXD_21	JUNCTION	0.04	0.23	99.41	0 12:04	0.23
EXD_22	JUNCTION	0.02	0.13	99.28	0 12:07	0.13
EXD_23	JUNCTION	0.04	0.22	98.97	0 12:12	0.22
EXD_24	JUNCTION	0.02	0.12	98.79	0 12:15	0.12
EXD_25	JUNCTION	0.03	0.23	98.75	0 12:16	0.23
EXD_26	JUNCTION	0.02	0.13	98.61	0 12:18	0.13
EXD_27	JUNCTION	0.04	0.25	98.42	0 12:00	0.25
EXD_3	JUNCTION	0.01	0.11	103.30	0 12:03	0.11
EXD_4	JUNCTION	0.01	0.11	102.76	0 12:04	0.11
EXD_5	JUNCTION	0.01	0.17	102.66	0 12:05	0.17
EXD_6	JUNCTION	0.01	0.12	102.44	0 12:05	0.12
EXD_7	JUNCTION	0.01	0.12	101.61	0 12:08	0.12
EXD_8	JUNCTION	0.02	0.20	100.69	0 12:14	0.20
EXD_9	JUNCTION	0.01	0.10	100.49	0 12:19	0.10
J10	JUNCTION	0.00	0.00	103.60	0 00:00	0.00
J11	JUNCTION	0.00	0.00	103.50	0 00:00	0.00
J12	JUNCTION	0.00	0.00	103.40	0 00:00	0.00
J13	JUNCTION	0.00	0.00	103.30	0 00:00	0.00
J17	JUNCTION	0.01	0.12	104.50	0 12:00	0.12
J19	JUNCTION	0.00	0.01	105.41	0 12:00	0.01
J20	JUNCTION	0.00	0.01	105.46	0 12:00	0.01
J21	JUNCTION	0.00	0.04	105.59	0 12:00	0.04
J22	JUNCTION	0.00	0.01	105.71	0 12:00	0.01
J23	JUNCTION	0.00	0.00	106.00	0 00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0 00:00	0.00
J25	JUNCTION	0.00	0.00	105.30	0 14:55	0.00
J26	JUNCTION	0.00	0.00	105.70	0 13:44	0.00
J28	JUNCTION	0.00	0.01	109.21	0 12:00	0.01
J29	JUNCTION	0.00	0.01	108.81	0 12:00	0.01
J32	JUNCTION	0.00	0.00	106.00	0 12:33	0.00
J36	JUNCTION	0.00	0.01	104.71	0 12:00	0.01
J39	JUNCTION	0.00	0.00	104.60	0 12:01	0.00
J40	JUNCTION	0.00	0.01	104.46	0 12:00	0.01
J41	JUNCTION	0.00	0.00	103.20	0 12:12	0.00
J43	JUNCTION	0.00	0.01	104.21	0 12:00	0.01
J44	JUNCTION	0.00	0.01	104.51	0 12:00	0.01
J46	JUNCTION	0.00	0.01	104.61	0 12:00	0.01
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.01	105.76	0 12:00	0.01
J51	JUNCTION	0.00	0.00	106.75	0 12:00	0.00
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0 00:00	0.00
J58	JUNCTION	0.00	0.01	108.41	0 12:00	0.01
J59	JUNCTION	0.00	0.01	108.01	0 12:00	0.01
J6	JUNCTION	0.00	0.01	109.84	0 12:00	0.01
J61	JUNCTION	0.00	0.01	107.01	0 12:00	0.01
J62	JUNCTION	0.00	0.01	106.51	0 12:00	0.01
J74	JUNCTION	0.21	0.71	99.16	0 12:05	0.71
J9	JUNCTION	0.00	0.00	103.70	0 00:00	0.00
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.03	0.22	98.22	0 12:00	0.22
ST4_108A_(P-Stm)	OUTFALL	0.44	1.13	99.15	0 12:04	1.13
500_(C-STRM)	STORAGE	0.23	0.44	100.75	0 12:06	0.44
500A_(C-STRM)	STORAGE	0.27	0.85	100.95	0 12:07	0.85

502_(C-STRM)	STORAGE	0.10	1.39	101.93	0	12:01	1.39	0.000
503_(C-STRM)	STORAGE	0.08	1.46	102.04	0	12:00	1.46	0.017
504_(C-STRM)	STORAGE	0.32	1.10	104.14	0	12:00	1.10	0.375
505_(C-STRM)	STORAGE	0.32	1.13	104.59	0	12:00	1.13	0.105
506_(C-STRM)	STORAGE	0.32	1.18	105.00	0	12:00	1.17	0.090
507_(C-STRM)	STORAGE	0.31	1.12	105.26	0	12:00	1.11	0.160
508_(C-STRM)	STORAGE	0.32	1.16	105.52	0	12:01	1.16	0.000 ltr
509_(C-STRM)	STORAGE	0.32	1.19	105.79	0	12:01	1.19	5.112
510_(C-STRM)	STORAGE	0.32	1.14	105.99	0	12:01	1.14	0.031
511_(C-STRM)	STORAGE	0.32	1.14	106.05	0	12:00	1.14	6.409
512_(C-STRM)	STORAGE	0.32	1.08	106.19	0	12:00	1.08	0.142
513_(C-STRM)	STORAGE	0.32	1.04	106.28	0	12:01	1.04	0.428
514_(C-STRM)	STORAGE	0.23	0.72	106.31	0	12:01	0.72	10.620
515_(C-STRM)	STORAGE	0.23	0.49	106.34	0	12:02	0.48	0.049
516_(C-STRM)	STORAGE	0.32	1.10	106.55	0	12:01	1.09	0.110
517_(C-STRM)	STORAGE	0.32	1.20	106.82	0	12:01	1.20	0.033
518_(C-STRM)	STORAGE	0.33	1.40	107.25	0	12:00	1.39	10.415
519_(C-STRM)	STORAGE	0.31	1.24	107.31	0	12:00	1.23	0.039
520_(C-STRM)	STORAGE	0.31	1.09	107.44	0	12:00	1.08	0.115
522_(C-STRM)	STORAGE	0.30	0.60	104.91	0	12:00	0.60	0.000 ltr
525_(C-STRM)	STORAGE	0.07	1.50	102.11	0	12:03	1.50	0.033
528_(C-STRM)	STORAGE	0.05	1.64	102.37	0	12:05	1.64	25.162
532_(C-STRM)	STORAGE	0.04	1.70	102.53	0	12:05	1.70	0.000 ltr
536_(C-STRM)	STORAGE	0.04	1.69	102.67	0	12:05	1.69	0.000 ltr
540_(C-STRM)	STORAGE	0.32	1.93	102.79	0	12:06	1.93	0.000 ltr
541_(C-STRM)	STORAGE	0.32	1.92	102.85	0	12:06	1.92	0.390
551_(C-STRM)	STORAGE	0.32	1.37	102.01	0	12:01	1.37	0.222
552_(C-STRM)	STORAGE	0.31	1.31	102.05	0	12:00	1.31	0.010
553_(C-STRM)	STORAGE	0.32	1.20	102.14	0	12:01	1.20	0.004
554_(C-STRM)	STORAGE	0.31	1.16	102.21	0	12:01	1.16	0.094
555_(C-STRM)	STORAGE	0.31	1.09	102.33	0	12:00	1.08	0.151
556_(C-STRM)	STORAGE	0.31	1.12	102.48	0	12:00	1.09	0.064
601_(C-STRM)	STORAGE	0.08	1.13	101.58	0	12:03	1.13	0.062
602_(C-STRM)	STORAGE	0.09	1.59	102.11	0	12:02	1.59	0.026
603_(C-STRM)	STORAGE	0.09	1.60	102.23	0	12:02	1.60	0.003
604_(C-STRM)	STORAGE	0.08	1.67	102.55	0	12:02	1.67	0.055
605_(C-STRM)	STORAGE	0.08	1.55	102.64	0	12:02	1.55	0.132
606_(C-STRM)	STORAGE	0.08	1.60	102.83	0	12:01	1.60	0.019
619_(C-STRM)	STORAGE	0.08	1.64	103.02	0	12:01	1.64	0.283
622_(C-STRM)	STORAGE	0.08	1.54	103.07	0	12:01	1.53	0.003
626_(C-STRM)	STORAGE	0.23	0.45	104.39	0	12:02	0.45	0.030
627_(C-STRM)	STORAGE	0.23	0.60	103.73	0	12:03	0.60	0.030
629_(C-STRM)	STORAGE	0.08	1.45	103.10	0	12:01	1.45	0.074
630_(C-STRM)	STORAGE	0.09	1.19	103.26	0	12:00	1.18	0.001
630A_(C-STRM)	STORAGE	0.08	1.19	103.31	0	12:00	1.19	0.081
631_(C-STRM)	STORAGE	0.00	0.01	106.01	0	12:00	0.01	0.042
645_(C-STRM)	STORAGE	0.34	1.46	103.49	0	12:00	1.46	0.004
647_(C-STRM)	STORAGE	0.33	1.48	103.62	0	12:01	1.48	0.004
650_(C-STRM)	STORAGE	0.33	1.49	103.71	0	12:01	1.49	0.316
651_(C-STRM)	STORAGE	0.33	1.49	103.80	0	12:01	1.49	0.238
682_(C-STRM)	STORAGE	0.00	0.03	105.43	0	12:00	0.02	0.599
MTD_(C-STRM)	STORAGE	0.16	1.37	101.74	0	12:02	1.37	1.129
OVERFLOW_(C-STRM)	STORAGE	0.24	0.83	101.01	0	12:05	0.83	0.000 ltr
POND_(C-STRM)	STORAGE	0.62	1.61	101.06	0	13:25	1.61	0.000 ltr
S_525-MTD	STORAGE	0.00	0.04	103.34	0	12:02	0.04	0.000 ltr
S_528-525	STORAGE	0.00	0.04	103.45	0	12:02	0.04	0.000 ltr
S_532-528	STORAGE	0.00	0.04	103.54	0	12:02	0.04	0.000 ltr
S_536-532	STORAGE	0.00	0.07	103.67	0	12:02	0.07	0.000 ltr
S_540-536	STORAGE	0.00	0.06	103.77	0	12:02	0.06	0.000 ltr
S_541-540	STORAGE	0.00	0.06	103.87	0	12:03	0.06	0.000 ltr
S_604-603	STORAGE	0.00	0.04	105.54	0	12:02	0.04	0.000 ltr
S_605-604	STORAGE	0.00	0.05	106.77	0	12:02	0.05	0.000 ltr
S_619-606	STORAGE	0.00	0.05	106.55	0	12:02	0.05	0.000 ltr
S_622-619	STORAGE	0.00	0.09	105.79	0	12:04	0.09	0.000 ltr
S_622-619_2	STORAGE	0.00	0.06	106.56	0	12:02	0.06	0.000 ltr
S_627-630	STORAGE	0.00	0.03	106.73	0	12:01	0.03	0.000 ltr
S_629-622	STORAGE	0.00	0.05	106.07	0	12:03	0.05	0.000 ltr
SU2	STORAGE	0.00	0.00	106.75	0	12:01	0.00	0.000 ltr
SU5	STORAGE	0.00	0.01	104.19	0	12:02	0.01	0.000 ltr

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.087	0	12:00	0	0.181	- 0.004
EXD_10	JUNCTION	0.354	0.359	0	12:00	2	2.25	- 0.097
EXD_11	JUNCTION	0.000	0.325	0	12:03	0	2.25	0.004
EXD_12	JUNCTION	0.074	0.387	0	12:02	0.478	2.73	0.003
EXD_13	JUNCTION	0.000	0.087	0	12:00	0	0.181	- 0.208
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.072	0.072	0	12:00	0.498	0.498	- 0.002
EXD_16	JUNCTION	0.000	0.064	0	12:00	0	0.498	- 0.026
EXD_17	JUNCTION	0.000	0.063	0	12:00	0	0.498	- 0.055
EXD_18	JUNCTION	0.000	0.064	0	12:02	0	0.498	0.132
EXD_19	JUNCTION	0.000	0.058	0	12:05	0	0.502	- 0.019
EXD_2	JUNCTION	0.000	0.085	0	12:01	0	0.181	0.283
EXD_20	JUNCTION	0.088	0.103	0	12:01	0.176	0.678	- 0.003
EXD_21	JUNCTION	0.000	0.100	0	12:04	0	0.673	- 0.030
EXD_22	JUNCTION	0.000	0.100	0	12:05	0	0.674	- 0.030
EXD_23	JUNCTION	0.000	0.098	0	12:07	0	0.674	0.131
EXD_24	JUNCTION	0.000	0.092	0	12:13	0	0.673	0.115
EXD_25	JUNCTION	0.082	0.105	0	12:14	0.151	0.823	- 0.035
EXD_26	JUNCTION	0.000	0.117	0	12:16	0	0.823	0.074
EXD_27	JUNCTION	0.116	0.548	0	12:00	0.265	3.81	- 0.001
EXD_3	JUNCTION	0.000	0.080	0	12:03	0	0.181	0.081
EXD_4	JUNCTION	0.000	0.079	0	12:04	0	0.18	0.042
EXD_5	JUNCTION	0.000	0.079	0	12:04	0	0.18	0.004
EXD_6	JUNCTION	0.000	0.078	0	12:05	0	0.18	- 0.316
EXD_7	JUNCTION	0.031	0.108	0	12:06	0.0738	0.255	- 0.238
EXD_8	JUNCTION	0.000	0.099	0	12:08	0	0.255	0.599
EXD_9	JUNCTION	0.000	0.082	0	12:14	0	0.254	1.129
J10	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J11	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J12	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J13	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J17	JUNCTION	0.000	0.087	0	12:00	0	0.181	0.017
J19	JUNCTION	0.234	0.235	0	12:00	0.487	0.487	- 0.375
J20	JUNCTION	0.022	0.030	0	12:00	0.0449	0.0485	- 0.105
J21	JUNCTION	0.038	0.038	0	12:00	0.0793	0.0794	0.090
J22	JUNCTION	0.024	0.024	0	12:00	0.0485	0.0485	- 0.160
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.000	0	13:57	0	0.000209	5.112
J26	JUNCTION	0.000	0.000	0	12:46	0	0.000223	6.409
J28	JUNCTION	0.120	0.120	0	12:00	0.248	0.248	- 0.142
J29	JUNCTION	0.335	0.336	0	12:00	0.698	0.698	- 0.428
J32	JUNCTION	0.000	0.000	0	12:01	0	0.000247	10.620
J36	JUNCTION	0.046	0.046	0	12:00	0.0944	0.0947	- 0.049
J39	JUNCTION	0.000	0.000	0	11:53	0	0.000327	11.377
J40	JUNCTION	0.100	0.100	0	12:00	0.206	0.207	- 0.110
J41	JUNCTION	0.000	0.001	0	12:00	0	0.000619	0.033
J43	JUNCTION	0.000	0.001	0	12:00	0	0.000683	10.415
J44	JUNCTION	0.060	0.061	0	12:00	0.123	0.124	- 0.039
J46	JUNCTION	0.083	0.083	0	12:00	0.172	0.172	- 0.115
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.068	0.068	0	12:00	0.14	0.14	- 0.033
J51	JUNCTION	0.000	0.000	0	11:59	0	0.000179	25.162
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.211	0.211	0	12:00	0.44	0.44	- 0.390
J59	JUNCTION	0.058	0.058	0	12:00	0.12	0.12	- 0.094
J6	JUNCTION	0.088	0.088	0	12:00	0.181	0.181	- 0.151
J61	JUNCTION	0.235	0.235	0	12:00	0.487	0.487	- 0.064
J62	JUNCTION	0.000	0.000	0	12:00	0	0.000274	11.124
J74	JUNCTION	0.000	0.279	0	13:25	0	21	0.003
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.066	0.066	0	12:00	0.119	0.119	0.000
OF3	OUTFALL	0.000	0.531	0	12:00	0	3.81	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.279	0	13:25	0	21	0.000
500_(C-STRM)	STORAGE	0.000	0.091	0	12:06	0	0.115	- 0.006
500A_(C-STRM)	STORAGE	0.000	2.213	0	12:01	0	5.96	0.222
502_(C-STRM)	STORAGE	0.000	1.140	0	12:00	0	3.22	0.010
503_(C-STRM)	STORAGE	0.000	0.883	0	12:00	0	2.47	- 0.004
504_(C-STRM)	STORAGE	0.000	0.846	0	12:00	0	2.34	- 0.160
505_(C-STRM)	STORAGE	0.000	0.718	0	11:57	0	1.98	- 0.053
506_(C-STRM)	STORAGE	0.000	0.728	0	11:56	0	1.99	0.266
507_(C-STRM)	STORAGE	0.000	0.536	0	12:03	0	1.5	- 0.400
508_(C-STRM)	STORAGE	0.000	0.526	0	12:03	0	1.5	- 0.005
509_(C-STRM)	STORAGE	0.000	0.533	0	11:55	0	1.5	- 0.008
510_(C-STRM)	STORAGE	0.000	0.552	0	11:56	0	1.5	- 0.020
511_(C-STRM)	STORAGE	0.000	0.569	0	11:56	0	1.5	0.035
512_(C-STRM)	STORAGE	0.000	0.526	0	11:56	0	1.38	- 0.098
513_(C-STRM)	STORAGE	0.000	0.580	0	11:57	0	1.41	0.576
514_(C-STRM)	STORAGE	0.000	0.067	0	11:59	0	0.0225	5.881
515_(C-STRM)	STORAGE	0.000	0.023	0	12:01	0	0.00285	- 25.525
516_(C-STRM)	STORAGE	0.000	0.388	0	11:58	0	0.938	- 0.858
517_(C-STRM)	STORAGE	0.000	0.407	0	11:58	0	0.942	0.362
518_(C-STRM)	STORAGE	0.000	0.429	0	11:59	0	0.949	0.742
519_(C-STRM)	STORAGE	0.000	0.112	0	11:59	0	0.245	- 1.365
520_(C-STRM)	STORAGE	0.000	0.120	0	12:00	0	0.249	1.373
522_(C-STRM)	STORAGE	0.000	0.087	0	12:00	0	0.18	0.022
525_(C-STRM)	STORAGE	0.000	1.262	0	12:10	0	2.85	0.062
528_(C-STRM)	STORAGE	0.000	1.051	0	12:10	0	2.4	- 0.007
532_(C-STRM)	STORAGE	0.000	0.840	0	12:10	0	1.94	- 0.151
536_(C-STRM)	STORAGE	0.000	0.731	0	12:09	0	1.72	0.110
540_(C-STRM)	STORAGE	0.000	0.480	0	12:10	0	1.16	0.021
541_(C-STRM)	STORAGE	0.000	0.368	0	11:51	0	0.922	0.025
551_(C-STRM)	STORAGE	0.000	0.285	0	11:54	0	0.753	0.527
552_(C-STRM)	STORAGE	0.000	0.221	0	11:54	0	0.543	- 0.654
553_(C-STRM)	STORAGE	0.000	0.239	0	11:55	0	0.547	0.590
554_(C-STRM)	STORAGE	0.000	0.209	0	11:56	0	0.448	- 1.023
555_(C-STRM)	STORAGE	0.000	0.212	0	11:57	0	0.45	0.282
556_(C-STRM)	STORAGE	0.000	0.214	0	11:58	0	0.451	0.170
601_(C-STRM)	STORAGE	0.000	4.664	0	12:03	0	12.7	- 0.000
602_(C-STRM)	STORAGE	0.000	4.666	0	12:02	0	12.7	- 0.000
603_(C-STRM)	STORAGE	0.000	4.651	0	12:02	0	12.5	0.001

604_(C-STRM)	STORAGE	0.000	4.666	0	12:02	0	12.5	-	0.000
605_(C-STRM)	STORAGE	0.000	4.403	0	12:01	0	12	-	0.002
606_(C-STRM)	STORAGE	0.000	3.696	0	12:01	0	10.8	-	0.001
619_(C-STRM)	STORAGE	0.000	3.734	0	12:01	0	10.8	-	0.002
622_(C-STRM)	STORAGE	0.000	3.560	0	12:00	0	10.5	-	0.001
626_(C-STRM)	STORAGE	0.000	0.069	0	12:01	0	0.112	-	1.045
627_(C-STRM)	STORAGE	0.000	0.165	0	12:02	0	0.241	-	0.600
629_(C-STRM)	STORAGE	0.000	3.064	0	12:00	0	9.34	-	0.149
630_(C-STRM)	STORAGE	0.000	2.961	0	12:00	0	9.13	-	0.229
630A_(C-STRM)	STORAGE	0.000	2.828	0	12:00	0	8.9	-	0.052
631_(C-STRM)	STORAGE	2.265	2.265	0	12:00	6.99	6.99	-	0.070
645_(C-STRM)	STORAGE	0.000	0.615	0	12:02	0	1.91	-	0.055
647_(C-STRM)	STORAGE	0.000	0.593	0	12:02	0	1.86	-	0.142
650_(C-STRM)	STORAGE	0.000	0.568	0	12:00	0	1.78	-	0.195
651_(C-STRM)	STORAGE	0.000	0.544	0	11:58	0	1.73	-	0.057
682_(C-STRM)	STORAGE	0.610	0.610	0	12:00	1.69	1.69	-	0.040
MTD_(C-STRM)	STORAGE	0.000	2.272	0	12:01	0	6.07	-	0.079
OVERFLOW_(C-STRM)	STORAGE	0.000	2.267	0	12:01	0	6.07	-	0.002
POND_(C-STRM)	STORAGE	0.957	7.001	0	12:04	2.3	21	-	0.060
S_525-MTD	STORAGE	0.307	0.307	0	12:00	0.45	0.45	-	0.013
S_528-525	STORAGE	0.311	0.311	0	12:00	0.456	0.456	-	0.013
S_532-528	STORAGE	0.157	0.157	0	12:00	0.231	0.231	-	0.013
S_536-532	STORAGE	0.361	0.361	0	12:00	0.554	0.554	-	0.014
S_540-536	STORAGE	0.164	0.164	0	12:00	0.241	0.241	-	0.013
S_541-540	STORAGE	0.628	0.628	0	12:00	0.922	0.922	-	0.013
S_604-603	STORAGE	0.464	0.464	0	12:00	0.681	0.681	-	0.000
S_605-604	STORAGE	1.245	1.245	0	12:00	1.85	1.85	-	0.000
S_619-606	STORAGE	0.346	0.346	0	12:00	0.507	0.507	-	0.000
S_622-619	STORAGE	0.712	0.712	0	12:00	1.06	1.06	-	0.000
S_622-619_2	STORAGE	0.398	0.398	0	12:00	0.584	0.584	-	0.000
S_627-630	STORAGE	0.136	0.136	0	12:00	0.2	0.2	-	0.000
S_629-622	STORAGE	0.236	0.236	0	12:00	0.347	0.347	-	0.000
SU2	STORAGE	0.074	0.074	0	12:00	0.112	0.112	-	0.001
SU5	STORAGE	0.104	0.104	0	12:01	0.218	0.218	-	0.001

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	8.0	0.0	0.0	0.000	15.4	0 12:06	0.091
500A_(C-STRM)	0.528	25.0	0.0	0.0	1.768	83.6	0 12:07	2.054
502_(C-STRM)	0.000	2.6	0.0	0.0	0.002	37.5	0 12:01	1.131
503_(C-STRM)	0.000	2.1	0.0	0.0	0.002	37.1	0 12:00	0.879
504_(C-STRM)	0.000	11.9	0.0	0.0	0.001	40.9	0 12:00	0.834
505_(C-STRM)	0.000	9.8	0.0	0.0	0.001	34.8	0 12:00	0.698
506_(C-STRM)	0.000	10.2	0.0	0.0	0.001	37.2	0 12:00	0.718
507_(C-STRM)	0.000	10.2	0.0	0.0	0.001	36.1	0 12:00	0.548
508_(C-STRM)	0.000	10.1	0.0	0.0	0.001	37.0	0 12:01	0.536
509_(C-STRM)	0.000	10.1	0.0	0.0	0.001	38.0	0 12:01	0.526
510_(C-STRM)	0.000	10.2	0.0	0.0	0.001	37.1	0 12:01	0.533
511_(C-STRM)	0.000	10.3	0.0	0.0	0.001	37.0	0 12:00	0.552
512_(C-STRM)	0.000	10.1	0.0	0.0	0.001	34.5	0 12:00	0.512
513_(C-STRM)	0.000	10.1	0.0	0.0	0.001	33.0	0 12:01	0.547
514_(C-STRM)	0.000	7.2	0.0	0.0	0.001	22.9	0 12:01	0.062
515_(C-STRM)	0.000	7.0	0.0	0.0	0.001	15.0	0 12:02	0.022
516_(C-STRM)	0.000	10.3	0.0	0.0	0.001	35.8	0 12:01	0.375
517_(C-STRM)	0.000	10.6	0.0	0.0	0.001	39.6	0 12:01	0.388
518_(C-STRM)	0.000	11.2	0.0	0.0	0.002	47.8	0 12:00	0.407
519_(C-STRM)	0.000	10.9	0.0	0.0	0.001	44.0	0 12:00	0.134
520_(C-STRM)	0.000	11.6	0.0	0.0	0.001	41.1	0 12:00	0.112
522_(C-STRM)	0.000	10.1	0.0	0.0	0.001	20.1	0 12:00	0.086
525_(C-STRM)	0.000	2.7	0.0	0.0	0.002	55.9	0 12:03	1.270
528_(C-STRM)	0.000	1.7	0.0	0.0	0.002	61.3	0 12:05	1.059
532_(C-STRM)	0.000	1.5	0.0	0.0	0.002	63.5	0 12:05	0.846
536_(C-STRM)	0.000	1.7	0.0	0.0	0.002	64.5	0 12:05	0.736
540_(C-STRM)	0.000	11.4	0.0	0.0	0.002	67.9	0 12:06	0.512
541_(C-STRM)	0.000	10.9	0.0	0.0	0.002	66.2	0 12:06	0.401
551_(C-STRM)	0.000	8.6	0.0	0.0	0.002	36.1	0 12:01	0.261
552_(C-STRM)	0.000	8.0	0.0	0.0	0.001	33.8	0 12:00	0.209
553_(C-STRM)	0.000	8.4	0.0	0.0	0.001	31.8	0 12:01	0.221
554_(C-STRM)	0.000	7.9	0.0	0.0	0.001	29.7	0 12:01	0.193
555_(C-STRM)	0.000	8.0	0.0	0.0	0.001	27.7	0 12:00	0.209
556_(C-STRM)	0.000	8.0	0.0	0.0	0.001	28.7	0 12:00	0.212
601_(C-STRM)	0.000	1.9	0.0	0.0	0.001	25.6	0 12:03	4.667
602_(C-STRM)	0.000	2.3	0.0	0.0	0.002	38.7	0 12:02	4.664
603_(C-STRM)	0.000	2.2	0.0	0.0	0.002	41.0	0 12:02	4.643
604_(C-STRM)	0.000	1.6	0.0	0.0	0.002	34.3	0 12:02	4.651
605_(C-STRM)	0.000	1.4	0.0	0.0	0.002	27.6	0 12:02	4.372
606_(C-STRM)	0.000	1.5	0.0	0.0	0.002	27.8	0 12:01	3.660
619_(C-STRM)	0.000	1.6	0.0	0.0	0.002	31.9	0 12:01	3.696
622_(C-STRM)	0.000	1.8	0.0	0.0	0.002	34.3	0 12:01	3.501
626_(C-STRM)	0.000	6.9	0.0	0.0	0.001	13.5	0 12:02	0.068
627_(C-STRM)	0.000	6.5	0.0	0.0	0.001	16.8	0 12:03	0.164
629_(C-STRM)	0.000	1.9	0.0	0.0	0.002	32.5	0 12:01	3.009
630_(C-STRM)	0.000	2.2	0.0	0.0	0.001	28.7	0 12:00	2.930
630A_(C-STRM)	0.000	2.2	0.0	0.0	0.001	30.6	0 12:00	2.816
631_(C-STRM)	0.001	0.0	0.0	0.0	0.046	1.8	0 12:00	2.249
645_(C-STRM)	0.000	9.2	0.0	0.0	0.002	39.6	0 12:00	0.632
647_(C-STRM)	0.000	9.8	0.0	0.0	0.002	43.5	0 12:01	0.609
650_(C-STRM)	0.000	10.4	0.0	0.0	0.002	46.7	0 12:01	0.570
651_(C-STRM)	0.000	10.9	0.0	0.0	0.002	49.0	0 12:01	0.544
682_(C-STRM)	0.000	0.0	0.0	0.0	0.038	5.0	0 12:00	0.526
MTD_(C-STRM)	0.000	5.0	0.0	0.0	0.002	42.9	0 12:02	2.267
OVERFLOW_(C-STRM)	0.000	8.7	0.0	0.0	0.001	30.0	0 12:05	2.259
POND_(C-STRM)	2.868	7.9	0.0	0.0	11.866	32.8	0 13:25	0.279
S_525-MTD	0.000	0.1	0.0	0.0	0.051	8.9	0 12:02	0.203
S_528-525	0.000	0.1	0.0	0.0	0.052	9.0	0 12:02	0.205
S_532-528	0.000	0.1	0.0	0.0	0.026	8.9	0 12:02	0.104
S_536-532	0.000	0.1	0.0	0.0	0.060	14.0	0 12:02	0.246
S_540-536	0.000	0.1	0.0	0.0	0.025	12.0	0 12:02	0.110
S_541-540	0.001	0.1	0.0	0.0	0.138	11.7	0 12:03	0.368
S_604-603	0.000	0.0	0.0	31.7	0.077	8.8	0 12:02	0.308
S_605-604	0.001	0.1	0.0	33.0	0.241	10.5	0 12:02	0.786
S_619-606	0.000	0.0	0.0	31.8	0.044	10.3	0 12:02	0.243
S_622-619	0.002	0.1	0.0	33.5	0.238	18.3	0 12:04	0.328
S_622-619_2	0.000	0.1	0.0	31.8	0.063	12.8	0 12:02	0.261
S_627-630	0.000	0.0	0.0	36.1	0.015	5.9	0 12:01	0.103
S_629-622	0.000	0.1	0.0	33.7	0.049	11.0	0 12:03	0.143
SU2	0.000	0.0	0.0	0.0	0.005	1.0	0 12:01	0.069
SU5	0.000	0.0	0.0	0.0	0.006	1.1	0 12:02	0.103

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	45.82	0.002	0.066	0.119
OF3	94.84	0.023	0.531	3.815
ST4_108A_(P-Stm)	93.55	0.130	0.279	21.049
System	58.55	0.155	0.735	24.983

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.064	0 12:00	0.96	0.95	0.52
BDR-C2	CONDUIT	0.100	0 12:04	1.26	1.91	0.61
BDR-C3	CONDUIT	0.117	0 12:16	1.86	0.60	0.36
BDR-C4	CONDUIT	0.386	0 12:03	2.04	0.13	0.22
C1_1	CHANNEL	0.000	0 12:46	0.00	0.00	0.01
C1_17	CHANNEL	0.001	0 12:00	0.35	0.00	0.03
C1_3	CHANNEL	0.000	0 12:00	0.07	0.00	0.03
C1_30	CHANNEL	0.000	0 13:57	0.00	0.00	0.01
C1_4	CHANNEL	0.000	0 14:55	0.00	0.00	0.01
C14_1	CHANNEL	0.000	0 12:00	0.05	0.00	0.04
C14_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C14_4	CHANNEL	0.000	0 12:00	0.02	0.00	0.09
C14_5	CHANNEL	0.008	0 12:00	0.45	0.00	0.10
C15_1	CHANNEL	0.000	0 12:00	0.08	0.00	0.03
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.02
C2	CONDUIT	0.000	0 12:12	0.00	0.00	0.00
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.02
C20_2	CHANNEL	0.001	0 12:00	0.15	0.00	0.03
C20_3	CHANNEL	0.001	0 12:00	0.16	0.00	0.03
C20_4	CHANNEL	0.000	0 11:59	0.21	0.00	0.02
C20_5	CHANNEL	0.000	0 12:00	0.18	0.00	0.02
C20_7	CHANNEL	0.001	0 12:00	0.26	0.00	0.03
C23_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C23_7	CHANNEL	0.001	0 12:00	0.68	0.00	0.02
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.000	0 12:01	0.29	0.00	0.02
C4_3	CHANNEL	0.000	0 00:00	0.00	0.00	0.01

Conduit							
C4_4	CHANNEL	0.000	0	12:00	0.27	0.00	0.04
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.02
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C5_1	CHANNEL	0.087	0	12:00	0.29	0.02	0.12
C5_10	CHANNEL	0.063	0	12:00	0.42	0.02	0.19
C5_11	CHANNEL	0.058	0	12:05	0.17	0.02	0.23
C5_12	CHANNEL	0.531	0	12:00	1.04	0.04	0.22
C5_13	CHANNEL	0.064	0	12:02	0.51	0.02	0.18
C5_14	CHANNEL	0.062	0	12:07	0.12	0.04	0.29
C5_15	CHANNEL	0.098	0	12:07	0.36	0.03	0.22
C5_16	CHANNEL	0.092	0	12:13	0.37	0.02	0.15
C5_17	CHANNEL	0.091	0	12:15	0.21	0.01	0.16
C5_19	CHANNEL	0.100	0	12:05	0.37	0.07	0.20
C5_2	CHANNEL	0.080	0	12:03	0.53	0.01	0.16
C5_20	CHANNEL	0.102	0	12:18	0.23	0.01	0.16
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.17
C5_23	CHANNEL	0.087	0	12:00	0.28	0.02	0.12
C5_3	CHANNEL	0.085	0	12:01	0.49	0.01	0.16
C5_4	CHANNEL	0.079	0	12:04	0.47	0.00	0.12
C5_5	CHANNEL	0.080	0	12:06	0.58	0.01	0.11
C5_6	CHANNEL	0.079	0	12:04	0.66	0.00	0.09
C5_7	CHANNEL	0.075	0	12:19	0.23	0.01	0.17
C5_8	CHANNEL	0.099	0	12:08	0.44	0.01	0.15
C5_9	CHANNEL	0.325	0	12:03	0.59	0.03	0.23
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C7	CHANNEL	0.000	0	12:00	0.08	0.00	0.03
C9_1	CHANNEL	0.001	0	12:00	0.13	0.00	0.03
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.02
C9_2	CHANNEL	0.000	0	11:53	0.19	0.00	0.02
C9_5	CHANNEL	0.000	0	12:01	0.07	0.00	0.02
C9_6	CHANNEL	0.000	0	12:07	0.19	0.00	0.03
C9_7	CHANNEL	0.001	0	12:00	0.30	0.00	0.03
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.375	0	12:01	1.13	1.00	1.00
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.388	0	11:58	1.09	1.19	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.407	0	11:58	1.44	1.71	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.091	0	12:06	1.13	0.21	0.33
C-STRM-101_(C-STRM)	CONDUIT	0.091	0	12:06	1.86	0.11	0.23
C-STRM-102_(C-STRM)	CONDUIT	2.213	0	12:01	3.97	0.88	0.80
C-STRM-103_(C-STRM)	CONDUIT	0.570	0	12:03	1.07	1.03	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.609	0	12:02	1.14	1.10	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.632	0	12:02	1.18	1.14	1.00
C-STRM-2_(I)_(C-STRM)	CONDUIT	0.512	0	11:56	1.61	0.91	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.526	0	11:56	1.72	0.93	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.068	0	12:02	1.37	0.24	0.42
C-STRM-21_(C-STRM)	CONDUIT	0.164	0	12:03	1.36	0.54	0.55
C-STRM-22_(1)_(C-STRM)	CONDUIT	3.309	0	12:00	1.44	0.68	0.83
C-STRM-22_(C-STRM)	CONDUIT	2.930	0	12:00	2.24	1.07	0.77
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.261	0	12:00	1.03	0.78	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.209	0	12:01	0.73	0.62	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.718	0	11:57	1.68	0.91	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.548	0	12:03	1.68	0.92	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.536	0	12:03	1.50	0.90	1.00
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.526	0	12:03	1.47	0.88	1.00
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.533	0	11:55	1.59	0.95	1.00
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.552	0	11:56	1.71	0.98	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.544	0	12:03	1.12	0.98	1.00
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.209	0	11:56	1.17	1.22	1.00
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.212	0	11:57	1.01	1.23	1.00
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.221	0	11:54	1.13	0.90	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.193	0	11:55	0.89	0.79	1.00
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.834	0	12:01	2.03	0.97	0.88
C-STRM-4_(C-STRM)	CONDUIT	0.698	0	11:57	1.65	0.89	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.401	0	12:12	0.82	0.72	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.512	0	12:12	0.96	0.92	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.736	0	12:10	1.16	1.05	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.846	0	12:10	1.13	0.98	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.059	0	12:10	1.42	1.22	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.879	0	12:00	1.18	1.00	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.112	0	11:59	0.95	0.88	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.134	0	12:01	0.64	0.80	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.086	0	12:00	1.06	0.98	0.69
C-STRM-74_(C-STRM)	CONDUIT	3.696	0	12:01	1.54	0.72	0.90
C-STRM-75_(C-STRM)	CONDUIT	3.660	0	12:01	1.56	0.71	0.88
C-STRM-76_(C-STRM)	CONDUIT	1.270	0	12:10	1.27	1.27	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.267	0	12:01	2.84	1.17	0.90
C-STRM-78_(C-STRM)	CONDUIT	1.131	0	12:00	1.51	0.92	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	4.651	0	12:02	1.92	0.74	0.91
C-STRM-79_(C-STRM)	CONDUIT	4.372	0	12:02	1.82	0.76	0.90
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.067	0	11:59	0.42	0.35	0.90
C-STRM-8_(C-STRM)	CONDUIT	0.023	0	12:01	0.30	0.18	0.57
C-STRM-80_(C-STRM)	CONDUIT	4.643	0	12:02	1.95	1.05	0.89
C-STRM-81_(C-STRM)	CONDUIT	4.664	0	12:03	2.26	1.05	0.76
C-STRM-82_(C-STRM)	CONDUIT	4.667	0	12:03	2.86	1.05	0.61
C-STRM-83_(1)_(C-STRM)	CONDUIT	2.816	0	12:00	1.98	1.03	0.79
C-STRM-84_(C-STRM)	CONDUIT	3.501	0	12:01	1.53	0.68	0.88
CVR-C2	CONDUIT	0.078	0	12:05	1.83	0.29	0.32
CVR-C3	CONDUIT	0.082	0	12:14	2.01	0.50	0.38
CVR-C4	CONDUIT	0.325	0	12:03	2.10	0.11	0.19
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	0.279	0	13:25	1.22	0.29	0.86
W1	CHANNEL	2.028	0	12:07	0.85	0.01	0.03
OR1	ORIFICE	0.279	0	13:25			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.249	0	11:52			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	11:52			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	11:51			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	11:50			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	11:51			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	11:52			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	11:52			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	11:53			
C-STRM-83_(C-STRM)	DUMMY	2.249	0	12:00			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	11:51			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	11:52			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	11:52			
OL1	DUMMY	0.097	0	11:53			
OL10	DUMMY	0.026	0	04:13			
OL11	DUMMY	0.046	0	11:59			
OL12	DUMMY	0.100	0	12:00			
OL13	DUMMY	0.083	0	12:00			
OL14	DUMMY	0.120	0	12:00			
OL15	DUMMY	0.087	0	12:00			
OL16	DUMMY	0.335	0	12:00			
OL17	DUMMY	0.210	0	12:00			
OL18	DUMMY	0.058	0	12:00			
OL19	DUMMY	0.235	0	12:00			
OL2	DUMMY	0.069	0	12:01			
OL20	DUMMY	0.067	0	12:00			
OL21	DUMMY	0.060	0	11:59			
OL22	DUMMY	0.103	0	12:02			
OL3	DUMMY	0.134	0	11:52			
OL4	DUMMY	0.110	0	11:52			
OL5	DUMMY	0.023	0	12:00			
OL6	DUMMY	0.029	0	11:48			
OL7	DUMMY	0.030	0	12:00			
OL8	DUMMY	0.018	0	11:58			
OL9	DUMMY	0.214	0	11:58			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.45	0.00
BDR-C2	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.33	0.00
BDR-C3	1.00	0.05	0.00	0.00	0.39	0.56	0.00	0.00	0.00	0.00
BDR-C4	1.00	0.05	0.00	0.00	0.71	0.25	0.00	0.00	0.90	0.00
C1_1	1.00	0.25	0.00	0.00	0.73	0.02	0.00	0.00	0.72	0.00
C1_17	1.00	0.54	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
C1_3	1.00	0.52	0.02	0.00	0.46	0.00	0.00	0.00	0.75	0.00
C1_30	1.00	0.25	0.00	0.00	0.32	0.43	0.00	0.00	0.11	0.00
C1_4	1.00	0.24	0.02	0.00	0.73	0.00	0.00	0.00	0.73	0.00
C14_1	1.00	0.53	0.02	0.00	0.46	0.00	0.00	0.00	0.76	0.00
C14_2	1.00	0.55	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.54	0.01	0.00	0.45	0.00	0.00	0.00	0.76	0.00
C14_5	1.00	0.54	0.00	0.00	0.45	0.01	0.00	0.00	0.76	0.00
C15_1	1.00	0.51	0.02	0.00	0.47	0.00	0.00	0.00	0.75	0.00
C15_2	1.00	0.53	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
C20_1	1.00	0.53	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.53	0.01	0.00	0.45	0.01	0.00	0.00	0.76	0.00
C20_3	1.00	0.52	0.01	0.00	0.46	0.01	0.00	0.00	0.01	0.00
C20_4	1.00	0.05	0.49	0.00	0.45	0.01	0.00	0.00	0.75	0.00
C20_5	1.00	0.05	0.20	0.00	0.64	0.12	0.00	0.00	0.74	0.00
C20_7	1.00	0.53	0.01	0.00	0.44	0.02	0.00	0.00	0.01	0.00
C23_5	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C23_7	1.00	0.24	0.00	0.00	0.67	0.09	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.24	0.00	0.00	0.75	0.01	0.00	0.00	0.00	0.00
C4_3	1.00	0.25	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.05	0.49	0.00	0.45	0.01	0.00	0.00	0.75	0.00
C4_5	1.00	0.54	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_1	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.00	0.59	0.00
C5_10	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C5_11	1.00	0.05	0.01	0.00	0.94	0.00	0.00	0.00	0.94	0.00
C5_12	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.05	0.00	0.00	0.56	0.39	0.00	0.00	0.00	0.00
C5_14	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.32	0.00
C5_15	1.00	0.05	0.00	0.00	0.93	0.02	0.00	0.00	0.91	0.00
C5_16	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.05	0.04	0.00	0.92	0.00	0.00	0.00	0.91	0.00
C5_19	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.38	0.00
C5_2	1.00	0.07	0.00	0.00	0.68	0.25	0.00	0.00	0.00	0.00
C5_20	1.00	0.05	0.01	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_21	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.05	0.00	0.00	0.84	0.11	0.00	0.00	0.47	0.00
C5_3	1.00	0.06	0.00	0.00	0.94	0.01	0.00	0.00	0.92	0.00
C5_4	1.00	0.08	0.00	0.00	0.92	0.00	0.00	0.00	0.91	0.00
C5_5	1.00	0.09	0.00	0.00	0.90	0.01	0.00	0.00	0.91	0.00
C5_6	1.00	0.08	0.00	0.00	0.92	0.00	0.00	0.00	0.63	0.00
C5_7	1.00	0.05	0.07	0.00	0.88	0.00	0.00	0.00	0.88	0.00
C5_8	1.00	0.10	0.00	0.00	0.90	0.00	0.00	0.00	0.87	0.00
C5_9	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.53	0.00	0.00	0.46	0.00	0.00	0.00	0.75	0.00
C9_1	1.00	0.53	0.01	0.00	0.46	0.00	0.00	0.00	0.75	0.00
C9_11	1.00	0.54	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.05	0.50	0.00	0.45	0.01	0.00	0.00	0.75	0.00
C9_5	1.00	0.05	0.20	0.00	0.10	0.65	0.00	0.00	0.01	0.00
C9_6	1.00	0.05	0.49	0.00	0.45	0.01	0.00	0.00	0.75	0.00
C9_7	1.00	0.05	0.49	0.00	0.45	0.01	0.00	0.00	0.75	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.05	0.01	0.00	0.94	0.00	0.00	0.00	0.11	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.01	0.22	0.00
C-STRM-1_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.25	0.64	0.00	0.07	0.00	0.00	0.04	0.64	0.00
C-STRM-101_(C-STRM)	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
C-STRM-102_(C-STRM)	1.00	0.05	0.00	0.00	0.75	0.20	0.00	0.00	0.07	0.00
C-STRM-103_(C-STRM)	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.00	0.76	0.00
C-STRM-104_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.92	0.00
C-STRM-105_(C-STRM)	1.00	0.06	0.00	0.00	0.14	0.00	0.00	0.80	0.01	0.00
C-STRM-2_(I)_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00
C-STRM-2_(C-STRM)	1.00	0.05	0.00	0.00	0.93	0.01	0.00	0.01	0.38	0.00
C-STRM-20_(C-STRM)	1.00	0.25	0.00	0.00	0.01	0.00	0.00	0.75	0.01	0.00
C-STRM-21_(C-STRM)	1.00	0.24	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.05	0.02	0.00	0.92	0.00	0.00	0.00	0.93	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.90	0.04	0.00	0.01	0.40	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.06	0.01	0.00	0.93	0.00	0.00	0.00	0.50	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.06	0.00	0.00	0.93	0.00	0.00	0.01	0.38	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.13	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.01	0.41	0.00
C-STRM-33_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.73	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.94	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.05	0.04	0.00	0.91	0.00	0.00	0.01	0.93	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.05	0.02	0.00	0.93	0.00	0.00	0.00	0.93	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.05	0.00	0.00	0.91	0.02	0.00	0.01	0.51	0.00
C-STRM-49_(C-STRM)	1.00	0.05	0.26	0.00	0.69	0.00	0.00	0.00	0.90	0.00
C-STRM-50_(C-STRM)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.92	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.80	0.00
C-STRM-53_(C-STRM)	1.00	0.05	0.14	0.00	0.81	0.00	0.00	0.00	0.73	0.00
C-STRM-57_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.45	0.00
C-STRM-62_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.06	0.00	0.00	0.04	0.00	0.00	0.90	0.01	0.00
C-STRM-64_(C-STRM)	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.49	0.00
C-STRM-75_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.05	0.00	0.00	0.39	0.00	0.00	0.56	0.09	0.00
C-STRM-77_(C-STRM)	1.00	0.05	0.00	0.00	0.80	0.15	0.00	0.00	0.31	0.00
C-STRM-78_(C-STRM)	1.00	0.05	0.00	0.00	0.38	0.00	0.00	0.57	0.05	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.86	0.00
C-STRM-79_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.24	0.00	0.00	0.01	0.00	0.00	0.74	0.00	0.00
C-STRM-8_(C-STRM)	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.90	0.00
C-STRM-81_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.47	0.00
C-STRM-82_(C-STRM)	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.50	0.00
C-STRM-84_(C-STRM)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.90	0.00
CVR-C2	1.00	0.09	0.00	0.00	0.70	0.22	0.00	0.00	0.83	0.00
CVR-C3	1.00	0.11	0.00	0.00	0.38	0.51	0.00	0.00	0.02	0.00
CVR-C4	1.00	0.05	0.00	0.00	0.41	0.54	0.00	0.00	0.11	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.02	0.21	0.00
W1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00

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Conduit Surcharge Summary
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| Conduit | Hours Full: Both Ends |

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C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)        0.06       0.08       0.07       0.01       0.05
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)       0.07       0.10       0.07       0.01       0.07
C-STRM-3_(1)_(1)_(1)_(C-STRM)       0.10       0.16       0.10       0.01       0.10
C-STRM-3_(1)_(1)_(C-STRM)       0.16       0.20       0.16       0.01       0.16
C-STRM-3_(1)_(2)_(C-STRM)       0.16       0.16       0.20       0.01       0.01
C-STRM-3_(1)_(C-STRM)       0.16       0.16       0.16       0.01       0.03
C-STRM-33_(C-STRM)       0.18       0.18       0.19       0.01       0.01
C-STRM-34_(1)_(1)_(C-STRM)       0.10       0.10       0.13       0.14       0.05
C-STRM-34_(1)_(C-STRM)       0.08       0.08       0.10       0.17       0.05
C-STRM-35_(1)_(C-STRM)       0.18       0.18       0.25       0.01       0.01
C-STRM-35_(C-STRM)       0.13       0.13       0.18       0.01       0.01
C-STRM-4_(1)_(C-STRM)       0.01       0.08       0.01       0.01       0.01
C-STRM-4_(C-STRM)       0.07       0.07       0.08       0.01       0.06
C-STRM-49_(C-STRM)       0.33       0.33       0.34       0.01       0.01
C-STRM-50_(C-STRM)       0.34       0.34       0.34       0.01       0.24
C-STRM-51_(C-STRM)       0.34       0.34       0.34       0.12       0.34
C-STRM-52_(C-STRM)       0.34       0.34       0.34       0.01       0.31
C-STRM-53_(C-STRM)       0.33       0.34       0.33       0.27       0.33
C-STRM-57_(C-STRM)       0.31       0.31       0.31       0.01       0.30
C-STRM-62_(C-STRM)       0.13       0.13       0.17       0.01       0.01
C-STRM-63_(C-STRM)       0.17       0.17       0.21       0.01       0.01
C-STRM-76_(C-STRM)       0.32       0.33       0.32       0.28       0.32
C-STRM-77_(C-STRM)       0.01       0.32       0.01       0.26       0.01
C-STRM-78_(C-STRM)       0.31       0.31       0.32       0.01       0.25
C-STRM-8_(1)_(C-STRM)       0.01       0.01       0.09       0.01       0.01
C-STRM-80_(C-STRM)       0.01       0.01       0.01       0.09       0.01
C-STRM-81_(C-STRM)       0.01       0.01       0.01       0.10       0.01
C-STRM-82_(C-STRM)       0.01       0.01       0.01       0.09       0.01
C-STRM-83_(1)_(C-STRM)       0.01       0.01       0.01       0.03       0.01


Analysis begun on:  Thu Apr  9 12:13:35 2026
Analysis ended on:  Thu Apr  9 12:13:47 2026
Total elapsed time: 00:00:12Post-Development 1:100 year 24-hour SCS Event

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

WARNING 02: maximum depth increased for Node J74

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 34
Number of nodes ........... 76
Number of links ........... 101
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************

Name                Data Source                 Data       Recording
                                                Type       Interval
----------------------------------------------------------------------
Rainfall            SCS_24h_100                 INTENSITY   15 min.


*********************
Subcatchment Summary
*********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
---------------
S1                          0.50    278.00     64.29    2.0000 Rainfall             J14
S10                         0.46    288.00     71.43    2.0000 Rainfall             J16
S11                         0.23    157.40     71.43    2.0000 Rainfall             J18
S12                         0.57    518.00     71.43    2.0000 Rainfall             J22
S13                         7.80    224.00     85.71    2.0000 Rainfall             S_536-537
S14                         5.41    157.16     85.71    2.0000 Rainfall             S_561-562
S15                         0.60    370.00     71.43    2.0000 Rainfall             J2
S17                         6.26    202.00      0.00    2.0000 Rainfall             OF1
S18                         0.44    330.00     71.43    2.0000 Rainfall             J25
S19                         3.19    237.00     85.71    2.0000 Rainfall             S_538-539
S2                          3.91    879.08     64.29    2.0000 Rainfall             S_530-531
S20                         1.69    650.00     71.43    2.0000 Rainfall             J3
S21                         1.05    440.00     71.43    2.0000 Rainfall             J6
S22                         0.23    165.00     50.00    2.0000 Rainfall             OF2
S23                         0.34    262.00     57.14    2.0000 Rainfall             OF2
S24                         0.98    344.00     71.43    2.0000 Rainfall             J21
S25                         1.25    560.00     71.43    2.0000 Rainfall             J7
S26                         6.00   1350.62     71.43    2.0000 Rainfall             S_505-504
S27                         0.30    150.00     71.43    2.0000 Rainfall             J4
S28                         3.32    746.60     71.43    2.0000 Rainfall             S_540-531
S29                         3.30    280.00      0.00    2.0000 Rainfall             S_521-522
S3                          1.28    468.00     64.29    2.0000 Rainfall             J11
S30                         1.02    424.00     71.43    2.0000 Rainfall             J23
S31                         3.33    749.10     64.29    2.0000 Rainfall             S_547-548
S32                         0.42    322.00     71.43    2.0000 Rainfall             J20
S33                         0.33    232.00     64.29    2.0000 Rainfall             J13
S34                         3.66    190.00     85.71    2.0000 Rainfall             PND-2
S35                         1.99    120.00     35.71    2.0000 Rainfall             S_504-554
S4                          3.12    702.16     64.29    2.0000 Rainfall             S_523-524
S5                          0.89    199.78     71.43    2.0000 Rainfall             S_548-550
S6                          1.82    409.17     71.43    2.0000 Rainfall             S_551-552
S7                          0.86    193.25     71.43    2.0000 Rainfall             S_552-553
S8                          1.65    371.50     64.29    2.0000 Rainfall             S_553-501
S9                          1.70    383.61     64.29    2.0000 Rainfall             S_501-
PND-2


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Node Summary
************

Name                Type                 Invert      Max.    Ponded    External
                                          Elev.      Depth      Area    Inflow
-----------------------------------------------------------------------------
J1                  JUNCTION            105.60       0.50       0.0
J10                 JUNCTION            106.50       0.50       0.0
J11                 JUNCTION            106.00       0.50       0.0
J12                 JUNCTION            106.20       0.50       0.0
J13                 JUNCTION            102.10       0.50       0.0
J14                 JUNCTION            107.00       0.50       0.0
J16                 JUNCTION            103.70       0.50       0.0
J18                 JUNCTION            103.85       0.50       0.0
J19                 JUNCTION            103.70       0.50       0.0
J2                  JUNCTION            109.00       0.50       0.0
J20                 JUNCTION            105.10       0.50       0.0
J21                 JUNCTION            106.00       0.50       0.0
J22                 JUNCTION            106.00       0.50       0.0
J23                 JUNCTION            104.35       0.50       0.0
J24                 JUNCTION            103.55       0.50       0.0
J25                 JUNCTION            109.00       0.50       0.0
J3                  JUNCTION            108.80       0.50       0.0
J4                  JUNCTION            108.40       0.50       0.0
J5                  JUNCTION            108.47       0.50       0.0
J6                  JUNCTION            109.10       0.50       0.0
J7                  JUNCTION            108.00       0.50       0.0
J74                 JUNCTION             98.43       0.90       0.0
J8                  JUNCTION            107.00       0.50       0.0
J9                  JUNCTION            109.75       0.50       0.0
564_(C-STRM)        OUTFALL             103.64       0.30       0.0
OF1                 OUTFALL               0.00       0.00       0.0
OF2                 OUTFALL               0.00       0.00       0.0
ST4_108A_(P-Stm)    OUTFALL              98.02       1.20       0.0
501_(C-STRM)        STORAGE              99.02       3.10       0.0
503_(C-STRM)        STORAGE              99.54       4.04       0.0
504_(C-STRM)        STORAGE              99.35       4.38       0.0
505_(C-STRM)        STORAGE             101.80       4.19       0.0
506_(C-STRM)        STORAGE             103.91       4.07       0.0
507_(C-STRM)        STORAGE             104.22       4.17       0.0
508_(C-STRM)        STORAGE             105.17       3.60       0.0
509_(C-STRM)        STORAGE             105.47       3.62       0.0
521_(C-STRM)        STORAGE             103.85       3.17       0.0
522_(C-STRM)        STORAGE             103.56       3.28       0.0
523_(C-STRM)        STORAGE             103.41       3.06       0.0
524_(C-STRM)        STORAGE             103.20       3.00       0.0
527_(C-STRM)        STORAGE             103.37       3.28       0.0
528_(C-STRM)        STORAGE             102.71       3.28       0.0
529_(C-STRM)        STORAGE             102.35       2.86       0.0
530_(C-STRM)        STORAGE             101.87       2.52       0.0
531_(C-STRM)        STORAGE              99.73       3.99       0.0
536_(C-STRM)        STORAGE             102.49       4.01       0.0
537_(C-STRM)        STORAGE             101.85       2.88       0.0
538_(C-STRM)        STORAGE             101.40       3.45       0.0
539_(C-STRM)        STORAGE             100.81       3.21       0.0
540_(C-STRM)        STORAGE             100.52       3.34       0.0
547_(C-STRM)        STORAGE              99.93       2.72       0.0
548_(C-STRM)        STORAGE              99.73       2.85       0.0
550_(C-STRM)        STORAGE              99.66       2.79       0.0
551_(C-STRM)        STORAGE              99.48       2.88       0.0
552_(C-STRM)        STORAGE              99.32       2.99       0.0
553_(C-STRM)        STORAGE              99.14       3.07       0.0
554_(C-STRM)        STORAGE              99.17       5.16       0.0
561_(C-STRM)        STORAGE             105.66       3.34       0.0
562_(C-STRM)        STORAGE             105.42       3.08       0.0
563_(C-STRM)        STORAGE             104.98       2.32       0.0
PND-2               STORAGE              98.46       2.39       0.0    Yes
S_501-PND-2         STORAGE             102.10       0.50       0.0
S_504-554           STORAGE             104.00       0.50       0.0
S_505-504           STORAGE             109.00       0.50       0.0
S_521-522           STORAGE             106.75       0.50       0.0
S_523-524           STORAGE             107.00       0.50       0.0
S_530-531           STORAGE             104.23       0.50       0.0
S_536-537           STORAGE             103.95       0.50       0.0
S_538-539           STORAGE             103.00       0.50       0.0
S_540-531           STORAGE             104.00       0.50       0.0
S_547-548           STORAGE             102.55       0.50       0.0
S_548-550           STORAGE             102.55       0.50       0.0
S_551-552           STORAGE             102.50       0.50       0.0
S_552-553           STORAGE             102.30       0.50       0.0
S_553-501           STORAGE             102.20       0.50       0.0
S_561-562           STORAGE             107.00       0.50       0.0


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Link Summary
************
Name                From Node           To Node             Type           Length    %Slope
Roughness
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-
C1                  J14                 J11                 CONDUIT         144.3    0.6932
0.0130
C1_10               J21                 J19                 CONDUIT         171.6    1.3402
0.0130
C1_11               J10                 J11                 CONDUIT          72.0    0.6944
0.0130
C1_12               J12                 J11                 CONDUIT         163.0    0.1227
0.0130
C1_13               J8                  J10                 CONDUIT          75.0    0.6670
0.0130
C1_15               J9                  J8                  CONDUIT         192.7    1.4271
0.0130
C1_16               J12                 J22                 CONDUIT          27.0    0.7408
0.0130
C1_17               J25                 J1                  CONDUIT         167.1    2.0352
0.0130
C1_2                J3                  J4                  CONDUIT         328.1    0.1219
0.0130
C1_3                J2                  J3                  CONDUIT         194.8    0.1027
0.0130
C1_4                J5                  J4                  CONDUIT          40.6    0.1724
0.0130
C1_5                J6                  J4                  CONDUIT         190.7    0.3672
0.0130
C1_6                J7                  J8                  CONDUIT         207.0    0.4831
0.0130
C1_7                J4                  J7                  CONDUIT          76.8    0.5211
0.0130
C1_8                J8                  J21                 CONDUIT          72.0    1.3889
0.0130
C2                  J22                 J23                 CONDUIT         262.0    0.6299
0.0130
C2_1                J11                 J16                 CONDUIT         239.9    0.9588
0.0130
C2_3                J16                 J24                 CONDUIT         116.0    0.1293
0.0130
C2_4                J20                 J19                 CONDUIT         163.6    0.8558
0.0130
C2_7                J18                 J16                 CONDUIT          70.2    0.2137
0.0130
C2_8                J23                 J18                 CONDUIT         220.7    0.2266
0.0130
C2_9                J19                 J24                 CONDUIT          31.1    0.4830
0.0130
C3                  J24                 J13                 CONDUIT         105.0    1.3810
0.0130
C4                  554_(C-STRM)        PND-2               CONDUIT          34.3    0.3411
0.0130
C-STRM-1_(C-STRM)  508_(C-STRM)      507_(C-STRM)      CONDUIT          319.3    0.2998
0.0130
C-STRM-19_(C-STRM) 521_(C-STRM)      522_(C-STRM)      CONDUIT          148.0    0.2000
0.0130
C-STRM-2_(C-STRM) 507_(C-STRM)      506_(C-STRM)      CONDUIT           76.5    0.4001
0.0130
C-STRM-20_(C-STRM) 522_(C-STRM)      523_(C-STRM)      CONDUIT           72.3    0.1992
0.0130
C-STRM-21_(C-STRM) 523_(C-STRM)      524_(C-STRM)      CONDUIT           72.4    0.3011
0.0130
C-STRM-22_(C-STRM) 524_(C-STRM)      528_(C-STRM)      CONDUIT          162.8    0.2998
0.0130
C-STRM-23_(C-STRM) 528_(C-STRM)      529_(C-STRM)      CONDUIT           71.7    0.5005
0.0130
C-STRM-24_(C-STRM) 529_(C-STRM)      530_(C-STRM)      CONDUIT           96.1    0.4996
0.0130
C-STRM-25_(C-STRM) 530_(C-STRM)      531_(C-STRM)      CONDUIT           72.0    0.9996
0.0130
C-STRM-26_(C-STRM) 531_(C-STRM)      503_(C-STRM)      CONDUIT          119.0    0.1597
0.0130
C-STRM-27_(C-STRM) 527_(C-STRM)      528_(C-STRM)      CONDUIT           72.3    0.4994
0.0130
C-STRM-3_(1)_(C-STRM) 506_(C-STRM)     505_(C-STRM)     CONDUIT          279.1    0.3999
0.0130
C-STRM-31_(C-STRM) 536_(C-STRM)      537_(C-STRM)      CONDUIT          128.6    0.5000
0.0130
C-STRM-33_(C-STRM) 537_(C-STRM)      538_(C-STRM)      CONDUIT           58.9    0.5006
0.0130
C-STRM-34_(C-STRM) 538_(C-STRM)      539_(C-STRM)      CONDUIT          147.9    0.4003
0.0130
C-STRM-35_(1)_(C-STRM) 540_(C-STRM)      531_(C-STRM)      CONDUIT           72.3    0.4497
0.0130
C-STRM-35_(C-STRM) 539_(C-STRM)      540_(C-STRM)      CONDUIT           73.3    0.3997
0.0130
C-STRM-4_(C-STRM) 505_(C-STRM)      504_(C-STRM)      CONDUIT          168.6    1.0001
0.0130
C-STRM-42_(C-STRM) 547_(C-STRM)      548_(C-STRM)      CONDUIT           69.0    0.1797
0.0130
C-STRM-49_(C-STRM) 548_(C-STRM)      550_(C-STRM)      CONDUIT           47.7    0.1508
0.0130
C-STRM-50_(C-STRM) 550_(C-STRM)      551_(C-STRM)      CONDUIT           72.0    0.1500
0.0130
C-STRM-51_(C-STRM) 551_(C-STRM)      552_(C-STRM)      CONDUIT           45.5    0.1802
0.0130
C-STRM-52_(C-STRM) 552_(C-STRM)      553_(C-STRM)      CONDUIT           72.0    0.1500
0.0130
C-STRM-53_(C-STRM) 553_(C-STRM)      501_(C-STRM)      CONDUIT           75.0    0.1507
0.0130
C-STRM-54_(C-STRM) 504_(C-STRM)      554_(C-STRM)      CONDUIT           71.7    0.2510
0.0130
C-STRM-57_(C-STRM) 503_(C-STRM)      504_(C-STRM)      CONDUIT           28.1    0.1604
0.0130
C-STRM-62_(C-STRM) 561_(C-STRM)      562_(C-STRM)      CONDUIT           95.9    0.2504
0.0130
C-STRM-63_(C-STRM) 562_(C-STRM)      508_(C-STRM)      CONDUIT           97.5    0.2504
0.0130
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C-STRM-64_(C-STRM)	563_(C-STRM)	564_(C-STRM)	CONDUIT	81.9	2.0009
0.0130					
C-STRM-7_(C-STRM)	501_(C-STRM)	PND-2	CONDUIT	49.5	0.1455
0.0130					
C-STRM-8_(C-STRM)	509_(C-STRM)	507_(C-STRM)	CONDUIT	190.3	0.5003
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	43.1	0.2600
0.0130					
ST4-Pipe_-_(99)_(P-Stm)_1	PND-2	J74	ORIFICE		
W1	J13	PND-2	WEIR		
W10	S_523-524	J11	WEIR		
W11	S_505-504	J21	WEIR		
W12	J11	J16	WEIR		
W13	J18	J16	WEIR		
W14	J16	PND-2	WEIR		
W15	J21	PND-2	WEIR		
W2	S_547-548	S_548-550	WEIR		
W3	S_548-550	S_551-552	WEIR		
W4	S_551-552	S_552-553	WEIR		
W5	S_552-553	S_553-501	WEIR		
W6	S_553-501	S_501-PND-2	WEIR		
W7	S_501-PND-2	PND-2	WEIR		
W8	S_540-531	J18	WEIR		
W9	S_530-531	J16	WEIR		
C-STRM-14_(C-STRM)	S_505-504	505_(C-STRM)	OUTLET		
C-STRM-36_(1)_(C-STRM)	S_540-531	540_(C-STRM)	OUTLET		
OL1	S_538-539	538_(C-STRM)	OUTLET		
OL10	S_521-522	521_(C-STRM)	OUTLET		
OL11	S_523-524	523_(C-STRM)	OUTLET		
OL12	J14	527_(C-STRM)	OUTLET		
OL13	J11	528_(C-STRM)	OUTLET		
OL14	J13	538_(C-STRM)	OUTLET		
OL15	J20	554_(C-STRM)	OUTLET		
OL16	J21	505_(C-STRM)	OUTLET		
OL17	J7	506_(C-STRM)	OUTLET		
OL18	J4	507_(C-STRM)	OUTLET		
OL19	J6	509_(C-STRM)	OUTLET		
OL2	S_536-537	536_(C-STRM)	OUTLET		
OL20	J3	508_(C-STRM)	OUTLET		
OL21	J2	561_(C-STRM)	OUTLET		
OL22	J16	531_(C-STRM)	OUTLET		
OL23	J18	540_(C-STRM)	OUTLET		
OL24	S_504-554	504_(C-STRM)	OUTLET		
OL25	J22	536_(C-STRM)	OUTLET		
OL26	J25	563_(C-STRM)	OUTLET		
OL27	S_530-531	530_(C-STRM)	OUTLET		
OL3	S_561-562	561_(C-STRM)	OUTLET		
OL4	S_547-548	547_(C-STRM)	OUTLET		
OL5	S_548-550	548_(C-STRM)	OUTLET		
OL6	S_551-552	551_(C-STRM)	OUTLET		
OL7	S_552-553	552_(C-STRM)	OUTLET		
OL8	S_553-501	553_(C-STRM)	OUTLET		
OL9	S_501-PND-2	501_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C1_10	ROW_24m	0.32	3.34	0.14	24.00	1	8.11
C1_11	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C1_12	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C1_13	ROW_18m	0.25	2.05	0.13	18.00	1	3.34
C1_15	ROW_18m	0.25	2.05	0.13	18.00	1	4.88
C1_16	ROW_18m	0.25	2.05	0.13	18.00	1	3.51
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	10.26
C1_2	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.31
C1_4	ROW_24m	0.32	3.34	0.14	24.00	1	2.91
C1_5	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C1_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C1_7	ROW_24m	0.32	3.34	0.14	24.00	1	5.06
C1_8	ROW_24m	0.32	3.34	0.14	24.00	1	8.25
C2	ROW_18m	0.25	2.05	0.13	18.00	1	3.24
C2_1	ROW_18m	0.25	2.05	0.13	18.00	1	4.00
C2_3	ROW_24m	0.32	3.34	0.14	24.00	1	2.52
C2_4	ROW_24m	0.32	3.34	0.14	24.00	1	6.48
C2_7	ROW_24m	0.32	3.34	0.14	24.00	1	3.24
C2_8	ROW_24m	0.32	3.34	0.14	24.00	1	3.33
C2_9	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C3	ROW_18m	0.25	2.05	0.13	18.00	1	4.80
C4	CIRCULAR	1.80	2.54	0.45	1.80	1	6.71
C-STRM-1_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.50
C-STRM-19_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.50
C-STRM-2_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.73
C-STRM-20_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.50
C-STRM-21_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.61
C-STRM-22_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.61
C-STRM-23_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.79
C-STRM-24_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.79
C-STRM-25_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	1.11
C-STRM-26_(C-STRM)	CIRCULAR	1.65	2.14	0.41	1.65	1	3.64
C-STRM-27_(C-STRM)	CIRCULAR	0.45	0.16	0.11	0.45	1	0.20
C-STRM-3_(1)_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.73
C-STRM-31_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.93
C-STRM-33_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.93
C-STRM-34_(C-STRM)	CIRCULAR	1.20	1.13	0.30	1.20	1	2.47
C-STRM-35_(1)_(C-STRM)	CIRCULAR	1.20	1.13	0.30	1.20	1	2.61
C-STRM-35_(C-STRM)	CIRCULAR	1.20	1.13	0.30	1.20	1	2.47
C-STRM-4_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	2.73
C-STRM-47_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.47
C-STRM-49_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM)	CIRCULAR	0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM)	CIRCULAR	0.90	0.64	0.23	0.90	1	0.77
C-STRM-52_(C-STRM)	CIRCULAR	0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.06
C-STRM-54_(C-STRM)	CIRCULAR	1.80	2.54	0.45	1.80	1	5.76
C-STRM-57_(C-STRM)	CIRCULAR	1.65	2.14	0.41	1.65	1	3.65
C-STRM-62_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.37
C-STRM-63_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.37
C-STRM-64_(C-STRM)	CIRCULAR	0.30	0.07	0.07	0.30	1	0.14
C-STRM-7_(C-STRM)	CIRCULAR	1.05	0.87	0.26	1.05	1	1.04
C-STRM-8_(C-STRM)	CIRCULAR	0.75	0.44	0.19	0.75	1	0.79
ST4-Pipe_-_(99)_(P-Stm)	CIRCULAR	0.90	0.64	0.23	0.90	1	0.92

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Transect Summary
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Transect GBR
Area:

0.0002	0.0008	0.0018	0.0032	0.0051
0.0073	0.0099	0.0130	0.0164	0.0203
0.0245	0.0292	0.0343	0.0401	0.0532
0.0756	0.1002	0.1249	0.1496	0.1742
0.1989	0.2235	0.2482	0.2729	0.2975
0.3222	0.3468	0.3715	0.3962	0.4209
0.4460	0.4715	0.4974	0.5237	0.5505
0.5776	0.6051	0.6331	0.6614	0.6902
0.7193	0.7489	0.7789	0.8092	0.8400
0.8712	0.9028	0.9348	0.9672	1.0000

Hrad:

0.0148	0.0296	0.0444	0.0592	0.0741
0.0889	0.1037	0.1185	0.1333	0.1481
0.1629	0.1777	0.1925	0.1451	0.0889
0.0921	0.1222	0.1522	0.1821	0.2121
0.2420	0.2720	0.3019	0.3318	0.3616
0.3915	0.4213	0.4511	0.4809	0.5106
0.5398	0.5684	0.5963	0.6237	0.6505
0.6768	0.7026	0.7280	0.7529	0.7773
0.8013	0.8249	0.8480	0.8708	0.8932
0.9153	0.9369	0.9583	0.9793	1.0000

Width:

0.0123	0.0246	0.0369	0.0492	0.0614
0.0737	0.0860	0.0983	0.1106	0.1229
0.1352	0.1475	0.1598	0.2496	0.5446
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7542
0.7665	0.7788	0.7911	0.8034	0.8157
0.8280	0.8402	0.8525	0.8648	0.8771
0.8894	0.9017	0.9140	0.9263	0.9386
0.9508	0.9631	0.9754	0.9877	1.0000

Transect ROW_14m
Area:

0.0004	0.0017	0.0038	0.0067	0.0104
0.0150	0.0204	0.0267	0.0338	0.0417
0.0504	0.0600	0.0704	0.0817	0.0938
0.1067	0.1204	0.1350	0.1504	0.1667
0.1838	0.2017	0.2204	0.2400	0.2605
0.2817	0.3038	0.3267	0.3502	0.3738
0.3973	0.4209	0.4446	0.4692	0.4952
0.5225	0.5510	0.5808	0.6118	0.6439
0.6767	0.7100	0.7440	0.7787	0.8140
0.8499	0.8865	0.9237	0.9615	1.0000

Hrad:

0.0169	0.0338	0.0507	0.0677	0.0846
0.1015	0.1184	0.1353	0.1522	0.1692
0.1861	0.2030	0.2199	0.2368	0.2537
0.2707	0.2876	0.3045	0.3214	0.3383
0.3552	0.3722	0.3891	0.4060	0.4229
0.4398	0.4567	0.4736	0.5027	0.5359
0.5591	0.6078	0.6353	0.6667	0.6957
0.7226	0.7474	0.7704	0.7918	0.8123
0.8326	0.8526	0.8721	0.8914	0.9103
0.9289	0.9471	0.9651	0.9827	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6200	0.6529	0.6857
0.7186	0.7514	0.7843	0.8171	0.8357
0.8521	0.8686	0.8850	0.9014	0.9179
0.9343	0.9507	0.9671	0.9836	1.0000

Transect ROW_14m_Mountable
Area:

0.0003	0.0012	0.0028	0.0049	0.0077
0.0111	0.0151	0.0197	0.0249	0.0307
0.0372	0.0442	0.0519	0.0602	0.0691
0.0787	0.0888	0.0996	0.1109	0.1229
0.1355	0.1487	0.1625	0.1770	0.1923
0.2092	0.2277	0.2477	0.2693	0.2924
0.3170	0.3433	0.3711	0.4004	0.4310
0.4626	0.4954	0.5293	0.5642	0.6002
0.6373	0.6755	0.7144	0.7538	0.7936
0.8340	0.8748	0.9160	0.9578	1.0000

Hrad:

0.0222	0.0445	0.0667	0.0889	0.1111
0.1334	0.1556	0.1778	0.2001	0.2223
0.2445	0.2667	0.2890	0.3112	0.3334
0.3556	0.3779	0.4001	0.4223	0.4446
0.4668	0.4890	0.5112	0.5335	0.5550
0.5733	0.5891	0.6029	0.6151	0.6263
0.6367	0.6465	0.6559	0.6653	0.6759
0.6872	0.6992	0.7116	0.7245	0.7378
0.7514	0.7663	0.7966	0.8266	0.8563
0.8856	0.9147	0.9434	0.9719	1.0000

Width:

0.0145	0.0290	0.0434	0.0579	0.0724
0.0869	0.1013	0.1158	0.1303	0.1448
0.1593	0.1737	0.1882	0.2027	0.2172
0.2316	0.2461	0.2606	0.2751	0.2896
0.3040	0.3185	0.3330	0.3475	0.3798
0.4164	0.4530	0.4897	0.5263	0.5629
0.5995	0.6362	0.6728	0.7080	0.7335
0.7591	0.7846	0.8102	0.8357	0.8613
0.8868	0.9114	0.9225	0.9336	0.9446
0.9557	0.9668	0.9779	0.9889	1.0000

Transect ROW_14m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0153	0.0209	0.0273	0.0345	0.0426
0.0516	0.0614	0.0721	0.0836	0.0959
0.1091	0.1232	0.1381	0.1539	0.1705
0.1880	0.2064	0.2255	0.2456	0.2665
0.2882	0.3108	0.3343	0.3583	0.3824
0.4065	0.4306	0.4548	0.4797	0.5055
0.5322	0.5598	0.5883	0.6176	0.6479
0.6791	0.7112	0.7441	0.7780	0.8127
0.8484	0.8850	0.9224	0.9608	1.0000

Hrad:

0.0166	0.0332	0.0498	0.0664	0.0830
0.0997	0.1163	0.1329	0.1495	0.1661
0.1827	0.1993	0.2159	0.2325	0.2491
0.2657	0.2823	0.2990	0.3156	0.3322
0.3488	0.3654	0.3820	0.3986	0.4152
0.4318	0.4484	0.4650	0.4935	0.5262
0.5588	0.5913	0.6238	0.6553	0.6853
0.7137	0.7407	0.7664	0.7909	0.8143
0.8366	0.8579	0.8783	0.8979	0.9166
0.9346	0.9519	0.9685	0.9845	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6160	0.6386	0.6612
0.6838	0.7063	0.7289	0.7515	0.7741
0.7967	0.8193	0.8419	0.8645	0.8871
0.9096	0.9322	0.9548	0.9774	1.0000

Transect ROW_14m-MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0407	0.0484	0.0568	0.0659	0.0757
0.0861	0.0972	0.1089	0.1214	0.1345
0.1483	0.1631	0.1791	0.1963	0.2146
0.2342	0.2549	0.2768	0.2999	0.3242
0.3497	0.3764	0.4043	0.4333	0.4635
0.4949	0.5273	0.5601	0.5935	0.6274
0.6618	0.6967	0.7326	0.7693	0.8064
0.8441	0.8823	0.9210	0.9603	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0792	0.0990
0.1188	0.1386	0.1584	0.1782	0.1980
0.2178	0.2376	0.2574	0.2772	0.2971
0.3169	0.3367	0.3565	0.3763	0.3961
0.4159	0.4347	0.4520	0.4681	0.4834
0.4979	0.5119	0.5256	0.5389	0.5521
0.5650	0.5779	0.5907	0.6035	0.6162
0.6289	0.6560	0.6844	0.7123	0.7397
0.7667	0.7933	0.8190	0.8459	0.8726
0.8988	0.9247	0.9501	0.9752	1.0000

Width:

0.0168	0.0336	0.0504	0.0673	0.0841
0.1009	0.1177	0.1345	0.1513	0.1681
0.1849	0.2018	0.2186	0.2354	0.2522
0.2690	0.2858	0.3026	0.3195	0.3363
0.3552	0.3849	0.4146	0.4442	0.4739
0.5036	0.5332	0.5629	0.5926	0.6223
0.6519	0.6816	0.7113	0.7409	0.7706
0.8003	0.8150	0.8279	0.8407	0.8536

```
            0.8664    0.8836    0.9093    0.9229    0.9357
            0.9486    0.9614    0.9743    0.9871    1.0000

Transect ROW_16.5m_Mountable
Area:
            0.0003    0.0012    0.0027    0.0048    0.0074
            0.0107    0.0145    0.0190    0.0240    0.0297
            0.0359    0.0428    0.0502    0.0582    0.0668
            0.0760    0.0858    0.0962    0.1072    0.1188
            0.1309    0.1437    0.1571    0.1710    0.1856
            0.2012    0.2183    0.2369    0.2570    0.2786
            0.3017    0.3263    0.3524    0.3800    0.4091
            0.4397    0.4719    0.5055    0.5406    0.5772
            0.6153    0.6544    0.6944    0.7354    0.7772
            0.8199    0.8636    0.9082    0.9536    1.0000
Hrad:
            0.0233    0.0465    0.0698    0.0931    0.1163
            0.1396    0.1628    0.1861    0.2094    0.2326
            0.2559    0.2792    0.3024    0.3257    0.3489
            0.3722    0.3955    0.4187    0.4420    0.4653
            0.4885    0.5118    0.5350    0.5583    0.5816
            0.6036    0.6224    0.6386    0.6529    0.6657
            0.6773    0.6882    0.6985    0.7084    0.7180
            0.7275    0.7370    0.7464    0.7559    0.7655
            0.7817    0.8084    0.8343    0.8597    0.8844
            0.9085    0.9321    0.9552    0.9779    1.0000
Width:
            0.0127    0.0254    0.0380    0.0507    0.0634
            0.0761    0.0888    0.1014    0.1141    0.1268
            0.1395    0.1522    0.1648    0.1775    0.1902
            0.2029    0.2156    0.2283    0.2409    0.2536
            0.2663    0.2790    0.2917    0.3043    0.3170
            0.3491    0.3812    0.4132    0.4453    0.4774
            0.5095    0.5415    0.5736    0.6057    0.6378
            0.6698    0.7019    0.7340    0.7661    0.7981
            0.8255    0.8448    0.8642    0.8836    0.9030
            0.9224    0.9418    0.9612    0.9806    1.0000

Transect ROW_16.5m_PH3
Area:
            0.0004    0.0017    0.0039    0.0069    0.0107
            0.0154    0.0210    0.0275    0.0347    0.0429
            0.0519    0.0618    0.0725    0.0841    0.0965
            0.1098    0.1240    0.1390    0.1548    0.1716
            0.1892    0.2076    0.2269    0.2471    0.2677
            0.2884    0.3090    0.3297    0.3510    0.3731
            0.3962    0.4201    0.4449    0.4705    0.4971
            0.5245    0.5527    0.5819    0.6119    0.6428
            0.6746    0.7073    0.7408    0.7752    0.8105
            0.8466    0.8837    0.9216    0.9603    1.0000
Hrad:
            0.0173    0.0347    0.0520    0.0694    0.0867
            0.1041    0.1214    0.1388    0.1561    0.1735
            0.1908    0.2082    0.2255    0.2429    0.2602
            0.2776    0.2949    0.3123    0.3296    0.3470
            0.3643    0.3817    0.3990    0.4164    0.4493
            0.4834    0.5173    0.5513    0.5844    0.6155
            0.6449    0.6727    0.6990    0.7239    0.7475
            0.7699    0.7913    0.8116    0.8310    0.8496
            0.8673    0.8843    0.9007    0.9164    0.9316
            0.9462    0.9603    0.9739    0.9872    1.0000
Width:
            0.0214    0.0428    0.0642    0.0856    0.1070
            0.1284    0.1498    0.1712    0.1926    0.2140
            0.2354    0.2568    0.2782    0.2996    0.3210
            0.3424    0.3638    0.3852    0.4066    0.4280
            0.4494    0.4708    0.4922    0.5136    0.5152
            0.5152    0.5152    0.5200    0.5418    0.5636
            0.5855    0.6073    0.6291    0.6509    0.6727
            0.6945    0.7164    0.7382    0.7600    0.7818
            0.8036    0.8255    0.8473    0.8691    0.8909
            0.9127    0.9345    0.9564    0.9782    1.0000

Transect ROW_18m
Area:
            0.0004    0.0016    0.0036    0.0064    0.0100
            0.0144    0.0196    0.0255    0.0323    0.0399
            0.0483    0.0575    0.0675    0.0782    0.0898
            0.1022    0.1154    0.1293    0.1441    0.1597
            0.1760    0.1932    0.2112    0.2299    0.2495
            0.2698    0.2906    0.3114    0.3321    0.3529
            0.3742    0.3967    0.4204    0.4452    0.4712
            0.4983    0.5266    0.5560    0.5867    0.6184
            0.6514    0.6855    0.7207    0.7571    0.7947
            0.8335    0.8734    0.9144    0.9566    1.0000
Hrad:
            0.0183    0.0366    0.0549    0.0732    0.0915
            0.1098    0.1281    0.1464    0.1647    0.1829
            0.2012    0.2195    0.2378    0.2561    0.2744
            0.2927    0.3110    0.3293    0.3476    0.3659
            0.3842    0.4025    0.4208    0.4391    0.4574
            0.4757    0.5117    0.5476    0.5834    0.6192
            0.6542    0.6864    0.7162    0.7437    0.7692
            0.7927    0.8145    0.8348    0.8537    0.8713
            0.8877    0.9031    0.9176    0.9313    0.9442
            0.9565    0.9681    0.9792    0.9898    1.0000
Width:
            0.0182    0.0363    0.0545    0.0726    0.0908
            0.1090    0.1271    0.1453    0.1635    0.1816
            0.1998    0.2179    0.2361    0.2543    0.2724
            0.2906    0.3088    0.3269    0.3451    0.3632
            0.3814    0.3996    0.4177    0.4359    0.4541
            0.4722    0.4722    0.4722    0.4722    0.4722
            0.4986    0.5250    0.5514    0.5778    0.6042
            0.6369    0.6693    0.6833    0.7097    0.7361
            0.7625    0.7889    0.8153    0.8417    0.8681
            0.8944    0.9208    0.9472    0.9736    1.0000

Transect ROW_18m_MB_1
Area:
            0.0003    0.0013    0.0030    0.0054    0.0084
            0.0121    0.0165    0.0215    0.0272    0.0336
            0.0406    0.0484    0.0568    0.0658    0.0756
            0.0861    0.0978    0.1107    0.1247    0.1400
            0.1564    0.1740    0.1928    0.2128    0.2340
            0.2564    0.2798    0.3039    0.3285    0.3536
            0.3793    0.4059    0.4335    0.4621    0.4918
            0.5221    0.5529    0.5842    0.6160    0.6484
            0.6812    0.7146    0.7485    0.7828    0.8178
            0.8532    0.8891    0.9256    0.9625    1.0000
Hrad:
            0.0198    0.0396    0.0594    0.0793    0.0991
            0.1189    0.1387    0.1585    0.1783    0.1982
            0.2180    0.2378    0.2576    0.2774    0.2972
            0.3166    0.3340    0.3498    0.3646    0.3786
            0.3921    0.4053    0.4183    0.4311    0.4439
            0.4566    0.4700    0.5054    0.5332    0.5603
            0.5869    0.6122    0.6360    0.6586    0.6807
            0.7040    0.7271    0.7499    0.7723    0.7944
            0.8163    0.8378    0.8591    0.8800    0.9007
            0.9211    0.9412    0.9611    0.9807    1.0000
Width:
            0.0178    0.0356    0.0534    0.0712    0.0890
            0.1068    0.1246    0.1424    0.1602    0.1780
            0.1958    0.2136    0.2314    0.2492    0.2670
            0.2942    0.3256    0.3571    0.3885    0.4199
            0.4513    0.4827    0.5141    0.5455    0.5769
            0.6083    0.6314    0.6450    0.6586    0.6722
            0.6911    0.7183    0.7456    0.7728    0.7958
            0.8094    0.8231    0.8367    0.8503    0.8639
            0.8775    0.8911    0.9047    0.9183    0.9319
            0.9456    0.9592    0.9728    0.9864    1.0000

Transect ROW_18m_MB_2
Area:
            0.0003    0.0013    0.0030    0.0054    0.0084
            0.0121    0.0165    0.0215    0.0272    0.0336
            0.0406    0.0484    0.0568    0.0658    0.0756
            0.0861    0.0978    0.1107    0.1247    0.1400
            0.1564    0.1740    0.1928    0.2128    0.2340
            0.2564    0.2798    0.3039    0.3285    0.3536
            0.3793    0.4059    0.4335    0.4621    0.4918
            0.5221    0.5529    0.5842    0.6160    0.6484
            0.6812    0.7146    0.7485    0.7828    0.8178
            0.8532    0.8891    0.9256    0.9625    1.0000
Hrad:
            0.0198    0.0395    0.0593    0.0791    0.0989
            0.1186    0.1384    0.1582    0.1780    0.1977
            0.2175    0.2373    0.2571    0.2768    0.2966
            0.3160    0.3333    0.3491    0.3638    0.3778
            0.3913    0.4045    0.4174    0.4302    0.4430
            0.4557    0.4760    0.5044    0.5321    0.5592
            0.5857    0.6109    0.6347    0.6572    0.6793
            0.7027    0.7258    0.7486    0.7711    0.7933
            0.8152    0.8368    0.8581    0.8792    0.9000
            0.9205    0.9408    0.9608    0.9805    1.0000
Width:
            0.0178    0.0356    0.0534    0.0712    0.0890
            0.1068    0.1246    0.1424    0.1602    0.1780
            0.1958    0.2136    0.2314    0.2492    0.2670
            0.2942    0.3256    0.3571    0.3885    0.4199
            0.4513    0.4827    0.5141    0.5455    0.5769
            0.6083    0.6314    0.6450    0.6586    0.6722
            0.6911    0.7183    0.7456    0.7728    0.7958
            0.8094    0.8231    0.8367    0.8503    0.8639
            0.8775    0.8911    0.9047    0.9183    0.9319
            0.9456    0.9592    0.9728    0.9864    1.0000

Transect ROW_18m_Mountable
Area:
            0.0003    0.0011    0.0026    0.0046    0.0072
            0.0103    0.0140    0.0183    0.0232    0.0286
            0.0346    0.0412    0.0484    0.0561    0.0644
            0.0733    0.0827    0.0928    0.1034    0.1145
            0.1263    0.1386    0.1515    0.1650    0.1799
            0.1964    0.2143    0.2337    0.2546    0.2770
            0.3009    0.3263    0.3532    0.3816    0.4115
            0.4429    0.4758    0.5102    0.5459    0.5826
            0.6202    0.6587    0.6981    0.7385    0.7797
            0.8219    0.8651    0.9091    0.9541    1.0000
Hrad:
            0.0235    0.0471    0.0706    0.0942    0.1177
            0.1413    0.1648    0.1884    0.2119    0.2355
            0.2590    0.2826    0.3061    0.3297    0.3532
            0.3768    0.4003    0.4238    0.4474    0.4709
            0.4945    0.5180    0.5416    0.5650    0.5852
            0.6022    0.6168    0.6296    0.6410    0.6515
            0.6613    0.6707    0.6799    0.6889    0.6979
            0.7069    0.7161    0.7253    0.7478    0.7737
            0.7989    0.8234    0.8474    0.8707    0.8935
            0.9157    0.9375    0.9588    0.9796    1.0000
Width:
            0.0124    0.0247    0.0371    0.0494    0.0618
            0.0741    0.0865    0.0988    0.1112    0.1235
            0.1359    0.1482    0.1606    0.1729    0.1853
            0.1976    0.2100    0.2223    0.2347    0.2470
            0.2594    0.2717    0.2841    0.3058    0.3381
            0.3704    0.4027    0.4349    0.4672    0.4995
            0.5318    0.5641    0.5964    0.6287    0.6610
            0.6933    0.7255    0.7578    0.7807    0.8006
            0.8206    0.8405    0.8604    0.8804    0.9003
            0.9202    0.9402    0.9601    0.9801    1.0000

Transect ROW_18m_PH3
Area:
            0.0004    0.0017    0.0038    0.0068    0.0107
            0.0154    0.0209    0.0273    0.0346    0.0427
            0.0516    0.0614    0.0721    0.0836    0.0960
            0.1092    0.1233    0.1382    0.1540    0.1707
            0.1882    0.2065    0.2256    0.2447    0.2638
            0.2830    0.3026    0.3232    0.3447    0.3670
            0.3903    0.4144    0.4394    0.4653    0.4921
            0.5197    0.5483    0.5777    0.6080    0.6392
            0.6713    0.7043    0.7382    0.7729    0.8085
            0.8451    0.8825    0.9208    0.9599    1.0000
Hrad:
            0.0179    0.0359    0.0538    0.0717    0.0896
            0.1076    0.1255    0.1434    0.1613    0.1793
            0.1972    0.2151    0.2330    0.2510    0.2689
            0.2868    0.3047    0.3227    0.3406    0.3585
            0.3764    0.3944    0.4225    0.4577    0.4928
            0.5279    0.5629    0.5942    0.6243    0.6525
            0.6791    0.7042    0.7279    0.7504    0.7716
            0.7918    0.8110    0.8292    0.8467    0.8634
            0.8794    0.8948    0.9095    0.9238    0.9375
            0.9508    0.9636    0.9761    0.9882    1.0000
Width:
            0.0211    0.0421    0.0632    0.0843    0.1053
            0.1264    0.1475    0.1685    0.1896    0.2107
            0.2318    0.2528    0.2739    0.2950    0.3160
            0.3371    0.3582    0.3792    0.4003    0.4214
            0.4424    0.4635    0.4722    0.4722    0.4722
            0.4752    0.4971    0.5190    0.5408    0.5627
            0.5846    0.6064    0.6283    0.6502    0.6720
            0.6939    0.7158    0.7376    0.7595    0.7813
            0.8032    0.8251    0.8469    0.8688    0.8907
            0.9125    0.9344    0.9563    0.9781    1.0000

Transect ROW_22m
Area:
            0.0003    0.0014    0.0031    0.0055    0.0086
            0.0124    0.0169    0.0221    0.0280    0.0346
            0.0418    0.0498    0.0584    0.0678    0.0778
            0.0885    0.0998    0.1120    0.1248    0.1383
            0.1525    0.1674    0.1829    0.1992    0.2161
            0.2337    0.2521    0.2711    0.2908    0.3119
            0.3348    0.3594    0.3857    0.4133    0.4420
            0.4717    0.5025    0.5343    0.5673    0.6013
            0.6363    0.6725    0.7097    0.7479    0.7873
            0.8277    0.8692    0.9117    0.9553    1.0000
Hrad:
            0.0200    0.0399    0.0599    0.0798    0.0998
            0.1198    0.1397    0.1597    0.1796    0.1996
            0.2196    0.2395    0.2595    0.2794    0.2994
            0.3194    0.3393    0.3593    0.3792    0.3992
            0.4192    0.4391    0.4591    0.4790    0.4990
            0.5190    0.5389    0.5589    0.5789    0.5976
            0.6138    0.6280    0.6465    0.6764    0.7046
            0.7312    0.7564    0.7804    0.8033    0.8250
            0.8458    0.8656    0.8847    0.9030    0.9206
            0.9376    0.9539    0.9698    0.9851    1.0000
Width:
            0.0153    0.0306    0.0459    0.0612    0.0765
            0.0918    0.1071    0.1224    0.1376    0.1529
            0.1682    0.1835    0.1988    0.2141    0.2294
            0.2447    0.2600    0.2753    0.2906    0.3059
            0.3212    0.3365    0.3518    0.3671    0.3824
            0.3976    0.4129    0.4282    0.4472    0.4861
            0.5250    0.5640    0.5982    0.6218    0.6455
            0.6691    0.6927    0.7164    0.7400    0.7636
            0.7873    0.8109    0.8345    0.8582    0.8818
            0.9055    0.9291    0.9527    0.9764    1.0000

Transect ROW_24m
Area:
            0.0004    0.0017    0.0039    0.0069    0.0107
            0.0155    0.0211    0.0275    0.0348    0.0430
            0.0520    0.0619    0.0726    0.0843    0.0967
            0.1100    0.1234    0.1369    0.1503    0.1637
            0.1772    0.1906    0.2040    0.2176    0.2324
            0.2484    0.2655    0.2840    0.3036    0.3245
            0.3466    0.3699    0.3945    0.4203    0.4473
            0.4756    0.5050    0.5357    0.5677    0.6008
            0.6352    0.6708    0.7077    0.7458    0.7851
            0.8256    0.8674    0.9103    0.9546    1.0000
Hrad:
            0.0217    0.0434    0.0652    0.0869    0.1086
            0.1303    0.1520    0.1737    0.1955    0.2172
```

0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579
0.4893	0.5214	0.5541	0.5875	0.6216
0.6564	0.6919	0.7280	0.7648	0.8023
0.8405	0.8794	0.9189	0.9591	1.0000

Hrad:

0.0217	0.0433	0.0650	0.0866	0.1083
0.1299	0.1516	0.1732	0.1949	0.2158
0.2334	0.2493	0.2650	0.2808	0.2970
0.3137	0.3309	0.3485	0.3666	0.3838
0.3990	0.4128	0.4110	0.4455	0.4784
0.5099	0.5402	0.5694	0.5973	0.6230
0.6462	0.6674	0.6867	0.7046	0.7237
0.7433	0.7628	0.7822	0.8014	0.8205
0.8393	0.8580	0.8765	0.8948	0.9128
0.9307	0.9483	0.9657	0.9830	1.0000

Width:

0.0110	0.0219	0.0329	0.0439	0.0549
0.0658	0.0768	0.0878	0.0987	0.1153
0.1272	0.1592	0.1811	0.2031	0.2250
0.2469	0.2689	0.2908	0.3130	0.3514
0.3898	0.4282	0.4619	0.4783	0.4948
0.5112	0.5277	0.5442	0.5692	0.6021
0.6350	0.6679	0.7008	0.7337	0.7531
0.7696	0.7860	0.8025	0.8190	0.8354
0.8519	0.8683	0.8848	0.9013	0.9177
0.9342	0.9506	0.9671	0.9835	1.0000

Transect ROW_26m
Area:

0.0003	0.0013	0.0030	0.0053	0.0083
0.0120	0.0164	0.0214	0.0270	0.0334
0.0404	0.0481	0.0564	0.0654	0.0751
0.0854	0.0964	0.1081	0.1205	0.1335
0.1472	0.1615	0.1765	0.1922	0.2086
0.2261	0.2453	0.2663	0.2888	0.3123
0.3369	0.3625	0.3892	0.4168	0.4456
0.4753	0.5061	0.5379	0.5707	0.6046
0.6395	0.6754	0.7124	0.7504	0.7894
0.8295	0.8705	0.9127	0.9558	1.0000

Hrad:

0.0209	0.0418	0.0627	0.0836	0.1045
0.1254	0.1463	0.1672	0.1880	0.2089
0.2298	0.2507	0.2716	0.2925	0.3134
0.3343	0.3552	0.3761	0.3970	0.4179
0.4388	0.4597	0.4806	0.5015	0.5223
0.5421	0.5589	0.5735	0.5992	0.6295
0.6579	0.6846	0.7097	0.7334	0.7558
0.7771	0.7974	0.8167	0.8352	0.8529
0.8699	0.8863	0.9021	0.9173	0.9321
0.9464	0.9604	0.9739	0.9871	1.0000

Width:

0.0149	0.0299	0.0448	0.0597	0.0747
0.0896	0.1045	0.1195	0.1344	0.1493
0.1643	0.1792	0.1941	0.2090	0.2240
0.2389	0.2538	0.2688	0.2837	0.2986
0.3136	0.3285	0.3434	0.3584	0.3733
0.4113	0.4493	0.4873	0.5154	0.5385
0.5615	0.5846	0.6077	0.6308	0.6538
0.6769	0.7000	0.7231	0.7462	0.7692
0.7923	0.8154	0.8385	0.8615	0.8846
0.9077	0.9308	0.9538	0.9769	1.0000

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date 01/01/2000 00:00:00
Ending Date 01/03/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	7.214	103.200
Evaporation Loss	0.000	0.000
Infiltration Loss	2.724	38.963
Surface Runoff	4.424	63.287
Final Storage	0.069	0.991
Continuity Error (%)	-0.041	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.424	44.240
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.045	0.453
External Outflow	4.381	43.807
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.122	1.222
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.006	0.061
Continuity Error (%)	-0.888	

****
Highest Continuity Errors
****
Node 527_(C-STRM) (9.47%)
Node J19 (6.93%)
Node J4 (5.98%)
Node J10 (5.57%)
Node J8 (4.82%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link OL12 (45)
Link OL13 (42)
Link OL25 (40)
Link OL9 (38)
Link OL4 (38)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : -0.00
Average Iterations per Step : 2.01
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
S1	103.20	0.00	0.00	26.93	75.34	0.37	0.17	0.730
S10	103.20	0.00	0.00	21.48	80.68	0.37	0.16	0.782
S11	103.20	0.00	0.00	21.47	80.69	0.19	0.08	0.782
S12	103.20	0.00	0.00	21.44	80.74	0.46	0.19	0.782
S13	103.20	0.00	0.00	11.34	90.52	7.07	2.45	0.877
S14	103.20	0.00	0.00	11.34	90.53	4.90	1.70	0.877
S15	103.20	0.00	0.00	21.49	80.68	0.48	0.20	0.782
S17	103.20	0.00	0.00	88.99	14.22	0.89	0.27	0.138
S18	103.20	0.00	0.00	21.46	80.71	0.35	0.15	0.782
S19	103.20	0.00	0.00	10.97	90.91	2.90	1.08	0.881
S2	103.20	0.00	0.00	49.15	53.10	2.07	1.30	0.515
S20	103.20	0.00	0.00	21.58	80.57	1.36	0.57	0.781
S21	103.20	0.00	0.00	21.56	80.59	0.85	0.36	0.781
S22	103.20	0.00	0.00	37.74	64.75	0.15	0.08	0.627
S23	103.20	0.00	0.00	32.28	70.11	0.24	0.11	0.679
S24	103.20	0.00	0.00	21.60	80.54	0.79	0.33	0.780
S25	103.20	0.00	0.00	21.54	80.61	1.01	0.43	0.781
S26	103.20	0.00	0.00	44.96	57.17	3.43	2.03	0.554
S27	103.20	0.00	0.00	21.52	80.63	0.24	0.10	0.781
S28	103.20	0.00	0.00	44.96	57.17	1.90	1.12	0.554
S29	103.20	0.00	0.00	83.24	19.96	0.66	0.32	0.193
S3	103.20	0.00	0.00	27.07	75.19	0.96	0.43	0.729
S30	103.20	0.00	0.00	21.56	80.59	0.82	0.34	0.781
S31	103.20	0.00	0.00	49.15	53.10	1.77	1.11	0.515
S32	103.20	0.00	0.00	21.46	80.71	0.34	0.14	0.782
S33	103.20	0.00	0.00	26.87	75.40	0.25	0.11	0.731
S34	103.20	0.00	0.00	11.09	90.79	3.32	1.21	0.880
S35	103.20	0.00	0.00	71.75	30.92	0.62	0.29	0.300
S4	103.20	0.00	0.00	49.15	53.10	1.66	1.04	0.515
S5	103.20	0.00	0.00	44.96	57.17	0.51	0.30	0.554
S6	103.20	0.00	0.00	44.96	57.17	1.04	0.62	0.554
S7	103.20	0.00	0.00	44.96	57.17	0.49	0.29	0.554
S8	103.20	0.00	0.00	49.15	53.10	0.88	0.55	0.515
S9	103.20	0.00	0.00	49.15	53.10	0.91	0.57	0.515

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.10	0.13	105.73	1 19:47	0.13
J10	JUNCTION	0.00	0.07	106.57	0 12:06	0.07
J11	JUNCTION	0.00	0.08	106.08	0 12:00	0.08
J12	JUNCTION	0.00	0.00	106.20	0 00:00	0.00
J13	JUNCTION	0.00	0.14	102.24	0 12:01	0.14
J14	JUNCTION	0.00	0.07	107.07	0 12:00	0.07
J16	JUNCTION	0.00	0.14	103.84	0 12:00	0.14
J18	JUNCTION	0.00	0.07	103.92	0 12:00	0.07
J19	JUNCTION	0.00	0.11	103.81	0 12:00	0.11
J2	JUNCTION	0.00	0.09	109.09	0 12:00	0.09
J20	JUNCTION	0.00	0.05	105.15	0 12:00	0.05
J21	JUNCTION	0.00	0.09	106.09	0 12:00	0.09
J22	JUNCTION	0.00	0.07	106.07	0 12:00	0.07
J23	JUNCTION	0.00	0.11	104.46	0 12:00	0.11
J24	JUNCTION	0.00	0.11	103.66	0 12:01	0.11
J25	JUNCTION	0.00	0.05	109.05	0 12:00	0.05

J3	JUNCTION	0.00	0.13	108.93	0	12:00	0.13	
J4	JUNCTION	0.00	0.09	108.49	0	12:01	0.09	
J5	JUNCTION	0.00	0.03	108.50	0	12:02	0.03	
J6	JUNCTION	0.00	0.09	109.19	0	11:57	0.09	
J7	JUNCTION	0.00	0.12	108.12	0	12:00	0.12	
J74	JUNCTION	0.32	1.31	99.74	0	12:13	1.31	
J8	JUNCTION	0.00	0.07	107.07	0	12:01	0.07	
J9	JUNCTION	0.00	0.00	109.75	0	00:00	0.00	
564_(C-STRM)	OUTFALL	0.01	0.18	103.82	0	11:46	0.18	
OF1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00	
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00	
ST4_108A_(P-Stm)	OUTFALL	0.53	1.69	99.71	0	12:13	1.69	
501_(C-STRM)	STORAGE	0.54	1.28	100.30	0	13:21	1.28	
503_(C-STRM)	STORAGE	0.42	1.81	101.35	0	12:03	1.81	
504_(C-STRM)	STORAGE	0.46	1.94	101.29	0	12:03	1.94	
505_(C-STRM)	STORAGE	0.36	1.67	103.46	0	12:05	1.67	
506_(C-STRM)	STORAGE	0.37	1.50	105.42	0	12:04	1.50	
507_(C-STRM)	STORAGE	0.36	1.52	105.73	0	12:04	1.52	
508_(C-STRM)	STORAGE	0.36	1.54	106.72	0	12:04	1.54	
509_(C-STRM)	STORAGE	0.31	0.57	106.04	0	12:03	0.57	
521_(C-STRM)	STORAGE	0.23	0.57	104.43	0	12:20	0.57	
522_(C-STRM)	STORAGE	0.24	0.80	104.36	0	12:06	0.80	
523_(C-STRM)	STORAGE	0.27	0.93	104.35	0	12:05	0.92	
524_(C-STRM)	STORAGE	0.27	1.02	104.21	0	12:05	1.01	
527_(C-STRM)	STORAGE	0.32	0.53	103.91	0	12:04	0.53	
528_(C-STRM)	STORAGE	0.33	1.17	103.88	0	12:04	1.17	
529_(C-STRM)	STORAGE	0.33	1.19	103.54	0	12:05	1.19	
530_(C-STRM)	STORAGE	0.33	1.22	103.09	0	12:05	1.22	
531_(C-STRM)	STORAGE	0.40	1.90	101.64	0	12:04	1.90	
536_(C-STRM)	STORAGE	0.36	1.55	104.04	0	12:01	1.55	
537_(C-STRM)	STORAGE	0.36	1.58	103.43	0	12:02	1.58	
538_(C-STRM)	STORAGE	0.37	1.75	103.15	0	12:01	1.75	
539_(C-STRM)	STORAGE	0.37	1.63	102.44	0	12:02	1.63	
540_(C-STRM)	STORAGE	0.37	1.58	102.10	0	12:03	1.58	
547_(C-STRM)	STORAGE	0.33	0.93	100.86	0	12:06	0.93	
548_(C-STRM)	STORAGE	0.34	1.02	100.75	0	12:05	1.02	
550_(C-STRM)	STORAGE	0.35	1.02	100.68	0	12:06	1.01	
551_(C-STRM)	STORAGE	0.39	1.09	100.56	0	12:06	1.08	
552_(C-STRM)	STORAGE	0.43	1.14	100.46	0	12:06	1.14	
553_(C-STRM)	STORAGE	0.50	1.19	100.33	0	12:06	1.19	
554_(C-STRM)	STORAGE	0.52	1.76	100.93	0	12:03	1.76	
561_(C-STRM)	STORAGE	0.36	1.42	107.08	0	12:02	1.42	
562_(C-STRM)	STORAGE	0.36	1.48	106.89	0	12:03	1.48	
563_(C-STRM)	STORAGE	0.30	0.48	105.46	0	11:46	0.48	
POND-2	STORAGE	0.71	1.84	100.30	0	13:24	1.84	
S_501-POND-2	STORAGE	0.00	0.22	102.32	0	12:00	0.22	
S_504-554	STORAGE	0.00	0.05	104.05	0	12:11	0.05	
S_505-504	STORAGE	0.00	0.10	109.10	0	12:00	0.10	
S_521-522	STORAGE	0.00	0.15	106.90	0	12:26	0.15	
S_523-524	STORAGE	0.00	0.07	107.07	0	12:00	0.07	
S_530-531	STORAGE	0.00	0.08	104.31	0	12:00	0.08	
S_536-537	STORAGE	0.00	0.09	104.04	0	12:01	0.09	
S_538-539	STORAGE	0.00	0.15	103.15	0	12:02	0.15	
S_540-531	STORAGE	0.00	0.07	104.07	0	12:00	0.07	
S_547-548	STORAGE	0.00	0.17	102.72	0	12:00	0.17	
S_548-550	STORAGE	0.00	0.15	102.70	0	12:00	0.15	
S_551-552	STORAGE	0.00	0.16	102.66	0	12:00	0.16	
S_552-553	STORAGE	0.00	0.20	102.50	0	12:00	0.20	
S_553-501	STORAGE	0.00	0.22	102.42	0	12:00	0.22	
S_561-562	STORAGE	0.00	0.08	107.08	0	12:02	0.08	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	0.060	0	12:00	0	0.0442	0.000
J10	JUNCTION	0.000	0.111	0	12:01	0	0.0771	5.896
J11	JUNCTION	0.426	1.193	0	12:00	0.962	1.5	- 2.187
J12	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J13	JUNCTION	0.111	0.615	0	12:00	0.247	0.569	- 0.165
J14	JUNCTION	0.167	0.167	0	12:00	0.373	0.373	- 41.625
J16	JUNCTION	0.157	2.709	0	12:00	0.373	2.11	- 0.255
J18	JUNCTION	0.078	0.884	0	12:00	0.185	0.711	- 0.682
J19	JUNCTION	0.000	0.338	0	12:00	0	0.195	7.446
J2	JUNCTION	0.203	0.203	0	12:00	0.483	0.483	- 1.639
J20	JUNCTION	0.143	0.143	0	12:00	0.339	0.339	- 1.876
J21	JUNCTION	0.333	1.611	0	12:00	0.792	1.66	- 0.608
J22	JUNCTION	0.194	0.194	0	12:00	0.46	0.46	- 2.425
J23	JUNCTION	0.345	0.451	0	12:00	0.819	0.897	1.177
J24	JUNCTION	0.000	0.584	0	12:00	0	0.331	3.025
J25	JUNCTION	0.148	0.148	0	12:00	0.351	0.351	- 2.090
J3	JUNCTION	0.573	0.646	0	12:00	1.36	1.41	- 0.681
J4	JUNCTION	0.103	0.416	0	12:00	0.245	0.435	6.360
J5	JUNCTION	0.000	0.005	0	12:00	0	0.00129	33.013
J6	JUNCTION	0.357	0.357	0	12:00	0.849	0.849	- 1.299
J7	JUNCTION	0.426	0.629	0	12:00	1.01	1.16	- 0.986
J74	JUNCTION	0.000	0.577	0	13:24	0	42.2	0.002
J8	JUNCTION	0.000	0.331	0	12:00	0	0.192	5.065
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
564_(C-STRM)	OUTFALL	0.000	0.088	0	11:46	0	0.314	0.000
OF1	OUTFALL	0.267	0.267	0	12:00	0.889	0.889	0.000
OF2	OUTFALL	0.191	0.191	0	12:00	0.391	0.391	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.577	0	13:24	0	42.2	0.000
501_(C-STRM)	STORAGE	0.000	1.464	0	12:04	0	4.34	0.585
503_(C-STRM)	STORAGE	0.000	4.634	0	12:04	0	17.2	- 0.138
504_(C-STRM)	STORAGE	0.000	7.917	0	12:05	0	29.5	0.067
505_(C-STRM)	STORAGE	0.000	3.107	0	12:05	0	11.7	0.241
506_(C-STRM)	STORAGE	0.000	2.073	0	11:54	0	8.75	- 0.091
507_(C-STRM)	STORAGE	0.000	1.913	0	11:54	0	7.7	- 0.824
508_(C-STRM)	STORAGE	0.000	1.689	0	11:52	0	6.69	0.061
509_(C-STRM)	STORAGE	0.000	0.214	0	11:46	0	0.771	1.018
521_(C-STRM)	STORAGE	0.000	0.141	0	11:53	0	0.658	0.185
522_(C-STRM)	STORAGE	0.000	0.141	0	12:20	0	0.674	- 0.221
523_(C-STRM)	STORAGE	0.000	0.572	0	12:00	0	1.71	0.832
524_(C-STRM)	STORAGE	0.000	0.570	0	12:00	0	1.68	- 0.532
527_(C-STRM)	STORAGE	0.000	0.069	0	11:45	0	0.569	10.465
528_(C-STRM)	STORAGE	0.000	0.812	0	11:59	0	3.07	1.009
529_(C-STRM)	STORAGE	0.000	0.824	0	12:08	0	3.04	- 0.543
530_(C-STRM)	STORAGE	0.000	1.306	0	12:05	0	4.36	0.591
531_(C-STRM)	STORAGE	0.000	4.629	0	12:04	0	17.2	- 0.002
536_(C-STRM)	STORAGE	0.000	1.894	0	11:51	0	7.44	0.042
537_(C-STRM)	STORAGE	0.000	1.900	0	11:52	0	7.44	- 0.336
538_(C-STRM)	STORAGE	0.000	2.836	0	11:57	0	11.1	- 0.083
539_(C-STRM)	STORAGE	0.000	2.833	0	12:08	0	11.1	- 0.242
540_(C-STRM)	STORAGE	0.000	3.243	0	12:02	0	12.5	0.163
547_(C-STRM)	STORAGE	0.000	0.462	0	11:47	0	1.39	3.113
548_(C-STRM)	STORAGE	0.000	0.595	0	12:06	0	1.75	0.222
550_(C-STRM)	STORAGE	0.000	0.595	0	12:06	0	1.75	- 0.341
551_(C-STRM)	STORAGE	0.000	0.869	0	12:05	0	2.58	0.763
552_(C-STRM)	STORAGE	0.000	0.998	0	12:05	0	2.96	0.344
553_(C-STRM)	STORAGE	0.000	1.227	0	12:05	0	3.63	0.196
554_(C-STRM)	STORAGE	0.000	7.981	0	12:03	0	29.8	- 0.046
561_(C-STRM)	STORAGE	0.000	1.375	0	11:51	0	5.32	- 0.518
562_(C-STRM)	STORAGE	0.000	1.371	0	11:52	0	5.34	- 0.485
563_(C-STRM)	STORAGE	0.000	0.088	0	11:46	0	0.315	0.014
POND-2	STORAGE	1.557	16.770	0	12:00	3.77	42.2	- 0.080
S_501-POND-2	STORAGE	0.566	2.174	0	12:00	0.905	1.98	- 1.016
S_504-554	STORAGE	0.295	0.295	0	12:00	0.616	0.616	- 0.009
S_505-504	STORAGE	2.030	2.030	0	12:00	3.43	3.43	- 0.792
S_521-522	STORAGE	0.323	0.323	0	12:00	0.658	0.658	- 0.002
S_523-524	STORAGE	1.036	1.036	0	12:00	1.66	1.66	- 0.498
S_530-531	STORAGE	1.297	1.297	0	12:00	2.07	2.07	- 0.531
S_536-537	STORAGE	2.447	2.447	0	12:00	7.07	7.07	0.272
S_538-539	STORAGE	1.078	1.078	0	12:00	2.9	2.9	0.880
S_540-531	STORAGE	1.122	1.122	0	12:00	1.9	1.9	- 0.793
S_547-548	STORAGE	1.105	1.105	0	12:00	1.77	1.77	- 2.178
S_548-550	STORAGE	0.300	0.934	0	12:00	0.508	0.928	- 0.929
S_551-552	STORAGE	0.615	1.414	0	12:00	1.04	1.57	- 1.237
S_552-553	STORAGE	0.291	1.427	0	12:00	0.491	1.25	- 0.645
S_553-501	STORAGE	0.548	1.843	0	12:00	0.877	1.74	- 1.108
S_561-562	STORAGE	1.699	1.699	0	12:00	4.9	4.9	0.596

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J74	JUNCTION	0.38	0.412	0.000

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
501_(C-STRM)	0.001	17	0	0	0.001	41	0 13:21	1.464
503_(C-STRM)	0.000	10	0	0	0.002	45	0 12:03	4.634
504_(C-STRM)	0.001	11	0	0	0.002	44	0 12:03	7.919
505_(C-STRM)	0.000	9	0	0	0.002	40	0 12:05	3.096
506_(C-STRM)	0.000	9	0	0	0.002	37	0 12:04	2.006
507_(C-STRM)	0.000	9	0	0	0.002	36	0 12:04	1.819
508_(C-STRM)	0.000	10	0	0	0.002	43	0 12:04	1.638
509_(C-STRM)	0.000	9	0	0	0.001	16	0 12:03	0.214
521_(C-STRM)	0.000	7	0	0	0.001	18	0 12:20	0.141
522_(C-STRM)	0.000	7	0	0	0.001	24	0 12:06	0.199
523_(C-STRM)	0.000	9	0	0	0.001	30	0 12:05	0.570
524_(C-STRM)	0.000	9	0	0	0.001	34	0 12:05	0.566
527_(C-STRM)	0.000	10	0	0	0.001	16	0 12:04	0.069
528_(C-STRM)	0.000	10	0	0	0.001	36	0 12:04	0.824
529_(C-STRM)	0.000	12	0	0	0.001	42	0 12:05	0.844

530_(C-STRM)	0.000	13	0	0	0.001	48	0	12:05
1.304								
531_(C-STRM)	0.000	10	0	0	0.002	48	0	12:04
4.634								
536_(C-STRM)	0.000	9	0	0	0.002	39	0	12:01
1.900								
537_(C-STRM)	0.000	12	0	0	0.002	55	0	12:02
1.919								
538_(C-STRM)	0.000	11	0	0	0.002	51	0	12:01
2.833								
539_(C-STRM)	0.000	12	0	0	0.002	51	0	12:02
2.836								
540_(C-STRM)	0.000	11	0	0	0.002	47	0	12:03
3.241								
547_(C-STRM)	0.000	12	0	0	0.001	34	0	12:06
0.463								
548_(C-STRM)	0.000	12	0	0	0.001	36	0	12:05
0.595								
550_(C-STRM)	0.000	13	0	0	0.001	36	0	12:06
0.605								
551_(C-STRM)	0.000	14	0	0	0.001	38	0	12:06
0.869								
552_(C-STRM)	0.000	15	0	0	0.001	38	0	12:06
0.998								
553_(C-STRM)	0.001	16	0	0	0.001	39	0	12:06
1.227								
554_(C-STRM)	0.001	10	0	0	0.002	34	0	12:03
7.980								
561_(C-STRM)	0.000	11	0	0	0.002	43	0	12:02
1.371								
562_(C-STRM)	0.000	12	0	0	0.002	48	0	12:03
1.397								
563_(C-STRM)	0.000	13	0	0	0.001	21	0	11:46
0.088								
PND-2	6.641	16	0	0	26.735	63	0	13:24
0.577								
S_501-PND-2	0.000	0	0	0	0.038	45	0	12:00
2.170								
S_504-554	0.000	0	0	0	0.054	11	0	12:11
0.191								
S_505-504	0.000	0	0	13	0.063	21	0	12:00
2.026								
S_521-522	0.002	0	0	0	0.150	30	0	12:26
0.141								
S_523-524	0.000	0	0	14	0.021	14	0	12:00
1.033								
S_530-531	0.000	0	0	14	0.031	16	0	12:00
1.293								
S_536-537	0.001	0	0	0	0.232	19	0	12:01
1.809								
S_538-539	0.001	0	0	0	0.228	30	0	12:02
0.739								
S_540-531	0.000	0	0	13	0.023	14	0	12:00
1.171								
S_547-548	0.000	0	0	0	0.057	34	0	12:00
1.096								
S_548-550	0.000	0	0	0	0.014	31	0	12:00
0.933								
S_551-552	0.000	0	0	0	0.028	31	0	12:00
1.411								
S_552-553	0.000	0	0	0	0.017	40	0	12:00
1.425								
S_553-501	0.000	0	0	0	0.037	45	0	12:00
1.838								
S_561-562	0.001	0	0	0	0.207	17	0	12:02
1.254								

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
564_(C-STRM)	47.86	0.004	0.088	0.314
OF1	5.36	0.096	0.267	0.889
OF2	47.96	0.005	0.191	0.391
ST4_108A_(P-Stm)	95.72	0.255	0.577	42.213
System	49.23	0.360	0.888	43.807

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CHANNEL	0.097	0 12:00	0.69	0.03	0.30
C1_10	CHANNEL	0.280	0 12:00	1.02	0.03	0.30
C1_11	CHANNEL	0.100	0 12:02	1.46	0.03	0.29
C1_12	CHANNEL	0.000	0 00:00	0.00	0.00	0.17
C1_13	CHANNEL	0.111	0 12:01	0.71	0.03	0.28
C1_15	CHANNEL	0.000	0 00:00	0.00	0.00	0.14
C1_16	CHANNEL	0.000	0 00:00	0.00	0.00	0.14
C1_17	CHANNEL	0.060	0 12:00	1.01	0.01	0.29
C1_2	CHANNEL	0.172	0 12:00	0.41	0.07	0.38
C1_3	CHANNEL	0.074	0 12:00	0.22	0.03	0.37
C1_4	CHANNEL	0.005	0 12:00	0.07	0.00	0.19
C1_5	CHANNEL	0.149	0 11:59	0.71	0.03	0.30
C1_6	CHANNEL	0.331	0 12:00	1.08	0.07	0.29
C1_7	CHANNEL	0.224	0 12:01	1.11	0.04	0.33
C1_8	CHANNEL	0.179	0 12:01	1.67	0.02	0.24
C2	CHANNEL	0.107	0 12:00	0.59	0.03	0.36
C2_1	CHANNEL	0.196	0 12:00	0.49	0.05	0.44
C2_3	CHANNEL	0.283	0 12:00	0.57	0.11	0.39
C2_4	CHANNEL	0.058	0 12:00	0.82	0.01	0.25
C2_7	CHANNEL	0.057	0 12:00	0.15	0.02	0.32
C2_8	CHANNEL	0.193	0 12:00	0.75	0.06	0.28
C2_9	CHANNEL	0.301	0 12:00	0.73	0.06	0.34
C3	CHANNEL	0.554	0 12:01	1.07	0.12	0.50
C4	CONDUIT	7.980	0 12:03	3.67	1.19	0.80
C-STRM-1_(C-STRM)	CONDUIT	1.638	0 11:54	2.00	1.10	1.00
C-STRM-19_(C-STRM)	CONDUIT	0.141	0 12:20	0.97	0.28	0.51
C-STRM-2_(C-STRM)	CONDUIT	1.819	0 11:54	2.27	1.05	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.199	0 12:07	0.99	0.40	0.75
C-STRM-21_(C-STRM)	CONDUIT	0.570	0 12:00	1.58	0.93	0.90
C-STRM-22_(C-STRM)	CONDUIT	0.566	0 11:59	1.49	0.93	0.98
C-STRM-23_(C-STRM)	CONDUIT	0.824	0 12:08	2.02	1.05	1.00
C-STRM-24_(C-STRM)	CONDUIT	0.844	0 12:08	2.07	1.07	1.00
C-STRM-25_(C-STRM)	CONDUIT	1.304	0 12:05	3.00	1.17	0.95
C-STRM-26_(C-STRM)	CONDUIT	4.634	0 12:04	2.24	1.27	0.94
C-STRM-27_(C-STRM)	CONDUIT	0.069	0 11:50	1.15	0.34	0.76
C-STRM-3_(1)_(C-STRM)	CONDUIT	2.006	0 12:05	2.48	1.16	0.88
C-STRM-31_(C-STRM)	CONDUIT	1.900	0 11:52	2.48	0.98	1.00
C-STRM-33_(C-STRM)	CONDUIT	1.919	0 12:08	2.27	0.99	1.00
C-STRM-34_(C-STRM)	CONDUIT	2.833	0 12:08	2.51	1.15	1.00
C-STRM-35_(1)_(C-STRM)	CONDUIT	3.241	0 12:02	3.01	1.24	0.98
C-STRM-35_(C-STRM)	CONDUIT	2.836	0 12:07	2.58	1.15	1.00
C-STRM-4_(C-STRM)	CONDUIT	3.096	0 12:05	3.65	1.13	0.96
C-STRM-42_(C-STRM)	CONDUIT	0.463	0 12:06	1.29	0.98	0.85
C-STRM-49_(C-STRM)	CONDUIT	0.595	0 12:06	1.30	1.07	0.87
C-STRM-50_(C-STRM)	CONDUIT	0.605	0 12:06	1.30	1.09	0.86
C-STRM-51_(C-STRM)	CONDUIT	0.869	0 12:05	1.51	1.13	0.86
C-STRM-52_(C-STRM)	CONDUIT	0.998	0 12:05	1.49	1.15	0.85
C-STRM-53_(C-STRM)	CONDUIT	1.227	0 12:04	1.63	1.16	0.88
C-STRM-54_(C-STRM)	CONDUIT	7.919	0 12:04	3.40	1.37	0.86
C-STRM-57_(C-STRM)	CONDUIT	4.634	0 12:04	2.34	1.27	0.91
C-STRM-62_(C-STRM)	CONDUIT	1.371	0 11:52	1.80	1.00	1.00
C-STRM-63_(C-STRM)	CONDUIT	1.397	0 12:11	1.73	1.02	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0 11:46	2.06	0.65	0.59
C-STRM-7_(C-STRM)	CONDUIT	1.464	0 12:04	2.20	1.41	0.97
C-STRM-8_(C-STRM)	CONDUIT	0.214	0 12:03	1.40	0.27	0.68
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	0.577	0 13:24	1.45	0.63	1.00
ST4-Pipe_-_(99)_(P-Stm)_1	ORIFICE	0.577	0 13:24			1.00
W1	WEIR	0.588	0 12:01			0.28
W10	WEIR	0.597	0 12:00			0.20
W11	WEIR	1.118	0 12:00			0.30
W12	WEIR	0.786	0 12:00			0.24
W13	WEIR	0.769	0 12:00			0.19
W14	WEIR	2.294	0 12:00			0.40
W15	WEIR	1.121	0 12:00			0.25
W2	WEIR	0.634	0 12:00			0.49
W3	WEIR	0.800	0 12:00			0.44
W4	WEIR	1.137	0 12:00			0.45
W5	WEIR	1.296	0 12:00			0.58
W6	WEIR	1.609	0 12:00			0.64
W7	WEIR	1.933	0 12:00			0.64
W8	WEIR	0.617	0 12:00			0.20
W9	WEIR	0.747	0 12:00			0.23
C-STRM-14_(C-STRM)	DUMMY	0.902	0 11:47			
C-STRM-36_(1)_(C-STRM)	DUMMY	0.501	0 11:47			
OL1	DUMMY	0.739	0 11:48			
OL10	DUMMY	0.141	0 11:53			
OL11	DUMMY	0.433	0 11:47			
OL12	DUMMY	0.069	0 11:45			
OL13	DUMMY	0.177	0 11:45			
OL14	DUMMY	0.206	0 11:46			
OL15	DUMMY	0.085	0 11:46			
OL16	DUMMY	0.199	0 11:47			
OL17	DUMMY	0.254	0 11:46			
OL18	DUMMY	0.061	0 11:46			
OL19	DUMMY	0.214	0 11:46			
OL2	DUMMY	1.809	0 11:51			
OL20	DUMMY	0.343	0 11:46			
OL21	DUMMY	0.121	0 11:46			
OL22	DUMMY	0.094	0 11:46			
OL23	DUMMY	0.047	0 11:48			
OL24	DUMMY	0.191	0 11:55			
OL25	DUMMY	0.085	0 11:45			
OL26	DUMMY	0.088	0 11:46			
OL27	DUMMY	0.542	0 11:47			
OL3	DUMMY	1.254	0 11:51			
OL4	DUMMY	0.462	0 11:47			
OL5	DUMMY	0.133	0 11:47			
OL6	DUMMY	0.274	0 11:47			
OL7	DUMMY	0.129	0 11:47			
OL8	DUMMY	0.229	0 11:47			
OL9	DUMMY	0.237	0 11:47			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.56	0.15	0.00	0.28	0.00	0.00	0.00	0.17	0.00
C1_10	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C1_11	1.00	0.09	0.15	0.00	0.34	0.42	0.00	0.00	0.00	0.00
C1_12	1.00	0.66	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_13	1.00	0.24	0.00	0.00	0.75	0.01	0.00	0.00	0.75	0.00
C1_15	1.00	0.24	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_16	1.00	0.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_17	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C1_2	1.00	0.50	0.00	0.00	0.50	0.00	0.00	0.00	0.77	0.00
C1_3	1.00	0.50	0.02	0.00	0.48	0.00	0.00	0.00	0.74	0.00
C1_4	1.00	0.03	0.22	0.00	0.66	0.10	0.00	0.00	0.00	0.00
C1_5	1.00	0.50	0.00	0.00	0.46	0.03	0.00	0.00	0.77	0.00
C1_6	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C1_7	1.00	0.51	0.01	0.00	0.43	0.05	0.00	0.00	0.01	0.00
C1_8	1.00	0.03	0.21	0.00	0.58	0.18	0.00	0.00	0.01	0.00
C2	1.00	0.50	0.17	0.00	0.32	0.00	0.00	0.00	0.77	0.00
C2_1	1.00	0.52	0.14	0.00	0.34	0.00	0.00	0.00	0.76	0.00
C2_3	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C2_4	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C2_7	1.00	0.51	0.01	0.00	0.48	0.00	0.00	0.00	0.78	0.00
C2_8	1.00	0.50	0.00	0.00	0.46	0.03	0.00	0.00	0.00	0.00
C2_9	1.00	0.24	0.00	0.00	0.61	0.14	0.00	0.00	0.75	0.00
C3	1.00	0.03	0.21	0.00	0.56	0.19	0.00	0.00	0.23	0.00
C4	1.00	0.03	0.00	0.00	0.38	0.00	0.00	0.59	0.04	0.00
C-STRM-1_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.06	0.00
C-STRM-19_(C-STRM)	1.00	0.90	0.03	0.00	0.07	0.00	0.00	0.00	0.75	0.00
C-STRM-2_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C-STRM-20_(C-STRM)	1.00	0.80	0.11	0.00	0.09	0.00	0.00	0.00	0.73	0.00
C-STRM-21_(C-STRM)	1.00	0.74	0.06	0.00	0.19	0.00	0.00	0.01	0.73	0.00
C-STRM-22_(C-STRM)	1.00	0.03	0.71	0.00	0.26	0.00	0.00	0.00	0.82	0.00
C-STRM-23_(C-STRM)	1.00	0.03	0.00	0.00	0.87	0.06	0.00	0.04	0.62	0.00
C-STRM-24_(C-STRM)	1.00	0.03	0.01	0.00	0.50	0.01	0.00	0.46	0.38	0.00
C-STRM-25_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.60	0.00
C-STRM-27_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.01	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-31_(C-STRM)	1.00	0.03	0.00	0.00	0.51	0.36	0.00	0.10	0.60	0.00
C-STRM-33_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-34_(C-STRM)	1.00	0.03	0.00	0.00	0.82	0.13	0.00	0.02	0.49	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.03	0.00	0.00	0.81	0.05	0.00	0.10	0.52	0.00
C-STRM-4_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-42_(C-STRM)	1.00	0.03	0.00	0.00	0.12	0.00	0.00	0.85	0.08	0.00
C-STRM-49_(C-STRM)	1.00	0.03	0.33	0.00	0.63	0.00	0.00	0.00	0.78	0.00
C-STRM-50_(C-STRM)	1.00	0.04	0.00	0.00	0.23	0.00	0.00	0.74	0.04	0.00
C-STRM-51_(C-STRM)	1.00	0.03	0.00	0.00	0.29	0.00	0.00	0.68	0.04	0.00
C-STRM-52_(C-STRM)	1.00	0.04	0.00	0.00	0.35	0.00	0.00	0.61	0.04	0.00
C-STRM-53_(C-STRM)	1.00	0.03	0.00	0.00	0.26	0.00	0.00	0.71	0.00	0.00
C-STRM-54_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.00	0.00	0.02	0.44	0.00
C-STRM-57_(C-STRM)	1.00	0.04	0.00	0.00	0.21	0.00	0.00	0.75	0.00	0.00
C-STRM-62_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.41	0.00
C-STRM-63_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.86	0.00
C-STRM-64_(C-STRM)	1.00	0.03	0.00	0.00	0.43	0.53	0.00	0.00	0.29	0.00
C-STRM-7_(C-STRM)	1.00	0.03	0.00	0.00	0.41	0.00	0.00	0.55	0.02	0.00
C-STRM-8_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.01	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.27	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C4	0.01	0.01	0.01	0.31	0.01
C-STRM-1_(C-STRM)	0.24	0.24	0.25	0.33	0.22
C-STRM-2_(C-STRM)	0.25	0.25	0.26	0.21	15
C-STRM-22_(C-STRM)	0.01	0.01	0.14	0.01	0.01
C-STRM-23_(C-STRM)	0.14	0.14	0.17	0.02	0.01
C-STRM-24_(C-STRM)	0.17	0.17	0.21	0.06	0.02
C-STRM-25_(C-STRM)	0.01	0.21	0.01	0.31	0.01
C-STRM-26_(C-STRM)	0.01	0.01	0.01	0.35	0.01
C-STRM-27_(C-STRM)	0.01	0.01	0.14	0.01	0.01
C-STRM-3_(1)_(C-STRM)	0.01	0.26	0.01	0.37	0.01
C-STRM-31_(C-STRM)	0.22	0.22	0.25	0.01	0.01
C-STRM-33_(C-STRM)	0.25	0.25	0.27	0.01	0.01
C-STRM-34_(C-STRM)	0.24	0.27	0.24	0.32	0.24
C-STRM-35_(1)_(C-STRM)	0.01	0.19	0.01	0.35	0.01
C-STRM-35_(C-STRM)	0.19	0.24	0.19	0.32	0.19
C-STRM-4_(C-STRM)	0.01	0.17	0.01	0.25	0.01
C-STRM-49_(C-STRM)	0.01	0.01	0.01	0.32	0.01
C-STRM-50_(C-STRM)	0.01	0.01	0.01	0.32	0.01
C-STRM-51_(C-STRM)	0.01	0.01	0.01	0.33	0.01
C-STRM-52_(C-STRM)	0.01	0.01	0.01	0.32	0.01
C-STRM-53_(C-STRM)	0.01	0.01	0.01	0.32	0.01
C-STRM-54_(C-STRM)	0.01	0.01	0.01	0.36	0.01
C-STRM-57_(C-STRM)	0.01	0.01	0.01	0.35	0.01
C-STRM-62_(C-STRM)	0.21	0.21	0.22	0.02	0.01
C-STRM-63_(C-STRM)	0.22	0.22	0.24	0.01	0.01

C-STRM-7_(C-STRM)	0.01	0.01	0.01	0.35	0.01
C-STRM-8_(C-STRM)	0.01	0.01	0.24	0.01	0.01
ST4-Pipe_-_(99)_(P-Stm)	0.38	0.38	0.42	0.01	0.01

Analysis begun on: Thu Oct 23 13:18:34 2025
Analysis ended on: Thu Oct 23 13:18:44 2025
Total elapsed time: 00:00:100.0130

Post-Development 1:100 year 24-hour SCS Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ***************
  Raingage Summary
  ***************
  Name                Data Source                Data       Recording
                                                 Type       Interval
  ----------------------------------------------------------------------
  24SCS100            24SCS100                   INTENSITY   15 min.
  6SCS050             6SCS050                    INTENSITY   15 min.
  Rainfall            SCS_24h_100                INTENSITY   15 min.


  ********************
  Subcatchment Summary
  ********************
  Name                Area     Width   %Imperv    %Slope Rain Gage           Outlet
  ----------------------------------------------------------------------------------
  A15                 3.46     13.10     18.98    0.5000 Rainfall            EXD_12
  A18                 0.59    338.21     39.12    0.5000 Rainfall            EXD_25
  A19                 1.11    332.78     22.32    0.5000 Rainfall            EXD_20
  A20                 4.83    279.76      8.37    1.5000 Rainfall            EXD_15
  NULL3               0.57    312.75     83.33    1.4500 Rainfall            EXD_27
  S1                  6.52   1467.98     66.38    2.0000 Rainfall            S_605-604
  S1_1                0.12    118.05     71.43    2.0000 Rainfall            J19
  S1_2                0.12    147.72     71.43    2.0000 Rainfall            J22
  S1_4                0.19    154.58     71.43    2.0000 Rainfall            J21
  S1_5                0.11    103.57     71.43    2.0000 Rainfall            J20
  S10_1               1.84    414.84     64.29    2.0000 Rainfall            S_619-606
  S10_2               2.12    478.11     64.29    2.0000 Rainfall            S_622-
619_2
  S10_4               0.73    163.42     64.29    2.0000 Rainfall            S_627-630
  S10_5               1.26    283.52     64.29    2.0000 Rainfall            S_629-622
  S11                 3.30    287.00      0.00    2.0000 Rainfall            SU2
  S12                 0.44    334.74     71.43    2.0000 Rainfall            J6
  S14_1               0.60    367.10     71.43    2.0000 Rainfall            J28
  S14_3               1.06    381.29     71.43    2.0000 Rainfall            J58
  S14_4               0.30    171.63     71.43    2.0000 Rainfall            J44
  S14_5               1.69    659.05     71.43    2.0000 Rainfall            J29
  S14_6               0.29    153.64     71.43    2.0000 Rainfall            J59
  S14_7               1.17    557.97     71.43    2.0000 Rainfall            J61
  S14_8               0.34    171.63     71.43    2.0000 Rainfall            J48
  S15                 1.64    368.26     64.29    2.0000 Rainfall            S_525-MTD
  S16                 1.47     16.60    100.00    0.5000 Rainfall            EXD_10
  S17                 6.26    202.00      3.33    0.5000 Rainfall            EXD_7
  S18_2               3.35    754.05     64.29    2.0000 Rainfall            S_541-540
  S18_3               1.66    372.76     64.29    2.0000 Rainfall            S_528-525
  S18_4               0.88    197.06     64.29    2.0000 Rainfall            S_540-536
  S18_5               1.83    412.02     71.43    2.0000 Rainfall            S_536-532
  S18_6               0.84    188.96     64.29    2.0000 Rainfall            S_532-528
  S19                 1.05    441.38     71.43    2.0000 Rainfall            J19
  S2                  3.72    837.17     66.87    2.0000 Rainfall            S_622-619
  S20_1               0.50    441.34     71.43    2.0000 Rainfall            J40
  S20_2               0.23    441.34     71.43    2.0000 Rainfall            J36
  S3                  2.48    557.29     64.29    2.0000 Rainfall            S_604-603
  S32                 0.41    327.12     71.43    2.0000 Rainfall            J46
  S36                 1.82     21.00    100.00    0.5000 Rainfall            EXD_10
  S4                 13.22    348.80     85.71    2.0000 Rainfall            631_(C-
STRM)
  S5                  3.19    291.50     85.71    1.0000 Rainfall            682_(C-
STRM)
  S6                  0.34    260.95     57.14    2.0000 Rainfall            OF2
  S7                  3.99    402.80     85.71    0.5000 Rainfall            POND_(C-
STRM)
  S8                  1.92    119.90     35.71    2.0000 Rainfall            SU5


  ************
  Node Summary
  ************
  Name                Type                 Invert      Max.    Ponded    External
                                            Elev.     Depth      Area    Inflow
  ----------------------------------------------------------------------------
  EXD_1               JUNCTION            104.39      1.51       0.0
  EXD_10              JUNCTION             98.65      1.20       0.0
  EXD_11              JUNCTION             98.50      1.20       0.0
  EXD_12              JUNCTION             98.31      1.20       0.0
  EXD_13              JUNCTION            104.32      1.10       0.0
  EXD_14              JUNCTION            102.49      0.80       0.0
  EXD_15              JUNCTION            100.27      0.80       0.0
  EXD_16              JUNCTION            100.20      0.80       0.0
  EXD_17              JUNCTION             99.89      0.80       0.0
  EXD_18              JUNCTION             99.40      0.84       0.0
  EXD_19              JUNCTION             99.19      0.88       0.0
  EXD_2               JUNCTION            103.47      1.93       0.0
  EXD_20              JUNCTION             99.19      0.88       0.0
  EXD_21              JUNCTION             99.18      0.88       0.0
  EXD_22              JUNCTION             99.14      0.88       0.0
  EXD_23              JUNCTION             98.75      1.14       0.0
  EXD_24              JUNCTION             98.67      1.14       0.0
  EXD_25              JUNCTION             98.52      1.13       0.0
  EXD_26              JUNCTION             98.48      1.13       0.0
  EXD_27              JUNCTION             98.17      1.20       0.0
  EXD_3               JUNCTION            103.19      1.41       0.0
  EXD_4               JUNCTION            102.64      1.20       0.0
  EXD_5               JUNCTION            102.50      1.20       0.0
  EXD_6               JUNCTION            102.32      1.08       0.0
  EXD_7               JUNCTION            101.50      1.06       0.0
  EXD_8               JUNCTION            100.48      1.06       0.0
  EXD_9               JUNCTION            100.39      1.06       0.0
  J10                 JUNCTION            103.60      0.50       0.0
  J11                 JUNCTION            103.50      0.50       0.0
  J12                 JUNCTION            103.40      0.50       0.0
  J13                 JUNCTION            103.30      0.50       0.0
  J17                 JUNCTION            104.37      1.04       0.0
  J19                 JUNCTION            105.40      0.50       0.0
  J20                 JUNCTION            105.45      0.50       0.0
  J21                 JUNCTION            105.55      0.50       0.0
  J22                 JUNCTION            105.70      0.50       0.0
  J23                 JUNCTION            106.00      0.50       0.0
  J24                 JUNCTION            106.20      0.50       0.0
  J25                 JUNCTION            105.30      0.50       0.0
  J26                 JUNCTION            105.70      0.50       0.0
  J28                 JUNCTION            109.00      0.50       0.0
  J29                 JUNCTION            108.80      0.50       0.0
  J32                 JUNCTION            106.00      0.50       0.0
  J36                 JUNCTION            104.70      0.50       0.0
  J39                 JUNCTION            104.60      0.50       0.0
  J40                 JUNCTION            104.45      0.50       0.0
  J41                 JUNCTION            103.20      0.50       0.0
  J43                 JUNCTION            104.20      0.50       0.0
  J44                 JUNCTION            104.50      0.50       0.0
  J46                 JUNCTION            104.60      0.50       0.0
  J47                 JUNCTION            105.10      0.50       0.0
  J48                 JUNCTION            105.75      0.50       0.0
  J51                 JUNCTION            106.75      0.50       0.0
  J52                 JUNCTION            109.75      0.50       0.0
  J53                 JUNCTION            109.00      0.50       0.0
  J56                 JUNCTION            109.10      0.50       0.0
  J57                 JUNCTION            108.47      0.50       0.0
  J58                 JUNCTION            108.40      0.50       0.0
  J59                 JUNCTION            108.00      0.50       0.0
  J6                  JUNCTION            109.83      0.30       0.0
  J61                 JUNCTION            107.00      0.50       0.0
  J62                 JUNCTION            106.50      0.50       0.0
  J74                 JUNCTION             98.45      0.90       0.0
  J9                  JUNCTION            103.70      0.50       0.0
  OF1                 OUTFALL             100.80      0.00       0.0
  OF2                 OUTFALL               0.00      0.00       0.0
  OF3                 OUTFALL              98.00      1.06       0.0
  ST4_108A_(P-Stm)    OUTFALL              98.02      1.19       0.0
  500_(C-STRM)        STORAGE             100.31      2.84       0.0
  500A_(C-STRM)       STORAGE             100.10      1.00       0.0
  502_(C-STRM)        STORAGE             100.54      3.70       0.0
  503_(C-STRM)        STORAGE             100.59      3.92       0.0
  504_(C-STRM)        STORAGE             103.04      2.70       0.0
  505_(C-STRM)        STORAGE             103.45      3.26       0.0
  506_(C-STRM)        STORAGE             103.82      3.16       0.0
  507_(C-STRM)        STORAGE             104.14      3.10       0.0
  508_(C-STRM)        STORAGE             104.37      3.12       0.0
  509_(C-STRM)        STORAGE             104.60      3.14       0.0
  510_(C-STRM)        STORAGE             104.85      3.09       0.0
  511_(C-STRM)        STORAGE             104.91      3.08       0.0
  512_(C-STRM)        STORAGE             105.11      3.12       0.0
  513_(C-STRM)        STORAGE             105.24      3.14       0.0
  514_(C-STRM)        STORAGE             105.59      3.16       0.0
  515_(C-STRM)        STORAGE             105.85      3.24       0.0
  516_(C-STRM)        STORAGE             105.46      3.06       0.0
  517_(C-STRM)        STORAGE             105.62      3.03       0.0
  518_(C-STRM)        STORAGE             105.85      2.92       0.0
  519_(C-STRM)        STORAGE             106.08      2.82       0.0
  520_(C-STRM)        STORAGE             106.34      2.66       0.0
  522_(C-STRM)        STORAGE             104.31      3.00       0.0
  525_(C-STRM)        STORAGE             100.61      2.69       0.0
  528_(C-STRM)        STORAGE             100.72      2.68       0.0
  532_(C-STRM)        STORAGE             100.83      2.67       0.0
  536_(C-STRM)        STORAGE             100.98      2.63       0.0
  540_(C-STRM)        STORAGE             100.86      2.85       0.0
  541_(C-STRM)        STORAGE             100.93      2.89       0.0
  551_(C-STRM)        STORAGE             100.65      3.78       0.0
  552_(C-STRM)        STORAGE             100.74      3.88       0.0
  553_(C-STRM)        STORAGE             100.93      3.78       0.0
  554_(C-STRM)        STORAGE             101.05      3.89       0.0
  555_(C-STRM)        STORAGE             101.25      3.93       0.0
  556_(C-STRM)        STORAGE             101.37      3.89       0.0
  601_(C-STRM)        STORAGE             100.45      4.43       0.0
  602_(C-STRM)        STORAGE             100.52      4.11       0.0
  603_(C-STRM)        STORAGE             100.63      3.89       0.0
  604_(C-STRM)        STORAGE             100.88      4.87       0.0
  605_(C-STRM)        STORAGE             101.09      5.63       0.0
  606_(C-STRM)        STORAGE             101.24      5.75       0.0
  619_(C-STRM)        STORAGE             101.38      5.14       0.0
  622_(C-STRM)        STORAGE             101.53      4.49       0.0
  626_(C-STRM)        STORAGE             103.94      3.33       0.0
  627_(C-STRM)        STORAGE             103.13      3.58       0.0
  629_(C-STRM)        STORAGE             101.65      4.46       0.0
  630_(C-STRM)        STORAGE             102.08      4.12       0.0
  630A_(C-STRM)       STORAGE             102.12      3.90       0.0
  631_(C-STRM)        STORAGE             106.00      0.50       0.0
  645_(C-STRM)        STORAGE             102.03      3.69       0.0
  647_(C-STRM)        STORAGE             102.14      3.40       0.0
  650_(C-STRM)        STORAGE             102.22      3.19       0.0
  651_(C-STRM)        STORAGE             102.31      3.03       0.0
  682_(C-STRM)        STORAGE             105.40      0.50       0.0
  MTD_(C-STRM)        STORAGE             100.37      3.19       0.0
  OVERFLOW_(C-STRM)   STORAGE             100.18      2.76       0.0
  POND_(C-STRM)       STORAGE              98.45      2.65       0.0    Yes
  S_525-MTD           STORAGE             103.30      0.50       0.0
  S_528-525           STORAGE             103.41      0.50       0.0
  S_532-528           STORAGE             103.50      0.50       0.0
  S_536-532           STORAGE             103.60      0.50       0.0
  S_540-536           STORAGE             103.71      0.50       0.0
  S_541-540           STORAGE             103.81      0.50       0.0
  S_604-603           STORAGE             105.50      0.50       0.0
  S_605-604           STORAGE             106.71      0.50       0.0
  S_619-606           STORAGE             106.50      0.50       0.0
  S_622-619           STORAGE             105.70      0.50       0.0
  S_622-619_2         STORAGE             106.50      0.50       0.0
  S_627-630           STORAGE             106.70      0.50       0.0
  S_629-622           STORAGE             106.01      0.50       0.0
  SU2                 STORAGE             106.75      0.50       0.0
  SU5                 STORAGE             104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                From Node           To Node             Type          Length    %Slope
Roughness
  ----------------------------------------------------------------------------------------
-
  BDR-C1              EXD_15              EXD_16              CONDUIT         17.7    0.3844
0.0250
  BDR-C2              EXD_20              EXD_21              CONDUIT          7.9    0.0632
0.0130
  BDR-C3              EXD_25              EXD_26              CONDUIT         14.2    0.2683
0.0130
  BDR-C4              EXD_12              EXD_27              CONDUIT         23.0    0.6077
0.0130
  C1_1                J32                 J26                 CONDUIT         71.8    0.4181
0.0130
  C1_17               J6                  EXD_1               CONDUIT        171.9    2.4608
0.0130
  C1_3                J28                 J29                 CONDUIT        183.6    0.1090
0.0130
  C1_30               J26                 J25                 CONDUIT         93.1    0.4296
0.0130
  C1_4                J25                 J39                 CONDUIT         75.0    0.9329
0.0130
  C14_1               J20                 J19                 CONDUIT         59.0    0.0847
0.0130
  C14_2               J23                 J22                 CONDUIT         73.9    0.4062
0.0130
  C14_4               J22                 J21                 CONDUIT         77.3    0.1941
0.0130
  C14_5               J21                 J20                 CONDUIT         51.8    0.1931
0.0130
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C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					

OR1	POND_(C-STRM)	J74	ORIFICE
OR2	POND_(C-STRM)	J74	ORIFICE
W10	S_536-532	J10	WEIR
W11	S_532-528	J11	WEIR
W12	S_528-525	J12	WEIR
W13	S_525-MTD	J13	WEIR
W14	S_629-622	J32	WEIR
W15	S_622-619	J26	WEIR
W2	POND_(C-STRM)	OF1	WEIR
W3	S_627-630	J24	WEIR
W4	S_622-619_2	J32	WEIR
W5	S_619-606	J62	WEIR
W6	S_605-604	J51	WEIR
W7	S_604-603	J25	WEIR
W8	S_541-540	J9	WEIR
W9	S_540-536	J9	WEIR
C1	S_622-619_2	622_(C-STRM)	OUTLET
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET
OL1	S_627-630	627_(C-STRM)	OUTLET
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET
OL11	J36	553_(C-STRM)	OUTLET
OL12	J40	551_(C-STRM)	OUTLET
OL13	J46	602_(C-STRM)	OUTLET
OL14	J28	520_(C-STRM)	OUTLET
OL15	J6	522_(C-STRM)	OUTLET
OL16	J29	518_(C-STRM)	OUTLET
OL17	J58	513_(C-STRM)	OUTLET
OL18	J59	511_(C-STRM)	OUTLET
OL19	J61	506_(C-STRM)	OUTLET
OL2	SU2	626_(C-STRM)	OUTLET
OL20	J48	504_(C-STRM)	OUTLET
OL21	J44	503_(C-STRM)	OUTLET
OL22	SU5	504_(C-STRM)	OUTLET
OL3	S_629-622	629_(C-STRM)	OUTLET
OL4	S_540-536	540_(C-STRM)	OUTLET
OL5	J22	645_(C-STRM)	OUTLET
OL6	J21	647_(C-STRM)	OUTLET
OL7	J20	650_(C-STRM)	OUTLET
OL8	J19	651_(C-STRM)	OUTLET
OL9	J19	556_(C-STRM)	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C12_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58

C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.24
C-STRM-100_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR		1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
0.25							
C-STRM-35_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-4_(C-STRM) CIRCULAR		0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM) CIRCULAR		0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM) CIRCULAR		0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
6.30							
C-STRM-79_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-8_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
2.74							
C-STRM-84_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7213	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1130	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1013	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3140	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929

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        0.4178    0.4430    0.4687    0.4947    0.5212
        0.5482    0.5760    0.6046    0.6335    0.6626
        0.6921    0.7218    0.7518    0.7820    0.8133
        0.8461    0.8801    0.9163    0.9564    1.0000
Hrad:
        0.0226    0.0600    0.0982    0.1332    0.1659
        0.1974    0.2291    0.2613    0.2925    0.3228
        0.3524    0.3813    0.4096    0.4373    0.4557
        0.4729    0.4908    0.5133    0.5388    0.5667
        0.5954    0.6238    0.6186    0.5790    0.5404
        0.5828    0.6246    0.6659    0.7067    0.7469
        0.7867    0.8189    0.8502    0.8811    0.9116
        0.9331    0.9497    0.9763    1.0109    1.0452
        1.0791    1.1126    1.1458    1.1787    1.1574
        1.1642    1.1570    1.1256    1.0602    1.0000
Width:
        0.0656    0.0958    0.1094    0.1231    0.1368
        0.1501    0.1622    0.1729    0.1837    0.1944
        0.2052    0.2159    0.2267    0.2377    0.2539
        0.2715    0.2891    0.3043    0.3175    0.3291
        0.3399    0.3507    0.3819    0.4435    0.5186
        0.5219    0.5251    0.5284    0.5317    0.5350
        0.5382    0.5468    0.5558    0.5647    0.5737
        0.5886    0.6068    0.6185    0.6243    0.6301
        0.6359    0.6417    0.6475    0.6534    0.6932
        0.7170    0.7512    0.8061    0.8978    1.0000

Transect Barnsdale_UPST7
Area:
        0.0031    0.0077    0.0135    0.0206    0.0292
        0.0385    0.0485    0.0590    0.0699    0.0811
        0.0928    0.1047    0.1170    0.1297    0.1427
        0.1561    0.1700    0.1843    0.1992    0.2145
        0.2304    0.2467    0.2636    0.2810    0.3005
        0.3224    0.3464    0.3708    0.3955    0.4204
        0.4456    0.4710    0.4972    0.5239    0.5510
        0.5784    0.6060    0.6340    0.6622    0.6907
        0.7195    0.7487    0.7782    0.8081    0.8383
        0.8691    0.9003    0.9322    0.9647    1.0000
Hrad:
        0.0323    0.0624    0.0905    0.1084    0.1375
        0.1686    0.1997    0.2314    0.2650    0.2977
        0.3296    0.3608    0.3913    0.4212    0.4493
        0.4751    0.5005    0.5247    0.5476    0.5703
        0.5929    0.6154    0.6378    0.6601    0.5891
        0.5938    0.5928    0.6266    0.6599    0.6927
        0.7252    0.7601    0.7705    0.7948    0.8255
        0.8559    0.8860    0.9157    0.9452    0.9727
        1.0000    1.0270    1.0538    1.0784    1.1003
        1.1221    1.1420    1.1557    1.1624    1.0000
Width:
        0.0999    0.1304    0.1570    0.1994    0.2229
        0.2396    0.2541    0.2664    0.2751    0.2837
        0.2923    0.3310    0.3096    0.3183    0.3279
        0.3390    0.3501    0.3618    0.3745    0.3872
        0.3998    0.4124    0.4251    0.4377    0.5266
        0.5610    0.6032    0.6092    0.6153    0.6213
        0.6274    0.6399    0.6563    0.6692    0.6761
        0.6830    0.6899    0.6967    0.7036    0.7118
        0.7199    0.7281    0.7362    0.7458    0.7573
        0.7688    0.7817    0.7991    0.8220    1.0000

Transect GBR
Area:
        0.0002    0.0008    0.0018    0.0032    0.0051
        0.0073    0.0099    0.0130    0.0164    0.0203
        0.0245    0.0292    0.0343    0.0401    0.0532
        0.0756    0.1002    0.1249    0.1496    0.1742
        0.1989    0.2235    0.2482    0.2729    0.2975
        0.3222    0.3468    0.3715    0.3962    0.4209
        0.4460    0.4715    0.4974    0.5237    0.5505
        0.5776    0.6051    0.6331    0.6614    0.6902
        0.7193    0.7489    0.7789    0.8092    0.8400
        0.8712    0.9028    0.9348    0.9672    1.0000
Hrad:
        0.0148    0.0296    0.0444    0.0592    0.0741
        0.0889    0.1037    0.1185    0.1333    0.1481
        0.1629    0.1777    0.1925    0.1451    0.0889
        0.0921    0.1222    0.1522    0.1821    0.2121
        0.2420    0.2720    0.3019    0.3318    0.3616
        0.3915    0.4213    0.4511    0.4809    0.5106
        0.5398    0.5684    0.5963    0.6237    0.6505
        0.6766    0.7280    0.7526    0.7529    0.7773
        0.8013    0.8249    0.8480    0.8708    0.8932
        0.9153    0.9369    0.9583    0.9793    1.0000
Width:
        0.0123    0.0246    0.0369    0.0492    0.0614
        0.0737    0.0860    0.0983    0.1106    0.1229
        0.1352    0.1475    0.1598    0.2496    0.5446
        0.7470    0.7470    0.7470    0.7470    0.7470
        0.7470    0.7470    0.7470    0.7470    0.7470
        0.7470    0.7470    0.7470    0.7470    0.7542
        0.7665    0.7788    0.7911    0.8034    0.8157
        0.8280    0.8402    0.8525    0.8648    0.8771
        0.8894    0.9017    0.9140    0.9263    0.9386
        0.9508    0.9631    0.9754    0.9877    1.0000

Transect Pond_SpillWay
Area:
        0.0040    0.0088    0.0142    0.0204    0.0274
        0.0350    0.0434    0.0524    0.0622    0.0728
        0.0840    0.0960    0.1087    0.1221    0.1362
        0.1511    0.1666    0.1829    0.2000    0.2177
        0.2362    0.2554    0.2753    0.2959    0.3173
        0.3393    0.3621    0.3856    0.4099    0.4348
        0.4600    0.4855    0.5113    0.5375    0.5640
        0.5908    0.6180    0.6454    0.6732    0.7013
        0.7297    0.7585    0.7875    0.8169    0.8466
        0.8767    0.9070    0.9377    0.9687    1.0000
Hrad:
        0.0187    0.0367    0.0543    0.0716    0.0888
        0.1059    0.1230    0.1400    0.1570    0.1740
        0.1910    0.2080    0.2251    0.2421    0.2592
        0.2763    0.2935    0.3106    0.3278    0.3450
        0.3622    0.3795    0.3967    0.4140    0.4313
        0.4486    0.4660    0.4833    0.5007    0.5241
        0.5500    0.5758    0.6013    0.6266    0.6517
        0.6766    0.7013    0.7257    0.7498    0.7737
        0.7974    0.8209    0.8441    0.8670    0.8898
        0.9123    0.9345    0.9566    0.9784    1.0000
Width:
        0.1394    0.1623    0.1853    0.2082    0.2311
        0.2541    0.2770    0.2999    0.3229    0.3458
        0.3687    0.3917    0.4146    0.4375    0.4605
        0.4834    0.5063    0.5293    0.5522    0.5751
        0.5981    0.6210    0.6439    0.6669    0.6898
        0.7127    0.7357    0.7586    0.7815    0.7956
        0.8059    0.8161    0.8263    0.8365    0.8467
        0.8569    0.8672    0.8774    0.8876    0.8978
        0.9080    0.9183    0.9285    0.9387    0.9489
        0.9591    0.9693    0.9796    0.9898    1.0000

Transect ROW_14m
Area:
        0.0004    0.0017    0.0038    0.0067    0.0104
        0.0150    0.0204    0.0267    0.0338    0.0417
        0.0504    0.0600    0.0704    0.0817    0.0938
        0.1067    0.1204    0.1350    0.1504    0.1667
        0.1838    0.2017    0.2204    0.2400    0.2605
        0.2817    0.3038    0.3267    0.3502    0.3738
        0.3973    0.4209    0.4446    0.4692    0.4952
        0.5225    0.5510    0.5808    0.6118    0.6439
        0.6767    0.7100    0.7440    0.7787    0.8140
        0.8499    0.8865    0.9237    0.9615    1.0000
Hrad:
        0.0169    0.0338    0.0507    0.0677    0.0846
        0.1015    0.1184    0.1353    0.1522    0.1692
        0.1861    0.2030    0.2199    0.2368    0.2537
        0.2707    0.2876    0.3045    0.3214    0.3383
        0.3552    0.3722    0.3891    0.4060    0.4229
        0.4398    0.4567    0.4736    0.5027    0.5359
        0.5691    0.6022    0.6353    0.6667    0.6957
        0.7226    0.7474    0.7704    0.7918    0.8123
        0.8326    0.8526    0.8721    0.8914    0.9103
        0.9289    0.9471    0.9651    0.9827    1.0000
Width:
        0.0215    0.0430    0.0645    0.0859    0.1074
        0.1289    0.1504    0.1719    0.1934    0.2148
        0.2363    0.2578    0.2793    0.3008    0.3223
        0.3437    0.3652    0.3867    0.4082    0.4297
        0.4512    0.4726    0.4941    0.5156    0.5371
        0.5586    0.5801    0.6015    0.6071    0.6071
        0.6071    0.6071    0.6200    0.6529    0.6857
        0.7186    0.7514    0.7843    0.8171    0.8357
        0.8521    0.8686    0.8850    0.9014    0.9179
        0.9343    0.9507    0.9671    0.9836    1.0000

Transect ROW_14m_Mountable
Area:
        0.0003    0.0012    0.0028    0.0049    0.0077
        0.0111    0.0151    0.0197    0.0249    0.0307
        0.0372    0.0442    0.0519    0.0602    0.0691
        0.0787    0.0888    0.0996    0.1109    0.1229
        0.1355    0.1487    0.1625    0.1770    0.1923
        0.2092    0.2277    0.2477    0.2693    0.2924
        0.3170    0.3433    0.3711    0.4004    0.4310
        0.4626    0.4954    0.5293    0.5642    0.6002
        0.6373    0.6755    0.7144    0.7538    0.7936
        0.8340    0.8748    0.9160    0.9578    1.0000
Hrad:
        0.0222    0.0445    0.0667    0.0889    0.1111
        0.1334    0.1556    0.1778    0.2001    0.2223
        0.2445    0.2667    0.2890    0.3112    0.3334
        0.3556    0.3779    0.4001    0.4223    0.4446
        0.4668    0.4890    0.5112    0.5335    0.5550
        0.5733    0.5891    0.6029    0.6151    0.6263
        0.6367    0.6465    0.6559    0.6653    0.6759
        0.6877    0.6992    0.7116    0.7245    0.7378
        0.7514    0.7663    0.7966    0.8266    0.8563
        0.8856    0.9147    0.9434    0.9719    1.0000
Width:
        0.0145    0.0290    0.0434    0.0579    0.0724
        0.0869    0.1013    0.1158    0.1303    0.1448
        0.1593    0.1737    0.1882    0.2027    0.2172
        0.2316    0.2461    0.2606    0.2751    0.2896
        0.3040    0.3185    0.3330    0.3475    0.3798
        0.4164    0.4530    0.4897    0.5263    0.5629
        0.5995    0.6362    0.6728    0.7080    0.7335
        0.7591    0.7846    0.8102    0.8357    0.8613
        0.8868    0.9114    0.9225    0.9336    0.9446
        0.9557    0.9668    0.9779    0.9889    1.0000

Transect ROW_14m_PH3
Area:
        0.0004    0.0017    0.0038    0.0068    0.0107
        0.0153    0.0209    0.0273    0.0345    0.0426
        0.0516    0.0614    0.0721    0.0836    0.0959
        0.1091    0.1232    0.1381    0.1539    0.1705
        0.1880    0.2064    0.2255    0.2456    0.2665
        0.2882    0.3108    0.3343    0.3583    0.3824
        0.4065    0.4306    0.4548    0.4797    0.5055
        0.5322    0.5598    0.5883    0.6176    0.6479
        0.6791    0.7112    0.7441    0.7780    0.8127
        0.8484    0.8850    0.9224    0.9608    1.0000
Hrad:
        0.0166    0.0332    0.0498    0.0664    0.0830
        0.0997    0.1163    0.1329    0.1495    0.1661
        0.1827    0.1993    0.2159    0.2325    0.2491
        0.2657    0.2823    0.2990    0.3156    0.3322
        0.3488    0.3654    0.3820    0.3986    0.4152
        0.4318    0.4484    0.4650    0.4935    0.5262
        0.5588    0.5913    0.6238    0.6553    0.6853
        0.7137    0.7407    0.7664    0.7909    0.8143
        0.8366    0.8579    0.8783    0.8979    0.9166
        0.9346    0.9519    0.9685    0.9845    1.0000
Width:
        0.0215    0.0430    0.0645    0.0859    0.1074
        0.1289    0.1504    0.1719    0.1934    0.2148
        0.2363    0.2578    0.2793    0.3008    0.3223
        0.3437    0.3652    0.3867    0.4082    0.4297
        0.4512    0.4726    0.4941    0.5156    0.5371
        0.5586    0.5801    0.6015    0.6071    0.6071
        0.6071    0.6071    0.6160    0.6386    0.6612
        0.6838    0.7063    0.7289    0.7515    0.7741
        0.7967    0.8193    0.8419    0.8645    0.8871
        0.9096    0.9322    0.9548    0.9774    1.0000

Transect ROW_14m-MB_1
Area:
        0.0003    0.0013    0.0030    0.0054    0.0084
        0.0121    0.0165    0.0215    0.0272    0.0336
        0.0407    0.0484    0.0568    0.0659    0.0757
        0.0861    0.0972    0.1089    0.1214    0.1345
        0.1483    0.1631    0.1791    0.1963    0.2146
        0.2342    0.2549    0.2768    0.2999    0.3242
        0.3497    0.3764    0.4043    0.4333    0.4635
        0.4949    0.5273    0.5601    0.5935    0.6274
        0.6618    0.6967    0.7326    0.7693    0.8064
        0.8441    0.8823    0.9210    0.9603    1.0000
Hrad:
        0.0198    0.0396    0.0594    0.0792    0.0990
        0.1188    0.1386    0.1584    0.1782    0.1980
        0.2178    0.2376    0.2574    0.2772    0.2971
        0.3169    0.3367    0.3565    0.3763    0.3961
        0.4159    0.4347    0.4520    0.4681    0.4834
        0.4979    0.5119    0.5256    0.5389    0.5521
        0.5650    0.5779    0.5907    0.6035    0.6162
        0.6289    0.6560    0.6844    0.7123    0.7397
        0.7667    0.7933    0.8190    0.8459    0.8726
        0.8988    0.9247    0.9501    0.9752    1.0000
Width:
        0.0168    0.0336    0.0504    0.0673    0.0841
        0.1009    0.1177    0.1345    0.1513    0.1681
        0.1849    0.2018    0.2186    0.2354    0.2522
        0.2690    0.2858    0.3026    0.3195    0.3363
        0.3552    0.3849    0.4146    0.4442    0.4739
        0.5036    0.5332    0.5629    0.5926    0.6223
        0.6519    0.6816    0.7113    0.7409    0.7706
        0.8003    0.8150    0.8279    0.8407    0.8536
        0.8664    0.8836    0.9093    0.9229    0.9357
        0.9486    0.9614    0.9743    0.9871    1.0000

Transect ROW_16.5m_Mountable
Area:
        0.0003    0.0012    0.0027    0.0048    0.0074
        0.0107    0.0145    0.0190    0.0240    0.0297
        0.0359    0.0428    0.0502    0.0582    0.0668
        0.0760    0.0858    0.0962    0.1072    0.1188
        0.1309    0.1437    0.1571    0.1710    0.1856
        0.2012    0.2183    0.2369    0.2570    0.2786
        0.3017    0.3263    0.3524    0.3800    0.4091
        0.4397    0.4719    0.5055    0.5406    0.5772
        0.6153    0.6544    0.6944    0.7354    0.7772
        0.8199    0.8636    0.9082    0.9536    1.0000
Hrad:
        0.0233    0.0465    0.0698    0.0931    0.1163
        0.1396    0.1628    0.1861    0.2094    0.2326
        0.2559    0.2792    0.3024    0.3257    0.3489
        0.3722    0.3955    0.4187    0.4420    0.4653
        0.4885    0.5118    0.5350    0.5583    0.5816
        0.6036    0.6224    0.6386    0.6529    0.6657
        0.6773    0.6882    0.6985    0.7084    0.7180
        0.7275    0.7370    0.7464    0.7559    0.7655
        0.7817    0.8084    0.8343    0.8597    0.8844
        0.9085    0.9321    0.9552    0.9779    1.0000
Width:
        0.0127    0.0254    0.0380    0.0507    0.0634
        0.0761    0.0888    0.1014    0.1141    0.1268
```

0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5631	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0998	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579

0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023
0.8405 0.8794 0.9189 0.9591 1.0000

Hrad:

0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000

Width:

0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking

Area:

0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000

Hrad:

0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000

Width:

0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m

Area:

0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000

Hrad:

0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000

Width:

0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1

Area:

0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7086 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000

Hrad:

0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000

Width:

0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2

Area:

0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000

Hrad:

0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000

Width:

0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3

Area:

0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1213 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000

Hrad:

0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2049 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4018 0.4273 0.4351 0.4545
0.4946 0.5339 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8390 0.8745 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1167 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000

Width:

0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5931 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4

Area:

0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0302 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000

Hrad:

0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4329 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6869 0.6742 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000

Width:

0.0541 0.0732 0.0923 0.1110 0.1246
0.1374 0.1502 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5488 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6548 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5

Area:

0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2635 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000

Hrad:

0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3749 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6771 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8746 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000

Width:

0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6

Area:

0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2153 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000

Hrad:

0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000

Width:

0.0616 0.0785 0.0947 0.1108 0.1267
0.1418 0.1569 0.1666 0.1758 0.1850
0.1952 0.2062 0.2171 0.2280 0.2365

0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/03/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	8.620	103.199
Evaporation Loss	0.000	0.000
Infiltration Loss	3.556	42.568
Surface Runoff	4.957	59.340
Final Storage	0.111	1.327
Continuity Error (%)	-0.035	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.957	49.566
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.028	0.284
External Outflow	4.723	47.227
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.262	2.616
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.002	0.021
Continuity Error (%)	-0.027	

****
Highest Continuity Errors
****
Node J24 (3.62%)
Node 514_(C-STRM) (2.61%)
Node J59 (2.18%)
Node J36 (2.16%)
Node J23 (1.71%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (7)
Link OL10 (4)
Link C-STRM-71_(C-STRM) (4)
Link OL16 (4)
Link OL9 (3)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****
Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.98 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.00 %
0.660 - 0.574 sec	:	0.00 %
0.574 - 0.500 sec	:	0.01 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Peak Runoff CMS	Runoff Coeff	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff 10^6 ltr
A15	103.20	0.00	0.00	60.13	19.28	19.32	34.74	1.20	0.14
A18	103.20	0.00	0.00	51.16	39.79	19.64	51.48	0.31	0.18
A19	103.20	0.00	0.00	64.22	22.70	20.50	38.66	0.43	0.23
A20	103.20	0.00	0.00	73.19	8.51	21.92	28.73	1.39	0.18
NULL3	103.20	0.00	0.00	20.92	84.75	13.25	81.05	0.46	0.19
S1	103.20	0.00	0.00	47.95	67.50	34.01	54.26	3.54	2.18
S1_1	103.20	0.00	0.00	29.06	72.66	14.98	73.11	0.09	0.04
S1_2	103.20	0.00	0.00	29.03	72.66	15.01	73.14	0.09	0.04
S1_4	103.20	0.00	0.00	29.07	72.66	14.96	73.09	0.14	0.06
S1_5	103.20	0.00	0.00	29.06	72.66	14.98	73.11	0.08	0.04
S10_1	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.98	0.61
S10_2	103.20	0.00	0.00	49.15	65.37	33.49	53.10	1.13	0.71
S10_4	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.39	0.24
S10_5	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.67	0.42
S11	103.20	0.00	0.00	83.11	0.00	20.09	20.09	0.66	0.33
S12	103.20	0.00	0.00	29.08	72.66	14.96	73.08	0.32	0.15
S14_1	103.20	0.00	0.00	29.11	72.66	14.93	73.05	0.44	0.20
S14_3	103.20	0.00	0.00	29.20	72.64	14.83	72.95	0.78	0.36
S14_4	103.20	0.00	0.00	29.12	72.66	14.92	73.04	0.22	0.10
S14_5	103.20	0.00	0.00	29.18	72.65	14.85	72.97	1.23	0.57
S14_6	103.20	0.00	0.00	29.13	72.65	14.90	73.03	0.21	0.10
S14_7	103.20	0.00	0.00	29.15	72.65	14.89	73.01	0.86	0.40
S14_8	103.20	0.00	0.00	29.14	72.65	14.90	73.02	0.25	0.11
S15	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.87	0.54
S16	103.20	0.00	0.00	0.00	101.51	0.00	101.51	1.49	0.31
S17	103.20	0.00	0.00	92.31	3.39	10.84	10.84	0.68	0.15
S18_2	103.20	0.00	0.00	49.15	65.37	33.49	53.10	1.78	1.11
S18_3	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.88	0.55
S18_4	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.47	0.29
S18_5	103.20	0.00	0.00	44.97	72.63	35.38	57.17	1.05	0.62
S18_6	103.20	0.00	0.00	49.15	65.37	33.49	53.10	0.45	0.28
S19	103.20	0.00	0.00	29.17	72.65	14.86	72.98	0.77	0.36
S2	103.20	0.00	0.00	47.67	68.00	34.14	54.54	2.03	1.24
S20_1	103.20	0.00	0.00	29.06	72.66	14.97	73.10	0.36	0.17
S20_2	103.20	0.00	0.00	29.00	72.66	15.05	73.17	0.17	0.08
S3	103.20	0.00	0.00	49.15	65.37	33.49	53.10	1.32	0.82
S32	103.20	0.00	0.00	29.08	72.66	14.96	73.09	0.30	0.14
S36	103.20	0.00	0.00	0.00	101.52	0.00	101.52	1.85	0.38
S4	103.20	0.00	0.00	11.39	87.12	3.36	90.47	11.96	4.10
S5	103.20	0.00	0.00	11.01	87.13	3.73	90.87	2.90	1.07
S6	103.20	0.00	0.00	38.58	58.13	17.30	63.80	0.22	0.11
S7	103.20	0.00	0.00	11.09	87.13	3.65	90.78	3.62	1.32
S8	103.20	0.00	0.00	71.60	36.31	31.06	31.06	0.60	0.29

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.16	104.56	0	12:00	0.16
EXD_10	JUNCTION	0.05	0.38	99.03	0	12:03	0.38
EXD_11	JUNCTION	0.04	0.28	98.78	0	12:03	0.28
EXD_12	JUNCTION	0.06	0.41	98.72	0	12:02	0.41
EXD_13	JUNCTION	0.01	0.17	104.50	0	12:00	0.17
EXD_14	JUNCTION	0.00	0.00	102.49	0	00:00	0.00
EXD_15	JUNCTION	0.06	0.43	100.70	0	12:00	0.43
EXD_16	JUNCTION	0.04	0.19	100.39	0	12:02	0.19
EXD_17	JUNCTION	0.05	0.18	100.07	0	11:58	0.18
EXD_18	JUNCTION	0.03	0.21	99.61	0	12:06	0.21
EXD_19	JUNCTION	0.06	0.41	99.60	0	12:05	0.41
EXD_2	JUNCTION	0.03	0.28	103.74	0	12:02	0.28
EXD_20	JUNCTION	0.06	0.41	99.60	0	12:04	0.41
EXD_21	JUNCTION	0.05	0.30	99.48	0	12:05	0.30
EXD_22	JUNCTION	0.03	0.20	99.34	0	12:07	0.20
EXD_23	JUNCTION	0.06	0.30	99.05	0	12:14	0.30
EXD_24	JUNCTION	0.03	0.25	98.92	0	12:14	0.25
EXD_25	JUNCTION	0.05	0.39	98.91	0	12:13	0.39
EXD_26	JUNCTION	0.03	0.19	98.68	0	12:15	0.19
EXD_27	JUNCTION	0.06	0.35	98.51	0	12:00	0.35
EXD_3	JUNCTION	0.01	0.15	103.34	0	12:03	0.15
EXD_4	JUNCTION	0.01	0.15	102.79	0	12:04	0.15
EXD_5	JUNCTION	0.01	0.23	102.72	0	12:04	0.23
EXD_6	JUNCTION	0.01	0.14	102.46	0	12:05	0.14
EXD_7	JUNCTION	0.01	0.19	101.68	0	12:07	0.19
EXD_8	JUNCTION	0.02	0.36	100.85	0	12:11	0.36
EXD_9	JUNCTION	0.01	0.18	100.56	0	12:15	0.18
J10	JUNCTION	0.00	0.12	103.72	0	12:01	0.12
J11	JUNCTION	0.00	0.14	103.64	0	12:01	0.14
J12	JUNCTION	0.00	0.16	103.56	0	12:02	0.16
J13	JUNCTION	0.01	0.20	103.50	0	12:04	0.20
J17	JUNCTION	0.01	0.16	104.53	0	12:00	0.16
J19	JUNCTION	0.00	0.10	105.50	0	12:00	0.10
J20	JUNCTION	0.00	0.07	105.52	0	12:00	0.07
J21	JUNCTION	0.00	0.06	105.61	0	11:54	0.06
J22	JUNCTION	0.00	0.02	105.72	0	12:06	0.02
J23	JUNCTION	0.00	0.07	106.07	0	12:04	0.07
J24	JUNCTION	0.00	0.05	106.25	0	12:02	0.05
J25	JUNCTION	0.00	0.17	105.47	0	12:04	0.17
J26	JUNCTION	0.00	0.18	105.88	0	12:03	0.18
J28	JUNCTION	0.00	0.09	109.09	0	12:00	0.09
J29	JUNCTION	0.00	0.13	108.93	0	12:00	0.13
J32	JUNCTION	0.00	0.16	106.16	0	12:02	0.16
J36	JUNCTION	0.00	0.11	104.81	0	12:00	0.11
J39	JUNCTION	0.00	0.21	104.81	0	12:03	0.21
J40	JUNCTION	0.00	0.20	104.65	0	12:04	0.20
J41	JUNCTION	0.00	0.23	103.43	0	12:05	0.23
J43	JUNCTION	0.00	0.16	104.36	0	12:04	0.16
J44	JUNCTION	0.00	0.10	104.60	0	12:03	0.10
J46	JUNCTION	0.00	0.07	104.67	0	12:00	0.07
J47	JUNCTION	0.00	0.00	105.10	0	00:00	0.00
J48	JUNCTION	0.00	0.10	105.85	0	12:03	0.10
J51	JUNCTION	0.00	0.11	106.86	0	12:02	0.11
J52	JUNCTION	0.00	0.00	109.75	0	00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0	00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0	00:00	0.00
J57	JUNCTION	0.00	0.03	108.50	0	12:01	0.02
J58	JUNCTION	0.00	0.09	108.49	0	12:00	0.09
J59	JUNCTION	0.00	0.09	108.09	0	12:01	0.09
J6	JUNCTION	0.00	0.04	109.87	0	12:00	0.04
J61	JUNCTION	0.00	0.08	107.08	0	12:00	0.08
J62	JUNCTION	0.00	0.11	106.61	0	12:01	0.11
J74	JUNCTION	0.34	1.00	99.45	0	12:13	1.00
J9	JUNCTION	0.00	0.10	103.80	0	12:01	0.10
OF1	OUTFALL	0.00	0.00	100.80	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
OF3	OUTFALL	0.04	0.31	98.31	0	12:00	0.31
ST4_108A_(P-Stm)	OUTFALL	0.49	1.41	99.43	0	12:13	1.41
500_(C-STRM)	STORAGE	0.23	0.49	100.80	0	12:07	0.49
500A_(C-STRM)	STORAGE	0.32	0.94	101.04	0	12:07	0.94
502_(C-STRM)	STORAGE	0.13	1.65	102.20	0	12:07	1.65
503_(C-STRM)	STORAGE	0.12	1.76	102.34	0	12:07	1.76

504_(C-STRM)	STORAGE	0.34	1.28	104.31	0	12:11	1.28	
505_(C-STRM)	STORAGE	0.34	1.42	104.88	0	12:09	1.42	
506_(C-STRM)	STORAGE	0.34	1.58	105.40	0	12:08	1.57	
507_(C-STRM)	STORAGE	0.34	1.60	105.74	0	12:09	1.60	
508_(C-STRM)	STORAGE	0.34	1.70	106.07	0	12:09	1.70	
509_(C-STRM)	STORAGE	0.34	1.82	106.42	0	12:09	1.82	
510_(C-STRM)	STORAGE	0.34	1.85	106.69	0	12:10	1.85	
511_(C-STRM)	STORAGE	0.34	1.86	106.78	0	12:10	1.86	
512_(C-STRM)	STORAGE	0.34	1.85	106.96	0	12:10	1.84	
513_(C-STRM)	STORAGE	0.34	1.83	107.08	0	12:10	1.83	
514_(C-STRM)	STORAGE	0.23	1.50	107.09	0	12:10	1.49	
515_(C-STRM)	STORAGE	0.23	1.24	107.09	0	12:10	1.23	
516_(C-STRM)	STORAGE	0.34	1.84	107.29	0	12:10	1.84	
517_(C-STRM)	STORAGE	0.34	1.91	107.52	0	12:09	1.91	
518_(C-STRM)	STORAGE	0.35	2.11	107.97	0	12:07	2.11	
519_(C-STRM)	STORAGE	0.33	1.91	107.98	0	12:06	1.89	
520_(C-STRM)	STORAGE	0.32	1.77	108.11	0	12:05	1.76	
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	12:03	0.61	
525_(C-STRM)	STORAGE	0.10	1.70	102.31	0	12:08	1.70	
528_(C-STRM)	STORAGE	0.07	1.84	102.56	0	12:09	1.84	
532_(C-STRM)	STORAGE	0.06	1.89	102.72	0	12:09	1.89	
536_(C-STRM)	STORAGE	0.06	1.89	102.87	0	12:09	1.89	
540_(C-STRM)	STORAGE	0.35	2.13	102.99	0	12:10	2.13	
541_(C-STRM)	STORAGE	0.34	2.11	103.04	0	12:10	2.11	
551_(C-STRM)	STORAGE	0.35	1.69	102.34	0	12:07	1.69	
552_(C-STRM)	STORAGE	0.33	1.64	102.39	0	12:07	1.64	
553_(C-STRM)	STORAGE	0.34	1.56	102.50	0	12:06	1.56	
554_(C-STRM)	STORAGE	0.33	1.52	102.57	0	12:06	1.51	
555_(C-STRM)	STORAGE	0.33	1.49	102.74	0	12:06	1.49	
556_(C-STRM)	STORAGE	0.33	1.55	102.92	0	12:05	1.53	
601_(C-STRM)	STORAGE	0.11	1.21	101.66	0	12:08	1.21	
602_(C-STRM)	STORAGE	0.13	1.72	102.34	0	12:08	1.72	
603_(C-STRM)	STORAGE	0.12	1.75	102.38	0	12:08	1.75	
604_(C-STRM)	STORAGE	0.11	1.89	102.77	0	12:08	1.89	
605_(C-STRM)	STORAGE	0.11	1.84	102.93	0	12:08	1.84	
606_(C-STRM)	STORAGE	0.12	1.93	103.17	0	12:07	1.93	
619_(C-STRM)	STORAGE	0.12	2.02	103.40	0	12:07	2.02	
622_(C-STRM)	STORAGE	0.11	1.97	103.49	0	12:07	1.97	
626_(C-STRM)	STORAGE	0.23	0.52	104.47	0	12:06	0.52	
627_(C-STRM)	STORAGE	0.24	0.90	104.03	0	12:09	0.90	
629_(C-STRM)	STORAGE	0.12	1.92	103.57	0	12:08	1.92	
630_(C-STRM)	STORAGE	0.12	1.67	103.75	0	12:06	1.67	
630A_(C-STRM)	STORAGE	0.11	1.69	103.81	0	12:06	1.69	
631_(C-STRM)	STORAGE	0.00	0.17	106.17	0	12:03	0.17	
645_(C-STRM)	STORAGE	0.37	1.97	104.00	0	12:05	1.97	
647_(C-STRM)	STORAGE	0.36	1.98	104.12	0	12:05	1.98	
650_(C-STRM)	STORAGE	0.36	2.00	104.22	0	12:05	1.99	
651_(C-STRM)	STORAGE	0.36	2.00	104.31	0	12:05	1.99	
682_(C-STRM)	STORAGE	0.00	0.24	105.64	0	12:02	0.24	
MTD_(C-STRM)	STORAGE	0.20	1.55	101.92	0	12:08	1.55	
OVERFLOW_(C-STRM)	STORAGE	0.28	0.92	101.09	0	12:07	0.92	
POND_(C-STRM)	STORAGE	1.28	2.24	100.69	0	13:53	2.24	
S_525-MTD	STORAGE	0.00	0.20	103.50	0	12:04	0.20	
S_528-525	STORAGE	0.00	0.17	103.57	0	12:02	0.16	
S_532-528	STORAGE	0.00	0.15	103.65	0	12:01	0.15	
S_536-532	STORAGE	0.00	0.23	103.83	0	12:00	0.23	
S_540-536	STORAGE	0.00	0.20	103.91	0	12:00	0.20	
S_541-540	STORAGE	0.00	0.19	104.00	0	12:02	0.19	
S_604-603	STORAGE	0.00	0.17	105.67	0	12:01	0.17	
S_605-604	STORAGE	0.00	0.20	106.91	0	12:03	0.20	
S_619-606	STORAGE	0.00	0.22	106.72	0	12:00	0.22	
S_622-619	STORAGE	0.00	0.22	105.92	0	12:02	0.22	
S_622-619_2	STORAGE	0.00	0.23	106.73	0	12:00	0.23	
S_627-630	STORAGE	0.00	0.14	106.84	0	12:00	0.14	
S_629-622	STORAGE	0.00	0.16	106.17	0	12:01	0.16	
SU2	STORAGE	0.00	0.16	106.91	0	12:26	0.16	
SU5	STORAGE	0.00	0.14	104.32	0	12:12	0.14	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.148	0	12:00	0	0.318	- 0.006
EXD_10	JUNCTION	0.690	0.721	0	12:00	3.34	4.33	- 0.160
EXD_11	JUNCTION	0.000	0.659	0	12:03	0	4.33	0.002
EXD_12	JUNCTION	0.142	0.774	0	12:02	1.2	5.54	0.004
EXD_13	JUNCTION	0.000	0.147	0	12:00	0	0.318	- 0.183
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.178	0.178	0	12:00	1.39	1.39	- 0.000
EXD_16	JUNCTION	0.000	0.119	0	12:00	0	1.39	- 0.009
EXD_17	JUNCTION	0.000	0.116	0	12:02	0	1.39	- 0.025
EXD_18	JUNCTION	0.000	0.122	0	12:00	0	1.39	0.109
EXD_19	JUNCTION	0.000	0.124	0	12:13	0	1.4	- 0.061
EXD_2	JUNCTION	0.000	0.146	0	12:00	0	0.319	0.206
EXD_20	JUNCTION	0.234	0.238	0	12:04	0.428	1.83	- 0.003
EXD_21	JUNCTION	0.000	0.235	0	12:04	0	1.82	- 0.020
EXD_22	JUNCTION	0.000	0.235	0	12:06	0	1.82	- 0.026
EXD_23	JUNCTION	0.000	0.233	0	12:07	0	1.82	0.108
EXD_24	JUNCTION	0.000	0.227	0	12:14	0	1.82	0.012
EXD_25	JUNCTION	0.176	0.259	0	12:10	0.305	2.12	- 0.004
EXD_26	JUNCTION	0.000	0.314	0	12:13	0	2.12	0.054
EXD_27	JUNCTION	0.195	1.103	0	12:00	0.458	8.11	- 0.000
EXD_3	JUNCTION	0.000	0.139	0	12:02	0	0.318	0.070
EXD_4	JUNCTION	0.000	0.138	0	12:03	0	0.318	0.027
EXD_5	JUNCTION	0.000	0.137	0	12:04	0	0.318	0.004
EXD_6	JUNCTION	0.000	0.137	0	12:04	0	0.318	- 0.354
EXD_7	JUNCTION	0.150	0.282	0	12:05	0.678	0.997	- 0.138
EXD_8	JUNCTION	0.000	0.276	0	12:07	0	0.998	0.294
EXD_9	JUNCTION	0.000	0.256	0	12:10	0	0.995	0.760
J10	JUNCTION	0.000	0.792	0	12:01	0	0.414	0.015
J11	JUNCTION	0.000	0.881	0	12:01	0	0.472	- 0.003
J12	JUNCTION	0.000	1.021	0	12:01	0	0.572	- 0.005
J13	JUNCTION	0.000	1.035	0	12:03	0	0.649	0.079
J17	JUNCTION	0.000	0.148	0	12:00	0	0.318	0.003
J19	JUNCTION	0.400	0.436	0	12:00	0.858	0.878	- 1.404
J20	JUNCTION	0.037	0.076	0	11:55	0.079	0.106	1.100
J21	JUNCTION	0.065	0.065	0	12:00	0.14	0.14	- 0.644
J22	JUNCTION	0.040	0.054	0	12:04	0.0854	0.111	0.036
J23	JUNCTION	0.000	0.057	0	12:02	0	0.0258	1.739
J24	JUNCTION	0.000	0.106	0	12:00	0	0.0382	3.756
J25	JUNCTION	0.000	1.414	0	12:03	0	0.954	0.432
J26	JUNCTION	0.000	1.185	0	12:02	0	0.812	- 0.246
J28	JUNCTION	0.204	0.204	0	12:00	0.437	0.437	- 1.896
J29	JUNCTION	0.573	0.649	0	12:00	1.23	1.28	0.032
J32	JUNCTION	0.000	0.903	0	12:01	0	0.462	0.045
J36	JUNCTION	0.077	0.271	0	12:00	0.166	0.293	2.213
J39	JUNCTION	0.000	1.472	0	12:03	0	1.06	0.480
J40	JUNCTION	0.169	1.455	0	12:03	0.363	1.41	- 0.141
J41	JUNCTION	0.000	2.645	0	12:04	0	1.94	0.138
J43	JUNCTION	0.000	1.729	0	12:04	0	1.31	- 0.045
J44	JUNCTION	0.101	0.476	0	12:02	0.217	0.583	0.220
J46	JUNCTION	0.141	0.141	0	12:00	0.303	0.303	- 1.081
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.115	0.511	0	12:02	0.247	0.596	- 0.096
J51	JUNCTION	0.000	0.479	0	12:02	0	0.355	1.444
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.004	0	11:58	0	0.00109	48.732
J58	JUNCTION	0.361	0.527	0	12:00	0.775	0.879	0.233
J59	JUNCTION	0.098	0.299	0	12:00	0.211	0.342	2.229
J6	JUNCTION	0.148	0.148	0	12:00	0.318	0.318	- 0.100
J61	JUNCTION	0.400	0.572	0	12:00	0.858	0.981	- 1.286
J62	JUNCTION	0.000	0.424	0	12:00	0	0.21	- 0.556
J74	JUNCTION	0.000	0.340	0	13:53	0	38.9	0.012
J9	JUNCTION	0.000	0.510	0	12:01	0	0.29	0.003
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.114	0.114	0	12:00	0.218	0.218	0.000
OF3	OUTFALL	0.000	1.080	0	12:00	0	8.11	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.340	0	13:53	0	38.9	0.000
500_(C-STRM)	STORAGE	0.000	0.163	0	12:07	0	0.357	0.029
500A_(C-STRM)	STORAGE	0.000	4.971	0	12:06	0	12.2	0.048
502_(C-STRM)	STORAGE	0.000	1.318	0	12:07	0	5.78	0.007
503_(C-STRM)	STORAGE	0.000	0.993	0	12:11	0	4.44	- 0.002
504_(C-STRM)	STORAGE	0.000	0.936	0	12:09	0	4.21	- 0.081
505_(C-STRM)	STORAGE	0.000	0.782	0	12:08	0	3.34	- 0.035
506_(C-STRM)	STORAGE	0.000	0.789	0	12:08	0	3.35	0.125
507_(C-STRM)	STORAGE	0.000	0.613	0	12:11	0	2.53	- 0.162
508_(C-STRM)	STORAGE	0.000	0.603	0	12:10	0	2.53	- 0.002
509_(C-STRM)	STORAGE	0.000	0.595	0	12:10	0	2.53	- 0.001
510_(C-STRM)	STORAGE	0.000	0.589	0	12:10	0	2.53	- 0.011
511_(C-STRM)	STORAGE	0.000	0.587	0	12:10	0	2.53	0.014
512_(C-STRM)	STORAGE	0.000	0.536	0	11:52	0	2.32	- 0.054
513_(C-STRM)	STORAGE	0.000	0.601	0	11:53	0	2.37	0.101
514_(C-STRM)	STORAGE	0.000	0.071	0	11:54	0	0.0583	2.683
515_(C-STRM)	STORAGE	0.000	0.035	0	11:57	0	0.012	- 7.920
516_(C-STRM)	STORAGE	0.000	0.398	0	11:53	0	1.57	- 0.541
517_(C-STRM)	STORAGE	0.000	0.417	0	11:53	0	1.56	- 0.212
518_(C-STRM)	STORAGE	0.000	0.438	0	11:54	0	1.57	0.444
519_(C-STRM)	STORAGE	0.000	0.120	0	11:48	0	0.393	- 0.976
520_(C-STRM)	STORAGE	0.000	0.121	0	11:46	0	0.397	1.008
522_(C-STRM)	STORAGE	0.000	0.088	0	11:46	0	0.278	0.016
525_(C-STRM)	STORAGE	0.000	1.263	0	12:20	0	4.86	0.038
528_(C-STRM)	STORAGE	0.000	1.053	0	12:21	0	4.05	- 0.007
532_(C-STRM)	STORAGE	0.000	0.842	0	12:20	0	3.26	- 0.057
536_(C-STRM)	STORAGE	0.000	0.732	0	12:20	0	2.88	0.039
540_(C-STRM)	STORAGE	0.000	0.498	0	12:22	0	1.95	- 0.022
541_(C-STRM)	STORAGE	0.000	0.368	0	11:47	0	1.55	0.014
551_(C-STRM)	STORAGE	0.000	0.340	0	12:06	0	1.34	0.196
552_(C-STRM)	STORAGE	0.000	0.242	0	12:06	0	0.887	- 0.308
553_(C-STRM)	STORAGE	0.000	0.250	0	11:50	0	0.89	0.240
554_(C-STRM)	STORAGE	0.000	0.214	0	11:52	0	0.712	- 0.616
555_(C-STRM)	STORAGE	0.000	0.217	0	11:47	0	0.714	0.230
556_(C-STRM)	STORAGE	0.000	0.214	0	11:46	0	0.715	0.137
601_(C-STRM)	STORAGE	0.000	5.238	0	12:08	0	22.4	0.015
602_(C-STRM)	STORAGE	0.000	5.238	0	12:08	0	22.4	- 0.001
603_(C-STRM)	STORAGE	0.000	5.222	0	12:08	0	22.2	- 0.000
604_(C-STRM)	STORAGE	0.000	5.223	0	12:07	0	22.2	0.000

605_(C-STRM)	STORAGE	0.000	4.932	0	12:07	0	21.3	-	0.002
606_(C-STRM)	STORAGE	0.000	4.192	0	12:06	0	19	-	0.000
619_(C-STRM)	STORAGE	0.000	4.198	0	12:06	0	19	-	0.002
622_(C-STRM)	STORAGE	0.000	3.971	0	12:06	0	18.4	-	0.000
626_(C-STRM)	STORAGE	0.000	0.141	0	11:54	0	0.662	-	0.410
627_(C-STRM)	STORAGE	0.000	0.238	0	12:01	0	0.903	-	0.046
629_(C-STRM)	STORAGE	0.000	3.423	0	12:06	0	16.5	-	0.162
630_(C-STRM)	STORAGE	0.000	3.294	0	12:05	0	16.1	-	0.188
630A_(C-STRM)	STORAGE	0.000	3.066	0	12:05	0	15.2	-	0.044
631_(C-STRM)	STORAGE	4.096	4.096	0	12:00	12	12	-	0.041
645_(C-STRM)	STORAGE	0.000	0.748	0	12:17	0	3.27	-	0.005
647_(C-STRM)	STORAGE	0.000	0.675	0	12:17	0	3.16	-	0.038
650_(C-STRM)	STORAGE	0.000	0.586	0	12:17	0	3.04	-	0.121
651_(C-STRM)	STORAGE	0.000	0.544	0	11:47	0	2.96	-	0.037
682_(C-STRM)	STORAGE	1.071	1.071	0	12:00	2.9	2.9	-	0.023
MTD_(C-STRM)	STORAGE	0.000	2.531	0	12:07	0	10.6	-	0.040
OVERFLOW_(C-STRM)	STORAGE	0.000	2.531	0	12:08	0	10.6	-	0.004
POND_(C-STRM)	STORAGE	1.660	10.780	0	12:07	3.9	38.9	-	0.023
S_525-MTD	STORAGE	0.543	0.543	0	12:00	0.869	0.888	-	0.005
S_528-525	STORAGE	0.550	0.550	0	12:00	0.88	0.88	-	0.007
S_532-528	STORAGE	0.279	0.279	0	12:00	0.446	0.446	-	0.007
S_536-532	STORAGE	0.619	0.619	0	12:00	1.05	1.05	-	0.008
S_540-536	STORAGE	0.291	0.291	0	12:00	0.465	0.465	-	0.007
S_541-540	STORAGE	1.112	1.112	0	12:00	1.78	1.78	-	0.007
S_604-603	STORAGE	0.822	0.822	0	12:00	1.32	1.32	-	0.000
S_605-604	STORAGE	2.179	2.179	0	12:00	3.54	3.54	-	0.000
S_619-606	STORAGE	0.612	0.612	0	12:00	0.979	0.979	-	0.000
S_622-619	STORAGE	1.245	1.245	0	12:00	2.03	2.03	-	0.000
S_622-619_2	STORAGE	0.705	0.705	0	12:00	1.13	1.13	-	0.000
S_627-630	STORAGE	0.241	0.241	0	12:00	0.386	0.386	-	0.000
S_629-622	STORAGE	0.418	0.418	0	12:00	0.669	0.669	-	0.000
SU2	STORAGE	0.329	0.329	0	12:00	0.662	0.662	-	0.000
SU5	STORAGE	0.291	0.291	0	12:00	0.595	0.595	-	0.000

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	8.2	0.0	0.0	0.001	17.1	0 12:07	0.163
500A_(C-STRM)	0.634	30.0	0.0	0.0	1.960	92.7	0 12:07	4.890
502_(C-STRM)	0.000	3.5	0.0	0.0	0.002	44.8	0 12:07	1.317
503_(C-STRM)	0.000	3.0	0.0	0.0	0.002	44.8	0 12:07	0.995
504_(C-STRM)	0.000	12.7	0.0	0.0	0.001	47.3	0 12:11	0.933
505_(C-STRM)	0.000	10.4	0.0	0.0	0.002	43.7	0 12:09	0.777
506_(C-STRM)	0.000	10.8	0.0	0.0	0.002	50.0	0 12:08	0.782
507_(C-STRM)	0.000	10.8	0.0	0.0	0.002	51.5	0 12:09	0.622
508_(C-STRM)	0.000	10.8	0.0	0.0	0.002	54.6	0 12:09	0.613
509_(C-STRM)	0.000	10.7	0.0	0.0	0.002	58.0	0 12:09	0.603
510_(C-STRM)	0.000	10.9	0.0	0.0	0.002	59.8	0 12:10	0.595
511_(C-STRM)	0.000	11.0	0.0	0.0	0.002	60.5	0 12:10	0.589
512_(C-STRM)	0.000	10.8	0.0	0.0	0.002	59.2	0 12:10	0.528
513_(C-STRM)	0.000	10.7	0.0	0.0	0.002	58.4	0 12:10	0.569
514_(C-STRM)	0.000	7.4	0.0	0.0	0.002	47.5	0 12:10	0.080
515_(C-STRM)	0.000	7.1	0.0	0.0	0.001	38.3	0 12:10	0.035
516_(C-STRM)	0.000	11.0	0.0	0.0	0.002	60.1	0 12:10	0.386
517_(C-STRM)	0.000	11.3	0.0	0.0	0.002	63.0	0 12:09	0.398
518_(C-STRM)	0.000	12.0	0.0	0.0	0.002	72.4	0 12:07	0.417
519_(C-STRM)	0.000	11.6	0.0	0.0	0.002	67.7	0 12:06	0.156
520_(C-STRM)	0.000	12.2	0.0	0.0	0.002	66.6	0 12:05	0.120
522_(C-STRM)	0.000	10.4	0.0	0.0	0.001	20.3	0 12:03	0.088
525_(C-STRM)	0.000	3.8	0.0	0.0	0.002	63.2	0 12:08	1.271
528_(C-STRM)	0.000	2.6	0.0	0.0	0.002	68.6	0 12:09	1.060
532_(C-STRM)	0.000	2.3	0.0	0.0	0.002	70.9	0 12:09	0.848
536_(C-STRM)	0.000	2.4	0.0	0.0	0.002	72.0	0 12:09	0.738
540_(C-STRM)	0.000	12.2	0.0	0.0	0.002	74.8	0 12:10	0.537
541_(C-STRM)	0.000	11.7	0.0	0.0	0.002	73.0	0 12:10	0.396
551_(C-STRM)	0.000	9.1	0.0	0.0	0.002	44.8	0 12:07	0.337
552_(C-STRM)	0.000	8.5	0.0	0.0	0.002	42.4	0 12:07	0.239
553_(C-STRM)	0.000	8.9	0.0	0.0	0.002	41.3	0 12:06	0.242
554_(C-STRM)	0.000	8.4	0.0	0.0	0.002	39.0	0 12:06	0.204
555_(C-STRM)	0.000	8.4	0.0	0.0	0.002	38.0	0 12:06	0.214
556_(C-STRM)	0.000	8.4	0.0	0.0	0.002	40.0	0 12:05	0.217
601_(C-STRM)	0.000	2.5	0.0	0.0	0.001	27.3	0 12:08	5.238
602_(C-STRM)	0.000	3.1	0.0	0.0	0.002	41.8	0 12:08	5.238
603_(C-STRM)	0.000	3.0	0.0	0.0	0.002	45.1	0 12:08	5.222
604_(C-STRM)	0.000	2.2	0.0	0.0	0.002	38.8	0 12:08	5.222
605_(C-STRM)	0.000	1.9	0.0	0.0	0.002	32.7	0 12:08	4.929
606_(C-STRM)	0.000	2.0	0.0	0.0	0.002	33.6	0 12:07	4.189
619_(C-STRM)	0.000	2.3	0.0	0.0	0.002	39.4	0 12:07	4.192
622_(C-STRM)	0.000	2.5	0.0	0.0	0.002	43.9	0 12:07	3.965
626_(C-STRM)	0.000	7.0	0.0	0.0	0.001	15.8	0 12:26	0.141
627_(C-STRM)	0.000	6.7	0.0	0.0	0.001	25.3	0 12:09	0.291
629_(C-STRM)	0.000	2.6	0.0	0.0	0.002	43.0	0 12:08	3.420
630_(C-STRM)	0.000	2.9	0.0	0.0	0.002	40.6	0 12:06	3.289
630A_(C-STRM)	0.000	2.9	0.0	0.0	0.002	43.3	0 12:06	3.062
631_(C-STRM)	0.005	0.2	0.0	0.0	0.847	33.9	0 12:03	2.438
645_(C-STRM)	0.000	9.9	0.0	0.0	0.002	53.4	0 12:05	0.807
647_(C-STRM)	0.000	10.6	0.0	0.0	0.002	58.2	0 12:05	0.740
650_(C-STRM)	0.000	11.2	0.0	0.0	0.002	62.7	0 12:05	0.668
651_(C-STRM)	0.000	11.8	0.0	0.0	0.002	65.9	0 12:05	0.583
682_(C-STRM)	0.003	0.4	0.0	0.0	0.364	48.6	0 12:02	0.526
MTD_(C-STRM)	0.000	6.3	0.0	0.0	0.002	48.7	0 12:08	2.531
OVERFLOW_(C-STRM)	0.000	10.3	0.0	0.0	0.001	33.2	0 12:07	2.532
POND_(C-STRM)	10.095	27.9	0.0	0.0	26.018	71.8	0 13:53	0.353
S_525-MTD	0.002	0.3	0.0	0.0	0.231	40.3	0 12:04	0.396
S_528-525	0.002	0.3	0.0	0.0	0.192	33.0	0 12:02	0.416
S_532-528	0.001	0.2	0.0	0.0	0.089	30.4	0 12:01	0.233
S_536-532	0.001	0.3	0.0	0.0	0.193	45.1	0 12:00	0.542
S_540-536	0.001	0.3	0.0	0.0	0.082	40.2	0 12:00	0.274
S_541-540	0.004	0.3	0.0	0.0	0.440	37.5	0 12:02	0.736
S_604-603	0.002	0.3	0.0	25.0	0.296	34.2	0 12:01	0.575
S_605-604	0.008	0.3	0.0	26.3	0.912	39.9	0 12:03	1.176
S_619-606	0.001	0.3	0.0	25.1	0.190	44.1	0 12:00	0.509
S_622-619	0.006	0.4	0.0	26.7	0.561	43.1	0 12:02	0.730
S_622-619_2	0.002	0.3	0.0	25.1	0.228	46.0	0 12:00	0.583
S_627-630	0.000	0.2	0.0	28.2	0.070	27.6	0 12:00	0.209
S_629-622	0.001	0.3	0.0	26.5	0.143	32.5	0 12:01	0.323
SU2	0.003	0.5	0.0	0.0	0.164	32.7	0 12:26	0.141
SU5	0.002	0.3	0.0	0.0	0.143	28.6	0 12:12	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	47.69	0.003	0.114	0.218
OF3	96.73	0.049	1.080	8.113
ST4_108A_(P-Stm)	96.97	0.232	0.340	38.896
System	60.35	0.283	1.359	47.227

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.119	0 12:00	1.20	1.77	0.74
BDR-C2	CONDUIT	0.235	0 12:04	2.01	4.50	0.88
BDR-C3	CONDUIT	0.314	0 12:13	2.67	1.60	0.58
BDR-C4	CONDUIT	0.773	0 12:02	2.54	0.25	0.31
C1_1	CHANNEL	0.796	0 12:02	0.87	0.30	0.68
C1_17	CHANNEL	0.060	0 12:00	0.93	0.01	0.15
C1_3	CHANNEL	0.077	0 12:00	0.25	0.03	0.37
C1_30	CHANNEL	1.172	0 12:03	1.21	0.44	0.70
C1_4	CHANNEL	1.394	0 12:04	1.27	0.35	0.75
C14_1	CHANNEL	0.037	0 12:00	0.16	0.03	0.34
C14_2	CHANNEL	0.049	0 12:05	0.92	0.02	0.17
C14_4	CHANNEL	0.001	0 12:04	0.12	0.00	0.14
C14_5	CHANNEL	0.039	0 11:55	0.41	0.02	0.26
C15_1	CHANNEL	0.173	0 12:00	0.41	0.07	0.38
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.16
C2	CONDUIT	2.622	0 12:06	1.85	0.29	0.46
C20_1	CHANNEL	0.004	0 11:58	0.09	0.00	0.18
C20_2	CHANNEL	0.187	0 12:01	0.96	0.04	0.27
C20_3	CHANNEL	0.212	0 12:00	0.71	0.04	0.29
C20_4	CHANNEL	0.126	0 12:00	0.59	0.03	0.29
C20_5	CHANNEL	0.476	0 12:02	1.27	0.06	0.32
C20_7	CHANNEL	0.435	0 12:03	1.19	0.05	0.32
C23_5	CHANNEL	0.928	0 12:04	0.74	0.58	0.86
C23_7	CHANNEL	1.718	0 12:04	1.84	0.30	0.78
C3	CONDUIT	0.506	0 12:01	0.74	0.08	0.22
C4	CONDUIT	0.791	0 12:01	0.97	0.10	0.26
C4_1	CHANNEL	0.057	0 12:02	0.63	0.02	0.24
C4_2	CHANNEL	0.397	0 12:01	0.78	0.12	0.54
C4_3	CHANNEL	0.023	0 12:02	0.06	0.02	0.43
C4_4	CHANNEL	0.163	0 12:00	0.69	0.05	0.39
C4_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.16

C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.888	0	12:02	0.95	0.14	0.31
C5_1	CHANNEL	0.148	0	12:00	0.34	0.03	0.16
C5_10	CHANNEL	0.116	0	12:02	0.53	0.03	0.23
C5_11	CHANNEL	0.124	0	12:13	0.21	0.04	0.36
C5_12	CHANNEL	1.080	0	12:00	1.26	0.09	0.31
C5_13	CHANNEL	0.122	0	12:00	0.58	0.03	0.25
C5_14	CHANNEL	0.148	0	12:12	0.16	0.10	0.46
C5_15	CHANNEL	0.233	0	12:07	0.49	0.06	0.31
C5_16	CHANNEL	0.227	0	12:14	0.44	0.05	0.24
C5_17	CHANNEL	0.229	0	12:16	0.23	0.02	0.28
C5_19	CHANNEL	0.235	0	12:06	0.48	0.16	0.28
C5_2	CHANNEL	0.139	0	12:02	0.62	0.02	0.20
C5_20	CHANNEL	0.258	0	12:15	0.35	0.03	0.23
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.27
C5_23	CHANNEL	0.147	0	12:00	0.32	0.03	0.16
C5_3	CHANNEL	0.146	0	12:00	0.56	0.01	0.20
C5_4	CHANNEL	0.137	0	12:04	0.53	0.01	0.16
C5_5	CHANNEL	0.136	0	12:05	0.54	0.01	0.16
C5_6	CHANNEL	0.138	0	12:03	0.78	0.01	0.12
C5_7	CHANNEL	0.247	0	12:15	0.38	0.02	0.26
C5_8	CHANNEL	0.276	0	12:07	0.55	0.02	0.26
C5_9	CHANNEL	0.659	0	12:03	0.72	0.06	0.33
C6	CONDUIT	1.035	0	12:03	0.94	0.16	0.36
C7	CONDUIT	0.056	0	12:00	0.30	0.02	0.27
C9_1	CHANNEL	0.194	0	12:00	0.55	0.05	0.32
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.11
C9_2	CHANNEL	0.200	0	12:00	0.52	0.06	0.47
C9_5	CHANNEL	1.425	0	12:03	1.16	0.35	0.64
C9_6	CHANNEL	1.336	0	12:04	1.39	0.32	0.56
C9_7	CHANNEL	0.409	0	12:03	0.84	0.06	0.41
C-STRM-1_(1)_(1)_(C-STRM) CONDUIT		0.386	0	11:53	1.14	1.03	1.00
C-STRM-1_(1)_(C-STRM) CONDUIT		0.398	0	11:53	1.12	1.22	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.417	0	11:53	1.47	1.75	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.163	0	12:07	1.30	0.38	0.46
C-STRM-101_(C-STRM)	CONDUIT	0.163	0	12:07	2.20	0.21	0.31
C-STRM-102_(C-STRM)	CONDUIT	2.370	0	12:08	3.01	0.94	0.88
C-STRM-103_(C-STRM)	CONDUIT	0.668	0	12:17	1.25	1.21	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.740	0	12:17	1.38	1.33	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.807	0	12:17	1.51	1.45	1.00
C-STRM-2_(I)_(C-STRM) CONDUIT		0.528	0	12:10	1.63	0.94	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.536	0	11:52	1.74	0.95	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.141	0	12:26	1.79	0.49	0.75
C-STRM-21_(C-STRM)	CONDUIT	0.291	0	12:17	1.53	0.96	1.00
C-STRM-22_(1)_(C-STRM) CONDUIT		3.420	0	12:06	1.59	0.77	1.00
C-STRM-22_(C-STRM)	CONDUIT	3.289	0	12:06	2.42	1.20	1.00
C-STRM-26_(1)_(C-STRM) CONDUIT		0.337	0	12:07	0.96	1.00	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.239	0	12:06	0.67	0.71	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT		0.782	0	12:08	1.77	0.99	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT		0.622	0	12:11	1.74	1.05	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM) CONDUIT		0.613	0	12:11	1.71	1.03	1.00
C-STRM-3_(1)_(1)_(C-STRM) CONDUIT		0.603	0	12:10	1.68	1.01	1.00
C-STRM-3_(1)_(2)_(C-STRM) CONDUIT		0.595	0	12:10	1.66	1.00	1.00
C-STRM-3_(1)_(C-STRM) CONDUIT		0.589	0	12:10	1.72	1.04	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.583	0	12:17	1.18	1.05	1.00
C-STRM-34_(1)_(1)_(C-STRM) CONDUIT		0.214	0	11:52	1.21	1.25	1.00
C-STRM-34_(1)_(C-STRM) CONDUIT		0.217	0	11:47	1.20	1.26	1.00
C-STRM-35_(1)_(C-STRM) CONDUIT		0.242	0	12:06	1.13	0.99	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.204	0	11:50	0.93	0.83	1.00
C-STRM-4_(1)_(C-STRM) CONDUIT		0.933	0	12:11	2.23	1.08	0.90
C-STRM-4_(C-STRM)	CONDUIT	0.777	0	12:09	1.76	0.99	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.396	0	12:23	0.85	0.71	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.537	0	12:22	1.01	0.97	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.738	0	12:20	1.16	1.05	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.848	0	12:21	1.14	0.98	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.060	0	12:20	1.42	1.22	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.995	0	12:11	1.33	1.14	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.120	0	11:48	0.98	0.94	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.156	0	12:10	0.72	0.94	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	12:03	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	4.192	0	12:06	1.65	0.82	1.00
C-STRM-75_(C-STRM)	CONDUIT	4.189	0	12:07	1.65	0.81	1.00
C-STRM-76_(C-STRM)	CONDUIT	1.271	0	12:20	1.70	1.27	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.531	0	12:08	3.00	1.31	0.94
C-STRM-78_(C-STRM)	CONDUIT	1.317	0	12:07	1.76	1.08	1.00
C-STRM-79_(1)_(C-STRM) CONDUIT		5.222	0	12:08	2.06	0.83	0.99
C-STRM-79_(C-STRM)	CONDUIT	4.929	0	12:07	1.94	0.86	1.00
C-STRM-8_(1)_(C-STRM) CONDUIT		0.080	0	12:18	0.45	0.42	1.00
C-STRM-8_(C-STRM)	CONDUIT	0.035	0	11:57	0.32	0.27	1.00
C-STRM-80_(C-STRM)	CONDUIT	5.222	0	12:08	2.08	1.18	0.96
C-STRM-81_(C-STRM)	CONDUIT	5.238	0	12:08	2.37	1.18	0.81
C-STRM-82_(C-STRM)	CONDUIT	5.238	0	12:08	2.39	1.17	0.65
C-STRM-83_(1)_(C-STRM) CONDUIT		3.062	0	12:05	2.13	1.12	1.00
C-STRM-84_(C-STRM)	CONDUIT	3.965	0	12:06	1.63	0.77	1.00
CVR-C2	CONDUIT	0.137	0	12:04	2.23	0.51	0.41
CVR-C3	CONDUIT	0.256	0	12:10	3.02	1.57	0.67
CVR-C4	CONDUIT	0.659	0	12:03	2.61	0.22	0.27
ST4-Pipe_-_(99)_(P-Stm) CONDUIT		0.340	0	13:53	1.28	0.35	1.00
W1	CHANNEL	4.864	0	12:07	1.16	0.02	0.06
OR1	ORIFICE	0.340	0	13:53			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.296	0	12:00			0.22
W11	WEIR	0.129	0	11:59			0.13
W12	WEIR	0.211	0	12:00			0.16
W13	WEIR	0.193	0	12:00			0.25
W14	WEIR	0.180	0	12:00			0.16
W15	WEIR	0.402	0	12:01			0.29
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.106	0	12:00			0.10
W4	WEIR	0.322	0	12:00			0.23
W5	WEIR	0.265	0	12:00			0.20
W6	WEIR	0.391	0	12:03			0.25
W7	WEIR	0.267	0	12:01			0.18
W8	WEIR	0.368	0	12:02			0.22
W9	WEIR	0.164	0	12:00			0.15
C1	DUMMY	0.249	0	11:47			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	11:47			
C-STRM-14_(1)_(C-STRM) DUMMY		0.743	0	11:47			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	11:46			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	11:47			
C-STRM-44_(1)_(C-STRM) DUMMY		0.203	0	11:47			
C-STRM-45_(1)_(C-STRM) DUMMY		0.233	0	11:47			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	11:47			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	11:49			
C-STRM-96_(1)_(C-STRM) DUMMY		0.246	0	11:47			
C-STRM-97_(1)_(C-STRM) DUMMY		0.104	0	11:47			
C-STRM-98_(1)_(C-STRM) DUMMY		0.205	0	11:47			
OL1	DUMMY	0.097	0	11:48			
OL10	DUMMY	0.026	0	02:10			
OL11	DUMMY	0.046	0	11:46			
OL12	DUMMY	0.101	0	11:46			
OL13	DUMMY	0.084	0	11:46			
OL14	DUMMY	0.121	0	11:46			
OL15	DUMMY	0.088	0	11:46			
OL16	DUMMY	0.342	0	11:46			
OL17	DUMMY	0.215	0	11:46			
OL18	DUMMY	0.059	0	11:46			
OL19	DUMMY	0.238	0	11:46			
OL2	DUMMY	0.141	0	11:54			
OL20	DUMMY	0.068	0	11:46			
OL21	DUMMY	0.060	0	11:46			
OL22	DUMMY	0.184	0	12:12			
OL3	DUMMY	0.134	0	11:47			
OL4	DUMMY	0.110	0	11:47			
OL5	DUMMY	0.046	0	12:03			
OL6	DUMMY	0.029	0	11:45			
OL7	DUMMY	0.034	0	11:47			
OL8	DUMMY	0.018	0	11:46			
OL9	DUMMY	0.214	0	11:46			

****
Flow Classification Summary
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Conduit	Adjusted /Actual	Fraction of Time in Flow Class Up	Down	Sub	Sup	Up	Down	Norm	Inlet
BDR-C1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.44
BDR-C2	1.00	0.03	0.00	0.00	0.97	0.01	0.00	0.00	0.33
BDR-C3	1.00	0.03	0.00	0.00	0.39	0.58	0.00	0.00	0.01
BDR-C4	1.00	0.03	0.00	0.00	0.33	0.64	0.00	0.00	0.66
C1_1	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75
C1_17	1.00	0.52	0.00	0.00	0.00	0.00	0.00	0.48	0.00
C1_3	1.00	0.50	0.02	0.00	0.48	0.00	0.00	0.00	0.75
C1_30	1.00	0.25	0.00	0.00	0.34	0.42	0.00	0.00	0.11
C1_4	1.00	0.24	0.01	0.00	0.75	0.01	0.00	0.00	0.75
C14_1	1.00	0.51	0.02	0.00	0.47	0.00	0.00	0.00	0.77
C14_2	1.00	0.03	0.22	0.00	0.57	0.18	0.00	0.00	0.00
C14_4	1.00	0.52	0.01	0.00	0.47	0.00	0.00	0.00	0.77
C14_5	1.00	0.52	0.00	0.00	0.46	0.02	0.00	0.00	0.00
C15_1	1.00	0.50	0.01	0.00	0.49	0.00	0.00	0.00	0.75
C15_2	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.00
C20_1	1.00	0.03	0.22	0.00	0.67	0.08	0.00	0.00	0.00
C20_2	1.00	0.51	0.01	0.00	0.45	0.03	0.00	0.00	0.76
C20_3	1.00	0.51	0.01	0.00	0.45	0.03	0.00	0.00	0.01
C20_4	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75
C20_5	1.00	0.03	0.21	0.00	0.61	0.15	0.00	0.00	0.01
C20_7	1.00	0.52	0.00	0.00	0.44	0.04	0.00	0.00	0.02
C23_5	1.00	0.25	0.00	0.00	0.69	0.06	0.00	0.00	0.00
C23_7	1.00	0.24	0.00	0.00	0.67	0.09	0.00	0.00	0.08
C3	1.00	0.86	0.04	0.00	0.09	0.00	0.00	0.00	0.75
C4	1.00	0.80	0.06	0.00	0.14	0.00	0.00	0.00	0.75
C4_1	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75
C4_2	1.00	0.24	0.00	0.00	0.76	0.00	0.00	0.00	0.75
C4_3	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75
C4_4	1.00	0.51	0.01	0.00	0.47	0.01	0.00	0.00	0.75
C4_5	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.74	0.06	0.00	0.19	0.00	0.00	0.00	0.75
C5_1	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.52
C5_10	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.92
C5_11	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.95
C5_12	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00
C5_13	1.00	0.03	0.00	0.00	0.59	0.38	0.00	0.00	0.01
C5_14	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.32
C5_15	1.00	0.03	0.00	0.00	0.95	0.01	0.00	0.00	0.93
C5_16	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00
C5_17	1.00	0.03	0.03	0.00	0.94	0.00	0.00	0.00	0.92
C5_19	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.36
C5_2	1.00	0.05	0.00	0.00	0.71	0.25	0.00	0.00	0.00
C5_20	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00
C5_21	1.00	0.03	0.97	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.03	0.00	0.00	0.86	0.10	0.00	0.00	0.64
C5_3	1.00	0.04	0.00	0.00	0.96	0.01	0.00	0.00	0.94
C5_4	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.93
C5_5	1.00	0.06	0.00	0.00	0.93	0.01	0.00	0.00	0.06
C5_6	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.61
C5_7	1.00	0.06	0.00	0.00	0.91	0.03	0.00	0.00	0.91
C5_8	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.90
C5_9	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.97
C6	1.00	0.25	0.49	0.00	0.26	0.00	0.00	0.00	0.75
C7	1.00	0.52	0.01	0.00	0.48	0.00	0.00	0.00	0.76
C9_1	1.00	0.51	0.00	0.00	0.47	0.02	0.00	0.00	0.01
C9_11	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.50	0.03	0.00	0.47	0.01	0.00	0.00	0.00
C9_5	1.00	0.03	0.21	0.00	0.08	0.68	0.00	0.00	0.01
C9_6	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.74
C9_7	1.00	0.03	0.49	0.00	0.47	0.01	0.00	0.00	0.75
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.08
C-STRM-1_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.41
C-STRM-1_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00
C-STRM-100_(C-STRM)	1.00	0.80	0.00	0.00	0.17	0.00	0.00	0.03	0.63
C-STRM-101_(C-STRM)	1.00	0.75	0.05	0.00	0.19	0.00	0.00	0.01	0.66
C-STRM-102_(C-STRM)	1.00	0.03	0.00	0.00	0.78	0.19	0.00	0.00	0.07
C-STRM-103_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.69
C-STRM-104_(C-STRM)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.93
C-STRM-105_(C-STRM)	1.00	0.04	0.00	0.00	0.27	0.00	0.00	0.69	0.01
C-STRM-2_(I)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.86
C-STRM-2_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.01	0.00	0.01	0.38
C-STRM-20_(C-STRM)	1.00	0.22	0.22	0.00	0.29	0.01	0.00	0.74	0.00
C-STRM-21_(C-STRM)	1.00	0.24	0.00	0.00	0.01	0.00	0.00	0.75	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00
C-STRM-26_(C-STRM)	1.00	0.03	0.02	0.00	0.95	0.00	0.00	0.00	0.94
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.90	0.05	0.00	0.01	0.33
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.01	0.00	0.00	0.94	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.04	0.04	0.01	0.00	0.95	0.00	0.00	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.01	0.31
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.20
C-STRM-3_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.37
C-STRM-33_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.72
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.95	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.03	0.04	0.00	0.93	0.00	0.00	0.00	0.94
C-STRM-35_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00
C-STRM-35_(C-STRM)	1.00	0.03	0.02	0.00	0.94	0.00	0.00	0.00	0.94
C-STRM-4_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00
C-STRM-4_(C-STRM)	1.00	0.03	0.01	0.00	0.91	0.04	0.00	0.00	0.52
C-STRM-49_(C-STRM)	1.00	0.03	0.26	0.00	0.71	0.00	0.00	0.00	0.91
C-STRM-50_(C-STRM)	1.00	0.03	0.00	0.00	0.04	0.00	0.00	0.93	0.00
C-STRM-51_(C-STRM)	1.00	0.03	0.00	0.00	0.03	0.00	0.00	0.94	0.00
C-STRM-52_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.76
C-STRM-53_(C-STRM)	1.00	0.03	0.12	0.00	0.85	0.00	0.00	0.00	0.60
C-STRM-57_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.39
C-STRM-62_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00
C-STRM-63_(C-STRM)	1.00	0.04	0.00	0.00	0.07	0.00	0.00	0.89	0.03
C-STRM-64_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.96	0.03
C-STRM-74_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.49
C-STRM-75_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.03	0.00	0.00	0.46	0.00	0.00	0.51	0.09
C-STRM-77_(C-STRM)	1.00	0.03	0.00	0.00	0.78	0.19	0.00	0.00	0.26
C-STRM-78_(C-STRM)	1.00	0.03	0.00	0.00	0.44	0.00	0.00	0.53	0.05
C-STRM-79_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.80
C-STRM-79_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.24	0.01	0.00	0.57	0.37	0.00	0.74	0.01
C-STRM-8_(C-STRM)	1.00	0.25	0.00	0.00	0.01	0.00	0.00	0.74	0.00
C-STRM-80_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.88
C-STRM-81_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.46
C-STRM-82_(C-STRM)	1.00	0.03	0.00	0.00	0.16	0.00	0.00	0.81	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.48
C-STRM-84_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.90
CVR-C2	1.00	0.06	0.01	0.00	0.57	0.37	0.00	0.00	0.78
CVR-C3	1.00	0.08	0.00	0.00	0.38	0.55	0.00	0.00	0.04
CVR-C4	1.00	0.03	0.00	0.00	0.39	0.58	0.00	0.00	0.12
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.03	0.00	0.00	0.80	0.00	0.00	0.17	0.00
W1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.20	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
BDR-C1	0.01	0.13	0.01	1.17	0.01
BDR-C2	0.01	0.16	0.01	2.17	0.01
BDR-C3	0.01	0.01	0.01	0.48	0.01
C-STRM-1_(1)_(1)_(C-STRM)	0.40	0.40	0.41	0.02	0.29
C-STRM-1_(1)_(C-STRM)	0.39	0.44	0.40	0.35	0.29
C-STRM-1_(C-STRM)	0.43	0.48	0.44	0.41	0.33
C-STRM-100_(C-STRM)	0.56	0.56	0.56	0.28	0.54
C-STRM-104_(C-STRM)	0.56	0.56	0.57	0.37	0.38
C-STRM-105_(C-STRM)	0.54	0.57	0.55	0.51	0.52
C-STRM-2_(I)_(C-STRM)	0.44	0.44	0.47	0.01	0.01
C-STRM-2_(C-STRM)	0.41	0.41	0.44	0.01	0.01
C-STRM-20_(C-STRM)	0.01	0.01	0.22	0.01	0.01
C-STRM-21_(C-STRM)	0.22	0.22	0.29	0.01	0.01
C-STRM-22_(1)_(C-STRM)	0.28	0.28	0.31	0.01	0.01

C-STRM-22_(C-STRM)	0.27	0.29	0.28	0.45	0.27
C-STRM-26_(1)_(C-STRM)	0.64	0.64	0.65	0.01	0.19
C-STRM-26_(C-STRM)	0.61	0.61	0.64	0.01	0.01
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	0.41	0.41	0.44	0.01	0.33
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.41	0.43	0.41	0.08	0.38
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.43	0.47	0.43	0.06	0.43
C-STRM-3_(1)_(1)_(C-STRM)	0.47	0.50	0.47	0.02	0.47
C-STRM-3_(1)_(2)_(C-STRM)	0.47	0.47	0.50	0.11	0.13
C-STRM-3_(1)_(C-STRM)	0.47	0.47	0.47	0.10	0.30
C-STRM-33_(C-STRM)	0.55	0.55	0.56	0.02	0.06
C-STRM-34_(1)_(1)_(C-STRM)	0.45	0.45	0.52	0.30	0.22
C-STRM-34_(1)_(C-STRM)	0.35	0.35	0.45	0.33	0.22
C-STRM-35_(1)_(C-STRM)	0.58	0.58	0.61	0.01	0.01
C-STRM-35_(C-STRM)	0.52	0.52	0.58	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.49	0.01	0.38	0.01
C-STRM-4_(C-STRM)	0.44	0.44	0.49	0.01	0.31
C-STRM-49_(C-STRM)	0.66	0.66	0.66	0.01	0.01
C-STRM-50_(C-STRM)	0.66	0.66	0.67	0.01	0.51
C-STRM-51_(C-STRM)	0.67	0.67	0.67	0.35	0.67
C-STRM-52_(C-STRM)	0.67	0.67	0.67	0.01	0.55
C-STRM-53_(C-STRM)	0.67	0.67	0.67	0.54	0.65
C-STRM-57_(C-STRM)	0.65	0.65	0.65	0.42	0.63
C-STRM-62_(C-STRM)	0.41	0.41	0.45	0.01	0.01
C-STRM-63_(C-STRM)	0.45	0.45	0.48	0.01	0.01
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.19	0.01
C-STRM-74_(C-STRM)	0.31	0.35	0.31	0.01	0.31
C-STRM-75_(C-STRM)	0.25	0.31	0.25	0.01	0.25
C-STRM-76_(C-STRM)	0.65	0.67	0.65	0.59	0.65
C-STRM-77_(C-STRM)	0.01	0.66	0.01	0.59	0.01
C-STRM-78_(C-STRM)	0.65	0.65	0.65	0.21	0.64
C-STRM-79_(1)_(C-STRM)	0.01	0.33	0.01	0.01	0.01
C-STRM-79_(C-STRM)	0.25	0.25	0.33	0.01	0.01
C-STRM-8_(1)_(C-STRM)	0.31	0.31	0.41	0.01	0.01
C-STRM-8_(C-STRM)	0.24	0.24	0.31	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.45	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.46	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.46	0.01
C-STRM-83_(1)_(C-STRM)	0.29	0.29	0.29	0.45	0.29
C-STRM-84_(C-STRM)	0.31	0.31	0.35	0.01	0.01
CVR-C3	0.01	0.01	0.01	0.43	0.01
ST4-Pipe_-_(99)_(P-Stm)	0.19	0.19	0.31	0.01	0.01

Analysis begun on: Thu Apr 9 12:14:10 2026
Analysis ended on: Thu Apr 9 12:14:39 2026
Total elapsed time: 00:00:29

Post-Development 1:100CC year 24-hour SCS Event

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  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
  Name                Data Source                Data       Recording
                                                 Type       Interval
  ----------------------------------------------------------------
  24SCS100            24SCS100                   INTENSITY   15 min.
  6SCS050             6SCS050                    INTENSITY   15 min.
  Rainfall            SCS_24h_100CC              INTENSITY   15 min.


  *********************
  Subcatchment Summary
  *********************
  Name                Area     Width   %Imperv    %Slope Rain Gage           Outlet
  ----------------------------------------------------------------------------------
  A15                 3.46     13.10     18.98    0.5000 Rainfall            EXD_12
  A18                 0.59    338.21     39.12    0.5000 Rainfall            EXD_25
  A19                 1.11    332.78     22.32    0.5000 Rainfall            EXD_20
  A20                 4.83    279.76      8.37    1.5000 Rainfall            EXD_15
  NULL3               0.57    312.75     83.33    1.4500 Rainfall            EXD_27
  S1                  6.52   1467.98     66.38    2.0000 Rainfall            S_605-604
  S1_1                0.12    118.05     71.43    2.0000 Rainfall            J19
  S1_2                0.12    147.72     71.43    2.0000 Rainfall            J22
  S1_4                0.19    154.58     71.43    2.0000 Rainfall            J21
  S1_5                0.11    103.57     71.43    2.0000 Rainfall            J20
  S10_1               1.84    414.84     64.29    2.0000 Rainfall            S_619-606
  S10_2               2.12    478.11     64.29    2.0000 Rainfall            S_622-
619_2
  S10_4               0.73    163.42     64.29    2.0000 Rainfall            S_627-630
  S10_5               1.26    283.52     64.29    2.0000 Rainfall            S_629-622
  S11                 3.30    287.00      0.00    2.0000 Rainfall            SU2
  S12                 0.44    334.74     71.43    2.0000 Rainfall            J6
  S14_1               0.60    367.10     71.43    2.0000 Rainfall            J28
  S14_3               1.06    381.29     71.43    2.0000 Rainfall            J58
  S14_4               0.30    171.63     71.43    2.0000 Rainfall            J44
  S14_5               1.69    659.05     71.43    2.0000 Rainfall            J29
  S14_6               0.29    153.64     71.43    2.0000 Rainfall            J59
  S14_7               1.17    557.97     71.43    2.0000 Rainfall            J61
  S14_8               0.34    171.63     71.43    2.0000 Rainfall            J48
  S15                 1.64    368.26     64.29    2.0000 Rainfall            S_525-MTD
  S16                 1.47     16.60    100.00    0.5000 Rainfall            EXD_10
  S17                 6.26    202.00      3.33    0.5000 Rainfall            EXD_7
  S18_2               3.35    754.05     64.29    2.0000 Rainfall            S_541-540
  S18_3               1.66    372.76     64.29    2.0000 Rainfall            S_528-525
  S18_4               0.88    197.06     64.29    2.0000 Rainfall            S_540-536
  S18_5               1.83    412.02     71.43    2.0000 Rainfall            S_536-532
  S18_6               0.84    188.96     64.29    2.0000 Rainfall            S_532-528
  S19                 1.05    441.38     71.43    2.0000 Rainfall            J19
  S2                  3.72    837.17     66.87    2.0000 Rainfall            S_622-619
  S20_1               0.50    441.34     71.43    2.0000 Rainfall            J40
  S20_2               0.23    441.34     71.43    2.0000 Rainfall            J36
  S3                  2.48    557.29     64.29    2.0000 Rainfall            S_604-603
  S32                 0.41    327.12     71.43    2.0000 Rainfall            J46
  S36                 1.82     21.00    100.00    0.5000 Rainfall            EXD_10
  S4                 13.22    348.80     85.71    2.0000 Rainfall            631_(C-
STRM)
  S5                  3.19    291.50     85.71    1.0000 Rainfall            682_(C-
STRM)
  S6                  0.34    260.95     57.14    2.0000 Rainfall            OF2
  S7                  3.99    402.80     85.71    0.5000 Rainfall            POND_(C-
STRM)
  S8                  1.92    119.90     35.71    2.0000 Rainfall            SU5


  ************
  Node Summary
  ************
  Name                Type                Invert      Max.    Ponded    External
                                           Elev.     Depth      Area    Inflow
  ----------------------------------------------------------------------------
  EXD_1               JUNCTION            104.39      1.51       0.0
  EXD_10              JUNCTION             98.65      1.20       0.0
  EXD_11              JUNCTION             98.50      1.20       0.0
  EXD_12              JUNCTION             98.31      1.20       0.0
  EXD_13              JUNCTION            104.32      1.10       0.0
  EXD_14              JUNCTION            102.49      0.80       0.0
  EXD_15              JUNCTION            100.27      0.80       0.0
  EXD_16              JUNCTION            100.20      0.80       0.0
  EXD_17              JUNCTION             99.89      0.80       0.0
  EXD_18              JUNCTION             99.40      0.84       0.0
  EXD_19              JUNCTION             99.19      0.88       0.0
  EXD_2               JUNCTION            103.47      1.93       0.0
  EXD_20              JUNCTION             99.19      0.88       0.0
  EXD_21              JUNCTION             99.18      0.88       0.0
  EXD_22              JUNCTION             99.14      0.88       0.0
  EXD_23              JUNCTION             98.75      1.14       0.0
  EXD_24              JUNCTION             98.67      1.14       0.0
  EXD_25              JUNCTION             98.52      1.13       0.0
  EXD_26              JUNCTION             98.48      1.13       0.0
  EXD_27              JUNCTION             98.17      1.20       0.0
  EXD_3               JUNCTION            103.19      1.41       0.0
  EXD_4               JUNCTION            102.64      1.20       0.0
  EXD_5               JUNCTION            102.50      1.20       0.0
  EXD_6               JUNCTION            102.32      1.08       0.0
  EXD_7               JUNCTION            101.50      1.06       0.0
  EXD_8               JUNCTION            100.48      1.06       0.0
  EXD_9               JUNCTION            100.39      1.06       0.0
  J10                 JUNCTION            103.60      0.50       0.0
  J11                 JUNCTION            103.50      0.50       0.0
  J12                 JUNCTION            103.40      0.50       0.0
  J13                 JUNCTION            103.30      0.50       0.0
  J17                 JUNCTION            104.37      1.04       0.0
  J19                 JUNCTION            105.40      0.50       0.0
  J20                 JUNCTION            105.45      0.50       0.0
  J21                 JUNCTION            105.55      0.50       0.0
  J22                 JUNCTION            105.70      0.50       0.0
  J23                 JUNCTION            106.00      0.50       0.0
  J24                 JUNCTION            106.20      0.50       0.0
  J25                 JUNCTION            105.30      0.50       0.0
  J26                 JUNCTION            105.70      0.50       0.0
  J28                 JUNCTION            109.00      0.50       0.0
  J29                 JUNCTION            108.80      0.50       0.0
  J32                 JUNCTION            106.00      0.50       0.0
  J36                 JUNCTION            104.70      0.50       0.0
  J39                 JUNCTION            104.60      0.50       0.0
  J40                 JUNCTION            104.45      0.50       0.0
  J41                 JUNCTION            103.20      0.50       0.0
  J43                 JUNCTION            104.20      0.50       0.0
  J44                 JUNCTION            104.50      0.50       0.0
  J46                 JUNCTION            104.60      0.50       0.0
  J47                 JUNCTION            105.10      0.50       0.0
  J48                 JUNCTION            105.75      0.50       0.0
  J51                 JUNCTION            106.75      0.50       0.0
  J52                 JUNCTION            109.75      0.50       0.0
  J53                 JUNCTION            109.00      0.50       0.0
  J56                 JUNCTION            109.10      0.50       0.0
  J57                 JUNCTION            108.47      0.50       0.0
  J58                 JUNCTION            108.40      0.50       0.0
  J59                 JUNCTION            108.00      0.50       0.0
  J6                  JUNCTION            109.83      0.30       0.0
  J61                 JUNCTION            107.00      0.50       0.0
  J62                 JUNCTION            106.50      0.50       0.0
  J74                 JUNCTION             98.45      0.90       0.0
  J9                  JUNCTION            103.70      0.50       0.0
  OF1                 OUTFALL             100.80      0.00       0.0
  OF2                 OUTFALL               0.00      0.00       0.0
  OF3                 OUTFALL              98.00      1.06       0.0
  ST4_108A_(P-Stm)    OUTFALL              98.02      1.19       0.0
  500_(C-STRM)        STORAGE             100.31      2.84       0.0
  500A_(C-STRM)       STORAGE             100.10      1.05       0.0
  502_(C-STRM)        STORAGE             100.54      3.70       0.0
  503_(C-STRM)        STORAGE             100.59      3.92       0.0
  504_(C-STRM)        STORAGE             103.04      2.70       0.0
  505_(C-STRM)        STORAGE             103.45      3.26       0.0
  506_(C-STRM)        STORAGE             103.82      3.16       0.0
  507_(C-STRM)        STORAGE             104.14      3.10       0.0
  508_(C-STRM)        STORAGE             104.37      3.12       0.0
  509_(C-STRM)        STORAGE             104.60      3.14       0.0
  510_(C-STRM)        STORAGE             104.85      3.09       0.0
  511_(C-STRM)        STORAGE             104.91      3.08       0.0
  512_(C-STRM)        STORAGE             105.11      3.12       0.0
  513_(C-STRM)        STORAGE             105.24      3.14       0.0
  514_(C-STRM)        STORAGE             105.59      3.16       0.0
  515_(C-STRM)        STORAGE             105.85      3.24       0.0
  516_(C-STRM)        STORAGE             105.46      3.06       0.0
  517_(C-STRM)        STORAGE             105.62      3.03       0.0
  518_(C-STRM)        STORAGE             105.85      2.92       0.0
  519_(C-STRM)        STORAGE             106.08      2.82       0.0
  520_(C-STRM)        STORAGE             106.34      2.66       0.0
  522_(C-STRM)        STORAGE             104.31      3.00       0.0
  525_(C-STRM)        STORAGE             100.61      2.69       0.0
  528_(C-STRM)        STORAGE             100.72      2.68       0.0
  532_(C-STRM)        STORAGE             100.83      2.67       0.0
  536_(C-STRM)        STORAGE             100.98      2.63       0.0
  540_(C-STRM)        STORAGE             100.86      2.85       0.0
  541_(C-STRM)        STORAGE             100.93      2.89       0.0
  551_(C-STRM)        STORAGE             100.65      3.78       0.0
  552_(C-STRM)        STORAGE             100.74      3.88       0.0
  553_(C-STRM)        STORAGE             100.93      3.78       0.0
  554_(C-STRM)        STORAGE             101.05      3.89       0.0
  555_(C-STRM)        STORAGE             101.25      3.93       0.0
  556_(C-STRM)        STORAGE             101.37      3.89       0.0
  601_(C-STRM)        STORAGE             100.45      4.43       0.0
  602_(C-STRM)        STORAGE             100.52      4.11       0.0
  603_(C-STRM)        STORAGE             100.63      3.89       0.0
  604_(C-STRM)        STORAGE             100.88      4.87       0.0
  605_(C-STRM)        STORAGE             101.09      5.63       0.0
  606_(C-STRM)        STORAGE             101.24      5.75       0.0
  619_(C-STRM)        STORAGE             101.38      5.14       0.0
  622_(C-STRM)        STORAGE             101.53      4.49       0.0
  626_(C-STRM)        STORAGE             103.94      3.33       0.0
  627_(C-STRM)        STORAGE             103.13      3.58       0.0
  629_(C-STRM)        STORAGE             101.65      4.46       0.0
  630_(C-STRM)        STORAGE             102.08      4.12       0.0
  630A_(C-STRM)       STORAGE             102.12      3.90       0.0
  631_(C-STRM)        STORAGE             106.00      0.50       0.0
  645_(C-STRM)        STORAGE             102.03      3.69       0.0
  647_(C-STRM)        STORAGE             102.14      3.40       0.0
  650_(C-STRM)        STORAGE             102.22      3.19       0.0
  651_(C-STRM)        STORAGE             102.31      3.03       0.0
  682_(C-STRM)        STORAGE             105.40      0.50       0.0
  MTD_(C-STRM)        STORAGE             100.37      3.19       0.0
  OVERFLOW_(C-STRM)   STORAGE             100.18      2.76       0.0
  POND_(C-STRM)       STORAGE              98.45      2.65       0.0    Yes
  S_525-MTD           STORAGE             103.30      0.50       0.0
  S_528-525           STORAGE             103.41      0.50       0.0
  S_532-528           STORAGE             103.50      0.50       0.0
  S_536-532           STORAGE             103.60      0.50       0.0
  S_540-536           STORAGE             103.71      0.50       0.0
  S_541-540           STORAGE             103.81      0.50       0.0
  S_604-603           STORAGE             105.50      0.50       0.0
  S_605-604           STORAGE             106.71      0.50       0.0
  S_619-606           STORAGE             106.50      0.50       0.0
  S_622-619           STORAGE             105.70      0.50       0.0
  S_622-619_2         STORAGE             106.50      0.50       0.0
  S_627-630           STORAGE             106.70      0.50       0.0
  S_629-622           STORAGE             106.01      0.50       0.0
  SU2                 STORAGE             106.75      0.50       0.0
  SU5                 STORAGE             104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                From Node           To Node             Type           Length    %Slope
Roughness
  ----------------------------------------------------------------------------------------
-
  BDR-C1              EXD_15              EXD_16              CONDUIT          17.7    0.3844
0.0250
  BDR-C2              EXD_20              EXD_21              CONDUIT           7.9    0.0632
0.0130
  BDR-C3              EXD_25              EXD_26              CONDUIT          14.2    0.2683
0.0130
  BDR-C4              EXD_12              EXD_27              CONDUIT          23.0    0.6077
0.0130
  C1_1                J32                 J26                 CONDUIT          71.8    0.4181
0.0130
  C1_17               J6                  EXD_1               CONDUIT         171.9    2.4608
0.0130
  C1_3                J28                 J29                 CONDUIT         183.6    0.1090
0.0130
  C1_30               J26                 J25                 CONDUIT          93.1    0.4296
0.0130
  C1_4                J25                 J39                 CONDUIT          75.0    0.9329
0.0130
  C14_1               J20                 J19                 CONDUIT          59.0    0.0847
0.0130
  C14_2               J23                 J22                 CONDUIT          73.9    0.4062
0.0130
  C14_4               J22                 J21                 CONDUIT          77.3    0.1941
0.0130
  C14_5               J21                 J20                 CONDUIT          51.8    0.1931
0.0130
  C15_1               J29                 J58                 CONDUIT         329.5    0.1214
0.0130
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C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					

OR1	POND_(C-STRM)	J74	ORIFICE
OR2	POND_(C-STRM)	J74	ORIFICE
W10	S_536-532	J10	WEIR
W11	S_532-528	J11	WEIR
W12	S_528-525	J12	WEIR
W13	S_525-MTD	J13	WEIR
W14	S_629-622	J32	WEIR
W15	S_622-619	J26	WEIR
W2	POND_(C-STRM)	OF1	WEIR
W3	S_627-630	J24	WEIR
W4	S_622-619_2	J32	WEIR
W5	S_619-606	J62	WEIR
W6	S_605-604	J51	WEIR
W7	S_604-603	J25	WEIR
W8	S_541-540	J9	WEIR
W9	S_540-536	J9	WEIR
C1	S_622-619_2	622_(C-STRM)	OUTLET
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET
OL1	S_627-630	627_(C-STRM)	OUTLET
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET
OL11	J36	553_(C-STRM)	OUTLET
OL12	J40	551_(C-STRM)	OUTLET
OL13	J46	602_(C-STRM)	OUTLET
OL14	J28	520_(C-STRM)	OUTLET
OL15	J6	522_(C-STRM)	OUTLET
OL16	J29	518_(C-STRM)	OUTLET
OL17	J58	513_(C-STRM)	OUTLET
OL18	J59	511_(C-STRM)	OUTLET
OL19	J61	506_(C-STRM)	OUTLET
OL2	SU2	626_(C-STRM)	OUTLET
OL20	J48	504_(C-STRM)	OUTLET
OL21	J44	503_(C-STRM)	OUTLET
OL22	SU5	504_(C-STRM)	OUTLET
OL3	S_629-622	629_(C-STRM)	OUTLET
OL4	S_540-536	540_(C-STRM)	OUTLET
OL5	J22	645_(C-STRM)	OUTLET
OL6	J21	647_(C-STRM)	OUTLET
OL7	J20	650_(C-STRM)	OUTLET
OL8	J19	651_(C-STRM)	OUTLET
OL9	J19	556_(C-STRM)	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_8m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47

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C4_2                ROW_18m              0.25     2.05     0.13    18.00        1     3.40
C4_3                ROW_18m              0.25     2.05     0.13    18.00        1     1.43
C4_4                ROW_18m              0.25     2.05     0.13    18.00        1     3.33
C4_5                ROW_18m              0.25     2.05     0.13    18.00        1     4.49
C4_7                ROW_18m              0.25     2.05     0.13    18.00        1     5.90
C5                  RECT_OPEN            0.50     3.10     0.43     6.19        1     6.57
C5_1                Upstream1            1.04     5.92     0.43    13.00        1     4.37
C5_10               Barnsdale_UPST1      0.80     3.11     0.29    10.00        1     3.43
C5_11               Barnsdale_UPST3      0.84     3.40     0.32    10.00        1     2.77
C5_12               Upstream6            1.06     6.96     0.40    17.00        1    11.86
C5_13               Barnsdale_UPST2      0.77     3.01     0.30     9.50        1     3.74
C5_14               Barnsdale_UPST4      0.88     3.22     0.34     8.50        1     1.49
C5_15               Barnsdale_UPST5      0.80     3.10     0.32     9.00        1     3.61
C5_16               Barnsdale_UPST6      1.14     6.38     0.46    13.00        1     4.25
C5_17               Barnsdale_UPST7      1.13     7.59     0.53    13.50        1    10.23
C5_19               Barnsdale_UPST4      0.88     3.22     0.34     8.50        1     1.50
C5_2                Upstream3            1.07     5.77     0.42    13.00        1     6.98
C5_20               Barnsdale_UPST7      1.13     7.59     0.53    13.50        1    10.24
C5_21               Barnsdale_UPST1      0.80     3.11     0.29    10.00        1     6.89
C5_23               Upstream1            1.04     5.92     0.43    13.00        1     4.86
C5_3                Upstream2            1.10     6.55     0.44    14.00        1    13.83
C5_4                Upstream4            1.20     7.30     0.50    13.50        1    17.41
C5_5                Upstream5            1.06     6.46     0.42    15.00        1    12.79
C5_6                Upstream4            1.20     7.30     0.50    13.50        1    17.40
C5_7                Upstream6            1.06     6.96     0.40    17.00        1    11.85
C5_8                Upstream6            1.06     6.96     0.40    17.00        1    11.85
C5_9                Upstream6            1.06     6.96     0.40    17.00        1    11.85
C6                  RECT_OPEN            0.50     3.10     0.43     6.19        1     6.58
C7                  ROW_24m              0.32     3.34     0.14    24.00        1     2.64
C9_1                ROW_24m              0.32     3.34     0.14    24.00        1     3.94
C9_11               ROW_24m              0.32     3.34     0.14    24.00        1     5.13
C9_2                ROW_24m              0.32     3.34     0.14    24.00        1     3.28
C9_5                ROW_24m              0.32     3.34     0.14    24.00        1     4.09
C9_6                ROW_24m              0.32     3.34     0.14    24.00        1     4.13
C9_7                ROW_24m              0.32     3.34     0.14    24.00        1     6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR              0.68     0.36     0.17     0.68        1
0.38
C-STRM-1_(1)_(C-STRM) CIRCULAR              0.68     0.36     0.17     0.68        1     0.33
C-STRM-1_(C-STRM) CIRCULAR           0.60     0.28     0.15     0.60        1     0.24
C-STRM-1U0_(C-STRM) CIRCULAR          0.60     0.28     0.15     0.60        1     0.43
C-STRM-101_(C-STRM) CIRCULAR          0.60     0.28     0.15     0.60        1     0.79
C-STRM-102_(C-STRM) CIRCULAR          1.05     0.87     0.26     1.05        1     2.51
C-STRM-103_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.55
C-STRM-104_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.56
C-STRM-105_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR              0.68     0.36     0.17     0.68        1     0.56
C-STRM-2_(C-STRM) CIRCULAR           0.68     0.36     0.17     0.68        1     0.56
C-STRM-2U_(C-STRM) CIRCULAR          0.45     0.16     0.11     0.45        1     0.29
C-STRM-21_(C-STRM) CIRCULAR          0.53     0.22     0.13     0.53        1     0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR             1.80     2.54     0.45     1.80        1
4.45
C-STRM-22_(C-STRM) CIRCULAR          1.50     1.77     0.38     1.50        1     2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR             0.68     0.36     0.17     0.68        1
0.34
C-STRM-26_(C-STRM) CIRCULAR          0.68     0.36     0.17     0.68        1     0.34
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR              0.75     0.44     0.19     0.75
1     0.79
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR             0.68     0.36     0.17     0.68
1     0.59
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR             0.68     0.36     0.17     0.68        1
0.59
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR          0.68     0.36     0.17     0.68        1
0.60
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR          0.68     0.36     0.17     0.68        1
0.56
C-STRM-3_(1)_(C-STRM) CIRCULAR           0.68     0.36     0.17     0.68        1     0.57
C-STRM-33_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR          0.53     0.22     0.13     0.53        1
0.17
C-STRM-34_(1)_(C-STRM) CIRCULAR          0.53     0.22     0.13     0.53        1
0.17
C-STRM-35_(1)_(C-STRM) CIRCULAR          0.60     0.28     0.15     0.60        1
0.25
C-STRM-35_(C-STRM) CIRCULAR          0.60     0.28     0.15     0.60        1     0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR       0.75     0.44     0.19     0.75        1     0.86
C-STRM-4_(C-STRM) CIRCULAR           0.75     0.44     0.19     0.75        1     0.79
C-STRM-49_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.56
C-STRM-50_(C-STRM) CIRCULAR          0.82     0.53     0.21     0.82        1     0.56
C-STRM-51_(C-STRM) CIRCULAR          0.90     0.64     0.23     0.90        1     0.70
C-STRM-52_(C-STRM) CIRCULAR          0.97     0.75     0.24     0.97        1     0.87
C-STRM-53_(C-STRM) CIRCULAR          0.97     0.75     0.24     0.97        1     0.87
C-STRM-57_(C-STRM) CIRCULAR          0.97     0.75     0.24     0.97        1     0.88
C-STRM-62_(C-STRM) CIRCULAR          0.45     0.16     0.11     0.45        1     0.13
C-STRM-63_(C-STRM) CIRCULAR          0.53     0.22     0.13     0.53        1     0.17
C-STRM-64_(C-STRM) CIRCULAR          0.38     0.11     0.09     0.38        1     0.09
C-STRM-74_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     5.14
C-STRM-75_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     5.14
C-STRM-76_(C-STRM) CIRCULAR          0.97     0.75     0.24     0.97        1     1.00
C-STRM-77_(C-STRM) CIRCULAR          1.05     0.87     0.26     1.05        1     1.93
C-STRM-78_(C-STRM) CIRCULAR          0.97     0.75     0.24     0.97        1     1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR             1.80     2.54     0.45     1.80        1
6.30
C-STRM-79_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR           0.53     0.22     0.13     0.53        1     0.19
C-STRM-8_(C-STRM) CIRCULAR           0.45     0.16     0.11     0.45        1     0.13
C-STRM-80_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     4.44
C-STRM-81_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     4.45
C-STRM-82_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR             1.50     1.77     0.38     1.50        1
2.74
C-STRM-84_(C-STRM) CIRCULAR          1.80     2.54     0.45     1.80        1     5.14
CVR-C2              CIRCULAR         0.45     0.16     0.11     0.45        1     0.27
CVR-C3              CIRCULAR         0.40     0.13     0.10     0.40        1     0.16
CVR-C4              CIRCULAR         1.20     1.13     0.30     1.20        1     3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR            0.90     0.64     0.23     0.90        1
0.96
W1                  Pond_SpillWay    3.89   318.30     4.06   128.79        1   256.54


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Transect Summary
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Transect Barnsdale_UPST1
Area:
          0.0007    0.0026    0.0059    0.0100    0.0149
          0.0207    0.0273    0.0348    0.0435    0.0533
          0.0641    0.0755    0.0875    0.1001    0.1134
          0.1273    0.1419    0.1570    0.1727    0.1890
          0.2058    0.2232    0.2412    0.2598    0.2794
          0.3002    0.3220    0.3442    0.3665    0.3891
          0.4119    0.4349    0.4583    0.4822    0.5066
          0.5315    0.5570    0.5831    0.6101    0.6380
          0.6668    0.6965    0.7269    0.7591    0.7934
          0.8297    0.8679    0.9090    0.9525    1.0000
Hrad:
          0.0267    0.0534    0.0845    0.1173    0.1482
          0.1779    0.2068    0.2287    0.2500    0.2739
          0.3074    0.3422    0.3761    0.4092    0.4417
          0.4735    0.5058    0.5384    0.5706    0.6022
          0.6336    0.6645    0.6952    0.7211    0.7289
          0.7389    0.7693    0.8107    0.8515    0.8918
          0.9314    0.9705    0.9981    1.0255    1.0527
          1.0797    1.1065    1.1183    1.1300    1.1430
          1.1590    1.1755    1.1892    1.1587    1.1416
          1.1348    1.1201    1.0963    1.0803    1.0000
Width:
          0.0256    0.0512    0.0720    0.0882    0.1043
          0.1204    0.1365    0.1575    0.1801    0.2014
          0.2154    0.2277    0.2399    0.2522    0.2645
          0.2767    0.2885    0.2997    0.3108    0.3220
          0.3332    0.3444    0.3555    0.3691    0.3929
          0.4167    0.4284    0.4327    0.4370    0.4414
          0.4457    0.4500    0.4599    0.4698    0.4796
          0.4895    0.4994    0.5167    0.5344    0.5520
          0.5684    0.5847    0.6028    0.6472    0.6875
          0.7239    0.7682    0.8237    0.8773    1.0000

Transect Barnsdale_UPST2
Area:
          0.0005    0.0018    0.0041    0.0073    0.0120
          0.0186    0.0260    0.0341    0.0428    0.0523
          0.0626    0.0736    0.0854    0.0979    0.1110
          0.1249    0.1397    0.1578    0.1780    0.1990
          0.2203    0.2420    0.2642    0.2867    0.3095
          0.3327    0.3562    0.3798    0.4037    0.4277
          0.4520    0.4765    0.5012    0.5261    0.5512
          0.5765    0.6020    0.6278    0.6540    0.6807
          0.7080    0.7357    0.7640    0.7931    0.8231
          0.8541    0.8865    0.9207    0.9573    1.0000
Hrad:
          0.0256    0.0511    0.0767    0.1022    0.1074
          0.1357    0.1722    0.2069    0.2401    0.2711
          0.3004    0.3302    0.3603    0.3898    0.4189
          0.4476    0.4415    0.4190    0.4388    0.4798
          0.5199    0.5592    0.5977    0.6356    0.6728
          0.7128    0.7535    0.7938    0.8334    0.8726
          0.9113    0.9495    0.9872    1.0245    1.0613
          1.0977    1.1337    1.1646    1.1879    1.2112
          1.2344    1.2576    1.2751    1.2829    1.2917
          1.2903    1.2812    1.2529    1.2104    1.0000
Width:
          0.0187    0.0374    0.0561    0.0748    0.1175
          0.1437    0.1580    0.1723    0.1866    0.2018
          0.2178    0.2330    0.2475    0.2621    0.2767
          0.2912    0.3305    0.3942    0.4243    0.4322
          0.4400    0.4479    0.4557    0.4636    0.4714
          0.4767    0.4810    0.4853    0.4895    0.4938
          0.4981    0.5023    0.5066    0.5109    0.5152
          0.5194    0.5237    0.5304    0.5408    0.5513
          0.5617    0.5722    0.5855    0.6041    0.6226
          0.6472    0.6774    0.7214    0.7794    1.0000

Transect Barnsdale_UPST3
Area:
          0.0027    0.0069    0.0125    0.0193    0.0272
          0.0363    0.0466    0.0579    0.0700    0.0826
          0.0959    0.1092    0.1240    0.1388    0.1542
          0.1700    0.1863    0.2031    0.2203    0.2379
          0.2560    0.2747    0.2941    0.3141    0.3347
          0.3558    0.3771    0.3985    0.4201    0.4418
          0.4636    0.4856    0.5078    0.5301    0.5527
          0.5758    0.5993    0.6232    0.6476    0.6725
          0.6978    0.7237    0.7501    0.7771    0.8071
          0.8402    0.8745    0.9118    0.9532    1.0000
Hrad:
          0.0392    0.0744    0.1058    0.1366    0.1672
          0.1959    0.2240    0.2580    0.2951    0.3310
          0.3684    0.4055    0.4418    0.4773    0.5121
          0.5462    0.5798    0.6159    0.6517    0.6870
          0.7143    0.7404    0.7665    0.7925    0.8185
          0.8566    0.8974    0.9376    0.9773    1.0164
          1.0550    1.0931    1.1307    1.1674    1.1903
          1.2133    1.2361    1.2590    1.2818    1.3028
          1.3220    1.3414    1.3608    1.3804    1.2136
          1.2174    1.2098    1.1515    1.0615    1.0000
Width:
          0.0725    0.0983    0.1241    0.1486    0.1712
          0.1949    0.2186    0.2358    0.2487    0.2616
          0.2724    0.2826    0.2929    0.3031    0.3133
          0.3235    0.3337    0.3419    0.3500    0.3580
          0.3702    0.3830    0.3958    0.4086    0.4214
          0.4264    0.4294    0.4323    0.4353    0.4382
          0.4412    0.4442    0.4471    0.4503    0.4593
          0.4683    0.4773    0.4863    0.4953    0.5050
          0.5156    0.5261    0.5367    0.5473    0.6537
          0.6785    0.7115    0.7829    0.8936    1.0000

Transect Barnsdale_UPST4
Area:
          0.0019    0.0059    0.0112    0.0176    0.0253
          0.0342    0.0443    0.0558    0.0685    0.0822
          0.0971    0.1134    0.1308    0.1486    0.1667
          0.1851    0.2037    0.2227    0.2420    0.2614
          0.2810    0.3009    0.3209    0.3410    0.3614
          0.3820    0.4028    0.4237    0.4448    0.4662
          0.4877    0.5094    0.5313    0.5534    0.5759
          0.5987    0.6218    0.6452    0.6689    0.6930
          0.7173    0.7420    0.7676    0.7942    0.8219
          0.8514    0.8839    0.9202    0.9581    1.0000
Hrad:
          0.0280    0.0647    0.0967    0.1263    0.1549
          0.1817    0.2078    0.2337    0.2601    0.2914
          0.3149    0.3386    0.3726    0.4140    0.4543
          0.4937    0.5323    0.5700    0.6090    0.6481
          0.6864    0.7241    0.7612    0.7976    0.8335
          0.8688    0.9036    0.9379    0.9716    1.0049
          1.0377    1.0701    1.1011    1.1277    1.1541
          1.1801    1.2060    1.2316    1.2570    1.2823
          1.3073    1.3203    1.3149    1.3115    1.2912
          1.2608    1.1459    1.1371    1.1279    1.0000
Width:
          0.0734    0.0994    0.1255    0.1515    0.1772
          0.2041    0.2314    0.2587    0.2854    0.3056
          0.3340    0.3624    0.3786    0.3849    0.3912
          0.3975    0.4038    0.4101    0.4147    0.4188
          0.4228    0.4269    0.4309    0.4350    0.4390
          0.4430    0.4471    0.4511    0.4552    0.4592
          0.4633    0.4673    0.4719    0.4786    0.4852
          0.4919    0.4986    0.5052    0.5119    0.5186
          0.5252    0.5375    0.5591    0.5808    0.6126
          0.6529    0.7560    0.7953    0.8372    1.0000

Transect Barnsdale_UPST5
Area:
          0.0011    0.0046    0.0104    0.0185    0.0278
          0.0383    0.0495    0.0612    0.0736    0.0865
          0.1000    0.1141    0.1288    0.1443    0.1606
          0.1778    0.1959    0.2143    0.2330    0.2518
          0.2709    0.2903    0.3099    0.3296    0.3497
          0.3699    0.3904    0.4111    0.4319    0.4530
          0.4743    0.4958    0.5175    0.5395    0.5616
          0.5839    0.6064    0.6292    0.6521    0.6753
          0.6991    0.7235    0.7484    0.7740    0.8019
          0.8364    0.8742    0.9142    0.9560    1.0000
Hrad:
          0.0248    0.0493    0.0735    0.1040    0.1389
          0.1735    0.2124    0.2498    0.2859    0.3209
          0.3550    0.3881    0.4187    0.4434    0.4680
          0.4924    0.5212    0.5606    0.5992    0.6372
          0.6745    0.7111    0.7472    0.7827    0.8176
          0.8520    0.8860    0.9202    0.9539    0.9872
          1.0201    1.0525    1.0845    1.1162    1.1474
          1.1784    1.2090    1.2392    1.2691    1.2876
          1.2994    1.3117    1.3244    1.3163    1.1702
          1.0461    1.0307    1.0260    1.0309    1.0000
Width:
          0.0497    0.0999    0.1518    0.1903    0.2141
          0.2355    0.2481    0.2607    0.2733    0.2859
          0.2985    0.3111    0.3252    0.3438    0.3625
          0.3813    0.3961    0.4010    0.4059    0.4108
          0.4157    0.4206    0.4255    0.4303    0.4352
          0.4401    0.4450    0.4494    0.4538    0.4583
          0.4627    0.4672    0.4716    0.4761    0.4805
          0.4850    0.4894    0.4938    0.4983    0.5078
          0.5204    0.5330    0.5457    0.5684    0.6711
          0.7919    0.8423    0.8866    0.9238    1.0000

Transect Barnsdale_UPST6
Area:
          0.0014    0.0054    0.0102    0.0156    0.0217
          0.0284    0.0356    0.0434    0.0517    0.0605
          0.0698    0.0796    0.0899    0.1007    0.1121
          0.1243    0.1373    0.1512    0.1656    0.1807
          0.1962    0.2123    0.2291    0.2483    0.2703
          0.2945    0.3189    0.3434    0.3680    0.3929
          0.4178    0.4430    0.4687    0.4947    0.5212
          0.5482    0.5760    0.6046    0.6335    0.6626
```

0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000
Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000
Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000
Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000
Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3010 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000
Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7026 0.7280 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000
Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000
Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000
Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000
Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000
Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2668 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6872 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000
Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000
Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000
Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6153 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000
Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000
Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268
0.1395 0.1522 0.1648 0.1775 0.1902
0.2029 0.2156 0.2283 0.2409 0.2536

0.2663 0.2790 0.2917 0.3043 0.3170
0.3491 0.3812 0.4132 0.4453 0.4774
0.5095 0.5415 0.5736 0.6057 0.6378
0.6698 0.7019 0.7340 0.7661 0.7981
0.8255 0.8448 0.8642 0.8836 0.9030
0.9224 0.9418 0.9612 0.9806 1.0000

Transect ROW_16.5m_PH3
Area:
0.0004 0.0017 0.0039 0.0069 0.0107
0.0154 0.0210 0.0275 0.0347 0.0429
0.0519 0.0618 0.0725 0.0841 0.0965
0.1098 0.1240 0.1390 0.1548 0.1716
0.1892 0.2076 0.2269 0.2471 0.2677
0.2884 0.3090 0.3297 0.3510 0.3731
0.3962 0.4201 0.4449 0.4705 0.4971
0.5245 0.5527 0.5819 0.6119 0.6428
0.6746 0.7073 0.7408 0.7752 0.8105
0.8466 0.8837 0.9216 0.9603 1.0000
Hrad:
0.0173 0.0347 0.0520 0.0694 0.0867
0.1041 0.1214 0.1388 0.1561 0.1735
0.1908 0.2082 0.2255 0.2429 0.2602
0.2776 0.2949 0.3123 0.3296 0.3470
0.3643 0.3990 0.4164 0.4493
0.4834 0.5173 0.5513 0.5844 0.6155
0.6449 0.6727 0.6990 0.7239 0.7475
0.7699 0.7913 0.8116 0.8310 0.8496
0.8673 0.8843 0.9007 0.9164 0.9316
0.9462 0.9603 0.9739 0.9872 1.0000
Width:
0.0214 0.0428 0.0642 0.0856 0.1070
0.1284 0.1498 0.1712 0.1926 0.2140
0.2354 0.2568 0.2782 0.2996 0.3210
0.3424 0.3638 0.3852 0.4066 0.4280
0.4494 0.4708 0.4922 0.5136 0.5152
0.5152 0.5152 0.5200 0.5418 0.5636
0.5855 0.6073 0.6291 0.6509 0.6727
0.6945 0.7164 0.7382 0.7600 0.7818
0.8036 0.8255 0.8473 0.8691 0.8909
0.9127 0.9345 0.9564 0.9782 1.0000

Transect ROW_18m
Area:
0.0004 0.0016 0.0036 0.0064 0.0100
0.0144 0.0196 0.0255 0.0323 0.0399
0.0483 0.0575 0.0675 0.0782 0.0898
0.1022 0.1154 0.1293 0.1441 0.1597
0.1760 0.1932 0.2112 0.2299 0.2495
0.2698 0.2906 0.3114 0.3321 0.3529
0.3742 0.3967 0.4204 0.4452 0.4712
0.4983 0.5266 0.5560 0.5867 0.6184
0.6514 0.6855 0.7207 0.7571 0.7947
0.8335 0.8734 0.9144 0.9566 1.0000
Hrad:
0.0183 0.0366 0.0549 0.0732 0.0915
0.1098 0.1281 0.1464 0.1647 0.1829
0.2012 0.2195 0.2378 0.2561 0.2744
0.2927 0.3110 0.3293 0.3476 0.3659
0.3842 0.4025 0.4208 0.4391 0.4574
0.4757 0.5117 0.5476 0.5834 0.6192
0.6542 0.6864 0.7162 0.7437 0.7692
0.7927 0.8145 0.8348 0.8537 0.8713
0.8877 0.9031 0.9176 0.9313 0.9442
0.9565 0.9681 0.9792 0.9898 1.0000
Width:
0.0182 0.0363 0.0545 0.0726 0.0908
0.1090 0.1271 0.1453 0.1635 0.1816
0.1998 0.2179 0.2361 0.2543 0.2724
0.2906 0.3088 0.3269 0.3451 0.3632
0.3814 0.3996 0.4177 0.4359 0.4541
0.4722 0.4722 0.4722 0.4722 0.4722
0.4986 0.5250 0.5514 0.5778 0.6042
0.6306 0.6569 0.6833 0.7097 0.7361
0.7625 0.7889 0.8153 0.8417 0.8681
0.8944 0.9208 0.9472 0.9736 1.0000

Transect ROW_18m_MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0793 0.0991
0.1189 0.1387 0.1585 0.1783 0.1982
0.2180 0.2378 0.2576 0.2774 0.2972
0.3166 0.3340 0.3498 0.3646 0.3786
0.3921 0.4053 0.4183 0.4311 0.4439
0.4566 0.4770 0.5054 0.5332 0.5603
0.5869 0.6122 0.6360 0.6586 0.6807
0.7040 0.7471 0.7499 0.7723 0.7944
0.8163 0.8378 0.8591 0.8800 0.9007
0.9211 0.9412 0.9611 0.9807 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_MB_2
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0395 0.0593 0.0791 0.0989
0.1186 0.1384 0.1582 0.1780 0.1977
0.2175 0.2373 0.2571 0.2768 0.2966
0.3160 0.3333 0.3491 0.3638 0.3778
0.3913 0.4045 0.4174 0.4302 0.4430
0.4557 0.4760 0.5044 0.5321 0.5592
0.5857 0.6109 0.6347 0.6572 0.6793
0.7027 0.7258 0.7486 0.7711 0.7933
0.8152 0.8368 0.8581 0.8792 0.9000
0.9205 0.9408 0.9608 0.9805 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_Mountable
Area:
0.0003 0.0011 0.0026 0.0046 0.0072
0.0103 0.0140 0.0183 0.0232 0.0286
0.0346 0.0412 0.0484 0.0561 0.0644
0.0733 0.0827 0.0928 0.1034 0.1145
0.1263 0.1386 0.1515 0.1650 0.1799
0.1964 0.2143 0.2337 0.2546 0.2770
0.3009 0.3263 0.3532 0.3816 0.4115
0.4429 0.4758 0.5102 0.5459 0.5826
0.6202 0.6587 0.6981 0.7385 0.7797
0.8219 0.8651 0.9091 0.9541 1.0000
Hrad:
0.0235 0.0471 0.0706 0.0942 0.1177
0.1413 0.1648 0.1884 0.2119 0.2355
0.2590 0.2826 0.3061 0.3297 0.3532
0.3768 0.4003 0.4238 0.4474 0.4709
0.4945 0.5180 0.5416 0.5650 0.5852
0.6022 0.6168 0.6296 0.6410 0.6515
0.6613 0.6707 0.6799 0.6889 0.6979
0.7069 0.7161 0.7253 0.7478 0.7737
0.7989 0.8234 0.8474 0.8707 0.8935
0.9157 0.9375 0.9588 0.9796 1.0000
Width:
0.0124 0.0247 0.0371 0.0494 0.0618
0.0741 0.0865 0.0988 0.1112 0.1235
0.1359 0.1482 0.1606 0.1729 0.1853
0.1976 0.2100 0.2223 0.2347 0.2470
0.2594 0.2717 0.2841 0.3058 0.3381
0.3704 0.4027 0.4349 0.4672 0.4995
0.5318 0.5641 0.5964 0.6287 0.6610
0.6933 0.7255 0.7578 0.7807 0.8006
0.8206 0.8405 0.8604 0.8804 0.9003
0.9202 0.9402 0.9601 0.9801 1.0000

Transect ROW_18m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0154 0.0209 0.0273 0.0346 0.0427
0.0516 0.0614 0.0721 0.0836 0.0960
0.1092 0.1232 0.1382 0.1540 0.1707
0.1882 0.2065 0.2256 0.2447 0.2638
0.2830 0.3026 0.3232 0.3447 0.3670
0.3903 0.4144 0.4394 0.4653 0.4921
0.5197 0.5483 0.5777 0.6080 0.6392
0.6713 0.7043 0.7382 0.7729 0.8085
0.8451 0.8825 0.9208 0.9599 1.0000
Hrad:
0.0179 0.0359 0.0538 0.0717 0.0896
0.1076 0.1255 0.1434 0.1613 0.1793
0.1972 0.2151 0.2330 0.2510 0.2689
0.2868 0.3047 0.3227 0.3406 0.3585
0.3764 0.3944 0.4225 0.4577 0.4928
0.5279 0.5621 0.5942 0.6243 0.6525
0.6791 0.7042 0.7279 0.7504 0.7716
0.7918 0.8110 0.8292 0.8467 0.8634
0.8794 0.8948 0.9095 0.9238 0.9375
0.9508 0.9636 0.9761 0.9882 1.0000
Width:
0.0211 0.0421 0.0632 0.0843 0.1053
0.1264 0.1475 0.1685 0.1896 0.2107
0.2318 0.2528 0.2739 0.2950 0.3160
0.3371 0.3582 0.3792 0.4003 0.4214
0.4424 0.4635 0.4722 0.4722 0.4722
0.4752 0.4971 0.5190 0.5408 0.5627
0.5846 0.6064 0.6283 0.6502 0.6720
0.6939 0.7158 0.7376 0.7595 0.7813
0.8032 0.8251 0.8469 0.8688 0.8907
0.9125 0.9344 0.9563 0.9781 1.0000

Transect ROW_22m
Area:
0.0003 0.0014 0.0031 0.0055 0.0086
0.0124 0.0169 0.0221 0.0280 0.0346
0.0418 0.0498 0.0584 0.0678 0.0778
0.0885 0.0999 0.1120 0.1248 0.1383
0.1525 0.1674 0.1829 0.1992 0.2161
0.2337 0.2521 0.2711 0.2908 0.3119
0.3348 0.3594 0.3857 0.4133 0.4420
0.4717 0.5025 0.5343 0.5673 0.6013
0.6363 0.6725 0.7097 0.7479 0.7873
0.8277 0.8692 0.9117 0.9553 1.0000
Hrad:
0.0200 0.0399 0.0599 0.0798 0.0998
0.1198 0.1397 0.1597 0.1796 0.1996
0.2196 0.2395 0.2595 0.2794 0.2994
0.3194 0.3393 0.3593 0.3792 0.3992
0.4192 0.4391 0.4591 0.4790 0.4990
0.5190 0.5389 0.5589 0.5789 0.5976
0.6138 0.6280 0.6465 0.6764 0.7046
0.7312 0.7565 0.7804 0.8033 0.8250
0.8458 0.8656 0.8847 0.9030 0.9206
0.9376 0.9539 0.9698 0.9851 1.0000
Width:
0.0153 0.0306 0.0459 0.0612 0.0765
0.0918 0.1071 0.1224 0.1376 0.1529
0.1682 0.1835 0.1988 0.2141 0.2294
0.2447 0.2600 0.2753 0.2906 0.3059
0.3212 0.3365 0.3518 0.3671 0.3824
0.3976 0.4129 0.4282 0.4472 0.4861
0.5250 0.5640 0.5982 0.6218 0.6455
0.6691 0.6927 0.7164 0.7400 0.7636
0.7873 0.8109 0.8345 0.8582 0.8818
0.9055 0.9291 0.9527 0.9764 1.0000

Transect ROW_24m
Area:
0.0004 0.0017 0.0039 0.0069 0.0107
0.0155 0.0211 0.0275 0.0348 0.0430
0.0520 0.0619 0.0726 0.0843 0.0967
0.1100 0.1234 0.1369 0.1503 0.1637
0.1772 0.1906 0.2040 0.2176 0.2324
0.2484 0.2655 0.2840 0.3036 0.3245
0.3466 0.3699 0.3945 0.4203 0.4473
0.4756 0.5050 0.5357 0.5677 0.6008
0.6352 0.6708 0.7077 0.7458 0.7851
0.8256 0.8674 0.9103 0.9546 1.0000
Hrad:
0.0217 0.0434 0.0652 0.0869 0.1086
0.1303 0.1520 0.1737 0.1955 0.2172
0.2389 0.2606 0.2823 0.3041 0.3258
0.3554 0.3981 0.4407 0.4831 0.5253
0.5674 0.6094 0.6512 0.6926 0.7297
0.7620 0.7900 0.8143 0.8353 0.8535
0.8693 0.8830 0.8951 0.9057 0.9151
0.9235 0.9311 0.9381 0.9445 0.9505
0.9561 0.9614 0.9666 0.9716 0.9764
0.9812 0.9859 0.9906 0.9953 1.0000
Width:
0.0187 0.0373 0.0560 0.0747 0.0933
0.1120 0.1307 0.1493 0.1680 0.1867
0.2053 0.2240 0.2427 0.2613 0.2800
0.2917 0.2917 0.2917 0.2917 0.2917
0.2917 0.2917 0.2917 0.3067 0.3333
0.3600 0.3867 0.4133 0.4400 0.4667
0.4933 0.5200 0.5467 0.5733 0.6000
0.6267 0.6533 0.6800 0.7067 0.7333
0.7600 0.7867 0.8133 0.8400 0.8667
0.8933 0.9200 0.9467 0.9733 1.0000

Transect ROW_24m_1
Area:
0.0002 0.0009 0.0020 0.0036 0.0057
0.0081 0.0111 0.0145 0.0183 0.0227
0.0279 0.0340 0.0410 0.0489 0.0577
0.0675 0.0781 0.0897 0.1021 0.1158
0.1311 0.1479 0.1664 0.1857 0.2058
0.2265 0.2480 0.2700 0.2929 0.3171
0.3426 0.3694 0.3976 0.4272 0.4579
0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023

0.8405 0.8794 0.9189 0.9591 1.0000
Hrad:
0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000
Width:
0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking
Area:
0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000
Hrad:
0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000
Width:
0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m
Area:
0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000
Hrad:
0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000
Width:
0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1
Area:
0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7088 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000
Hrad:
0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000
Width:
0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2
Area:
0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0658 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000
Hrad:
0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000
Width:
0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3
Area:
0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1213 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000
Hrad:
0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2047 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4015 0.4273 0.4351 0.4545
0.4946 0.5339 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8390 0.8745 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1067 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000
Width:
0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5931 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4
Area:
0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0303 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000
Hrad:
0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4302 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6659 0.6758 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000
Width:
0.0541 0.0732 0.0923 0.1110 0.1246
0.1474 0.1522 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5444 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6648 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5
Area:
0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2635 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000
Hrad:
0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3749 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6771 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8125 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000
Width:
0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6
Area:
0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2156 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000
Hrad:
0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000
Width:
0.0616 0.0785 0.0947 0.1108 0.1267
0.1418 0.1569 0.1666 0.1758 0.1850
0.1952 0.2062 0.2171 0.2280 0.2365
0.2466 0.2570 0.2674 0.2776 0.2853
0.2930 0.3007 0.3084 0.3161 0.3238

0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/03/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	10.344	123.839
Evaporation Loss	0.000	0.000
Infiltration Loss	4.044	48.420
Surface Runoff	6.187	74.076
Final Storage	0.116	1.388
Continuity Error (%)	-0.036	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	6.187	61.875
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.042	0.423
External Outflow	5.763	57.629
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.305	3.045
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.163	1.631
Continuity Error (%)	-0.011	

****
Highest Continuity Errors
****
Node J36 (3.39%)
Node 514_(C-STRM) (2.35%)
Node J19 (-2.02%)
Node J59 (1.68%)
Node J20 (1.40%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (7)
Link C-STRM-71_(C-STRM) (4)
Link OL16 (4)
Link OL9 (3)
Link BDR-C3 (2)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.97 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.01 %
0.660 - 0.574 sec	:	0.01 %
0.574 - 0.500 sec	:	0.01 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Peak Runoff CMS	Total Runoff mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff 10^6 ltr
A15	123.84	0.18	0.386	0.00	0.00	66.23	23.20	29.25	47.81
A18	123.84	0.22	0.521	0.00	0.00	58.78	47.88	26.21	64.51
A19	123.84	0.31	0.405	0.00	0.00	73.34	27.32	28.33	50.18
A20	123.84	0.26	0.322	0.00	0.00	82.70	10.24	31.67	39.86
NULL3	123.84	0.23	0.797	0.00	0.00	23.88	101.97	17.17	98.74
S1	123.84	2.64	0.551	0.00	0.00	54.60	81.21	43.90	68.26
S1_1	123.84	0.05	0.723	0.00	0.00	33.31	87.42	19.59	89.52
S1_2	123.84	0.05	0.723	0.00	0.00	33.29	87.42	19.61	89.54
S1_4	123.84	0.08	0.723	0.00	0.00	33.32	87.42	19.57	89.51
S1_5	123.84	0.04	0.723	0.00	0.00	33.31	87.42	19.59	89.52
S10_1	123.84	0.74	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S10_2	123.84	0.86	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S10_4	123.84	0.29	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S10_5	123.84	0.51	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S11	123.84	0.48	0.237	0.00	0.00	94.49	0.00	29.36	29.36
S12	123.84	0.18	0.723	0.00	0.00	33.32	87.42	19.57	89.50
S14_1	123.84	0.25	0.722	0.00	0.00	33.35	87.41	19.54	89.47
S14_3	123.84	0.44	0.722	0.00	0.00	33.42	87.40	19.46	89.38
S14_4	123.84	0.12	0.722	0.00	0.00	33.35	87.41	19.53	89.46
S14_5	123.84	0.69	0.722	0.00	0.00	33.40	87.40	19.48	89.40
S14_6	123.84	0.12	0.722	0.00	0.00	33.36	87.41	19.52	89.45
S14_7	123.84	0.48	0.722	0.00	0.00	33.38	87.41	19.51	89.43
S14_8	123.84	0.14	0.722	0.00	0.00	33.37	87.41	19.52	89.45
S15	123.84	0.66	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S16	123.84	0.39	0.986	0.00	0.00	0.00	122.15	0.00	122.15
S17	123.84	0.22	0.144	0.00	0.00	105.91	4.07	17.88	17.88
S18_2	123.84	1.35	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S18_3	123.84	0.67	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S18_4	123.84	0.35	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S18_5	123.84	0.75	0.579	0.00	0.00	51.04	87.39	45.53	71.75
S18_6	123.84	0.34	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S19	123.84	0.43	0.722	0.00	0.00	33.39	87.41	19.49	89.41
S2	123.84	1.51	0.554	0.00	0.00	54.27	81.81	44.05	68.59
S20_1	123.84	0.20	0.723	0.00	0.00	33.31	87.42	19.58	89.52
S20_2	123.84	0.09	0.723	0.00	0.00	33.27	87.41	19.63	89.56
S3	123.84	1.00	0.540	0.00	0.00	55.98	78.65	43.33	66.92
S32	123.84	0.17	0.723	0.00	0.00	33.32	87.42	19.57	89.50
S36	123.84	0.49	0.986	0.00	0.00	0.00	122.16	0.00	122.16
S4	123.84	5.03	0.884	0.00	0.00	12.98	104.81	4.71	109.52
S5	123.84	1.30	0.888	0.00	0.00	12.61	104.83	5.08	109.91
S6	123.84	0.14	0.636	0.00	0.00	44.28	69.94	22.81	78.76
S7	123.84	1.61	0.887	0.00	0.00	12.69	104.82	5.00	109.83
S8	123.84	0.40	0.341	0.00	0.00	81.06	43.69	42.24	42.24

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.02	0.18	104.57	0 12:00	0.18
EXD_10	JUNCTION	0.05	0.44	99.09	0 12:05	0.44
EXD_11	JUNCTION	0.04	0.32	98.82	0 12:03	0.32
EXD_12	JUNCTION	0.07	0.47	98.78	0 12:02	0.47
EXD_13	JUNCTION	0.02	0.19	104.51	0 12:00	0.19
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.07	0.58	100.84	0 12:03	0.58
EXD_16	JUNCTION	0.04	0.21	100.41	0 12:02	0.21
EXD_17	JUNCTION	0.05	0.20	100.08	0 12:07	0.20
EXD_18	JUNCTION	0.04	0.28	99.68	0 12:06	0.28
EXD_19	JUNCTION	0.06	0.48	99.67	0 12:04	0.48
EXD_2	JUNCTION	0.04	0.30	103.77	0 12:02	0.30
EXD_20	JUNCTION	0.07	0.48	99.67	0 12:04	0.48
EXD_21	JUNCTION	0.06	0.33	99.51	0 12:05	0.33
EXD_22	JUNCTION	0.04	0.22	99.36	0 12:09	0.22
EXD_23	JUNCTION	0.06	0.33	99.08	0 12:12	0.33
EXD_24	JUNCTION	0.03	0.30	98.97	0 12:11	0.30
EXD_25	JUNCTION	0.06	0.44	98.96	0 12:12	0.43
EXD_26	JUNCTION	0.03	0.22	98.70	0 12:13	0.21
EXD_27	JUNCTION	0.07	0.39	98.55	0 12:00	0.39
EXD_3	JUNCTION	0.01	0.16	103.35	0 12:02	0.16
EXD_4	JUNCTION	0.01	0.16	102.80	0 12:03	0.16
EXD_5	JUNCTION	0.02	0.26	102.75	0 12:04	0.26
EXD_6	JUNCTION	0.02	0.15	102.47	0 12:04	0.15
EXD_7	JUNCTION	0.02	0.22	101.71	0 12:06	0.22
EXD_8	JUNCTION	0.03	0.51	100.99	0 12:15	0.51
EXD_9	JUNCTION	0.02	0.19	100.58	0 12:18	0.19
J10	JUNCTION	0.00	0.17	103.77	0 12:01	0.17
J11	JUNCTION	0.00	0.20	103.70	0 12:01	0.20
J12	JUNCTION	0.00	0.22	103.62	0 12:02	0.22
J13	JUNCTION	0.01	0.29	103.59	0 12:05	0.29
J17	JUNCTION	0.02	0.18	104.55	0 12:00	0.18
J19	JUNCTION	0.00	0.11	105.51	0 12:00	0.11
J20	JUNCTION	0.00	0.08	105.53	0 12:00	0.08
J21	JUNCTION	0.00	0.07	105.62	0 12:00	0.07
J22	JUNCTION	0.00	0.07	105.77	0 12:05	0.07
J23	JUNCTION	0.00	0.08	106.08	0 12:02	0.08
J24	JUNCTION	0.00	0.07	106.27	0 12:01	0.07
J25	JUNCTION	0.00	0.21	105.51	0 12:03	0.21
J26	JUNCTION	0.00	0.23	105.93	0 12:02	0.23
J28	JUNCTION	0.00	0.10	109.10	0 12:00	0.10
J29	JUNCTION	0.00	0.16	108.96	0 12:00	0.16
J32	JUNCTION	0.00	0.20	106.20	0 12:01	0.20
J36	JUNCTION	0.00	0.16	104.86	0 12:04	0.16
J39	JUNCTION	0.00	0.26	104.86	0 12:05	0.26
J40	JUNCTION	0.00	0.25	104.70	0 12:05	0.25
J41	JUNCTION	0.00	0.32	103.52	0 12:05	0.32
J43	JUNCTION	0.00	0.20	104.40	0 12:03	0.20
J44	JUNCTION	0.00	0.14	104.64	0 12:02	0.14
J46	JUNCTION	0.00	0.08	104.68	0 12:00	0.08
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.13	105.88	0 12:02	0.13
J51	JUNCTION	0.00	0.14	106.89	0 12:02	0.14
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.05	108.52	0 12:01	0.05
J58	JUNCTION	0.00	0.12	108.52	0 12:00	0.12
J59	JUNCTION	0.00	0.12	108.12	0 12:01	0.12
J6	JUNCTION	0.00	0.05	109.88	0 12:00	0.05
J61	JUNCTION	0.00	0.10	107.10	0 12:00	0.10
J62	JUNCTION	0.00	0.14	106.64	0 12:00	0.14
J74	JUNCTION	0.37	1.26	99.71	0 12:16	1.26
J9	JUNCTION	0.00	0.14	103.84	0 12:00	0.14
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.05	0.35	98.35	0 12:00	0.35
ST4_108A_(P-Stm)	OUTFALL	0.52	1.68	99.70	0 12:16	1.68
500_(C-STRM)	STORAGE	0.26	0.68	100.99	0 13:08	0.67
500A_(C-STRM)	STORAGE	0.34	0.98	101.08	0 12:06	0.98
502_(C-STRM)	STORAGE	0.14	1.72	102.26	0 12:09	1.72
503_(C-STRM)	STORAGE	0.13	1.83	102.42	0 12:09	1.83
504_(C-STRM)	STORAGE	0.35	1.37	104.41	0 12:14	1.37
505_(C-STRM)	STORAGE	0.35	1.54	105.00	0 12:12	1.54

506_(C-STRM)	STORAGE	0.35	1.72	105.54	0	12:12	1.71	
507_(C-STRM)	STORAGE	0.34	1.75	105.89	0	12:12	1.74	
508_(C-STRM)	STORAGE	0.34	1.87	106.24	0	12:13	1.87	
509_(C-STRM)	STORAGE	0.35	2.00	106.59	0	12:13	1.99	
510_(C-STRM)	STORAGE	0.35	2.02	106.87	0	12:13	2.01	
511_(C-STRM)	STORAGE	0.35	2.03	106.95	0	12:13	2.03	
512_(C-STRM)	STORAGE	0.34	2.01	107.12	0	12:13	2.01	
513_(C-STRM)	STORAGE	0.34	2.00	107.24	0	12:13	2.00	
514_(C-STRM)	STORAGE	0.24	1.66	107.25	0	12:13	1.65	
515_(C-STRM)	STORAGE	0.23	1.40	107.25	0	12:13	1.39	
516_(C-STRM)	STORAGE	0.34	2.00	107.45	0	12:12	1.99	
517_(C-STRM)	STORAGE	0.35	2.07	107.68	0	12:12	2.07	
518_(C-STRM)	STORAGE	0.36	2.26	108.11	0	12:08	2.24	
519_(C-STRM)	STORAGE	0.33	2.05	108.13	0	12:07	2.05	
520_(C-STRM)	STORAGE	0.33	1.91	108.26	0	12:07	1.90	
522_(C-STRM)	STORAGE	0.32	0.61	104.91	0	12:03	0.61	
525_(C-STRM)	STORAGE	0.11	1.74	102.35	0	12:10	1.74	
528_(C-STRM)	STORAGE	0.08	1.88	102.61	0	12:11	1.88	
532_(C-STRM)	STORAGE	0.07	1.94	102.77	0	12:11	1.94	
536_(C-STRM)	STORAGE	0.07	1.93	102.91	0	12:11	1.93	
540_(C-STRM)	STORAGE	0.36	2.17	103.03	0	12:12	2.17	
541_(C-STRM)	STORAGE	0.35	2.16	103.09	0	12:12	2.16	
551_(C-STRM)	STORAGE	0.35	1.76	102.41	0	12:09	1.76	
552_(C-STRM)	STORAGE	0.34	1.71	102.46	0	12:09	1.71	
553_(C-STRM)	STORAGE	0.34	1.64	102.57	0	12:08	1.63	
554_(C-STRM)	STORAGE	0.33	1.60	102.65	0	12:08	1.59	
555_(C-STRM)	STORAGE	0.34	1.57	102.82	0	12:08	1.57	
556_(C-STRM)	STORAGE	0.33	1.63	103.00	0	12:07	1.62	
601_(C-STRM)	STORAGE	0.14	1.21	101.66	0	12:11	1.21	
602_(C-STRM)	STORAGE	0.15	1.73	102.25	0	12:11	1.73	
603_(C-STRM)	STORAGE	0.13	1.77	102.40	0	12:14	1.77	
604_(C-STRM)	STORAGE	0.12	1.91	102.59	0	12:14	1.91	
605_(C-STRM)	STORAGE	0.12	1.87	102.95	0	12:14	1.87	
606_(C-STRM)	STORAGE	0.13	1.96	103.20	0	12:14	1.96	
619_(C-STRM)	STORAGE	0.13	2.06	103.44	0	12:13	2.06	
622_(C-STRM)	STORAGE	0.12	2.01	103.53	0	12:13	2.00	
626_(C-STRM)	STORAGE	0.24	0.52	104.47	0	12:33	0.52	
627_(C-STRM)	STORAGE	0.24	0.95	104.08	0	12:13	0.95	
629_(C-STRM)	STORAGE	0.13	1.96	103.61	0	12:13	1.96	
630_(C-STRM)	STORAGE	0.13	1.72	103.79	0	12:13	1.72	
630A_(C-STRM)	STORAGE	0.13	1.74	103.85	0	12:13	1.74	
631_(C-STRM)	STORAGE	0.00	0.31	106.31	0	12:04	0.31	
645_(C-STRM)	STORAGE	0.38	2.03	104.06	0	12:12	2.03	
647_(C-STRM)	STORAGE	0.37	2.05	104.19	0	12:12	2.05	
650_(C-STRM)	STORAGE	0.37	2.06	104.28	0	12:08	2.06	
651_(C-STRM)	STORAGE	0.37	2.06	104.37	0	12:07	2.05	
682_(C-STRM)	STORAGE	0.00	0.37	105.77	0	12:03	0.37	
MTD_(C-STRM)	STORAGE	0.21	1.60	101.96	0	12:10	1.60	
OVERFLOW_(C-STRM)	STORAGE	0.30	0.96	101.13	0	12:07	0.96	
POND_(C-STRM)	STORAGE	1.45	2.46	100.91	0	13:06	2.46	
S_525-MTD	STORAGE	0.00	0.29	103.59	0	12:05	0.29	
S_528-525	STORAGE	0.00	0.22	103.62	0	12:02	0.22	
S_532-528	STORAGE	0.00	0.20	103.70	0	12:01	0.20	
S_536-532	STORAGE	0.00	0.25	103.85	0	12:00	0.25	
S_540-536	STORAGE	0.00	0.22	103.92	0	12:00	0.22	
S_541-540	STORAGE	0.00	0.23	104.04	0	12:01	0.23	
S_604-603	STORAGE	0.00	0.21	105.71	0	12:01	0.21	
S_605-604	STORAGE	0.00	0.26	106.97	0	12:02	0.26	
S_619-606	STORAGE	0.00	0.25	106.75	0	12:00	0.25	
S_622-619	STORAGE	0.00	0.27	105.97	0	12:02	0.26	
S_622-619_2	STORAGE	0.00	0.26	106.76	0	12:00	0.26	
S_627-630	STORAGE	0.00	0.15	106.85	0	12:00	0.15	
S_629-622	STORAGE	0.00	0.20	106.21	0	12:01	0.20	
SU2	STORAGE	0.01	0.37	107.12	0	12:36	0.37	
SU5	STORAGE	0.00	0.24	104.42	0	12:18	0.24	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.178	0	12:00	0	0.39	- 0.006
EXD_10	JUNCTION	0.873	0.931	0	12:00	4.02	5.51	- 0.173
EXD_11	JUNCTION	0.000	0.858	0	12:05	0	5.52	0.001
EXD_12	JUNCTION	0.180	0.996	0	12:02	1.66	7.18	0.005
EXD_13	JUNCTION	0.000	0.178	0	12:00	0	0.39	- 0.170
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.262	0.262	0	12:00	1.93	1.93	- 0.000
EXD_16	JUNCTION	0.000	0.149	0	12:03	0	1.93	- 0.008
EXD_17	JUNCTION	0.000	0.150	0	12:04	0	1.93	- 0.011
EXD_18	JUNCTION	0.000	0.149	0	12:07	0	1.93	0.088
EXD_19	JUNCTION	0.000	0.167	0	12:16	0	1.95	- 0.057
EXD_2	JUNCTION	0.000	0.177	0	12:00	0	0.39	0.176
EXD_20	JUNCTION	0.309	0.309	0	12:00	0.555	2.51	- 0.003
EXD_21	JUNCTION	0.000	0.292	0	12:04	0	2.48	- 0.015
EXD_22	JUNCTION	0.000	0.292	0	12:05	0	2.48	- 0.024
EXD_23	JUNCTION	0.000	0.290	0	12:09	0	2.48	0.101
EXD_24	JUNCTION	0.000	0.287	0	12:13	0	2.48	- 0.007
EXD_25	JUNCTION	0.221	0.339	0	12:11	0.383	2.87	0.009
EXD_26	JUNCTION	0.000	0.410	0	12:12	0	2.86	0.037
EXD_27	JUNCTION	0.235	1.418	0	12:00	0.558	10.6	0.001
EXD_3	JUNCTION	0.000	0.170	0	12:02	0	0.39	0.071
EXD_4	JUNCTION	0.000	0.169	0	12:03	0	0.389	0.021
EXD_5	JUNCTION	0.000	0.168	0	12:03	0	0.389	0.004
EXD_6	JUNCTION	0.000	0.168	0	12:04	0	0.389	- 0.376
EXD_7	JUNCTION	0.224	0.386	0	12:04	1.12	1.51	- 0.158
EXD_8	JUNCTION	0.000	0.379	0	12:06	0	1.51	0.286
EXD_9	JUNCTION	0.000	0.295	0	12:15	0	1.51	0.676
J10	JUNCTION	0.000	1.310	0	12:00	0	0.811	0.008
J11	JUNCTION	0.000	1.428	0	12:01	0	0.922	- 0.001
J12	JUNCTION	0.000	1.627	0	12:02	0	1.12	- 0.009
J13	JUNCTION	0.000	1.623	0	12:02	0	1.3	- 0.003
J17	JUNCTION	0.000	0.178	0	12:00	0	0.39	0.003
J19	JUNCTION	0.482	0.542	0	12:00	1.05	1.09	- 1.983
J20	JUNCTION	0.044	0.098	0	12:00	0.0968	0.153	1.420
J21	JUNCTION	0.078	0.092	0	12:00	0.171	0.197	- 0.733
J22	JUNCTION	0.048	0.120	0	12:02	0.104	0.164	0.859
J23	JUNCTION	0.000	0.113	0	12:01	0	0.0595	0.150
J24	JUNCTION	0.000	0.178	0	12:00	0	0.0852	0.753
J25	JUNCTION	0.000	2.493	0	12:02	0	1.84	0.242
J26	JUNCTION	0.000	2.060	0	12:01	0	1.54	- 0.087
J28	JUNCTION	0.246	0.246	0	12:00	0.536	0.536	- 2.132
J29	JUNCTION	0.692	0.810	0	12:00	1.51	1.59	0.052
J32	JUNCTION	0.000	1.544	0	12:00	0	0.938	0.034
J36	JUNCTION	0.093	0.396	0	12:00	0.203	0.424	3.509
J39	JUNCTION	0.000	2.461	0	12:03	0	2.04	0.282
J40	JUNCTION	0.204	2.388	0	12:05	0.444	2.47	- 0.095
J41	JUNCTION	0.000	4.490	0	12:05	0	4.06	0.127
J43	JUNCTION	0.000	3.167	0	12:03	0	2.79	- 0.043
J44	JUNCTION	0.122	1.025	0	12:01	0.266	1.11	0.268
J46	JUNCTION	0.170	0.170	0	12:00	0.371	0.376	- 1.319
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.139	1.010	0	12:01	0.302	1.1	- 0.067
J51	JUNCTION	0.000	0.966	0	12:01	0	0.799	0.779
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.007	0	11:55	0	0.00283	18.196
J58	JUNCTION	0.436	0.737	0	12:00	0.95	1.17	0.380
J59	JUNCTION	0.119	0.512	0	12:00	0.258	0.543	1.709
J6	JUNCTION	0.179	0.179	0	12:00	0.39	0.39	- 0.088
J61	JUNCTION	0.482	0.850	0	12:00	1.05	1.34	- 1.102
J62	JUNCTION	0.000	0.747	0	12:00	0	0.447	- 0.463
J74	JUNCTION	0.000	0.426	0	13:06	0	43	0.023
J9	JUNCTION	0.000	0.865	0	12:00	0	0.569	0.001
OF1	OUTFALL	0.000	0.648	0	13:06	0	3.8	0.000
OF2	OUTFALL	0.139	0.139	0	12:00	0.269	0.269	0.000
OF3	OUTFALL	0.000	1.393	0	12:00	0	10.6	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.426	0	13:06	0	43	0.000
500_(C-STRM)	STORAGE	0.000	0.198	0	12:07	0	0.697	0.065
500A_(C-STRM)	STORAGE	0.000	6.838	0	12:06	0	16.1	0.023
502_(C-STRM)	STORAGE	0.000	1.368	0	12:09	0	6.88	- 0.003
503_(C-STRM)	STORAGE	0.000	1.044	0	12:14	0	5.33	- 0.002
504_(C-STRM)	STORAGE	0.000	0.986	0	12:12	0	5.05	- 0.066
505_(C-STRM)	STORAGE	0.000	0.797	0	12:12	0	3.93	- 0.033
506_(C-STRM)	STORAGE	0.000	0.802	0	12:12	0	3.93	0.083
507_(C-STRM)	STORAGE	0.000	0.614	0	12:14	0	2.96	- 0.122
508_(C-STRM)	STORAGE	0.000	0.599	0	12:13	0	2.96	- 0.001
509_(C-STRM)	STORAGE	0.000	0.583	0	12:13	0	2.96	0.002
510_(C-STRM)	STORAGE	0.000	0.585	0	12:12	0	2.96	- 0.000
511_(C-STRM)	STORAGE	0.000	0.590	0	12:10	0	2.96	0.007
512_(C-STRM)	STORAGE	0.000	0.538	0	12:09	0	2.71	- 0.036
513_(C-STRM)	STORAGE	0.000	0.599	0	11:52	0	2.77	0.154
514_(C-STRM)	STORAGE	0.000	0.072	0	11:53	0	0.0644	2.403
515_(C-STRM)	STORAGE	0.000	0.036	0	11:56	0	0.0135	- 7.225
516_(C-STRM)	STORAGE	0.000	0.396	0	11:52	0	1.84	- 0.533
517_(C-STRM)	STORAGE	0.000	0.416	0	11:52	0	1.83	- 0.088
518_(C-STRM)	STORAGE	0.000	0.439	0	11:48	0	1.84	0.215
519_(C-STRM)	STORAGE	0.000	0.126	0	11:47	0	0.459	- 0.756
520_(C-STRM)	STORAGE	0.000	0.121	0	11:45	0	0.463	0.737
522_(C-STRM)	STORAGE	0.000	0.088	0	11:45	0	0.323	0.014
525_(C-STRM)	STORAGE	0.000	1.262	0	12:24	0	5.64	0.033
528_(C-STRM)	STORAGE	0.000	1.047	0	12:23	0	4.7	- 0.006
532_(C-STRM)	STORAGE	0.000	0.837	0	12:22	0	3.78	- 0.058
536_(C-STRM)	STORAGE	0.000	0.730	0	12:22	0	3.33	0.026
540_(C-STRM)	STORAGE	0.000	0.497	0	12:24	0	2.26	- 0.017
541_(C-STRM)	STORAGE	0.000	0.368	0	11:46	0	1.8	0.014
551_(C-STRM)	STORAGE	0.000	0.344	0	12:08	0	1.55	0.188
552_(C-STRM)	STORAGE	0.000	0.246	0	12:08	0	1.04	- 0.351
553_(C-STRM)	STORAGE	0.000	0.249	0	12:08	0	1.04	0.246
554_(C-STRM)	STORAGE	0.000	0.214	0	11:50	0	0.836	- 0.551
555_(C-STRM)	STORAGE	0.000	0.218	0	11:46	0	0.838	0.145
556_(C-STRM)	STORAGE	0.000	0.214	0	11:45	0	0.839	0.110
601_(C-STRM)	STORAGE	0.000	5.284	0	12:11	0	27	0.037
602_(C-STRM)	STORAGE	0.000	5.284	0	12:10	0	27	- 0.001
603_(C-STRM)	STORAGE	0.000	5.267	0	12:14	0	26.7	- 0.001
604_(C-STRM)	STORAGE	0.000	5.267	0	12:14	0	26.7	0.000
605_(C-STRM)	STORAGE	0.000	4.973	0	12:14	0	25.7	- 0.002

606_(C-STRM)	STORAGE	0.000	4.230	0	12:13	0	23	0.000	
619_(C-STRM)	STORAGE	0.000	4.230	0	12:13	0	23	0.002	
622_(C-STRM)	STORAGE	0.000	3.997	0	12:13	0	22.3	0.000	-
626_(C-STRM)	STORAGE	0.000	0.141	0	11:52	0	0.967	0.282	-
627_(C-STRM)	STORAGE	0.000	0.238	0	11:59	0	1.24	0.295	-
629_(C-STRM)	STORAGE	0.000	3.448	0	12:09	0	20.1	0.110	-
630_(C-STRM)	STORAGE	0.000	3.317	0	12:08	0	19.7	0.123	-
630A_(C-STRM)	STORAGE	0.000	3.082	0	12:08	0	18.4	0.052	-
631_(C-STRM)	STORAGE	5.028	5.028	0	12:00	14.5	14.5	0.034	-
645_(C-STRM)	STORAGE	0.000	0.766	0	12:27	0	3.96	0.013	-
647_(C-STRM)	STORAGE	0.000	0.684	0	12:27	0	3.83	0.005	-
650_(C-STRM)	STORAGE	0.000	0.589	0	12:27	0	3.68	0.047	-
651_(C-STRM)	STORAGE	0.000	0.544	0	11:46	0	3.57	0.026	-
682_(C-STRM)	STORAGE	1.299	1.299	0	12:00	3.5	3.5	0.019	-
MTD_(C-STRM)	STORAGE	0.000	2.587	0	12:09	0	12.5	0.046	-
OVERFLOW_(C-STRM)	STORAGE	0.000	2.586	0	12:10	0	12.5	0.014	-
POND_(C-STRM)	STORAGE	2.044	13.000	0	12:05	4.8	48.6	0.022	-
S_525-MTD	STORAGE	0.660	0.733	0	11:58	1.1	1.12	0.000	-
S_528-525	STORAGE	0.668	0.668	0	12:00	1.11	1.11	0.006	-
S_532-528	STORAGE	0.339	0.339	0	12:00	0.562	0.562	0.006	-
S_536-532	STORAGE	0.749	0.749	0	12:00	1.31	1.31	0.006	-
S_540-536	STORAGE	0.353	0.353	0	12:00	0.586	0.586	0.006	-
S_541-540	STORAGE	1.351	1.351	0	12:00	2.24	2.24	0.005	-
S_604-603	STORAGE	0.999	0.999	0	12:00	1.66	1.66	0.000	-
S_605-604	STORAGE	2.643	2.643	0	12:00	4.45	4.45	0.000	-
S_619-606	STORAGE	0.744	0.744	0	12:00	1.23	1.23	0.000	-
S_622-619	STORAGE	1.509	1.509	0	12:00	2.55	2.55	0.000	-
S_622-619_2	STORAGE	0.857	0.857	0	12:00	1.42	1.42	0.000	-
S_627-630	STORAGE	0.293	0.293	0	12:00	0.486	0.486	0.000	-
S_629-622	STORAGE	0.508	0.508	0	12:00	0.843	0.843	0.000	-
SU2	STORAGE	0.476	0.476	0	12:00	0.967	0.967	0.000	-
SU5	STORAGE	0.404	0.404	0	12:00	0.81	0.81	0.000	-

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	9.2	0.0	0.0	0.001	23.9	0 13:08	0.198
500A_(C-STRM)	0.679	30.4	0.0	0.0	2.066	92.5	0 12:06	6.816
502_(C-STRM)	0.000	3.8	0.0	0.0	0.002	46.5	0 12:09	1.367
503_(C-STRM)	0.000	3.3	0.0	0.0	0.002	46.8	0 12:09	1.045
504_(C-STRM)	0.000	13.0	0.0	0.0	0.002	50.8	0 12:14	0.984
505_(C-STRM)	0.000	10.7	0.0	0.0	0.002	47.4	0 12:12	0.793
506_(C-STRM)	0.000	11.1	0.0	0.0	0.002	54.4	0 12:12	0.797
507_(C-STRM)	0.000	11.1	0.0	0.0	0.002	56.5	0 12:12	0.631
508_(C-STRM)	0.000	11.0	0.0	0.0	0.002	59.9	0 12:13	0.614
509_(C-STRM)	0.000	11.0	0.0	0.0	0.002	63.5	0 12:13	0.599
510_(C-STRM)	0.000	11.2	0.0	0.0	0.002	65.4	0 12:13	0.583
511_(C-STRM)	0.000	11.3	0.0	0.0	0.002	66.0	0 12:13	0.585
512_(C-STRM)	0.000	11.0	0.0	0.0	0.002	64.5	0 12:13	0.531
513_(C-STRM)	0.000	11.0	0.0	0.0	0.002	63.6	0 12:13	0.567
514_(C-STRM)	0.000	7.5	0.0	0.0	0.002	52.5	0 12:13	0.076
515_(C-STRM)	0.000	7.2	0.0	0.0	0.002	43.2	0 12:13	0.037
516_(C-STRM)	0.000	11.3	0.0	0.0	0.002	65.3	0 12:12	0.384
517_(C-STRM)	0.000	11.6	0.0	0.0	0.002	68.3	0 12:12	0.396
518_(C-STRM)	0.000	12.2	0.0	0.0	0.003	77.3	0 12:08	0.416
519_(C-STRM)	0.000	11.8	0.0	0.0	0.002	72.8	0 12:07	0.154
520_(C-STRM)	0.000	12.4	0.0	0.0	0.002	72.0	0 12:07	0.117
522_(C-STRM)	0.000	10.6	0.0	0.0	0.001	20.3	0 12:03	0.088
525_(C-STRM)	0.000	4.2	0.0	0.0	0.002	64.8	0 12:10	1.273
528_(C-STRM)	0.000	3.0	0.0	0.0	0.002	70.3	0 12:11	1.059
532_(C-STRM)	0.000	2.6	0.0	0.0	0.002	72.5	0 12:11	0.842
536_(C-STRM)	0.000	2.7	0.0	0.0	0.002	73.7	0 12:11	0.733
540_(C-STRM)	0.000	12.5	0.0	0.0	0.002	76.4	0 12:12	0.534
541_(C-STRM)	0.000	12.0	0.0	0.0	0.002	74.6	0 12:12	0.393
551_(C-STRM)	0.000	9.3	0.0	0.0	0.002	46.6	0 12:09	0.341
552_(C-STRM)	0.000	8.7	0.0	0.0	0.002	44.2	0 12:09	0.243
553_(C-STRM)	0.000	9.1	0.0	0.0	0.002	43.3	0 12:08	0.246
554_(C-STRM)	0.000	8.6	0.0	0.0	0.002	41.0	0 12:08	0.203
555_(C-STRM)	0.000	8.6	0.0	0.0	0.002	40.0	0 12:08	0.214
556_(C-STRM)	0.000	8.6	0.0	0.0	0.002	42.1	0 12:07	0.218
601_(C-STRM)	0.000	3.3	0.0	0.0	0.001	27.4	0 12:11	5.284
602_(C-STRM)	0.000	3.6	0.0	0.0	0.002	42.1	0 12:11	5.284
603_(C-STRM)	0.000	3.4	0.0	0.0	0.002	45.4	0 12:14	5.267
604_(C-STRM)	0.000	2.4	0.0	0.0	0.002	39.2	0 12:14	5.267
605_(C-STRM)	0.000	2.1	0.0	0.0	0.002	33.2	0 12:14	4.973
606_(C-STRM)	0.000	2.3	0.0	0.0	0.002	34.1	0 12:14	4.230
619_(C-STRM)	0.000	2.5	0.0	0.0	0.002	40.1	0 12:13	4.230
622_(C-STRM)	0.000	2.8	0.0	0.0	0.002	44.7	0 12:13	3.997
626_(C-STRM)	0.000	7.1	0.0	0.0	0.001	15.8	0 12:33	0.141
627_(C-STRM)	0.000	6.8	0.0	0.0	0.001	26.6	0 12:13	0.242
629_(C-STRM)	0.000	2.9	0.0	0.0	0.002	43.9	0 12:13	3.446
630_(C-STRM)	0.000	3.2	0.0	0.0	0.002	41.7	0 12:13	3.314
630A_(C-STRM)	0.000	3.3	0.0	0.0	0.002	44.5	0 12:13	3.080
631_(C-STRM)	0.013	0.5	0.0	0.0	1.564	62.6	0 12:04	2.438
645_(C-STRM)	0.000	10.2	0.0	0.0	0.002	55.0	0 12:12	0.834
647_(C-STRM)	0.000	10.9	0.0	0.0	0.002	60.1	0 12:12	0.761
650_(C-STRM)	0.000	11.6	0.0	0.0	0.002	64.6	0 12:08	0.677
651_(C-STRM)	0.000	12.2	0.0	0.0	0.002	67.8	0 12:07	0.585
682_(C-STRM)	0.005	0.7	0.0	0.0	0.561	74.8	0 12:03	0.526
MTD_(C-STRM)	0.000	6.7	0.0	0.0	0.002	50.0	0 12:10	2.586
OVERFLOW_(C-STRM)	0.000	10.9	0.0	0.0	0.001	34.6	0 12:07	2.590
POND_(C-STRM)	12.818	35.4	0.0	0.0	31.629	87.3	0 13:06	1.177
S_525-MTD	0.003	0.5	0.0	0.0	0.337	58.8	0 12:05	0.462
S_528-525	0.002	0.4	0.0	0.0	0.252	43.4	0 12:02	0.474
S_532-528	0.001	0.3	0.0	0.0	0.118	40.1	0 12:01	0.266
S_536-532	0.002	0.4	0.0	0.0	0.216	50.5	0 12:00	0.707
S_540-536	0.001	0.4	0.0	0.0	0.088	43.1	0 12:00	0.348
S_541-540	0.005	0.4	0.0	0.0	0.534	45.5	0 12:01	1.014
S_604-603	0.003	0.3	0.0	23.0	0.358	41.2	0 12:01	0.800
S_605-604	0.011	0.5	0.0	24.3	1.177	51.5	0 12:02	1.552
S_619-606	0.002	0.4	0.0	23.1	0.215	50.0	0 12:00	0.694
S_622-619	0.007	0.5	0.0	24.8	0.690	53.0	0 12:02	0.952
S_622-619_2	0.002	0.4	0.0	23.1	0.259	52.3	0 12:00	0.791
S_627-630	0.001	0.2	0.0	26.4	0.078	30.8	0 12:00	0.281
S_629-622	0.001	0.3	0.0	24.6	0.175	39.6	0 12:01	0.389
SU2	0.009	1.8	0.0	0.0	0.369	73.8	0 12:36	0.141
SU5	0.004	0.7	0.0	0.0	0.241	48.2	0 12:18	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	8.52	0.259	0.648	3.805
OF2	48.19	0.003	0.139	0.269
OF3	97.26	0.063	1.393	10.598
ST4_108A_(P-Stm)	97.48	0.255	0.426	42.957
System	62.86	0.580	1.698	57.629

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.149	0 12:03	1.45	2.22	0.76
BDR-C2	CONDUIT	0.292	0 12:04	2.43	5.57	0.91
BDR-C3	CONDUIT	0.410	0 12:12	3.05	2.10	0.65
BDR-C4	CONDUIT	0.996	0 12:02	2.75	0.33	0.36
C1_1	CHANNEL	1.437	0 12:01	1.02	0.54	0.85
C1_17	CHANNEL	0.090	0 12:00	1.03	0.01	0.17
C1_3	CHANNEL	0.119	0 12:00	0.26	0.05	0.45
C1_30	CHANNEL	2.042	0 12:02	1.35	0.76	0.87
C1_4	CHANNEL	2.461	0 12:03	1.46	0.62	0.92
C14_1	CHANNEL	0.060	0 12:00	0.22	0.05	0.39
C14_2	CHANNEL	0.110	0 12:02	0.67	0.04	0.29
C14_4	CHANNEL	0.050	0 12:05	0.36	0.03	0.26
C14_5	CHANNEL	0.054	0 12:00	0.37	0.03	0.30
C15_1	CHANNEL	0.310	0 12:00	0.49	0.12	0.47
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.19
C2	CONDUIT	4.491	0 12:05	2.27	0.49	0.64
C20_1	CHANNEL	0.010	0 12:02	0.09	0.00	0.25
C20_2	CHANNEL	0.400	0 12:01	0.96	0.08	0.35
C20_3	CHANNEL	0.408	0 12:00	0.87	0.08	0.37
C20_4	CHANNEL	0.234	0 12:00	0.65	0.06	0.37
C20_5	CHANNEL	0.962	0 12:02	1.64	0.13	0.42
C20_7	CHANNEL	0.936	0 12:02	1.56	0.11	0.42
C23_5	CHANNEL	1.376	0 12:05	0.73	0.86	1.00
C23_7	CHANNEL	3.159	0 12:03	1.98	0.55	0.90
C3	CONDUIT	0.871	0 12:01	0.91	0.13	0.31
C4	CONDUIT	1.312	0 12:01	1.16	0.16	0.36
C4_1	CHANNEL	0.113	0 12:01	0.69	0.03	0.30
C4_2	CHANNEL	0.730	0 12:00	0.87	0.21	0.67
C4_3	CHANNEL	0.046	0 12:01	0.08	0.03	0.54
C4_4	CHANNEL	0.297	0 12:00	0.75	0.09	0.49
C4_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.21
C4_7	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C5	CONDUIT	1.436	0 12:02	1.12	0.22	0.41

C5_1	CHANNEL	0.178	0	12:00	0.37	0.04	0.17	
C5_10	CHANNEL	0.150	0	12:04	0.58	0.04	0.25	
C5_11	CHANNEL	0.167	0	12:16	0.26	0.06	0.45	
C5_12	CHANNEL	1.393	0	12:00	1.35	0.12	0.35	
C5_13	CHANNEL	0.149	0	12:07	0.60	0.04	0.31	
C5_14	CHANNEL	0.185	0	12:17	0.20	0.12	0.54	
C5_15	CHANNEL	0.290	0	12:09	0.50	0.08	0.35	
C5_16	CHANNEL	0.287	0	12:13	0.45	0.07	0.28	
C5_17	CHANNEL	0.298	0	12:12	0.25	0.03	0.32	
C5_19	CHANNEL	0.292	0	12:15	0.52	0.19	0.31	
C5_2	CHANNEL	0.170	0	12:02	0.66	0.02	0.21	
C5_20	CHANNEL	0.333	0	12:13	0.38	0.03	0.26	
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.36	
C5_23	CHANNEL	0.178	0	12:00	0.35	0.04	0.18	
C5_3	CHANNEL	0.177	0	12:00	0.59	0.01	0.22	
C5_4	CHANNEL	0.168	0	12:03	0.54	0.01	0.17	
C5_5	CHANNEL	0.167	0	12:04	0.54	0.01	0.17	
C5_6	CHANNEL	0.169	0	12:03	0.82	0.01	0.13	
C5_7	CHANNEL	0.293	0	12:18	0.43	0.02	0.29	
C5_8	CHANNEL	0.379	0	12:06	0.58	0.03	0.33	
C5_9	CHANNEL	0.860	0	12:05	0.76	0.07	0.37	
C6	CONDUIT	1.623	0	12:02	1.10	0.25	0.50	
C7	CHANNEL	0.085	0	12:00	0.33	0.03	0.34	
C9_1	CHANNEL	0.303	0	12:00	0.65	0.08	0.37	
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.13	
C9_2	CHANNEL	0.328	0	11:59	0.61	0.10	0.65	
C9_5	CHANNEL	2.359	0	12:05	1.19	0.58	0.79	
C9_6	CHANNEL	2.278	0	12:05	1.52	0.55	0.70	
C9_7	CHANNEL	0.956	0	12:02	1.17	0.14	0.53	
C-STRM-1_(1)_(1)_(C-STRM) CONDUIT	0.384	0	11:52	1.14	1.02	1.00		
C-STRM-1_(1)_(C-STRM) CONDUIT	0.396	0	11:52	1.11	1.22	1.00		
C-STRM-1_(C-STRM) CONDUIT	0.416	0	11:52	1.47	1.75	1.00		
C-STRM-100_(C-STRM) CONDUIT	0.198	0	12:07	1.36	0.46	0.51		
C-STRM-101_(C-STRM) CONDUIT	0.198	0	12:07	2.32	0.25	0.74		
C-STRM-102_(C-STRM) CONDUIT	2.398	0	12:10	3.00	0.96	0.92		
C-STRM-103_(C-STRM) CONDUIT	0.677	0	12:27	1.27	1.22	1.00		
C-STRM-104_(C-STRM) CONDUIT	0.761	0	12:27	1.42	1.37	1.00		
C-STRM-105_(C-STRM) CONDUIT	0.834	0	12:27	1.56	1.50	1.00		
C-STRM-2_(I)_(C-STRM) CONDUIT	0.531	0	12:10	1.61	0.94	1.00		
C-STRM-2_(C-STRM) CONDUIT	0.538	0	12:09	1.73	0.95	1.00		
C-STRM-20_(C-STRM) CONDUIT	0.141	0	12:33	1.80	0.49	0.75		
C-STRM-21_(C-STRM) CONDUIT	0.242	0	11:56	1.47	0.79	1.00		
C-STRM-22_(1)_(C-STRM) CONDUIT	3.446	0	12:13	1.61	0.77	1.00		
C-STRM-22_(C-STRM) CONDUIT	3.314	0	12:09	2.43	1.21	1.00		
C-STRM-26_(1)_(C-STRM) CONDUIT	0.341	0	12:09	0.95	1.02	1.00		
C-STRM-26_(C-STRM) CONDUIT	0.243	0	12:08	0.68	0.72	1.00		
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT	0.797	0	12:12	1.80	1.01	1.00		
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT	0.631	0	12:14	1.76	1.06	1.00		
C-STRM-3_(1)_(1)_(1)_(C-STRM) CONDUIT	0.614	0	12:14	1.72	1.03	1.00		
C-STRM-3_(1)_(1)_(C-STRM) CONDUIT	0.599	0	12:13	1.67	1.01	1.00		
C-STRM-3_(1)_(2)_(C-STRM) CONDUIT	0.583	0	12:13	1.63	1.03	1.00		
C-STRM-3_(1)_(C-STRM) CONDUIT	0.585	0	12:12	1.70	1.03	1.00		
C-STRM-33_(C-STRM) CONDUIT	0.585	0	12:27	1.18	1.05	1.00		
C-STRM-34_(1)_(1)_(C-STRM) CONDUIT	0.214	0	11:50	1.21	1.25	1.00		
C-STRM-34_(1)_(C-STRM) CONDUIT	0.218	0	11:46	1.18	1.27	1.00		
C-STRM-35_(1)_(C-STRM) CONDUIT	0.246	0	12:08	1.02	1.00	1.00		
C-STRM-35_(C-STRM) CONDUIT	0.203	0	12:08	0.93	0.82	1.00		
C-STRM-4_(1)_(C-STRM) CONDUIT	0.984	0	12:14	2.34	1.14	0.91		
C-STRM-4_(C-STRM) CONDUIT	0.793	0	12:12	1.79	1.01	1.00		
C-STRM-49_(C-STRM) CONDUIT	0.393	0	12:25	0.79	0.71	1.00		
C-STRM-50_(C-STRM) CONDUIT	0.534	0	12:24	1.00	0.96	1.00		
C-STRM-51_(C-STRM) CONDUIT	0.733	0	12:22	1.15	1.04	1.00		
C-STRM-52_(C-STRM) CONDUIT	0.842	0	12:23	1.13	0.97	1.00		
C-STRM-53_(C-STRM) CONDUIT	1.059	0	12:24	1.42	1.22	1.00		
C-STRM-57_(C-STRM) CONDUIT	1.045	0	12:13	1.40	1.19	1.00		
C-STRM-62_(C-STRM) CONDUIT	0.117	0	11:47	0.96	0.92	1.00		
C-STRM-63_(C-STRM) CONDUIT	0.154	0	12:12	0.71	0.92	1.00		
C-STRM-64_(C-STRM) CONDUIT	0.088	0	12:03	1.07	1.00	0.70		
C-STRM-74_(C-STRM) CONDUIT	4.230	0	12:13	1.66	0.82	1.00		
C-STRM-75_(C-STRM) CONDUIT	4.230	0	12:14	1.66	0.82	1.00		
C-STRM-76_(C-STRM) CONDUIT	1.273	0	12:23	1.70	1.27	1.00		
C-STRM-77_(C-STRM) CONDUIT	2.586	0	12:10	3.04	1.34	0.96		
C-STRM-78_(C-STRM) CONDUIT	1.367	0	12:09	1.83	1.12	1.00		
C-STRM-79_(1)_(C-STRM) CONDUIT	5.267	0	12:14	2.07	0.84	0.99		
C-STRM-79_(C-STRM) CONDUIT	4.973	0	12:14	1.95	0.86	1.00		
C-STRM-8_(1)_(C-STRM) CONDUIT	0.076	0	12:22	0.43	0.40	1.00		
C-STRM-8_(C-STRM) CONDUIT	0.037	0	12:14	0.32	0.29	1.00		
C-STRM-80_(C-STRM) CONDUIT	5.267	0	12:14	2.09	1.19	0.97		
C-STRM-81_(C-STRM) CONDUIT	5.284	0	12:11	2.37	1.19	0.82		
C-STRM-82_(C-STRM) CONDUIT	5.284	0	12:11	3.00	1.18	0.65		
C-STRM-83_(1)_(C-STRM) CONDUIT	3.080	0	12:08	2.13	1.13	1.00		
C-STRM-84_(C-STRM) CONDUIT	3.997	0	12:13	1.64	0.78	1.00		
CVR-C2	CONDUIT	0.168	0	12:04	2.37	0.63	0.46	
CVR-C3	CONDUIT	0.295	0	12:15	3.16	1.81	0.74	
CVR-C4	CONDUIT	0.858	0	12:05	2.84	0.28	0.31	
ST4-Pipe_-_(99)_(P-Stm) CONDUIT	0.426	0	13:06	1.36	0.44	1.00		
W1	CHANNEL	6.790	0	12:06	1.28	0.03	0.07	
OR1	ORIFICE	0.355	0	13:06			1.00	
OR2	ORIFICE	0.071	0	13:06			0.46	
W10	WEIR	0.461	0	11:56			0.29	
W11	WEIR	0.162	0	11:56			0.25	
W12	WEIR	0.269	0	11:57			0.29	
W13	WEIR	0.259	0	12:09			0.49	
W14	WEIR	0.246	0	12:00			0.25	
W15	WEIR	0.624	0	12:01			0.41	
W2	WEIR	0.648	0	13:06			0.38	
W3	WEIR	0.178	0	12:02			0.13	
W4	WEIR	0.530	0	12:00			0.32	
W5	WEIR	0.450	0	12:00			0.29	
W6	WEIR	0.767	0	12:02			0.39	
W7	WEIR	0.492	0	12:01			0.27	
W8	WEIR	0.646	0	12:01			0.32	
W9	WEIR	0.238	0	12:00			0.19	
C1	DUMMY	0.249	0	11:45				
C-STRM-107_(C-STRM)	DUMMY	0.294	0	11:46				
C-STRM-14_(1)_(C-STRM) DUMMY	0.743	0	11:46					
C-STRM-23_(C-STRM)	DUMMY	0.302	0	11:45				
C-STRM-42_(C-STRM)	DUMMY	0.368	0	11:46				
C-STRM-44_(1)_(C-STRM) DUMMY	0.203	0	11:46					
C-STRM-45_(1)_(C-STRM) DUMMY	0.233	0	11:46					
C-STRM-71_(C-STRM)	DUMMY	0.526	0	11:46				
C-STRM-83_(C-STRM)	DUMMY	2.438	0	11:48				
C-STRM-96_(1)_(C-STRM) DUMMY	0.246	0	11:46					
C-STRM-97_(1)_(C-STRM) DUMMY	0.104	0	11:46					
C-STRM-98_(1)_(C-STRM) DUMMY	0.205	0	11:46					
OL1	DUMMY	0.097	0	11:47				
OL10	DUMMY	0.026	0	01:51				
OL11	DUMMY	0.046	0	11:45				
OL12	DUMMY	0.101	0	11:45				
OL13	DUMMY	0.084	0	11:45				
OL14	DUMMY	0.121	0	11:45				
OL15	DUMMY	0.088	0	11:45				
OL16	DUMMY	0.342	0	11:46				
OL17	DUMMY	0.215	0	11:46				
OL18	DUMMY	0.059	0	11:46				
OL19	DUMMY	0.238	0	11:45				
OL2	DUMMY	0.141	0	11:52				
OL20	DUMMY	0.068	0	11:45				
OL21	DUMMY	0.060	0	11:45				
OL22	DUMMY	0.184	0	12:14				
OL3	DUMMY	0.134	0	11:46				
OL4	DUMMY	0.110	0	11:46				
OL5	DUMMY	0.046	0	11:48				
OL6	DUMMY	0.029	0	11:45				
OL7	DUMMY	0.034	0	11:46				
OL8	DUMMY	0.018	0	11:45				
OL9	DUMMY	0.214	0	11:45				

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Up Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.44	0.00
BDR-C2	1.00	0.02	0.00	0.00	0.96	0.01	0.00	0.00	0.32	0.00
BDR-C3	1.00	0.02	0.00	0.00	0.38	0.59	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.02	0.00	0.00	0.26	0.72	0.00	0.00	0.55	0.00
C1_1	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75	0.00
C1_17	1.00	0.51	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00
C1_3	1.00	0.49	0.02	0.00	0.49	0.00	0.00	0.00	0.75	0.00
C1_30	1.00	0.25	0.00	0.00	0.34	0.42	0.00	0.00	0.11	0.00
C1_4	1.00	0.24	0.01	0.00	0.74	0.01	0.00	0.00	0.75	0.00
C14_1	1.00	0.50	0.02	0.00	0.48	0.00	0.00	0.00	0.77	0.00
C14_2	1.00	0.02	0.22	0.00	0.57	0.18	0.00	0.00	0.00	0.00
C14_4	1.00	0.51	0.01	0.00	0.48	0.00	0.00	0.00	0.78	0.00
C14_5	1.00	0.51	0.00	0.00	0.45	0.03	0.00	0.00	0.00	0.00
C15_1	1.00	0.50	0.01	0.00	0.50	0.00	0.00	0.00	0.76	0.00
C15_2	1.00	0.51	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.24	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00
C20_1	1.00	0.51	0.02	0.00	0.67	0.08	0.00	0.00	0.00	0.00
C20_2	1.00	0.51	0.01	0.00	0.44	0.05	0.00	0.00	0.77	0.00
C20_3	1.00	0.51	0.01	0.00	0.44	0.05	0.00	0.00	0.02	0.00
C20_4	1.00	0.02	0.49	0.00	0.48	0.01	0.00	0.00	0.75	0.00
C20_5	1.00	0.02	0.22	0.00	0.60	0.15	0.00	0.00	0.01	0.00
C20_7	1.00	0.51	0.00	0.00	0.42	0.06	0.00	0.00	0.02	0.00
C23_5	1.00	0.24	0.00	0.00	0.69	0.06	0.00	0.00	0.00	0.00
C23_7	1.00	0.24	0.00	0.00	0.67	0.09	0.00	0.00	0.08	0.00
C3	1.00	0.86	0.04	0.00	0.09	0.00	0.00	0.00	0.75	0.00
C4	1.00	0.80	0.06	0.00	0.14	0.00	0.00	0.00	0.75	0.00
C4_1	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75	0.00
C4_2	1.00	0.24	0.00	0.00	0.76	0.00	0.00	0.00	0.75	0.00
C4_3	1.00	0.25	0.00	0.00	0.75	0.00	0.00	0.00	0.75	0.00
C4_4	1.00	0.02	0.49	0.00	0.48	0.01	0.00	0.00	0.75	0.00
C4_5	1.00	0.51	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.74	0.06	0.00	0.20	0.00	0.00	0.00	0.75	0.00
C5_1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.52	0.00
C5_10	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.91	0.00
C5_11	1.00	0.03	0.01	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C5_12	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.03	0.00	0.00	0.60	0.37	0.00	0.00	0.01	0.00
C5_14	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.32	0.00
C5_15	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.94	0.00
C5_16	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.02	0.03	0.00	0.95	0.00	0.00	0.00	0.91	0.00
C5_19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.36	0.00
C5_2	1.00	0.04	0.00	0.00	0.71	0.25	0.00	0.00	0.00	0.00
C5_20	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_21	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.03	0.00	0.00	0.87	0.10	0.00	0.00	0.75	0.00
C5_3	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.95	0.00
C5_4	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C5_5	1.00	0.06	0.00	0.00	0.94	0.01	0.00	0.00	0.07	0.00
C5_6	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.60	0.00
C5_7	1.00	0.02	0.05	0.00	0.92	0.00	0.00	0.00	0.92	0.00
C5_8	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.91	0.00
C5_9	1.00	0.07	0.00	0.00	0.97	0.00	0.00	0.00	0.75	0.00
C6	1.00	0.25	0.49	0.00	0.26	0.00	0.00	0.00	0.75	0.00
C7	1.00	0.51	0.01	0.00	0.48	0.00	0.00	0.00	0.77	0.00
C9_1	1.00	0.50	0.00	0.00	0.47	0.03	0.00	0.00	0.02	0.00
C9_11	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.02	0.50	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C9_5	1.00	0.02	0.22	0.00	0.08	0.68	0.00	0.00	0.01	0.00
C9_6	1.00	0.02	0.49	0.00	0.47	0.02	0.00	0.00	0.74	0.00
C9_7	1.00	0.02	0.49	0.00	0.47	0.01	0.00	0.00	0.75	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.97	0.00	0.00	0.00	0.09	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.41	0.00
C-STRM-1_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.73	0.00	0.00	0.24	0.00	0.00	0.02	0.66	0.00
C-STRM-101_(C-STRM)	1.00	0.66	0.08	0.00	0.25	0.00	0.00	0.01	0.53	0.00
C-STRM-102_(C-STRM)	1.00	0.03	0.00	0.00	0.81	0.16	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.59	0.00
C-STRM-104_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C-STRM-105_(C-STRM)	1.00	0.03	0.00	0.00	0.33	0.00	0.00	0.64	0.00	0.00
C-STRM-2_(I)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.86	0.00
C-STRM-2_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.02	0.00	0.01	0.37	0.00
C-STRM-20_(C-STRM)	1.00	0.24	0.00	0.00	0.01	0.00	0.00	0.74	0.01	0.00
C-STRM-21_(C-STRM)	1.00	0.24	0.00	0.00	0.01	0.00	0.00	0.75	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.03	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.03	0.02	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.91	0.06	0.00	0.01	0.33	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.50	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.32	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.20	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.36	0.00
C-STRM-33_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.72	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.03	0.04	0.00	0.93	0.00	0.00	0.00	0.94	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.03	0.02	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.03	0.01	0.00	0.87	0.09	0.00	0.00	0.52	0.00
C-STRM-49_(C-STRM)	1.00	0.03	0.26	0.00	0.71	0.00	0.00	0.00	0.90	0.00
C-STRM-50_(C-STRM)	1.00	0.03	0.00	0.00	0.05	0.00	0.00	0.92	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.03	0.00	0.00	0.03	0.00	0.00	0.94	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.79	0.00
C-STRM-53_(C-STRM)	1.00	0.03	0.15	0.00	0.82	0.00	0.00	0.00	0.61	0.00
C-STRM-57_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.38	0.00
C-STRM-62_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.03	0.00	0.00	0.09	0.00	0.00	0.88	0.03	0.00
C-STRM-64_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.49	0.00
C-STRM-75_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.46	0.00
C-STRM-76_(C-STRM)	1.00	0.03	0.00	0.00	0.47	0.00	0.00	0.50	0.09	0.00
C-STRM-77_(C-STRM)	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.00	0.25	0.00
C-STRM-78_(C-STRM)	1.00	0.02	0.00	0.00	0.45	0.00	0.00	0.52	0.05	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.83	0.00
C-STRM-79_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.23	0.01	0.00	0.02	0.00	0.00	0.73	0.01	0.00
C-STRM-8_(C-STRM)	1.00	0.25	0.00	0.00	0.01	0.00	0.00	0.74	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.79	0.00
C-STRM-81_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46	0.00
C-STRM-82_(C-STRM)	1.00	0.02	0.00	0.00	0.32	0.00	0.00	0.66	0.03	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.48	0.00
C-STRM-84_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.89	0.00
CVR-C2	1.00	0.05	0.00	0.00	0.50	0.44	0.00	0.00	0.77	0.00
CVR-C3	1.00	0.07	0.00	0.00	0.38	0.56	0.00	0.00	0.04	0.00
CVR-C4	1.00	0.02	0.00	0.00	0.38	0.59	0.00	0.00	0.13	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.02	0.00	0.00	0.83	0.00	0.00	0.15	0.00	0.00
W1	1.00	0.74	0.00	0.00	0.08	0.00	0.00	0.18	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
BDR-C1	0.01	1.15

C-STRM-22_(1)_(C-STRM)	0.46	0.46	0.49	0.01	0.01
C-STRM-22_(C-STRM)	0.45	0.47	0.46	0.63	0.45
C-STRM-26_(1)_(C-STRM)	0.74	0.74	0.75	0.05	0.26
C-STRM-26_(C-STRM)	0.71	0.71	0.74	0.01	0.01
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	0.51	0.52	0.54	0.04	0.43
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.51	0.53	0.51	0.08	0.47
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.53	0.57	0.53	0.06	0.53
C-STRM-3_(1)_(1)_(C-STRM)	0.57	0.60	0.57	0.01	0.57
C-STRM-3_(1)_(2)_(C-STRM)	0.57	0.57	0.60	0.16	0.19
C-STRM-3_(1)_(C-STRM)	0.56	0.56	0.57	0.14	0.36
C-STRM-33_(C-STRM)	0.71	0.71	0.71	0.03	0.07
C-STRM-34_(1)_(1)_(C-STRM)	0.56	0.56	0.62	0.34	0.28
C-STRM-34_(1)_(C-STRM)	0.49	0.49	0.56	0.37	0.28
C-STRM-35_(1)_(C-STRM)	0.68	0.68	0.71	0.01	0.03
C-STRM-35_(C-STRM)	0.62	0.62	0.68	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.61	0.01	0.49	0.01
C-STRM-4_(C-STRM)	0.54	0.54	0.61	0.03	0.42
C-STRM-49_(C-STRM)	0.75	0.75	0.76	0.01	0.01
C-STRM-50_(C-STRM)	0.76	0.76	0.77	0.01	0.55
C-STRM-51_(C-STRM)	0.76	0.77	0.76	0.41	0.76
C-STRM-52_(C-STRM)	0.76	0.76	0.77	0.01	0.63
C-STRM-53_(C-STRM)	0.77	0.77	0.77	0.62	0.74
C-STRM-57_(C-STRM)	0.75	0.76	0.75	0.53	0.74
C-STRM-62_(C-STRM)	0.49	0.49	0.54	0.01	0.01
C-STRM-63_(C-STRM)	0.54	0.54	0.57	0.01	0.01
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.21	0.01
C-STRM-74_(C-STRM)	0.49	0.52	0.49	0.01	0.49
C-STRM-75_(C-STRM)	0.42	0.49	0.42	0.01	0.42
C-STRM-76_(C-STRM)	0.76	0.77	0.76	0.67	0.76
C-STRM-77_(C-STRM)	0.01	0.76	0.01	0.68	0.01
C-STRM-78_(C-STRM)	0.75	0.75	0.76	0.35	0.74
C-STRM-79_(1)_(C-STRM)	0.01	0.51	0.01	0.01	0.01
C-STRM-79_(C-STRM)	0.42	0.42	0.51	0.01	0.01
C-STRM-8_(1)_(C-STRM)	0.41	0.41	0.51	0.01	0.01
C-STRM-8_(C-STRM)	0.33	0.33	0.40	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.61	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.62	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.61	0.01
C-STRM-83_(1)_(C-STRM)	0.47	0.47	0.47	0.63	0.47
C-STRM-84_(C-STRM)	0.49	0.49	0.52	0.01	0.01
CVR-C3	0.01	0.46	0.01	0.91	0.01
ST4-Pipe_-_(99)_(P-Stm)	0.42	0.42	0.50	0.01	0.01

Analysis begun on: Thu Apr 9 12:48:56 2026
Analysis ended on: Thu Apr 9 12:49:08 2026
Total elapsed time: 00:00:12

Post-Development 1:2 year 3-hour Chicago Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
  Name                Data Source                 Data       Recording
                                                  Type       Interval
  ----------------------------------------------------------------------
  24SCS100            24SCS100                    INTENSITY   15 min.
  6SCS050             6SCS050                     INTENSITY   15 min.
  Rainfall            CHI_3hr_2                   INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------
  A15                 3.46     13.10     18.98    0.5000 Rainfall             EXD_12
  A18                 0.59    338.21     39.12    0.5000 Rainfall             EXD_25
  A19                 1.11    332.78     22.32    0.5000 Rainfall             EXD_20
  A20                 4.83    279.76      8.37    1.5000 Rainfall             EXD_15
  NULL3               0.57    312.75     83.33    1.4500 Rainfall             EXD_27
  S1                  6.52   1467.98     66.38    2.0000 Rainfall             S_605-604
  S1_1                0.12    118.05     71.43    2.0000 Rainfall             J19
  S1_2                0.12    147.72     71.43    2.0000 Rainfall             J22
  S1_4                0.19    154.58     71.43    2.0000 Rainfall             J21
  S1_5                0.11    103.57     71.43    2.0000 Rainfall             J20
  S10_1               1.84    414.84     64.29    2.0000 Rainfall             S_619-606
  S10_2               2.12    478.11     64.29    2.0000 Rainfall             S_622-
619_2
  S10_4               0.73    163.42     64.29    2.0000 Rainfall             S_627-630
  S10_5               1.26    283.52     64.29    2.0000 Rainfall             S_629-622
  S11                 3.30    287.00      0.00    2.0000 Rainfall             SU2
  S12                 0.44    334.74     71.43    2.0000 Rainfall             J6
  S14_1               0.60    367.10     71.43    2.0000 Rainfall             J28
  S14_3               1.06    381.29     71.43    2.0000 Rainfall             J58
  S14_4               0.30    171.63     71.43    2.0000 Rainfall             J44
  S14_5               1.69    659.05     71.43    2.0000 Rainfall             J29
  S14_6               0.29    153.64     71.43    2.0000 Rainfall             J59
  S14_7               1.17    557.97     71.43    2.0000 Rainfall             J61
  S14_8               0.34    171.63     71.43    2.0000 Rainfall             J48
  S15                 1.64    368.26     64.29    2.0000 Rainfall             S_525-MTD
  S16                 1.47     16.60    100.00    0.5000 Rainfall             EXD_10
  S17                 6.26    202.00      3.33    0.5000 Rainfall             EXD_7
  S18_2               3.35    754.05     64.29    2.0000 Rainfall             S_541-540
  S18_3               1.66    372.76     64.29    2.0000 Rainfall             S_528-525
  S18_4               0.88    197.06     64.29    2.0000 Rainfall             S_540-536
  S18_5               1.83    412.02     71.43    2.0000 Rainfall             S_536-532
  S18_6               0.84    188.96     64.29    2.0000 Rainfall             S_532-528
  S19                 1.05    441.38     71.43    2.0000 Rainfall             J19
  S2                  3.72    837.17     66.87    2.0000 Rainfall             S_622-619
  S20_1               0.50    441.34     71.43    2.0000 Rainfall             J20
  S20_2               0.23    441.34     71.43    2.0000 Rainfall             J36
  S3                  2.48    557.29     64.29    2.0000 Rainfall             S_604-603
  S32                 0.41    327.12     71.43    2.0000 Rainfall             J46
  S36                 1.82     21.00    100.00    0.5000 Rainfall             EXD_10
  S4                 13.22    348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
  S5                  3.19    291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
  S6                  0.34    260.95     57.14    2.0000 Rainfall             OF2
  S7                  3.99    402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
  S8                  1.92    119.90     35.71    2.0000 Rainfall             SU5


  ************
  Node Summary
  ************
  Name                Type                 Invert      Max.    Ponded    External
                                            Elev.     Depth      Area    Inflow
  ----------------------------------------------------------------------------
  EXD_1               JUNCTION            104.39      1.51       0.0
  EXD_10              JUNCTION             98.65      1.20       0.0
  EXD_11              JUNCTION             98.50      1.20       0.0
  EXD_12              JUNCTION             98.31      1.20       0.0
  EXD_13              JUNCTION            104.32      1.10       0.0
  EXD_14              JUNCTION            102.49      0.80       0.0
  EXD_15              JUNCTION            100.27      0.80       0.0
  EXD_16              JUNCTION            100.20      0.80       0.0
  EXD_17              JUNCTION             99.89      0.80       0.0
  EXD_18              JUNCTION             99.40      0.84       0.0
  EXD_19              JUNCTION             99.19      0.88       0.0
  EXD_2               JUNCTION            103.47      1.93       0.0
  EXD_20              JUNCTION             99.19      0.88       0.0
  EXD_21              JUNCTION             99.18      0.88       0.0
  EXD_22              JUNCTION             99.14      0.88       0.0
  EXD_23              JUNCTION             98.75      1.14       0.0
  EXD_24              JUNCTION             98.67      1.14       0.0
  EXD_25              JUNCTION             98.52      1.13       0.0
  EXD_26              JUNCTION             98.48      1.13       0.0
  EXD_27              JUNCTION             98.17      1.20       0.0
  EXD_3               JUNCTION            103.19      1.41       0.0
  EXD_4               JUNCTION            102.64      1.20       0.0
  EXD_5               JUNCTION            102.50      1.20       0.0
  EXD_6               JUNCTION            102.32      1.08       0.0
  EXD_7               JUNCTION            101.50      1.06       0.0
  EXD_8               JUNCTION            100.48      1.06       0.0
  EXD_9               JUNCTION            100.39      1.06       0.0
  J10                 JUNCTION            103.60      0.50       0.0
  J11                 JUNCTION            103.50      0.50       0.0
  J12                 JUNCTION            103.40      0.50       0.0
  J13                 JUNCTION            103.30      0.50       0.0
  J17                 JUNCTION            104.37      1.04       0.0
  J19                 JUNCTION            105.40      0.50       0.0
  J20                 JUNCTION            105.45      0.50       0.0
  J21                 JUNCTION            105.55      0.50       0.0
  J22                 JUNCTION            105.70      0.50       0.0
  J23                 JUNCTION            106.00      0.50       0.0
  J24                 JUNCTION            106.20      0.50       0.0
  J25                 JUNCTION            105.30      0.50       0.0
  J26                 JUNCTION            105.70      0.50       0.0
  J28                 JUNCTION            109.00      0.50       0.0
  J29                 JUNCTION            108.80      0.50       0.0
  J32                 JUNCTION            106.00      0.50       0.0
  J36                 JUNCTION            104.70      0.50       0.0
  J39                 JUNCTION            104.60      0.50       0.0
  J40                 JUNCTION            104.45      0.50       0.0
  J41                 JUNCTION            103.20      0.50       0.0
  J43                 JUNCTION            104.20      0.50       0.0
  J44                 JUNCTION            104.50      0.50       0.0
  J46                 JUNCTION            104.60      0.50       0.0
  J47                 JUNCTION            105.10      0.50       0.0
  J48                 JUNCTION            105.75      0.50       0.0
  J51                 JUNCTION            106.75      0.50       0.0
  J52                 JUNCTION            109.75      0.50       0.0
  J53                 JUNCTION            109.00      0.50       0.0
  J56                 JUNCTION            109.10      0.50       0.0
  J57                 JUNCTION            108.47      0.50       0.0
  J58                 JUNCTION            108.40      0.50       0.0
  J59                 JUNCTION            108.00      0.50       0.0
  J6                  JUNCTION            109.83      0.30       0.0
  J61                 JUNCTION            107.00      0.50       0.0
  J62                 JUNCTION            106.50      0.50       0.0
  J74                 JUNCTION             98.45      0.90       0.0
  J9                  JUNCTION            103.70      0.50       0.0
  OF1                 OUTFALL             100.80      0.00       0.0
  OF2                 OUTFALL               0.00      0.00       0.0
  OF3                 OUTFALL              98.00      1.06       0.0
  ST4_108A_(P-Stm)    OUTFALL              98.02      1.19       0.0
  500_(C-STRM)        STORAGE             100.31      2.84       0.0
  500A_(C-STRM)       STORAGE             100.10      1.00       0.0
  502_(C-STRM)        STORAGE             100.54      3.70       0.0
  503_(C-STRM)        STORAGE             100.59      3.92       0.0
  504_(C-STRM)        STORAGE             103.04      2.70       0.0
  505_(C-STRM)        STORAGE             103.45      3.26       0.0
  506_(C-STRM)        STORAGE             103.82      3.16       0.0
  507_(C-STRM)        STORAGE             104.14      3.10       0.0
  508_(C-STRM)        STORAGE             104.37      3.12       0.0
  509_(C-STRM)        STORAGE             104.60      3.14       0.0
  510_(C-STRM)        STORAGE             104.85      3.09       0.0
  511_(C-STRM)        STORAGE             104.91      3.08       0.0
  512_(C-STRM)        STORAGE             105.11      3.12       0.0
  513_(C-STRM)        STORAGE             105.24      3.14       0.0
  514_(C-STRM)        STORAGE             105.59      3.16       0.0
  515_(C-STRM)        STORAGE             105.85      3.24       0.0
  516_(C-STRM)        STORAGE             105.46      3.06       0.0
  517_(C-STRM)        STORAGE             105.62      3.03       0.0
  518_(C-STRM)        STORAGE             105.85      2.92       0.0
  519_(C-STRM)        STORAGE             106.08      2.82       0.0
  520_(C-STRM)        STORAGE             106.34      2.66       0.0
  522_(C-STRM)        STORAGE             104.31      3.00       0.0
  525_(C-STRM)        STORAGE             100.61      2.69       0.0
  528_(C-STRM)        STORAGE             100.72      2.68       0.0
  532_(C-STRM)        STORAGE             100.83      2.67       0.0
  536_(C-STRM)        STORAGE             100.98      2.63       0.0
  540_(C-STRM)        STORAGE             100.86      2.85       0.0
  541_(C-STRM)        STORAGE             100.93      2.89       0.0
  551_(C-STRM)        STORAGE             100.65      3.78       0.0
  552_(C-STRM)        STORAGE             100.74      3.88       0.0
  553_(C-STRM)        STORAGE             100.93      3.78       0.0
  554_(C-STRM)        STORAGE             101.05      3.89       0.0
  555_(C-STRM)        STORAGE             101.25      3.93       0.0
  556_(C-STRM)        STORAGE             101.37      3.89       0.0
  601_(C-STRM)        STORAGE             100.45      4.43       0.0
  602_(C-STRM)        STORAGE             100.52      4.11       0.0
  603_(C-STRM)        STORAGE             100.63      3.89       0.0
  604_(C-STRM)        STORAGE             100.88      4.87       0.0
  605_(C-STRM)        STORAGE             101.09      5.63       0.0
  606_(C-STRM)        STORAGE             101.24      5.75       0.0
  619_(C-STRM)        STORAGE             101.38      5.14       0.0
  622_(C-STRM)        STORAGE             101.53      4.49       0.0
  626_(C-STRM)        STORAGE             103.94      3.33       0.0
  627_(C-STRM)        STORAGE             103.13      3.58       0.0
  629_(C-STRM)        STORAGE             101.65      4.46       0.0
  630_(C-STRM)        STORAGE             102.08      4.12       0.0
  630A_(C-STRM)       STORAGE             102.12      3.90       0.0
  631_(C-STRM)        STORAGE             106.00      0.50       0.0
  645_(C-STRM)        STORAGE             102.03      3.69       0.0
  647_(C-STRM)        STORAGE             102.14      3.40       0.0
  650_(C-STRM)        STORAGE             102.22      3.19       0.0
  651_(C-STRM)        STORAGE             102.31      3.03       0.0
  682_(C-STRM)        STORAGE             105.40      0.50       0.0
  MTD_(C-STRM)        STORAGE             100.37      3.19       0.0
  OVERFLOW_(C-STRM)   STORAGE             100.18      2.76       0.0
  POND_(C-STRM)       STORAGE              98.45      2.65       0.0    Yes
  S_525-MTD           STORAGE             103.30      0.50       0.0
  S_528-525           STORAGE             103.41      0.50       0.0
  S_532-528           STORAGE             103.50      0.50       0.0
  S_536-532           STORAGE             103.60      0.50       0.0
  S_540-536           STORAGE             103.71      0.50       0.0
  S_541-540           STORAGE             103.81      0.50       0.0
  S_604-603           STORAGE             105.50      0.50       0.0
  S_605-604           STORAGE             106.71      0.50       0.0
  S_619-606           STORAGE             106.50      0.50       0.0
  S_622-619           STORAGE             105.70      0.50       0.0
  S_622-619_2         STORAGE             106.50      0.50       0.0
  S_627-630           STORAGE             106.70      0.50       0.0
  S_629-622           STORAGE             106.01      0.50       0.0
  SU2                 STORAGE             106.75      0.50       0.0
  SU5                 STORAGE             104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                From Node           To Node             Type           Length    %Slope
Roughness
  ----------------------------------------------------------------------------------------
-
  BDR-C1              EXD_15              EXD_16              CONDUIT          17.7    0.3844
0.0250
  BDR-C2              EXD_20              EXD_21              CONDUIT           7.9    0.0632
0.0130
  BDR-C3              EXD_25              EXD_26              CONDUIT          14.2    0.2683
0.0130
  BDR-C4              EXD_12              EXD_27              CONDUIT          23.0    0.6077
0.0130
  C1_1                J32                 J26                 CONDUIT          71.8    0.4181
0.0130
  C1_17               J6                  EXD_1               CONDUIT         171.9    2.4608
0.0130
  C1_3                J28                 J29                 CONDUIT         183.6    0.1090
0.0130
  C1_30               J26                 J25                 CONDUIT          93.1    0.4296
0.0130
  C1_4                J25                 J39                 CONDUIT          75.0    0.9329
0.0130
  C14_1               J20                 J19                 CONDUIT          59.0    0.0847
0.0130
  C14_2               J23                 J22                 CONDUIT          73.9    0.4062
0.0130
  C14_4               J22                 J21                 CONDUIT          77.3    0.1941
0.0130
  C14_5               J21                 J20                 CONDUIT          51.8    0.1931
0.0130
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C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					

OR1	POND_(C-STRM)	J74	ORIFICE
OR2	POND_(C-STRM)	J74	ORIFICE
W10	S_536-532	J10	WEIR
W11	S_532-528	J11	WEIR
W12	S_528-525	J12	WEIR
W13	S_525-MTD	J13	WEIR
W14	S_629-622	J32	WEIR
W15	S_622-619	J26	WEIR
W2	POND_(C-STRM)	OF1	WEIR
W3	S_627-630	J24	WEIR
W4	S_622-619_2	J32	WEIR
W5	S_619-606	J62	WEIR
W6	S_605-604	J51	WEIR
W7	S_604-603	J25	WEIR
W8	S_541-540	J9	WEIR
W9	S_540-536	J9	WEIR
C1	S_622-619_2	622_(C-STRM)	OUTLET
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET
OL1	S_627-630	627_(C-STRM)	OUTLET
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET
OL11	J36	553_(C-STRM)	OUTLET
OL12	J40	551_(C-STRM)	OUTLET
OL13	J46	602_(C-STRM)	OUTLET
OL14	J28	520_(C-STRM)	OUTLET
OL15	J6	522_(C-STRM)	OUTLET
OL16	J29	518_(C-STRM)	OUTLET
OL17	J58	513_(C-STRM)	OUTLET
OL18	J59	511_(C-STRM)	OUTLET
OL19	J61	506_(C-STRM)	OUTLET
OL2	SU2	626_(C-STRM)	OUTLET
OL20	J48	504_(C-STRM)	OUTLET
OL21	J44	503_(C-STRM)	OUTLET
OL22	SU5	504_(C-STRM)	OUTLET
OL3	S_629-622	629_(C-STRM)	OUTLET
OL4	S_540-536	540_(C-STRM)	OUTLET
OL5	J22	645_(C-STRM)	OUTLET
OL6	J21	647_(C-STRM)	OUTLET
OL7	J20	650_(C-STRM)	OUTLET
OL8	J19	651_(C-STRM)	OUTLET
OL9	J19	556_(C-STRM)	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C12_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58

C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.24
C-STRM-100_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR		1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
0.25							
C-STRM-35_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-4_(C-STRM) CIRCULAR		0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM) CIRCULAR		0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM) CIRCULAR		0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
6.30							
C-STRM-79_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-8_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
2.74							
C-STRM-84_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7405	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1130	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1013	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3140	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929

0.4178 0.4430 0.4687 0.4947 0.5212
0.5482 0.5760 0.6046 0.6335 0.6626
0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000

Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000

Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000

Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000

Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3110 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000

Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7280 0.7526 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000

Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000

Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000

Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000

Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000

Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2667 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6822 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000

Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000

Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000

Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000

Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6533 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000

Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000

Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268

0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5631	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0998	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579

0.4893	0.5214	0.5541	0.5875	0.6216
0.6564	0.6919	0.7280	0.7648	0.8023
0.8405	0.8794	0.9189	0.9591	1.0000

Hrad:

0.0217	0.0433	0.0650	0.0866	0.1083
0.1299	0.1516	0.1732	0.1949	0.2158
0.2334	0.2493	0.2650	0.2808	0.2970
0.3137	0.3309	0.3485	0.3666	0.3838
0.3990	0.4128	0.4110	0.4455	0.4784
0.5099	0.5402	0.5694	0.5973	0.6230
0.6462	0.6674	0.6867	0.7046	0.7237
0.7433	0.7628	0.7822	0.8014	0.8205
0.8393	0.8580	0.8765	0.8948	0.9128
0.9307	0.9483	0.9657	0.9830	1.0000

Width:

0.0110	0.0219	0.0329	0.0439	0.0549
0.0658	0.0768	0.0878	0.0987	0.1153
0.1372	0.1592	0.1811	0.2031	0.2250
0.2469	0.2689	0.2908	0.3130	0.3514
0.3898	0.4282	0.4619	0.4783	0.4948
0.5112	0.5277	0.5442	0.5692	0.6021
0.6350	0.6679	0.7008	0.7337	0.7531
0.7696	0.7860	0.8025	0.8190	0.8354
0.8519	0.8683	0.8848	0.9013	0.9177
0.9342	0.9506	0.9671	0.9835	1.0000

Transect ROW_24m_Parking
Area:

0.0004	0.0014	0.0032	0.0056	0.0088
0.0126	0.0172	0.0225	0.0285	0.0351
0.0425	0.0506	0.0594	0.0689	0.0790
0.0899	0.1015	0.1138	0.1268	0.1410
0.1566	0.1735	0.1918	0.2107	0.2304
0.2507	0.2716	0.2933	0.3156	0.3391
0.3638	0.3900	0.4174	0.4462	0.4758
0.5061	0.5371	0.5687	0.6010	0.6339
0.6675	0.7018	0.7367	0.7724	0.8086
0.8456	0.8832	0.9215	0.9604	1.0000

Hrad:

0.0204	0.0408	0.0612	0.0816	0.1020
0.1224	0.1428	0.1632	0.1836	0.2040
0.2244	0.2448	0.2652	0.2856	0.3060
0.3264	0.3469	0.3673	0.3877	0.4065
0.4232	0.4385	0.4621	0.4937	0.5239
0.5528	0.5805	0.6070	0.6326	0.6563
0.6776	0.6968	0.7143	0.7308	0.7488
0.7668	0.7846	0.8023	0.8198	0.8372
0.8543	0.8713	0.8880	0.9046	0.9210
0.9372	0.9532	0.9690	0.9846	1.0000

Width:

0.0176	0.0352	0.0528	0.0704	0.0880
0.1056	0.1231	0.1407	0.1583	0.1759
0.1935	0.2111	0.2287	0.2463	0.2639
0.2815	0.2991	0.3167	0.3384	0.3727
0.4069	0.4412	0.4667	0.4833	0.5000
0.5167	0.5333	0.5500	0.5708	0.6042
0.6375	0.6708	0.7042	0.7333	0.7500
0.7667	0.7833	0.8000	0.8167	0.8333
0.8500	0.8667	0.8833	0.9000	0.9167
0.9333	0.9500	0.9667	0.9833	1.0000

Transect ROW_26m
Area:

0.0003	0.0013	0.0030	0.0053	0.0083
0.0120	0.0164	0.0214	0.0270	0.0334
0.0404	0.0481	0.0564	0.0654	0.0751
0.0854	0.0964	0.1081	0.1205	0.1335
0.1472	0.1615	0.1765	0.1922	0.2086
0.2261	0.2453	0.2663	0.2888	0.3123
0.3369	0.3625	0.3892	0.4168	0.4456
0.4753	0.5061	0.5379	0.5707	0.6046
0.6395	0.6754	0.7124	0.7504	0.7894
0.8295	0.8705	0.9127	0.9558	1.0000

Hrad:

0.0209	0.0418	0.0627	0.0836	0.1045
0.1254	0.1463	0.1672	0.1880	0.2089
0.2298	0.2507	0.2716	0.2925	0.3134
0.3343	0.3552	0.3761	0.3970	0.4179
0.4388	0.4597	0.4806	0.5015	0.5223
0.5421	0.5589	0.5735	0.5992	0.6295
0.6579	0.6846	0.7097	0.7334	0.7558
0.7771	0.7974	0.8167	0.8352	0.8529
0.8699	0.8863	0.9021	0.9173	0.9321
0.9464	0.9604	0.9739	0.9871	1.0000

Width:

0.0149	0.0299	0.0448	0.0597	0.0747
0.0896	0.1045	0.1195	0.1344	0.1493
0.1643	0.1792	0.1941	0.2090	0.2240
0.2389	0.2538	0.2688	0.2837	0.2986
0.3136	0.3285	0.3434	0.3584	0.3733
0.4113	0.4493	0.4873	0.5154	0.5385
0.5615	0.5846	0.6077	0.6308	0.6538
0.6769	0.7000	0.7231	0.7462	0.7692
0.7923	0.8154	0.8385	0.8615	0.8846
0.9077	0.9308	0.9538	0.9769	1.0000

Transect Upstream1
Area:

0.0025	0.0106	0.0203	0.0306	0.0413
0.0526	0.0643	0.0765	0.0889	0.1016
0.1146	0.1277	0.1411	0.1547	0.1685
0.1826	0.1968	0.2113	0.2260	0.2410
0.2562	0.2716	0.2875	0.3036	0.3201
0.3370	0.3541	0.3718	0.3916	0.4132
0.4352	0.4574	0.4798	0.5024	0.5256
0.5499	0.5749	0.6004	0.6263	0.6529
0.6803	0.7086	0.7388	0.7719	0.8061
0.8411	0.8773	0.9158	0.9566	1.0000

Hrad:

0.0236	0.0542	0.0978	0.1394	0.1791
0.2172	0.2558	0.2953	0.3343	0.3743
0.4135	0.4519	0.4897	0.5268	0.5632
0.5991	0.6344	0.6691	0.7034	0.7372
0.7686	0.7966	0.8243	0.8517	0.8789
0.9059	0.9305	0.9395	0.8568	0.8707
0.9044	0.9376	0.9705	1.0029	1.0032
1.0093	1.0327	1.0560	1.0792	1.0918
1.1023	1.1020	1.0403	1.0362	1.0565
1.0711	1.0710	1.0500	1.0287	1.0000

Width:

0.1112	0.2068	0.2183	0.2299	0.2414
0.2530	0.2625	0.2696	0.2763	0.2812
0.2861	0.2910	0.2959	0.3008	0.3057
0.3106	0.3155	0.3204	0.3253	0.3301
0.3360	0.3434	0.3508	0.3582	0.3656
0.3731	0.3815	0.3971	0.4616	0.4787
0.4839	0.4890	0.4941	0.4992	0.5218
0.5423	0.5531	0.5639	0.5747	0.5916
0.6102	0.6359	0.7052	0.7403	0.7577
0.7795	0.8137	0.8682	0.9276	1.0000

Transect Upstream2
Area:

0.0010	0.0033	0.0061	0.0095	0.0135
0.0180	0.0231	0.0287	0.0349	0.0417
0.0491	0.0571	0.0658	0.0753	0.0857
0.0969	0.1089	0.1216	0.1350	0.1491
0.1643	0.1807	0.1983	0.2174	0.2378
0.2598	0.2837	0.3085	0.3337	0.3593
0.3851	0.4112	0.4375	0.4641	0.4910
0.5185	0.5468	0.5756	0.6049	0.6346
0.6647	0.6958	0.7278	0.7609	0.7954
0.8324	0.8717	0.9124	0.9551	1.0000

Hrad:

0.0245	0.0622	0.0947	0.1245	0.1527
0.1802	0.2071	0.2329	0.2579	0.2827
0.3074	0.3275	0.3469	0.3639	0.3812
0.4022	0.4237	0.4479	0.4730	0.4917
0.5021	0.5129	0.5218	0.5312	0.5437
0.5471	0.5612	0.5918	0.6316	0.6711
0.7100	0.7484	0.7864	0.8238	0.8538
0.8769	0.9017	0.9331	0.9642	0.9950
1.0193	1.0315	1.0445	1.0569	1.0476
1.0094	1.0241	1.0243	1.0266	1.0000

Width:

0.0422	0.0543	0.0664	0.0785	0.0905
0.1024	0.1141	0.1261	0.1385	0.1508
0.1631	0.1781	0.1939	0.2117	0.2302
0.2467	0.2633	0.2781	0.2924	0.3107
0.3356	0.3615	0.3904	0.4208	0.4502
0.4893	0.5205	0.5353	0.5411	0.5466
0.5522	0.5577	0.5632	0.5687	0.5793
0.5947	0.6089	0.6182	0.6274	0.6366
0.6500	0.6718	0.6936	0.7162	0.7558
0.8227	0.8489	0.8887	0.9286	1.0000

Transect Upstream3
Area:

0.0006	0.0023	0.0050	0.0083	0.0121
0.0165	0.0214	0.0269	0.0329	0.0397
0.0479	0.0574	0.0681	0.0800	0.0928
0.1066	0.1213	0.1370	0.1537	0.1724
0.1916	0.2112	0.2310	0.2512	0.2719
0.2933	0.3154	0.3379	0.3607	0.3838
0.4072	0.4308	0.4548	0.4792	0.5043
0.5302	0.5566	0.5834	0.6106	0.6382
0.6665	0.6955	0.7273	0.7625	0.7988
0.8362	0.8744	0.9141	0.9558	1.0000

Hrad:

0.0253	0.0506	0.0845	0.1172	0.1476
0.1766	0.2049	0.2322	0.2591	0.2672
0.2667	0.2864	0.3020	0.3243	0.3504
0.3762	0.4018	0.4273	0.4351	0.4545
0.4946	0.5339	0.5724	0.6101	0.6377
0.6626	0.6916	0.7293	0.7664	0.8029
0.8390	0.8745	0.9096	0.9307	0.9485
0.9716	1.0018	1.0317	1.0613	1.0906
1.1167	1.1229	1.0191	1.0199	1.0379
1.0594	1.0820	1.0709	1.0785	1.0000

Width:

0.0239	0.0478	0.0617	0.0733	0.0849
0.0965	0.1081	0.1196	0.1312	0.1535
0.1863	0.2081	0.2344	0.2566	0.2757
0.2950	0.3144	0.3339	0.3682	0.3946
0.4014	0.4082	0.4149	0.4217	0.4354
0.4510	0.4634	0.4693	0.4752	0.4811
0.4870	0.4929	0.4988	0.5128	0.5290
0.5420	0.5507	0.5594	0.5681	0.5768
0.5931	0.6096	0.7080	0.7423	0.7640
0.7831	0.8014	0.8479	0.8809	1.0000

Transect Upstream4
Area:

0.0018	0.0046	0.0083	0.0128	0.0180
0.0238	0.0302	0.0371	0.0448	0.0547
0.0662	0.0782	0.0907	0.1038	0.1174
0.1319	0.1472	0.1638	0.1825	0.2018
0.2212	0.2408	0.2608	0.2810	0.3017
0.3227	0.3453	0.3685	0.3919	0.4155
0.4393	0.4633	0.4875	0.5118	0.5364
0.5615	0.5871	0.6133	0.6408	0.6690
0.6977	0.7269	0.7568	0.7876	0.8192
0.8516	0.8851	0.9205	0.9583	1.0000

Hrad:

0.0356	0.0671	0.0952	0.1219	0.1526
0.1825	0.2111	0.2388	0.2457	0.2281
0.2626	0.2959	0.3290	0.3614	0.3872
0.4105	0.4329	0.4402	0.4405	0.4805
0.5198	0.5573	0.5905	0.6232	0.6553
0.6869	0.6742	0.7110	0.7474	0.7833
0.8187	0.8537	0.8883	0.9224	0.9509
0.9733	0.9956	1.0049	1.0036	1.0287
1.0536	1.0784	1.0896	1.1008	1.1169
1.1330	1.1274	1.1025	1.0707	1.0000

Width:

0.0541	0.0732	0.0923	0.1110	0.1246
0.1374	0.1502	0.1630	0.1916	0.2527
0.2652	0.2777	0.2895	0.3012	0.3179
0.3368	0.3586	0.3902	0.4339	0.4377
0.4416	0.4466	0.4547	0.4628	0.4709
0.4791	0.5224	0.5268	0.5312	0.5356
0.5400	0.5488	0.5488	0.5532	0.5611
0.5729	0.5847	0.6049	0.6332	0.6440
0.6548	0.6656	0.6857	0.7062	0.7236
0.7412	0.7753	0.8268	0.8894	1.0000

Transect Upstream5
Area:

0.0012	0.0039	0.0075	0.0122	0.0185
0.0256	0.0332	0.0413	0.0500	0.0592
0.0689	0.0792	0.0900	0.1012	0.1130
0.1251	0.1375	0.1502	0.1632	0.1765
0.1902	0.2041	0.2184	0.2330	0.2480
0.2635	0.2798	0.2968	0.3145	0.3331
0.3525	0.3727	0.3942	0.4178	0.4431
0.4698	0.4988	0.5309	0.5639	0.5984
0.6349	0.6722	0.7101	0.7485	0.7872
0.8265	0.8666	0.9084	0.9530	1.0000

Hrad:

0.0281	0.0626	0.0927	0.1114	0.1369
0.1752	0.2115	0.2463	0.2799	0.3124
0.3424	0.3749	0.4068	0.4379	0.4694
0.5056	0.5411	0.5759	0.6102	0.6439
0.6771	0.7099	0.7421	0.7699	0.7956
0.8104	0.8232	0.8370	0.8495	0.8616
0.8746	0.8886	0.8484	0.8428	0.8418
0.8363	0.8155	0.8068	0.8309	0.8203
0.8497	0.8801	0.9176	0.9547	0.9913
1.0230	1.0475	1.0267	1.0168	1.0000

Width:

0.0449	0.0640	0.0831	0.1124	0.1386
0.1495	0.1603	0.1712	0.1820	0.1929
0.2048	0.2146	0.2243	0.2341	0.2433
0.2496	0.2559	0.2622	0.2684	0.2747
0.2810	0.2873	0.2936	0.3016	0.3105
0.3241	0.3390	0.3539	0.3698	0.3865
0.4032	0.4199	0.4663	0.4984	0.5298
0.5663	0.6178	0.6645	0.6844	0.7354
0.7522	0.7679	0.7768	0.7857	0.7946
0.8074	0.8259	0.8838	0.9366	1.0000

Transect Upstream6
Area:

0.0020	0.0057	0.0101	0.0154	0.0216
0.0285	0.0362	0.0446	0.0534	0.0628
0.0726	0.0829	0.0939	0.1054	0.1174
0.1299	0.1429	0.1564	0.1705	0.1850
0.2000	0.2153	0.2310	0.2472	0.2637
0.2808	0.2986	0.3172	0.3364	0.3564
0.3786	0.4016	0.4255	0.4503	0.4760
0.5026	0.5304	0.5593	0.5897	0.6214
0.6541	0.6875	0.7215	0.7561	0.7915
0.8280	0.8671	0.9077	0.9506	1.0000

Hrad:

0.0333	0.0728	0.1080	0.1404	0.1714
0.2022	0.2321	0.2687	0.3047	0.3396
0.3717	0.4020	0.4318	0.4612	0.4948
0.5246	0.5534	0.5820	0.6106	0.6442
0.6773	0.7100	0.7423	0.7742	0.8057
0.8224	0.8398	0.8578	0.8777	0.8995
0.8582	0.8792	0.8979	0.9152	0.9365
0.9490	0.9612	0.9727	0.9697	0.9916
1.0145	1.0496	1.0816	1.1092	1.1367
1.1540	1.1196	1.1309	1.0883	1.0000

Width:

0.0616	0.0785	0.0947	0.1108	0.1267
0.1418	0.1569	0.1666	0.1758	0.1850
0.1952	0.2062	0.2171	0.2280	0.2365

0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/02/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	2.663	31.879
Evaporation Loss	0.000	0.000
Infiltration Loss	1.273	15.238
Surface Runoff	1.305	15.620
Final Storage	0.087	1.038
Continuity Error (%)	-0.053	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.305	13.048
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.003	0.028
External Outflow	1.237	12.369
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.070	0.702
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.001	0.013
Continuity Error (%)	-0.069	

****
Highest Continuity Errors
****
Node J51 (52.10%)
Node J25 (48.88%)
Node J39 (37.68%)
Node J26 (33.78%)
Node J32 (33.19%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL9_(6)
Link OL16 (6)
Link OL17 (4)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.36 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	100.00 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.00 %
0.660 - 0.574 sec	:	0.00 %
0.574 - 0.500 sec	:	0.00 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	31.88	0.00	0.00	25.92	5.74	0.01	4.60	0.16	0.05	0.144
A18	31.88	0.00	0.00	21.18	11.87	0.60	10.10	0.06	0.04	0.317
A19	31.88	0.00	0.00	25.99	6.77	0.13	5.55	0.06	0.04	0.174
A20	31.88	0.00	0.00	28.58	2.54	0.00	2.03	0.10	0.07	0.064
NULL3	31.88	0.00	0.00	7.00	25.28	3.39	23.62	0.13	0.11	0.741
S1	31.88	0.00	0.00	15.29	20.14	9.54	15.58	1.02	0.86	0.489
S1_1	31.88	0.00	0.00	10.77	21.68	2.69	20.04	0.02	0.02	0.628
S1_2	31.88	0.00	0.00	10.74	21.68	2.73	20.07	0.02	0.02	0.630
S1_4	31.88	0.00	0.00	10.80	21.68	2.66	20.00	0.04	0.03	0.627
S1_5	31.88	0.00	0.00	10.77	21.68	2.69	20.03	0.02	0.02	0.628
S10_1	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.27	0.23	0.466
S10_2	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.32	0.26	0.466
S10_4	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.11	0.09	0.466
S10_5	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.19	0.16	0.466
S11	31.88	0.00	0.00	31.87	0.00	0.01	0.01	0.00	0.00	0.000
S12	31.88	0.00	0.00	10.81	21.68	2.65	19.99	0.09	0.08	0.627
S14_1	31.88	0.00	0.00	10.85	21.68	2.60	19.95	0.12	0.10	0.626
S14_3	31.88	0.00	0.00	10.99	21.67	2.46	19.80	0.21	0.17	0.621
S14_4	31.88	0.00	0.00	10.86	21.68	2.59	19.93	0.06	0.05	0.625
S14_5	31.88	0.00	0.00	10.96	21.67	2.49	19.83	0.33	0.27	0.622
S14_6	31.88	0.00	0.00	10.88	21.68	2.57	19.91	0.06	0.05	0.625
S14_7	31.88	0.00	0.00	10.91	21.68	2.54	19.88	0.23	0.19	0.624
S14_8	31.88	0.00	0.00	10.89	21.68	2.56	19.90	0.07	0.06	0.624
S15	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.24	0.20	0.466
S16	31.88	0.00	0.00	0.00	30.15	0.00	30.15	0.44	0.09	0.946
S17	31.88	0.00	0.00	31.82	1.01	0.01	0.01	0.00	0.00	0.000
S18_2	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.50	0.42	0.466
S18_3	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.25	0.21	0.466
S18_4	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.13	0.11	0.466
S18_5	31.88	0.00	0.00	13.44	21.67	10.85	17.35	0.32	0.28	0.544
S18_6	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.12	0.10	0.466
S19	31.88	0.00	0.00	10.94	21.67	2.51	19.85	0.21	0.17	0.623
S2	31.88	0.00	0.00	15.11	20.28	9.66	15.75	0.59	0.50	0.494
S20_1	31.88	0.00	0.00	10.78	21.68	2.67	20.02	0.10	0.09	0.628
S20_2	31.88	0.00	0.00	10.70	21.69	2.77	20.12	0.05	0.04	0.631
S3	31.88	0.00	0.00	16.03	19.50	9.02	14.87	0.37	0.31	0.466
S32	31.88	0.00	0.00	10.80	21.68	2.65	20.00	0.08	0.07	0.627
S36	31.88	0.00	0.00	0.00	30.16	0.00	30.16	0.55	0.11	0.946
S4	31.88	0.00	0.00	4.55	25.97	0.00	25.98	3.43	1.86	0.815
S5	31.88	0.00	0.00	4.54	25.99	0.01	26.00	0.83	0.55	0.815
S6	31.88	0.00	0.00	15.30	17.35	1.84	15.72	0.05	0.05	0.493
S7	31.88	0.00	0.00	4.55	25.98	0.01	25.99	1.04	0.66	0.815
S8	31.88	0.00	0.00	28.19	10.83	3.14	3.14	0.06	0.03	0.098

****
Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.11	104.50	0	01:10	0.11
EXD_10	JUNCTION	0.03	0.21	98.86	0	01:20	0.21
EXD_11	JUNCTION	0.02	0.16	98.66	0	01:21	0.16
EXD_12	JUNCTION	0.03	0.23	98.53	0	01:20	0.23
EXD_13	JUNCTION	0.01	0.12	104.44	0	01:12	0.12
EXD_14	JUNCTION	0.00	0.00	102.49	0	00:00	0.00
EXD_15	JUNCTION	0.01	0.25	100.52	0	01:10	0.25
EXD_16	JUNCTION	0.01	0.14	100.34	0	01:11	0.14
EXD_17	JUNCTION	0.01	0.15	100.04	0	01:13	0.15
EXD_18	JUNCTION	0.01	0.12	99.52	0	01:18	0.12
EXD_19	JUNCTION	0.02	0.20	99.39	0	01:21	0.20
EXD_2	JUNCTION	0.02	0.19	103.66	0	01:15	0.19
EXD_20	JUNCTION	0.02	0.20	99.39	0	01:21	0.20
EXD_21	JUNCTION	0.02	0.18	99.36	0	01:22	0.18
EXD_22	JUNCTION	0.01	0.11	99.25	0	01:13	0.11
EXD_23	JUNCTION	0.03	0.17	98.92	0	01:28	0.17
EXD_24	JUNCTION	0.01	0.09	98.76	0	01:33	0.09
EXD_25	JUNCTION	0.02	0.16	98.68	0	01:36	0.16
EXD_26	JUNCTION	0.01	0.09	98.58	0	01:39	0.09
EXD_27	JUNCTION	0.03	0.20	98.36	0	01:20	0.20
EXD_3	JUNCTION	0.00	0.09	103.28	0	01:16	0.09
EXD_4	JUNCTION	0.00	0.09	102.74	0	01:18	0.09
EXD_5	JUNCTION	0.01	0.13	102.63	0	01:18	0.13
EXD_6	JUNCTION	0.01	0.11	102.43	0	01:20	0.11
EXD_7	JUNCTION	0.01	0.09	101.58	0	01:23	0.09
EXD_8	JUNCTION	0.01	0.13	100.61	0	01:31	0.13
EXD_9	JUNCTION	0.01	0.06	100.45	0	01:40	0.06
J10	JUNCTION	0.00	0.00	103.60	0	00:00	0.00
J11	JUNCTION	0.00	0.00	103.50	0	00:00	0.00
J12	JUNCTION	0.00	0.00	103.40	0	00:00	0.00
J13	JUNCTION	0.00	0.00	103.30	0	00:00	0.00
J17	JUNCTION	0.01	0.11	104.48	0	01:11	0.11
J19	JUNCTION	0.00	0.01	105.41	0	01:10	0.01
J20	JUNCTION	0.00	0.01	105.46	0	01:10	0.01
J21	JUNCTION	0.00	0.02	105.57	0	01:10	0.02
J22	JUNCTION	0.00	0.00	105.70	0	01:10	0.00
J23	JUNCTION	0.00	0.00	106.00	0	00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0	00:00	0.00
J25	JUNCTION	0.00	0.00	105.30	0	19:47	0.00
J26	JUNCTION	0.00	0.00	105.70	0	11:18	0.00
J28	JUNCTION	0.00	0.01	109.01	0	01:10	0.01
J29	JUNCTION	0.00	0.01	108.81	0	01:10	0.01
J32	JUNCTION	0.00	0.00	106.00	0	04:32	0.00
J36	JUNCTION	0.00	0.01	104.71	0	01:10	0.01
J39	JUNCTION	0.00	0.00	104.60	0	01:18	0.00
J40	JUNCTION	0.00	0.01	104.46	0	01:10	0.01
J41	JUNCTION	0.00	0.00	103.20	0	01:50	0.00
J43	JUNCTION	0.00	0.01	104.21	0	01:11	0.01
J44	JUNCTION	0.00	0.01	104.51	0	01:10	0.01
J46	JUNCTION	0.00	0.01	104.61	0	01:10	0.01
J47	JUNCTION	0.00	0.00	105.10	0	00:00	0.00
J48	JUNCTION	0.00	0.01	105.76	0	01:10	0.01
J51	JUNCTION	0.00	0.00	106.75	0	01:20	0.00
J52	JUNCTION	0.00	0.00	109.75	0	00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0	00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0	00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0	00:00	0.00
J58	JUNCTION	0.00	0.01	108.41	0	01:10	0.01
J59	JUNCTION	0.00	0.01	108.01	0	01:10	0.01
J6	JUNCTION	0.00	0.01	109.84	0	01:10	0.01
J61	JUNCTION	0.00	0.01	107.01	0	01:10	0.01
J62	JUNCTION	0.00	0.00	106.50	0	01:16	0.00
J74	JUNCTION	0.22	0.37	98.82	0	02:43	0.37
J9	JUNCTION	0.00	0.00	103.70	0	00:00	0.00
OF1	OUTFALL	0.00	0.00	100.80	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
OF3	OUTFALL	0.02	0.16	98.16	0	01:20	0.16
ST4_108A_(P-Stm)	OUTFALL	0.16	0.58	98.60	0	02:43	0.58
500_(C-STRM)	STORAGE	0.29	0.37	100.68	0	01:28	0.37
500A_(C-STRM)	STORAGE	0.32	0.80	100.90	0	01:26	0.80
502_(C-STRM)	STORAGE	0.08	0.97	101.52	0	01:14	0.97
503_(C-STRM)	STORAGE	0.07	0.98	101.57	0	01:14	0.98

504_(C-STRM)	STORAGE	0.32	0.83	103.87	0	01:12	0.83	
505_(C-STRM)	STORAGE	0.31	0.84	104.29	0	01:11	0.84	
506_(C-STRM)	STORAGE	0.31	0.85	104.68	0	01:10	0.85	
507_(C-STRM)	STORAGE	0.31	0.85	104.99	0	01:12	0.84	
508_(C-STRM)	STORAGE	0.31	0.86	105.23	0	01:12	0.86	
509_(C-STRM)	STORAGE	0.31	0.87	105.47	0	01:11	0.87	
510_(C-STRM)	STORAGE	0.31	0.79	105.63	0	01:11	0.79	
511_(C-STRM)	STORAGE	0.31	0.79	105.70	0	01:11	0.79	
512_(C-STRM)	STORAGE	0.31	0.76	105.87	0	01:10	0.76	
513_(C-STRM)	STORAGE	0.31	0.75	106.00	0	01:10	0.75	
514_(C-STRM)	STORAGE	0.29	0.42	106.01	0	01:12	0.42	
515_(C-STRM)	STORAGE	0.00	0.00	105.85	0	00:00	0.00	
516_(C-STRM)	STORAGE	0.31	0.83	106.28	0	01:11	0.82	
517_(C-STRM)	STORAGE	0.31	0.88	106.49	0	01:10	0.88	
518_(C-STRM)	STORAGE	0.32	0.92	106.77	0	01:10	0.91	
519_(C-STRM)	STORAGE	0.30	0.74	106.81	0	01:10	0.74	
520_(C-STRM)	STORAGE	0.30	0.60	106.94	0	01:10	0.60	
522_(C-STRM)	STORAGE	0.30	0.56	104.87	0	01:10	0.56	
525_(C-STRM)	STORAGE	0.06	1.06	101.67	0	01:14	1.06	
528_(C-STRM)	STORAGE	0.03	1.11	101.83	0	01:13	1.11	
532_(C-STRM)	STORAGE	0.03	1.11	101.94	0	01:14	1.11	
536_(C-STRM)	STORAGE	0.03	1.06	102.04	0	01:13	1.06	
540_(C-STRM)	STORAGE	0.32	1.27	102.13	0	01:13	1.26	
541_(C-STRM)	STORAGE	0.31	1.23	102.17	0	01:13	1.23	
551_(C-STRM)	STORAGE	0.32	0.89	101.54	0	01:14	0.89	
552_(C-STRM)	STORAGE	0.31	0.80	101.54	0	01:13	0.80	
553_(C-STRM)	STORAGE	0.31	0.69	101.62	0	01:10	0.69	
554_(C-STRM)	STORAGE	0.30	0.67	101.72	0	01:11	0.67	
555_(C-STRM)	STORAGE	0.31	0.69	101.94	0	01:10	0.69	
556_(C-STRM)	STORAGE	0.31	0.72	102.08	0	01:10	0.72	
601_(C-STRM)	STORAGE	0.06	1.02	101.46	0	01:14	1.02	
602_(C-STRM)	STORAGE	0.06	1.39	101.91	0	01:14	1.39	
603_(C-STRM)	STORAGE	0.06	1.38	102.01	0	01:14	1.38	
604_(C-STRM)	STORAGE	0.05	1.40	102.28	0	01:13	1.40	
605_(C-STRM)	STORAGE	0.05	1.26	102.34	0	01:13	1.26	
606_(C-STRM)	STORAGE	0.06	1.31	102.54	0	01:13	1.31	
619_(C-STRM)	STORAGE	0.06	1.34	102.72	0	01:12	1.34	
622_(C-STRM)	STORAGE	0.05	1.23	102.76	0	01:12	1.23	
626_(C-STRM)	STORAGE	0.29	0.31	104.25	0	01:20	0.31	
627_(C-STRM)	STORAGE	0.29	0.49	103.62	0	01:11	0.49	
629_(C-STRM)	STORAGE	0.06	1.15	102.80	0	01:12	1.14	
630_(C-STRM)	STORAGE	0.06	0.94	103.01	0	01:10	0.94	
630A_(C-STRM)	STORAGE	0.05	0.97	103.08	0	01:10	0.97	
631_(C-STRM)	STORAGE	0.00	0.01	106.01	0	01:10	0.01	
645_(C-STRM)	STORAGE	0.33	1.23	103.26	0	01:10	1.23	
647_(C-STRM)	STORAGE	0.32	1.25	103.38	0	01:11	1.24	
650_(C-STRM)	STORAGE	0.32	1.25	103.47	0	01:11	1.25	
651_(C-STRM)	STORAGE	0.32	1.24	103.55	0	01:10	1.24	
682_(C-STRM)	STORAGE	0.00	0.01	105.41	0	01:10	0.01	
MTD_(C-STRM)	STORAGE	0.16	1.06	101.42	0	01:14	1.05	
OVERFLOW_(C-STRM)	STORAGE	0.27	0.72	100.89	0	01:28	0.72	
POND_(C-STRM)	STORAGE	0.61	1.32	99.77	0	02:43	1.32	
S_525-MTD	STORAGE	0.00	0.01	103.31	0	01:10	0.01	
S_528-525	STORAGE	0.00	0.01	103.41	0	01:10	0.01	
S_532-528	STORAGE	0.00	0.01	103.51	0	01:10	0.01	
S_536-532	STORAGE	0.00	0.01	103.62	0	01:11	0.01	
S_540-536	STORAGE	0.00	0.01	103.71	0	01:10	0.01	
S_541-540	STORAGE	0.00	0.01	103.83	0	01:11	0.01	
S_604-603	STORAGE	0.00	0.01	105.51	0	01:10	0.01	
S_605-604	STORAGE	0.00	0.01	106.72	0	01:10	0.01	
S_619-606	STORAGE	0.00	0.01	106.51	0	01:10	0.01	
S_622-619	STORAGE	0.00	0.02	105.72	0	01:14	0.02	
S_622-619_2	STORAGE	0.00	0.01	106.51	0	01:10	0.01	
S_627-630	STORAGE	0.00	0.01	106.71	0	01:10	0.01	
S_629-622	STORAGE	0.00	0.01	106.02	0	01:10	0.01	
SU2	STORAGE	0.00	0.00	106.75	0	01:11	0.00	
SU5	STORAGE	0.00	0.00	104.18	0	01:20	0.00	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.072	0	01:10	0	0.0869	- 0.076
EXD_10	JUNCTION	0.205	0.205	0	01:20	0.991	1.08	- 0.165
EXD_11	JUNCTION	0.000	0.202	0	01:20	0	1.08	0.015
EXD_12	JUNCTION	0.049	0.243	0	01:20	0.159	1.24	0.005
EXD_13	JUNCTION	0.000	0.068	0	01:11	0	0.0871	- 0.418
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.069	0.069	0	01:10	0.0982	0.0982	- 0.013
EXD_16	JUNCTION	0.000	0.057	0	01:10	0	0.0982	- 0.498
EXD_17	JUNCTION	0.000	0.055	0	01:11	0	0.0987	- 0.173
EXD_18	JUNCTION	0.000	0.053	0	01:14	0	0.0989	1.082
EXD_19	JUNCTION	0.000	0.046	0	01:18	0	0.109	- 0.183
EXD_2	JUNCTION	0.000	0.063	0	01:12	0	0.0874	0.654
EXD_20	JUNCTION	0.045	0.054	0	01:20	0.0614	0.17	- 0.027
EXD_21	JUNCTION	0.000	0.053	0	01:20	0	0.159	- 0.067
EXD_22	JUNCTION	0.000	0.052	0	01:22	0	0.16	- 0.967
EXD_23	JUNCTION	0.000	0.056	0	01:15	0	0.161	1.162
EXD_24	JUNCTION	0.000	0.050	0	01:30	0	0.159	0.542
EXD_25	JUNCTION	0.045	0.053	0	01:32	0.0599	0.218	- 0.048
EXD_26	JUNCTION	0.000	0.058	0	01:35	0	0.218	- 0.007
EXD_27	JUNCTION	0.111	0.310	0	01:10	0.133	1.59	0.043
EXD_3	JUNCTION	0.000	0.053	0	01:15	0	0.0869	0.303
EXD_4	JUNCTION	0.000	0.052	0	01:17	0	0.0866	0.125
EXD_5	JUNCTION	0.000	0.051	0	01:18	0	0.0865	- 0.011
EXD_6	JUNCTION	0.000	0.051	0	01:18	0	0.0865	- 0.722
EXD_7	JUNCTION	0.001	0.051	0	01:21	0.000547	0.0877	- 0.683
EXD_8	JUNCTION	0.000	0.051	0	01:24	0	0.0883	1.914
EXD_9	JUNCTION	0.000	0.035	0	01:31	0	0.0866	3.166
J10	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J11	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J12	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J13	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J17	JUNCTION	0.000	0.071	0	01:10	0	0.087	- 0.108
J19	JUNCTION	0.192	0.192	0	01:10	0.233	0.233	- 0.809
J20	JUNCTION	0.019	0.020	0	01:10	0.0217	0.0218	- 0.081
J21	JUNCTION	0.034	0.034	0	01:10	0.0382	0.0382	- 0.035
J22	JUNCTION	0.021	0.021	0	01:10	0.0234	0.0234	- 0.112
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.000	0	13:04	0	3.5e-05	17.090 ltr
J26	JUNCTION	0.000	0.000	0	06:12	0	5.28e-05	51.006
J28	JUNCTION	0.102	0.102	0	01:10	0.119	0.119	- 0.260
J29	JUNCTION	0.270	0.270	0	01:10	0.334	0.334	- 0.901
J32	JUNCTION	0.000	0.000	0	01:18	0	7.9e-05	49.675
J36	JUNCTION	0.042	0.043	0	01:10	0.0456	0.0457	- 0.028
J39	JUNCTION	0.000	0.000	0	01:10	0	8.12e-05	60.471
J40	JUNCTION	0.088	0.088	0	01:10	0.0994	0.0994	- 0.038
J41	JUNCTION	0.000	0.000	0	01:11	0	0.000183	0.058
J43	JUNCTION	0.000	0.001	0	01:10	0	0.000213	16.663
J44	JUNCTION	0.050	0.051	0	01:10	0.0592	0.0595	- 0.059
J46	JUNCTION	0.073	0.073	0	01:10	0.0829	0.0829	- 0.225
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.056	0.056	0	01:10	0.0672	0.0672	- 0.050
J51	JUNCTION	0.000	0.000	0	01:10	0	6.14e-05	108.768
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.168	0.168	0	01:10	0.21	0.21	- 0.758
J59	JUNCTION	0.048	0.049	0	01:10	0.0575	0.0576	- 0.161
J6	JUNCTION	0.076	0.076	0	01:10	0.0871	0.0871	- 0.283
J61	JUNCTION	0.193	0.194	0	01:10	0.234	0.234	- 0.079
J62	JUNCTION	0.000	0.000	0	01:10	0	8.81e-05	11.430
J74	JUNCTION	0.000	0.248	0	02:43	0	10.7	- 0.022
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.046	0.046	0	01:10	0.0538	0.0538	0.000
OF3	OUTFALL	0.000	0.295	0	01:20	0	1.59	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.248	0	02:43	0	10.7	0.000
500_(C-STRM)	STORAGE	0.000	0.021	0	01:28	0	0.0373	- 0.013
500A_(C-STRM)	STORAGE	0.000	1.730	0	01:14	0	3.02	0.017
502_(C-STRM)	STORAGE	0.000	0.818	0	01:10	0	1.49	0.059
503_(C-STRM)	STORAGE	0.000	0.620	0	01:12	0	1.13	- 0.013
504_(C-STRM)	STORAGE	0.000	0.606	0	01:11	0	1.07	- 0.349
505_(C-STRM)	STORAGE	0.000	0.562	0	01:10	0	0.944	- 0.079
506_(C-STRM)	STORAGE	0.000	0.571	0	01:10	0	0.951	0.672
507_(C-STRM)	STORAGE	0.000	0.454	0	01:12	0	0.712	- 0.822
508_(C-STRM)	STORAGE	0.000	0.457	0	01:11	0	0.712	0.015
509_(C-STRM)	STORAGE	0.000	0.464	0	01:11	0	0.712	- 0.052
510_(C-STRM)	STORAGE	0.000	0.465	0	01:10	0	0.713	0.099
511_(C-STRM)	STORAGE	0.000	0.468	0	01:10	0	0.714	0.113
512_(C-STRM)	STORAGE	0.000	0.432	0	01:10	0	0.656	- 0.233
513_(C-STRM)	STORAGE	0.000	0.457	0	01:10	0	0.671	1.944
514_(C-STRM)	STORAGE	0.000	0.013	0	01:10	0	0.00221	- 24.059
515_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0	0.000 ltr
516_(C-STRM)	STORAGE	0.000	0.317	0	01:10	0	0.449	- 1.651
517_(C-STRM)	STORAGE	0.000	0.326	0	01:10	0	0.451	0.405
518_(C-STRM)	STORAGE	0.000	0.340	0	01:10	0	0.457	1.187
519_(C-STRM)	STORAGE	0.000	0.099	0	01:10	0	0.118	- 2.121
520_(C-STRM)	STORAGE	0.000	0.102	0	01:10	0	0.12	1.508
522_(C-STRM)	STORAGE	0.000	0.075	0	01:10	0	0.087	0.041
525_(C-STRM)	STORAGE	0.000	0.989	0	01:13	0	1.56	0.154
528_(C-STRM)	STORAGE	0.000	0.851	0	01:13	0	1.32	- 0.026
532_(C-STRM)	STORAGE	0.000	0.709	0	01:13	0	1.07	- 0.239
536_(C-STRM)	STORAGE	0.000	0.660	0	01:10	0	0.945	0.141
540_(C-STRM)	STORAGE	0.000	0.456	0	01:10	0	0.628	0.006
541_(C-STRM)	STORAGE	0.000	0.368	0	01:10	0	0.498	0.081
551_(C-STRM)	STORAGE	0.000	0.260	0	01:10	0	0.362	0.125
552_(C-STRM)	STORAGE	0.000	0.193	0	01:10	0	0.261	- 1.078
553_(C-STRM)	STORAGE	0.000	0.199	0	01:10	0	0.263	0.872
554_(C-STRM)	STORAGE	0.000	0.170	0	01:10	0	0.217	- 0.622
555_(C-STRM)	STORAGE	0.000	0.173	0	01:10	0	0.216	- 0.455
556_(C-STRM)	STORAGE	0.000	0.177	0	01:10	0	0.217	0.467
601_(C-STRM)	STORAGE	0.000	3.795	0	01:14	0	6.61	0.398
602_(C-STRM)	STORAGE	0.000	3.796	0	01:13	0	6.61	- 0.001
603_(C-STRM)	STORAGE	0.000	3.799	0	01:13	0	6.52	0.003
604_(C-STRM)	STORAGE	0.000	3.851	0	01:12	0	6.52	- 0.011

605_(C-STRM)	STORAGE	0.000	3.682	0	01:12	0	6.24	-	0.003
606_(C-STRM)	STORAGE	0.000	3.041	0	01:11	0	5.47	-	0.003
619_(C-STRM)	STORAGE	0.000	3.109	0	01:11	0	5.47	-	0.000
622_(C-STRM)	STORAGE	0.000	3.011	0	01:10	0	5.26	-	0.001
626_(C-STRM)	STORAGE	0.000	0.001	0	01:11	0	0.000457	-	7.290
627_(C-STRM)	STORAGE	0.000	0.078	0	01:10	0	0.0755	-	0.034
629_(C-STRM)	STORAGE	0.000	2.560	0	01:10	0	4.57	-	0.180
630_(C-STRM)	STORAGE	0.000	2.434	0	01:10	0	4.45	-	0.329
630A_(C-STRM)	STORAGE	0.000	2.366	0	01:10	0	4.38	-	0.109
631_(C-STRM)	STORAGE	1.862	1.862	0	01:10	3.43	3.43	-	0.139
645_(C-STRM)	STORAGE	0.000	0.586	0	01:11	0	0.939	-	0.260
647_(C-STRM)	STORAGE	0.000	0.569	0	01:11	0	0.911	-	0.562
650_(C-STRM)	STORAGE	0.000	0.552	0	01:10	0	0.868	-	0.630
651_(C-STRM)	STORAGE	0.000	0.541	0	01:10	0	0.848	-	0.135
682_(C-STRM)	STORAGE	0.549	0.549	0	01:10	0.829	0.829	-	0.080
MTD_(C-STRM)	STORAGE	0.000	1.732	0	01:14	0	3.05	-	0.199
OVERFLOW_(C-STRM)	STORAGE	0.000	1.731	0	01:14	0	3.06	-	0.000
POND_(C-STRM)	STORAGE	0.702	4.245	0	01:14	1.06	10.7		0.001
S_525-MTD	STORAGE	0.203	0.203	0	01:10	0.243	0.243	-	0.027
S_528-525	STORAGE	0.205	0.205	0	01:10	0.246	0.246	-	0.027
S_532-528	STORAGE	0.104	0.104	0	01:10	0.125	0.125	-	0.028
S_536-532	STORAGE	0.282	0.282	0	01:10	0.318	0.318	-	0.027
S_540-536	STORAGE	0.108	0.108	0	01:10	0.13	0.13	-	0.027
S_541-540	STORAGE	0.415	0.415	0	01:10	0.498	0.498	-	0.025
S_604-603	STORAGE	0.307	0.307	0	01:10	0.368	0.368	-	0.000
S_605-604	STORAGE	0.864	0.864	0	01:10	1.02	1.02		0.000
S_619-606	STORAGE	0.228	0.228	0	01:10	0.274	0.274	-	0.000
S_622-619	STORAGE	0.500	0.500	0	01:10	0.586	0.586	-	0.000
S_622-619_2	STORAGE	0.263	0.263	0	01:10	0.316	0.316	-	0.000
S_627-630	STORAGE	0.090	0.090	0	01:10	0.108	0.108	-	0.000
S_629-622	STORAGE	0.156	0.156	0	01:10	0.187	0.187		0.000
SU2	STORAGE	0.002	0.002	0	01:10	0.000487	0.000487	-	0.133
SU5	STORAGE	0.027	0.027	0	01:20	0.0601	0.0601	-	0.004

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	10.1	0.0	0.0	0.000	12.9	0 01:28	0.021
500A_(C-STRM)	0.642	30.4	0.0	0.0	1.654	78.3	0 01:26	0.911
502_(C-STRM)	0.000	2.2	0.0	0.0	0.001	26.3	0 01:14	0.777
503_(C-STRM)	0.000	1.7	0.0	0.0	0.001	25.1	0 01:14	0.618
504_(C-STRM)	0.000	11.7	0.0	0.0	0.001	30.8	0 01:12	0.598
505_(C-STRM)	0.000	9.6	0.0	0.0	0.001	25.8	0 01:11	0.555
506_(C-STRM)	0.000	9.9	0.0	0.0	0.001	27.0	0 01:10	0.562
507_(C-STRM)	0.000	10.0	0.0	0.0	0.001	27.3	0 01:12	0.453
508_(C-STRM)	0.000	9.9	0.0	0.0	0.001	27.7	0 01:12	0.454
509_(C-STRM)	0.000	9.9	0.0	0.0	0.001	27.7	0 01:11	0.457
510_(C-STRM)	0.000	10.1	0.0	0.0	0.001	25.5	0 01:11	0.464
511_(C-STRM)	0.000	10.1	0.0	0.0	0.001	25.7	0 01:11	0.465
512_(C-STRM)	0.000	10.0	0.0	0.0	0.001	24.3	0 01:10	0.431
513_(C-STRM)	0.000	9.9	0.0	0.0	0.001	24.0	0 01:10	0.445
514_(C-STRM)	0.000	9.1	0.0	0.0	0.000	13.3	0 01:12	0.014
515_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
516_(C-STRM)	0.000	10.2	0.0	0.0	0.001	27.0	0 01:11	0.312
517_(C-STRM)	0.000	10.3	0.0	0.0	0.001	29.0	0 01:10	0.317
518_(C-STRM)	0.000	10.9	0.0	0.0	0.001	31.4	0 01:10	0.326
519_(C-STRM)	0.000	10.8	0.0	0.0	0.001	26.2	0 01:10	0.114
520_(C-STRM)	0.000	11.5	0.0	0.0	0.001	22.5	0 01:10	0.099
522_(C-STRM)	0.000	10.1	0.0	0.0	0.001	18.8	0 01:10	0.071
525_(C-STRM)	0.000	2.2	0.0	0.0	0.001	39.4	0 01:14	0.977
528_(C-STRM)	0.000	1.3	0.0	0.0	0.001	41.4	0 01:13	0.837
532_(C-STRM)	0.000	1.0	0.0	0.0	0.001	41.6	0 01:14	0.692
536_(C-STRM)	0.000	1.0	0.0	0.0	0.001	40.5	0 01:13	0.627
540_(C-STRM)	0.000	11.1	0.0	0.0	0.001	44.5	0 01:13	0.414
541_(C-STRM)	0.000	10.8	0.0	0.0	0.001	42.7	0 01:13	0.352
551_(C-STRM)	0.000	8.3	0.0	0.0	0.001	23.6	0 01:14	0.243
552_(C-STRM)	0.000	7.9	0.0	0.0	0.001	20.6	0 01:13	0.190
553_(C-STRM)	0.000	8.2	0.0	0.0	0.001	18.2	0 01:10	0.193
554_(C-STRM)	0.000	7.8	0.0	0.0	0.001	17.2	0 01:11	0.164
555_(C-STRM)	0.000	7.9	0.0	0.0	0.001	17.6	0 01:10	0.170
556_(C-STRM)	0.000	7.9	0.0	0.0	0.001	18.5	0 01:10	0.173
601_(C-STRM)	0.000	1.3	0.0	0.0	0.001	22.9	0 01:14	3.799
602_(C-STRM)	0.000	1.6	0.0	0.0	0.002	34.0	0 01:14	3.795
603_(C-STRM)	0.000	1.6	0.0	0.0	0.002	35.3	0 01:14	3.771
604_(C-STRM)	0.000	1.1	0.0	0.0	0.002	28.7	0 01:13	3.799
605_(C-STRM)	0.000	0.9	0.0	0.0	0.001	22.4	0 01:13	3.608
606_(C-STRM)	0.000	1.0	0.0	0.0	0.001	22.7	0 01:13	2.984
619_(C-STRM)	0.000	1.1	0.0	0.0	0.002	26.2	0 01:12	3.041
622_(C-STRM)	0.000	1.2	0.0	0.0	0.001	27.5	0 01:12	2.913
626_(C-STRM)	0.000	8.6	0.0	0.0	0.000	9.3	0 01:20	0.000
627_(C-STRM)	0.000	8.2	0.0	0.0	0.001	13.6	0 01:11	0.075
629_(C-STRM)	0.000	1.2	0.0	0.0	0.001	25.7	0 01:12	2.474
630_(C-STRM)	0.000	1.4	0.0	0.0	0.001	22.8	0 01:10	2.426
630A_(C-STRM)	0.000	1.4	0.0	0.0	0.001	24.8	0 01:10	2.367
631_(C-STRM)	0.001	0.0	0.0	0.0	0.038	1.5	0 01:10	1.837
645_(C-STRM)	0.000	8.9	0.0	0.0	0.001	33.4	0 01:10	0.598
647_(C-STRM)	0.000	9.5	0.0	0.0	0.001	36.6	0 01:11	0.576
650_(C-STRM)	0.000	10.1	0.0	0.0	0.001	39.2	0 01:11	0.540
651_(C-STRM)	0.000	10.6	0.0	0.0	0.001	40.9	0 01:10	0.532
682_(C-STRM)	0.000	0.0	0.0	0.0	0.016	2.2	0 01:10	0.526
MTD_(C-STRM)	0.000	5.0	0.0	0.0	0.001	33.1	0 01:14	1.731
OVERFLOW_(C-STRM)	0.000	9.9	0.0	0.0	0.001	26.0	0 01:28	1.731
POND_(C-STRM)	2.110	5.8	0.0	0.0	7.110	19.6	0 02:43	0.248
S_525-MTD	0.000	0.0	0.0	0.0	0.011	1.9	0 01:10	0.189
S_528-525	0.000	0.0	0.0	0.0	0.011	1.9	0 01:10	0.191
S_532-528	0.000	0.0	0.0	0.0	0.005	1.9	0 01:10	0.097
S_536-532	0.000	0.0	0.0	0.0	0.011	2.7	0 01:11	0.246
S_540-536	0.000	0.0	0.0	0.0	0.004	1.9	0 01:10	0.104
S_541-540	0.000	0.0	0.0	0.0	0.025	2.1	0 01:11	0.368
S_604-603	0.000	0.0	0.0	23.0	0.016	1.8	0 01:10	0.285
S_605-604	0.001	0.0	0.0	24.7	0.047	2.1	0 01:10	0.786
S_619-606	0.000	0.0	0.0	23.2	0.008	1.8	0 01:10	0.218
S_622-619	0.001	0.0	0.0	25.3	0.060	4.6	0 01:14	0.328
S_622-619_2	0.000	0.0	0.0	23.2	0.010	1.9	0 01:10	0.251
S_627-630	0.000	0.0	0.0	30.2	0.004	1.6	0 01:10	0.084
S_629-622	0.000	0.0	0.0	26.3	0.009	2.0	0 01:10	0.143
SU2	0.000	0.0	0.0	0.0	0.000	0.0	0 01:11	0.001
SU5	0.000	0.0	0.0	0.0	0.001	0.3	0 01:20	0.026

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	11.72	0.005	0.046	0.054
OF3	97.59	0.019	0.295	1.588
ST4_108A_(P-Stm)	97.75	0.127	0.248	10.728
System	51.77	0.151	0.513	12.369

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.057	0 01:10	0.92	0.84	0.49
BDR-C2	CONDUIT	0.053	0 01:20	0.91	1.02	0.48
BDR-C3	CONDUIT	0.058	0 01:35	1.50	0.30	0.25
BDR-C4	CONDUIT	0.242	0 01:20	1.79	0.08	0.18
C1_1	CHANNEL	0.000	0 06:12	0.00	0.00	0.00
C1_17	CHANNEL	0.001	0 01:10	0.32	0.00	0.03
C1_3	CHANNEL	0.000	0 01:10	0.06	0.00	0.03
C1_30	CHANNEL	0.000	0 13:04	0.00	0.00	0.00
C1_4	CHANNEL	0.000	0 19:47	0.00	0.00	0.00
C14_1	CHANNEL	0.000	0 01:10	0.03	0.00	0.03
C14_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C14_4	CHANNEL	0.000	0 01:10	0.02	0.00	0.05
C14_5	CHANNEL	0.001	0 01:10	0.11	0.00	0.05
C15_1	CHANNEL	0.000	0 01:10	0.06	0.00	0.03
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C2	CONDUIT	0.000	0 01:50	0.00	0.00	0.00
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C20_2	CHANNEL	0.000	0 01:10	0.13	0.00	0.03
C20_3	CHANNEL	0.000	0 01:10	0.13	0.00	0.02
C20_4	CHANNEL	0.000	0 01:10	0.20	0.00	0.01
C20_5	CHANNEL	0.000	0 01:20	0.02	0.00	0.01
C20_7	CHANNEL	0.001	0 01:10	0.22	0.00	0.03
C23_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C23_7	CHANNEL	0.000	0 01:11	0.00	0.00	0.01
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.000	0 01:18	0.00	0.00	0.01
C4_3	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_4	CHANNEL	0.000	0 01:10	0.24	0.00	0.02
C4_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.02

C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C5_1	CHANNEL	0.071	0	01:10	0.27	0.02	0.11
C5_10	CHANNEL	0.055	0	01:11	0.42	0.02	0.18
C5_11	CHANNEL	0.046	0	01:18	0.19	0.02	0.18
C5_12	CHANNEL	0.295	0	01:20	0.87	0.02	0.17
C5_13	CHANNEL	0.053	0	01:14	0.58	0.01	0.17
C5_14	CHANNEL	0.044	0	01:22	0.17	0.03	0.23
C5_15	CHANNEL	0.056	0	01:15	0.40	0.02	0.17
C5_16	CHANNEL	0.050	0	01:10	0.30	0.01	0.11
C5_17	CHANNEL	0.049	0	01:33	0.19	0.00	0.11
C5_19	CHANNEL	0.052	0	01:22	0.30	0.03	0.16
C5_2	CHANNEL	0.053	0	01:15	0.46	0.01	0.13
C5_20	CHANNEL	0.051	0	01:39	0.17	0.01	0.12
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.16
C5_23	CHANNEL	0.068	0	01:11	0.25	0.01	0.11
C5_3	CHANNEL	0.063	0	01:12	0.49	0.01	0.14
C5_4	CHANNEL	0.051	0	01:18	0.42	0.00	0.09
C5_5	CHANNEL	0.051	0	01:21	0.71	0.00	0.09
C5_6	CHANNEL	0.052	0	01:17	0.58	0.00	0.08
C5_7	CHANNEL	0.027	0	01:40	0.13	0.00	0.12
C5_8	CHANNEL	0.051	0	01:24	0.55	0.00	0.09
C5_9	CHANNEL	0.202	0	01:21	0.52	0.02	0.19
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C7	CONDUIT	0.000	0	01:10	0.07	0.00	0.03
C9_1	CHANNEL	0.000	0	01:10	0.10	0.00	0.03
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.01
C9_2	CHANNEL	0.000	0	01:10	0.17	0.00	0.02
C9_5	CHANNEL	0.000	0	01:18	0.02	0.00	0.02
C9_6	CHANNEL	0.000	0	01:10	0.17	0.00	0.02
C9_7	CHANNEL	0.000	0	01:10	0.28	0.00	0.02
C-STRM-1_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.312	0	01:11	1.15	0.83	0.72
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.317	0	01:10	1.02	0.97	0.81
C-STRM-1_(C-STRM)	CONDUIT	0.326	0	01:10	1.20	1.37	0.92
C-STRM-100_(C-STRM)	CONDUIT	0.021	0	01:28	0.76	0.05	0.15
C-STRM-101_(C-STRM)	CONDUIT	0.021	0	01:28	1.20	0.03	0.11
C-STRM-102_(C-STRM)	CONDUIT	1.730	0	01:14	4.73	0.69	0.72
C-STRM-103_(C-STRM)	CONDUIT	0.540	0	01:11	1.08	0.97	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.576	0	01:11	1.08	1.04	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.598	0	01:11	1.12	1.07	1.00
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.431	0	01:11	1.60	0.76	0.70
C-STRM-2_(C-STRM)	CONDUIT	0.432	0	01:10	1.68	0.77	0.67
C-STRM-20_(C-STRM)	CONDUIT	0.000	0	01:20	0.08	0.00	0.12
C-STRM-21_(C-STRM)	CONDUIT	0.075	0	01:11	1.12	0.25	0.35
C-STRM-22_(1)_(C-STRM)	CONDUIT	2.474	0	01:11	1.51	0.56	0.66
C-STRM-22_(C-STRM)	CONDUIT	2.426	0	01:10	2.27	0.89	0.59
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.243	0	01:10	1.05	0.72	0.93
C-STRM-26_(C-STRM)	CONDUIT	0.190	0	01:11	0.71	0.56	0.80
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.562	0	01:10	1.64	0.71	0.72
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.453	0	01:12	1.60	0.76	0.75
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.454	0	01:12	1.44	0.76	0.82
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.457	0	01:11	1.44	0.77	0.84
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.464	0	01:11	1.56	0.82	0.78
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.465	0	01:10	1.68	0.82	0.73
C-STRM-33_(C-STRM)	CONDUIT	0.532	0	01:10	1.14	0.95	1.00
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.170	0	01:10	1.14	0.99	0.65
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.173	0	01:10	1.00	1.01	0.77
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.193	0	01:10	1.11	0.79	0.64
C-STRM-35_(C-STRM)	CONDUIT	0.164	0	01:11	0.88	0.67	0.63
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.598	0	01:12	1.93	0.69	0.66
C-STRM-4_(C-STRM)	CONDUIT	0.555	0	01:11	1.66	0.71	0.71
C-STRM-49_(C-STRM)	CONDUIT	0.352	0	01:10	0.78	0.63	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.414	0	01:10	0.85	0.74	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.627	0	01:13	1.07	0.89	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.692	0	01:13	0.93	0.80	1.00
C-STRM-53_(C-STRM)	CONDUIT	0.837	0	01:13	1.12	0.96	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.618	0	01:12	0.88	0.71	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.099	0	01:10	0.92	0.77	0.72
C-STRM-63_(C-STRM)	CONDUIT	0.114	0	01:11	0.60	0.68	0.91
C-STRM-64_(C-STRM)	CONDUIT	0.071	0	01:10	1.01	0.81	0.61
C-STRM-74_(C-STRM)	CONDUIT	3.041	0	01:11	1.56	0.59	0.74
C-STRM-75_(C-STRM)	CONDUIT	2.984	0	01:12	1.57	0.58	0.71
C-STRM-76_(C-STRM)	CONDUIT	0.977	0	01:14	1.31	0.98	1.00
C-STRM-77_(C-STRM)	CONDUIT	1.731	0	01:14	2.33	0.90	0.81
C-STRM-78_(C-STRM)	CONDUIT	0.777	0	01:12	1.28	0.63	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	3.799	0	01:13	1.82	0.60	0.77
C-STRM-79_(C-STRM)	CONDUIT	3.608	0	01:12	1.85	0.63	0.74
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.014	0	01:13	0.21	0.07	0.39
C-STRM-8_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.05
C-STRM-80_(C-STRM)	CONDUIT	3.771	0	01:13	1.80	0.85	0.77
C-STRM-81_(C-STRM)	CONDUIT	3.795	0	01:14	2.10	0.85	0.67
C-STRM-82_(C-STRM)	CONDUIT	3.799	0	01:14	2.66	0.85	0.55
C-STRM-83_(1)_(C-STRM)	CONDUIT	2.367	0	01:10	2.00	0.86	0.64
C-STRM-84_(C-STRM)	CONDUIT	2.913	0	01:11	1.56	0.57	0.72
CVR-C2	CONDUIT	0.051	0	01:18	1.53	0.19	0.26
CVR-C3	CONDUIT	0.035	0	01:31	1.94	0.21	0.23
CVR-C4	CONDUIT	0.202	0	01:20	1.81	0.07	0.16
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	0.248	0	02:43	1.18	0.26	0.36
W1	CHANNEL	0.885	0	01:26	0.61	0.00	0.02
OR1	ORIFICE	0.248	0	02:43			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.239	0	01:10			
C-STRM-107_(C-STRM)	DUMMY	0.271	0	01:10			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	01:10			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:08			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:10			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.189	0	01:10			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.208	0	01:10			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:08			
C-STRM-83_(C-STRM)	DUMMY	1.837	0	01:10			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	01:09			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.097	0	01:10			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.191	0	01:10			
OL1	DUMMY	0.078	0	01:10			
OL10	DUMMY	0.026	0	00:43			
OL11	DUMMY	0.042	0	01:10			
OL12	DUMMY	0.088	0	01:10			
OL13	DUMMY	0.072	0	01:10			
OL14	DUMMY	0.102	0	01:10			
OL15	DUMMY	0.075	0	01:10			
OL16	DUMMY	0.269	0	01:10			
OL17	DUMMY	0.167	0	01:10			
OL18	DUMMY	0.048	0	01:10			
OL19	DUMMY	0.193	0	01:10			
OL2	DUMMY	0.001	0	01:11			
OL20	DUMMY	0.055	0	01:10			
OL21	DUMMY	0.050	0	01:10			
OL22	DUMMY	0.026	0	01:20			
OL3	DUMMY	0.134	0	01:10			
OL4	DUMMY	0.104	0	01:10			
OL5	DUMMY	0.021	0	01:10			
OL6	DUMMY	0.029	0	01:07			
OL7	DUMMY	0.020	0	01:10			
OL8	DUMMY	0.015	0	01:10			
OL9	DUMMY	0.177	0	01:10			

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Flow Classification Summary
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Conduit	Adjusted /Actual	Fraction of Time in Flow Class Up	Down	Sub	Sup	Up	Down	Norm	Inlet

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
BDR-C1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.86	0.00
BDR-C2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.00
BDR-C3	1.00	0.02	0.00	0.00	0.76	0.22	0.00	0.00	0.00	0.00
BDR-C4	1.00	0.02	0.00	0.00	0.75	0.22	0.00	0.00	0.85	0.00
C1_1	1.00	0.05	0.00	0.00	0.69	0.26	0.00	0.00	0.62	0.00
C1_17	1.00	0.87	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
C1_3	1.00	0.84	0.03	0.00	0.13	0.00	0.00	0.00	0.95	0.00
C1_30	1.00	0.11	0.00	0.00	0.27	0.62	0.00	0.00	0.00	0.00
C1_4	1.00	0.04	0.36	0.00	0.60	0.00	0.00	0.00	0.59	0.00
C14_1	1.00	0.85	0.04	0.00	0.11	0.00	0.00	0.00	0.97	0.00
C14_2	1.00	0.89	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.87	0.01	0.00	0.11	0.00	0.00	0.00	0.97	0.00
C14_5	1.00	0.87	0.00	0.00	0.10	0.02	0.00	0.00	0.00	0.00
C15_1	1.00	0.82	0.03	0.00	0.15	0.00	0.00	0.00	0.95	0.00
C15_2	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.59	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00
C20_1	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.87	0.01	0.00	0.10	0.02	0.00	0.00	0.97	0.00
C20_3	1.00	0.84	0.01	0.00	0.12	0.03	0.00	0.00	0.02	0.00
C20_4	1.00	0.02	0.85	0.00	0.11	0.02	0.00	0.00	0.94	0.00
C20_5	1.00	0.02	0.02	0.00	0.82	0.13	0.00	0.00	0.01	0.00
C20_7	1.00	0.87	0.01	0.00	0.08	0.04	0.00	0.00	0.95	0.00
C23_5	1.00	0.59	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C23_7	1.00	0.04	0.00	0.00	0.78	0.18	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.04	0.00	0.00	0.85	0.11	0.00	0.00	0.85	0.00
C4_3	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.02	0.85	0.00	0.11	0.01	0.00	0.00	0.00	0.00
C4_5	1.00	0.88	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_1	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.89	0.00
C5_10	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.96	0.00
C5_11	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_12	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.03	0.00	0.00	0.25	0.73	0.00	0.00	0.00	0.00
C5_14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.66	0.00
C5_15	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.95	0.00
C5_16	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.02	0.02	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.71	0.00
C5_2	1.00	0.02	0.00	0.00	0.61	0.36	0.00	0.00	0.00	0.00
C5_20	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_21	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.03	0.00	0.00	0.77	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.03	0.00	0.00	0.97	0.01	0.00	0.00	0.96	0.00
C5_4	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_5	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00
C5_6	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.89	0.00
C5_7	1.00	0.03	0.00	0.00	0.95	0.02	0.00	0.00	0.00	0.00
C5_8	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C5_9	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.87	0.01	0.00	0.12	0.00	0.00	0.00	0.96	0.00
C9_1	1.00	0.85	0.00	0.00	0.13	0.02	0.00	0.00	0.01	0.00
C9_11	1.00	0.88	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.02	0.87	0.00	0.10	0.01	0.00	0.00	0.00	0.00
C9_5	1.00	0.02	0.02	0.00	0.31	0.64	0.00	0.00	0.02	0.00
C9_6	1.00	0.02	0.86	0.00	0.11	0.01	0.00	0.00	0.95	0.00
C9_7	1.00	0.02	0.86	0.00	0.11	0.01	0.00	0.00	0.95	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.14	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.01	0.40	0.00
C-STRM-1_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.05	0.84	0.00	0.03	0.01	0.00	0.07	0.85	0.00
C-STRM-101_(C-STRM)	1.00	0.05	0.00	0.00	0.00	0.01	0.00	0.94	0.00	0.00
C-STRM-102_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.03	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.81	0.00
C-STRM-104_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C-STRM-105_(C-STRM)	1.00	0.03	0.00	0.00	0.11	0.00	0.00	0.87	0.02	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.76	0.00
C-STRM-2_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.01	0.00	0.01	0.62	0.00
C-STRM-20_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.95	0.00
C-STRM-21_(C-STRM)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.94	0.03	0.00	0.01	0.75	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.86	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.73	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.14	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.02	0.78	0.00
C-STRM-33_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.64	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.02	0.02	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.86	0.00
C-STRM-49_(C-STRM)	1.00	0.02	0.39	0.00	0.58	0.00	0.00	0.00	0.89	0.00
C-STRM-50_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.93	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.71	0.00
C-STRM-53_(C-STRM)	1.00	0.02	0.19	0.00	0.79	0.00	0.00	0.00	0.72	0.00
C-STRM-57_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.56	0.00
C-STRM-62_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.03	0.00	0.00	0.06	0.00	0.00	0.91	0.03	0.00
C-STRM-64_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.84	0.00
C-STRM-75_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.02	0.00	0.00	0.48	0.00	0.00	0.49	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.02	0.00	0.00	0.36	0.00
C-STRM-78_(C-STRM)	1.00	0.02	0.00	0.00	0.48	0.00	0.00	0.50	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.87	0.00
C-STRM-79_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.02	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.04	0.01	0.00	0.02	0.00	0.00	0.93	0.02	0.00
C-STRM-8_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.90	0.00
C-STRM-81_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.77	0.00
C-STRM-82_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.83	0.00
C-STRM-84_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
CVR-C2	1.00	0.05	0.00	0.00	0.84	0.11	0.00	0.00	0.87	0.00
CVR-C3	1.00	0.05	0.00	0.00	0.61	0.34	0.00	0.00	0.01	0.00
CVR-C4	1.00	0.02	0.00	0.00	0.58	0.40	0.00	0.00	0.06	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.02	0.00	0.00	0.17	0.00	0.00	0.81	0.00	0.00
W1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
B

C-STRM-76_(C-STRM)	0.02	0.08	0.02	0.01	0.02
C-STRM-77_(C-STRM)	0.01	0.02	0.01	0.01	0.01
C-STRM-78_(C-STRM)	0.01	0.01	0.02	0.01	0.01

Analysis begun on: Thu Apr 9 10:32:15 2026
Analysis ended on: Thu Apr 9 10:32:21 2026
Total elapsed time: 00:00:06

Post-Development 1:5 year 3-hour Chicago Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                Data       Recording
  Name                 Data Source              Type       Interval
  -------------------------------------------------------------------
  24SCS100             24SCS100                 INTENSITY   15 min.
  6SCS050              6SCS050                  INTENSITY   15 min.
  Rainfall             CHI_3hr_5                INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall             EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall             EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall             EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall             EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall             EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall             S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall             J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall             J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall             J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall             J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall             S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall             S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall             S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall             S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall             SU2
  S12                  0.44    334.74     71.43    2.0000 Rainfall             J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall             J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall             J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall             J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall             J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall             J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall             J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall             J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall             S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall             EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall             EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall             S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall             S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall             S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall             S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall             S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall             J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall             S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall             J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall             J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall             S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall             J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall             EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall             OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall             SU5


  ************
  Node Summary
  ************
                                        Invert      Max.    Ponded    External
  Name                 Type               Elev.     Depth      Area    Inflow
  ---------------------------------------------------------------------------
  EXD_1                JUNCTION          104.39      1.51       0.0
  EXD_10               JUNCTION           98.65      1.20       0.0
  EXD_11               JUNCTION           98.50      1.20       0.0
  EXD_12               JUNCTION           98.31      1.20       0.0
  EXD_13               JUNCTION          104.32      1.10       0.0
  EXD_14               JUNCTION          102.49      0.80       0.0
  EXD_15               JUNCTION          100.27      0.80       0.0
  EXD_16               JUNCTION          100.20      0.80       0.0
  EXD_17               JUNCTION           99.89      0.80       0.0
  EXD_18               JUNCTION           99.40      0.84       0.0
  EXD_19               JUNCTION           99.19      0.88       0.0
  EXD_2                JUNCTION          103.47      1.93       0.0
  EXD_20               JUNCTION           99.19      0.88       0.0
  EXD_21               JUNCTION           99.18      0.88       0.0
  EXD_22               JUNCTION           99.14      0.88       0.0
  EXD_23               JUNCTION           98.75      1.14       0.0
  EXD_24               JUNCTION           98.67      1.14       0.0
  EXD_25               JUNCTION           98.52      1.13       0.0
  EXD_26               JUNCTION           98.48      1.13       0.0
  EXD_27               JUNCTION           98.17      1.20       0.0
  EXD_3                JUNCTION          103.19      1.41       0.0
  EXD_4                JUNCTION          102.64      1.20       0.0
  EXD_5                JUNCTION          102.50      1.20       0.0
  EXD_6                JUNCTION          102.32      1.08       0.0
  EXD_7                JUNCTION          101.50      1.06       0.0
  EXD_8                JUNCTION          100.48      1.06       0.0
  EXD_9                JUNCTION          100.39      1.06       0.0
  J10                  JUNCTION          103.60      0.50       0.0
  J11                  JUNCTION          103.50      0.50       0.0
  J12                  JUNCTION          103.40      0.50       0.0
  J13                  JUNCTION          103.30      0.50       0.0
  J17                  JUNCTION          104.37      1.04       0.0
  J19                  JUNCTION          105.40      0.50       0.0
  J20                  JUNCTION          105.45      0.50       0.0
  J21                  JUNCTION          105.55      0.50       0.0
  J22                  JUNCTION          105.70      0.50       0.0
  J23                  JUNCTION          106.00      0.50       0.0
  J24                  JUNCTION          106.20      0.50       0.0
  J25                  JUNCTION          105.30      0.50       0.0
  J26                  JUNCTION          105.70      0.50       0.0
  J28                  JUNCTION          109.00      0.50       0.0
  J29                  JUNCTION          108.80      0.50       0.0
  J32                  JUNCTION          106.00      0.50       0.0
  J36                  JUNCTION          104.70      0.50       0.0
  J39                  JUNCTION          104.60      0.50       0.0
  J40                  JUNCTION          104.45      0.50       0.0
  J41                  JUNCTION          103.20      0.50       0.0
  J43                  JUNCTION          104.20      0.50       0.0
  J44                  JUNCTION          104.50      0.50       0.0
  J46                  JUNCTION          104.60      0.50       0.0
  J47                  JUNCTION          105.10      0.50       0.0
  J48                  JUNCTION          105.75      0.50       0.0
  J51                  JUNCTION          106.75      0.50       0.0
  J52                  JUNCTION          109.75      0.50       0.0
  J53                  JUNCTION          109.00      0.50       0.0
  J56                  JUNCTION          109.10      0.50       0.0
  J57                  JUNCTION          108.47      0.50       0.0
  J58                  JUNCTION          108.40      0.50       0.0
  J59                  JUNCTION          108.00      0.50       0.0
  J6                   JUNCTION          109.83      0.30       0.0
  J61                  JUNCTION          107.00      0.50       0.0
  J62                  JUNCTION          106.50      0.50       0.0
  J74                  JUNCTION           98.45      0.90       0.0
  J9                   JUNCTION          103.70      0.50       0.0
  OF1                  OUTFALL           100.80      0.00       0.0
  OF2                  OUTFALL             0.00      0.00       0.0
  OF3                  OUTFALL            98.00      1.06       0.0
  ST4_108A_(P-Stm)     OUTFALL            98.02      1.19       0.0
  500_(C-STRM)         STORAGE           100.31      2.84       0.0
  500A_(C-STRM)        STORAGE           100.10      1.00       0.0
  502_(C-STRM)         STORAGE           100.54      3.70       0.0
  503_(C-STRM)         STORAGE           100.59      3.92       0.0
  504_(C-STRM)         STORAGE           103.04      2.70       0.0
  505_(C-STRM)         STORAGE           103.45      3.26       0.0
  506_(C-STRM)         STORAGE           103.82      3.16       0.0
  507_(C-STRM)         STORAGE           104.14      3.10       0.0
  508_(C-STRM)         STORAGE           104.37      3.12       0.0
  509_(C-STRM)         STORAGE           104.60      3.14       0.0
  510_(C-STRM)         STORAGE           104.85      3.09       0.0
  511_(C-STRM)         STORAGE           104.91      3.08       0.0
  512_(C-STRM)         STORAGE           105.11      3.12       0.0
  513_(C-STRM)         STORAGE           105.24      3.14       0.0
  514_(C-STRM)         STORAGE           105.59      3.16       0.0
  515_(C-STRM)         STORAGE           105.85      3.24       0.0
  516_(C-STRM)         STORAGE           105.46      3.06       0.0
  517_(C-STRM)         STORAGE           105.62      3.03       0.0
  518_(C-STRM)         STORAGE           105.85      2.92       0.0
  519_(C-STRM)         STORAGE           106.08      2.82       0.0
  520_(C-STRM)         STORAGE           106.34      2.66       0.0
  522_(C-STRM)         STORAGE           104.31      3.00       0.0
  525_(C-STRM)         STORAGE           100.61      2.69       0.0
  528_(C-STRM)         STORAGE           100.72      2.68       0.0
  532_(C-STRM)         STORAGE           100.83      2.67       0.0
  536_(C-STRM)         STORAGE           100.98      2.63       0.0
  540_(C-STRM)         STORAGE           100.86      2.85       0.0
  541_(C-STRM)         STORAGE           100.93      2.89       0.0
  551_(C-STRM)         STORAGE           100.65      3.78       0.0
  552_(C-STRM)         STORAGE           100.74      3.88       0.0
  553_(C-STRM)         STORAGE           100.93      3.78       0.0
  554_(C-STRM)         STORAGE           101.05      3.89       0.0
  555_(C-STRM)         STORAGE           101.25      3.93       0.0
  556_(C-STRM)         STORAGE           101.37      3.89       0.0
  601_(C-STRM)         STORAGE           100.45      4.43       0.0
  602_(C-STRM)         STORAGE           100.52      4.11       0.0
  603_(C-STRM)         STORAGE           100.63      3.89       0.0
  604_(C-STRM)         STORAGE           100.88      4.87       0.0
  605_(C-STRM)         STORAGE           101.09      5.63       0.0
  606_(C-STRM)         STORAGE           101.24      5.75       0.0
  619_(C-STRM)         STORAGE           101.38      5.14       0.0
  622_(C-STRM)         STORAGE           101.53      4.49       0.0
  626_(C-STRM)         STORAGE           103.94      3.33       0.0
  627_(C-STRM)         STORAGE           103.13      3.58       0.0
  629_(C-STRM)         STORAGE           101.65      4.46       0.0
  630_(C-STRM)         STORAGE           102.08      4.12       0.0
  630A_(C-STRM)        STORAGE           102.12      3.90       0.0
  631_(C-STRM)         STORAGE           106.00      3.50       0.0
  645_(C-STRM)         STORAGE           102.03      3.69       0.0
  647_(C-STRM)         STORAGE           102.14      3.40       0.0
  650_(C-STRM)         STORAGE           102.22      3.19       0.0
  651_(C-STRM)         STORAGE           102.31      3.03       0.0
  682_(C-STRM)         STORAGE           105.40      0.50       0.0
  MTD_(C-STRM)         STORAGE           100.37      3.19       0.0
  OVERFLOW_(C-STRM)    STORAGE           100.18      2.76       0.0
  POND_(C-STRM)        STORAGE            98.45      2.65       0.0    Yes
  S_525-MTD            STORAGE           103.30      0.50       0.0
  S_528-525            STORAGE           103.41      0.50       0.0
  S_532-528            STORAGE           103.50      0.50       0.0
  S_536-532            STORAGE           103.60      0.50       0.0
  S_540-536            STORAGE           103.71      0.50       0.0
  S_541-540            STORAGE           103.81      0.50       0.0
  S_604-603            STORAGE           105.50      0.50       0.0
  S_605-604            STORAGE           106.71      0.50       0.0
  S_619-606            STORAGE           106.50      0.50       0.0
  S_622-619            STORAGE           105.70      0.50       0.0
  S_622-619_2          STORAGE           106.50      0.50       0.0
  S_627-630            STORAGE           106.70      0.50       0.0
  S_629-622            STORAGE           106.01      0.50       0.0
  SU2                  STORAGE           106.75      0.50       0.0
  SU5                  STORAGE           104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                 From Node        To Node          Type           Length    %Slope
Roughness
  ---------------------------------------------------------------------------------------
-
  BDR-C1               EXD_15           EXD_16           CONDUIT          17.7    0.3844
0.0250
  BDR-C2               EXD_20           EXD_21           CONDUIT           7.9    0.0632
0.0130
  BDR-C3               EXD_25           EXD_26           CONDUIT          14.2    0.2683
0.0130
  BDR-C4               EXD_12           EXD_27           CONDUIT          23.0    0.6077
0.0130
  C1_1                 J32              J26              CONDUIT          71.8    0.4181
0.0130
  C1_17                J6               EXD_1            CONDUIT         171.9    2.4608
0.0130
  C1_3                 J28              J29              CONDUIT         183.6    0.1090
0.0130
  C1_30                J26              J25              CONDUIT          93.1    0.4296
0.0130
  C1_4                 J25              J39              CONDUIT          75.0    0.9329
0.0130
  C14_1                J20              J19              CONDUIT          59.0    0.0847
0.0130
  C14_2                J23              J22              CONDUIT          73.9    0.4062
0.0130
  C14_4                J22              J21              CONDUIT          77.3    0.1941
0.0130
  C14_5                J21              J20              CONDUIT          51.8    0.1931
0.0130
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C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT	73.5	0.5007
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	0.5003
0.0130					
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	0.4989
0.0130					
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					

OR1	POND_(C-STRM)	J74	ORIFICE
OR2	POND_(C-STRM)	J74	ORIFICE
W10	S_536-532	J10	WEIR
W11	S_532-528	J11	WEIR
W12	S_528-525	J12	WEIR
W13	S_525-MTD	J13	WEIR
W14	S_629-622	J32	WEIR
W15	S_622-619	J26	WEIR
W2	POND_(C-STRM)	OF1	WEIR
W3	S_627-630	J24	WEIR
W4	S_622-619_2	J32	WEIR
W5	S_619-606	J62	WEIR
W6	S_605-604	J51	WEIR
W7	S_604-603	J25	WEIR
W8	S_541-540	J9	WEIR
W9	S_540-536	J9	WEIR
C1	S_622-619_2	622_(C-STRM)	OUTLET
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET
OL1	S_627-630	627_(C-STRM)	OUTLET
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET
OL11	J36	553_(C-STRM)	OUTLET
OL12	J40	551_(C-STRM)	OUTLET
OL13	J46	602_(C-STRM)	OUTLET
OL14	J28	520_(C-STRM)	OUTLET
OL15	J6	522_(C-STRM)	OUTLET
OL16	J29	518_(C-STRM)	OUTLET
OL17	J58	513_(C-STRM)	OUTLET
OL18	J59	511_(C-STRM)	OUTLET
OL19	J61	506_(C-STRM)	OUTLET
OL2	SU2	626_(C-STRM)	OUTLET
OL20	J48	504_(C-STRM)	OUTLET
OL21	J44	503_(C-STRM)	OUTLET
OL22	SU5	504_(C-STRM)	OUTLET
OL3	S_629-622	629_(C-STRM)	OUTLET
OL4	S_540-536	540_(C-STRM)	OUTLET
OL5	J22	645_(C-STRM)	OUTLET
OL6	J21	647_(C-STRM)	OUTLET
OL7	J20	650_(C-STRM)	OUTLET
OL8	J19	651_(C-STRM)	OUTLET
OL9	J19	556_(C-STRM)	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C12_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58

C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.24
C-STRM-100_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR		1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
0.25							
C-STRM-35_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-4_(C-STRM) CIRCULAR		0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM) CIRCULAR		0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM) CIRCULAR		0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
6.30							
C-STRM-79_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-8_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
2.74							
C-STRM-84_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7213	0.7403	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1130	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1013	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3140	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929

0.4178 0.4430 0.4687 0.4947 0.5212
0.5482 0.5760 0.6046 0.6335 0.6626
0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000

Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000

Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000

Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000

Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3110 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000

Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7280 0.7526 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000

Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000

Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000

Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000

Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000

Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2667 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6822 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000

Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000

Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000

Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000

Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6533 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000

Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000

Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268

0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5631	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0998	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579

```
        0.4893    0.5214    0.5541    0.5875    0.6216
        0.6564    0.6919    0.7280    0.7648    0.8023
        0.8405    0.8794    0.9189    0.9591    1.0000
Hrad:
        0.0217    0.0433    0.0650    0.0866    0.1083
        0.1299    0.1516    0.1732    0.1949    0.2158
        0.2334    0.2493    0.2650    0.2808    0.2970
        0.3137    0.3309    0.3485    0.3666    0.3838
        0.3990    0.4128    0.4110    0.4455    0.4784
        0.5099    0.5402    0.5694    0.5973    0.6230
        0.6462    0.6674    0.6867    0.7046    0.7237
        0.7433    0.7628    0.7822    0.8014    0.8205
        0.8393    0.8580    0.8765    0.8948    0.9128
        0.9307    0.9483    0.9657    0.9830    1.0000
Width:
        0.0110    0.0219    0.0329    0.0439    0.0549
        0.0658    0.0768    0.0878    0.0987    0.1153
        0.1372    0.1592    0.1811    0.2031    0.2250
        0.2469    0.2689    0.2908    0.3130    0.3514
        0.3898    0.4282    0.4619    0.4783    0.4948
        0.5112    0.5277    0.5442    0.5692    0.6021
        0.6350    0.6679    0.7008    0.7337    0.7531
        0.7696    0.7860    0.8025    0.8190    0.8354
        0.8519    0.8683    0.8848    0.9013    0.9177
        0.9342    0.9506    0.9671    0.9835    1.0000

Transect ROW_24m_Parking
Area:
        0.0004    0.0014    0.0032    0.0056    0.0088
        0.0126    0.0172    0.0225    0.0285    0.0351
        0.0425    0.0506    0.0594    0.0689    0.0790
        0.0899    0.1138    0.1268    0.1410    0.1410
        0.1566    0.1735    0.1918    0.2107    0.2304
        0.2507    0.2716    0.2933    0.3156    0.3391
        0.3638    0.3900    0.4174    0.4462    0.4758
        0.5061    0.5371    0.5687    0.6010    0.6339
        0.6675    0.7018    0.7367    0.7724    0.8086
        0.8456    0.8832    0.9215    0.9604    1.0000
Hrad:
        0.0204    0.0408    0.0612    0.0816    0.1020
        0.1224    0.1428    0.1632    0.1836    0.2040
        0.2244    0.2448    0.2652    0.2856    0.3060
        0.3264    0.3469    0.3673    0.3877    0.4065
        0.4232    0.4385    0.4621    0.4937    0.5239
        0.5528    0.5805    0.6070    0.6326    0.6563
        0.6776    0.6968    0.7143    0.7308    0.7488
        0.7668    0.7846    0.8023    0.8198    0.8372
        0.8543    0.8713    0.8880    0.9046    0.9210
        0.9372    0.9532    0.9690    0.9846    1.0000
Width:
        0.0176    0.0352    0.0528    0.0704    0.0880
        0.1056    0.1231    0.1407    0.1583    0.1759
        0.1935    0.2111    0.2287    0.2463    0.2639
        0.2815    0.2991    0.3167    0.3384    0.3727
        0.4069    0.4412    0.4667    0.4833    0.5000
        0.5167    0.5333    0.5500    0.5708    0.6042
        0.6375    0.6708    0.7042    0.7333    0.7500
        0.7667    0.7833    0.8000    0.8167    0.8333
        0.8500    0.8667    0.8833    0.9000    0.9167
        0.9333    0.9500    0.9667    0.9833    1.0000

Transect ROW_26m
Area:
        0.0003    0.0013    0.0030    0.0053    0.0083
        0.0120    0.0164    0.0214    0.0270    0.0334
        0.0404    0.0481    0.0564    0.0654    0.0751
        0.0854    0.0964    0.1081    0.1205    0.1335
        0.1472    0.1615    0.1765    0.1922    0.2086
        0.2261    0.2453    0.2663    0.2888    0.3123
        0.3369    0.3625    0.3892    0.4168    0.4456
        0.4753    0.5061    0.5379    0.5707    0.6046
        0.6395    0.6754    0.7124    0.7504    0.7894
        0.8295    0.8705    0.9127    0.9558    1.0000
Hrad:
        0.0209    0.0418    0.0627    0.0836    0.1045
        0.1254    0.1463    0.1672    0.1880    0.2089
        0.2298    0.2507    0.2716    0.2925    0.3134
        0.3343    0.3552    0.3761    0.3970    0.4179
        0.4388    0.4597    0.4806    0.5015    0.5223
        0.5421    0.5589    0.5735    0.5992    0.6295
        0.6579    0.6846    0.7097    0.7334    0.7558
        0.7771    0.7974    0.8167    0.8352    0.8529
        0.8699    0.8863    0.9021    0.9173    0.9321
        0.9464    0.9604    0.9739    0.9871    1.0000
Width:
        0.0149    0.0299    0.0448    0.0597    0.0747
        0.0896    0.1045    0.1195    0.1344    0.1493
        0.1643    0.1792    0.1941    0.2090    0.2240
        0.2389    0.2538    0.2688    0.2837    0.2986
        0.3136    0.3285    0.3434    0.3584    0.3733
        0.4113    0.4493    0.4873    0.5154    0.5385
        0.5615    0.5846    0.6077    0.6308    0.6538
        0.6769    0.7000    0.7231    0.7462    0.7692
        0.7923    0.8154    0.8385    0.8615    0.8846
        0.9077    0.9308    0.9538    0.9769    1.0000

Transect Upstream1
Area:
        0.0025    0.0106    0.0203    0.0306    0.0413
        0.0526    0.0643    0.0765    0.0889    0.1016
        0.1146    0.1277    0.1411    0.1547    0.1685
        0.1826    0.1968    0.2113    0.2260    0.2410
        0.2562    0.2716    0.2875    0.3036    0.3201
        0.3370    0.3541    0.3718    0.3916    0.4132
        0.4352    0.4574    0.4798    0.5024    0.5256
        0.5499    0.5749    0.6004    0.6263    0.6529
        0.6803    0.7086    0.7388    0.7719    0.8061
        0.8411    0.8773    0.9158    0.9566    1.0000
Hrad:
        0.0236    0.0542    0.0978    0.1394    0.1791
        0.2172    0.2558    0.2953    0.3343    0.3743
        0.4135    0.4519    0.4897    0.5268    0.5632
        0.5991    0.6344    0.6691    0.7034    0.7372
        0.7686    0.7966    0.8243    0.8517    0.8789
        0.9059    0.9305    0.9395    0.8568    0.8707
        0.9044    0.9376    0.9705    1.0029    1.0032
        1.0093    1.0327    1.0560    1.0792    1.0918
        1.1023    1.1020    1.0403    1.0362    1.0565
        1.0711    1.0710    1.0500    1.0287    1.0000
Width:
        0.1112    0.2068    0.2183    0.2299    0.2414
        0.2530    0.2625    0.2696    0.2763    0.2812
        0.2861    0.2910    0.2959    0.3008    0.3057
        0.3106    0.3155    0.3204    0.3253    0.3301
        0.3360    0.3434    0.3508    0.3582    0.3656
        0.3731    0.3815    0.3971    0.4616    0.4787
        0.4839    0.4890    0.4941    0.4992    0.5218
        0.5423    0.5531    0.5639    0.5747    0.5916
        0.6102    0.6359    0.7052    0.7403    0.7577
        0.7795    0.8137    0.8682    0.9276    1.0000

Transect Upstream2
Area:
        0.0010    0.0033    0.0061    0.0095    0.0135
        0.0180    0.0231    0.0287    0.0349    0.0417
        0.0491    0.0571    0.0658    0.0753    0.0857
        0.0969    0.1089    0.1216    0.1350    0.1491
        0.1643    0.1807    0.1983    0.2174    0.2378
        0.2598    0.2837    0.3085    0.3337    0.3593
        0.3851    0.4112    0.4375    0.4641    0.4910
        0.5185    0.5468    0.5756    0.6049    0.6346
        0.6647    0.6958    0.7278    0.7609    0.7954
        0.8324    0.8717    0.9124    0.9551    1.0000
Hrad:
        0.0245    0.0622    0.0947    0.1245    0.1527
        0.1802    0.2071    0.2329    0.2579    0.2827
        0.3074    0.3275    0.3469    0.3639    0.3812
        0.4022    0.4237    0.4479    0.4730    0.4917
        0.5021    0.5129    0.5218    0.5312    0.5437
        0.5471    0.5612    0.5918    0.6316    0.6711
        0.7100    0.7484    0.7864    0.8238    0.8538
        0.8769    0.9017    0.9331    0.9642    0.9950
        1.0193    1.0315    1.0445    1.0569    1.0476
        1.0094    1.0241    1.0243    1.0266    1.0000
Width:
        0.0422    0.0543    0.0664    0.0785    0.0905
        0.1024    0.1141    0.1261    0.1385    0.1508
        0.1631    0.1781    0.1939    0.2117    0.2302
        0.2467    0.2633    0.2781    0.2924    0.3107
        0.3356    0.3615    0.3904    0.4208    0.4502
        0.4893    0.5205    0.5353    0.5411    0.5466
        0.5522    0.5577    0.5632    0.5687    0.5793
        0.5947    0.6089    0.6182    0.6274    0.6366
        0.6500    0.6718    0.6936    0.7162    0.7558
        0.8227    0.8489    0.8887    0.9286    1.0000

Transect Upstream3
Area:
        0.0006    0.0023    0.0050    0.0083    0.0121
        0.0165    0.0214    0.0269    0.0329    0.0397
        0.0479    0.0574    0.0681    0.0800    0.0928
        0.1066    0.1213    0.1370    0.1537    0.1724
        0.1916    0.2112    0.2310    0.2512    0.2719
        0.2933    0.3154    0.3379    0.3607    0.3838
        0.4072    0.4308    0.4548    0.4792    0.5043
        0.5302    0.5566    0.5834    0.6106    0.6382
        0.6665    0.6955    0.7273    0.7625    0.7988
        0.8362    0.8744    0.9141    0.9558    1.0000
Hrad:
        0.0253    0.0506    0.0845    0.1172    0.1476
        0.1766    0.2049    0.2322    0.2591    0.2672
        0.2667    0.2864    0.3020    0.3243    0.3504
        0.3762    0.4018    0.4273    0.4351    0.4545
        0.4946    0.5339    0.5724    0.6101    0.6377
        0.6626    0.6916    0.7293    0.7664    0.8029
        0.8390    0.8745    0.9096    0.9307    0.9485
        0.9716    1.0018    1.0317    1.0613    1.0906
        1.1167    1.1229    1.0191    1.0199    1.0379
        1.0594    1.0820    1.0709    1.0785    1.0000
Width:
        0.0239    0.0478    0.0617    0.0733    0.0849
        0.0965    0.1081    0.1196    0.1312    0.1535
        0.1863    0.2081    0.2344    0.2566    0.2757
        0.2950    0.3144    0.3339    0.3682    0.3946
        0.4014    0.4082    0.4149    0.4217    0.4354
        0.4510    0.4634    0.4693    0.4752    0.4811
        0.4870    0.4929    0.4988    0.5128    0.5290
        0.5420    0.5507    0.5594    0.5681    0.5768
        0.5931    0.6096    0.7080    0.7423    0.7640
        0.7831    0.8014    0.8479    0.8809    1.0000

Transect Upstream4
Area:
        0.0018    0.0046    0.0083    0.0128    0.0180
        0.0238    0.0302    0.0371    0.0448    0.0547
        0.0662    0.0782    0.0907    0.1038    0.1174
        0.1319    0.1472    0.1638    0.1825    0.2018
        0.2212    0.2408    0.2608    0.2810    0.3017
        0.3227    0.3453    0.3685    0.3919    0.4155
        0.4393    0.4633    0.4875    0.5118    0.5364
        0.5615    0.5871    0.6133    0.6408    0.6690
        0.6977    0.7269    0.7568    0.7876    0.8192
        0.8516    0.8851    0.9205    0.9583    1.0000
Hrad:
        0.0356    0.0671    0.0952    0.1219    0.1526
        0.1825    0.2111    0.2388    0.2457    0.2281
        0.2626    0.2959    0.3290    0.3614    0.3872
        0.4105    0.4302    0.4402    0.4405    0.4805
        0.5198    0.5573    0.5905    0.6232    0.6553
        0.6869    0.6742    0.7110    0.7474    0.7833
        0.8187    0.8537    0.8883    0.9224    0.9509
        0.9733    0.9956    1.0049    1.0036    1.0287
        1.0536    1.0784    1.0896    1.1008    1.1169
        1.1330    1.1274    1.1025    1.0707    1.0000
Width:
        0.0541    0.0732    0.0923    0.1110    0.1246
        0.1374    0.1502    0.1630    0.1916    0.2527
        0.2652    0.2777    0.2895    0.3012    0.3179
        0.3368    0.3586    0.3902    0.4339    0.4377
        0.4416    0.4466    0.4547    0.4628    0.4709
        0.4791    0.5224    0.5268    0.5312    0.5356
        0.5400    0.5488    0.5488    0.5532    0.5611
        0.5729    0.5847    0.6049    0.6332    0.6440
        0.6548    0.6656    0.6857    0.7062    0.7236
        0.7412    0.7753    0.8268    0.8894    1.0000

Transect Upstream5
Area:
        0.0012    0.0039    0.0075    0.0122    0.0185
        0.0256    0.0332    0.0413    0.0500    0.0592
        0.0689    0.0792    0.0900    0.1012    0.1130
        0.1251    0.1375    0.1502    0.1632    0.1765
        0.1902    0.2041    0.2184    0.2330    0.2480
        0.2635    0.2798    0.2968    0.3145    0.3331
        0.3525    0.3727    0.3942    0.4178    0.4431
        0.4698    0.4988    0.5309    0.5639    0.5984
        0.6349    0.6722    0.7101    0.7485    0.7872
        0.8265    0.8666    0.9084    0.9530    1.0000
Hrad:
        0.0281    0.0626    0.0927    0.1114    0.1369
        0.1752    0.2115    0.2463    0.2799    0.3124
        0.3424    0.3749    0.4068    0.4379    0.4694
        0.5056    0.5411    0.5759    0.6102    0.6439
        0.6771    0.7099    0.7421    0.7699    0.7956
        0.8104    0.8232    0.8370    0.8495    0.8616
        0.8746    0.8886    0.8484    0.8428    0.8418
        0.8363    0.8155    0.8068    0.8309    0.8203
        0.8497    0.8801    0.9176    0.9547    0.9913
        1.0230    1.0475    1.0267    1.0168    1.0000
Width:
        0.0449    0.0640    0.0831    0.1124    0.1386
        0.1495    0.1603    0.1712    0.1820    0.1929
        0.2048    0.2146    0.2243    0.2341    0.2433
        0.2496    0.2559    0.2622    0.2684    0.2747
        0.2810    0.2873    0.2936    0.3016    0.3105
        0.3241    0.3390    0.3539    0.3698    0.3865
        0.4032    0.4199    0.4663    0.4984    0.5298
        0.5663    0.6178    0.6645    0.6844    0.7354
        0.7522    0.7679    0.7768    0.7857    0.7946
        0.8074    0.8259    0.8838    0.9366    1.0000

Transect Upstream6
Area:
        0.0020    0.0057    0.0101    0.0154    0.0216
        0.0285    0.0362    0.0446    0.0534    0.0628
        0.0726    0.0829    0.0939    0.1054    0.1174
        0.1299    0.1429    0.1564    0.1705    0.1850
        0.2000    0.2153    0.2310    0.2472    0.2637
        0.2808    0.2986    0.3172    0.3364    0.3564
        0.3786    0.4016    0.4255    0.4503    0.4760
        0.5026    0.5304    0.5593    0.5897    0.6214
        0.6541    0.6875    0.7215    0.7561    0.7915
        0.8280    0.8671    0.9077    0.9506    1.0000
Hrad:
        0.0333    0.0728    0.1080    0.1404    0.1714
        0.2022    0.2321    0.2687    0.3047    0.3396
        0.3717    0.4020    0.4318    0.4612    0.4948
        0.5246    0.5534    0.5820    0.6106    0.6442
        0.6773    0.7100    0.7423    0.7742    0.8057
        0.8224    0.8398    0.8578    0.8777    0.8995
        0.8582    0.8792    0.8979    0.9152    0.9365
        0.9490    0.9612    0.9727    0.9697    0.9916
        1.0145    1.0496    1.0816    1.1092    1.1367
        1.1540    1.1196    1.1309    1.0883    1.0000
Width:
        0.0616    0.0785    0.0947    0.1108    0.1267
        0.1418    0.1569    0.1666    0.1758    0.1850
        0.1952    0.2062    0.2171    0.2280    0.2365
```

0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/02/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	3.553	42.541
Evaporation Loss	0.000	0.000
Infiltration Loss	1.521	18.205
Surface Runoff	1.948	23.325
Final Storage	0.087	1.037
Continuity Error (%)	-0.062	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.948	19.483
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.008	0.079
External Outflow	1.873	18.727
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.083	0.833
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.001	0.014
Continuity Error (%)	-0.063	

****
Highest Continuity Errors
****
Node J51 (26.54%)
Node J39 (10.61%)
Node J43 (9.30%)
Node J62 (7.18%)
Node 514_(C-STRM) (5.57%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL9 (6)
Link OL12 (6)
Link OL16 (6)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.97 %
0.871 - 0.758 sec	:	0.01 %
0.758 - 0.660 sec	:	0.01 %
0.660 - 0.574 sec	:	0.01 %
0.574 - 0.500 sec	:	0.01 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	42.54	0.00	0.00	34.84	7.76	0.15	6.36	0.22	0.08
A18	42.54	0.00	0.00	24.19	16.05	4.93	17.77	0.11	0.08
A19	42.54	0.00	0.00	31.34	9.16	3.54	10.86	0.12	0.08
A20	42.54	0.00	0.00	38.27	3.43	0.26	3.01	0.15	0.09
NULL3	42.54	0.00	0.00	7.62	34.18	6.32	33.67	0.19	0.16
S1	42.54	0.00	0.00	16.41	27.22	16.97	25.13	1.64	1.45
S1_1	42.54	0.00	0.00	11.96	29.31	6.08	29.53	0.04	0.03
S1_2	42.54	0.00	0.00	11.94	29.31	6.11	29.56	0.03	0.03
S1_4	42.54	0.00	0.00	11.98	29.31	6.06	29.50	0.06	0.05
S1_5	42.54	0.00	0.00	11.96	29.31	6.08	29.53	0.03	0.03
S10_1	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.45	0.39
S10_2	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.52	0.45
S10_4	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.18	0.16
S10_5	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.31	0.27
S11	42.54	0.00	0.00	40.47	0.00	2.07	2.07	0.07	0.04
S12	42.54	0.00	0.00	11.99	29.31	6.05	29.50	0.13	0.11
S14_1	42.54	0.00	0.00	12.02	29.31	6.01	29.46	0.18	0.15
S14_3	42.54	0.00	0.00	12.13	29.30	5.89	29.33	0.31	0.26
S14_4	42.54	0.00	0.00	12.03	29.30	6.00	29.45	0.09	0.08
S14_5	42.54	0.00	0.00	12.11	29.30	5.92	29.36	0.50	0.42
S14_6	42.54	0.00	0.00	12.05	29.30	5.99	29.43	0.09	0.07
S14_7	42.54	0.00	0.00	12.07	29.30	5.96	29.40	0.35	0.30
S14_8	42.54	0.00	0.00	12.05	29.30	5.98	29.42	0.10	0.09
S15	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.40	0.35
S16	42.54	0.00	0.00	0.00	40.81	0.00	40.81	0.60	0.14
S17	42.54	0.00	0.00	41.78	1.37	0.71	0.71	0.04	0.02
S18_2	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.82	0.72
S18_3	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.40	0.35
S18_4	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.21	0.19
S18_5	42.54	0.00	0.00	14.35	29.29	18.33	27.12	0.50	0.45
S18_6	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.20	0.18
S19	42.54	0.00	0.00	12.09	29.30	5.93	29.37	0.31	0.26
S2	42.54	0.00	0.00	16.21	27.42	17.09	25.32	0.94	0.84
S20_1	42.54	0.00	0.00	11.97	29.31	6.07	29.52	0.15	0.13
S20_2	42.54	0.00	0.00	11.91	29.31	6.15	29.60	0.07	0.06
S3	42.54	0.00	0.00	17.24	26.36	16.42	24.33	0.60	0.53
S32	42.54	0.00	0.00	11.99	29.31	6.05	29.50	0.12	0.11
S36	42.54	0.00	0.00	0.00	40.82	0.00	40.82	0.74	0.18
S4	42.54	0.00	0.00	5.62	35.12	0.46	35.57	4.70	2.73
S5	42.54	0.00	0.00	5.42	35.13	0.66	35.79	1.14	0.78
S6	42.54	0.00	0.00	17.03	23.45	5.91	24.67	0.08	0.08
S7	42.54	0.00	0.00	5.47	35.13	0.61	35.73	1.42	0.94
S8	42.54	0.00	0.00	31.64	14.64	10.35	10.35	0.20	0.08

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.13	104.53	0	01:10	0.13
EXD_10	JUNCTION	0.03	0.26	98.91	0	01:19	0.26
EXD_11	JUNCTION	0.03	0.20	98.69	0	01:19	0.20
EXD_12	JUNCTION	0.04	0.28	98.59	0	01:17	0.28
EXD_13	JUNCTION	0.01	0.14	104.47	0	01:12	0.14
EXD_14	JUNCTION	0.00	0.00	102.49	0	00:00	0.00
EXD_15	JUNCTION	0.02	0.30	100.57	0	01:10	0.30
EXD_16	JUNCTION	0.01	0.16	100.36	0	01:11	0.16
EXD_17	JUNCTION	0.02	0.16	100.05	0	01:12	0.16
EXD_18	JUNCTION	0.01	0.14	99.54	0	01:17	0.13
EXD_19	JUNCTION	0.02	0.25	99.45	0	01:20	0.25
EXD_2	JUNCTION	0.02	0.23	103.70	0	01:14	0.23
EXD_20	JUNCTION	0.02	0.26	99.45	0	01:20	0.26
EXD_21	JUNCTION	0.02	0.22	99.40	0	01:20	0.22
EXD_22	JUNCTION	0.01	0.13	99.28	0	01:23	0.13
EXD_23	JUNCTION	0.03	0.22	98.97	0	01:26	0.22
EXD_24	JUNCTION	0.01	0.12	98.79	0	01:29	0.12
EXD_25	JUNCTION	0.02	0.23	98.76	0	01:30	0.23
EXD_26	JUNCTION	0.01	0.13	98.61	0	01:32	0.13
EXD_27	JUNCTION	0.04	0.24	98.41	0	01:20	0.24
EXD_3	JUNCTION	0.01	0.12	103.31	0	01:15	0.12
EXD_4	JUNCTION	0.01	0.11	102.76	0	01:17	0.11
EXD_5	JUNCTION	0.01	0.17	102.67	0	01:17	0.17
EXD_6	JUNCTION	0.01	0.12	102.44	0	01:17	0.12
EXD_7	JUNCTION	0.01	0.12	101.61	0	01:20	0.12
EXD_8	JUNCTION	0.01	0.19	100.67	0	01:28	0.19
EXD_9	JUNCTION	0.01	0.10	100.48	0	01:35	0.10
J10	JUNCTION	0.00	0.00	103.60	0	00:00	0.00
J11	JUNCTION	0.00	0.00	103.50	0	00:00	0.00
J12	JUNCTION	0.00	0.00	103.40	0	00:00	0.00
J13	JUNCTION	0.00	0.00	103.30	0	00:00	0.00
J17	JUNCTION	0.01	0.13	104.50	0	01:11	0.13
J19	JUNCTION	0.00	0.05	105.45	0	01:10	0.04
J20	JUNCTION	0.00	0.02	105.47	0	01:10	0.02
J21	JUNCTION	0.00	0.05	105.60	0	01:10	0.05
J22	JUNCTION	0.00	0.01	105.71	0	01:10	0.01
J23	JUNCTION	0.00	0.00	106.00	0	00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0	00:00	0.00
J25	JUNCTION	0.00	0.01	105.31	0	01:35	0.01
J26	JUNCTION	0.00	0.02	105.72	0	01:26	0.02
J28	JUNCTION	0.00	0.05	109.05	0	01:10	0.04
J29	JUNCTION	0.00	0.04	108.84	0	01:10	0.04
J32	JUNCTION	0.00	0.02	106.02	0	01:17	0.02
J36	JUNCTION	0.00	0.04	104.74	0	01:10	0.04
J39	JUNCTION	0.00	0.02	104.62	0	01:13	0.02
J40	JUNCTION	0.00	0.05	104.50	0	01:10	0.05
J41	JUNCTION	0.00	0.01	103.21	0	01:13	0.01
J43	JUNCTION	0.00	0.04	104.24	0	01:11	0.04
J44	JUNCTION	0.00	0.04	104.54	0	01:10	0.03
J45	JUNCTION	0.00	0.04	104.64	0	01:10	0.04
J47	JUNCTION	0.00	0.00	105.10	0	00:00	0.00
J48	JUNCTION	0.00	0.03	105.78	0	01:10	0.03
J51	JUNCTION	0.00	0.02	106.77	0	01:12	0.02
J52	JUNCTION	0.00	0.00	109.75	0	00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0	00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0	00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0	00:00	0.00
J58	JUNCTION	0.00	0.03	108.43	0	01:10	0.03
J59	JUNCTION	0.00	0.02	108.02	0	01:10	0.02
J6	JUNCTION	0.00	0.03	109.86	0	01:10	0.03
J61	JUNCTION	0.00	0.04	107.04	0	01:10	0.03
J62	JUNCTION	0.00	0.03	106.53	0	01:11	0.03
J74	JUNCTION	0.30	0.40	98.85	0	02:53	0.40
J9	JUNCTION	0.00	0.00	103.70	0	00:00	0.00
OF1	OUTFALL	0.00	0.00	100.80	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
OF3	OUTFALL	0.02	0.20	98.20	0	01:20	0.20
ST4_108A_(P-Stm)	OUTFALL	0.17	0.77	98.79	0	01:17	0.77
500_(C-STRM)	STORAGE	0.29	0.43	100.75	0	01:22	0.43
500A_(C-STRM)	STORAGE	0.33	0.85	100.95	0	01:23	0.85
502_(C-STRM)	STORAGE	0.09	1.34	101.88	0	01:14	1.34
503_(C-STRM)	STORAGE	0.08	1.40	101.98	0	01:14	1.40

504_(C-STRM)	STORAGE	0.32	1.05	104.09	0	01:13	1.05	
505_(C-STRM)	STORAGE	0.32	1.10	104.55	0	01:12	1.09	
506_(C-STRM)	STORAGE	0.32	1.16	104.98	0	01:12	1.13	
507_(C-STRM)	STORAGE	0.32	1.10	105.24	0	01:12	1.09	
508_(C-STRM)	STORAGE	0.32	1.14	105.51	0	01:13	1.14	
509_(C-STRM)	STORAGE	0.32	1.19	105.79	0	01:13	1.19	
510_(C-STRM)	STORAGE	0.32	1.15	105.99	0	01:13	1.15	
511_(C-STRM)	STORAGE	0.32	1.14	106.06	0	01:12	1.14	
512_(C-STRM)	STORAGE	0.32	1.08	106.19	0	01:12	1.07	
513_(C-STRM)	STORAGE	0.32	1.04	106.29	0	01:12	1.04	
514_(C-STRM)	STORAGE	0.29	0.72	106.31	0	01:13	0.71	
515_(C-STRM)	STORAGE	0.29	0.48	106.34	0	01:14	0.48	
516_(C-STRM)	STORAGE	0.32	1.10	106.56	0	01:13	1.10	
517_(C-STRM)	STORAGE	0.32	1.23	106.85	0	01:13	1.23	
518_(C-STRM)	STORAGE	0.33	1.46	107.31	0	01:12	1.42	
519_(C-STRM)	STORAGE	0.31	1.29	107.37	0	01:12	1.29	
520_(C-STRM)	STORAGE	0.31	1.16	107.28	0	01:12	1.12	
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	01:12	0.61	
525_(C-STRM)	STORAGE	0.07	1.47	102.08	0	01:18	1.47	
528_(C-STRM)	STORAGE	0.05	1.61	102.34	0	01:19	1.61	
532_(C-STRM)	STORAGE	0.04	1.67	102.50	0	01:20	1.67	
536_(C-STRM)	STORAGE	0.04	1.67	102.64	0	01:20	1.67	
540_(C-STRM)	STORAGE	0.33	1.90	102.76	0	01:20	1.90	
541_(C-STRM)	STORAGE	0.33	1.89	102.82	0	01:20	1.89	
551_(C-STRM)	STORAGE	0.33	1.31	101.96	0	01:14	1.31	
552_(C-STRM)	STORAGE	0.32	1.25	102.00	0	01:13	1.25	
553_(C-STRM)	STORAGE	0.32	1.14	102.08	0	01:13	1.14	
554_(C-STRM)	STORAGE	0.31	1.09	102.14	0	01:13	1.07	
555_(C-STRM)	STORAGE	0.31	1.01	102.25	0	01:13	1.01	
556_(C-STRM)	STORAGE	0.31	1.04	102.40	0	01:12	0.97	
601_(C-STRM)	STORAGE	0.07	1.16	101.61	0	01:15	1.16	
602_(C-STRM)	STORAGE	0.08	1.63	102.01	0	01:14	1.63	
603_(C-STRM)	STORAGE	0.07	1.65	102.28	0	01:14	1.64	
604_(C-STRM)	STORAGE	0.07	1.73	102.61	0	01:14	1.72	
605_(C-STRM)	STORAGE	0.07	1.63	102.71	0	01:14	1.62	
606_(C-STRM)	STORAGE	0.07	1.68	102.92	0	01:14	1.68	
619_(C-STRM)	STORAGE	0.07	1.73	103.11	0	01:13	1.73	
622_(C-STRM)	STORAGE	0.07	1.64	103.16	0	01:13	1.62	
626_(C-STRM)	STORAGE	0.29	0.41	104.35	0	01:20	0.41	
627_(C-STRM)	STORAGE	0.30	0.56	103.69	0	01:20	0.56	
629_(C-STRM)	STORAGE	0.07	1.55	103.20	0	01:13	1.54	
630_(C-STRM)	STORAGE	0.07	1.28	103.35	0	01:13	1.27	
630A_(C-STRM)	STORAGE	0.06	1.29	103.40	0	01:13	1.29	
631_(C-STRM)	STORAGE	0.00	0.02	106.02	0	01:11	0.02	
645_(C-STRM)	STORAGE	0.34	1.55	103.58	0	01:13	1.54	
647_(C-STRM)	STORAGE	0.33	1.55	103.69	0	01:13	1.55	
650_(C-STRM)	STORAGE	0.33	1.56	103.78	0	01:13	1.56	
651_(C-STRM)	STORAGE	0.33	1.56	103.87	0	01:12	1.55	
682_(C-STRM)	STORAGE	0.00	0.06	105.46	0	01:12	0.06	
MTD_(C-STRM)	STORAGE	0.17	1.34	101.71	0	01:15	1.34	
OVERFLOW_(C-STRM)	STORAGE	0.28	0.82	101.00	0	01:22	0.82	
POND_(C-STRM)	STORAGE	0.99	1.63	100.08	0	02:53	1.63	
S_525-MTD	STORAGE	0.00	0.04	103.34	0	01:14	0.04	
S_528-525	STORAGE	0.00	0.04	103.45	0	01:14	0.04	
S_532-528	STORAGE	0.00	0.04	103.54	0	01:14	0.04	
S_536-532	STORAGE	0.00	0.08	103.69	0	01:14	0.08	
S_540-536	STORAGE	0.00	0.06	103.77	0	01:14	0.06	
S_541-540	STORAGE	0.00	0.06	103.87	0	01:15	0.06	
S_604-603	STORAGE	0.00	0.04	105.54	0	01:14	0.04	
S_605-604	STORAGE	0.00	0.05	106.77	0	01:15	0.05	
S_619-606	STORAGE	0.00	0.05	106.55	0	01:13	0.05	
S_622-619	STORAGE	0.00	0.09	105.79	0	01:19	0.09	
S_622-619_2	STORAGE	0.00	0.06	106.56	0	01:14	0.06	
S_627-630	STORAGE	0.00	0.03	106.73	0	01:13	0.03	
S_629-622	STORAGE	0.00	0.05	106.07	0	01:15	0.05	
SU2	STORAGE	0.00	0.00	106.75	0	01:20	0.00	
SU5	STORAGE	0.00	0.00	104.18	0	01:20	0.00	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.103	0	01:10	0	0.128	- 0.057
EXD_10	JUNCTION	0.326	0.326	0	01:10	1.34	1.51	- 0.237
EXD_11	JUNCTION	0.000	0.309	0	01:19	0	1.51	0.012
EXD_12	JUNCTION	0.076	0.371	0	01:17	0.22	1.73	0.004
EXD_13	JUNCTION	0.000	0.100	0	01:11	0	0.128	- 0.329
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.093	0.093	0	01:10	0.145	0.145	- 0.009
EXD_16	JUNCTION	0.000	0.076	0	01:10	0	0.145	- 0.296
EXD_17	JUNCTION	0.000	0.074	0	01:11	0	0.146	- 0.225
EXD_18	JUNCTION	0.000	0.074	0	01:13	0	0.146	0.717
EXD_19	JUNCTION	0.000	0.065	0	01:17	0	0.158	- 0.051
EXD_2	JUNCTION	0.000	0.095	0	01:12	0	0.129	0.492
EXD_20	JUNCTION	0.082	0.098	0	01:19	0.12	0.278	- 0.016
EXD_21	JUNCTION	0.000	0.098	0	01:20	0	0.265	- 0.032
EXD_22	JUNCTION	0.000	0.097	0	01:21	0	0.266	- 0.658
EXD_23	JUNCTION	0.000	0.095	0	01:23	0	0.267	0.819
EXD_24	JUNCTION	0.000	0.091	0	01:27	0	0.268	0.523
EXD_25	JUNCTION	0.082	0.106	0	01:28	0.105	0.372	- 0.195
EXD_26	JUNCTION	0.000	0.119	0	01:30	0	0.37	0.050
EXD_27	JUNCTION	0.156	0.486	0	01:10	0.19	2.29	0.019
EXD_3	JUNCTION	0.000	0.084	0	01:15	0	0.128	0.203
EXD_4	JUNCTION	0.000	0.083	0	01:16	0	0.128	0.094
EXD_5	JUNCTION	0.000	0.082	0	01:17	0	0.128	- 0.004
EXD_6	JUNCTION	0.000	0.082	0	01:17	0	0.128	- 0.530
EXD_7	JUNCTION	0.018	0.101	0	01:18	0.0445	0.173	- 0.942
EXD_8	JUNCTION	0.000	0.096	0	01:20	0	0.175	1.595
EXD_9	JUNCTION	0.000	0.072	0	01:28	0	0.172	2.679
J10	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J11	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J12	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J13	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J17	JUNCTION	0.000	0.103	0	01:10	0	0.128	- 0.078
J19	JUNCTION	0.295	0.297	0	01:10	0.345	0.346	- 0.769
J20	JUNCTION	0.029	0.044	0	01:10	0.0319	0.0368	
J21	JUNCTION	0.050	0.050	0	01:10	0.0563	0.0564	
J22	JUNCTION	0.031	0.031	0	01:10	0.0345	0.0345	- 0.279
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.001	0	01:26	0	0.00222	4.661
J26	JUNCTION	0.000	0.002	0	01:17	0	0.00226	1.779
J28	JUNCTION	0.155	0.155	0	01:10	0.176	0.176	- 0.318
J29	JUNCTION	0.418	0.428	0	01:10	0.495	0.497	- 0.486
J32	JUNCTION	0.000	0.006	0	01:12	0	0.00238	5.512
J36	JUNCTION	0.061	0.079	0	01:10	0.0671	0.0712	0.697
J39	JUNCTION	0.000	0.009	0	01:10	0	0.0046	11.869
J40	JUNCTION	0.131	0.132	0	01:10	0.146	0.151	- 0.779
J41	JUNCTION	0.000	0.030	0	01:11	0	0.00876	1.248
J43	JUNCTION	0.000	0.046	0	01:10	0	0.00966	10.252
J44	JUNCTION	0.076	0.099	0	01:10	0.0875	0.0924	0.160
J46	JUNCTION	0.109	0.109	0	01:10	0.122	0.122	- 0.303
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.086	0.087	0	01:10	0.0993	0.101	- 0.409
J51	JUNCTION	0.000	0.009	0	01:10	0	0.00176	36.124
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.260	0.266	0	01:10	0.312	0.313	- 0.595
J59	JUNCTION	0.074	0.080	0	01:10	0.085	0.0865	0.146
J6	JUNCTION	0.114	0.114	0	01:10	0.128	0.128	- 0.203
J61	JUNCTION	0.297	0.303	0	01:10	0.345	0.347	- 0.275
J62	JUNCTION	0.000	0.014	0	01:10	0	0.00257	7.738
J74	JUNCTION	0.000	0.282	0	02:53	0	16.3	- 0.018
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.079	0.079	0	01:10	0.0843	0.0843	0.000
OF3	OUTFALL	0.000	0.474	0	01:20	0	2.29	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.282	0	02:53	0	16.3	0.000
500_(C-STRM)	STORAGE	0.000	0.087	0	01:22	0	0.119	- 0.005
500A_(C-STRM)	STORAGE	0.000	2.193	0	01:15	0	4.74	0.011
502_(C-STRM)	STORAGE	0.000	1.105	0	01:12	0	2.32	- 0.009
503_(C-STRM)	STORAGE	0.000	0.862	0	01:13	0	1.79	- 0.006
504_(C-STRM)	STORAGE	0.000	0.827	0	01:10	0	1.7	- 0.263
505_(C-STRM)	STORAGE	0.000	0.723	0	01:09	0	1.4	- 0.065
506_(C-STRM)	STORAGE	0.000	0.735	0	01:09	0	1.41	0.482
507_(C-STRM)	STORAGE	0.000	0.537	0	01:15	0	1.06	- 0.543
508_(C-STRM)	STORAGE	0.000	0.531	0	01:15	0	1.06	- 0.003
509_(C-STRM)	STORAGE	0.000	0.542	0	01:08	0	1.06	- 0.027
510_(C-STRM)	STORAGE	0.000	0.565	0	01:08	0	1.06	0.041
511_(C-STRM)	STORAGE	0.000	0.581	0	01:08	0	1.06	0.072
512_(C-STRM)	STORAGE	0.000	0.535	0	01:09	0	0.974	- 0.136
513_(C-STRM)	STORAGE	0.000	0.599	0	01:10	0	1	0.908
514_(C-STRM)	STORAGE	0.000	0.070	0	01:11	0	0.0222	5.901
515_(C-STRM)	STORAGE	0.000	0.023	0	01:13	0	0.00271	- 27.404
516_(C-STRM)	STORAGE	0.000	0.397	0	01:10	0	0.663	- 1.231
517_(C-STRM)	STORAGE	0.000	0.416	0	01:10	0	0.666	0.456
518_(C-STRM)	STORAGE	0.000	0.438	0	01:11	0	0.673	1.001
519_(C-STRM)	STORAGE	0.000	0.116	0	01:05	0	0.172	- 1.897
520_(C-STRM)	STORAGE	0.000	0.121	0	01:05	0	0.175	1.658
522_(C-STRM)	STORAGE	0.000	0.088	0	01:05	0	0.125	0.032
525_(C-STRM)	STORAGE	0.000	1.253	0	01:25	0	2.53	0.097
528_(C-STRM)	STORAGE	0.000	1.045	0	01:25	0	2.13	- 0.015
532_(C-STRM)	STORAGE	0.000	0.836	0	01:24	0	1.73	- 0.175
536_(C-STRM)	STORAGE	0.000	0.728	0	01:24	0	1.52	0.108
540_(C-STRM)	STORAGE	0.000	0.479	0	01:24	0	1.03	- 0.003
541_(C-STRM)	STORAGE	0.000	0.368	0	01:05	0	0.816	0.054
551_(C-STRM)	STORAGE	0.000	0.312	0	01:08	0	0.535	0.699
552_(C-STRM)	STORAGE	0.000	0.241	0	01:08	0	0.385	- 0.877
553_(C-STRM)	STORAGE	0.000	0.252	0	01:08	0	0.387	0.478
554_(C-STRM)	STORAGE	0.000	0.214	0	01:10	0	0.315	- 1.287
555_(C-STRM)	STORAGE	0.000	0.214	0	01:10	0	0.316	0.244
556_(C-STRM)	STORAGE	0.000	0.214	0	01:05	0	0.318	0.417
601_(C-STRM)	STORAGE	0.000	4.852	0	01:15	0	9.98	0.001
602_(C-STRM)	STORAGE	0.000	4.855	0	01:14	0	9.98	- 0.002
603_(C-STRM)	STORAGE	0.000	4.831	0	01:14	0	9.86	0.004
604_(C-STRM)	STORAGE	0.000	4.845	0	01:14	0	9.86	- 0.001

605_(C-STRM)	STORAGE	0.000	4.575	0	01:14	0	9.36	-	0.004
606_(C-STRM)	STORAGE	0.000	3.860	0	01:13	0	8.02		0.001
619_(C-STRM)	STORAGE	0.000	3.893	0	01:13	0	8.02		0.004
622_(C-STRM)	STORAGE	0.000	3.719	0	01:13	0	7.65		0.002
626_(C-STRM)	STORAGE	0.000	0.037	0	01:20	0	0.0682	-	1.086
627_(C-STRM)	STORAGE	0.000	0.133	0	01:20	0	0.206		0.374
629_(C-STRM)	STORAGE	0.000	3.222	0	01:11	0	6.43	-	0.253
630_(C-STRM)	STORAGE	0.000	3.135	0	01:12	0	6.21		0.398
630A_(C-STRM)	STORAGE	0.000	3.028	0	01:10	0	6.01		0.074
631_(C-STRM)	STORAGE	2.725	2.725	0	01:10	4.7	4.7	-	0.101
645_(C-STRM)	STORAGE	0.000	0.620	0	01:14	0	1.3	-	0.156
647_(C-STRM)	STORAGE	0.000	0.599	0	01:14	0	1.26	-	0.381
650_(C-STRM)	STORAGE	0.000	0.574	0	01:11	0	1.2	-	0.587
651_(C-STRM)	STORAGE	0.000	0.544	0	01:05	0	1.17		0.103
682_(C-STRM)	STORAGE	0.779	0.779	0	01:10	1.14	1.14	-	0.059
MTD_(C-STRM)	STORAGE	0.000	2.224	0	01:14	0	4.85	-	0.105
OVERFLOW_(C-STRM)	STORAGE	0.000	2.223	0	01:15	0	4.85	-	0.004
POND_(C-STRM)	STORAGE	1.014	6.785	0	01:21	1.5	16.3		0.001
S_525-MTD	STORAGE	0.350	0.350	0	01:10	0.398	0.398	-	0.016
S_528-525	STORAGE	0.354	0.354	0	01:10	0.403	0.403	-	0.017
S_532-528	STORAGE	0.180	0.180	0	01:10	0.204	0.204	-	0.017
S_536-532	STORAGE	0.446	0.446	0	01:10	0.497	0.497	-	0.017
S_540-536	STORAGE	0.187	0.187	0	01:10	0.213	0.213	-	0.017
S_541-540	STORAGE	0.717	0.717	0	01:10	0.815	0.815	-	0.016
S_604-603	STORAGE	0.530	0.530	0	01:10	0.603	0.603		0.000
S_605-604	STORAGE	1.455	1.455	0	01:10	1.64	1.64	-	0.000
S_619-606	STORAGE	0.394	0.394	0	01:10	0.449	0.449	-	0.000
S_622-619	STORAGE	0.837	0.837	0	01:10	0.942	0.942		0.000
S_622-619_2	STORAGE	0.454	0.454	0	01:10	0.517	0.517	-	0.000
S_627-630	STORAGE	0.155	0.155	0	01:10	0.177	0.177		0.000
S_629-622	STORAGE	0.269	0.269	0	01:10	0.307	0.307	-	0.000
SU2	STORAGE	0.037	0.037	0	01:20	0.0683	0.0683	-	0.002
SU5	STORAGE	0.076	0.076	0	01:20	0.198	0.198	-	0.001

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	10.2	0.0	0.0	0.000	15.3	0 01:22	0.087
500A_(C-STRM)	0.653	30.9	0.0	0.0	1.764	83.5	0 01:23	2.011
502_(C-STRM)	0.000	2.5	0.0	0.0	0.002	36.2	0 01:14	1.092
503_(C-STRM)	0.000	2.0	0.0	0.0	0.002	35.6	0 01:14	0.862
504_(C-STRM)	0.000	12.0	0.0	0.0	0.001	39.0	0 01:13	0.802
505_(C-STRM)	0.000	9.8	0.0	0.0	0.001	33.8	0 01:12	0.706
506_(C-STRM)	0.000	10.2	0.0	0.0	0.001	36.6	0 01:12	0.723
507_(C-STRM)	0.000	10.2	0.0	0.0	0.001	35.5	0 01:12	0.545
508_(C-STRM)	0.000	10.2	0.0	0.0	0.001	36.6	0 01:13	0.537
509_(C-STRM)	0.000	10.1	0.0	0.0	0.001	37.9	0 01:13	0.531
510_(C-STRM)	0.000	10.3	0.0	0.0	0.001	37.2	0 01:13	0.542
511_(C-STRM)	0.000	10.4	0.0	0.0	0.001	37.1	0 01:12	0.565
512_(C-STRM)	0.000	10.2	0.0	0.0	0.001	34.7	0 01:12	0.522
513_(C-STRM)	0.000	10.1	0.0	0.0	0.001	33.2	0 01:12	0.567
514_(C-STRM)	0.000	9.2	0.0	0.0	0.001	22.8	0 01:13	0.049
515_(C-STRM)	0.000	8.8	0.0	0.0	0.001	14.9	0 01:14	0.019
516_(C-STRM)	0.000	10.4	0.0	0.0	0.001	36.1	0 01:13	0.387
517_(C-STRM)	0.000	10.6	0.0	0.0	0.001	40.6	0 01:13	0.397
518_(C-STRM)	0.000	11.1	0.0	0.0	0.002	50.0	0 01:12	0.416
519_(C-STRM)	0.000	11.0	0.0	0.0	0.001	45.9	0 01:12	0.153
520_(C-STRM)	0.000	11.7	0.0	0.0	0.001	43.8	0 01:12	0.116
522_(C-STRM)	0.000	10.2	0.0	0.0	0.001	20.3	0 01:12	0.088
525_(C-STRM)	0.000	2.7	0.0	0.0	0.002	54.7	0 01:18	1.260
528_(C-STRM)	0.000	1.8	0.0	0.0	0.002	60.2	0 01:19	1.054
532_(C-STRM)	0.000	1.6	0.0	0.0	0.002	62.5	0 01:20	0.855
536_(C-STRM)	0.000	1.7	0.0	0.0	0.002	63.4	0 01:20	0.741
540_(C-STRM)	0.000	11.7	0.0	0.0	0.002	66.9	0 01:20	0.521
541_(C-STRM)	0.000	11.4	0.0	0.0	0.002	65.2	0 01:20	0.403
551_(C-STRM)	0.000	8.6	0.0	0.0	0.001	34.8	0 01:14	0.274
552_(C-STRM)	0.000	8.2	0.0	0.0	0.001	32.4	0 01:13	0.213
553_(C-STRM)	0.000	8.4	0.0	0.0	0.001	30.3	0 01:13	0.241
554_(C-STRM)	0.000	8.0	0.0	0.0	0.001	27.9	0 01:13	0.206
555_(C-STRM)	0.000	8.0	0.0	0.0	0.001	25.6	0 01:13	0.214
556_(C-STRM)	0.000	8.0	0.0	0.0	0.001	26.7	0 01:12	0.214
601_(C-STRM)	0.000	1.5	0.0	0.0	0.001	26.2	0 01:15	4.856
602_(C-STRM)	0.000	1.9	0.0	0.0	0.002	39.8	0 01:14	4.852
603_(C-STRM)	0.000	1.9	0.0	0.0	0.002	42.3	0 01:14	4.821
604_(C-STRM)	0.000	1.4	0.0	0.0	0.002	35.6	0 01:14	4.831
605_(C-STRM)	0.000	1.2	0.0	0.0	0.002	28.9	0 01:14	4.551
606_(C-STRM)	0.000	1.2	0.0	0.0	0.002	29.2	0 01:14	3.832
619_(C-STRM)	0.000	1.4	0.0	0.0	0.002	33.7	0 01:13	3.860
622_(C-STRM)	0.000	1.5	0.0	0.0	0.002	36.5	0 01:13	3.660
626_(C-STRM)	0.000	8.7	0.0	0.0	0.000	12.3	0 01:20	0.037
627_(C-STRM)	0.000	8.3	0.0	0.0	0.001	15.7	0 01:20	0.133
629_(C-STRM)	0.000	1.5	0.0	0.0	0.002	34.8	0 01:13	3.168
630_(C-STRM)	0.000	1.7	0.0	0.0	0.001	31.0	0 01:13	3.088
630A_(C-STRM)	0.000	1.6	0.0	0.0	0.001	33.0	0 01:13	3.012
631_(C-STRM)	0.001	0.1	0.0	0.0	0.076	3.1	0 01:11	2.438
645_(C-STRM)	0.000	9.1	0.0	0.0	0.002	41.9	0 01:13	0.636
647_(C-STRM)	0.000	9.8	0.0	0.0	0.002	45.7	0 01:13	0.611
650_(C-STRM)	0.000	10.4	0.0	0.0	0.002	48.9	0 01:13	0.570
651_(C-STRM)	0.000	10.9	0.0	0.0	0.002	51.3	0 01:12	0.546
682_(C-STRM)	0.001	0.1	0.0	0.0	0.091	12.1	0 01:12	0.526
MTD_(C-STRM)	0.000	5.4	0.0	0.0	0.002	41.9	0 01:15	2.223
OVERFLOW_(C-STRM)	0.000	10.1	0.0	0.0	0.001	29.9	0 01:22	2.223
POND_(C-STRM)	5.032	13.9	0.0	0.0	12.374	34.2	0 02:53	0.282
S_525-MTD	0.001	0.1	0.0	0.0	0.051	8.9	0 01:14	0.203
S_528-525	0.001	0.1	0.0	0.0	0.052	8.9	0 01:14	0.205
S_532-528	0.000	0.1	0.0	0.0	0.026	8.9	0 01:14	0.104
S_536-532	0.001	0.2	0.0	0.0	0.071	16.7	0 01:14	0.246
S_540-536	0.000	0.1	0.0	0.0	0.025	12.1	0 01:14	0.110
S_541-540	0.002	0.2	0.0	0.0	0.133	11.3	0 01:15	0.368
S_604-603	0.001	0.1	0.0	16.6	0.076	8.8	0 01:14	0.308
S_605-604	0.003	0.1	0.0	18.1	0.245	10.8	0 01:15	0.786
S_619-606	0.000	0.1	0.0	16.8	0.046	10.6	0 01:13	0.243
S_622-619	0.004	0.3	0.0	18.7	0.236	18.1	0 01:19	0.328
S_622-619_2	0.001	0.1	0.0	16.8	0.063	12.7	0 01:14	0.261
S_627-630	0.000	0.1	0.0	22.0	0.016	6.4	0 01:13	0.103
S_629-622	0.001	0.1	0.0	19.1	0.047	10.7	0 01:15	0.143
SU2	0.000	0.0	0.0	0.0	0.003	0.5	0 01:20	0.037
SU5	0.000	0.0	0.0	0.0	0.004	0.8	0 01:20	0.075

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	12.16	0.008	0.079	0.084
OF3	97.99	0.027	0.474	2.293
ST4_108A_(P-Stm)	98.16	0.193	0.282	16.350
System	52.08	0.228	0.731	18.727

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.076	0 01:10	1.03	1.13	0.57
BDR-C2	CONDUIT	0.098	0 01:20	1.24	1.87	0.60
BDR-C3	CONDUIT	0.119	0 01:30	1.88	0.61	0.36
BDR-C4	CONDUIT	0.370	0 01:18	2.03	0.12	0.22
C1_1	CHANNEL	0.002	0 01:17	0.32	0.00	0.06
C1_17	CHANNEL	0.015	0 01:10	0.66	0.00	0.09
C1_3	CHANNEL	0.011	0 01:10	0.19	0.00	0.14
C1_30	CHANNEL	0.001	0 01:26	0.30	0.00	0.05
C1_4	CHANNEL	0.001	0 01:35	0.17	0.00	0.05
C14_1	CHANNEL	0.002	0 01:10	0.05	0.00	0.14
C14_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C14_4	CHANNEL	0.000	0 01:10	0.02	0.00	0.11
C14_5	CHANNEL	0.016	0 01:10	0.44	0.01	0.14
C15_1	CHANNEL	0.006	0 01:10	0.17	0.00	0.11
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.05
C2	CONDUIT	0.013	0 01:13	0.24	0.00	0.02
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.04
C20_2	CHANNEL	0.006	0 01:10	0.27	0.00	0.09
C20_3	CHANNEL	0.008	0 01:10	0.32	0.00	0.08
C20_4	CHANNEL	0.009	0 01:10	0.45	0.00	0.08
C20_5	CHANNEL	0.004	0 01:11	0.52	0.00	0.06
C20_7	CHANNEL	0.012	0 01:10	0.37	0.00	0.10
C23_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.02
C23_7	CHANNEL	0.030	0 01:11	1.49	0.01	0.10
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.006	0 01:12	0.56	0.00	0.08
C4_3	CHANNEL	0.000	0 00:00	0.00	0.00	0.03
C4_4	CHANNEL	0.014	0 01:10	0.51	0.00	0.12
C4_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.07

C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C5_1	CHANNEL	0.103	0	01:10	0.31	0.02	0.13
C5_10	CHANNEL	0.074	0	01:11	0.45	0.02	0.20
C5_11	CHANNEL	0.065	0	01:17	0.19	0.02	0.23
C5_12	CHANNEL	0.474	0	01:20	1.00	0.04	0.21
C5_13	CHANNEL	0.074	0	01:13	0.54	0.02	0.19
C5_14	CHANNEL	0.063	0	01:21	0.16	0.04	0.29
C5_15	CHANNEL	0.095	0	01:23	0.45	0.03	0.22
C5_16	CHANNEL	0.091	0	01:17	0.37	0.02	0.15
C5_17	CHANNEL	0.089	0	01:29	0.21	0.01	0.16
C5_19	CHANNEL	0.097	0	01:21	0.36	0.06	0.20
C5_2	CHANNEL	0.084	0	01:15	0.54	0.01	0.16
C5_20	CHANNEL	0.103	0	01:32	0.23	0.01	0.16
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.19
C5_23	CHANNEL	0.100	0	01:11	0.29	0.02	0.13
C5_3	CHANNEL	0.095	0	01:12	0.50	0.01	0.17
C5_4	CHANNEL	0.082	0	01:17	0.48	0.00	0.12
C5_5	CHANNEL	0.084	0	01:18	0.60	0.01	0.11
C5_6	CHANNEL	0.083	0	01:16	0.67	0.00	0.10
C5_7	CHANNEL	0.063	0	01:35	0.20	0.01	0.16
C5_8	CHANNEL	0.096	0	01:20	0.56	0.01	0.14
C5_9	CHANNEL	0.309	0	01:19	0.59	0.03	0.23
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C7	CHANNEL	0.011	0	01:10	0.21	0.00	0.12
C9_1	CHANNEL	0.021	0	01:10	0.35	0.01	0.13
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.07
C9_2	CHANNEL	0.009	0	01:10	0.36	0.00	0.09
C9_5	CHANNEL	0.003	0	01:11	0.40	0.00	0.10
C9_6	CHANNEL	0.024	0	01:10	0.42	0.01	0.13
C9_7	CHANNEL	0.022	0	01:10	0.45	0.00	0.12
C-STRM-1_(1)_(1)_(C-STRM) CONDUIT		0.387	0	01:13	1.14	1.03	1.00
C-STRM-1_(1)_(C-STRM) CONDUIT		0.397	0	01:10	1.11	1.22	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.416	0	01:10	1.47	1.75	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.087	0	01:22	1.12	0.20	0.32
C-STRM-101_(C-STRM)	CONDUIT	0.087	0	01:22	1.84	0.11	0.22
C-STRM-102_(C-STRM)	CONDUIT	2.182	0	01:15	4.81	0.87	0.80
C-STRM-103_(C-STRM)	CONDUIT	0.570	0	01:15	1.13	1.03	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.611	0	01:14	1.14	1.10	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.636	0	01:15	1.19	1.14	1.00
C-STRM-2_(1)_(C-STRM) CONDUIT		0.522	0	01:08	1.62	0.93	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.535	0	01:09	1.73	0.95	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.037	0	01:20	1.17	0.13	0.33
C-STRM-21_(C-STRM)	CONDUIT	0.133	0	01:20	1.29	0.44	0.52
C-STRM-22_(1)_(C-STRM) CONDUIT		3.168	0	01:13	1.58	0.71	0.88
C-STRM-22_(C-STRM)	CONDUIT	3.088	0	01:11	2.38	1.13	0.84
C-STRM-26_(1)_(C-STRM) CONDUIT		0.274	0	01:07	1.05	0.82	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.213	0	01:14	0.74	0.63	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT		0.723	0	01:09	1.68	0.92	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT		0.545	0	01:14	1.64	0.92	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM) CONDUIT		0.537	0	01:15	1.50	0.91	1.00
C-STRM-3_(1)_(1)_(C-STRM) CONDUIT		0.531	0	01:15	1.49	0.89	1.00
C-STRM-3_(1)_(2)_(C-STRM) CONDUIT		0.542	0	01:08	1.60	0.96	1.00
C-STRM-3_(1)_(C-STRM) CONDUIT		0.565	0	01:08	1.72	1.00	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.546	0	01:14	1.18	0.98	1.00
C-STRM-34_(1)_(1)_(C-STRM) CONDUIT		0.214	0	01:10	1.21	1.25	1.00
C-STRM-34_(1)_(C-STRM) CONDUIT		0.214	0	01:10	1.10	1.25	1.00
C-STRM-35_(1)_(C-STRM) CONDUIT		0.241	0	01:08	1.14	0.98	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.206	0	01:08	0.93	0.84	1.00
C-STRM-4_(1)_(C-STRM) CONDUIT		0.802	0	01:13	1.99	0.93	0.87
C-STRM-4_(C-STRM)	CONDUIT	0.706	0	01:10	1.67	0.90	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.403	0	01:26	0.83	0.72	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.521	0	01:26	0.97	0.94	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.741	0	01:26	1.17	1.06	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.855	0	01:26	1.15	0.99	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.054	0	01:25	1.41	1.21	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.862	0	01:12	1.15	0.98	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.116	0	01:26	0.96	0.91	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.153	0	01:13	0.71	0.92	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	01:12	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	3.860	0	01:13	1.62	0.75	0.95
C-STRM-75_(C-STRM)	CONDUIT	3.832	0	01:14	1.64	0.75	0.92
C-STRM-76_(C-STRM)	CONDUIT	1.260	0	01:25	1.69	1.26	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.223	0	01:15	2.80	1.15	0.89
C-STRM-78_(C-STRM)	CONDUIT	1.292	0	01:12	1.66	0.99	1.00
C-STRM-79_(1)_(C-STRM) CONDUIT		4.831	0	01:14	1.95	0.77	0.94
C-STRM-79_(C-STRM)	CONDUIT	4.551	0	01:14	1.89	0.79	0.93
C-STRM-8_(1)_(C-STRM) CONDUIT		0.070	0	01:11	0.38	0.37	0.90
C-STRM-8_(C-STRM)	CONDUIT	0.023	0	01:13	0.27	0.18	0.56
C-STRM-80_(C-STRM)	CONDUIT	4.821	0	01:14	1.98	1.09	0.91
C-STRM-81_(C-STRM)	CONDUIT	4.852	0	01:15	2.29	1.09	0.78
C-STRM-82_(C-STRM)	CONDUIT	4.856	0	01:15	2.29	1.09	0.63
C-STRM-83_(1)_(C-STRM) CONDUIT		3.012	0	01:10	2.13	1.10	0.85
C-STRM-84_(C-STRM)	CONDUIT	3.660	0	01:13	1.63	0.71	0.93
CVR-C2	CONDUIT	0.082	0	01:17	1.83	0.30	0.32
CVR-C3	CONDUIT	0.072	0	01:28	2.35	0.44	0.34
CVR-C4	CONDUIT	0.309	0	01:19	2.07	0.10	0.19
ST4-Pipe_-_(99)_(P-Stm) CONDUIT		0.282	0	02:53	1.22	0.29	0.47
W1	CHANNEL	1.985	0	01:23	0.85	0.01	0.03
OR1	ORIFICE	0.282	0	02:53			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.249	0	01:05			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:06			
C-STRM-14_(1)_(C-STRM) DUMMY		0.743	0	01:05			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:04			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:05			
C-STRM-44_(1)_(C-STRM) DUMMY		0.203	0	01:06			
C-STRM-45_(1)_(C-STRM) DUMMY		0.233	0	01:06			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:03			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	01:08			
C-STRM-96_(1)_(C-STRM) DUMMY		0.246	0	01:04			
C-STRM-97_(1)_(C-STRM) DUMMY		0.104	0	01:06			
C-STRM-98_(1)_(C-STRM) DUMMY		0.205	0	01:06			
OL1	DUMMY	0.097	0	01:07			
OL10	DUMMY	0.026	0	00:37			
OL11	DUMMY	0.046	0	01:04			
OL12	DUMMY	0.101	0	01:04			
OL13	DUMMY	0.084	0	01:04			
OL14	DUMMY	0.121	0	01:05			
OL15	DUMMY	0.088	0	01:05			
OL16	DUMMY	0.342	0	01:06			
OL17	DUMMY	0.215	0	01:06			
OL18	DUMMY	0.059	0	01:05			
OL19	DUMMY	0.238	0	01:05			
OL2	DUMMY	0.037	0	01:20			
OL20	DUMMY	0.068	0	01:05			
OL21	DUMMY	0.060	0	01:05			
OL22	DUMMY	0.075	0	01:20			
OL3	DUMMY	0.134	0	01:05			
OL4	DUMMY	0.110	0	01:06			
OL5	DUMMY	0.031	0	01:10			
OL6	DUMMY	0.029	0	01:01			
OL7	DUMMY	0.034	0	01:07			
OL8	DUMMY	0.018	0	01:05			
OL9	DUMMY	0.214	0	01:05			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual	Fraction of Time in Flow Class Up	Down	Sub	Sup	Up	Down	Norm	Inlet
BDR-C1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.85	0.00
BDR-C2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.00
BDR-C3	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.00	0.00
BDR-C4	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.90	0.00
C1_1	1.00	0.05	0.00	0.00	0.95	0.01	0.00	0.00	0.94	0.00
C1_17	1.00	0.87	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
C1_3	1.00	0.83	0.03	0.00	0.13	0.00	0.00	0.00	0.95	0.00
C1_30	1.00	0.05	0.00	0.00	0.52	0.44	0.00	0.00	0.00	0.00
C1_4	1.00	0.04	0.01	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C14_1	1.00	0.85	0.04	0.00	0.12	0.00	0.00	0.00	0.97	0.00
C14_2	1.00	0.88	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.87	0.01	0.00	0.12	0.00	0.00	0.00	0.97	0.00
C14_5	1.00	0.87	0.00	0.00	0.10	0.03	0.00	0.00	0.00	0.00
C15_1	1.00	0.82	0.03	0.00	0.15	0.00	0.00	0.00	0.95	0.00
C15_2	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.55	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00
C20_1	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.86	0.01	0.00	0.10	0.02	0.00	0.00	0.97	0.00
C20_3	1.00	0.84	0.01	0.00	0.12	0.03	0.00	0.00	0.02	0.00
C20_4	1.00	0.02	0.85	0.00	0.11	0.01	0.00	0.00	0.95	0.00
C20_5	1.00	0.02	0.02	0.00	0.72	0.24	0.00	0.00	0.01	0.00
C20_7	1.00	0.86	0.01	0.00	0.08	0.05	0.00	0.00	0.02	0.00
C23_5	1.00	0.55	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C23_7	1.00	0.04	0.00	0.00	0.78	0.18	0.00	0.00	0.78	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.04	0.00	0.00	0.95	0.01	0.00	0.00	0.95	0.00
C4_3	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.05	0.85	0.00	0.11	0.01	0.00	0.00	0.00	0.00
C4_5	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.88	0.00
C5_10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.96	0.00
C5_11	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_12	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.02	0.00	0.00	0.26	0.72	0.00	0.00	0.01	0.00
C5_14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.65	0.00
C5_15	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.95	0.00
C5_16	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.02	0.03	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.70	0.00
C5_2	1.00	0.03	0.00	0.00	0.61	0.36	0.00	0.00	0.00	0.00
C5_20	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C5_21	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.02	0.00	0.00	0.78	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.96	0.00
C5_4	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_5	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.04	0.00
C5_6	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.89	0.00
C5_7	1.00	0.03	0.00	0.00	0.95	0.02	0.00	0.00	0.95	0.00
C5_8	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C5_9	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.86	0.01	0.00	0.13	0.00	0.00	0.00	0.95	0.00
C9_1	1.00	0.85	0.00	0.00	0.13	0.02	0.00	0.00	0.01	0.00
C9_11	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.02	0.87	0.00	0.10	0.01	0.00	0.00	0.95	0.00
C9_5	1.00	0.02	0.02	0.00	0.01	0.95	0.00	0.00	0.01	0.00
C9_6	1.00	0.02	0.83	0.00	0.14	0.01	0.00	0.00	0.95	0.00
C9_7	1.00	0.02	0.86	0.00	0.11	0.01	0.00	0.00	0.95	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.14	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.41	0.00
C-STRM-1_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.05	0.84	0.00	0.03	0.00	0.00	0.08	0.84	0.00
C-STRM-101_(C-STRM)	1.00	0.05	0.84	0.00	0.00	0.00	0.00	0.95	0.00	0.00
C-STRM-102_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.03	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.82	0.00
C-STRM-104_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.93	0.00
C-STRM-105_(C-STRM)	1.00	0.02	0.00	0.00	0.11	0.00	0.00	0.86	0.02	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.76	0.00
C-STRM-2_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.02	0.00	0.02	0.62	0.00
C-STRM-20_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.94	0.95	0.00
C-STRM-21_(C-STRM)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.92	0.05	0.00	0.02	0.75	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.01	0.73	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.01	0.86	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.15	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.00	0.00	0.02	0.78	0.00
C-STRM-33_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.63	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.02	0.01	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.89	0.00
C-STRM-49_(C-STRM)	1.00	0.02	0.39	0.00	0.58	0.00	0.00	0.00	0.88	0.00
C-STRM-50_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.00	0.00	0.03	0.96	0.00
C-STRM-51_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.70	0.00
C-STRM-53_(C-STRM)	1.00	0.02	0.18	0.00	0.80	0.00	0.00	0.00	0.65	0.00
C-STRM-57_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.00
C-STRM-62_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.90	0.03	0.00
C-STRM-64_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.83	0.00
C-STRM-75_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.02	0.00	0.00	0.49	0.00	0.00	0.49	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.02	0.00	0.00	0.35	0.00
C-STRM-78_(C-STRM)	1.00	0.02	0.00	0.00	0.48	0.00	0.00	0.50	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.87	0.00
C-STRM-79_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.04	0.01	0.00	0.03	0.00	0.00	0.93	0.01	0.00
C-STRM-8_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.02	0.01	0.00	0.98	0.00	0.00	0.00	0.89	0.00
C-STRM-81_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.77	0.00
C-STRM-82_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.83	0.00
C-STRM-84_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.90	0.00
CVR-C2	1.00	0.04	0.00	0.00	0.83	0.12	0.00	0.00	0.87	0.00
CVR-C3	1.00	0.05	0.00	0.00	0.61	0.35	0.00	0.00	0.03	0.00
CVR-C4	1.00	0.02	0.00	0.00	0.57	0.41	0.00	0.00	0.07	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.02	0.00	0.00	0.17	0.00	0.00	0.81	0.00	0.00
W1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00

****
Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
BDR-C1	0.01	0.01	0.01	0.08	0.01
BDR-C2	0.01	0.01	0.01	0.49	0.01

C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.06	0.09	0.06	0.01	0.06
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.09	0.17	0.09	0.01	0.09
C-STRM-3_(1)_(1)_(C-STRM)	0.17	0.22	0.17	0.01	0.17
C-STRM-3_(1)_(2)_(C-STRM)	0.18	0.18	0.22	0.01	0.01
C-STRM-3_(1)_(C-STRM)	0.18	0.18	0.18	0.01	0.06
C-STRM-33_(C-STRM)	0.24	0.24	0.25	0.01	0.02
C-STRM-34_(1)_(1)_(C-STRM)	0.08	0.08	0.12	0.13	0.03
C-STRM-34_(1)_(C-STRM)	0.06	0.06	0.08	0.16	0.03
C-STRM-35_(1)_(C-STRM)	0.21	0.21	0.29	0.01	0.01
C-STRM-35_(C-STRM)	0.12	0.12	0.21	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.02	0.01	0.01	0.01
C-STRM-4_(C-STRM)	0.02	0.03	0.02	0.01	0.02
C-STRM-49_(C-STRM)	0.35	0.35	0.36	0.01	0.01
C-STRM-50_(C-STRM)	0.36	0.36	0.36	0.01	0.26
C-STRM-51_(C-STRM)	0.36	0.36	0.36	0.18	0.36
C-STRM-52_(C-STRM)	0.36	0.36	0.36	0.01	0.33
C-STRM-53_(C-STRM)	0.36	0.36	0.36	0.29	0.36
C-STRM-57_(C-STRM)	0.33	0.34	0.34	0.01	0.31
C-STRM-62_(C-STRM)	0.13	0.13	0.17	0.01	0.01
C-STRM-63_(C-STRM)	0.17	0.17	0.21	0.01	0.01
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.05	0.01
C-STRM-76_(C-STRM)	0.34	0.36	0.34	0.30	0.34
C-STRM-77_(C-STRM)	0.01	0.34	0.01	0.28	0.01
C-STRM-78_(C-STRM)	0.33	0.34	0.34	0.01	0.27
C-STRM-8_(1)_(C-STRM)	0.01	0.01	0.10	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.14	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.15	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.15	0.01
C-STRM-83_(1)_(C-STRM)	0.01	0.01	0.01	0.11	0.01

Analysis begun on: Thu Apr 9 10:32:22 2026
Analysis ended on: Thu Apr 9 10:32:28 2026
Total elapsed time: 00:00:06

Post-Development 1:100 year 3-hour Chicago Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
  Name                 Data Source          Data       Recording
                                            Type       Interval
  -------------------------------------------------------------
  24SCS100             24SCS100             INTENSITY   15 min.
  6SCS050              6SCS050              INTENSITY   15 min.
  Rainfall             CHI_3hr_100          INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall             EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall             EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall             EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall             EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall             EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall             S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall             J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall             J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall             J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall             J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall             S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall             S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall             S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall             S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall             SU2
  S12                  0.44    334.74     71.43    2.0000 Rainfall             J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall             J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall             J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall             J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall             J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall             J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall             J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall             J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall             S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall             EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall             EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall             S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall             S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall             S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall             S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall             S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall             J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall             S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall             J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall             J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall             S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall             J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall             EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall             OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall             SU5


  ************
  Node Summary
  ************
                                      Invert      Max.     Ponded    External
  Name                 Type             Elev.     Depth       Area    Inflow
  ---------------------------------------------------------------------------
  EXD_1                JUNCTION        104.39      1.51        0.0
  EXD_10               JUNCTION         98.65      1.20        0.0
  EXD_11               JUNCTION         98.50      1.20        0.0
  EXD_12               JUNCTION         98.31      1.20        0.0
  EXD_13               JUNCTION        104.32      1.10        0.0
  EXD_14               JUNCTION        102.49      0.80        0.0
  EXD_15               JUNCTION        100.27      0.80        0.0
  EXD_16               JUNCTION        100.20      0.80        0.0
  EXD_17               JUNCTION         99.89      0.80        0.0
  EXD_18               JUNCTION         99.40      0.84        0.0
  EXD_19               JUNCTION         99.19      0.88        0.0
  EXD_2                JUNCTION        103.47      1.93        0.0
  EXD_20               JUNCTION         99.19      0.88        0.0
  EXD_21               JUNCTION         99.18      0.88        0.0
  EXD_22               JUNCTION         99.14      0.88        0.0
  EXD_23               JUNCTION         98.75      1.14        0.0
  EXD_24               JUNCTION         98.67      1.14        0.0
  EXD_25               JUNCTION         98.52      1.13        0.0
  EXD_26               JUNCTION         98.48      1.13        0.0
  EXD_27               JUNCTION         98.17      1.20        0.0
  EXD_3                JUNCTION        103.19      1.41        0.0
  EXD_4                JUNCTION        102.64      1.20        0.0
  EXD_5                JUNCTION        102.50      1.20        0.0
  EXD_6                JUNCTION        102.32      1.08        0.0
  EXD_7                JUNCTION        101.50      1.06        0.0
  EXD_8                JUNCTION        100.48      1.06        0.0
  EXD_9                JUNCTION        100.39      1.06        0.0
  J10                  JUNCTION        103.60      0.50        0.0
  J11                  JUNCTION        103.50      0.50        0.0
  J12                  JUNCTION        103.40      0.50        0.0
  J13                  JUNCTION        103.30      0.50        0.0
  J17                  JUNCTION        104.37      1.04        0.0
  J19                  JUNCTION        105.40      0.50        0.0
  J20                  JUNCTION        105.45      0.50        0.0
  J21                  JUNCTION        105.55      0.50        0.0
  J22                  JUNCTION        105.70      0.50        0.0
  J23                  JUNCTION        106.00      0.50        0.0
  J24                  JUNCTION        106.20      0.50        0.0
  J25                  JUNCTION        105.30      0.50        0.0
  J26                  JUNCTION        105.70      0.50        0.0
  J28                  JUNCTION        109.00      0.50        0.0
  J29                  JUNCTION        108.80      0.50        0.0
  J32                  JUNCTION        106.00      0.50        0.0
  J36                  JUNCTION        104.70      0.50        0.0
  J39                  JUNCTION        104.60      0.50        0.0
  J40                  JUNCTION        104.45      0.50        0.0
  J41                  JUNCTION        103.20      0.50        0.0
  J43                  JUNCTION        104.20      0.50        0.0
  J44                  JUNCTION        104.50      0.50        0.0
  J46                  JUNCTION        104.60      0.50        0.0
  J47                  JUNCTION        105.10      0.50        0.0
  J48                  JUNCTION        105.75      0.50        0.0
  J51                  JUNCTION        106.75      0.50        0.0
  J52                  JUNCTION        109.75      0.50        0.0
  J53                  JUNCTION        109.00      0.50        0.0
  J56                  JUNCTION        109.10      0.50        0.0
  J57                  JUNCTION        108.47      0.50        0.0
  J58                  JUNCTION        108.40      0.50        0.0
  J59                  JUNCTION        108.00      0.50        0.0
  J6                   JUNCTION        109.83      0.30        0.0
  J61                  JUNCTION        107.00      0.50        0.0
  J62                  JUNCTION        106.50      0.50        0.0
  J74                  JUNCTION         98.45      0.90        0.0
  J9                   JUNCTION        103.70      0.50        0.0
  OF1                  OUTFALL         100.80      0.00        0.0
  OF2                  OUTFALL           0.00      0.00        0.0
  OF3                  OUTFALL          98.00      1.06        0.0
  ST4_108A_(P-Stm)     OUTFALL          98.02      1.19        0.0
  500_(C-STRM)         STORAGE         100.31      2.84        0.0
  500A_(C-STRM)        STORAGE         100.10      1.00        0.0
  502_(C-STRM)         STORAGE         100.54      3.70        0.0
  503_(C-STRM)         STORAGE         100.59      3.92        0.0
  504_(C-STRM)         STORAGE         103.04      2.70        0.0
  505_(C-STRM)         STORAGE         103.45      3.26        0.0
  506_(C-STRM)         STORAGE         103.82      3.16        0.0
  507_(C-STRM)         STORAGE         104.14      3.10        0.0
  508_(C-STRM)         STORAGE         104.37      3.12        0.0
  509_(C-STRM)         STORAGE         104.60      3.14        0.0
  510_(C-STRM)         STORAGE         104.85      3.09        0.0
  511_(C-STRM)         STORAGE         104.91      3.08        0.0
  512_(C-STRM)         STORAGE         105.11      3.12        0.0
  513_(C-STRM)         STORAGE         105.24      3.14        0.0
  514_(C-STRM)         STORAGE         105.59      3.16        0.0
  515_(C-STRM)         STORAGE         105.85      3.24        0.0
  516_(C-STRM)         STORAGE         105.46      3.06        0.0
  517_(C-STRM)         STORAGE         105.62      3.03        0.0
  518_(C-STRM)         STORAGE         105.85      2.92        0.0
  519_(C-STRM)         STORAGE         106.08      2.82        0.0
  520_(C-STRM)         STORAGE         106.34      2.66        0.0
  522_(C-STRM)         STORAGE         104.31      3.00        0.0
  525_(C-STRM)         STORAGE         100.61      2.69        0.0
  528_(C-STRM)         STORAGE         100.72      2.68        0.0
  532_(C-STRM)         STORAGE         100.83      2.67        0.0
  536_(C-STRM)         STORAGE         100.98      2.63        0.0
  540_(C-STRM)         STORAGE         100.86      2.85        0.0
  541_(C-STRM)         STORAGE         100.93      2.89        0.0
  551_(C-STRM)         STORAGE         100.65      3.78        0.0
  552_(C-STRM)         STORAGE         100.74      3.88        0.0
  553_(C-STRM)         STORAGE         100.93      3.78        0.0
  554_(C-STRM)         STORAGE         101.05      3.89        0.0
  555_(C-STRM)         STORAGE         101.25      3.93        0.0
  556_(C-STRM)         STORAGE         101.37      3.89        0.0
  601_(C-STRM)         STORAGE         100.45      4.43        0.0
  602_(C-STRM)         STORAGE         100.52      4.11        0.0
  603_(C-STRM)         STORAGE         100.63      3.89        0.0
  604_(C-STRM)         STORAGE         100.88      4.87        0.0
  605_(C-STRM)         STORAGE         101.09      5.63        0.0
  606_(C-STRM)         STORAGE         101.24      5.75        0.0
  619_(C-STRM)         STORAGE         101.38      5.14        0.0
  622_(C-STRM)         STORAGE         101.53      4.49        0.0
  626_(C-STRM)         STORAGE         103.94      3.33        0.0
  627_(C-STRM)         STORAGE         103.13      3.58        0.0
  629_(C-STRM)         STORAGE         101.65      4.46        0.0
  630_(C-STRM)         STORAGE         102.08      4.12        0.0
  630A_(C-STRM)        STORAGE         102.12      3.90        0.0
  631_(C-STRM)         STORAGE         106.00      0.50        0.0
  645_(C-STRM)         STORAGE         102.03      3.69        0.0
  647_(C-STRM)         STORAGE         102.14      3.40        0.0
  650_(C-STRM)         STORAGE         102.22      3.19        0.0
  651_(C-STRM)         STORAGE         102.31      3.03        0.0
  682_(C-STRM)         STORAGE         105.40      0.50        0.0
  MTD_(C-STRM)         STORAGE         100.37      3.19        0.0
  OVERFLOW_(C-STRM)    STORAGE         100.18      2.76        0.0
  POND_(C-STRM)        STORAGE          98.45      2.65        0.0    Yes
  S_525-MTD            STORAGE         103.30      0.50        0.0
  S_528-525            STORAGE         103.41      0.50        0.0
  S_532-528            STORAGE         103.50      0.50        0.0
  S_536-532            STORAGE         103.60      0.50        0.0
  S_540-536            STORAGE         103.71      0.50        0.0
  S_541-540            STORAGE         103.81      0.50        0.0
  S_604-603            STORAGE         105.50      0.50        0.0
  S_605-604            STORAGE         106.71      0.50        0.0
  S_619-606            STORAGE         106.50      0.50        0.0
  S_622-619            STORAGE         105.70      0.50        0.0
  S_622-619_2          STORAGE         106.50      0.50        0.0
  S_627-630            STORAGE         106.70      0.50        0.0
  S_629-622            STORAGE         106.01      0.50        0.0
  SU2                  STORAGE         106.75      0.50        0.0
  SU5                  STORAGE         104.18      0.50        0.0


  ************
  Link Summary
  ************
  Name            From Node        To Node          Type          Length    %Slope
Roughness
  ---------------------------------------------------------------------------------
-
  BDR-C1          EXD_15           EXD_16           CONDUIT         17.7    0.3844
0.0250
  BDR-C2          EXD_20           EXD_21           CONDUIT          7.9    0.0632
0.0130
  BDR-C3          EXD_25           EXD_26           CONDUIT         14.2    0.2683
0.0130
  BDR-C4          EXD_12           EXD_27           CONDUIT         23.0    0.6077
0.0130
  C1_1            J32              J26              CONDUIT         71.8    0.4181
0.0130
  C1_17           J6               EXD_1            CONDUIT        171.9    2.4608
0.0130
  C1_3            J28              J29              CONDUIT        183.6    0.1090
0.0130
  C1_30           J26              J25              CONDUIT         93.1    0.4296
0.0130
  C1_4            J25              J39              CONDUIT         75.0    0.9329
0.0130
  C14_1           J20              J19              CONDUIT         59.0    0.0847
0.0130
  C14_2           J23              J22              CONDUIT         73.9    0.4062
0.0130
  C14_4           J22              J21              CONDUIT         77.3    0.1941
0.0130
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C14_5	J21	J20	CONDUIT	51.8	0.1931
0.0130					
C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61

C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-100_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-101_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-102_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-103_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-104_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-105_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-20_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-21_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-22_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
4.45							
C-STRM-22_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
C-STRM-26_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.34							
C-STRM-26_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR				0.60	0.28	0.15	0.60
0.25							
C-STRM-35_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-4_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
C-STRM-4_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-49_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-50_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-51_(C-STRM) CIRCULAR			0.90	0.64	0.23	0.90	1
C-STRM-52_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-53_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-57_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-62_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-63_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-64_(C-STRM) CIRCULAR			0.38	0.11	0.09	0.38	1
C-STRM-74_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-75_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-76_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-77_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-78_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-79_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
6.30							
C-STRM-79_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-8_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
C-STRM-8_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-80_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-81_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-82_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-83_(1)_(C-STRM) CIRCULAR				1.50	1.77	0.38	1.50
2.74							
C-STRM-84_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
CVR-C2	CIRCULAR		0.45	0.16	0.11	0.45	1
CVR-C3	CIRCULAR		0.40	0.13	0.10	0.40	1
CVR-C4	CIRCULAR		1.20	1.13	0.30	1.20	1
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR				0.90	0.64	0.23	0.90
0.96							
W1	Pond_SpillWay		3.89	318.30	4.06	128.79	1

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Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4738	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4985	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8861	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807

0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929
0.4178	0.4430	0.4687	0.4947	0.5212
0.5482	0.5760	0.6046	0.6335	0.6626
0.6921	0.7218	0.7518	0.7820	0.8133
0.8461	0.8801	0.9163	0.9564	1.0000

Hrad:

0.0226	0.0600	0.0982	0.1332	0.1659
0.1974	0.2291	0.2613	0.2925	0.3228
0.3524	0.3813	0.4096	0.4373	0.4557
0.4729	0.4908	0.5133	0.5388	0.5667
0.5954	0.6238	0.6186	0.5790	0.5404
0.5828	0.6246	0.6659	0.7067	0.7469
0.7867	0.8189	0.8502	0.8811	0.9116
0.9331	0.9497	0.9763	1.0109	1.0452
1.0791	1.1126	1.1458	1.1787	1.1574
1.1642	1.1570	1.1256	1.0602	1.0000

Width:

0.0656	0.0958	0.1094	0.1231	0.1368
0.1501	0.1622	0.1729	0.1837	0.1944
0.2052	0.2159	0.2267	0.2377	0.2539
0.2715	0.2891	0.3043	0.3175	0.3291
0.3399	0.3507	0.3819	0.4435	0.5186
0.5219	0.5251	0.5284	0.5317	0.5350
0.5382	0.5468	0.5558	0.5647	0.5737
0.5886	0.6068	0.6185	0.6243	0.6301
0.6359	0.6417	0.6475	0.6534	0.6932
0.7170	0.7512	0.8061	0.8978	1.0000

Transect Barnsdale_UPST7

Area:

0.0031	0.0077	0.0135	0.0206	0.0292
0.0385	0.0485	0.0590	0.0699	0.0811
0.0928	0.1047	0.1170	0.1297	0.1427
0.1561	0.1700	0.1843	0.1992	0.2145
0.2304	0.2467	0.2636	0.2810	0.3005
0.3224	0.3464	0.3708	0.3955	0.4204
0.4456	0.4710	0.4972	0.5239	0.5510
0.5784	0.6060	0.6340	0.6622	0.6907
0.7195	0.7487	0.7782	0.8081	0.8383
0.8691	0.9003	0.9322	0.9647	1.0000

Hrad:

0.0323	0.0624	0.0905	0.1084	0.1375
0.1686	0.1997	0.2314	0.2650	0.2977
0.3296	0.3608	0.3913	0.4212	0.4493
0.4751	0.5005	0.5247	0.5476	0.5703
0.5929	0.6154	0.6378	0.6601	0.5891
0.5938	0.5928	0.6266	0.6599	0.6927
0.7252	0.7501	0.7705	0.7948	0.8255
0.8559	0.8860	0.9157	0.9452	0.9727
1.0000	1.0270	1.0538	1.0784	1.1003
1.1221	1.1420	1.1557	1.1624	1.0000

Width:

0.0999	0.1304	0.1570	0.1994	0.2229
0.2396	0.2541	0.2664	0.2751	0.2837
0.2923	0.3010	0.3096	0.3183	0.3279
0.3390	0.3501	0.3618	0.3745	0.3872
0.3998	0.4124	0.4251	0.4377	0.5266
0.5610	0.6032	0.6092	0.6153	0.6213
0.6274	0.6399	0.6563	0.6692	0.6761
0.6830	0.6899	0.6967	0.7036	0.7118
0.7199	0.7281	0.7362	0.7458	0.7573
0.7688	0.7817	0.7991	0.8220	1.0000

Transect GBR

Area:

0.0002	0.0008	0.0018	0.0032	0.0051
0.0073	0.0099	0.0130	0.0164	0.0203
0.0245	0.0292	0.0343	0.0401	0.0532
0.0756	0.1002	0.1249	0.1496	0.1742
0.1989	0.2235	0.2482	0.2729	0.2975
0.3222	0.3468	0.3715	0.3962	0.4209
0.4460	0.4715	0.4974	0.5237	0.5505
0.5776	0.6051	0.6331	0.6614	0.6902
0.7193	0.7489	0.7789	0.8092	0.8400
0.8712	0.9028	0.9348	0.9672	1.0000

Hrad:

0.0148	0.0296	0.0444	0.0592	0.0741
0.0889	0.1037	0.1185	0.1333	0.1481
0.1629	0.1777	0.1925	0.1451	0.0889
0.0921	0.1222	0.1522	0.1821	0.2121
0.2420	0.2720	0.3019	0.3318	0.3616
0.3915	0.4213	0.4809	0.5106	0.5403
0.5398	0.5684	0.5963	0.6237	0.6505
0.6768	0.7026	0.7280	0.7529	0.7773
0.8013	0.8249	0.8480	0.8708	0.8932
0.9153	0.9369	0.9583	0.9793	1.0000

Width:

0.0123	0.0246	0.0369	0.0492	0.0614
0.0737	0.0860	0.0983	0.1106	0.1229
0.1352	0.1475	0.1598	0.2496	0.5446
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7542
0.7665	0.7788	0.7911	0.8034	0.8157
0.8280	0.8402	0.8525	0.8648	0.8771
0.8894	0.9017	0.9140	0.9263	0.9386
0.9508	0.9631	0.9754	0.9877	1.0000

Transect Pond_SpillWay

Area:

0.0040	0.0088	0.0142	0.0204	0.0274
0.0350	0.0434	0.0524	0.0622	0.0728
0.0840	0.0960	0.1087	0.1221	0.1362
0.1511	0.1666	0.1829	0.2000	0.2177
0.2362	0.2554	0.2753	0.2959	0.3173
0.3393	0.3621	0.3856	0.4099	0.4348
0.4600	0.4855	0.5113	0.5375	0.5640
0.5908	0.6180	0.6454	0.6732	0.7013
0.7297	0.7585	0.7875	0.8169	0.8466
0.8767	0.9070	0.9377	0.9687	1.0000

Hrad:

0.0187	0.0367	0.0543	0.0716	0.0888
0.1059	0.1230	0.1400	0.1570	0.1740
0.1910	0.2080	0.2251	0.2421	0.2592
0.2763	0.2935	0.3106	0.3278	0.3450
0.3622	0.3795	0.3967	0.4140	0.4313
0.4486	0.4660	0.4833	0.5007	0.5241
0.5500	0.5758	0.6013	0.6266	0.6517
0.6766	0.7013	0.7257	0.7498	0.7737
0.7974	0.8209	0.8441	0.8670	0.8898
0.9123	0.9345	0.9566	0.9784	1.0000

Width:

0.1394	0.1623	0.1853	0.2082	0.2311
0.2541	0.2770	0.2999	0.3229	0.3458
0.3687	0.3917	0.4146	0.4375	0.4605
0.4834	0.5063	0.5293	0.5522	0.5751
0.5981	0.6210	0.6439	0.6669	0.6898
0.7127	0.7357	0.7586	0.7815	0.7956
0.8059	0.8161	0.8263	0.8365	0.8467
0.8569	0.8672	0.8774	0.8876	0.8978
0.9080	0.9183	0.9285	0.9387	0.9489
0.9591	0.9693	0.9796	0.9898	1.0000

Transect ROW_14m

Area:

0.0004	0.0017	0.0038	0.0067	0.0104
0.0150	0.0204	0.0267	0.0338	0.0417
0.0504	0.0600	0.0704	0.0817	0.0938
0.1067	0.1204	0.1350	0.1504	0.1667
0.1838	0.2017	0.2204	0.2400	0.2605
0.2817	0.3038	0.3267	0.3502	0.3738
0.3973	0.4209	0.4446	0.4692	0.4952
0.5225	0.5510	0.5808	0.6118	0.6439
0.6767	0.7100	0.7440	0.7787	0.8140
0.8499	0.8865	0.9237	0.9615	1.0000

Hrad:

0.0169	0.0338	0.0507	0.0677	0.0846
0.1015	0.1184	0.1353	0.1522	0.1692
0.1861	0.2030	0.2199	0.2368	0.2537
0.2707	0.2876	0.3045	0.3214	0.3383
0.3552	0.3722	0.3891	0.4060	0.4229
0.4398	0.4567	0.4736	0.5027	0.5359
0.5691	0.6022	0.6353	0.6667	0.6957
0.7226	0.7474	0.7704	0.7918	0.8123
0.8326	0.8526	0.8721	0.8914	0.9103
0.9289	0.9471	0.9651	0.9827	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6200	0.6529	0.6857
0.7186	0.7514	0.7843	0.8171	0.8357
0.8521	0.8686	0.8850	0.9014	0.9179
0.9343	0.9507	0.9671	0.9836	1.0000

Transect ROW_14m_Mountable

Area:

0.0003	0.0012	0.0028	0.0049	0.0077
0.0111	0.0151	0.0197	0.0249	0.0307
0.0372	0.0442	0.0519	0.0602	0.0691
0.0787	0.0888	0.0996	0.1109	0.1229
0.1355	0.1487	0.1625	0.1770	0.1923
0.2092	0.2277	0.2477	0.2693	0.2924
0.3170	0.3433	0.3711	0.4004	0.4310
0.4626	0.4954	0.5293	0.5642	0.6002
0.6373	0.6755	0.7144	0.7538	0.7936
0.8340	0.8748	0.9160	0.9578	1.0000

Hrad:

0.0222	0.0445	0.0667	0.0889	0.1111
0.1334	0.1556	0.1778	0.2001	0.2223
0.2445	0.2667	0.2890	0.3112	0.3334
0.3556	0.3779	0.4001	0.4223	0.4446
0.4668	0.4890	0.5112	0.5335	0.5550
0.5833	0.5891	0.6029	0.6151	0.6263
0.6367	0.6465	0.6559	0.6653	0.6759
0.6872	0.6992	0.7116	0.7245	0.7378
0.7514	0.7663	0.7966	0.8266	0.8563
0.8856	0.9147	0.9434	0.9719	1.0000

Width:

0.0145	0.0290	0.0434	0.0579	0.0724
0.0869	0.1013	0.1158	0.1303	0.1448
0.1593	0.1737	0.1882	0.2027	0.2172
0.2316	0.2461	0.2606	0.2751	0.2896
0.3040	0.3185	0.3330	0.3475	0.3798
0.4164	0.4530	0.4897	0.5263	0.5629
0.5995	0.6362	0.6728	0.7080	0.7335
0.7591	0.7846	0.8102	0.8357	0.8613
0.8868	0.9114	0.9225	0.9336	0.9446
0.9557	0.9668	0.9779	0.9889	1.0000

Transect ROW_14m_PH3

Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0153	0.0209	0.0273	0.0345	0.0426
0.0516	0.0614	0.0721	0.0836	0.0959
0.1091	0.1229	0.1381	0.1539	0.1705
0.1880	0.2064	0.2255	0.2456	0.2665
0.2882	0.3108	0.3343	0.3583	0.3824
0.4065	0.4306	0.4548	0.4797	0.5055
0.5322	0.5598	0.5883	0.6176	0.6479
0.6791	0.7112	0.7441	0.7780	0.8127
0.8484	0.8850	0.9224	0.9608	1.0000

Hrad:

0.0166	0.0332	0.0498	0.0664	0.0830
0.0997	0.1163	0.1329	0.1495	0.1661
0.1827	0.1993	0.2159	0.2325	0.2491
0.2657	0.2823	0.2990	0.3156	0.3322
0.3488	0.3654	0.3820	0.3986	0.4152
0.4318	0.4484	0.4650	0.4935	0.5262
0.5588	0.5913	0.6238	0.6553	0.6853
0.7137	0.7407	0.7664	0.7909	0.8143
0.8366	0.8579	0.8783	0.8979	0.9166
0.9346	0.9519	0.9685	0.9845	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6160	0.6386	0.6612
0.6838	0.7063	0.7289	0.7515	0.7741
0.7967	0.8193	0.8419	0.8645	0.8871
0.9096	0.9322	0.9548	0.9774	1.0000

Transect ROW_14m-MB_1

Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0407	0.0484	0.0568	0.0659	0.0757
0.0861	0.0972	0.1089	0.1214	0.1345
0.1483	0.1631	0.1791	0.1963	0.2146
0.2342	0.2549	0.2768	0.2999	0.3242
0.3497	0.3764	0.4043	0.4333	0.4635
0.4949	0.5273	0.5601	0.5935	0.6274
0.6618	0.6967	0.7326	0.7693	0.8064
0.8441	0.8823	0.9210	0.9603	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0792	0.0990
0.1188	0.1386	0.1584	0.1782	0.1980
0.2178	0.2376	0.2574	0.2772	0.2971
0.3169	0.3367	0.3565	0.3763	0.3961
0.4159	0.4347	0.4520	0.4681	0.4834
0.4979	0.5119	0.5256	0.5389	0.5521
0.5650	0.5779	0.5907	0.6035	0.6162
0.6289	0.6560	0.6844	0.7123	0.7397
0.7667	0.7933	0.8190	0.8459	0.8726
0.8988	0.9247	0.9501	0.9752	1.0000

Width:

0.0168	0.0336	0.0504	0.0673	0.0841
0.1009	0.1177	0.1345	0.1513	0.1681
0.1849	0.2018	0.2186	0.2354	0.2522
0.2690	0.2858	0.3026	0.3195	0.3363
0.3552	0.3849	0.4146	0.4442	0.4739
0.5036	0.5332	0.5629	0.5926	0.6223
0.6519	0.6816	0.7113	0.7409	0.7706
0.8003	0.8150	0.8279	0.8407	0.8536
0.8664	0.8836	0.9093	0.9229	0.9357
0.9486	0.9614	0.9743	0.9871	1.0000

Transect ROW_16.5m_Mountable

Area:

0.0003	0.0012	0.0027	0.0048	0.0074
0.0107	0.0145	0.0190	0.0240	0.0297
0.0359	0.0428	0.0502	0.0582	0.0668
0.0760	0.0858	0.0962	0.1072	0.1188
0.1309	0.1437	0.1571	0.1710	0.1856
0.2012	0.2183	0.2369	0.2570	0.2786
0.3037	0.3263	0.3524	0.3800	0.4091
0.4397	0.4719	0.5055	0.5406	0.5772
0.6153	0.6544	0.6944	0.7354	0.7772
0.8199	0.8636	0.9082	0.9536	1.0000

Hrad:

0.0233	0.0465	0.0698	0.0931	0.1163
0.1396	0.1628	0.1861	0.2094	0.2326
0.2559	0.2792	0.3024	0.3257	0.3489
0.3722	0.3955	0.4187	0.4420	0.4653
0.4885	0.5118	0.5350	0.5583	0.5816
0.6036	0.6224	0.6386	0.6529	0.6657
0.6773	0.6882	0.6985	0.7084	0.7180
0.7275	0.7370	0.7464	0.7559	0.7655
0.7817	0.8084	0.8343	0.8597	0.8844
0.9085	0.9321	0.9552	0.9779	1.0000

Width:

0.0127	0.0254	0.0380	0.0507	0.0634
0.0761	0.0888	0.1014	0.1141	0.1268
0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5621	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0999	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8831	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058

0.2265 0.2480 0.2700 0.2929 0.3171
0.3426 0.3694 0.3976 0.4272 0.4579
0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023
0.8405 0.8794 0.9189 0.9591 1.0000

Hrad:
0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000

Width:
0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking
Area:
0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000

Hrad:
0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000

Width:
0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m
Area:
0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000

Hrad:
0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000

Width:
0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1
Area:
0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2715 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7086 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000

Hrad:
0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000

Width:
0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2
Area:
0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000

Hrad:
0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000

Width:
0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3
Area:
0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1211 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000

Hrad:
0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2047 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4018 0.4273 0.4351 0.4545
0.4946 0.5339 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8590 0.8716 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1067 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000

Width:
0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5931 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4
Area:
0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0302 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000

Hrad:
0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4302 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6869 0.6742 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000

Width:
0.0541 0.0732 0.0923 0.1110 0.1246
0.1374 0.1502 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5444 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6548 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5
Area:
0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2625 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000

Hrad:
0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3739 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6771 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8746 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000

Width:
0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6
Area:
0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2153 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000

Hrad:
0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000

Width:
0.0616 0.0785 0.0947 0.1108 0.1267

0.1418	0.1569	0.1666	0.1758	0.1850
0.1952	0.2062	0.2171	0.2280	0.2365
0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/02/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	5.990	71.708
Evaporation Loss	0.000	0.000
Infiltration Loss	1.965	23.522
Surface Runoff	3.943	47.200
Final Storage	0.087	1.037
Continuity Error (%)	-0.071	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.943	39.426
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.035	0.345
External Outflow	3.084	30.841
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.110	1.099
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.784	7.843
Continuity Error (%)	-0.030	

****
Highest Continuity Errors
****
Node J36 (3.33%)
Node 514_(C-STRM) (2.56%)
Node J19 (-2.53%)
Node J59 (2.18%)
Node J46 (-1.84%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL16 (7)
Link OL12 (7)
Link OL9 (6)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****
Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.95 %
0.871 - 0.758 sec	:	0.01 %
0.758 - 0.660 sec	:	0.01 %
0.660 - 0.574 sec	:	0.01 %
0.574 - 0.500 sec	:	0.02 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	71.71	0.00	0.00	57.62	13.30	2.11	12.75	0.44	0.16	0.178
A18	71.71	0.00	0.00	28.35	27.48	20.83	42.81	0.25	0.21	0.597
A19	71.71	0.00	0.00	37.38	15.68	21.47	34.02	0.38	0.24	0.474
A20	71.71	0.00	0.00	59.80	5.88	5.96	10.66	0.52	0.17	0.149
NULL3	71.71	0.00	0.00	8.63	58.53	15.06	61.88	0.35	0.27	0.863
S1	71.71	0.00	0.00	18.21	46.61	38.56	52.54	3.43	2.96	0.733
S1_1	71.71	0.00	0.00	13.82	50.18	16.75	56.90	0.07	0.06	0.793
S1_2	71.71	0.00	0.00	13.80	50.18	16.77	56.92	0.07	0.06	0.794
S1_4	71.71	0.00	0.00	13.83	50.18	16.73	56.87	0.11	0.09	0.793
S1_5	71.71	0.00	0.00	13.82	50.18	16.75	56.83	0.06	0.05	0.793
S10_1	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.95	0.82	0.719
S10_2	71.71	0.00	0.00	19.20	45.14	38.04	51.58	1.10	0.95	0.719
S10_4	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.37	0.32	0.719
S10_5	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.65	0.56	0.719
S11	71.71	0.00	0.00	50.90	0.00	20.81	20.81	0.69	0.25	0.290
S12	71.71	0.00	0.00	13.84	50.18	16.72	56.87	0.25	0.21	0.793
S14_1	71.71	0.00	0.00	13.86	50.18	16.69	56.84	0.34	0.29	0.793
S14_3	71.71	0.00	0.00	13.95	50.16	16.60	56.73	0.60	0.50	0.791
S14_4	71.71	0.00	0.00	13.87	50.18	16.69	56.83	0.17	0.14	0.792
S14_5	71.71	0.00	0.00	13.93	50.17	16.62	56.75	0.96	0.80	0.791
S14_6	71.71	0.00	0.00	13.88	50.17	16.67	56.81	0.16	0.14	0.792
S14_7	71.71	0.00	0.00	13.90	50.17	16.65	56.79	0.67	0.56	0.792
S14_8	71.71	0.00	0.00	13.89	50.17	16.66	56.80	0.19	0.16	0.792
S15	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.84	0.73	0.719
S16	71.71	0.00	0.00	0.00	69.98	0.00	69.98	1.03	0.32	0.976
S17	71.71	0.00	0.00	60.22	2.34	11.44	11.44	0.72	0.14	0.160
S18_2	71.71	0.00	0.00	19.20	45.14	38.04	51.58	1.73	1.49	0.719
S18_3	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.85	0.74	0.719
S18_4	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.45	0.39	0.719
S18_5	71.71	0.00	0.00	15.74	50.15	39.88	54.93	1.01	0.86	0.766
S18_6	71.71	0.00	0.00	19.20	45.14	38.04	51.58	0.43	0.37	0.719
S19	71.71	0.00	0.00	13.92	50.17	16.63	56.76	0.60	0.50	0.792
S2	71.71	0.00	0.00	17.97	46.95	38.68	52.77	1.96	1.69	0.736
S20_1	71.71	0.00	0.00	13.82	50.18	16.74	56.89	0.28	0.24	0.793
S20_2	71.71	0.00	0.00	13.77	50.17	16.80	56.94	0.13	0.11	0.794
S3	71.71	0.00	0.00	19.20	45.14	38.04	51.58	1.28	1.10	0.719
S32	71.71	0.00	0.00	13.84	50.18	16.73	56.87	0.24	0.20	0.793
S36	71.71	0.00	0.00	0.00	69.99	0.00	69.99	1.27	0.40	0.976
S4	71.71	0.00	0.00	6.81	60.13	3.44	63.57	8.40	5.26	0.886
S5	71.71	0.00	0.00	6.46	60.15	3.79	63.93	2.04	1.44	0.892
S6	71.71	0.00	0.00	19.95	40.14	18.86	50.97	0.17	0.16	0.711
S7	71.71	0.00	0.00	6.53	60.14	3.71	63.85	2.54	1.76	0.890
S8	71.71	0.00	0.00	35.79	25.07	35.39	35.39	0.68	0.27	0.494

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.19	104.58	0 01:10	0.19
EXD_10	JUNCTION	0.05	0.40	99.05	0 01:26	0.40
EXD_11	JUNCTION	0.04	0.29	98.79	0 01:26	0.29
EXD_12	JUNCTION	0.05	0.42	98.73	0 01:26	0.42
EXD_13	JUNCTION	0.01	0.20	104.52	0 01:11	0.20
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.03	0.42	100.69	0 01:10	0.42
EXD_16	JUNCTION	0.02	0.18	100.39	0 01:11	0.18
EXD_17	JUNCTION	0.02	0.19	100.08	0 01:10	0.19
EXD_18	JUNCTION	0.02	0.20	99.60	0 01:19	0.20
EXD_19	JUNCTION	0.04	0.40	99.59	0 01:20	0.40
EXD_2	JUNCTION	0.02	0.30	103.77	0 01:13	0.30
EXD_20	JUNCTION	0.04	0.41	99.59	0 01:19	0.41
EXD_21	JUNCTION	0.03	0.30	99.48	0 01:20	0.30
EXD_22	JUNCTION	0.02	0.19	99.34	0 01:21	0.19
EXD_23	JUNCTION	0.04	0.30	99.05	0 01:27	0.30
EXD_24	JUNCTION	0.02	0.26	98.93	0 01:26	0.26
EXD_25	JUNCTION	0.04	0.40	98.92	0 01:26	0.40
EXD_26	JUNCTION	0.02	0.20	98.68	0 01:31	0.20
EXD_27	JUNCTION	0.05	0.35	98.52	0 01:27	0.35
EXD_3	JUNCTION	0.01	0.16	103.35	0 01:14	0.16
EXD_4	JUNCTION	0.01	0.16	102.80	0 01:15	0.16
EXD_5	JUNCTION	0.01	0.26	102.75	0 01:15	0.26
EXD_6	JUNCTION	0.01	0.15	102.47	0 01:16	0.15
EXD_7	JUNCTION	0.01	0.19	101.68	0 01:20	0.19
EXD_8	JUNCTION	0.03	0.36	100.85	0 01:24	0.36
EXD_9	JUNCTION	0.02	0.18	100.56	0 01:28	0.18
J10	JUNCTION	0.00	0.14	103.74	0 01:12	0.14
J11	JUNCTION	0.00	0.17	103.67	0 01:13	0.17
J12	JUNCTION	0.00	0.19	103.59	0 01:13	0.19
J13	JUNCTION	0.01	0.23	103.53	0 01:17	0.23
J17	JUNCTION	0.01	0.19	104.56	0 01:10	0.19
J19	JUNCTION	0.00	0.12	105.52	0 01:10	0.12
J20	JUNCTION	0.00	0.09	105.54	0 01:10	0.09
J21	JUNCTION	0.00	0.07	105.62	0 01:10	0.07
J22	JUNCTION	0.00	0.06	105.76	0 01:19	0.06
J23	JUNCTION	0.00	0.07	106.07	0 01:15	0.07
J24	JUNCTION	0.00	0.06	106.26	0 01:13	0.06
J25	JUNCTION	0.00	0.18	105.48	0 01:15	0.18
J26	JUNCTION	0.01	0.20	105.90	0 01:14	0.20
J28	JUNCTION	0.00	0.11	109.11	0 01:10	0.11
J29	JUNCTION	0.00	0.16	108.96	0 01:11	0.16
J32	JUNCTION	0.00	0.18	106.18	0 01:14	0.18
J36	JUNCTION	0.00	0.13	104.83	0 01:17	0.13
J39	JUNCTION	0.01	0.23	104.83	0 01:15	0.23
J40	JUNCTION	0.00	0.23	104.68	0 01:15	0.23
J41	JUNCTION	0.00	0.28	103.48	0 01:17	0.28
J43	JUNCTION	0.00	0.18	104.38	0 01:16	0.18
J44	JUNCTION	0.00	0.12	104.62	0 01:15	0.12
J46	JUNCTION	0.00	0.09	104.69	0 01:10	0.09
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.11	105.86	0 01:15	0.11
J51	JUNCTION	0.00	0.12	106.87	0 01:14	0.12
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.04	108.51	0 01:11	0.04
J58	JUNCTION	0.00	0.11	108.51	0 01:11	0.11
J59	JUNCTION	0.00	0.11	108.11	0 01:13	0.11
J6	JUNCTION	0.00	0.06	109.89	0 01:10	0.06
J61	JUNCTION	0.00	0.10	107.10	0 01:10	0.10
J62	JUNCTION	0.00	0.13	106.63	0 01:12	0.13
J74	JUNCTION	0.42	0.99	99.44	0 01:30	0.99
J9	JUNCTION	0.00	0.12	103.82	0 01:12	0.12
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.04	0.31	98.31	0 01:27	0.31
ST4_108A_(P-Stm)	OUTFALL	0.21	1.41	99.42	0 01:30	1.41
500_(C-STRM)	STORAGE	0.32	0.51	100.82	0 02:44	0.51
500A_(C-STRM)	STORAGE	0.34	0.96	101.06	0 01:19	0.96

502_(C-STRM)	STORAGE	0.12	1.67	102.21	0	01:23	1.67	0.049
503_(C-STRM)	STORAGE	0.11	1.78	102.36	0	01:23	1.77	0.049
504_(C-STRM)	STORAGE	0.34	1.31	104.35	0	01:29	1.31	2.467
505_(C-STRM)	STORAGE	0.34	1.48	104.93	0	01:26	1.47	2.467
506_(C-STRM)	STORAGE	0.34	1.65	105.47	0	01:26	1.64	1.365
507_(C-STRM)	STORAGE	0.34	1.68	105.82	0	01:26	1.67	1.365
508_(C-STRM)	STORAGE	0.34	1.80	106.17	0	01:26	1.80	0.636
509_(C-STRM)	STORAGE	0.34	1.93	106.52	0	01:27	1.92	0.636
510_(C-STRM)	STORAGE	0.34	1.95	106.80	0	01:27	1.95	0.266
511_(C-STRM)	STORAGE	0.34	1.96	106.88	0	01:27	1.96	0.266
512_(C-STRM)	STORAGE	0.34	1.94	107.05	0	01:26	1.94	1.029
513_(C-STRM)	STORAGE	0.34	1.93	107.17	0	01:26	1.91	1.029
514_(C-STRM)	STORAGE	0.31	1.59	107.18	0	01:27	1.59	1.315
515_(C-STRM)	STORAGE	0.30	1.33	107.19	0	01:27	1.32	1.315
516_(C-STRM)	STORAGE	0.34	1.93	107.39	0	01:26	1.93	0.374
517_(C-STRM)	STORAGE	0.34	2.01	107.63	0	01:25	2.01	0.374
518_(C-STRM)	STORAGE	0.35	2.18	108.03	0	01:22	2.17	0.106
519_(C-STRM)	STORAGE	0.33	1.97	108.04	0	01:21	1.96	0.106
520_(C-STRM)	STORAGE	0.33	1.83	108.17	0	01:21	1.82	3.105
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	01:16	0.61	3.105
525_(C-STRM)	STORAGE	0.10	1.71	102.32	0	01:24	1.71	0.113
528_(C-STRM)	STORAGE	0.08	1.85	102.58	0	01:24	1.85	0.113
532_(C-STRM)	STORAGE	0.07	1.91	102.73	0	01:25	1.91	0.025
536_(C-STRM)	STORAGE	0.07	1.90	102.88	0	01:26	1.90	0.025
540_(C-STRM)	STORAGE	0.36	2.14	103.00	0	01:26	2.14	3.445
541_(C-STRM)	STORAGE	0.36	2.13	103.06	0	01:26	2.13	3.445
551_(C-STRM)	STORAGE	0.35	1.71	102.36	0	01:22	1.71	0.295
552_(C-STRM)	STORAGE	0.34	1.66	102.40	0	01:22	1.66	0.295
553_(C-STRM)	STORAGE	0.34	1.58	102.51	0	01:22	1.58	0.154
554_(C-STRM)	STORAGE	0.33	1.54	102.59	0	01:21	1.54	0.154
555_(C-STRM)	STORAGE	0.33	1.51	102.76	0	01:21	1.50	0.092
556_(C-STRM)	STORAGE	0.33	1.57	102.94	0	01:21	1.56	0.092
601_(C-STRM)	STORAGE	0.13	1.21	101.66	0	01:25	1.21	0.021
602_(C-STRM)	STORAGE	0.13	1.73	102.25	0	01:25	1.73	0.021
603_(C-STRM)	STORAGE	0.11	1.77	102.40	0	01:25	1.77	0.273
604_(C-STRM)	STORAGE	0.10	1.91	102.78	0	01:25	1.91	0.273
605_(C-STRM)	STORAGE	0.10	1.86	102.95	0	01:25	1.86	1.807
606_(C-STRM)	STORAGE	0.11	1.95	103.19	0	01:25	1.95	1.807
619_(C-STRM)	STORAGE	0.11	2.05	103.43	0	01:25	2.05	0.000 ltr
622_(C-STRM)	STORAGE	0.10	2.00	103.52	0	01:25	2.00	0.096
626_(C-STRM)	STORAGE	0.30	0.52	104.47	0	01:46	0.52	0.096
627_(C-STRM)	STORAGE	0.31	0.94	104.07	0	01:26	0.94	0.995
629_(C-STRM)	STORAGE	0.10	1.95	103.60	0	01:25	1.95	0.995
630_(C-STRM)	STORAGE	0.10	1.71	103.78	0	01:25	1.71	0.000 ltr
630A_(C-STRM)	STORAGE	0.10	1.72	103.84	0	01:25	1.72	0.000 ltr
631_(C-STRM)	STORAGE	0.00	0.26	106.26	0	01:18	0.26	0.000 ltr
645_(C-STRM)	STORAGE	0.37	2.01	104.04	0	01:22	2.01	0.000 ltr
647_(C-STRM)	STORAGE	0.37	2.03	104.17	0	01:22	2.03	0.000 ltr
650_(C-STRM)	STORAGE	0.37	2.04	104.27	0	01:21	2.04	0.000 ltr
651_(C-STRM)	STORAGE	0.36	2.04	104.35	0	01:21	2.03	0.000 ltr
682_(C-STRM)	STORAGE	0.01	0.32	105.72	0	01:17	0.32	20.426
MTD_(C-STRM)	STORAGE	0.20	1.56	101.93	0	01:23	1.56	0.473
OVERFLOW_(C-STRM)	STORAGE	0.29	0.93	101.11	0	01:20	0.93	0.473
POND_(C-STRM)	STORAGE	1.83	2.35	101.80	0	03:09	2.35	2.224
S_525-MTD	STORAGE	0.00	0.23	103.53	0	01:17	0.23	2.224
S_528-525	STORAGE	0.00	0.19	103.59	0	01:14	0.19	0.131
S_532-528	STORAGE	0.00	0.17	103.67	0	01:13	0.17	0.131
S_536-532	STORAGE	0.00	0.25	103.85	0	01:11	0.25	1.615
S_540-536	STORAGE	0.00	0.21	103.92	0	01:11	0.21	1.615
S_541-540	STORAGE	0.00	0.20	104.02	0	01:13	0.20	0.502
S_604-603	STORAGE	0.00	0.18	105.08	0	01:13	0.18	0.502
S_605-604	STORAGE	0.00	0.22	106.94	0	01:15	0.22	0.037
S_619-606	STORAGE	0.00	0.23	106.73	0	01:11	0.23	0.037
S_622-619	STORAGE	0.01	0.23	105.93	0	01:15	0.23	0.003
S_622-619_2	STORAGE	0.00	0.24	106.74	0	01:12	0.24	0.003
S_627-630	STORAGE	0.00	0.15	106.85	0	01:11	0.15	0.036
S_629-622	STORAGE	0.00	0.18	106.19	0	01:13	0.18	0.003
SU2	STORAGE	0.01	0.15	106.90	0	01:42	0.15	0.124
SU5	STORAGE	0.00	0.18	104.36	0	01:30	0.18	0.029
								0.226
								0.233
								0.000
								0.012
								0.036
								0.029
								0.072
								0.287
								2.624
								7.422
								0.852
								0.072
								0.448
								1.511
								1.252
								0.022
								0.065
								0.008
								0.117
								0.054
								0.004
								0.033
								0.395
								0.464
								0.330
								0.879
								0.213
								0.306
								0.038
								0.001

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Balance Error Percent
EXD_1	JUNCTION	0.000	0.203	0	01:10	0	0.248	- 0.044
EXD_10	JUNCTION	0.725	0.738	0	01:24	2.3	3.25	- 0.343
EXD_11	JUNCTION	0.000	0.727	0	01:26	0	3.26	0.007
EXD_12	JUNCTION	0.160	0.808	0	01:25	0.442	3.7	0.001
EXD_13	JUNCTION	0.000	0.199	0	01:10	0	0.248	- 0.273
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.167	0.167	0	01:10	0.515	0.515	- 0.002
EXD_16	JUNCTION	0.000	0.115	0	01:10	0	0.515	- 0.071
EXD_17	JUNCTION	0.000	0.114	0	01:11	0	0.516	- 0.119
EXD_18	JUNCTION	0.000	0.126	0	01:12	0	0.516	0.337
EXD_19	JUNCTION	0.000	0.108	0	01:14	0	0.538	- 0.097
EXD_2	JUNCTION	0.000	0.192	0	01:11	0	0.248	0.328
EXD_20	JUNCTION	0.237	0.237	0	01:10	0.376	0.915	- 0.008
EXD_21	JUNCTION	0.000	0.231	0	01:19	0	0.891	- 0.040
EXD_22	JUNCTION	0.000	0.230	0	01:20	0	0.892	- 0.183
EXD_23	JUNCTION	0.000	0.229	0	01:21	0	0.893	0.329
EXD_24	JUNCTION	0.000	0.225	0	01:28	0	0.902	0.136
EXD_25	JUNCTION	0.210	0.275	0	01:26	0.254	1.15	- 0.068
EXD_26	JUNCTION	0.000	0.336	0	01:27	0	1.14	0.089
EXD_27	JUNCTION	0.274	1.117	0	01:26	0.35	5.2	- 0.015
EXD_3	JUNCTION	0.000	0.170	0	01:13	0	0.248	0.154
EXD_4	JUNCTION	0.000	0.168	0	01:14	0	0.247	0.049
EXD_5	JUNCTION	0.000	0.167	0	01:15	0	0.247	0.004
EXD_6	JUNCTION	0.000	0.166	0	01:15	0	0.247	- 0.543
EXD_7	JUNCTION	0.141	0.290	0	01:17	0.716	0.964	- 0.350
EXD_8	JUNCTION	0.000	0.281	0	01:20	0	0.967	0.546
EXD_9	JUNCTION	0.000	0.257	0	01:23	0	0.962	1.262
J10	JUNCTION	0.000	1.026	0	01:11	0	0.659	0.010
J11	JUNCTION	0.000	1.122	0	01:13	0	0.748	- 0.003
J12	JUNCTION	0.000	1.258	0	01:14	0	0.91	- 0.010
J13	JUNCTION	0.000	1.282	0	01:14	0	1.06	0.116
J17	JUNCTION	0.000	0.202	0	01:10	0	0.248	- 0.049
J19	JUNCTION	0.556	0.623	0	01:10	0.667	0.7	- 2.467
J20	JUNCTION	0.052	0.118	0	01:10	0.0615	0.102	1.365
J21	JUNCTION	0.091	0.098	0	01:10	0.109	0.121	- 0.636
J22	JUNCTION	0.056	0.092	0	01:16	0.0664	0.11	0.266
J23	JUNCTION	0.000	0.081	0	01:13	0	0.0437	1.029
J24	JUNCTION	0.000	0.145	0	01:11	0	0.0631	1.315
J25	JUNCTION	0.000	1.823	0	01:14	0	1.51	0.374
J26	JUNCTION	0.000	1.512	0	01:14	0	1.27	- 0.106
J28	JUNCTION	0.285	0.285	0	01:10	0.34	0.34	- 3.105
J29	JUNCTION	0.795	0.932	0	01:10	0.957	1.03	0.113
J32	JUNCTION	0.000	1.187	0	01:12	0	0.742	0.025
J36	JUNCTION	0.108	0.469	0	01:10	0.129	0.313	3.445
J39	JUNCTION	0.000	1.882	0	01:14	0	1.68	0.295
J40	JUNCTION	0.237	1.882	0	01:15	0.282	1.94	- 0.154
J41	JUNCTION	0.000	3.520	0	01:16	0	3.29	0.092
J43	JUNCTION	0.000	2.387	0	01:16	0	2.25	- 0.021
J44	JUNCTION	0.141	0.692	0	01:14	0.169	0.852	0.273
J46	JUNCTION	0.198	0.198	0	01:10	0.236	0.238	- 1.807
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.160	0.703	0	01:14	0.192	0.838	- 0.096
J51	JUNCTION	0.000	0.653	0	01:14	0	0.653	0.995
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.011	0	01:10	0	0.00231	20.426
J58	JUNCTION	0.500	0.734	0	01:10	0.603	0.782	0.473
J59	JUNCTION	0.137	0.410	0	01:10	0.164	0.397	2.224
J6	JUNCTION	0.208	0.208	0	01:10	0.248	0.248	- 0.131
J61	JUNCTION	0.557	0.773	0	01:10	0.667	0.9	- 1.615
J62	JUNCTION	0.000	0.585	0	01:11	0	0.354	- 0.502
J74	JUNCTION	0.000	0.349	0	03:09	0	25.5	0.037
J9	JUNCTION	0.000	0.621	0	01:12	0	0.456	0.003
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.158	0.158	0	01:10	0.174	0.174	0.000
OF3	OUTFALL	0.000	1.115	0	01:27	0	5.2	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.349	0	03:10	0	25.5	0.000
500_(C-STRM)	STORAGE	0.000	0.177	0	01:20	0	0.415	0.036
500A_(C-STRM)	STORAGE	0.000	5.807	0	01:17	0	11.7	0.003
502_(C-STRM)	STORAGE	0.000	1.330	0	01:23	0	4.48	0.016
503_(C-STRM)	STORAGE	0.000	1.012	0	01:29	0	3.49	- 0.003
504_(C-STRM)	STORAGE	0.000	0.953	0	01:26	0	3.31	- 0.124
505_(C-STRM)	STORAGE	0.000	0.796	0	01:26	0	2.42	- 0.029
506_(C-STRM)	STORAGE	0.000	0.801	0	01:26	0	2.43	0.226
507_(C-STRM)	STORAGE	0.000	0.608	0	01:27	0	1.83	- 0.233
508_(C-STRM)	STORAGE	0.000	0.595	0	01:27	0	1.83	- 0.000
509_(C-STRM)	STORAGE	0.000	0.582	0	01:27	0	1.83	- 0.012
510_(C-STRM)	STORAGE	0.000	0.585	0	01:26	0	1.83	0.036
511_(C-STRM)	STORAGE	0.000	0.590	0	01:26	0	1.83	0.029
512_(C-STRM)	STORAGE	0.000	0.537	0	01:23	0	1.67	- 0.072
513_(C-STRM)	STORAGE	0.000	0.600	0	01:07	0	1.72	0.287
514_(C-STRM)	STORAGE	0.000	0.071	0	01:08	0	0.0619	2.624
515_(C-STRM)	STORAGE	0.000	0.036	0	01:11	0	0.0129	- 7.422
516_(C-STRM)	STORAGE	0.000	0.397	0	01:07	0	1.12	- 0.852
517_(C-STRM)	STORAGE	0.000	0.417	0	01:08	0	1.12	- 0.072
518_(C-STRM)	STORAGE	0.000	0.438	0	01:08	0	1.13	0.448
519_(C-STRM)	STORAGE	0.000	0.124	0	01:02	0	0.276	- 1.511
520_(C-STRM)	STORAGE	0.000	0.121	0	01:00	0	0.279	1.252
522_(C-STRM)	STORAGE	0.000	0.088	0	01:00	0	0.192	0.022
525_(C-STRM)	STORAGE	0.000	1.262	0	01:39	0	4.28	0.065
528_(C-STRM)	STORAGE	0.000	1.052	0	01:40	0	3.56	- 0.008
532_(C-STRM)	STORAGE	0.000	0.841	0	01:40	0	2.87	- 0.117
536_(C-STRM)	STORAGE	0.000	0.732	0	01:39	0	2.53	0.054
540_(C-STRM)	STORAGE	0.000	0.497	0	01:41	0	1.72	- 0.004
541_(C-STRM)	STORAGE	0.000	0.368	0	01:01	0	1.37	0.033
551_(C-STRM)	STORAGE	0.000	0.341	0	01:22	0	0.99	0.395
552_(C-STRM)	STORAGE	0.000	0.243	0	01:22	0	0.631	- 0.464
553_(C-STRM)	STORAGE	0.000	0.251	0	01:05	0	0.634	0.330
554_(C-STRM)	STORAGE	0.000	0.215	0	01:07	0	0.502	- 0.879
555_(C-STRM)	STORAGE	0.000	0.219	0	01:01	0	0.503	0.213
556_(C-STRM)	STORAGE	0.000	0.214	0	01:00	0	0.505	0.306
601_(C-STRM)	STORAGE	0.000	5.279	0	01:25	0	18.4	0.038
602_(C-STRM)	STORAGE	0.000	5.279	0	01:25	0	18.4	- 0.001
603_(C-STRM)	STORAGE	0.000	5.252	0	01:26	0	18.2	- 0.001

604_(C-STRM)	STORAGE	0.000	5.252	0	01:26	0	18.2	- 0.001
605_(C-STRM)	STORAGE	0.000	4.958	0	01:26	0	17.3	- 0.003
606_(C-STRM)	STORAGE	0.000	4.215	0	01:23	0	14.7	0.000
619_(C-STRM)	STORAGE	0.000	4.217	0	01:23	0	14.7	0.003
622_(C-STRM)	STORAGE	0.000	3.988	0	01:23	0	14.1	0.000
626_(C-STRM)	STORAGE	0.000	0.141	0	01:08	0	0.686	- 0.391
627_(C-STRM)	STORAGE	0.000	0.238	0	01:15	0	0.947	0.128
629_(C-STRM)	STORAGE	0.000	3.441	0	01:22	0	12.1	- 0.221
630_(C-STRM)	STORAGE	0.000	3.311	0	01:22	0	11.7	0.249
630A_(C-STRM)	STORAGE	0.000	3.078	0	01:22	0	10.7	0.077
631_(C-STRM)	STORAGE	5.259	5.259	0	01:10	8.4	8.4	- 0.057
645_(C-STRM)	STORAGE	0.000	0.754	0	01:40	0	2.33	- 0.041
647_(C-STRM)	STORAGE	0.000	0.682	0	01:40	0	2.23	- 0.057
650_(C-STRM)	STORAGE	0.000	0.590	0	01:03	0	2.15	- 0.146
651_(C-STRM)	STORAGE	0.000	0.544	0	01:01	0	2.08	0.057
682_(C-STRM)	STORAGE	1.443	1.443	0	01:10	2.04	2.04	- 0.032
MTD_(C-STRM)	STORAGE	0.000	2.545	0	01:23	0	8.76	- 0.060
OVERFLOW_(C-STRM)	STORAGE	0.000	2.545	0	01:23	0	8.76	0.001
POND_(C-STRM)	STORAGE	2.166	11.979	0	01:18	2.89	33.3	- 0.017
S_525-MTD	STORAGE	0.730	0.730	0	01:10	0.844	0.863	- 0.004
S_528-525	STORAGE	0.739	0.739	0	01:10	0.854	0.854	- 0.008
S_532-528	STORAGE	0.375	0.375	0	01:10	0.433	0.433	- 0.008
S_536-532	STORAGE	0.855	0.855	0	01:10	1.01	1.01	- 0.009
S_540-536	STORAGE	0.391	0.391	0	01:10	0.452	0.452	- 0.008
S_541-540	STORAGE	1.495	1.495	0	01:10	1.73	1.73	- 0.008
S_604-603	STORAGE	1.105	1.105	0	01:10	1.28	1.28	- 0.000
S_605-604	STORAGE	2.955	2.955	0	01:10	3.43	3.43	- 0.000
S_619-606	STORAGE	0.822	0.822	0	01:10	0.951	0.951	- 0.000
S_622-619	STORAGE	1.691	1.691	0	01:10	1.96	1.96	0.000
S_622-619_2	STORAGE	0.948	0.948	0	01:10	1.1	1.1	- 0.000
S_627-630	STORAGE	0.324	0.324	0	01:10	0.375	0.375	0.000
S_629-622	STORAGE	0.562	0.562	0	01:10	0.65	0.65	- 0.000
SU2	STORAGE	0.254	0.254	0	01:20	0.686	0.686	- 0.000
SU5	STORAGE	0.269	0.269	0	01:13	0.678	0.678	- 0.000

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	11.1	0.0	0.0	0.001	17.9	0 02:44	0.177
500A_(C-STRM)	0.676	32.0	0.0	0.0	2.009	95.0	0 01:19	5.739
502_(C-STRM)	0.000	3.3	0.0	0.0	0.002	45.2	0 01:23	1.328
503_(C-STRM)	0.000	2.8	0.0	0.0	0.002	45.3	0 01:23	1.012
504_(C-STRM)	0.000	12.7	0.0	0.0	0.001	48.6	0 01:29	0.952
505_(C-STRM)	0.000	10.4	0.0	0.0	0.002	45.3	0 01:26	0.792
506_(C-STRM)	0.000	10.8	0.0	0.0	0.002	52.2	0 01:26	0.796
507_(C-STRM)	0.000	10.9	0.0	0.0	0.002	54.3	0 01:26	0.622
508_(C-STRM)	0.000	10.9	0.0	0.0	0.002	57.7	0 01:26	0.608
509_(C-STRM)	0.000	10.9	0.0	0.0	0.002	61.3	0 01:27	0.595
510_(C-STRM)	0.000	11.1	0.0	0.0	0.002	63.2	0 01:27	0.582
511_(C-STRM)	0.000	11.1	0.0	0.0	0.002	63.8	0 01:27	0.585
512_(C-STRM)	0.000	10.9	0.0	0.0	0.002	62.2	0 01:26	0.531
513_(C-STRM)	0.000	10.8	0.0	0.0	0.002	61.4	0 01:26	0.568
514_(C-STRM)	0.000	9.7	0.0	0.0	0.002	50.4	0 01:27	0.075
515_(C-STRM)	0.000	9.2	0.0	0.0	0.002	41.2	0 01:27	0.032
516_(C-STRM)	0.000	11.1	0.0	0.0	0.002	63.2	0 01:26	0.385
517_(C-STRM)	0.000	11.4	0.0	0.0	0.002	66.4	0 01:25	0.397
518_(C-STRM)	0.000	12.0	0.0	0.0	0.002	74.5	0 01:22	0.417
519_(C-STRM)	0.000	11.8	0.0	0.0	0.002	69.8	0 01:21	0.146
520_(C-STRM)	0.000	12.4	0.0	0.0	0.002	68.7	0 01:21	0.117
522_(C-STRM)	0.000	10.4	0.0	0.0	0.001	20.3	0 01:16	0.088
525_(C-STRM)	0.000	3.7	0.0	0.0	0.002	63.6	0 01:24	1.270
528_(C-STRM)	0.000	3.0	0.0	0.0	0.002	69.1	0 01:24	1.059
532_(C-STRM)	0.000	2.8	0.0	0.0	0.002	71.4	0 01:25	0.847
536_(C-STRM)	0.000	2.8	0.0	0.0	0.002	72.5	0 01:26	0.737
540_(C-STRM)	0.000	12.8	0.0	0.0	0.002	75.3	0 01:26	0.534
541_(C-STRM)	0.000	12.5	0.0	0.0	0.002	73.5	0 01:26	0.393
551_(C-STRM)	0.000	9.3	0.0	0.0	0.002	45.3	0 01:22	0.338
552_(C-STRM)	0.000	8.8	0.0	0.0	0.002	42.8	0 01:22	0.240
553_(C-STRM)	0.000	9.0	0.0	0.0	0.002	41.8	0 01:22	0.243
554_(C-STRM)	0.000	8.6	0.0	0.0	0.002	39.5	0 01:21	0.205
555_(C-STRM)	0.000	8.5	0.0	0.0	0.002	38.5	0 01:21	0.215
56_(C-STRM)	0.000	8.5	0.0	0.0	0.002	40.5	0 01:21	0.219
601_(C-STRM)	0.000	3.0	0.0	0.0	0.001	27.4	0 01:25	5.279
602_(C-STRM)	0.000	3.3	0.0	0.0	0.002	42.1	0 01:25	5.279
603_(C-STRM)	0.000	2.8	0.0	0.0	0.002	45.4	0 01:25	5.252
604_(C-STRM)	0.000	2.1	0.0	0.0	0.002	39.1	0 01:25	5.252
605_(C-STRM)	0.000	1.8	0.0	0.0	0.002	33.1	0 01:25	4.958
606_(C-STRM)	0.000	1.9	0.0	0.0	0.002	34.0	0 01:25	4.215
619_(C-STRM)	0.000	2.1	0.0	0.0	0.002	39.9	0 01:25	4.215
622_(C-STRM)	0.000	2.3	0.0	0.0	0.002	44.5	0 01:25	3.984
626_(C-STRM)	0.000	9.1	0.0	0.0	0.001	15.8	0 01:46	0.141
627_(C-STRM)	0.000	8.8	0.0	0.0	0.001	26.2	0 01:26	0.258
629_(C-STRM)	0.000	2.3	0.0	0.0	0.002	43.7	0 01:25	3.437
630_(C-STRM)	0.000	2.4	0.0	0.0	0.002	41.4	0 01:25	3.307
630A_(C-STRM)	0.000	2.4	0.0	0.0	0.002	44.2	0 01:25	3.075
631_(C-STRM)	0.022	0.9	0.0	0.0	1.324	53.0	0 01:18	2.438
645_(C-STRM)	0.000	10.0	0.0	0.0	0.002	54.5	0 01:22	0.813
647_(C-STRM)	0.000	10.7	0.0	0.0	0.002	59.6	0 01:22	0.749
650_(C-STRM)	0.000	11.4	0.0	0.0	0.002	64.0	0 01:21	0.675
651_(C-STRM)	0.000	12.0	0.0	0.0	0.002	67.1	0 01:21	0.586
682_(C-STRM)	0.010	1.3	0.0	0.0	0.481	64.2	0 01:17	0.526
MTD_(C-STRM)	0.000	6.1	0.0	0.0	0.002	49.0	0 01:23	2.545
OVERFLOW_(C-STRM)	0.000	10.5	0.0	0.0	0.001	33.8	0 01:20	2.548
POND_(C-STRM)	17.645	48.7	0.0	0.0	28.734	79.3	0 03:09	0.397
S_525-MTD	0.005	0.8	0.0	0.0	0.266	46.4	0 01:17	0.457
S_528-525	0.004	0.7	0.0	0.0	0.216	37.2	0 01:14	0.470
S_532-528	0.002	0.6	0.0	0.0	0.102	34.6	0 01:13	0.277
S_536-532	0.003	0.8	0.0	0.0	0.211	49.3	0 01:11	0.671
S_540-536	0.001	0.7	0.0	0.0	0.087	42.4	0 01:11	0.330
S_541-540	0.009	0.8	0.0	0.0	0.470	40.0	0 01:13	0.818
S_604-603	0.006	0.6	0.0	10.2	0.318	36.7	0 01:13	0.650
S_605-604	0.020	0.9	0.0	11.5	1.014	44.4	0 01:15	1.311
S_619-606	0.003	0.8	0.0	10.3	0.202	46.9	0 01:11	0.593
S_622-619	0.014	1.0	0.0	11.9	0.606	46.5	0 01:15	0.778
S_622-619_2	0.004	0.8	0.0	10.3	0.242	48.9	0 01:12	0.672
S_627-630	0.001	0.5	0.0	14.1	0.075	29.4	0 01:11	0.248
S_629-622	0.003	0.6	0.0	12.0	0.155	35.2	0 01:13	0.357
SU2	0.005	1.1	0.0	0.0	0.154	30.8	0 01:42	0.141
SU5	0.005	0.9	0.0	0.0	0.176	35.3	0 01:30	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	12.83	0.016	0.158	0.174
OF3	98.62	0.061	1.115	5.197
ST4_108A_(P-Stm)	98.78	0.298	0.349	25.470
System	52.56	0.375	1.445	30.841

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.115	0 01:10	1.17	1.71	0.73
BDR-C2	CONDUIT	0.231	0 01:19	2.00	4.41	0.88
BDR-C3	CONDUIT	0.336	0 01:27	2.77	1.72	0.59
BDR-C4	CONDUIT	0.808	0 01:26	2.57	0.27	0.32
C1_1	CHANNEL	1.068	0 01:14	0.96	0.40	0.76
C1_17	CHANNEL	0.115	0 01:10	1.10	0.01	0.19
C1_3	CHANNEL	0.188	0 01:10	0.28	0.06	0.44
C1_30	CHANNEL	1.503	0 01:15	1.28	0.56	0.77
C1_4	CHANNEL	1.801	0 01:15	1.35	0.46	0.83
C14_1	CHANNEL	0.070	0 01:10	0.20	0.06	0.42
C14_2	CHANNEL	0.076	0 01:16	0.81	0.03	0.24
C14_4	CHANNEL	0.025	0 01:20	0.30	0.01	0.21
C14_5	CHANNEL	0.066	0 01:10	0.54	0.04	0.33
C15_1	CHANNEL	0.265	0 01:11	0.47	0.11	0.44
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.18
C2	CONDUIT	3.516	0 01:17	2.07	0.38	0.55
C20_1	CHANNEL	0.011	0 01:10	0.08	0.00	0.23
C20_2	CHANNEL	0.293	0 01:13	0.88	0.06	0.31
C20_3	CHANNEL	0.324	0 01:11	0.82	0.06	0.33
C20_4	CHANNEL	0.201	0 01:10	0.69	0.05	0.32
C20_5	CHANNEL	0.652	0 01:15	1.41	0.09	0.36
C20_7	CHANNEL	0.632	0 01:15	1.35	0.07	0.37
C23_5	CHANNEL	1.187	0 01:15	0.74	0.74	0.96
C23_7	CHANNEL	2.373	0 01:16	2.06	0.41	0.86
C3	CONDUIT	0.619	0 01:12	0.79	0.09	0.26
C4	CONDUIT	1.037	0 01:12	1.08	0.13	0.31
C4_1	CHANNEL	0.081	0 01:13	0.75	0.02	0.27
C4_2	CHANNEL	0.559	0 01:12	0.92	0.16	0.61
C4_3	CHANNEL	0.034	0 01:13	0.07	0.02	0.48

C4_4	CHANNEL	0.259	0	01:10	0.79	0.08	0.45
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.20
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	1.128	0	01:13	1.03	0.17	0.35
C5_1	CHANNEL	0.202	0	01:10	0.39	0.05	0.18
C5_10	CHANNEL	0.114	0	01:11	0.52	0.03	0.23
C5_11	CHANNEL	0.108	0	01:14	0.18	0.04	0.36
C5_12	CHANNEL	1.115	0	01:27	1.27	0.09	0.31
C5_13	CHANNEL	0.126	0	01:12	0.60	0.03	0.24
C5_14	CHANNEL	0.127	0	01:04	0.15	0.09	0.46
C5_15	CHANNEL	0.229	0	01:21	0.51	0.06	0.31
C5_16	CHANNEL	0.225	0	01:28	0.43	0.05	0.25
C5_17	CHANNEL	0.234	0	01:31	0.23	0.02	0.29
C5_19	CHANNEL	0.230	0	01:20	0.48	0.15	0.28
C5_2	CHANNEL	0.170	0	01:13	0.66	0.02	0.21
C5_20	CHANNEL	0.274	0	01:31	0.34	0.03	0.24
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.26
C5_23	CHANNEL	0.199	0	01:10	0.37	0.04	0.18
C5_3	CHANNEL	0.192	0	01:11	0.63	0.01	0.22
C5_4	CHANNEL	0.167	0	01:15	0.55	0.01	0.17
C5_5	CHANNEL	0.164	0	01:16	0.63	0.01	0.16
C5_6	CHANNEL	0.168	0	01:14	0.82	0.01	0.13
C5_7	CHANNEL	0.246	0	01:28	0.35	0.02	0.27
C5_8	CHANNEL	0.281	0	01:20	0.67	0.02	0.26
C5_9	CHANNEL	0.727	0	01:26	0.74	0.06	0.34
C6	CONDUIT	1.282	0	01:14	1.04	0.19	0.40
C7	CHANNEL	0.108	0	01:10	0.35	0.04	0.31
C9_1	CHANNEL	0.362	0	01:10	0.71	0.09	0.39
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.14
C9_2	CHANNEL	0.346	0	01:10	0.68	0.11	0.55
C9_5	CHANNEL	1.814	0	01:15	1.18	0.44	0.71
C9_6	CHANNEL	1.761	0	01:16	1.46	0.43	0.63
C9_7	CHANNEL	0.627	0	01:15	0.99	0.09	0.47
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.385	0	01:07	1.14	1.03	1.00
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.397	0	01:07	1.12	1.22	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.417	0	01:08	1.47	1.75	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.177	0	01:20	1.32	0.41	0.48
C-STRM-101_(C-STRM)	CONDUIT	0.177	0	01:21	2.25	0.22	0.50
C-STRM-102_(C-STRM)	CONDUIT	2.376	0	01:24	4.24	0.95	0.90
C-STRM-103_(C-STRM)	CONDUIT	0.675	0	01:40	1.26	1.22	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.749	0	01:40	1.40	1.35	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.813	0	01:40	1.52	1.46	1.00
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.531	0	01:26	1.62	0.94	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.537	0	01:23	1.74	0.95	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.141	0	01:47	1.79	0.49	0.75
C-STRM-21_(C-STRM)	CONDUIT	0.258	0	01:40	1.52	0.85	1.00
C-STRM-22_(1)_(C-STRM)	CONDUIT	3.437	0	01:23	1.68	0.77	1.00
C-STRM-22_(C-STRM)	CONDUIT	3.307	0	01:22	2.45	1.21	1.00
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.338	0	01:22	1.02	1.01	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.240	0	01:22	0.71	0.71	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.796	0	01:26	1.80	1.01	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.622	0	01:28	1.74	1.05	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.608	0	01:27	1.70	1.02	1.00
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.595	0	01:27	1.66	1.00	1.00
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.582	0	01:27	1.63	1.03	1.00
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.585	0	01:26	1.71	1.03	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.586	0	01:40	1.18	1.05	1.00
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.215	0	01:07	1.21	1.25	1.00
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.219	0	01:01	1.21	1.27	1.00
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.243	0	01:22	1.13	0.99	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.205	0	01:05	0.93	0.83	1.00
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.952	0	01:29	2.27	1.10	0.90
C-STRM-4_(C-STRM)	CONDUIT	0.792	0	01:26	1.79	1.01	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.393	0	01:42	0.91	0.70	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.534	0	01:41	1.00	0.96	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.737	0	01:40	1.16	1.05	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.847	0	01:40	1.13	0.98	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.059	0	01:39	1.42	1.22	1.00
C-STRM-57_(C-STRM)	CONDUIT	1.012	0	01:29	1.36	1.16	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.117	0	01:02	0.96	0.91	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.146	0	01:26	0.68	0.88	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	01:16	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	4.215	0	01:23	1.67	0.82	1.00
C-STRM-75_(C-STRM)	CONDUIT	4.215	0	01:26	1.69	0.82	1.00
C-STRM-76_(C-STRM)	CONDUIT	1.270	0	01:38	1.70	1.27	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.545	0	01:23	3.01	1.32	0.94
C-STRM-78_(C-STRM)	CONDUIT	1.328	0	01:23	1.78	1.09	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	5.252	0	01:26	2.07	0.83	0.99
C-STRM-79_(C-STRM)	CONDUIT	4.958	0	01:26	1.95	0.86	1.00
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.075	0	01:37	0.43	0.39	1.00
C-STRM-8_(C-STRM)	CONDUIT	0.036	0	01:11	0.32	0.28	1.00
C-STRM-80_(C-STRM)	CONDUIT	5.252	0	01:26	2.08	1.18	0.97
C-STRM-81_(C-STRM)	CONDUIT	5.279	0	01:25	2.37	1.19	0.82
C-STRM-82_(C-STRM)	CONDUIT	5.279	0	01:26	3.00	1.18	0.65
C-STRM-83_(1)_(C-STRM)	CONDUIT	3.075	0	01:22	2.17	1.12	1.00
C-STRM-84_(C-STRM)	CONDUIT	3.984	0	01:23	1.70	0.77	1.00
CVR-C2	CONDUIT	0.166	0	01:15	2.37	0.62	0.45
CVR-C3	CONDUIT	0.257	0	01:23	3.09	1.58	0.67
CVR-C4	CONDUIT	0.727	0	01:26	2.69	0.24	0.29
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	4.349	0	03:10	1.29	0.36	1.00
W1	CHANNEL	5.713	0	01:19	1.22	0.02	0.06
OR1	ORIFICE	0.349	0	03:09			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.425	0	01:11			0.28
W11	WEIR	0.173	0	01:10			0.18
W12	WEIR	0.265	0	01:11			0.22
W13	WEIR	0.254	0	01:11			0.33
W14	WEIR	0.214	0	01:10			0.19
W15	WEIR	0.450	0	01:16			0.33
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.145	0	01:11			0.12
W4	WEIR	0.411	0	01:12			0.27
W5	WEIR	0.349	0	01:11			0.24
W6	WEIR	0.525	0	01:15			0.30
W7	WEIR	0.342	0	01:13			0.21
W8	WEIR	0.450	0	01:13			0.25
W9	WEIR	0.220	0	01:11			0.18
C1	DUMMY	0.249	0	01:01			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:02			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	01:01			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:01			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:01			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	01:02			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	01:02			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:01			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	01:02			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	01:01			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	01:02			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	01:02			
OL1	DUMMY	0.097	0	01:02			
OL10	DUMMY	0.026	0	00:27			
OL11	DUMMY	0.046	0	01:00			
OL12	DUMMY	0.101	0	01:00			
OL13	DUMMY	0.084	0	01:00			
OL14	DUMMY	0.121	0	01:00			
OL15	DUMMY	0.088	0	01:00			
OL16	DUMMY	0.342	0	01:00			
OL17	DUMMY	0.215	0	01:01			
OL18	DUMMY	0.059	0	01:01			
OL19	DUMMY	0.238	0	01:00			
OL2	DUMMY	0.141	0	01:08			
OL20	DUMMY	0.068	0	01:00			
OL21	DUMMY	0.060	0	01:00			
OL22	DUMMY	0.184	0	01:30			
OL3	DUMMY	0.134	0	01:02			
OL4	DUMMY	0.110	0	01:01			
OL5	DUMMY	0.046	0	01:02			
OL6	DUMMY	0.029	0	01:00			
OL7	DUMMY	0.034	0	01:01			
OL8	DUMMY	0.018	0	01:00			
OL9	DUMMY	0.214	0	01:00			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.80	0.00
BDR-C2	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.58	0.00
BDR-C3	1.00	0.01	0.00	0.00	0.71	0.28	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.00	0.97	0.00
C1_1	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C1_17	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_3	1.00	0.82	0.04	0.00	0.14	0.00	0.00	0.00	0.95	0.00
C1_30	1.00	0.04	0.00	0.00	0.54	0.42	0.00	0.00	0.06	0.00
C1_4	1.00	0.04	0.01	0.00	0.94	0.02	0.00	0.00	0.95	0.00
C14_1	1.00	0.84	0.04	0.00	0.12	0.00	0.00	0.00	0.97	0.00
C14_2	1.00	0.01	0.04	0.00	0.60	0.35	0.00	0.00	0.00	0.00
C14_4	1.00	0.85	0.01	0.00	0.13	0.00	0.00	0.00	0.98	0.00
C14_5	1.00	0.86	0.00	0.00	0.09	0.04	0.00	0.00	0.01	0.00
C15_1	1.00	0.82	0.01	0.00	0.17	0.00	0.00	0.00	0.95	0.00
C15_2	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C20_1	1.00	0.01	0.03	0.00	0.82	0.13	0.00	0.00	0.01	0.00
C20_2	1.00	0.85	0.01	0.00	0.08	0.06	0.00	0.00	0.97	0.00
C20_3	1.00	0.85	0.01	0.00	0.08	0.06	0.00	0.00	0.03	0.00
C20_4	1.00	0.01	0.85	0.00	0.12	0.02	0.00	0.00	0.95	0.00
C20_5	1.00	0.01	0.02	0.00	0.70	0.27	0.00	0.00	0.01	0.00
C20_7	1.00	0.85	0.01	0.00	0.05	0.09	0.00	0.00	0.04	0.00
C23_5	1.00	0.04	0.00	0.00	0.82	0.13	0.00	0.00	0.01	0.00
C23_7	1.00	0.03	0.00	0.00	0.79	0.18	0.00	0.00	0.16	0.00
C3	1.00	0.72	0.09	0.00	0.19	0.00	0.00	0.00	0.95	0.00
C4	1.00	0.61	0.12	0.00	0.28	0.00	0.00	0.00	0.95	0.00
C4_1	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C4_2	1.00	0.01	0.00	0.00	0.96	0.01	0.00	0.00	0.95	0.00
C4_3	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C4_4	1.00	0.01	0.85	0.00	0.12	0.02	0.00	0.00	0.95	0.00
C4_5	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.48	0.13	0.00	0.39	0.00	0.00	0.00	0.95	0.00
C5_1	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.88	0.00
C5_10	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.94	0.00
C5_11	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.96	0.00
C5_12	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.02	0.00	0.00	0.30	0.68	0.00	0.00	0.02	0.00
C5_14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.64	0.00
C5_15	1.00	0.02	0.00	0.00	0.98	0.01	0.00	0.00	0.96	0.00
C5_16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.01	0.02	0.00	0.96	0.00	0.00	0.00	0.93	0.00
C5_19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.96	0.00
C5_2	1.00	0.02	0.00	0.00	0.62	0.36	0.00	0.00	0.00	0.00
C5_20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
C5_21	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.02	0.00	0.00	0.78	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.02	0.00	0.00	0.98	0.01	0.00	0.00	0.97	0.00
C5_4	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.96	0.00
C5_5	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.93	0.00
C5_6	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.89	0.00
C5_7	1.00	0.01	0.04	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_8	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_9	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C6	1.00	0.05	0.43	0.00	0.52	0.00	0.00	0.00	0.95	0.00
C7	1.00	0.86	0.01	0.00	0.13	0.00	0.00	0.00	0.96	0.00
C9_1	1.00	0.84	0.00	0.00	0.12	0.03	0.00	0.00	0.03	0.00
C9_11	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.01	0.87	0.00	0.10	0.02	0.00	0.00	0.94	0.00
C9_5	1.00	0.01	0.02	0.00	0.02	0.94	0.00	0.00	0.02	0.00
C9_6	1.00	0.01	0.82	0.00	0.14	0.03	0.00	0.00	0.94	0.00
C9_7	1.00	0.01	0.86	0.00	0.11	0.02	0.00	0.00	0.95	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.79	0.00
C-STRM-1_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.72	0.16	0.00	0.08	0.00	0.00	0.04	0.91	0.00
C-STRM-101_(C-STRM)	1.00	0.53	0.19	0.00	0.25	0.00	0.00	0.03	0.70	0.00
C-STRM-102_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.04	0.00	0.00	0.09	0.00
C-STRM-103_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.82	0.00
C-STRM-104_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C-STRM-105_(C-STRM)	1.00	0.02	0.00	0.00	0.13	0.00	0.00	0.85	0.00	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.98	0.00	0.00	0.00	0.73	0.00
C-STRM-2_(C-STRM)	1.00	0.01	0.00	0.00	0.94	0.03	0.00	0.02	0.71	0.00
C-STRM-20_(C-STRM)	1.00	0.04	0.00	0.00	0.02	0.01	0.00	0.93	0.03	0.00
C-STRM-21_(C-STRM)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.94	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.93	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.92	0.06	0.00	0.01	0.64	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.03	0.00	0.00	0.95	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.86	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.63	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.25	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.02	0.00	0.02	0.71	0.00
C-STRM-33_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.61	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.03	0.00	0.00	0.95	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.94	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.01	0.90	0.00
C-STRM-49_(C-STRM)	1.00	0.01	0.39	0.00	0.59	0.00	0.00	0.00	0.86	0.00
C-STRM-50_(C-STRM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.91	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.72	0.00
C-STRM-53_(C-STRM)	1.00	0.01	0.20	0.00	0.79	0.00	0.00	0.00	0.71	0.00
C-STRM-57_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.61	0.00
C-STRM-62_(C-STRM)	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.01	0.00
C-STRM-63_(C-STRM)	1.00	0.02	0.00	0.00	0.11	0.00	0.00	0.87	0.05	0.00
C-STRM-64_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.83	0.00
C-STRM-75_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.01	0.00	0.00	0.50	0.00	0.00	0.48	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.35	0.00
C-STRM-78_(C-STRM)	1.00	0.01	0.00	0.00	0.49	0.00	0.00	0.50	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.87	0.00
C-STRM-79_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.04	0.00	0.00	0.91	0.01	0.00
C-STRM-8_(C-STRM)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.93	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.74	0.00
C-STRM-81_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.58	0.00
C-STRM-82_(C-STRM)	1.00	0.01	0.00	0.00	0.41	0.00	0.00	0.58	0.05	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.82	0.00
C-STRM-84_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.88	0.00
CVR-C2	1.00	0.03	0.00	0.00	0.82	0.15	0.00	0.00	0.84	0.00
CVR-C3	1.00	0.04	0.00	0.00	0.61	0.35	0.00	0.00	0.07	0.00
CVR-C4	1.00	0.01	0.00	0.00	0.56	0.43	0.00	0.00	0.10	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.01	0.00	0.00	0.19	0.00	0.00	0.80	0.00	0.00
W1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00

Conduit Surcharge Summary

| Conduit | Hours Full: Both Ends | Upstream | Dnstream | Hours Above Full Normal

C-STRM-2 (C-STRM)	0.49	0.49	0.52	0.01	0.01
C-STRM-20 (C-STRM)	0.01	0.01	0.37	0.01	0.01
C-STRM-21 (C-STRM)	0.37	0.37	0.44	0.01	0.01
C-STRM-22 (1) (C-STRM)	0.43	0.43	0.46	0.01	0.01
C-STRM-22 (C-STRM)	0.42	0.44	0.43	0.61	0.42
C-STRM-26 (1) (C-STRM)	0.71	0.71	0.72	0.02	0.23
C-STRM-26 (C-STRM)	0.68	0.68	0.71	0.01	0.01
C-STRM-3 (1) (1) (1) (1) (C-STRM)	0.49	0.50	0.53	0.04	0.41
C-STRM-3 (1) (1) (1) (1) (C-STRM)	0.50	0.52	0.50	0.07	0.46
C-STRM-3 (1) (1) (1) (C-STRM)	0.52	0.55	0.52	0.05	0.52
C-STRM-3 (1) (1) (C-STRM)	0.55	0.58	0.55	0.01	0.55
C-STRM-3 (1) (2) (C-STRM)	0.55	0.55	0.58	0.15	0.18
C-STRM-3 (1) (C-STRM)	0.55	0.55	0.55	0.13	0.36
C-STRM-33 (C-STRM)	0.70	0.70	0.70	0.03	0.07
C-STRM-34 (1) (1) (C-STRM)	0.53	0.53	0.60	0.31	0.23
C-STRM-34 (1) (C-STRM)	0.44	0.44	0.53	0.35	0.23
C-STRM-35 (1) (C-STRM)	0.65	0.65	0.68	0.01	0.01
C-STRM-35 (C-STRM)	0.60	0.60	0.65	0.01	0.01
C-STRM-4 (1) (C-STRM)	0.01	0.58	0.01	0.48	0.01
C-STRM-4 (C-STRM)	0.53	0.53	0.58	0.03	0.39
C-STRM-49 (C-STRM)	0.72	0.72	0.73	0.01	0.01
C-STRM-50 (C-STRM)	0.73	0.73	0.73	0.01	0.59
C-STRM-51 (C-STRM)	0.73	0.73	0.73	0.41	0.73
C-STRM-52 (C-STRM)	0.73	0.73	0.74	0.01	0.62
C-STRM-53 (C-STRM)	0.73	0.74	0.73	0.61	0.73
C-STRM-57 (C-STRM)	0.72	0.72	0.72	0.51	0.71
C-STRM-62 (C-STRM)	0.48	0.48	0.53	0.01	0.01
C-STRM-63 (C-STRM)	0.53	0.53	0.55	0.01	0.01
C-STRM-64 (C-STRM)	0.01	0.01	0.01	0.16	0.01
C-STRM-74 (C-STRM)	0.46	0.50	0.46	0.01	0.46
C-STRM-75 (C-STRM)	0.40	0.46	0.40	0.01	0.40
C-STRM-76 (C-STRM)	0.72	0.73	0.72	0.65	0.72
C-STRM-77 (C-STRM)	0.01	0.72	0.01	0.66	0.01
C-STRM-78 (C-STRM)	0.72	0.72	0.72	0.32	0.71
C-STRM-79 (1) (C-STRM)	0.01	0.48	0.01	0.01	0.01
C-STRM-79 (C-STRM)	0.40	0.40	0.48	0.01	0.01
C-STRM-8 (1) (C-STRM)	0.39	0.39	0.49	0.01	0.01
C-STRM-8 (C-STRM)	0.31	0.31	0.39	0.01	0.01
C-STRM-80 (C-STRM)	0.01	0.01	0.01	0.60	0.01
C-STRM-81 (C-STRM)	0.01	0.01	0.01	0.60	0.01
C-STRM-82 (C-STRM)	0.01	0.01	0.01	0.60	0.01
C-STRM-83 (1) (C-STRM)	0.44	0.44	0.44	0.61	0.44
C-STRM-84 (C-STRM)	0.46	0.46	0.50	0.01	0.01
CVR-C3	0.01	0.01	0.01	0.51	0.01
ST4-Pipe_-_(99)_(P-Stm)	0.21	0.21	0.35	0.01	0.01

Analysis begun on: Thu Apr 9 10:32:08 2026
Analysis ended on: Thu Apr 9 10:32:14 2026
Total elapsed time: 00:00:06

Post-Development 1:100CC year 3-hour Chicago Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                Data       Recording
  Name                 Data Source              Type       Interval
  ---------------------------------------------------------------------
  24SCS100             24SCS100                 INTENSITY   15 min.
  6SCS050              6SCS050                  INTENSITY   15 min.
  Rainfall             CHI_3hr_100CC            INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage           Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall            EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall            EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall            EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall            EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall            EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall            S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall            J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall            J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall            J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall            J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall            S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall            S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall            S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall            S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall            SU2
  S12                  0.44    134.74     71.43    2.0000 Rainfall            J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall            J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall            J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall            J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall            J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall            J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall            J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall            J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall            S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall            EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall            EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall            S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall            S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall            S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall            S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall            S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall            J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall            S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall            J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall            J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall            S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall            J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall            EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall            631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall            682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall            OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall            POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall            SU5


  ************
  Node Summary
  ************
                                      Invert      Max.    Ponded    External
  Name                 Type             Elev.     Depth      Area    Inflow
  ---------------------------------------------------------------------------
  EXD_1                JUNCTION        104.39      1.51       0.0
  EXD_10               JUNCTION         98.65      1.20       0.0
  EXD_11               JUNCTION         98.50      1.20       0.0
  EXD_12               JUNCTION         98.31      1.20       0.0
  EXD_13               JUNCTION        104.32      1.10       0.0
  EXD_14               JUNCTION        102.49      0.80       0.0
  EXD_15               JUNCTION        100.27      0.80       0.0
  EXD_16               JUNCTION        100.20      0.80       0.0
  EXD_17               JUNCTION         99.89      0.80       0.0
  EXD_18               JUNCTION         99.40      0.84       0.0
  EXD_19               JUNCTION         99.19      0.88       0.0
  EXD_2                JUNCTION        103.47      1.93       0.0
  EXD_20               JUNCTION         99.19      0.88       0.0
  EXD_21               JUNCTION         99.18      0.88       0.0
  EXD_22               JUNCTION         99.14      0.88       0.0
  EXD_23               JUNCTION         98.75      1.14       0.0
  EXD_24               JUNCTION         98.67      1.14       0.0
  EXD_25               JUNCTION         98.52      1.13       0.0
  EXD_26               JUNCTION         98.48      1.13       0.0
  EXD_27               JUNCTION         98.17      1.20       0.0
  EXD_3                JUNCTION        103.19      1.41       0.0
  EXD_4                JUNCTION        102.64      1.20       0.0
  EXD_5                JUNCTION        102.50      1.20       0.0
  EXD_6                JUNCTION        102.32      1.08       0.0
  EXD_7                JUNCTION        101.50      1.06       0.0
  EXD_8                JUNCTION        100.48      1.06       0.0
  EXD_9                JUNCTION        100.39      1.06       0.0
  J10                  JUNCTION        103.60      0.50       0.0
  J11                  JUNCTION        103.50      0.50       0.0
  J12                  JUNCTION        103.40      0.50       0.0
  J13                  JUNCTION        103.30      0.50       0.0
  J17                  JUNCTION        104.37      1.04       0.0
  J19                  JUNCTION        105.40      0.50       0.0
  J20                  JUNCTION        105.45      0.50       0.0
  J21                  JUNCTION        105.55      0.50       0.0
  J22                  JUNCTION        105.70      0.50       0.0
  J23                  JUNCTION        106.00      0.50       0.0
  J24                  JUNCTION        106.20      0.50       0.0
  J25                  JUNCTION        105.30      0.50       0.0
  J26                  JUNCTION        105.70      0.50       0.0
  J28                  JUNCTION        109.00      0.50       0.0
  J29                  JUNCTION        108.80      0.50       0.0
  J32                  JUNCTION        106.00      0.50       0.0
  J36                  JUNCTION        104.70      0.50       0.0
  J39                  JUNCTION        104.60      0.50       0.0
  J40                  JUNCTION        104.45      0.50       0.0
  J41                  JUNCTION        103.20      0.50       0.0
  J43                  JUNCTION        104.20      0.50       0.0
  J44                  JUNCTION        104.50      0.50       0.0
  J46                  JUNCTION        104.60      0.50       0.0
  J47                  JUNCTION        105.10      0.50       0.0
  J48                  JUNCTION        105.75      0.50       0.0
  J51                  JUNCTION        106.75      0.50       0.0
  J52                  JUNCTION        109.75      0.50       0.0
  J53                  JUNCTION        109.00      0.50       0.0
  J56                  JUNCTION        109.10      0.50       0.0
  J57                  JUNCTION        108.47      0.50       0.0
  J58                  JUNCTION        108.40      0.50       0.0
  J59                  JUNCTION        108.00      0.50       0.0
  J6                   JUNCTION        109.83      0.30       0.0
  J61                  JUNCTION        107.00      0.50       0.0
  J62                  JUNCTION        106.50      0.50       0.0
  J74                  JUNCTION         98.45      0.90       0.0
  J9                   JUNCTION        103.70      0.50       0.0
  OF1                  OUTFALL         100.80      0.00       0.0
  OF2                  OUTFALL           0.00      0.00       0.0
  OF3                  OUTFALL          98.00      1.06       0.0
  ST4_108A_(P-Stm)     OUTFALL          98.02      1.19       0.0
  500_(C-STRM)         STORAGE         100.31      2.84       0.0
  500A_(C-STRM)        STORAGE         100.10      1.05       0.0
  502_(C-STRM)         STORAGE         100.54      3.70       0.0
  503_(C-STRM)         STORAGE         100.59      3.92       0.0
  504_(C-STRM)         STORAGE         103.04      2.70       0.0
  505_(C-STRM)         STORAGE         103.45      3.26       0.0
  506_(C-STRM)         STORAGE         103.82      3.16       0.0
  507_(C-STRM)         STORAGE         104.14      3.10       0.0
  508_(C-STRM)         STORAGE         104.37      3.12       0.0
  509_(C-STRM)         STORAGE         104.60      3.14       0.0
  510_(C-STRM)         STORAGE         104.85      3.09       0.0
  511_(C-STRM)         STORAGE         104.91      3.08       0.0
  512_(C-STRM)         STORAGE         105.11      3.12       0.0
  513_(C-STRM)         STORAGE         105.24      3.14       0.0
  514_(C-STRM)         STORAGE         105.59      3.16       0.0
  515_(C-STRM)         STORAGE         105.85      3.24       0.0
  516_(C-STRM)         STORAGE         105.46      3.06       0.0
  517_(C-STRM)         STORAGE         105.62      3.03       0.0
  518_(C-STRM)         STORAGE         105.85      2.92       0.0
  519_(C-STRM)         STORAGE         106.08      2.82       0.0
  520_(C-STRM)         STORAGE         106.34      2.66       0.0
  522_(C-STRM)         STORAGE         104.31      3.00       0.0
  525_(C-STRM)         STORAGE         100.61      2.69       0.0
  528_(C-STRM)         STORAGE         100.72      2.68       0.0
  532_(C-STRM)         STORAGE         100.83      2.67       0.0
  536_(C-STRM)         STORAGE         100.98      2.63       0.0
  540_(C-STRM)         STORAGE         100.86      2.85       0.0
  541_(C-STRM)         STORAGE         100.93      2.89       0.0
  551_(C-STRM)         STORAGE         100.65      3.78       0.0
  552_(C-STRM)         STORAGE         100.74      3.88       0.0
  553_(C-STRM)         STORAGE         100.93      3.78       0.0
  554_(C-STRM)         STORAGE         101.05      3.89       0.0
  555_(C-STRM)         STORAGE         101.25      3.93       0.0
  556_(C-STRM)         STORAGE         101.37      3.89       0.0
  601_(C-STRM)         STORAGE         100.45      4.43       0.0
  602_(C-STRM)         STORAGE         100.52      4.11       0.0
  603_(C-STRM)         STORAGE         100.63      3.89       0.0
  604_(C-STRM)         STORAGE         100.88      4.87       0.0
  605_(C-STRM)         STORAGE         101.09      5.63       0.0
  606_(C-STRM)         STORAGE         101.24      5.75       0.0
  619_(C-STRM)         STORAGE         101.38      5.14       0.0
  622_(C-STRM)         STORAGE         101.53      4.49       0.0
  626_(C-STRM)         STORAGE         103.94      3.33       0.0
  627_(C-STRM)         STORAGE         103.13      3.58       0.0
  629_(C-STRM)         STORAGE         101.65      4.46       0.0
  630_(C-STRM)         STORAGE         102.08      4.12       0.0
  630A_(C-STRM)        STORAGE         102.12      3.90       0.0
  631_(C-STRM)         STORAGE         106.00      0.50       0.0
  645_(C-STRM)         STORAGE         102.03      3.69       0.0
  647_(C-STRM)         STORAGE         102.14      3.40       0.0
  650_(C-STRM)         STORAGE         102.22      3.19       0.0
  651_(C-STRM)         STORAGE         102.31      3.03       0.0
  682_(C-STRM)         STORAGE         105.40      0.50       0.0
  MTD_(C-STRM)         STORAGE         100.37      3.19       0.0
  OVERFLOW_(C-STRM)    STORAGE         100.18      2.76       0.0
  POND_(C-STRM)        STORAGE          98.45      2.65       0.0    Yes
  S_525-MTD            STORAGE         103.30      0.50       0.0
  S_528-525            STORAGE         103.41      0.50       0.0
  S_532-528            STORAGE         103.50      0.50       0.0
  S_536-532            STORAGE         103.60      0.50       0.0
  S_540-536            STORAGE         103.71      0.50       0.0
  S_541-540            STORAGE         103.81      0.50       0.0
  S_604-603            STORAGE         105.50      0.50       0.0
  S_605-604            STORAGE         106.71      0.50       0.0
  S_619-606            STORAGE         106.50      0.50       0.0
  S_622-619            STORAGE         105.70      0.50       0.0
  S_622-619_2          STORAGE         106.50      0.50       0.0
  S_627-630            STORAGE         106.70      0.50       0.0
  S_629-622            STORAGE         106.01      0.50       0.0
  SU2                  STORAGE         106.75      0.50       0.0
  SU5                  STORAGE         104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                 From Node        To Node          Type            Length    %Slope
Roughness
  ---------------------------------------------------------------------------------------
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  BDR-C1               EXD_15           EXD_16           CONDUIT           17.7    0.3844
0.0250
  BDR-C2               EXD_20           EXD_21           CONDUIT            7.9    0.0632
0.0130
  BDR-C3               EXD_25           EXD_26           CONDUIT           14.2    0.2683
0.0130
  BDR-C4               EXD_12           EXD_27           CONDUIT           23.0    0.6077
0.0130
  C1_1                 J32              J26              CONDUIT           71.8    0.4181
0.0130
  C1_17                J6               EXD_1            CONDUIT          171.9    2.4608
0.0130
  C1_3                 J28              J29              CONDUIT          183.6    0.1090
0.0130
  C1_30                J26              J25              CONDUIT           93.1    0.4296
0.0130
  C1_4                 J25              J39              CONDUIT           75.0    0.9329
0.0130
  C14_1                J20              J19              CONDUIT           59.0    0.0847
0.0130
  C14_2                J23              J22              CONDUIT           73.9    0.4062
0.0130
  C14_4                J22              J21              CONDUIT           77.3    0.1941
0.0130
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C14_5	J21	J20	CONDUIT	51.8	0.1931
0.0130					
C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61

C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-100_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-101_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-102_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-103_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-104_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-105_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-20_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-21_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-22_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
4.45							
C-STRM-22_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
C-STRM-26_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.34							
C-STRM-26_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR					0.68	0.36	0.17
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
C-STRM-33_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR				0.60	0.28	0.15	0.60
0.25							
C-STRM-35_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-4_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
C-STRM-4_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-49_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-50_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-51_(C-STRM) CIRCULAR			0.90	0.64	0.23	0.90	1
C-STRM-52_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-53_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-57_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-62_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-63_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-64_(C-STRM) CIRCULAR			0.38	0.11	0.09	0.38	1
C-STRM-74_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-75_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-76_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-77_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-78_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-79_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
6.30							
C-STRM-79_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-8_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
C-STRM-8_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-80_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-81_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-82_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-83_(1)_(C-STRM) CIRCULAR				1.50	1.77	0.38	1.50
2.74							
C-STRM-84_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
CVR-C2	CIRCULAR		0.45	0.16	0.11	0.45	1
CVR-C3	CIRCULAR		0.40	0.13	0.10	0.40	1
CVR-C4	CIRCULAR		1.20	1.13	0.30	1.20	1
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR				0.90	0.64	0.23	0.90
0.96							
W1	Pond_SpillWay		3.89	318.30	4.06	128.79	1

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Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4738	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4985	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8858	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807

0.1962 0.2123 0.2291 0.2483 0.2703
0.2945 0.3189 0.3434 0.3680 0.3929
0.4178 0.4430 0.4687 0.4947 0.5212
0.5482 0.5760 0.6046 0.6335 0.6626
0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000

Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000

Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5558 0.5568 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6340 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000

Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000

Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3010 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000

Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4211 0.4809 0.5106 0.6505
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7026 0.7280 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000

Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000

Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000

Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000

Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000

Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2667 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5533 0.5889 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6872 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000

Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1229 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000

Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000

Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000

Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3037 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6153 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000

Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000

Width:

0.0127	0.0254	0.0380	0.0507	0.0634
0.0761	0.0888	0.1014	0.1141	0.1268
0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5621	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0999	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8831	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058

0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579
0.4893	0.5214	0.5541	0.5875	0.6216
0.6564	0.6919	0.7280	0.7648	0.8023
0.8405	0.8794	0.9189	0.9591	1.0000

Hrad:

0.0217	0.0433	0.0650	0.0866	0.1083
0.1299	0.1516	0.1732	0.1949	0.2158
0.2334	0.2493	0.2650	0.2808	0.2970
0.3137	0.3309	0.3485	0.3666	0.3838
0.3990	0.4128	0.4110	0.4455	0.4784
0.5099	0.5402	0.5694	0.5973	0.6230
0.6462	0.6674	0.6867	0.7046	0.7237
0.7433	0.7628	0.7822	0.8014	0.8205
0.8393	0.8580	0.8765	0.8948	0.9128
0.9307	0.9483	0.9657	0.9830	1.0000

Width:

0.0110	0.0219	0.0329	0.0439	0.0549
0.0658	0.0768	0.0878	0.0987	0.1153
0.1372	0.1592	0.1811	0.2031	0.2250
0.2469	0.2689	0.2908	0.3130	0.3514
0.3898	0.4282	0.4619	0.4783	0.4948
0.5112	0.5277	0.5442	0.5692	0.6021
0.6350	0.6679	0.7008	0.7337	0.7531
0.7696	0.7860	0.8025	0.8190	0.8354
0.8519	0.8683	0.8848	0.9013	0.9177
0.9342	0.9506	0.9671	0.9835	1.0000

Transect ROW_24m_Parking
Area:

0.0004	0.0014	0.0032	0.0056	0.0088
0.0126	0.0172	0.0225	0.0285	0.0351
0.0425	0.0506	0.0594	0.0689	0.0790
0.0899	0.1015	0.1138	0.1268	0.1410
0.1566	0.1735	0.1918	0.2107	0.2304
0.2507	0.2716	0.2933	0.3156	0.3391
0.3638	0.3900	0.4174	0.4462	0.4758
0.5061	0.5371	0.5687	0.6010	0.6339
0.6675	0.7018	0.7367	0.7724	0.8086
0.8456	0.8832	0.9215	0.9604	1.0000

Hrad:

0.0204	0.0408	0.0612	0.0816	0.1020
0.1224	0.1428	0.1632	0.1836	0.2040
0.2244	0.2448	0.2652	0.2856	0.3060
0.3264	0.3469	0.3673	0.3877	0.4065
0.4232	0.4385	0.4621	0.4937	0.5239
0.5528	0.6070	0.6326	0.6563	0.6776
0.6776	0.6968	0.7143	0.7308	0.7488
0.7668	0.7846	0.8023	0.8198	0.8372
0.8543	0.8713	0.8880	0.9046	0.9210
0.9372	0.9532	0.9690	0.9846	1.0000

Width:

0.0176	0.0352	0.0528	0.0704	0.0880
0.1056	0.1231	0.1407	0.1583	0.1759
0.1935	0.2111	0.2287	0.2463	0.2639
0.2815	0.2991	0.3167	0.3384	0.3727
0.4069	0.4412	0.4667	0.4833	0.5000
0.5167	0.5333	0.5500	0.5708	0.6042
0.6375	0.6708	0.7042	0.7333	0.7500
0.7667	0.7833	0.8000	0.8167	0.8333
0.8500	0.8667	0.8833	0.9000	0.9167
0.9333	0.9500	0.9667	0.9833	1.0000

Transect ROW_26m
Area:

0.0003	0.0013	0.0030	0.0053	0.0083
0.0120	0.0164	0.0214	0.0270	0.0334
0.0404	0.0481	0.0564	0.0654	0.0751
0.0854	0.0964	0.1081	0.1205	0.1335
0.1472	0.1615	0.1765	0.1922	0.2086
0.2261	0.2453	0.2663	0.2888	0.3123
0.3369	0.3625	0.3892	0.4168	0.4456
0.4753	0.5061	0.5379	0.5707	0.6046
0.6395	0.6754	0.7124	0.7504	0.7894
0.8295	0.8705	0.9127	0.9558	1.0000

Hrad:

0.0209	0.0418	0.0627	0.0836	0.1045
0.1254	0.1463	0.1672	0.1880	0.2089
0.2298	0.2507	0.2716	0.2925	0.3134
0.3343	0.3552	0.3761	0.3970	0.4179
0.4388	0.4597	0.4806	0.5015	0.5223
0.5421	0.5589	0.5735	0.5992	0.6295
0.6579	0.6846	0.7097	0.7334	0.7558
0.7771	0.7974	0.8167	0.8352	0.8529
0.8699	0.8863	0.9021	0.9173	0.9321
0.9464	0.9604	0.9739	0.9871	1.0000

Width:

0.0149	0.0299	0.0448	0.0597	0.0747
0.0896	0.1045	0.1195	0.1344	0.1493
0.1643	0.1792	0.1941	0.2090	0.2240
0.2389	0.2538	0.2688	0.2837	0.2986
0.3136	0.3285	0.3434	0.3584	0.3733
0.4113	0.4493	0.4873	0.5154	0.5385
0.5615	0.5846	0.6077	0.6308	0.6538
0.6769	0.7000	0.7231	0.7462	0.7692
0.7923	0.8154	0.8385	0.8615	0.8846
0.9077	0.9308	0.9538	0.9769	1.0000

Transect Upstream1
Area:

0.0025	0.0106	0.0203	0.0306	0.0413
0.0526	0.0643	0.0765	0.0889	0.1016
0.1146	0.1277	0.1411	0.1547	0.1685
0.1826	0.1968	0.2113	0.2260	0.2410
0.2562	0.2716	0.2875	0.3036	0.3201
0.3370	0.3541	0.3718	0.3916	0.4132
0.4352	0.4574	0.4798	0.5024	0.5256
0.5499	0.5749	0.6004	0.6263	0.6529
0.6803	0.7086	0.7388	0.7719	0.8061
0.8411	0.8773	0.9158	0.9566	1.0000

Hrad:

0.0236	0.0542	0.0978	0.1394	0.1791
0.2172	0.2558	0.2953	0.3343	0.3743
0.4135	0.4519	0.4897	0.5268	0.5632
0.5991	0.6344	0.6691	0.7034	0.7372
0.7686	0.7966	0.8243	0.8517	0.8789
0.9059	0.9305	0.9395	0.8568	0.8707
0.9044	0.9376	0.9705	1.0029	1.0032
1.0093	1.0327	1.0560	1.0792	1.0918
1.1023	1.1020	1.0403	1.0362	1.0565
1.0711	1.0710	1.0500	1.0287	1.0000

Width:

0.1112	0.2068	0.2183	0.2299	0.2414
0.2530	0.2625	0.2696	0.2763	0.2812
0.2861	0.2910	0.2959	0.3008	0.3057
0.3106	0.3155	0.3204	0.3253	0.3301
0.3360	0.3434	0.3508	0.3582	0.3656
0.3731	0.3815	0.3971	0.4616	0.4787
0.4839	0.4890	0.4941	0.4992	0.5218
0.5423	0.5531	0.5639	0.5747	0.5916
0.6102	0.6359	0.7052	0.7403	0.7577
0.7795	0.8137	0.8682	0.9276	1.0000

Transect Upstream2
Area:

0.0010	0.0033	0.0061	0.0095	0.0135
0.0180	0.0231	0.0287	0.0349	0.0417
0.0491	0.0571	0.0658	0.0753	0.0857
0.0969	0.1089	0.1216	0.1350	0.1491
0.1643	0.1807	0.1983	0.2174	0.2378
0.2598	0.2837	0.3085	0.3337	0.3593
0.3851	0.4112	0.4375	0.4641	0.4910
0.5185	0.5468	0.5756	0.6049	0.6346
0.6647	0.6958	0.7278	0.7609	0.7954
0.8324	0.8717	0.9124	0.9551	1.0000

Hrad:

0.0245	0.0622	0.0947	0.1245	0.1527
0.1802	0.2071	0.2329	0.2579	0.2827
0.3074	0.3275	0.3469	0.3639	0.3812
0.4022	0.4237	0.4479	0.4730	0.4917
0.5021	0.5129	0.5218	0.5312	0.5437
0.5471	0.5612	0.5918	0.6316	0.6711
0.7100	0.7484	0.7864	0.8238	0.8538
0.8769	0.9017	0.9331	0.9642	0.9950
1.0193	1.0315	1.0445	1.0569	1.0476
1.0094	1.0241	1.0243	1.0266	1.0000

Width:

0.0422	0.0543	0.0664	0.0785	0.0905
0.1024	0.1141	0.1261	0.1385	0.1508
0.1631	0.1781	0.1939	0.2117	0.2302
0.2467	0.2633	0.2781	0.2924	0.3107
0.3356	0.3615	0.3904	0.4208	0.4502
0.4893	0.5205	0.5353	0.5411	0.5466
0.5522	0.5577	0.5632	0.5687	0.5793
0.5947	0.6089	0.6182	0.6274	0.6366
0.6500	0.6718	0.6936	0.7162	0.7558
0.8227	0.8489	0.8887	0.9286	1.0000

Transect Upstream3
Area:

0.0006	0.0023	0.0050	0.0083	0.0121
0.0165	0.0214	0.0269	0.0329	0.0397
0.0479	0.0574	0.0681	0.0800	0.0928
0.1066	0.1211	0.1370	0.1537	0.1724
0.1916	0.2112	0.2310	0.2512	0.2719
0.2933	0.3154	0.3379	0.3607	0.3838
0.4072	0.4308	0.4548	0.4792	0.5043
0.5302	0.5566	0.5834	0.6106	0.6382
0.6665	0.6955	0.7273	0.7625	0.7988
0.8362	0.8744	0.9141	0.9558	1.0000

Hrad:

0.0253	0.0506	0.0845	0.1172	0.1476
0.1766	0.2047	0.2322	0.2591	0.2672
0.2667	0.2864	0.3020	0.3243	0.3504
0.3762	0.4018	0.4273	0.4351	0.4545
0.4946	0.5339	0.5724	0.6101	0.6377
0.6626	0.6916	0.7293	0.7664	0.8029
0.8390	0.8746	0.9096	0.9307	0.9485
0.9716	1.0018	1.0317	1.0613	1.0906
1.1067	1.1229	1.0191	1.0199	1.0379
1.0594	1.0820	1.0709	1.0785	1.0000

Width:

0.0239	0.0478	0.0617	0.0733	0.0849
0.0965	0.1081	0.1196	0.1312	0.1535
0.1863	0.2081	0.2344	0.2566	0.2757
0.2950	0.3144	0.3339	0.3682	0.3946
0.4014	0.4082	0.4149	0.4217	0.4354
0.4510	0.4634	0.4693	0.4752	0.4811
0.4870	0.4929	0.4988	0.5128	0.5290
0.5420	0.5507	0.5594	0.5681	0.5768
0.5931	0.6096	0.7080	0.7423	0.7640
0.7831	0.8014	0.8479	0.8809	1.0000

Transect Upstream4
Area:

0.0018	0.0046	0.0083	0.0128	0.0180
0.0238	0.0302	0.0371	0.0448	0.0547
0.0662	0.0782	0.0907	0.1038	0.1174
0.1319	0.1472	0.1638	0.1825	0.2018
0.2212	0.2408	0.2608	0.2810	0.3017
0.3227	0.3453	0.3685	0.3919	0.4155
0.4393	0.4633	0.4875	0.5118	0.5364
0.5615	0.5871	0.6133	0.6408	0.6690
0.6977	0.7269	0.7568	0.7876	0.8192
0.8516	0.8851	0.9205	0.9583	1.0000

Hrad:

0.0356	0.0671	0.0952	0.1219	0.1526
0.1825	0.2111	0.2388	0.2457	0.2281
0.2626	0.2959	0.3290	0.3614	0.3872
0.4105	0.4302	0.4402	0.4405	0.4805
0.5198	0.5573	0.5905	0.6232	0.6553
0.6869	0.6742	0.7110	0.7474	0.7833
0.8187	0.8537	0.8883	0.9224	0.9509
0.9733	0.9956	1.0049	1.0036	1.0287
1.0536	1.0784	1.0896	1.1008	1.1169
1.1330	1.1274	1.1025	1.0707	1.0000

Width:

0.0541	0.0732	0.0923	0.1110	0.1246
0.1374	0.1502	0.1630	0.1916	0.2527
0.2652	0.2777	0.2895	0.3012	0.3179
0.3368	0.3586	0.3902	0.4339	0.4377
0.4416	0.4466	0.4547	0.4628	0.4709
0.4791	0.5224	0.5268	0.5312	0.5356
0.5400	0.5444	0.5488	0.5532	0.5611
0.5729	0.5847	0.6049	0.6332	0.6440
0.6548	0.6656	0.6857	0.7062	0.7236
0.7412	0.7753	0.8268	0.8894	1.0000

Transect Upstream5
Area:

0.0012	0.0039	0.0075	0.0122	0.0185
0.0256	0.0332	0.0413	0.0500	0.0592
0.0689	0.0792	0.0900	0.1012	0.1130
0.1251	0.1375	0.1502	0.1632	0.1765
0.1902	0.2041	0.2184	0.2330	0.2480
0.2635	0.2798	0.2968	0.3145	0.3331
0.3525	0.3727	0.3942	0.4178	0.4431
0.4698	0.4988	0.5309	0.5639	0.5984
0.6349	0.6722	0.7101	0.7485	0.7872
0.8265	0.8666	0.9084	0.9530	1.0000

Hrad:

0.0281	0.0626	0.0927	0.1114	0.1369
0.1752	0.2115	0.2463	0.2799	0.3124
0.3424	0.3719	0.4068	0.4379	0.4694
0.5056	0.5411	0.5759	0.6102	0.6439
0.6771	0.7099	0.7421	0.7699	0.7956
0.8104	0.8232	0.8370	0.8495	0.8616
0.8746	0.8886	0.8484	0.8428	0.8418
0.8363	0.8155	0.8068	0.8309	0.8203
0.8497	0.8801	0.9176	0.9547	0.9913
1.0230	1.0475	1.0267	1.0168	1.0000

Width:

0.0449	0.0640	0.0831	0.1124	0.1386
0.1495	0.1603	0.1712	0.1820	0.1929
0.2048	0.2146	0.2243	0.2341	0.2433
0.2496	0.2559	0.2622	0.2684	0.2747
0.2810	0.2873	0.2936	0.3016	0.3105
0.3241	0.3390	0.3539	0.3698	0.3865
0.4032	0.4199	0.4663	0.4984	0.5298
0.5663	0.6178	0.6645	0.6844	0.7354
0.7522	0.7679	0.7768	0.7857	0.7946
0.8074	0.8259	0.8838	0.9366	1.0000

Transect Upstream6
Area:

0.0020	0.0057	0.0101	0.0154	0.0216
0.0285	0.0362	0.0446	0.0534	0.0628
0.0726	0.0829	0.0939	0.1054	0.1174
0.1299	0.1429	0.1564	0.1705	0.1850
0.2000	0.2153	0.2310	0.2472	0.2637
0.2808	0.2986	0.3172	0.3364	0.3564
0.3786	0.4016	0.4255	0.4503	0.4760
0.5026	0.5304	0.5593	0.5897	0.6214
0.6541	0.6875	0.7215	0.7561	0.7915
0.8280	0.8671	0.9077	0.9506	1.0000

Hrad:

0.0333	0.0728	0.1080	0.1404	0.1714
0.2022	0.2321	0.2687	0.3047	0.3396
0.3717	0.4020	0.4318	0.4612	0.4948
0.5246	0.5534	0.5820	0.6106	0.6442
0.6773	0.7100	0.7423	0.7742	0.8057
0.8224	0.8398	0.8578	0.8777	0.8995
0.8582	0.8792	0.8979	0.9152	0.9365
0.9490	0.9612	0.9727	0.9697	0.9916
1.0145	1.0496	1.0816	1.1092	1.1367
1.1540	1.1196	1.1309	1.0883	1.0000

Width:

0.0616	0.0785	0.0947	0.1108	0.1267

0.1418	0.1569	0.1666	0.1758	0.1850
0.1952	0.2062	0.2171	0.2280	0.2365
0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/02/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	7.188	86.049
Evaporation Loss	0.000	0.000
Infiltration Loss	2.117	25.342
Surface Runoff	4.989	59.732
Final Storage	0.087	1.038
Continuity Error (%)	-0.072	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.989	49.893
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.050	0.503
External Outflow	4.007	40.069
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.117	1.167
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.916	9.160
Continuity Error (%)	0.002	

****
Highest Continuity Errors
****
Node J19 (-2.40%)
Node J36 (2.40%)
Node J20 (2.34%)
Node 514_(C-STRM) (2.12%)
Node J46 (-1.77%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL16 (7)
Link OL12 (7)
Link OL9 (6)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.30 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.94 %
0.871 - 0.758 sec	:	0.01 %
0.758 - 0.660 sec	:	0.02 %
0.660 - 0.574 sec	:	0.01 %
0.574 - 0.500 sec	:	0.03 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	86.05	0.00	0.00	67.65	16.02	4.25	17.07	0.59	0.20	0.198
A18	86.05	0.00	0.00	29.63	33.10	29.41	55.89	0.33	0.28	0.650
A19	86.05	0.00	0.00	38.95	18.89	31.69	46.80	0.52	0.33	0.544
A20	86.05	0.00	0.00	68.61	7.08	10.51	16.17	0.78	0.21	0.188
NULL3	86.05	0.00	0.00	8.91	70.50	19.56	75.95	0.43	0.33	0.883
S1	86.05	0.00	0.00	18.72	56.14	49.54	66.39	4.33	3.64	0.772
S1_1	86.05	0.00	0.00	14.46	60.44	22.25	70.60	0.09	0.07	0.821
S1_2	86.05	0.00	0.00	14.44	60.44	22.27	70.62	0.08	0.07	0.821
S1_4	86.05	0.00	0.00	14.48	60.44	22.24	70.59	0.13	0.11	0.820
S1_5	86.05	0.00	0.00	14.46	60.44	22.25	70.60	0.08	0.06	0.820
S10_1	86.05	0.00	0.00	19.77	54.37	49.05	65.37	1.21	1.02	0.760
S10_2	86.05	0.00	0.00	19.77	54.37	49.05	65.37	1.39	1.17	0.760
S10_4	86.05	0.00	0.00	19.77	54.37	49.05	65.37	0.47	0.40	0.760
S10_5	86.05	0.00	0.00	19.77	54.37	49.05	65.37	0.82	0.70	0.760
S11	86.05	0.00	0.00	53.26	0.00	32.80	32.80	1.08	0.40	0.381
S12	86.05	0.00	0.00	14.48	60.44	22.23	70.58	0.31	0.25	0.820
S14_1	86.05	0.00	0.00	14.50	60.44	22.20	70.55	0.42	0.35	0.820
S14_3	86.05	0.00	0.00	14.58	60.43	22.12	70.46	0.75	0.61	0.819
S14_4	86.05	0.00	0.00	14.51	60.44	22.20	70.55	0.21	0.17	0.820
S14_5	86.05	0.00	0.00	14.57	60.43	22.14	70.48	1.19	0.97	0.819
S14_6	86.05	0.00	0.00	14.52	60.44	22.19	70.53	0.20	0.17	0.820
S14_7	86.05	0.00	0.00	14.54	60.43	22.17	70.51	0.83	0.68	0.819
S14_8	86.05	0.00	0.00	14.53	60.43	22.18	70.53	0.24	0.19	0.820
S15	86.05	0.00	0.00	19.77	54.37	49.05	65.37	1.07	0.90	0.760
S16	86.05	0.00	0.00	0.00	84.32	0.00	84.32	1.24	0.42	0.980
S17	86.05	0.00	0.00	65.70	2.82	20.30	20.30	1.27	0.23	0.236
S18_2	86.05	0.00	0.00	19.77	54.37	49.05	65.37	2.19	1.85	0.760
S18_3	86.05	0.00	0.00	19.77	54.37	49.05	65.37	1.08	0.91	0.760
S18_4	86.05	0.00	0.00	19.77	54.37	49.05	65.37	0.57	0.48	0.760
S18_5	86.05	0.00	0.00	16.15	60.41	50.76	68.88	1.26	1.04	0.800
S18_6	86.05	0.00	0.00	19.77	54.37	49.05	65.37	0.55	0.46	0.760
S19	86.05	0.00	0.00	14.55	60.43	22.15	70.49	0.74	0.61	0.819
S2	86.05	0.00	0.00	18.47	56.56	49.66	66.63	2.48	2.08	0.774
S20_1	86.05	0.00	0.00	14.47	60.44	22.24	70.60	0.35	0.29	0.820
S20_2	86.05	0.00	0.00	14.42	60.41	22.29	70.62	0.16	0.13	0.821
S3	86.05	0.00	0.00	19.77	54.37	49.05	65.37	1.62	1.37	0.760
S32	86.05	0.00	0.00	14.48	60.44	22.23	70.59	0.29	0.24	0.820
S36	86.05	0.00	0.00	0.00	84.33	0.00	84.33	1.53	0.52	0.980
S4	86.05	0.00	0.00	7.10	72.42	5.20	77.62	10.26	6.54	0.902
S5	86.05	0.00	0.00	6.76	72.45	5.54	77.99	2.49	1.77	0.906
S6	86.05	0.00	0.00	20.92	48.35	25.68	64.36	0.22	0.19	0.748
S7	86.05	0.00	0.00	6.83	72.44	5.47	77.91	3.10	2.17	0.905
S8	86.05	0.00	0.00	37.14	30.20	48.39	48.39	0.93	0.39	0.562

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.21	104.60	0 01:10	0.21
EXD_10	JUNCTION	0.05	0.46	99.11	0 01:22	0.46
EXD_11	JUNCTION	0.04	0.33	98.83	0 01:22	0.33
EXD_12	JUNCTION	0.06	0.49	98.79	0 01:21	0.49
EXD_13	JUNCTION	0.01	0.22	104.54	0 01:11	0.22
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.04	0.49	100.76	0 01:10	0.49
EXD_16	JUNCTION	0.03	0.20	100.40	0 01:12	0.20
EXD_17	JUNCTION	0.03	0.19	100.08	0 01:08	0.19
EXD_18	JUNCTION	0.02	0.28	99.68	0 01:21	0.28
EXD_19	JUNCTION	0.04	0.48	99.67	0 01:20	0.48
EXD_2	JUNCTION	0.03	0.32	103.79	0 01:12	0.32
EXD_20	JUNCTION	0.05	0.48	99.67	0 01:20	0.48
EXD_21	JUNCTION	0.04	0.33	99.51	0 01:20	0.33
EXD_22	JUNCTION	0.03	0.22	99.36	0 01:22	0.22
EXD_23	JUNCTION	0.05	0.34	99.08	0 01:26	0.34
EXD_24	JUNCTION	0.02	0.31	98.98	0 01:24	0.31
EXD_25	JUNCTION	0.05	0.45	98.97	0 01:24	0.44
EXD_26	JUNCTION	0.02	0.22	98.71	0 01:25	0.22
EXD_27	JUNCTION	0.05	0.40	98.56	0 01:21	0.40
EXD_3	JUNCTION	0.01	0.18	103.37	0 01:13	0.18
EXD_4	JUNCTION	0.01	0.18	102.82	0 01:14	0.18
EXD_5	JUNCTION	0.01	0.30	102.80	0 01:14	0.30
EXD_6	JUNCTION	0.01	0.17	102.49	0 01:15	0.17
EXD_7	JUNCTION	0.02	0.22	101.72	0 01:19	0.22
EXD_8	JUNCTION	0.04	0.54	101.03	0 01:32	0.54
EXD_9	JUNCTION	0.02	0.20	100.58	0 01:35	0.20
J10	JUNCTION	0.00	0.20	103.80	0 01:11	0.20
J11	JUNCTION	0.00	0.23	103.73	0 01:12	0.23
J12	JUNCTION	0.00	0.25	103.65	0 01:19	0.25
J13	JUNCTION	0.01	0.37	103.67	0 01:17	0.37
J17	JUNCTION	0.01	0.21	104.58	0 01:10	0.21
J19	JUNCTION	0.00	0.14	105.54	0 01:10	0.14
J20	JUNCTION	0.00	0.11	105.56	0 01:10	0.11
J21	JUNCTION	0.00	0.09	105.64	0 01:10	0.09
J22	JUNCTION	0.00	0.09	105.79	0 01:16	0.09
J23	JUNCTION	0.00	0.09	106.09	0 01:13	0.09
J24	JUNCTION	0.00	0.08	106.28	0 01:12	0.08
J25	JUNCTION	0.01	0.23	105.53	0 01:14	0.23
J26	JUNCTION	0.01	0.25	105.95	0 01:13	0.25
J28	JUNCTION	0.00	0.13	105.13	0 01:10	0.13
J29	JUNCTION	0.00	0.19	108.99	0 01:11	0.19
J32	JUNCTION	0.00	0.22	106.22	0 01:12	0.22
J36	JUNCTION	0.00	0.20	104.90	0 01:15	0.20
J39	JUNCTION	0.01	0.29	104.89	0 01:17	0.29
J40	JUNCTION	0.01	0.29	104.74	0 01:17	0.29
J41	JUNCTION	0.01	0.37	103.57	0 01:18	0.37
J43	JUNCTION	0.01	0.22	104.42	0 01:17	0.22
J44	JUNCTION	0.00	0.16	104.66	0 01:14	0.16
J46	JUNCTION	0.00	0.10	104.70	0 01:10	0.10
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.14	105.89	0 01:14	0.14
J51	JUNCTION	0.00	0.15	106.90	0 01:13	0.15
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.06	108.53	0 01:11	0.06
J58	JUNCTION	0.00	0.13	108.53	0 01:11	0.13
J59	JUNCTION	0.00	0.13	108.13	0 01:12	0.13
J6	JUNCTION	0.00	0.06	109.89	0 01:10	0.06
J61	JUNCTION	0.00	0.12	107.12	0 01:10	0.12
J62	JUNCTION	0.00	0.16	106.66	0 01:11	0.16
J74	JUNCTION	0.44	1.27	99.72	0 01:35	1.27
J9	JUNCTION	0.00	0.17	103.87	0 01:11	0.17
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.04	0.36	98.36	0 01:22	0.36
ST4_108A_(P-Stm)	OUTFALL	0.22	1.69	99.71	0 01:34	1.69
500_(C-STRM)	STORAGE	0.34	0.72	101.03	0 02:58	0.70
500A_(C-STRM)	STORAGE	0.38	1.00	101.10	0 01:19	1.00

502_(C-STRM)	STORAGE	0.15	1.76	102.30	0	01:27	1.75	
503_(C-STRM)	STORAGE	0.14	1.88	102.46	0	01:27	1.88	
504_(C-STRM)	STORAGE	0.35	1.42	104.45	0	01:31	1.42	
505_(C-STRM)	STORAGE	0.35	1.61	105.06	0	01:30	1.60	
506_(C-STRM)	STORAGE	0.35	1.80	105.62	0	01:30	1.79	
507_(C-STRM)	STORAGE	0.35	1.84	105.98	0	01:30	1.83	
508_(C-STRM)	STORAGE	0.35	1.97	106.34	0	01:30	1.97	
509_(C-STRM)	STORAGE	0.35	2.10	106.70	0	01:31	2.10	
510_(C-STRM)	STORAGE	0.35	2.12	106.97	0	01:30	2.12	
511_(C-STRM)	STORAGE	0.35	2.14	107.05	0	01:30	2.13	
512_(C-STRM)	STORAGE	0.35	2.12	107.23	0	01:30	2.11	
513_(C-STRM)	STORAGE	0.35	2.11	107.35	0	01:30	2.11	
514_(C-STRM)	STORAGE	0.31	1.78	107.36	0	01:30	1.77	
515_(C-STRM)	STORAGE	0.30	1.52	107.37	0	01:30	1.52	
516_(C-STRM)	STORAGE	0.35	2.12	107.57	0	01:29	2.11	
517_(C-STRM)	STORAGE	0.35	2.20	107.81	0	01:29	2.20	
518_(C-STRM)	STORAGE	0.36	2.36	108.21	0	01:28	2.35	
519_(C-STRM)	STORAGE	0.34	2.15	108.22	0	01:23	2.15	
520_(C-STRM)	STORAGE	0.34	2.01	108.35	0	01:23	1.98	
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	01:18	0.61	
525_(C-STRM)	STORAGE	0.12	1.77	102.38	0	01:28	1.77	
528_(C-STRM)	STORAGE	0.10	1.91	102.64	0	01:29	1.91	
532_(C-STRM)	STORAGE	0.09	1.97	102.79	0	01:29	1.97	
536_(C-STRM)	STORAGE	0.08	1.96	102.94	0	01:29	1.96	
540_(C-STRM)	STORAGE	0.37	2.20	103.06	0	01:30	2.20	
541_(C-STRM)	STORAGE	0.37	2.18	103.12	0	01:30	2.18	
551_(C-STRM)	STORAGE	0.36	1.80	102.45	0	01:27	1.80	
552_(C-STRM)	STORAGE	0.35	1.76	102.50	0	01:27	1.76	
553_(C-STRM)	STORAGE	0.35	1.68	102.62	0	01:26	1.68	
554_(C-STRM)	STORAGE	0.34	1.65	102.70	0	01:26	1.64	
555_(C-STRM)	STORAGE	0.34	1.63	102.87	0	01:26	1.63	
556_(C-STRM)	STORAGE	0.34	1.69	103.06	0	01:25	1.68	
601_(C-STRM)	STORAGE	0.17	1.22	101.67	0	01:24	1.22	
602_(C-STRM)	STORAGE	0.17	1.74	102.26	0	01:24	1.74	
603_(C-STRM)	STORAGE	0.14	1.78	102.41	0	01:24	1.78	
604_(C-STRM)	STORAGE	0.12	1.92	102.80	0	01:28	1.92	
605_(C-STRM)	STORAGE	0.11	1.88	102.96	0	01:28	1.88	
606_(C-STRM)	STORAGE	0.12	1.97	103.21	0	01:28	1.97	
619_(C-STRM)	STORAGE	0.12	2.07	103.45	0	01:29	2.07	
622_(C-STRM)	STORAGE	0.12	2.02	103.54	0	01:28	2.02	
626_(C-STRM)	STORAGE	0.31	0.52	104.47	0	01:50	0.52	
627_(C-STRM)	STORAGE	0.33	0.96	104.09	0	01:29	0.96	
629_(C-STRM)	STORAGE	0.12	1.97	103.62	0	01:28	1.97	
630_(C-STRM)	STORAGE	0.12	1.73	103.81	0	01:28	1.73	
630A_(C-STRM)	STORAGE	0.11	1.75	103.87	0	01:28	1.75	
631_(C-STRM)	STORAGE	0.01	0.45	106.45	0	01:21	0.45	
645_(C-STRM)	STORAGE	0.39	2.05	104.08	0	01:26	2.05	
647_(C-STRM)	STORAGE	0.38	2.07	104.21	0	01:26	2.07	
650_(C-STRM)	STORAGE	0.38	2.09	104.31	0	01:26	2.09	
651_(C-STRM)	STORAGE	0.38	2.08	104.39	0	01:25	2.08	
682_(C-STRM)	STORAGE	0.01	0.48	105.88	0	01:20	0.48	
MTD_(C-STRM)	STORAGE	0.23	1.62	101.99	0	01:28	1.62	
OVERFLOW_(C-STRM)	STORAGE	0.33	0.98	101.15	0	01:19	0.98	
POND_(C-STRM)	STORAGE	1.91	2.53	101.98	0	02:13	2.53	
S_525-MTD	STORAGE	0.01	0.37	103.67	0	01:17	0.37	
S_528-525	STORAGE	0.00	0.25	103.66	0	01:14	0.25	
S_532-528	STORAGE	0.00	0.24	103.74	0	01:12	0.24	
S_536-532	STORAGE	0.00	0.28	103.88	0	01:10	0.28	
S_540-536	STORAGE	0.00	0.23	103.94	0	01:10	0.23	
S_541-540	STORAGE	0.00	0.25	104.06	0	01:12	0.25	
S_604-603	STORAGE	0.00	0.22	105.12	0	01:12	0.22	
S_605-604	STORAGE	0.01	0.29	107.00	0	01:14	0.29	
S_619-606	STORAGE	0.00	0.27	106.77	0	01:11	0.27	
S_622-619	STORAGE	0.01	0.29	105.99	0	01:13	0.29	
S_622-619_2	STORAGE	0.01	0.28	106.78	0	01:11	0.28	
S_627-630	STORAGE	0.00	0.17	106.87	0	01:10	0.17	
S_629-622	STORAGE	0.00	0.22	106.23	0	01:12	0.22	
SU2	STORAGE	0.02	0.43	107.18	0	01:55	0.43	
SU5	STORAGE	0.01	0.29	104.47	0	01:38	0.29	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.248	0	01:10	0	0.307	- 0.040
EXD_10	JUNCTION	0.943	0.960	0	01:20	2.77	4.33	- 0.360
EXD_11	JUNCTION	0.000	0.935	0	01:22	0	4.35	0.006
EXD_12	JUNCTION	0.204	1.055	0	01:21	0.591	4.94	0.000
EXD_13	JUNCTION	0.000	0.244	0	01:10	0	0.308	- 0.263
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.215	0.215	0	01:10	0.782	0.782	- 0.001
EXD_16	JUNCTION	0.000	0.131	0	01:10	0	0.782	- 0.046
EXD_17	JUNCTION	0.000	0.128	0	01:12	0	0.782	- 0.081
EXD_18	JUNCTION	0.000	0.143	0	01:09	0	0.784	0.268
EXD_19	JUNCTION	0.000	0.134	0	01:27	0	0.821	- 0.103
EXD_2	JUNCTION	0.000	0.238	0	01:11	0	0.308	0.277
EXD_20	JUNCTION	0.334	0.334	0	01:10	0.518	1.34	- 0.007
EXD_21	JUNCTION	0.000	0.292	0	01:20	0	1.3	- 0.034
EXD_22	JUNCTION	0.000	0.292	0	01:20	0	1.3	- 0.125
EXD_23	JUNCTION	0.000	0.291	0	01:22	0	1.3	0.266
EXD_24	JUNCTION	0.000	0.287	0	01:27	0	1.31	0.061
EXD_25	JUNCTION	0.276	0.362	0	01:25	0.332	1.64	- 0.029
EXD_26	JUNCTION	0.000	0.433	0	01:24	0	1.63	0.064
EXD_27	JUNCTION	0.331	1.464	0	01:20	0.429	7	- 0.016
EXD_3	JUNCTION	0.000	0.217	0	01:12	0	0.307	0.158
EXD_4	JUNCTION	0.000	0.214	0	01:13	0	0.307	0.036
EXD_5	JUNCTION	0.000	0.212	0	01:14	0	0.307	0.010
EXD_6	JUNCTION	0.000	0.211	0	01:15	0	0.307	- 0.560
EXD_7	JUNCTION	0.232	0.413	0	01:16	1.27	1.58	- 0.316
EXD_8	JUNCTION	0.000	0.401	0	01:19	0	1.58	0.460
EXD_9	JUNCTION	0.000	0.307	0	01:32	0	1.58	1.055
J10	JUNCTION	0.000	1.685	0	01:11	0	1.18	0.004
J11	JUNCTION	0.000	1.843	0	01:12	0	1.34	- 0.005
J12	JUNCTION	0.000	2.077	0	01:13	0	1.63	- 0.005
J13	JUNCTION	0.000	2.065	0	01:13	0	1.95	0.124
J17	JUNCTION	0.000	0.247	0	01:10	0	0.307	- 0.041
J19	JUNCTION	0.676	0.784	0	01:10	0.829	0.918	- 2.346
J20	JUNCTION	0.063	0.158	0	01:10	0.0763	0.178	2.394
J21	JUNCTION	0.110	0.131	0	01:10	0.135	0.194	- 0.916
J22	JUNCTION	0.068	0.167	0	01:13	0.0824	0.168	0.052
J23	JUNCTION	0.000	0.156	0	01:12	0	0.0867	1.369
J24	JUNCTION	0.000	0.252	0	01:10	0	0.123	- 0.195
J25	JUNCTION	0.000	3.160	0	01:13	0	2.7	0.232
J26	JUNCTION	0.000	2.598	0	01:13	0	2.25	- 0.025
J28	JUNCTION	0.346	0.346	0	01:10	0.422	0.422	- 3.242
J29	JUNCTION	0.968	1.166	0	01:10	1.19	1.3	0.140
J32	JUNCTION	0.000	2.040	0	01:11	0	1.38	0.043
J36	JUNCTION	0.131	0.651	0	01:10	0.16	0.479	2.460
J39	JUNCTION	0.000	3.163	0	01:16	0	3.01	0.222
J40	JUNCTION	0.287	3.197	0	01:17	0.35	3.33	- 0.095
J41	JUNCTION	0.000	5.760	0	01:17	0	6.2	0.071
J43	JUNCTION	0.000	4.216	0	01:17	0	4.32	- 0.023
J44	JUNCTION	0.171	1.336	0	01:13	0.21	1.59	0.190
J46	JUNCTION	0.240	0.240	0	01:10	0.293	0.301	- 1.742
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.195	1.306	0	01:13	0.238	1.54	- 0.071
J51	JUNCTION	0.000	1.241	0	01:13	0	1.31	0.566
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.017	0	01:08	0	0.00438	12.318
J58	JUNCTION	0.609	1.005	0	01:10	0.749	1.08	0.556
J59	JUNCTION	0.167	0.661	0	01:10	0.204	0.653	1.420
J6	JUNCTION	0.252	0.252	0	01:10	0.307	0.307	- 0.112
J61	JUNCTION	0.677	1.106	0	01:10	0.828	1.29	- 1.214
J62	JUNCTION	0.000	1.019	0	01:10	0	0.678	- 0.429
J74	JUNCTION	0.000	0.495	0	02:13	0	26.7	0.036
J9	JUNCTION	0.000	1.070	0	01:11	0	0.826	0.003
OF1	OUTFALL	0.000	1.269	0	02:13	0	6.16	0.000
OF2	OUTFALL	0.193	0.193	0	01:10	0.22	0.22	0.000
OF3	OUTFALL	0.000	1.457	0	01:22	0	7	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.495	0	02:13	0	26.7	0.000
500_(C-STRM)	STORAGE	0.000	0.216	0	01:20	0	0.68	0.016
500A_(C-STRM)	STORAGE	0.000	8.048	0	01:18	0	15.8	0.040
502_(C-STRM)	STORAGE	0.000	1.399	0	01:27	0	5.29	- 0.000
503_(C-STRM)	STORAGE	0.000	1.068	0	01:32	0	4.16	- 0.003
504_(C-STRM)	STORAGE	0.000	1.011	0	01:30	0	3.95	- 0.116
505_(C-STRM)	STORAGE	0.000	0.808	0	01:30	0	2.78	- 0.019
506_(C-STRM)	STORAGE	0.000	0.813	0	01:30	0	2.79	0.210
507_(C-STRM)	STORAGE	0.000	0.611	0	01:32	0	2.09	- 0.272
508_(C-STRM)	STORAGE	0.000	0.597	0	01:32	0	2.09	0.001
509_(C-STRM)	STORAGE	0.000	0.588	0	01:30	0	2.09	- 0.013
510_(C-STRM)	STORAGE	0.000	0.592	0	01:29	0	2.09	0.037
511_(C-STRM)	STORAGE	0.000	0.596	0	01:29	0	2.09	0.025
512_(C-STRM)	STORAGE	0.000	0.542	0	01:26	0	1.92	- 0.050
513_(C-STRM)	STORAGE	0.000	0.598	0	01:06	0	1.97	0.264
514_(C-STRM)	STORAGE	0.000	0.072	0	01:08	0	0.0689	2.164
515_(C-STRM)	STORAGE	0.000	0.037	0	01:10	0	0.0146	- 6.834
516_(C-STRM)	STORAGE	0.000	0.396	0	01:07	0	1.29	- 0.801
517_(C-STRM)	STORAGE	0.000	0.416	0	01:07	0	1.29	- 0.040
518_(C-STRM)	STORAGE	0.000	0.440	0	01:03	0	1.29	0.351
519_(C-STRM)	STORAGE	0.000	0.127	0	01:01	0	0.317	- 1.296
520_(C-STRM)	STORAGE	0.000	0.121	0	01:00	0	0.32	1.047
522_(C-STRM)	STORAGE	0.000	0.088	0	01:00	0	0.221	0.019
525_(C-STRM)	STORAGE	0.000	1.264	0	01:44	0	4.84	0.061
528_(C-STRM)	STORAGE	0.000	1.053	0	01:44	0	4.03	- 0.003
532_(C-STRM)	STORAGE	0.000	0.841	0	01:43	0	3.23	- 0.080
536_(C-STRM)	STORAGE	0.000	0.731	0	01:43	0	2.84	0.067
540_(C-STRM)	STORAGE	0.000	0.497	0	01:44	0	1.94	- 0.005
541_(C-STRM)	STORAGE	0.000	0.368	0	01:01	0	1.53	0.031
551_(C-STRM)	STORAGE	0.000	0.348	0	01:26	0	1.14	0.454
552_(C-STRM)	STORAGE	0.000	0.249	0	01:26	0	0.74	- 0.432
553_(C-STRM)	STORAGE	0.000	0.252	0	01:26	0	0.742	0.272
554_(C-STRM)	STORAGE	0.000	0.215	0	01:06	0	0.593	- 0.737
555_(C-STRM)	STORAGE	0.000	0.217	0	01:01	0	0.594	0.075
556_(C-STRM)	STORAGE	0.000	0.214	0	01:00	0	0.596	0.264
601_(C-STRM)	STORAGE	0.000	5.326	0	01:24	0	22.1	0.057
602_(C-STRM)	STORAGE	0.000	5.327	0	01:24	0	22.1	- 0.000
603_(C-STRM)	STORAGE	0.000	5.276	0	01:30	0	21.8	0.001

604_(C-STRM)	STORAGE	0.000	5.275	0	01:29	0	21.8	-	0.003
605_(C-STRM)	STORAGE	0.000	4.981	0	01:29	0	20.8	-	0.001
606_(C-STRM)	STORAGE	0.000	4.238	0	01:29	0	17.9	-	0.001
619_(C-STRM)	STORAGE	0.000	4.238	0	01:27	0	17.9		0.002
622_(C-STRM)	STORAGE	0.000	4.006	0	01:27	0	17.1		0.001
626_(C-STRM)	STORAGE	0.000	0.141	0	01:06	0	1.08	-	0.249
627_(C-STRM)	STORAGE	0.000	0.238	0	01:13	0	1.38		0.378
629_(C-STRM)	STORAGE	0.000	3.457	0	01:26	0	14.9	-	0.111
630_(C-STRM)	STORAGE	0.000	3.324	0	01:26	0	14.5		0.151
630A_(C-STRM)	STORAGE	0.000	3.086	0	01:26	0	13.1		0.065
631_(C-STRM)	STORAGE	6.541	6.541	0	01:10	10.3	10.3	-	0.047
645_(C-STRM)	STORAGE	0.000	0.750	0	01:53	0	2.82	-	0.025
647_(C-STRM)	STORAGE	0.000	0.668	0	01:53	0	2.71	-	0.023
650_(C-STRM)	STORAGE	0.000	0.581	0	01:53	0	2.62	-	0.074
651_(C-STRM)	STORAGE	0.000	0.544	0	01:00	0	2.54		0.047
682_(C-STRM)	STORAGE	1.770	1.770	0	01:10	2.49	2.49	-	0.027
MTD_(C-STRM)	STORAGE	0.000	2.623	0	01:27	0	10.1	-	0.054
OVERFLOW_(C-STRM)	STORAGE	0.000	2.623	0	01:28	0	10.1		0.009
POND_(C-STRM)	STORAGE	2.721	14.537	0	01:19	3.61	42.2	-	0.035
S_525-MTD	STORAGE	0.903	0.903	0	01:10	1.07	1.13	-	0.002
S_528-525	STORAGE	0.914	0.914	0	01:10	1.08	1.08	-	0.006
S_532-528	STORAGE	0.463	0.497	0	01:09	0.549	0.549	-	0.005
S_536-532	STORAGE	1.043	1.043	0	01:10	1.26	1.26	-	0.007
S_540-536	STORAGE	0.483	0.483	0	01:10	0.572	0.572	-	0.006
S_541-540	STORAGE	1.849	1.849	0	01:10	2.19	2.19	-	0.006
S_604-603	STORAGE	1.366	1.366	0	01:10	1.62	1.62	-	0.000
S_605-604	STORAGE	3.638	3.638	0	01:10	4.33	4.33		0.000
S_619-606	STORAGE	1.017	1.017	0	01:10	1.21	1.21	-	0.000
S_622-619	STORAGE	2.079	2.079	0	01:10	2.48	2.48		0.000
S_622-619_2	STORAGE	1.172	1.172	0	01:10	1.39	1.39	-	0.000
S_627-630	STORAGE	0.401	0.401	0	01:10	0.475	0.475	-	0.000
S_629-622	STORAGE	0.695	0.695	0	01:10	0.824	0.824	-	0.000
SU2	STORAGE	0.397	0.397	0	01:10	1.08	1.08		0.000
SU5	STORAGE	0.389	0.389	0	01:12	0.928	0.928	-	0.000

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	12.1	0.0	0.0	0.001	25.4	0 02:58	0.216
500A_(C-STRM)	0.757	33.9	0.0	0.0	2.123	95.0	0 01:19	8.017
502_(C-STRM)	0.000	4.0	0.0	0.0	0.002	47.5	0 01:27	1.398
503_(C-STRM)	0.000	3.4	0.0	0.0	0.002	47.9	0 01:27	1.069
504_(C-STRM)	0.000	13.0	0.0	0.0	0.002	52.5	0 01:31	1.008
505_(C-STRM)	0.000	10.7	0.0	0.0	0.002	49.3	0 01:30	0.804
506_(C-STRM)	0.000	11.1	0.0	0.0	0.002	56.8	0 01:30	0.808
507_(C-STRM)	0.000	11.2	0.0	0.0	0.002	59.4	0 01:30	0.630
508_(C-STRM)	0.000	11.2	0.0	0.0	0.002	63.1	0 01:30	0.611
509_(C-STRM)	0.000	11.2	0.0	0.0	0.002	66.8	0 01:31	0.597
510_(C-STRM)	0.000	11.4	0.0	0.0	0.002	68.8	0 01:30	0.588
511_(C-STRM)	0.000	11.4	0.0	0.0	0.002	69.5	0 01:30	0.592
512_(C-STRM)	0.000	11.2	0.0	0.0	0.002	68.0	0 01:30	0.537
513_(C-STRM)	0.000	11.1	0.0	0.0	0.002	67.2	0 01:30	0.565
514_(C-STRM)	0.000	9.9	0.0	0.0	0.002	56.3	0 01:30	0.073
515_(C-STRM)	0.000	9.4	0.0	0.0	0.002	46.9	0 01:30	0.032
516_(C-STRM)	0.000	11.4	0.0	0.0	0.002	69.3	0 01:29	0.383
517_(C-STRM)	0.000	11.7	0.0	0.0	0.002	72.6	0 01:29	0.396
518_(C-STRM)	0.000	12.3	0.0	0.0	0.003	80.7	0 01:28	0.416
519_(C-STRM)	0.000	12.1	0.0	0.0	0.002	76.1	0 01:23	0.144
520_(C-STRM)	0.000	12.7	0.0	0.0	0.002	75.5	0 01:23	0.119
522_(C-STRM)	0.000	10.4	0.0	0.0	0.001	20.3	0 01:18	0.088
525_(C-STRM)	0.000	4.5	0.0	0.0	0.002	65.7	0 01:28	1.273
528_(C-STRM)	0.000	3.6	0.0	0.0	0.002	71.3	0 01:29	1.061
532_(C-STRM)	0.000	3.2	0.0	0.0	0.002	73.5	0 01:29	0.848
536_(C-STRM)	0.000	3.2	0.0	0.0	0.002	74.7	0 01:29	0.737
540_(C-STRM)	0.000	13.1	0.0	0.0	0.002	77.3	0 01:30	0.534
541_(C-STRM)	0.000	12.8	0.0	0.0	0.002	75.5	0 01:30	0.393
551_(C-STRM)	0.000	9.5	0.0	0.0	0.002	47.7	0 01:27	0.346
552_(C-STRM)	0.000	9.0	0.0	0.0	0.002	45.3	0 01:27	0.247
553_(C-STRM)	0.000	9.2	0.0	0.0	0.002	44.5	0 01:26	0.249
554_(C-STRM)	0.000	8.7	0.0	0.0	0.002	42.3	0 01:26	0.206
555_(C-STRM)	0.000	8.6	0.0	0.0	0.002	41.4	0 01:26	0.215
556_(C-STRM)	0.000	8.7	0.0	0.0	0.002	43.5	0 01:25	0.217
601_(C-STRM)	0.000	3.9	0.0	0.0	0.001	27.5	0 01:24	5.325
602_(C-STRM)	0.000	4.1	0.0	0.0	0.002	42.3	0 01:24	5.326
603_(C-STRM)	0.000	3.5	0.0	0.0	0.002	45.7	0 01:24	5.277
604_(C-STRM)	0.000	2.5	0.0	0.0	0.002	39.4	0 01:28	5.276
605_(C-STRM)	0.000	2.0	0.0	0.0	0.002	33.4	0 01:28	4.981
606_(C-STRM)	0.000	2.1	0.0	0.0	0.002	34.3	0 01:28	4.238
619_(C-STRM)	0.000	2.5	0.0	0.0	0.002	40.3	0 01:29	4.238
622_(C-STRM)	0.000	2.7	0.0	0.0	0.002	45.0	0 01:28	4.005
626_(C-STRM)	0.000	9.3	0.0	0.0	0.001	15.8	0 01:50	0.141
627_(C-STRM)	0.000	9.1	0.0	0.0	0.001	27.0	0 01:29	0.241
629_(C-STRM)	0.000	2.7	0.0	0.0	0.002	44.2	0 01:28	3.455
630_(C-STRM)	0.000	2.8	0.0	0.0	0.002	42.0	0 01:28	3.323
630A_(C-STRM)	0.000	2.8	0.0	0.0	0.002	44.9	0 01:28	3.086
631_(C-STRM)	0.049	2.0	0.0	0.0	2.259	90.4	0 01:21	2.438
645_(C-STRM)	0.000	10.4	0.0	0.0	0.002	55.5	0 01:26	0.826
647_(C-STRM)	0.000	11.2	0.0	0.0	0.002	60.9	0 01:26	0.746
650_(C-STRM)	0.000	11.9	0.0	0.0	0.002	65.4	0 01:26	0.662
651_(C-STRM)	0.000	12.5	0.0	0.0	0.002	68.7	0 01:25	0.578
682_(C-STRM)	0.018	2.4	0.0	0.0	0.723	96.4	0 01:20	0.526
MTD_(C-STRM)	0.000	7.1	0.0	0.0	0.002	50.7	0 01:28	2.623
OVERFLOW_(C-STRM)	0.000	11.8	0.0	0.0	0.001	35.3	0 01:19	2.627
POND_(C-STRM)	19.347	53.4	0.0	0.0	33.234	91.7	0 02:13	1.813
S_525-MTD	0.007	1.3	0.0	0.0	0.420	73.3	0 01:17	0.553
S_528-525	0.006	1.0	0.0	0.0	0.292	50.4	0 01:14	0.578
S_532-528	0.002	0.8	0.0	0.0	0.139	47.3	0 01:12	0.334
S_536-532	0.004	0.9	0.0	0.0	0.242	56.6	0 01:10	0.887
S_540-536	0.002	0.9	0.0	0.0	0.096	46.8	0 01:10	0.455
S_541-540	0.012	1.0	0.0	0.0	0.577	49.2	0 01:12	1.159
S_604-603	0.007	0.8	0.0	8.5	0.389	44.9	0 01:12	0.931
S_605-604	0.027	1.2	0.0	9.6	1.303	57.1	0 01:14	1.757
S_619-606	0.004	0.9	0.0	8.6	0.235	54.6	0 01:11	0.853
S_622-619	0.017	1.3	0.0	10.1	0.750	57.6	0 01:13	1.054
S_622-619_2	0.005	1.0	0.0	8.6	0.283	57.0	0 01:11	0.965
S_627-630	0.001	0.6	0.0	12.1	0.085	33.6	0 01:10	0.355
S_629-622	0.004	0.8	0.0	10.2	0.193	43.8	0 01:12	0.437
SU2	0.024	4.8	0.0	0.0	0.428	85.5	0 01:55	0.141
SU5	0.011	2.1	0.0	0.0	0.291	58.3	0 01:38	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	12.98	0.549	1.269	6.159
OF2	13.00	0.020	0.193	0.220
OF3	98.82	0.082	1.457	6.998
ST4_108A_(P-Stm)	98.98	0.312	0.495	26.692
System	55.95	0.963	2.394	40.069

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.131	0 01:10	1.31	1.95	0.75
BDR-C2	CONDUIT	0.292	0 01:20	2.44	5.58	0.91
BDR-C3	CONDUIT	0.433	0 01:24	3.14	2.22	0.67
BDR-C4	CONDUIT	1.055	0 01:21	2.79	0.35	0.37
C1_1	CHANNEL	1.884	0 01:12	1.09	0.71	0.93
C1_17	CHANNEL	0.160	0 01:10	1.19	0.01	0.21
C1_3	CHANNEL	0.199	0 01:10	0.30	0.08	0.52
C1_30	CHANNEL	2.584	0 01:14	1.41	0.97	0.95
C1_4	CHANNEL	3.120	0 01:14	1.68	0.79	0.96
C14_1	CHANNEL	0.110	0 01:10	0.65	0.09	0.49
C14_2	CHANNEL	0.147	0 01:13	0.68	0.06	0.34
C14_4	CHANNEL	0.093	0 01:16	0.41	0.05	0.33
C14_5	CHANNEL	0.096	0 01:10	0.38	0.05	0.39
C15_1	CHANNEL	0.447	0 01:11	0.56	0.18	0.52
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.22
C2	CONDUIT	5.744	0 01:18	2.49	0.63	0.75
C20_1	CHANNEL	0.017	0 01:08	0.10	0.01	0.30
C20_2	CHANNEL	0.549	0 01:12	1.09	0.11	0.39
C20_3	CHANNEL	0.559	0 01:11	0.99	0.11	0.41
C20_4	CHANNEL	0.340	0 01:10	0.74	0.08	0.41
C20_5	CHANNEL	1.240	0 01:14	1.80	0.16	0.46
C20_7	CHANNEL	1.234	0 01:14	1.74	0.15	0.47
C23_5	CHANNEL	1.564	0 01:17	0.76	0.97	1.00
C23_7	CHANNEL	4.205	0 01:18	2.32	0.73	0.95
C3	CONDUIT	1.083	0 01:12	0.97	0.16	0.36
C4	CONDUIT	1.688	0 01:12	1.27	0.20	0.43
C4_1	CHANNEL	0.156	0 01:12	0.84	0.04	0.33
C4_2	CHANNEL	0.993	0 01:11	0.99	0.29	0.75
C4_3	CHANNEL	0.064	0 01:12	0.09	0.04	0.60

C4_4	CHANNEL	0.411	0	01:10	0.84	0.12	0.54
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.23
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	1.863	0	01:13	1.25	0.28	0.48
C5_1	CHANNEL	0.247	0	01:10	0.42	0.06	0.20
C5_10	CHANNEL	0.128	0	01:12	0.55	0.04	0.24
C5_11	CHANNEL	0.134	0	01:27	0.21	0.05	0.45
C5_12	CHANNEL	1.457	0	01:22	1.37	0.12	0.36
C5_13	CHANNEL	0.133	0	01:09	0.59	0.04	0.29
C5_14	CHANNEL	0.158	0	01:02	0.17	0.11	0.54
C5_15	CHANNEL	0.291	0	01:22	0.52	0.08	0.35
C5_16	CHANNEL	0.287	0	01:27	0.45	0.07	0.28
C5_17	CHANNEL	0.304	0	01:28	0.25	0.03	0.33
C5_19	CHANNEL	0.292	0	01:20	0.52	0.19	0.31
C5_2	CHANNEL	0.217	0	01:12	0.70	0.03	0.23
C5_20	CHANNEL	0.360	0	01:25	0.38	0.04	0.27
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.31
C5_23	CHANNEL	0.244	0	01:10	0.40	0.05	0.20
C5_3	CHANNEL	0.238	0	01:11	0.67	0.02	0.24
C5_4	CHANNEL	0.212	0	01:14	0.56	0.01	0.20
C5_5	CHANNEL	0.207	0	01:15	0.64	0.02	0.18
C5_6	CHANNEL	0.214	0	01:13	0.88	0.01	0.15
C5_7	CHANNEL	0.306	0	01:35	0.45	0.03	0.30
C5_8	CHANNEL	0.401	0	01:19	0.71	0.03	0.35
C5_9	CHANNEL	0.936	0	01:22	0.77	0.08	0.39
C6	CONDUIT	2.065	0	01:13	1.24	0.31	0.61
C7	CHANNEL	0.152	0	01:10	0.38	0.06	0.38
C9_1	CHANNEL	0.522	0	01:10	0.80	0.13	0.45
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.16
C9_2	CHANNEL	0.538	0	01:10	0.78	0.16	0.75
C9_5	CHANNEL	3.117	0	01:17	1.22	0.76	0.89
C9_6	CHANNEL	3.072	0	01:17	1.56	0.74	0.80
C9_7	CHANNEL	1.270	0	01:14	1.39	0.18	0.59
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.383	0	01:06	1.13	1.02	1.00
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.396	0	01:07	1.11	1.22	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.416	0	01:07	1.47	1.75	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.216	0	01:20	1.38	0.50	0.54
C-STRM-101_(C-STRM)	CONDUIT	0.216	0	01:20	2.38	0.27	0.82
C-STRM-102_(C-STRM)	CONDUIT	2.402	0	01:28	3.98	0.97	0.94
C-STRM-103_(C-STRM)	CONDUIT	0.662	0	01:53	1.24	1.19	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.746	0	01:53	1.40	1.34	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.826	0	01:52	1.54	1.48	1.00
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.537	0	01:29	1.60	0.95	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.542	0	01:26	1.73	0.96	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.141	0	01:51	1.80	0.49	0.75
C-STRM-21_(C-STRM)	CONDUIT	0.241	0	01:10	1.46	0.79	1.00
C-STRM-22_(1)_(C-STRM)	CONDUIT	3.455	0	01:27	1.63	0.78	1.00
C-STRM-22_(C-STRM)	CONDUIT	3.323	0	01:26	2.44	1.21	1.00
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.346	0	01:27	0.99	1.03	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.247	0	01:26	0.69	0.73	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.808	0	01:30	1.83	1.03	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.630	0	01:31	1.76	1.06	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.611	0	01:32	1.71	1.03	1.00
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.597	0	01:32	1.67	1.00	1.00
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.588	0	01:30	1.64	1.04	1.00
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.592	0	01:29	1.70	1.04	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.578	0	01:53	1.14	1.04	1.00
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.215	0	01:06	1.21	1.25	1.00
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.217	0	01:01	1.16	1.26	1.00
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.249	0	01:26	2.08	1.02	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.206	0	01:26	0.93	0.84	1.00
C-STRM-4_(1)_(C-STRM)	CONDUIT	1.008	0	01:32	2.39	1.17	0.91
C-STRM-4_(C-STRM)	CONDUIT	0.804	0	01:30	1.82	1.02	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.393	0	01:46	0.86	0.70	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.534	0	01:44	1.00	0.96	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.737	0	01:43	1.16	1.05	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.848	0	01:44	1.14	0.98	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.061	0	01:44	1.42	1.22	1.00
C-STRM-57_(C-STRM)	CONDUIT	1.069	0	01:32	1.43	1.22	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.119	0	01:01	0.97	0.93	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.144	0	01:29	0.66	0.86	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	01:18	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	4.238	0	01:29	1.67	0.82	1.00
C-STRM-75_(C-STRM)	CONDUIT	4.238	0	01:29	1.67	0.82	1.00
C-STRM-76_(C-STRM)	CONDUIT	1.273	0	01:44	1.71	1.27	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.623	0	01:28	3.09	1.36	0.96
C-STRM-78_(C-STRM)	CONDUIT	1.398	0	01:27	1.87	1.14	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	5.276	0	01:30	2.08	0.84	0.99
C-STRM-79_(C-STRM)	CONDUIT	4.981	0	01:29	1.96	0.87	1.00
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.073	0	01:42	0.44	0.38	1.00
C-STRM-8_(C-STRM)	CONDUIT	0.037	0	01:10	0.32	0.29	1.00
C-STRM-80_(C-STRM)	CONDUIT	5.277	0	01:30	2.72	1.19	0.98
C-STRM-81_(C-STRM)	CONDUIT	5.326	0	01:24	2.38	1.20	0.82
C-STRM-82_(C-STRM)	CONDUIT	5.325	0	01:24	3.01	1.19	0.66
C-STRM-83_(1)_(C-STRM)	CONDUIT	3.086	0	01:26	2.16	1.13	1.00
C-STRM-84_(C-STRM)	CONDUIT	4.005	0	01:27	1.67	0.78	1.00
CVR-C2	CONDUIT	0.211	0	01:15	2.53	0.78	0.52
CVR-C3	CONDUIT	0.307	0	01:32	3.32	1.89	0.75
CVR-C4	CONDUIT	0.935	0	01:22	2.89	0.31	0.33
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	17.495	0	02:13	1.41	0.51	1.00
W1	CHANNEL	7.991	0	01:19	1.35	0.03	0.07
OR1	ORIFICE	0.356	0	02:12			1.00
OR2	ORIFICE	0.139	0	02:13			0.72
W10	WEIR	0.641	0	01:10			0.38
W11	WEIR	0.230	0	01:14			0.34
W12	WEIR	0.373	0	01:09			0.38
W13	WEIR	0.358	0	01:14			0.67
W14	WEIR	0.295	0	01:10			0.30
W15	WEIR	0.727	0	01:14			0.47
W2	WEIR	1.269	0	02:13			0.60
W3	WEIR	0.252	0	01:10			0.17
W4	WEIR	0.703	0	01:11			0.39
W5	WEIR	0.610	0	01:11			0.35
W6	WEIR	0.971	0	01:14			0.46
W7	WEIR	0.623	0	01:12			0.31
W8	WEIR	0.791	0	01:12			0.36
W9	WEIR	0.345	0	01:10			0.24
C1	DUMMY	0.249	0	01:01			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:01			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	01:01			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:00			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:01			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	01:01			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	01:01			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:00			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	01:01			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	01:00			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	01:01			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	01:01			
OL1	DUMMY	0.097	0	01:01			
OL10	DUMMY	0.026	0	00:23			
OL11	DUMMY	0.046	0	01:00			
OL12	DUMMY	0.101	0	01:00			
OL13	DUMMY	0.084	0	01:00			
OL14	DUMMY	0.121	0	01:00			
OL15	DUMMY	0.088	0	01:00			
OL16	DUMMY	0.342	0	01:00			
OL17	DUMMY	0.215	0	01:00			
OL18	DUMMY	0.059	0	01:00			
OL19	DUMMY	0.238	0	01:00			
OL2	DUMMY	0.141	0	01:06			
OL20	DUMMY	0.068	0	01:00			
OL21	DUMMY	0.060	0	01:00			
OL22	DUMMY	0.184	0	01:06			
OL3	DUMMY	0.134	0	01:01			
OL4	DUMMY	0.110	0	01:01			
OL5	DUMMY	0.046	0	01:01			
OL6	DUMMY	0.029	0	01:00			
OL7	DUMMY	0.034	0	01:00			
OL8	DUMMY	0.018	0	01:00			
OL9	DUMMY	0.214	0	01:00			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.80	0.00
BDR-C2	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.58	0.00
BDR-C3	1.00	0.01	0.00	0.00	0.70	0.29	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.01	0.00	0.00	0.67	0.32	0.00	0.00	0.88	0.00
C1_1	1.00	0.04	0.00	0.00	0.95	0.01	0.00	0.00	0.95	0.00
C1_17	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
C1_3	1.00	0.82	0.04	0.00	0.14	0.00	0.00	0.00	0.96	0.00
C1_30	1.00	0.04	0.00	0.00	0.54	0.42	0.00	0.00	0.06	0.00
C1_4	1.00	0.03	0.01	0.00	0.93	0.02	0.00	0.00	0.95	0.00
C14_1	1.00	0.84	0.04	0.00	0.12	0.00	0.00	0.00	0.97	0.00
C14_2	1.00	0.01	0.04	0.00	0.60	0.35	0.00	0.00	0.01	0.00
C14_4	1.00	0.85	0.01	0.00	0.14	0.00	0.00	0.00	0.98	0.00
C14_5	1.00	0.86	0.00	0.00	0.09	0.04	0.00	0.00	0.02	0.00
C15_1	1.00	0.82	0.01	0.00	0.17	0.00	0.00	0.00	0.94	0.00
C15_2	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C20_1	1.00	0.01	0.03	0.00	0.83	0.13	0.00	0.00	0.01	0.00
C20_2	1.00	0.85	0.01	0.00	0.07	0.07	0.00	0.00	0.96	0.00
C20_3	1.00	0.85	0.01	0.00	0.07	0.07	0.00	0.00	0.03	0.00
C20_4	1.00	0.01	0.85	0.00	0.12	0.02	0.00	0.00	0.95	0.00
C20_5	1.00	0.01	0.02	0.00	0.69	0.27	0.00	0.00	0.01	0.00
C20_7	1.00	0.85	0.01	0.00	0.04	0.10	0.00	0.00	0.05	0.00
C23_5	1.00	0.04	0.00	0.00	0.83	0.13	0.00	0.00	0.01	0.00
C23_7	1.00	0.03	0.00	0.00	0.79	0.19	0.00	0.00	0.16	0.00
C3	1.00	0.72	0.09	0.00	0.19	0.00	0.00	0.00	0.95	0.00
C4	1.00	0.60	0.12	0.00	0.28	0.00	0.00	0.00	0.95	0.00
C4_1	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C4_2	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.95	0.00
C4_3	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C4_4	1.00	0.01	0.85	0.00	0.12	0.02	0.00	0.00	0.95	0.00
C4_5	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.48	0.13	0.00	0.40	0.00	0.00	0.00	0.94	0.00
C5_1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.88	0.00
C5_10	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.89	0.00
C5_11	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.96	0.00
C5_12	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.01	0.00	0.00	0.31	0.67	0.00	0.00	0.03	0.00
C5_14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.64	0.00
C5_15	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.96	0.00
C5_16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.91	0.00
C5_19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.95	0.00
C5_2	1.00	0.02	0.00	0.00	0.62	0.36	0.00	0.00	0.00	0.00
C5_20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
C5_21	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.01	0.00	0.00	0.78	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.02	0.00	0.00	0.98	0.01	0.00	0.00	0.97	0.00
C5_4	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.96	0.00
C5_5	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.15	0.00
C5_6	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.89	0.00
C5_7	1.00	0.01	0.04	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_8	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_9	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.98	0.00
C6	1.00	0.05	0.43	0.00	0.52	0.00	0.00	0.00	0.94	0.00
C7	1.00	0.85	0.01	0.00	0.14	0.00	0.00	0.00	0.95	0.00
C9_1	1.00	0.84	0.00	0.00	0.13	0.03	0.00	0.00	0.04	0.00
C9_11	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.01	0.87	0.00	0.10	0.02	0.00	0.00	0.94	0.00
C9_5	1.00	0.01	0.02	0.00	0.02	0.94	0.00	0.00	0.03	0.00
C9_6	1.00	0.01	0.82	0.00	0.13	0.04	0.00	0.00	0.93	0.00
C9_7	1.00	0.01	0.86	0.00	0.10	0.03	0.00	0.00	0.95	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.79	0.00
C-STRM-1_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.66	0.18	0.00	0.13	0.00	0.00	0.03	0.82	0.00
C-STRM-101_(C-STRM)	1.00	0.47	0.19	0.00	0.32	0.00	0.00	0.02	0.63	0.00
C-STRM-102_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.04	0.00	0.00	0.09	0.00
C-STRM-103_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.82	0.00
C-STRM-104_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.90	0.00
C-STRM-105_(C-STRM)	1.00	0.01	0.00	0.00	0.13	0.00	0.00	0.85	0.01	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.71	0.00
C-STRM-2_(C-STRM)	1.00	0.01	0.00	0.00	0.94	0.03	0.00	0.02	0.70	0.00
C-STRM-20_(C-STRM)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.92	0.03	0.00
C-STRM-21_(C-STRM)	1.00	0.03	0.00	0.00	0.03	0.00	0.00	0.94	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.00
C-STRM-22_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.87	0.01	0.00
C-STRM-26_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.93	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.92	0.05	0.00	0.01	0.65	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.94	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.86	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.62	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.25	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.02	0.00	0.01	0.70	0.00
C-STRM-33_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.60	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.94	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.01	0.00	0.00	0.97	0.01	0.00	0.01	0.92	0.00
C-STRM-49_(C-STRM)	1.00	0.01	0.39	0.00	0.59	0.00	0.00	0.00	0.84	0.00
C-STRM-50_(C-STRM)	1.00	0.01	0.00	0.00	0.09	0.00	0.00	0.00	0.90	0.00
C-STRM-51_(C-STRM)	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.00	0.92	0.00
C-STRM-52_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.66	0.00
C-STRM-53_(C-STRM)	1.00	0.01	0.17	0.00	0.82	0.00	0.00	0.00	0.68	0.00
C-STRM-57_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.57	0.00
C-STRM-62_(C-STRM)	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.01	0.00	0.00	0.11	0.00	0.00	0.87	0.06	0.00
C-STRM-64_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.83	0.00
C-STRM-75_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.01	0.00	0.00	0.55	0.00	0.00	0.44	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.31	0.00
C-STRM-78_(C-STRM)	1.00	0.01	0.00	0.00	0.53	0.00	0.00	0.46	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.86	0.00
C-STRM-79_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.05	0.00	0.00	0.90	0.02	0.00
C-STRM-8_(C-STRM)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.67	0.00
C-STRM-81_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.52	0.00
C-STRM-82_(C-STRM)	1.00	0.01	0.00	0.00	0.49	0.00	0.00	0.50	0.05	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.82	0.00
C-STRM-84_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.86	0.00
CVR-C2	1.00	0.03	0.00	0.00	0.80	0.17	0.00	0.00	0.81	0.00
CVR-C3	1.00	0.04	0.00	0.00	0.61	0.35	0.00	0.00	0.06	0.00
CVR-C4	1.00	0.01	0.00	0.00	0.55	0.44	0.00	0.00	0.12	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.01	0.00	0.00	0.20	0.00	0.00	0.80	0.00	0.00
W1	1.00	0.84	0.00	0.00	0.13	0.00	0.00	0.04	0.00	0.00

****
Conduit Surcharge Summary
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| Conduit | Hours Full: Both Ends | Upstream | Dnstream | H

C-STRM-2_(1)_(C-STRM)	0.62	0.62	0.65	0.01	0.01
C-STRM-2_(C-STRM)	0.59	0.59	0.62	0.01	0.01
C-STRM-20_(C-STRM)	0.01	0.01	0.44	0.01	0.01
C-STRM-21_(C-STRM)	0.44	0.44	0.61	0.01	0.01
C-STRM-22_(1)_(C-STRM)	0.58	0.58	0.63	0.01	0.01
C-STRM-22_(C-STRM)	0.58	0.62	0.58	0.83	0.58
C-STRM-26_(1)_(C-STRM)	0.81	0.81	0.83	0.10	0.34
C-STRM-26_(C-STRM)	0.78	0.78	0.81	0.01	0.01
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	0.60	0.60	0.60	0.63	0.09	0.52
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.60	0.62	0.60	0.09	0.55
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.62	0.65	0.62	0.06	0.62
C-STRM-3_(1)_(1)_(C-STRM)	0.65	0.68	0.65	0.01	0.65
C-STRM-3_(1)_(2)_(C-STRM)	0.65	0.65	0.68	0.21	0.23
C-STRM-3_(1)_(C-STRM)	0.65	0.65	0.65	0.19	0.44
C-STRM-33_(C-STRM)	0.88	0.88	0.88	0.03	0.05
C-STRM-34_(1)_(1)_(C-STRM)	0.63	0.63	0.70	0.40	0.32
C-STRM-34_(1)_(C-STRM)	0.56	0.56	0.63	0.42	0.32
C-STRM-35_(1)_(C-STRM)	0.75	0.75	0.78	0.06	0.08
C-STRM-35_(C-STRM)	0.70	0.70	0.75	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.69	0.01	0.59	0.01
C-STRM-4_(C-STRM)	0.63	0.63	0.69	0.08	0.50
C-STRM-49_(C-STRM)	0.83	0.83	0.83	0.01	0.01
C-STRM-50_(C-STRM)	0.83	0.83	0.84	0.01	0.65
C-STRM-51_(C-STRM)	0.84	0.84	0.84	0.48	0.84
C-STRM-52_(C-STRM)	0.84	0.84	0.84	0.01	0.70
C-STRM-53_(C-STRM)	0.84	0.84	0.84	0.69	0.82
C-STRM-57_(C-STRM)	0.83	0.83	0.83	0.61	0.81
C-STRM-62_(C-STRM)	0.58	0.58	0.63	0.01	0.01
C-STRM-63_(C-STRM)	0.63	0.63	0.66	0.01	0.01
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.20	0.01
C-STRM-74_(C-STRM)	0.62	0.68	0.62	0.01	0.62
C-STRM-75_(C-STRM)	0.52	0.62	0.52	0.01	0.52
C-STRM-76_(C-STRM)	0.83	0.84	0.83	0.75	0.83
C-STRM-77_(C-STRM)	0.01	0.83	0.01	0.76	0.01
C-STRM-78_(C-STRM)	0.82	0.83	0.83	0.43	0.81
C-STRM-79_(1)_(C-STRM)	0.01	0.64	0.01	0.01	0.01
C-STRM-79_(C-STRM)	0.52	0.52	0.64	0.01	0.01
C-STRM-8_(1)_(C-STRM)	0.49	0.49	0.59	0.01	0.01
C-STRM-8_(C-STRM)	0.41	0.41	0.49	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.79	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.79	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.79	0.01
C-STRM-83_(1)_(C-STRM)	0.62	0.63	0.62	0.83	0.62
C-STRM-84_(C-STRM)	0.63	0.63	0.68	0.01	0.01
CVR-C3	0.01	0.67	0.01	1.15	0.01
ST4-Pipe_-_(99)_(P-Stm)	0.50	0.50	0.59	0.01	0.01

Analysis begun on: Thu Apr 9 12:48:49 2026
Analysis ended on: Thu Apr 9 12:48:55 2026
Total elapsed time: 00:00:06

Post-Development HIST 1979

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                Data       Recording
  Name                 Data Source              Type       Interval
  ---------------------------------------------------------------------
  24SCS100             24SCS100                 INTENSITY   15 min.
  6SCS050              6SCS050                  INTENSITY   15 min.
  Rainfall             JUL1-79                  INTENSITY    5 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv   %Slope Rain Gage           Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall           EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall           EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall           EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall           EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall           EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall           S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall           J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall           J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall           J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall           J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall           S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall           S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall           S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall           S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall           SU2
  S12                  0.44    134.74     71.43    2.0000 Rainfall           J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall           J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall           J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall           J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall           J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall           J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall           J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall           J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall           S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall           EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall           EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall           S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall           S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall           S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall           S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall           S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall           J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall           S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall           J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall           J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall           S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall           J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall           EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall           631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall           682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall           OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall           POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall           SU5


  ************
  Node Summary
  ************
                                        Invert      Max.    Ponded    External
  Name                 Type               Elev.     Depth      Area    Inflow
  ---------------------------------------------------------------------------
  EXD_1                JUNCTION          104.39      1.51       0.0
  EXD_10               JUNCTION           98.65      1.20       0.0
  EXD_11               JUNCTION           98.50      1.20       0.0
  EXD_12               JUNCTION           98.31      1.20       0.0
  EXD_13               JUNCTION          104.32      1.10       0.0
  EXD_14               JUNCTION          102.49      0.80       0.0
  EXD_15               JUNCTION          100.27      0.80       0.0
  EXD_16               JUNCTION          100.20      0.80       0.0
  EXD_17               JUNCTION           99.89      0.80       0.0
  EXD_18               JUNCTION           99.40      0.84       0.0
  EXD_19               JUNCTION           99.19      0.88       0.0
  EXD_2                JUNCTION          103.47      1.93       0.0
  EXD_20               JUNCTION           99.19      0.88       0.0
  EXD_21               JUNCTION           99.18      0.88       0.0
  EXD_22               JUNCTION           99.14      0.88       0.0
  EXD_23               JUNCTION           98.75      1.14       0.0
  EXD_24               JUNCTION           98.67      1.14       0.0
  EXD_25               JUNCTION           98.52      1.13       0.0
  EXD_26               JUNCTION           98.48      1.13       0.0
  EXD_27               JUNCTION           98.17      1.20       0.0
  EXD_3                JUNCTION          103.19      1.41       0.0
  EXD_4                JUNCTION          102.64      1.20       0.0
  EXD_5                JUNCTION          102.50      1.20       0.0
  EXD_6                JUNCTION          102.32      1.08       0.0
  EXD_7                JUNCTION          101.50      1.06       0.0
  EXD_8                JUNCTION          100.48      1.06       0.0
  EXD_9                JUNCTION          100.39      1.06       0.0
  J10                  JUNCTION          103.60      0.50       0.0
  J11                  JUNCTION          103.50      0.50       0.0
  J12                  JUNCTION          103.40      0.50       0.0
  J13                  JUNCTION          103.30      0.50       0.0
  J17                  JUNCTION          104.37      1.04       0.0
  J19                  JUNCTION          105.40      0.50       0.0
  J20                  JUNCTION          105.45      0.50       0.0
  J21                  JUNCTION          105.55      0.50       0.0
  J22                  JUNCTION          105.70      0.50       0.0
  J23                  JUNCTION          106.00      0.50       0.0
  J24                  JUNCTION          106.20      0.50       0.0
  J25                  JUNCTION          105.30      0.50       0.0
  J26                  JUNCTION          105.70      0.50       0.0
  J28                  JUNCTION          109.00      0.50       0.0
  J29                  JUNCTION          108.80      0.50       0.0
  J32                  JUNCTION          106.00      0.50       0.0
  J36                  JUNCTION          104.70      0.50       0.0
  J39                  JUNCTION          104.60      0.50       0.0
  J40                  JUNCTION          104.45      0.50       0.0
  J41                  JUNCTION          103.20      0.50       0.0
  J43                  JUNCTION          104.20      0.50       0.0
  J44                  JUNCTION          104.50      0.50       0.0
  J46                  JUNCTION          104.60      0.50       0.0
  J47                  JUNCTION          105.10      0.50       0.0
  J48                  JUNCTION          105.75      0.50       0.0
  J51                  JUNCTION          106.75      0.50       0.0
  J52                  JUNCTION          109.75      0.50       0.0
  J53                  JUNCTION          109.00      0.50       0.0
  J56                  JUNCTION          109.10      0.50       0.0
  J57                  JUNCTION          108.47      0.50       0.0
  J58                  JUNCTION          108.40      0.50       0.0
  J59                  JUNCTION          108.00      0.50       0.0
  J6                   JUNCTION          109.83      0.30       0.0
  J61                  JUNCTION          107.00      0.50       0.0
  J62                  JUNCTION          106.50      0.50       0.0
  J74                  JUNCTION           98.45      0.90       0.0
  J9                   JUNCTION          103.70      0.50       0.0
  OF1                  OUTFALL           100.80      0.00       0.0
  OF2                  OUTFALL             0.00      0.00       0.0
  OF3                  OUTFALL            98.00      1.06       0.0
  ST4_108A_(P-Stm)     OUTFALL            98.02      1.19       0.0
  500_(C-STRM)         STORAGE           100.31      2.84       0.0
  500A_(C-STRM)        STORAGE           100.10      1.50       0.0
  502_(C-STRM)         STORAGE           100.54      3.70       0.0
  503_(C-STRM)         STORAGE           100.59      3.92       0.0
  504_(C-STRM)         STORAGE           103.04      2.70       0.0
  505_(C-STRM)         STORAGE           103.45      3.26       0.0
  506_(C-STRM)         STORAGE           103.82      3.16       0.0
  507_(C-STRM)         STORAGE           104.14      3.10       0.0
  508_(C-STRM)         STORAGE           104.37      3.12       0.0
  509_(C-STRM)         STORAGE           104.60      3.14       0.0
  510_(C-STRM)         STORAGE           104.85      3.09       0.0
  511_(C-STRM)         STORAGE           104.91      3.08       0.0
  512_(C-STRM)         STORAGE           105.11      3.12       0.0
  513_(C-STRM)         STORAGE           105.24      3.14       0.0
  514_(C-STRM)         STORAGE           105.59      3.16       0.0
  515_(C-STRM)         STORAGE           105.85      3.24       0.0
  516_(C-STRM)         STORAGE           105.46      3.06       0.0
  517_(C-STRM)         STORAGE           105.62      3.03       0.0
  518_(C-STRM)         STORAGE           105.85      2.92       0.0
  519_(C-STRM)         STORAGE           106.08      2.82       0.0
  520_(C-STRM)         STORAGE           106.34      2.66       0.0
  522_(C-STRM)         STORAGE           104.31      3.00       0.0
  525_(C-STRM)         STORAGE           100.61      2.69       0.0
  528_(C-STRM)         STORAGE           100.72      2.68       0.0
  532_(C-STRM)         STORAGE           100.83      2.67       0.0
  536_(C-STRM)         STORAGE           100.98      2.63       0.0
  540_(C-STRM)         STORAGE           100.86      2.85       0.0
  541_(C-STRM)         STORAGE           100.93      2.89       0.0
  551_(C-STRM)         STORAGE           100.65      3.78       0.0
  552_(C-STRM)         STORAGE           100.74      3.88       0.0
  553_(C-STRM)         STORAGE           100.93      3.78       0.0
  554_(C-STRM)         STORAGE           101.05      3.89       0.0
  555_(C-STRM)         STORAGE           101.25      3.93       0.0
  556_(C-STRM)         STORAGE           101.37      3.89       0.0
  601_(C-STRM)         STORAGE           100.45      4.43       0.0
  602_(C-STRM)         STORAGE           100.52      4.11       0.0
  603_(C-STRM)         STORAGE           100.63      3.89       0.0
  604_(C-STRM)         STORAGE           100.88      4.87       0.0
  605_(C-STRM)         STORAGE           101.09      5.63       0.0
  606_(C-STRM)         STORAGE           101.24      5.75       0.0
  619_(C-STRM)         STORAGE           101.38      5.14       0.0
  622_(C-STRM)         STORAGE           101.53      4.49       0.0
  626_(C-STRM)         STORAGE           103.94      3.33       0.0
  627_(C-STRM)         STORAGE           103.13      3.58       0.0
  629_(C-STRM)         STORAGE           101.65      4.46       0.0
  630_(C-STRM)         STORAGE           102.08      4.12       0.0
  630A_(C-STRM)        STORAGE           102.12      3.90       0.0
  631_(C-STRM)         STORAGE           106.00      0.50       0.0
  645_(C-STRM)         STORAGE           102.03      3.69       0.0
  647_(C-STRM)         STORAGE           102.14      3.40       0.0
  650_(C-STRM)         STORAGE           102.22      3.19       0.0
  651_(C-STRM)         STORAGE           102.31      3.03       0.0
  682_(C-STRM)         STORAGE           105.40      0.50       0.0
  MTD_(C-STRM)         STORAGE           100.37      3.19       0.0
  OVERFLOW_(C-STRM)    STORAGE           100.18      2.76       0.0
  POND_(C-STRM)        STORAGE            98.45      2.65       0.0    Yes
  S_525-MTD            STORAGE           103.30      0.50       0.0
  S_528-525            STORAGE           103.41      0.50       0.0
  S_532-528            STORAGE           103.50      0.50       0.0
  S_536-532            STORAGE           103.60      0.50       0.0
  S_540-536            STORAGE           103.71      0.50       0.0
  S_541-540            STORAGE           103.81      0.50       0.0
  S_604-603            STORAGE           105.50      0.50       0.0
  S_605-604            STORAGE           106.71      0.50       0.0
  S_619-606            STORAGE           106.50      0.50       0.0
  S_622-619            STORAGE           105.70      0.50       0.0
  S_622-619_2          STORAGE           106.50      0.50       0.0
  S_627-630            STORAGE           106.70      0.50       0.0
  S_629-622            STORAGE           106.01      0.50       0.0
  SU2                  STORAGE           106.75      0.50       0.0
  SU5                  STORAGE           104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                 From Node        To Node          Type            Length    %Slope
Roughness
  ---------------------------------------------------------------------------------------
-
  BDR-C1               EXD_15           EXD_16           CONDUIT           17.7    0.3844
0.0250
  BDR-C2               EXD_20           EXD_21           CONDUIT            7.9    0.0632
0.0130
  BDR-C3               EXD_25           EXD_26           CONDUIT           14.2    0.2683
0.0130
  BDR-C4               EXD_12           EXD_27           CONDUIT           23.0    0.6077
0.0130
  C1_1                 J32              J26              CONDUIT           71.8    0.4181
0.0130
  C1_17                J6               EXD_1            CONDUIT          171.9    2.4608
0.0130
  C1_3                 J28              J29              CONDUIT          183.6    0.1090
0.0130
  C1_30                J26              J25              CONDUIT           93.1    0.4296
0.0130
  C1_4                 J25              J39              CONDUIT           75.0    0.9329
0.0130
  C14_1                J20              J19              CONDUIT           59.0    0.0847
0.0130
  C14_2                J23              J22              CONDUIT           73.9    0.4062
0.0130
  C14_4                J22              J21              CONDUIT           77.3    0.1941
0.0130
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C14_5	J21	J20	CONDUIT	51.8	0.1931
0.0130					
C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61

C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-100_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-101_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-102_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-103_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-104_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-105_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-200_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-201_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-22_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
4.45							
C-STRM-22_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
C-STRM-26_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.34							
C-STRM-26_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR				0.60	0.28	0.15	0.60
0.25							
C-STRM-35_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
C-STRM-4_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
C-STRM-4_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-49_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-50_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1
C-STRM-51_(C-STRM) CIRCULAR			0.90	0.64	0.23	0.90	1
C-STRM-52_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-53_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-57_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-62_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-63_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-64_(C-STRM) CIRCULAR			0.38	0.11	0.09	0.38	1
C-STRM-74_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-75_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-76_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-77_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1
C-STRM-78_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1
C-STRM-79_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80
6.30							
C-STRM-79_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-8_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53
C-STRM-8_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1
C-STRM-80_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-81_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-82_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
C-STRM-83_(1)_(C-STRM) CIRCULAR				1.50	1.77	0.38	1.50
2.74							
C-STRM-84_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
CVR-C2	CIRCULAR		0.45	0.16	0.11	0.45	1
CVR-C3	CIRCULAR		0.40	0.13	0.10	0.40	1
CVR-C4	CIRCULAR		1.20	1.13	0.30	1.20	1
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR				0.90	0.64	0.23	0.90
0.96							
W1	Pond_SpillWay		3.89	318.30	4.06	128.79	1

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Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4738	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6219	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4985	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8861	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807

0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929
0.4178	0.4430	0.4687	0.4947	0.5212
0.5482	0.5760	0.6046	0.6335	0.6626
0.6921	0.7218	0.7518	0.7820	0.8133
0.8461	0.8801	0.9163	0.9564	1.0000

Hrad:

0.0226	0.0600	0.0982	0.1332	0.1659
0.1974	0.2291	0.2613	0.2925	0.3228
0.3524	0.3813	0.4096	0.4373	0.4557
0.4729	0.4908	0.5133	0.5388	0.5667
0.5954	0.6238	0.6186	0.5790	0.5404
0.5828	0.6246	0.6659	0.7067	0.7469
0.7867	0.8189	0.8502	0.8811	0.9116
0.9331	0.9497	0.9763	1.0109	1.0452
1.0791	1.1126	1.1458	1.1787	1.1574
1.1642	1.1570	1.1256	1.0602	1.0000

Width:

0.0656	0.0958	0.1094	0.1231	0.1368
0.1501	0.1622	0.1729	0.1837	0.1944
0.2052	0.2159	0.2267	0.2377	0.2539
0.2715	0.2891	0.3043	0.3175	0.3291
0.3399	0.3507	0.3819	0.4435	0.5186
0.5219	0.5251	0.5284	0.5317	0.5350
0.5382	0.5468	0.5558	0.5647	0.5737
0.5886	0.6068	0.6185	0.6243	0.6301
0.6359	0.6417	0.6475	0.6534	0.6932
0.7170	0.7512	0.8061	0.8978	1.0000

Transect Barnsdale_UPST7

Area:

0.0031	0.0077	0.0135	0.0206	0.0292
0.0385	0.0485	0.0590	0.0699	0.0811
0.0928	0.1047	0.1170	0.1297	0.1427
0.1561	0.1700	0.1843	0.1992	0.2145
0.2304	0.2467	0.2636	0.2810	0.3005
0.3224	0.3464	0.3708	0.3955	0.4204
0.4456	0.4710	0.4972	0.5239	0.5510
0.5784	0.6060	0.6340	0.6622	0.6907
0.7195	0.7487	0.7782	0.8081	0.8383
0.8691	0.9003	0.9322	0.9647	1.0000

Hrad:

0.0323	0.0624	0.0905	0.1084	0.1375
0.1686	0.1997	0.2314	0.2650	0.2977
0.3296	0.3608	0.3913	0.4212	0.4493
0.4751	0.5005	0.5247	0.5476	0.5703
0.5929	0.6154	0.6378	0.6601	0.5891
0.5938	0.5928	0.6266	0.6599	0.6927
0.7252	0.7501	0.7705	0.7948	0.8255
0.8559	0.8860	0.9157	0.9452	0.9727
1.0000	1.0270	1.0538	1.0784	1.1003
1.1221	1.1420	1.1557	1.1624	1.0000

Width:

0.0999	0.1304	0.1570	0.1994	0.2229
0.2396	0.2541	0.2664	0.2751	0.2837
0.2923	0.3010	0.3096	0.3183	0.3279
0.3390	0.3501	0.3618	0.3745	0.3872
0.3998	0.4124	0.4251	0.4377	0.5266
0.5610	0.6032	0.6092	0.6153	0.6213
0.6274	0.6399	0.6563	0.6692	0.6761
0.6830	0.6899	0.6967	0.7036	0.7118
0.7199	0.7281	0.7362	0.7458	0.7573
0.7688	0.7817	0.7991	0.8220	1.0000

Transect GBR

Area:

0.0002	0.0008	0.0018	0.0032	0.0051
0.0073	0.0099	0.0130	0.0164	0.0203
0.0245	0.0292	0.0343	0.0401	0.0532
0.0756	0.1002	0.1249	0.1496	0.1742
0.1989	0.2235	0.2482	0.2729	0.2975
0.3222	0.3468	0.3715	0.3962	0.4209
0.4460	0.4715	0.4974	0.5237	0.5505
0.5776	0.6051	0.6331	0.6614	0.6902
0.7193	0.7489	0.7789	0.8092	0.8400
0.8712	0.9028	0.9348	0.9672	1.0000

Hrad:

0.0148	0.0296	0.0444	0.0592	0.0741
0.0889	0.1037	0.1185	0.1333	0.1481
0.1629	0.1777	0.1925	0.1451	0.0889
0.0921	0.1222	0.1522	0.1821	0.2121
0.2420	0.2720	0.3019	0.3318	0.3616
0.3915	0.4213	0.4809	0.5106	0.5403
0.5398	0.5684	0.5963	0.6237	0.6505
0.6768	0.7026	0.7280	0.7529	0.7773
0.8013	0.8249	0.8480	0.8708	0.8932
0.9153	0.9369	0.9583	0.9793	1.0000

Width:

0.0123	0.0246	0.0369	0.0492	0.0614
0.0737	0.0860	0.0983	0.1106	0.1229
0.1352	0.1475	0.1598	0.2496	0.5446
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7542
0.7665	0.7788	0.7911	0.8034	0.8157
0.8280	0.8402	0.8525	0.8648	0.8771
0.8894	0.9017	0.9140	0.9263	0.9386
0.9508	0.9631	0.9754	0.9877	1.0000

Transect Pond_SpillWay

Area:

0.0040	0.0088	0.0142	0.0204	0.0274
0.0350	0.0434	0.0524	0.0622	0.0728
0.0840	0.0960	0.1087	0.1221	0.1362
0.1511	0.1666	0.1829	0.2000	0.2177
0.2362	0.2554	0.2753	0.2959	0.3173
0.3393	0.3621	0.3856	0.4099	0.4348
0.4600	0.4855	0.5113	0.5375	0.5640
0.5908	0.6180	0.6454	0.6732	0.7013
0.7297	0.7585	0.7875	0.8169	0.8466
0.8767	0.9070	0.9377	0.9687	1.0000

Hrad:

0.0187	0.0367	0.0543	0.0716	0.0888
0.1059	0.1230	0.1400	0.1570	0.1740
0.1910	0.2080	0.2251	0.2421	0.2592
0.2763	0.2935	0.3106	0.3278	0.3450
0.3622	0.3795	0.3967	0.4140	0.4313
0.4486	0.4660	0.4833	0.5007	0.5241
0.5500	0.5758	0.6013	0.6266	0.6517
0.6766	0.7013	0.7257	0.7498	0.7737
0.7974	0.8209	0.8441	0.8670	0.8898
0.9123	0.9345	0.9566	0.9784	1.0000

Width:

0.1394	0.1623	0.1853	0.2082	0.2311
0.2541	0.2770	0.2999	0.3229	0.3458
0.3687	0.3917	0.4146	0.4375	0.4605
0.4834	0.5063	0.5293	0.5522	0.5751
0.5981	0.6210	0.6439	0.6669	0.6898
0.7127	0.7357	0.7586	0.7815	0.7956
0.8059	0.8161	0.8263	0.8365	0.8467
0.8569	0.8672	0.8774	0.8876	0.8978
0.9080	0.9183	0.9285	0.9387	0.9489
0.9591	0.9693	0.9796	0.9898	1.0000

Transect ROW_14m

Area:

0.0004	0.0017	0.0038	0.0067	0.0104
0.0150	0.0204	0.0267	0.0338	0.0417
0.0504	0.0600	0.0704	0.0817	0.0938
0.1067	0.1204	0.1350	0.1504	0.1667
0.1838	0.2017	0.2204	0.2400	0.2605
0.2817	0.3038	0.3267	0.3502	0.3738
0.3973	0.4209	0.4446	0.4692	0.4952
0.5225	0.5510	0.5808	0.6118	0.6439
0.6767	0.7100	0.7440	0.7787	0.8140
0.8499	0.8865	0.9237	0.9615	1.0000

Hrad:

0.0169	0.0338	0.0507	0.0677	0.0846
0.1015	0.1184	0.1353	0.1522	0.1692
0.1861	0.2030	0.2199	0.2368	0.2537
0.2707	0.2876	0.3045	0.3214	0.3383
0.3552	0.3722	0.3891	0.4060	0.4229
0.4398	0.4567	0.4736	0.5027	0.5359
0.5691	0.6022	0.6353	0.6667	0.6957
0.7226	0.7474	0.7704	0.7918	0.8123
0.8326	0.8526	0.8721	0.8914	0.9103
0.9289	0.9471	0.9651	0.9827	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6200	0.6529	0.6857
0.7186	0.7514	0.7843	0.8171	0.8357
0.8521	0.8686	0.8850	0.9014	0.9179
0.9343	0.9507	0.9671	0.9836	1.0000

Transect ROW_14m_Mountable

Area:

0.0003	0.0012	0.0028	0.0049	0.0077
0.0111	0.0151	0.0197	0.0249	0.0307
0.0372	0.0442	0.0519	0.0602	0.0691
0.0787	0.0888	0.0996	0.1109	0.1229
0.1355	0.1487	0.1625	0.1770	0.1923
0.2092	0.2277	0.2477	0.2693	0.2924
0.3170	0.3433	0.3711	0.4004	0.4310
0.4626	0.4954	0.5293	0.5642	0.6002
0.6373	0.6755	0.7144	0.7538	0.7936
0.8340	0.8748	0.9160	0.9578	1.0000

Hrad:

0.0222	0.0445	0.0667	0.0889	0.1111
0.1334	0.1556	0.1778	0.2001	0.2223
0.2445	0.2667	0.2890	0.3112	0.3334
0.3556	0.3779	0.4001	0.4223	0.4446
0.4668	0.4890	0.5112	0.5335	0.5550
0.5833	0.5891	0.6029	0.6151	0.6263
0.6367	0.6465	0.6559	0.6653	0.6759
0.6872	0.6992	0.7116	0.7245	0.7378
0.7514	0.7663	0.7966	0.8266	0.8563
0.8856	0.9147	0.9434	0.9719	1.0000

Width:

0.0145	0.0290	0.0434	0.0579	0.0724
0.0869	0.1013	0.1158	0.1303	0.1448
0.1593	0.1737	0.1882	0.2027	0.2172
0.2316	0.2461	0.2606	0.2751	0.2896
0.3040	0.3185	0.3330	0.3475	0.3798
0.4164	0.4530	0.4897	0.5263	0.5629
0.5995	0.6362	0.6728	0.7080	0.7335
0.7591	0.7846	0.8102	0.8357	0.8613
0.8868	0.9114	0.9225	0.9336	0.9446
0.9557	0.9668	0.9779	0.9889	1.0000

Transect ROW_14m_PH3

Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0153	0.0209	0.0273	0.0345	0.0426
0.0516	0.0614	0.0721	0.0836	0.0959
0.1091	0.1231	0.1381	0.1539	0.1705
0.1880	0.2064	0.2255	0.2456	0.2665
0.2882	0.3108	0.3343	0.3583	0.3824
0.4065	0.4306	0.4548	0.4797	0.5055
0.5322	0.5598	0.5883	0.6176	0.6479
0.6791	0.7112	0.7441	0.7780	0.8127
0.8484	0.8850	0.9224	0.9608	1.0000

Hrad:

0.0166	0.0332	0.0498	0.0664	0.0830
0.0997	0.1163	0.1329	0.1495	0.1661
0.1827	0.1993	0.2159	0.2325	0.2491
0.2657	0.2823	0.2990	0.3156	0.3322
0.3488	0.3654	0.3820	0.3986	0.4152
0.4318	0.4484	0.4650	0.4935	0.5262
0.5588	0.5913	0.6238	0.6553	0.6853
0.7137	0.7407	0.7664	0.7909	0.8143
0.8366	0.8579	0.8783	0.8979	0.9166
0.9346	0.9519	0.9685	0.9845	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6160	0.6386	0.6612
0.6838	0.7063	0.7289	0.7515	0.7741
0.7967	0.8193	0.8419	0.8645	0.8871
0.9096	0.9322	0.9548	0.9774	1.0000

Transect ROW_14m-MB_1

Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0407	0.0484	0.0568	0.0659	0.0757
0.0861	0.0972	0.1089	0.1214	0.1345
0.1483	0.1631	0.1791	0.1963	0.2146
0.2342	0.2549	0.2768	0.2999	0.3242
0.3497	0.3764	0.4043	0.4333	0.4635
0.4949	0.5273	0.5601	0.5935	0.6274
0.6618	0.6967	0.7326	0.7693	0.8064
0.8441	0.8823	0.9210	0.9603	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0792	0.0990
0.1188	0.1386	0.1584	0.1782	0.1980
0.2178	0.2376	0.2574	0.2772	0.2971
0.3169	0.3367	0.3565	0.3763	0.3961
0.4159	0.4347	0.4520	0.4681	0.4834
0.4979	0.5119	0.5256	0.5389	0.5521
0.5650	0.5779	0.5907	0.6035	0.6162
0.6289	0.6560	0.6844	0.7123	0.7397
0.7667	0.7933	0.8190	0.8459	0.8726
0.8988	0.9247	0.9501	0.9752	1.0000

Width:

0.0168	0.0336	0.0504	0.0673	0.0841
0.1009	0.1177	0.1345	0.1513	0.1681
0.1849	0.2018	0.2186	0.2354	0.2522
0.2690	0.2858	0.3026	0.3195	0.3363
0.3552	0.3849	0.4146	0.4442	0.4739
0.5036	0.5332	0.5629	0.5926	0.6223
0.6519	0.6816	0.7113	0.7409	0.7706
0.8003	0.8150	0.8279	0.8407	0.8536
0.8664	0.8836	0.9093	0.9229	0.9357
0.9486	0.9614	0.9743	0.9871	1.0000

Transect ROW_16.5m_Mountable

Area:

0.0003	0.0012	0.0027	0.0048	0.0074
0.0107	0.0145	0.0190	0.0240	0.0297
0.0359	0.0428	0.0502	0.0582	0.0668
0.0760	0.0858	0.0962	0.1072	0.1188
0.1309	0.1437	0.1571	0.1710	0.1856
0.2012	0.2183	0.2369	0.2570	0.2786
0.3037	0.3263	0.3524	0.3800	0.4091
0.4397	0.4719	0.5055	0.5406	0.5772
0.6153	0.6544	0.6944	0.7354	0.7772
0.8199	0.8636	0.9082	0.9536	1.0000

Hrad:

0.0233	0.0465	0.0698	0.0931	0.1163
0.1396	0.1628	0.1861	0.2094	0.2326
0.2559	0.2792	0.3024	0.3257	0.3489
0.3722	0.3955	0.4187	0.4420	0.4653
0.4885	0.5118	0.5350	0.5583	0.5816
0.6036	0.6224	0.6386	0.6529	0.6657
0.6773	0.6882	0.6985	0.7084	0.7180
0.7275	0.7370	0.7464	0.7559	0.7655
0.7817	0.8084	0.8343	0.8597	0.8844
0.9085	0.9321	0.9552	0.9779	1.0000

Width:

0.0127	0.0254	0.0380	0.0507	0.0634
0.0761	0.0888	0.1014	0.1141	0.1268
0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5621	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0999	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8831	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058

0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579
0.4893	0.5214	0.5541	0.5875	0.6216
0.6564	0.6919	0.7280	0.7648	0.8023
0.8405	0.8794	0.9189	0.9591	1.0000

Hrad:

0.0217	0.0433	0.0650	0.0866	0.1083
0.1299	0.1516	0.1732	0.1949	0.2158
0.2334	0.2493	0.2650	0.2808	0.2970
0.3137	0.3309	0.3485	0.3666	0.3838
0.3990	0.4128	0.4110	0.4455	0.4784
0.5099	0.5402	0.5694	0.5973	0.6230
0.6462	0.6674	0.6867	0.7046	0.7237
0.7433	0.7628	0.7822	0.8014	0.8205
0.8393	0.8580	0.8765	0.8948	0.9128
0.9307	0.9483	0.9657	0.9830	1.0000

Width:

0.0110	0.0219	0.0329	0.0439	0.0549
0.0658	0.0768	0.0878	0.0987	0.1153
0.1372	0.1592	0.1811	0.2031	0.2250
0.2469	0.2689	0.2908	0.3130	0.3514
0.3898	0.4282	0.4619	0.4783	0.4948
0.5112	0.5277	0.5442	0.5692	0.6021
0.6350	0.6679	0.7008	0.7337	0.7531
0.7696	0.7860	0.8025	0.8190	0.8354
0.8519	0.8683	0.8848	0.9013	0.9177
0.9342	0.9506	0.9671	0.9835	1.0000

Transect ROW_24m_Parking
Area:

0.0004	0.0014	0.0032	0.0056	0.0088
0.0126	0.0172	0.0225	0.0285	0.0351
0.0425	0.0506	0.0594	0.0689	0.0790
0.0899	0.1015	0.1138	0.1268	0.1410
0.1566	0.1735	0.1918	0.2107	0.2304
0.2507	0.2716	0.2933	0.3156	0.3391
0.3638	0.3900	0.4174	0.4462	0.4758
0.5061	0.5371	0.5687	0.6010	0.6339
0.6675	0.7018	0.7367	0.7724	0.8086
0.8456	0.8832	0.9215	0.9604	1.0000

Hrad:

0.0204	0.0408	0.0612	0.0816	0.1020
0.1224	0.1428	0.1632	0.1836	0.2040
0.2244	0.2448	0.2652	0.2856	0.3060
0.3264	0.3469	0.3673	0.3877	0.4065
0.4232	0.4385	0.4621	0.4937	0.5239
0.5528	0.5805	0.6070	0.6326	0.6563
0.6776	0.6968	0.7143	0.7308	0.7488
0.7668	0.7846	0.8023	0.8198	0.8372
0.8543	0.8713	0.8880	0.9046	0.9210
0.9372	0.9532	0.9690	0.9846	1.0000

Width:

0.0176	0.0352	0.0528	0.0704	0.0880
0.1056	0.1231	0.1407	0.1583	0.1759
0.1935	0.2111	0.2287	0.2463	0.2639
0.2815	0.2991	0.3167	0.3384	0.3727
0.4069	0.4412	0.4667	0.4833	0.5000
0.5167	0.5333	0.5500	0.5708	0.6042
0.6375	0.6708	0.7042	0.7333	0.7500
0.7667	0.7833	0.8000	0.8167	0.8333
0.8500	0.8667	0.8833	0.9000	0.9167
0.9333	0.9500	0.9667	0.9833	1.0000

Transect ROW_26m
Area:

0.0003	0.0013	0.0030	0.0053	0.0083
0.0120	0.0164	0.0214	0.0270	0.0334
0.0404	0.0481	0.0564	0.0654	0.0751
0.0854	0.0964	0.1081	0.1205	0.1335
0.1472	0.1615	0.1765	0.1922	0.2086
0.2261	0.2453	0.2663	0.2888	0.3123
0.3369	0.3625	0.3892	0.4168	0.4456
0.4753	0.5061	0.5379	0.5707	0.6046
0.6395	0.6754	0.7124	0.7504	0.7894
0.8295	0.8705	0.9127	0.9558	1.0000

Hrad:

0.0209	0.0418	0.0627	0.0836	0.1045
0.1254	0.1463	0.1672	0.1880	0.2089
0.2298	0.2507	0.2716	0.2925	0.3134
0.3343	0.3552	0.3761	0.3970	0.4179
0.4388	0.4597	0.4806	0.5015	0.5223
0.5421	0.5589	0.5735	0.5992	0.6295
0.6579	0.6846	0.7097	0.7334	0.7558
0.7771	0.7974	0.8167	0.8352	0.8529
0.8699	0.8863	0.9021	0.9173	0.9321
0.9464	0.9604	0.9739	0.9871	1.0000

Width:

0.0149	0.0299	0.0448	0.0597	0.0747
0.0896	0.1045	0.1195	0.1344	0.1493
0.1643	0.1792	0.1941	0.2090	0.2240
0.2389	0.2538	0.2688	0.2837	0.2986
0.3136	0.3285	0.3434	0.3584	0.3733
0.4113	0.4493	0.4873	0.5154	0.5385
0.5615	0.5846	0.6077	0.6308	0.6538
0.6769	0.7000	0.7231	0.7462	0.7692
0.7923	0.8154	0.8385	0.8615	0.8846
0.9077	0.9308	0.9538	0.9769	1.0000

Transect Upstream1
Area:

0.0025	0.0106	0.0203	0.0306	0.0413
0.0526	0.0643	0.0765	0.0889	0.1016
0.1146	0.1277	0.1411	0.1547	0.1685
0.1826	0.1968	0.2113	0.2260	0.2410
0.2562	0.2716	0.2875	0.3036	0.3201
0.3370	0.3541	0.3718	0.3916	0.4132
0.4352	0.4574	0.4798	0.5024	0.5256
0.5499	0.5749	0.6004	0.6263	0.6529
0.6803	0.7086	0.7388	0.7719	0.8061
0.8411	0.8773	0.9158	0.9566	1.0000

Hrad:

0.0236	0.0542	0.0978	0.1394	0.1791
0.2172	0.2558	0.2953	0.3343	0.3743
0.4135	0.4519	0.4897	0.5268	0.5632
0.5991	0.6344	0.6691	0.7034	0.7372
0.7686	0.7966	0.8243	0.8517	0.8789
0.9059	0.9305	0.9395	0.8568	0.8707
0.9044	0.9376	0.9705	1.0029	1.0032
1.0093	1.0327	1.0560	1.0792	1.0918
1.1023	1.1020	1.0403	1.0362	1.0565
1.0711	1.0710	1.0500	1.0287	1.0000

Width:

0.1112	0.2068	0.2183	0.2299	0.2414
0.2530	0.2625	0.2696	0.2763	0.2812
0.2861	0.2910	0.2959	0.3008	0.3057
0.3106	0.3155	0.3204	0.3253	0.3301
0.3360	0.3434	0.3508	0.3582	0.3656
0.3731	0.3815	0.3971	0.4616	0.4787
0.4839	0.4890	0.4941	0.4992	0.5218
0.5423	0.5531	0.5639	0.5747	0.5916
0.6102	0.6359	0.7052	0.7403	0.7577
0.7795	0.8137	0.8682	0.9276	1.0000

Transect Upstream2
Area:

0.0010	0.0033	0.0061	0.0095	0.0135
0.0180	0.0231	0.0287	0.0349	0.0417
0.0491	0.0571	0.0658	0.0753	0.0857
0.0969	0.1089	0.1216	0.1350	0.1491
0.1643	0.1807	0.1983	0.2174	0.2378
0.2598	0.2837	0.3085	0.3337	0.3593
0.3851	0.4112	0.4375	0.4641	0.4910
0.5185	0.5468	0.5756	0.6049	0.6346
0.6647	0.6958	0.7278	0.7609	0.7954
0.8324	0.8717	0.9124	0.9551	1.0000

Hrad:

0.0245	0.0622	0.0947	0.1245	0.1527
0.1802	0.2071	0.2329	0.2579	0.2827
0.3074	0.3275	0.3469	0.3639	0.3812
0.4022	0.4237	0.4479	0.4730	0.4917
0.5021	0.5129	0.5218	0.5312	0.5437
0.5471	0.5612	0.5918	0.6316	0.6711
0.7100	0.7484	0.7864	0.8238	0.8538
0.8769	0.9017	0.9331	0.9642	0.9950
1.0193	1.0315	1.0445	1.0569	1.0476
1.0094	1.0241	1.0243	1.0266	1.0000

Width:

0.0422	0.0543	0.0664	0.0785	0.0905
0.1024	0.1141	0.1261	0.1385	0.1508
0.1631	0.1781	0.1939	0.2117	0.2302
0.2467	0.2633	0.2781	0.2924	0.3107
0.3356	0.3615	0.3904	0.4208	0.4502
0.4893	0.5205	0.5353	0.5411	0.5466
0.5522	0.5577	0.5632	0.5687	0.5793
0.5947	0.6089	0.6182	0.6274	0.6366
0.6500	0.6718	0.6936	0.7162	0.7558
0.8227	0.8489	0.8887	0.9286	1.0000

Transect Upstream3
Area:

0.0006	0.0023	0.0050	0.0083	0.0121
0.0165	0.0214	0.0269	0.0329	0.0397
0.0479	0.0574	0.0681	0.0800	0.0928
0.1066	0.1216	0.1370	0.1537	0.1724
0.1916	0.2112	0.2310	0.2512	0.2719
0.2933	0.3154	0.3379	0.3607	0.3838
0.4072	0.4308	0.4548	0.4792	0.5043
0.5302	0.5566	0.5834	0.6106	0.6382
0.6665	0.6955	0.7273	0.7625	0.7988
0.8362	0.8744	0.9141	0.9558	1.0000

Hrad:

0.0253	0.0506	0.0845	0.1172	0.1476
0.1766	0.2047	0.2322	0.2591	0.2672
0.2667	0.2864	0.3020	0.3243	0.3504
0.3762	0.4018	0.4273	0.4351	0.4545
0.4946	0.5339	0.5724	0.6101	0.6377
0.6626	0.6916	0.7293	0.7664	0.8029
0.8390	0.8746	0.9096	0.9307	0.9485
0.9716	1.0018	1.0317	1.0613	1.0906
1.1067	1.1229	1.0191	1.0199	1.0379
1.0594	1.0820	1.0709	1.0785	1.0000

Width:

0.0239	0.0478	0.0617	0.0733	0.0849
0.0965	0.1081	0.1196	0.1312	0.1535
0.1863	0.2081	0.2344	0.2566	0.2757
0.1050	0.3144	0.3339	0.3682	0.3946
0.4014	0.4082	0.4149	0.4217	0.4354
0.4510	0.4634	0.4693	0.4752	0.4811
0.4870	0.4929	0.4988	0.5128	0.5290
0.5420	0.5507	0.5594	0.5681	0.5768
0.5931	0.6096	0.7080	0.7423	0.7640
0.7831	0.8014	0.8479	0.8809	1.0000

Transect Upstream4
Area:

0.0018	0.0046	0.0083	0.0128	0.0180
0.0238	0.0302	0.0371	0.0448	0.0547
0.0662	0.0782	0.0907	0.1038	0.1174
0.1319	0.1472	0.1638	0.1825	0.2018
0.2212	0.2408	0.2608	0.2810	0.3017
0.3227	0.3453	0.3685	0.3919	0.4155
0.4393	0.4633	0.4875	0.5118	0.5364
0.5615	0.5871	0.6133	0.6408	0.6690
0.6977	0.7269	0.7568	0.7876	0.8192
0.8516	0.8851	0.9205	0.9583	1.0000

Hrad:

0.0356	0.0671	0.0952	0.1219	0.1526
0.1825	0.2111	0.2388	0.2457	0.2281
0.2626	0.2959	0.3290	0.3614	0.3872
0.4105	0.4302	0.4402	0.4405	0.4805
0.5198	0.5573	0.5905	0.6232	0.6553
0.6869	0.6742	0.7110	0.7474	0.7833
0.8187	0.8537	0.8883	0.9224	0.9509
0.9733	0.9956	1.0049	1.0036	1.0287
1.0536	1.0784	1.0896	1.1008	1.1169
1.1330	1.1274	1.1025	1.0707	1.0000

Width:

0.0541	0.0732	0.0923	0.1110	0.1246
0.1374	0.1502	0.1630	0.1916	0.2527
0.2652	0.2777	0.2895	0.3012	0.3179
0.3368	0.3586	0.3902	0.4339	0.4377
0.4416	0.4466	0.4547	0.4628	0.4709
0.4791	0.5224	0.5268	0.5312	0.5356
0.5400	0.5444	0.5488	0.5532	0.5611
0.5729	0.5847	0.6049	0.6332	0.6440
0.6548	0.6656	0.6857	0.7062	0.7236
0.7412	0.7753	0.8268	0.8894	1.0000

Transect Upstream5
Area:

0.0012	0.0039	0.0075	0.0122	0.0185
0.0256	0.0332	0.0413	0.0500	0.0592
0.0689	0.0792	0.0900	0.1012	0.1130
0.1251	0.1375	0.1502	0.1632	0.1765
0.1902	0.2041	0.2184	0.2330	0.2480
0.2635	0.2798	0.2968	0.3145	0.3331
0.3525	0.3727	0.3942	0.4178	0.4431
0.4698	0.4988	0.5309	0.5639	0.5984
0.6349	0.6722	0.7101	0.7485	0.7872
0.8265	0.8666	0.9084	0.9530	1.0000

Hrad:

0.0281	0.0626	0.0927	0.1114	0.1369
0.1752	0.2115	0.2463	0.2799	0.3124
0.3424	0.3719	0.4068	0.4379	0.4694
0.5056	0.5411	0.5759	0.6102	0.6439
0.6771	0.7099	0.7421	0.7699	0.7956
0.8104	0.8232	0.8370	0.8495	0.8616
0.8746	0.8886	0.8484	0.8428	0.8418
0.8363	0.8155	0.8068	0.8309	0.8203
0.8497	0.8801	0.9176	0.9547	0.9913
1.0230	1.0475	1.0267	1.0168	1.0000

Width:

0.0449	0.0640	0.0831	0.1124	0.1386
0.1495	0.1603	0.1712	0.1820	0.1929
0.2048	0.2146	0.2243	0.2341	0.2433
0.2496	0.2559	0.2622	0.2684	0.2747
0.2810	0.2873	0.2936	0.3016	0.3105
0.3241	0.3390	0.3539	0.3698	0.3865
0.4032	0.4199	0.4663	0.4984	0.5298
0.5663	0.6178	0.6645	0.6844	0.7354
0.7522	0.7679	0.7768	0.7857	0.7946
0.8074	0.8259	0.8838	0.9366	1.0000

Transect Upstream6
Area:

0.0020	0.0057	0.0101	0.0154	0.0216
0.0285	0.0362	0.0446	0.0534	0.0628
0.0726	0.0829	0.0939	0.1054	0.1174
0.1299	0.1429	0.1564	0.1705	0.1850
0.2000	0.2153	0.2310	0.2472	0.2637
0.2808	0.2986	0.3172	0.3364	0.3564
0.3786	0.4016	0.4255	0.4503	0.4760
0.5026	0.5304	0.5593	0.5897	0.6214
0.6541	0.6875	0.7215	0.7561	0.7915
0.8280	0.8671	0.9077	0.9506	1.0000

Hrad:

0.0333	0.0728	0.1080	0.1404	0.1714
0.2022	0.2321	0.2687	0.3047	0.3396
0.3717	0.4020	0.4318	0.4612	0.4948
0.5246	0.5534	0.5820	0.6106	0.6442
0.6773	0.7100	0.7423	0.7742	0.8057
0.8224	0.8398	0.8578	0.8777	0.8995
0.8582	0.8792	0.8979	0.9152	0.9365
0.9490	0.9612	0.9727	0.9697	0.9916
1.0145	1.0496	1.0816	1.1092	1.1367
1.1540	1.1196	1.1309	1.0883	1.0000

Width:

0.0616	0.0785	0.0947	0.1108	0.1267

0.1418	0.1569	0.1666	0.1758	0.1850
0.1952	0.2062	0.2171	0.2280	0.2365
0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 07/01/1979 00:00:00
Ending Date 07/02/1979 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	7.015	83.988
Evaporation Loss	0.000	0.000
Infiltration Loss	2.089	25.006
Surface Runoff	4.841	57.962
Final Storage	0.087	1.037
Continuity Error (%)	-0.019	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.841	48.415
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.841	38.414
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.098	0.981
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.905	9.048
Continuity Error (%)	-0.057	

****
Highest Continuity Errors
****
Node J24 (5.63%)
Node 514_(C-STRM) (2.61%)
Node J23 (1.60%)
Node J59 (1.37%)
Node J36 (1.35%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL12 (7)
Link OL9 (6)
Link OL16 (6)

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.95 %
0.871 - 0.758 sec	:	0.01 %
0.758 - 0.660 sec	:	0.01 %
0.660 - 0.574 sec	:	0.01 %
0.574 - 0.500 sec	:	0.02 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	83.99	0.00	0.00	65.14	15.63	5.02	17.53	0.61	0.12	0.209
A18	83.99	0.00	0.00	29.47	32.26	28.12	53.92	0.32	0.15	0.642
A19	83.99	0.00	0.00	39.71	18.41	29.22	43.94	0.49	0.20	0.523
A20	83.99	0.00	0.00	66.73	6.90	10.47	15.99	0.77	0.13	0.190
NULL3	83.99	0.00	0.00	8.34	68.71	19.41	74.37	0.42	0.16	0.886
S1	83.99	0.00	0.00	17.94	54.73	48.61	65.03	4.24	1.80	0.774
S1_1	83.99	0.00	0.00	13.58	58.90	22.21	69.33	0.08	0.03	0.826
S1_2	83.99	0.00	0.00	13.52	58.91	22.27	69.39	0.08	0.03	0.826
S1_4	83.99	0.00	0.00	13.62	58.90	22.16	69.29	0.13	0.05	0.825
S1_5	83.99	0.00	0.00	13.58	58.90	22.21	69.33	0.07	0.03	0.825
S10_1	83.99	0.00	0.00	18.94	53.00	48.16	64.06	1.18	0.50	0.763
S10_2	83.99	0.00	0.00	18.94	53.00	48.16	64.06	1.36	0.58	0.763
S10_4	83.99	0.00	0.00	18.94	53.00	48.16	64.06	0.47	0.20	0.763
S10_5	83.99	0.00	0.00	18.94	53.00	48.16	64.06	0.81	0.34	0.763
S11	83.99	0.00	0.00	55.09	0.00	28.90	28.90	0.95	0.36	0.344
S12	83.99	0.00	0.00	13.63	58.90	22.15	69.27	0.30	0.12	0.825
S14_1	83.99	0.00	0.00	13.70	58.90	22.08	69.20	0.41	0.17	0.824
S14_3	83.99	0.00	0.00	13.90	58.89	21.89	69.00	0.73	0.30	0.822
S14_4	83.99	0.00	0.00	13.72	58.90	22.07	69.18	0.21	0.08	0.824
S14_5	83.99	0.00	0.00	13.86	58.89	21.92	69.04	1.16	0.48	0.822
S14_6	83.99	0.00	0.00	13.74	58.90	22.04	69.16	0.20	0.08	0.823
S14_7	83.99	0.00	0.00	13.78	58.90	22.00	69.11	0.81	0.33	0.823
S14_8	83.99	0.00	0.00	13.76	58.90	22.02	69.14	0.23	0.10	0.823
S15	83.99	0.00	0.00	18.94	53.00	48.16	64.06	1.05	0.45	0.763
S16	83.99	0.00	0.00	0.00	82.26	0.00	82.26	1.21	0.29	0.979
S17	83.99	0.00	0.00	67.28	2.75	16.66	16.66	1.04	0.23	0.198
S18_2	83.99	0.00	0.00	18.94	53.00	48.16	64.06	2.15	0.92	0.763
S18_3	83.99	0.00	0.00	18.94	53.00	48.16	64.06	1.06	0.45	0.763
S18_4	83.99	0.00	0.00	18.94	53.00	48.16	64.06	0.56	0.24	0.763
S18_5	83.99	0.00	0.00	15.52	58.89	49.70	67.37	1.23	0.51	0.802
S18_6	83.99	0.00	0.00	18.94	53.00	48.16	64.06	0.54	0.23	0.763
S19	83.99	0.00	0.00	13.83	58.89	21.95	69.07	0.73	0.30	0.822
S2	83.99	0.00	0.00	17.71	55.13	48.72	65.26	2.43	1.03	0.777
S20_1	83.99	0.00	0.00	13.60	58.90	22.19	69.31	0.34	0.14	0.825
S20_2	83.99	0.00	0.00	13.44	58.91	22.35	69.47	0.16	0.06	0.827
S3	83.99	0.00	0.00	18.94	53.00	48.16	64.06	1.59	0.68	0.763
S32	83.99	0.00	0.00	13.63	58.90	22.16	69.28	0.29	0.12	0.825
S36	83.99	0.00	0.00	0.00	82.26	0.00	82.26	1.50	0.36	0.979
S4	83.99	0.00	0.00	7.26	70.64	4.74	75.38	9.96	3.41	0.897
S5	83.99	0.00	0.00	6.78	70.65	5.22	75.87	2.42	0.89	0.903
S6	83.99	0.00	0.00	20.10	47.12	25.33	63.03	0.22	0.10	0.750
S7	83.99	0.00	0.00	6.89	70.65	5.11	75.76	3.02	1.10	0.902
S8	83.99	0.00	0.00	37.59	29.44	45.85	45.85	0.88	0.31	0.546

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.15	104.54	0 01:30	0.15
EXD_10	JUNCTION	0.05	0.43	99.08	0 01:43	0.43
EXD_11	JUNCTION	0.04	0.31	98.81	0 01:43	0.31
EXD_12	JUNCTION	0.06	0.46	98.76	0 01:42	0.46
EXD_13	JUNCTION	0.01	0.16	104.48	0 01:31	0.16
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.04	0.40	100.67	0 02:00	0.40
EXD_16	JUNCTION	0.03	0.19	100.39	0 01:41	0.19
EXD_17	JUNCTION	0.03	0.17	100.06	0 02:03	0.17
EXD_18	JUNCTION	0.02	0.22	99.63	0 01:42	0.22
EXD_19	JUNCTION	0.05	0.42	99.61	0 01:40	0.42
EXD_2	JUNCTION	0.03	0.25	103.72	0 01:33	0.25
EXD_20	JUNCTION	0.05	0.43	99.61	0 01:41	0.43
EXD_21	JUNCTION	0.04	0.31	99.49	0 01:41	0.31
EXD_22	JUNCTION	0.03	0.20	99.35	0 01:45	0.20
EXD_23	JUNCTION	0.05	0.31	99.06	0 01:48	0.31
EXD_24	JUNCTION	0.02	0.29	98.95	0 01:42	0.29
EXD_25	JUNCTION	0.05	0.42	98.95	0 01:42	0.42
EXD_26	JUNCTION	0.02	0.21	98.69	0 01:51	0.21
EXD_27	JUNCTION	0.06	0.38	98.54	0 01:40	0.38
EXD_3	JUNCTION	0.01	0.13	103.32	0 01:35	0.13
EXD_4	JUNCTION	0.01	0.13	102.78	0 01:36	0.13
EXD_5	JUNCTION	0.01	0.20	102.70	0 01:36	0.20
EXD_6	JUNCTION	0.01	0.13	102.45	0 01:37	0.13
EXD_7	JUNCTION	0.02	0.20	101.69	0 01:43	0.20
EXD_8	JUNCTION	0.04	0.46	100.94	0 01:57	0.46
EXD_9	JUNCTION	0.02	0.19	100.57	0 02:00	0.19
J10	JUNCTION	0.00	0.08	103.68	0 01:37	0.08
J11	JUNCTION	0.00	0.11	103.61	0 01:35	0.11
J12	JUNCTION	0.00	0.12	103.52	0 01:38	0.12
J13	JUNCTION	0.01	0.18	103.48	0 01:41	0.18
J17	JUNCTION	0.01	0.15	104.52	0 01:30	0.15
J19	JUNCTION	0.00	0.08	105.48	0 01:30	0.08
J20	JUNCTION	0.00	0.05	105.50	0 01:31	0.05
J21	JUNCTION	0.00	0.06	105.61	0 01:28	0.06
J22	JUNCTION	0.00	0.01	105.71	0 01:40	0.01
J23	JUNCTION	0.00	0.05	106.05	0 01:42	0.05
J24	JUNCTION	0.00	0.04	106.24	0 01:40	0.04
J25	JUNCTION	0.00	0.15	105.45	0 01:40	0.15
J26	JUNCTION	0.00	0.16	105.86	0 01:40	0.16
J28	JUNCTION	0.00	0.07	109.07	0 01:30	0.07
J29	JUNCTION	0.00	0.09	108.89	0 01:31	0.09
J32	JUNCTION	0.00	0.13	106.13	0 01:39	0.13
J36	JUNCTION	0.00	0.08	104.78	0 01:32	0.08
J39	JUNCTION	0.01	0.17	104.77	0 01:41	0.17
J40	JUNCTION	0.00	0.17	104.62	0 01:39	0.17
J41	JUNCTION	0.00	0.19	103.39	0 01:41	0.19
J43	JUNCTION	0.00	0.14	104.34	0 01:40	0.14
J44	JUNCTION	0.00	0.09	104.59	0 01:40	0.09
J46	JUNCTION	0.00	0.06	104.66	0 01:30	0.06
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.09	105.84	0 01:40	0.09
J51	JUNCTION	0.00	0.10	106.85	0 01:41	0.09
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0 00:00	0.00
J58	JUNCTION	0.00	0.06	108.46	0 01:32	0.06
J59	JUNCTION	0.00	0.06	108.06	0 01:35	0.06
J6	JUNCTION	0.00	0.04	109.86	0 01:30	0.04
J61	JUNCTION	0.00	0.06	107.06	0 01:30	0.06
J62	JUNCTION	0.00	0.08	106.58	0 01:36	0.08
J74	JUNCTION	0.42	0.57	99.02	0 02:21	0.57
J9	JUNCTION	0.00	0.08	103.78	0 01:38	0.08
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.04	0.34	98.34	0 01:40	0.34
ST4_108A_(P-Stm)	OUTFALL	0.00	0.00	98.02	0 00:00	0.00
500_(C-STRM)	STORAGE	0.34	0.77	101.09	0 02:12	0.77
500A_(C-STRM)	STORAGE	0.38	0.92	101.02	0 01:43	0.92

502_(C-STRM)	STORAGE	0.15	1.73	102.27	0	01:44	1.73	
503_(C-STRM)	STORAGE	0.14	1.85	102.43	0	01:44	1.85	
504_(C-STRM)	STORAGE	0.35	1.38	104.41	0	01:47	1.38	
505_(C-STRM)	STORAGE	0.35	1.55	105.00	0	01:44	1.54	
506_(C-STRM)	STORAGE	0.35	1.73	105.55	0	01:44	1.73	
507_(C-STRM)	STORAGE	0.35	1.78	105.92	0	01:44	1.77	
508_(C-STRM)	STORAGE	0.35	1.91	106.28	0	01:44	1.90	
509_(C-STRM)	STORAGE	0.36	2.05	106.65	0	01:45	2.05	
510_(C-STRM)	STORAGE	0.35	2.10	106.95	0	01:45	2.09	
511_(C-STRM)	STORAGE	0.36	2.12	107.04	0	01:45	2.12	
512_(C-STRM)	STORAGE	0.35	2.12	107.23	0	01:45	2.11	
513_(C-STRM)	STORAGE	0.35	2.11	107.36	0	01:45	2.11	
514_(C-STRM)	STORAGE	0.31	1.78	107.37	0	01:45	1.77	
515_(C-STRM)	STORAGE	0.30	1.53	107.38	0	01:45	1.53	
516_(C-STRM)	STORAGE	0.35	2.16	107.62	0	01:45	2.16	
517_(C-STRM)	STORAGE	0.36	2.27	107.89	0	01:44	2.27	
518_(C-STRM)	STORAGE	0.36	2.50	108.35	0	01:43	2.49	
519_(C-STRM)	STORAGE	0.35	2.29	108.37	0	01:42	2.28	
520_(C-STRM)	STORAGE	0.34	2.16	108.50	0	01:41	2.16	
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	01:38	0.61	
525_(C-STRM)	STORAGE	0.13	1.75	102.36	0	01:44	1.75	
528_(C-STRM)	STORAGE	0.11	1.89	102.62	0	01:45	1.89	
532_(C-STRM)	STORAGE	0.10	1.95	102.78	0	01:45	1.95	
536_(C-STRM)	STORAGE	0.10	1.94	102.92	0	01:46	1.94	
540_(C-STRM)	STORAGE	0.39	2.18	103.04	0	01:46	2.18	
541_(C-STRM)	STORAGE	0.38	2.17	103.10	0	01:46	2.17	
551_(C-STRM)	STORAGE	0.37	1.78	102.42	0	01:43	1.78	
552_(C-STRM)	STORAGE	0.36	1.73	102.48	0	01:43	1.73	
553_(C-STRM)	STORAGE	0.35	1.66	102.60	0	01:43	1.66	
554_(C-STRM)	STORAGE	0.34	1.63	102.68	0	01:42	1.62	
555_(C-STRM)	STORAGE	0.34	1.61	102.86	0	01:42	1.61	
556_(C-STRM)	STORAGE	0.34	1.67	103.04	0	01:42	1.67	
601_(C-STRM)	STORAGE	0.17	1.22	101.67	0	01:41	1.22	
602_(C-STRM)	STORAGE	0.17	1.73	102.25	0	01:40	1.73	
603_(C-STRM)	STORAGE	0.14	1.77	102.40	0	01:41	1.77	
604_(C-STRM)	STORAGE	0.12	1.91	102.79	0	01:41	1.91	
605_(C-STRM)	STORAGE	0.12	1.87	102.95	0	01:43	1.87	
606_(C-STRM)	STORAGE	0.12	1.96	103.20	0	01:43	1.96	
619_(C-STRM)	STORAGE	0.12	2.06	103.44	0	01:43	2.06	
622_(C-STRM)	STORAGE	0.12	2.01	103.53	0	01:42	2.01	
626_(C-STRM)	STORAGE	0.30	0.52	104.47	0	02:09	0.52	
627_(C-STRM)	STORAGE	0.33	0.95	104.08	0	01:43	0.95	
629_(C-STRM)	STORAGE	0.12	1.96	103.61	0	01:42	1.96	
630_(C-STRM)	STORAGE	0.11	1.72	103.79	0	01:42	1.72	
630A_(C-STRM)	STORAGE	0.10	1.73	103.85	0	01:42	1.73	
631_(C-STRM)	STORAGE	0.00	0.13	106.13	0	01:40	0.13	
645_(C-STRM)	STORAGE	0.38	2.03	104.05	0	01:41	2.02	
647_(C-STRM)	STORAGE	0.37	2.05	104.19	0	01:41	2.05	
650_(C-STRM)	STORAGE	0.37	2.06	104.29	0	01:40	2.06	
651_(C-STRM)	STORAGE	0.37	2.06	104.37	0	01:41	2.06	
682_(C-STRM)	STORAGE	0.00	0.19	105.59	0	01:41	0.19	
MTD_(C-STRM)	STORAGE	0.23	1.60	101.97	0	01:44	1.60	
OVERFLOW_(C-STRM)	STORAGE	0.32	0.91	101.09	0	01:44	0.91	
POND_(C-STRM)	STORAGE	1.89	2.53	101.98	0	02:20	2.53	
S_525-MTD	STORAGE	0.00	0.18	103.48	0	01:41	0.18	
S_528-525	STORAGE	0.00	0.14	103.55	0	01:38	0.14	
S_532-528	STORAGE	0.00	0.13	103.63	0	01:34	0.13	
S_536-532	STORAGE	0.00	0.20	103.80	0	01:34	0.20	
S_540-536	STORAGE	0.00	0.18	103.89	0	01:33	0.18	
S_541-540	STORAGE	0.00	0.17	103.99	0	01:40	0.17	
S_604-603	STORAGE	0.00	0.15	105.85	0	01:40	0.15	
S_605-604	STORAGE	0.00	0.18	106.90	0	01:41	0.18	
S_619-606	STORAGE	0.00	0.19	106.69	0	01:36	0.19	
S_622-619	STORAGE	0.01	0.20	105.90	0	01:40	0.20	
S_622-619_2	STORAGE	0.00	0.20	106.70	0	01:35	0.20	
S_627-630	STORAGE	0.00	0.12	106.82	0	01:36	0.12	
S_629-622	STORAGE	0.00	0.14	106.16	0	01:35	0.14	
SU2	STORAGE	0.02	0.36	107.11	0	02:11	0.36	
SU5	STORAGE	0.01	0.27	104.45	0	01:59	0.27	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.122	0 01:30	0	0.301	- 0.032
EXD_10	JUNCTION	0.648	0.864	0 01:40	2.7	4.04	- 0.248
EXD_11	JUNCTION	0.000	0.835	0 01:43	0	4.05	0.005
EXD_12	JUNCTION	0.124	0.937	0 01:42	0.607	4.65	0.001
EXD_13	JUNCTION	0.000	0.120	0 01:30	0	0.302	- 0.121
EXD_14	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.131	0.131	0 01:40	0.773	0.773	- 0.002
EXD_16	JUNCTION	0.000	0.110	0 02:00	0	0.773	- 0.078
EXD_17	JUNCTION	0.000	0.110	0 02:01	0	0.773	- 0.002
EXD_18	JUNCTION	0.000	0.109	0 02:03	0	0.773	0.236
EXD_19	JUNCTION	0.000	0.126	0 02:03	0	0.779	- 0.122
EXD_2	JUNCTION	0.000	0.118	0 01:31	0	0.302	0.251
EXD_20	JUNCTION	0.198	0.252	0 01:40	0.486	1.27	- 0.007
EXD_21	JUNCTION	0.000	0.250	0 01:40	0	1.26	- 0.024
EXD_22	JUNCTION	0.000	0.250	0 01:44	0	1.26	- 0.109
EXD_23	JUNCTION	0.000	0.249	0 01:45	0	1.26	0.182
EXD_24	JUNCTION	0.000	0.247	0 01:48	0	1.26	0.066
EXD_25	JUNCTION	0.147	0.317	0 01:40	0.32	1.58	0.009
EXD_26	JUNCTION	0.000	0.385	0 01:41	0	1.58	0.050
EXD_27	JUNCTION	0.164	1.325	0 01:40	0.42	6.65	- 0.010
EXD_3	JUNCTION	0.000	0.113	0 01:34	0	0.301	0.071
EXD_4	JUNCTION	0.000	0.113	0 01:35	0	0.301	0.025
EXD_5	JUNCTION	0.000	0.112	0 01:36	0	0.301	- 0.001
EXD_6	JUNCTION	0.000	0.112	0 01:36	0	0.301	- 0.677
EXD_7	JUNCTION	0.227	0.318	0 01:40	1.04	1.35	- 0.046
EXD_8	JUNCTION	0.000	0.313	0 01:43	0	1.35	0.236
EXD_9	JUNCTION	0.000	0.277	0 01:57	0	1.34	0.814
J10	JUNCTION	0.000	0.467	0 01:36	0	0.433	0.007
J11	JUNCTION	0.000	0.537	0 01:36	0	0.492	- 0.000
J12	JUNCTION	0.000	0.662	0 01:35	0	0.597	- 0.005
J13	JUNCTION	0.000	0.711	0 01:40	0	0.683	0.137
J17	JUNCTION	0.000	0.121	0 01:30	0	0.302	- 0.056
J19	JUNCTION	0.334	0.348	0 01:30	0.812	0.82	- 1.014
J20	JUNCTION	0.031	0.058	0 01:30	0.0749	0.095	0.343
J21	JUNCTION	0.054	0.055	0 01:30	0.132	0.133	- 0.192
J22	JUNCTION	0.033	0.044	0 01:40	0.081	0.0999	- 0.084
J23	JUNCTION	0.000	0.028	0 01:40	0	0.0193	1.625
J24	JUNCTION	0.000	0.046	0 01:36	0	0.029	5.964
J25	JUNCTION	0.000	0.983	0 01:40	0	1.06	0.191
J26	JUNCTION	0.000	0.818	0 01:39	0	0.916	- 0.345
J28	JUNCTION	0.170	0.170	0 01:30	0.414	0.414	- 0.967
J29	JUNCTION	0.478	0.516	0 01:30	1.16	1.19	- 0.046
J32	JUNCTION	0.000	0.477	0 01:35	0	0.405	0.203
J36	JUNCTION	0.065	0.161	0 01:30	0.157	0.226	1.365
J39	JUNCTION	0.000	0.981	0 01:40	0	1.11	0.517
J40	JUNCTION	0.141	1.034	0 01:39	0.344	1.44	- 0.116
J41	JUNCTION	0.000	1.914	0 01:40	0	1.97	0.104
J43	JUNCTION	0.000	1.215	0 01:40	0	1.29	- 0.058
J44	JUNCTION	0.085	0.357	0 01:40	0.206	0.543	0.087
J46	JUNCTION	0.118	0.118	0 01:30	0.287	0.287	- 0.671
J47	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J48	JUNCTION	0.096	0.380	0 01:40	0.233	0.589	- 0.077
J51	JUNCTION	0.000	0.329	0 01:40	0	0.359	1.005
J52	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J58	JUNCTION	0.301	0.356	0 01:30	0.733	0.783	- 0.121
J59	JUNCTION	0.082	0.149	0 01:30	0.2	0.265	1.388
J6	JUNCTION	0.124	0.124	0 01:30	0.302	0.302	- 0.084
J61	JUNCTION	0.334	0.385	0 01:30	0.812	0.872	- 0.864
J62	JUNCTION	0.000	0.178	0 01:35	0	0.147	- 0.450
J74	JUNCTION	0.000	0.501	0 02:20	0	26.7	0.052
J9	JUNCTION	0.000	0.335	0 01:38	0	0.331	0.003
OF1	OUTFALL	0.000	1.321	0 02:20	0	4.87	0.000
OF2	OUTFALL	0.095	0.095	0 01:30	0.215	0.215	0.000
OF3	OUTFALL	0.000	1.316	0 01:40	0	6.65	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.501	0 02:21	0	26.7	0.000
500_(C-STRM)	STORAGE	0.000	0.239	0 02:11	0	0.634	- 0.057
500A_(C-STRM)	STORAGE	0.000	4.345	0 01:42	0	13.4	0.053
502_(C-STRM)	STORAGE	0.000	1.382	0 01:43	0	5.96	- 0.002
503_(C-STRM)	STORAGE	0.000	1.047	0 01:47	0	4.62	- 0.004
504_(C-STRM)	STORAGE	0.000	0.989	0 01:46	0	4.39	- 0.074
505_(C-STRM)	STORAGE	0.000	0.804	0 01:44	0	3.24	- 0.057
506_(C-STRM)	STORAGE	0.000	0.811	0 01:44	0	3.24	0.203
507_(C-STRM)	STORAGE	0.000	0.621	0 01:46	0	2.45	- 0.246
508_(C-STRM)	STORAGE	0.000	0.614	0 01:45	0	2.45	0.005
509_(C-STRM)	STORAGE	0.000	0.610	0 01:45	0	2.45	- 0.018
510_(C-STRM)	STORAGE	0.000	0.607	0 01:45	0	2.45	0.063
511_(C-STRM)	STORAGE	0.000	0.608	0 01:45	0	2.45	0.024
512_(C-STRM)	STORAGE	0.000	0.554	0 01:44	0	2.25	- 0.060
513_(C-STRM)	STORAGE	0.000	0.592	0 01:43	0	2.31	0.346
514_(C-STRM)	STORAGE	0.000	0.075	0 01:23	0	0.0696	2.684
515_(C-STRM)	STORAGE	0.000	0.036	0 01:26	0	0.0147	- 6.640
516_(C-STRM)	STORAGE	0.000	0.398	0 01:43	0	1.53	- 0.873
517_(C-STRM)	STORAGE	0.000	0.419	0 01:42	0	1.53	- 0.053
518_(C-STRM)	STORAGE	0.000	0.438	0 01:42	0	1.53	0.336
519_(C-STRM)	STORAGE	0.000	0.113	0 01:41	0	0.391	- 0.817
520_(C-STRM)	STORAGE	0.000	0.121	0 01:20	0	0.395	0.715
522_(C-STRM)	STORAGE	0.000	0.088	0 01:20	0	0.282	0.013
525_(C-STRM)	STORAGE	0.000	1.264	0 02:06	0	5.92	0.045
528_(C-STRM)	STORAGE	0.000	1.053	0 02:05	0	4.95	- 0.003
532_(C-STRM)	STORAGE	0.000	0.842	0 02:05	0	3.99	- 0.090
536_(C-STRM)	STORAGE	0.000	0.732	0 02:05	0	3.51	0.059
540_(C-STRM)	STORAGE	0.000	0.499	0 02:06	0	2.38	- 0.020
541_(C-STRM)	STORAGE	0.000	0.368	0 01:12	0	1.87	0.021
551_(C-STRM)	STORAGE	0.000	0.350	0 01:43	0	1.34	0.298
552_(C-STRM)	STORAGE	0.000	0.251	0 01:42	0	0.882	- 0.303
553_(C-STRM)	STORAGE	0.000	0.254	0 01:42	0	0.884	0.229
554_(C-STRM)	STORAGE	0.000	0.210	0 01:42	0	0.708	- 0.592
555_(C-STRM)	STORAGE	0.000	0.213	0 01:42	0	0.708	- 0.176
556_(C-STRM)	STORAGE	0.000	0.214	0 01:20	0	0.709	0.189
601_(C-STRM)	STORAGE	0.000	5.314	0 01:40	0	23.7	0.053
602_(C-STRM)	STORAGE	0.000	5.315	0 01:40	0	23.7	- 0.001
603_(C-STRM)	STORAGE	0.000	5.261	0 01:44	0	23.5	0.004

604_(C-STRM)	STORAGE	0.000	5.261	0	01:43	0	23.5	-	0.006
605_(C-STRM)	STORAGE	0.000	4.967	0	01:43	0	22.1	-	0.002
606_(C-STRM)	STORAGE	0.000	4.223	0	01:42	0	18.6		0.003
619_(C-STRM)	STORAGE	0.000	4.224	0	01:42	0	18.6		0.000
622_(C-STRM)	STORAGE	0.000	3.990	0	01:42	0	17.6		0.000
626_(C-STRM)	STORAGE	0.000	0.141	0	01:24	0	0.952	-	0.285
627_(C-STRM)	STORAGE	0.000	0.238	0	01:31	0	1.34		0.045
629_(C-STRM)	STORAGE	0.000	3.441	0	01:41	0	14.7	-	0.170
630_(C-STRM)	STORAGE	0.000	3.310	0	01:41	0	14.1		0.126
630A_(C-STRM)	STORAGE	0.000	3.076	0	01:40	0	12.8		0.038
631_(C-STRM)	STORAGE	3.406	3.406	0	01:30	9.96	9.96	-	0.048
645_(C-STRM)	STORAGE	0.000	0.722	0	01:55	0	2.78	-	0.176
647_(C-STRM)	STORAGE	0.000	0.661	0	01:55	0	2.68	-	0.119
650_(C-STRM)	STORAGE	0.000	0.583	0	01:55	0	2.56	-	0.135
651_(C-STRM)	STORAGE	0.000	0.544	0	01:20	0	2.48		0.055
682_(C-STRM)	STORAGE	0.894	0.894	0	01:30	2.42	2.42	-	0.027
MTD_(C-STRM)	STORAGE	0.000	2.606	0	01:44	0	11.9	-	0.043
OVERFLOW_(C-STRM)	STORAGE	0.000	2.605	0	01:44	0	11.9		0.011
POND_(C-STRM)	STORAGE	1.099	10.345	0	01:42	3.02	40.7	-	0.036
S_525-MTD	STORAGE	0.447	0.447	0	01:30	1.05	1.06	-	0.006
S_528-525	STORAGE	0.453	0.453	0	01:30	1.06	1.06	-	0.006
S_532-528	STORAGE	0.230	0.230	0	01:30	0.538	0.538	-	0.007
S_536-532	STORAGE	0.513	0.513	0	01:30	1.23	1.23	-	0.007
S_540-536	STORAGE	0.239	0.239	0	01:30	0.561	0.561	-	0.006
S_541-540	STORAGE	0.916	0.916	0	01:30	2.15	2.15	-	0.006
S_604-603	STORAGE	0.677	0.677	0	01:30	1.59	1.59	-	0.000
S_605-604	STORAGE	1.797	1.797	0	01:30	4.24	4.24		0.000
S_619-606	STORAGE	0.504	0.504	0	01:30	1.18	1.18	-	0.000
S_622-619	STORAGE	1.027	1.027	0	01:30	2.43	2.43		0.000
S_622-619_2	STORAGE	0.581	0.581	0	01:30	1.36	1.36	-	0.000
S_627-630	STORAGE	0.199	0.199	0	01:30	0.465	0.465	-	0.000
S_629-622	STORAGE	0.344	0.344	0	01:30	0.807	0.807		0.000
SU2	STORAGE	0.359	0.359	0	01:40	0.952	0.952		0.000
SU5	STORAGE	0.311	0.311	0	01:40	0.879	0.879	-	0.000

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	11.9	0.0	0.0	0.001	27.2	0 02:12	0.271
500A_(C-STRM)	0.753	35.6	0.0	0.0	1.926	91.1	0 01:43	4.325
502_(C-STRM)	0.000	4.2	0.0	0.0	0.002	46.8	0 01:44	1.381
503_(C-STRM)	0.000	3.7	0.0	0.0	0.002	47.1	0 01:44	1.048
504_(C-STRM)	0.000	13.1	0.0	0.0	0.002	51.0	0 01:47	0.987
505_(C-STRM)	0.000	10.8	0.0	0.0	0.002	47.5	0 01:44	0.799
506_(C-STRM)	0.000	11.2	0.0	0.0	0.002	54.8	0 01:44	0.804
507_(C-STRM)	0.000	11.3	0.0	0.0	0.002	57.3	0 01:44	0.628
508_(C-STRM)	0.000	11.3	0.0	0.0	0.002	61.1	0 01:44	0.621
509_(C-STRM)	0.000	11.3	0.0	0.0	0.002	65.3	0 01:45	0.614
510_(C-STRM)	0.000	11.5	0.0	0.0	0.002	68.1	0 01:45	0.610
511_(C-STRM)	0.000	11.5	0.0	0.0	0.002	68.9	0 01:45	0.607
512_(C-STRM)	0.000	11.3	0.0	0.0	0.002	67.9	0 01:45	0.549
513_(C-STRM)	0.000	11.2	0.0	0.0	0.002	67.3	0 01:45	0.573
514_(C-STRM)	0.000	9.9	0.0	0.0	0.002	56.4	0 01:45	0.062
515_(C-STRM)	0.000	9.3	0.0	0.0	0.002	47.1	0 01:45	0.025
516_(C-STRM)	0.000	11.5	0.0	0.0	0.002	70.8	0 01:45	0.391
517_(C-STRM)	0.000	11.8	0.0	0.0	0.003	75.1	0 01:44	0.398
518_(C-STRM)	0.000	12.5	0.0	0.0	0.003	85.5	0 01:43	0.419
519_(C-STRM)	0.000	12.3	0.0	0.0	0.003	81.4	0 01:42	0.145
520_(C-STRM)	0.000	12.8	0.0	0.0	0.002	81.3	0 01:41	0.113
522_(C-STRM)	0.000	10.5	0.0	0.0	0.001	20.3	0 01:38	0.088
525_(C-STRM)	0.000	5.0	0.0	0.0	0.002	65.1	0 01:44	1.273
528_(C-STRM)	0.000	4.2	0.0	0.0	0.002	70.7	0 01:45	1.061
532_(C-STRM)	0.000	3.7	0.0	0.0	0.002	72.9	0 01:45	0.848
536_(C-STRM)	0.000	3.7	0.0	0.0	0.002	74.0	0 01:46	0.738
540_(C-STRM)	0.000	13.6	0.0	0.0	0.002	76.7	0 01:46	0.541
541_(C-STRM)	0.000	13.2	0.0	0.0	0.002	74.9	0 01:46	0.396
551_(C-STRM)	0.000	9.7	0.0	0.0	0.002	47.1	0 01:43	0.348
552_(C-STRM)	0.000	9.2	0.0	0.0	0.002	44.7	0 01:43	0.249
553_(C-STRM)	0.000	9.3	0.0	0.0	0.002	44.0	0 01:43	0.251
554_(C-STRM)	0.000	8.9	0.0	0.0	0.002	41.8	0 01:42	0.208
555_(C-STRM)	0.000	8.7	0.0	0.0	0.002	40.9	0 01:42	0.210
556_(C-STRM)	0.000	8.8	0.0	0.0	0.002	43.1	0 01:42	0.213
601_(C-STRM)	0.000	3.9	0.0	0.0	0.001	27.5	0 01:41	5.313
602_(C-STRM)	0.000	4.2	0.0	0.0	0.002	42.3	0 01:40	5.314
603_(C-STRM)	0.000	3.6	0.0	0.0	0.002	45.6	0 01:41	5.261
604_(C-STRM)	0.000	2.5	0.0	0.0	0.002	39.3	0 01:41	5.261
605_(C-STRM)	0.000	2.1	0.0	0.0	0.002	33.2	0 01:43	4.967
606_(C-STRM)	0.000	2.2	0.0	0.0	0.002	34.1	0 01:43	4.224
619_(C-STRM)	0.000	2.5	0.0	0.0	0.002	40.1	0 01:43	4.223
622_(C-STRM)	0.000	2.7	0.0	0.0	0.002	44.7	0 01:42	3.991
626_(C-STRM)	0.000	9.1	0.0	0.0	0.001	15.8	0 02:09	0.141
627_(C-STRM)	0.000	9.2	0.0	0.0	0.001	26.6	0 01:43	0.295
629_(C-STRM)	0.000	2.6	0.0	0.0	0.002	43.9	0 01:42	3.439
630_(C-STRM)	0.000	2.7	0.0	0.0	0.002	41.7	0 01:42	3.307
630A_(C-STRM)	0.000	2.7	0.0	0.0	0.002	44.5	0 01:42	3.074
631_(C-STRM)	0.010	0.4	0.0	0.0	0.634	25.4	0 01:40	2.438
645_(C-STRM)	0.000	10.3	0.0	0.0	0.002	54.9	0 01:41	0.772
647_(C-STRM)	0.000	11.0	0.0	0.0	0.002	60.1	0 01:41	0.710
650_(C-STRM)	0.000	11.6	0.0	0.0	0.002	64.6	0 01:40	0.647
651_(C-STRM)	0.000	12.2	0.0	0.0	0.002	67.9	0 01:41	0.575
682_(C-STRM)	0.005	0.7	0.0	0.0	0.286	38.2	0 01:41	0.526
MTD_(C-STRM)	0.000	7.3	0.0	0.0	0.002	50.2	0 01:44	2.605
OVERFLOW_(C-STRM)	0.000	11.7	0.0	0.0	0.001	32.9	0 01:44	2.606
POND_(C-STRM)	19.043	52.6	0.0	0.0	33.355	92.1	0 02:20	1.896
S_525-MTD	0.005	0.8	0.0	0.0	0.209	36.5	0 01:41	0.318
S_528-525	0.004	0.7	0.0	0.0	0.167	28.7	0 01:38	0.330
S_532-528	0.002	0.6	0.0	0.0	0.077	26.2	0 01:34	0.182
S_536-532	0.004	0.9	0.0	0.0	0.168	39.3	0 01:34	0.388
S_540-536	0.002	0.9	0.0	0.0	0.075	36.7	0 01:33	0.198
S_541-540	0.010	0.9	0.0	0.0	0.402	34.2	0 01:40	0.638
S_604-603	0.006	0.7	0.0	7.3	0.263	30.4	0 01:40	0.475
S_605-604	0.020	0.9	0.0	8.2	0.836	36.6	0 01:41	1.093
S_619-606	0.004	0.8	0.0	7.4	0.167	38.9	0 01:36	0.377
S_622-619	0.015	1.2	0.0	8.6	0.527	40.5	0 01:40	0.696
S_622-619_2	0.005	0.9	0.0	7.4	0.203	40.9	0 01:35	0.441
S_627-630	0.001	0.5	0.0	10.3	0.062	24.4	0 01:36	0.149
S_629-622	0.003	0.7	0.0	8.7	0.126	28.6	0 01:35	0.269
SU2	0.016	3.2	0.0	0.0	0.361	72.1	0 02:11	0.141
SU5	0.009	1.9	0.0	0.0	0.266	53.2	0 01:59	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	11.63	0.485	1.321	4.875
OF2	12.65	0.020	0.095	0.215
OF3	98.56	0.078	1.316	6.651
ST4_108A_(P-Stm)	98.66	0.313	0.501	26.673
System	55.37	0.896	2.539	38.414

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.110	0 02:00	1.12	1.63	0.73
BDR-C2	CONDUIT	0.250	0 01:40	2.12	4.77	0.89
BDR-C3	CONDUIT	0.385	0 01:41	2.96	1.97	0.63
BDR-C4	CONDUIT	0.937	0 01:42	2.68	0.31	0.35
C1_1	CHANNEL	0.450	0 01:39	0.66	0.17	0.58
C1_17	CHANNEL	0.034	0 01:30	0.81	0.00	0.12
C1_3	CHANNEL	0.038	0 01:30	0.20	0.02	0.27
C1_30	CHANNEL	0.817	0 01:40	1.07	0.31	0.62
C1_4	CHANNEL	0.981	0 01:40	1.19	0.25	0.65
C14_1	CHANNEL	0.015	0 01:31	0.12	0.01	0.25
C14_2	CHANNEL	0.026	0 01:42	0.81	0.01	0.12
C14_4	CHANNEL	0.000	0 01:40	0.08	0.00	0.13
C14_5	CHANNEL	0.027	0 01:30	0.43	0.02	0.21
C15_1	CHANNEL	0.063	0 01:32	0.31	0.03	0.26
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.11
C2	CONDUIT	1.910	0 01:42	1.64	0.21	0.38
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.10
C20_2	CHANNEL	0.068	0 01:34	0.74	0.01	0.19
C20_3	CHANNEL	0.079	0 01:32	0.57	0.02	0.20
C20_4	CHANNEL	0.053	0 01:31	0.51	0.01	0.22
C20_5	CHANNEL	0.325	0 01:41	1.11	0.04	0.29
C20_7	CHANNEL	0.305	0 01:40	1.07	0.04	0.28
C23_5	CHANNEL	0.703	0 01:41	0.72	0.44	0.74
C23_7	CHANNEL	1.213	0 01:40	1.84	0.21	0.66
C3	CONDUIT	0.334	0 01:38	0.66	0.05	0.16
C4	CONDUIT	0.466	0 01:37	0.79	0.06	0.19
C4_1	CHANNEL	0.028	0 01:40	0.51	0.01	0.19
C4_2	CHANNEL	0.174	0 01:36	0.71	0.05	0.43
C4_3	CHANNEL	0.012	0 01:40	0.05	0.01	0.35

C4_4	CHANNEL	0.070	0	01:30	0.60	0.02	0.27	
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.12	
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	
C5	CONDUIT	0.538	0	01:35	0.82	0.08	0.23	
C5_1	CHANNEL	0.121	0	01:30	0.32	0.03	0.14	
C5_10	CHANNEL	0.110	0	02:01	0.52	0.03	0.23	
C5_11	CHANNEL	0.126	0	02:03	0.22	0.05	0.38	
C5_12	CHANNEL	1.316	0	01:40	1.33	0.11	0.34	
C5_13	CHANNEL	0.109	0	02:03	0.63	0.03	0.26	
C5_14	CHANNEL	0.147	0	02:02	0.22	0.10	0.48	
C5_15	CHANNEL	0.249	0	01:45	0.45	0.07	0.32	
C5_16	CHANNEL	0.247	0	01:48	0.43	0.06	0.26	
C5_17	CHANNEL	0.261	0	01:51	0.24	0.03	0.31	
C5_19	CHANNEL	0.250	0	01:44	0.49	0.17	0.29	
C5_2	CHANNEL	0.113	0	01:34	0.59	0.02	0.18	
C5_20	CHANNEL	0.312	0	01:51	0.36	0.03	0.26	
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.25	
C5_23	CHANNEL	0.120	0	01:30	0.30	0.02	0.15	
C5_3	CHANNEL	0.118	0	01:31	0.60	0.01	0.19	
C5_4	CHANNEL	0.112	0	01:36	0.51	0.01	0.14	
C5_5	CHANNEL	0.112	0	01:37	0.64	0.01	0.15	
C5_6	CHANNEL	0.113	0	01:35	0.73	0.01	0.11	
C5_7	CHANNEL	0.277	0	02:00	0.45	0.02	0.29	
C5_8	CHANNEL	0.313	0	01:43	0.49	0.03	0.30	
C5_9	CHANNEL	0.835	0	01:43	0.76	0.07	0.36	
C6	CONDUIT	0.653	0	01:38	0.73	0.10	0.30	
C7	CHANNEL	0.031	0	01:30	0.26	0.01	0.19	
C9_1	CHANNEL	0.099	0	01:30	0.49	0.03	0.24	
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.09	
C9_2	CHANNEL	0.082	0	01:32	0.45	0.03	0.39	
C9_5	CHANNEL	0.955	0	01:42	1.07	0.23	0.54	
C9_6	CHANNEL	0.932	0	01:40	1.24	0.23	0.49	
C9_7	CHANNEL	0.287	0	01:40	0.62	0.04	0.36	
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.391	0	01:45	1.12	1.04	1.00	
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.398	0	01:43	1.11	1.22	1.00	
C-STRM-1_(C-STRM)	CONDUIT	0.419	0	01:42	1.48	1.76	1.00	
C-STRM-100_(C-STRM)	CONDUIT	0.157	0	01:44	1.29	0.36	0.54	
C-STRM-101_(C-STRM)	CONDUIT	0.271	0	02:10	2.18	0.34	0.87	
C-STRM-102_(C-STRM)	CONDUIT	2.449	0	01:44	4.65	0.98	0.87	
C-STRM-103_(C-STRM)	CONDUIT	0.647	0	01:55	1.21	1.17	1.00	
C-STRM-104_(C-STRM)	CONDUIT	0.710	0	01:55	1.33	1.28	1.00	
C-STRM-105_(C-STRM)	CONDUIT	0.772	0	01:55	1.44	1.39	1.00	
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.549	0	01:45	1.58	0.97	1.00	
C-STRM-2_(C-STRM)	CONDUIT	0.554	0	01:44	1.70	0.98	1.00	
C-STRM-20_(C-STRM)	CONDUIT	0.141	0	02:09	1.80	0.49	0.75	
C-STRM-21_(C-STRM)	CONDUIT	0.295	0	01:54	1.52	0.97	1.00	
C-STRM-22_(1)_(C-STRM)	CONDUIT	3.439	0	01:42	1.40	0.77	1.00	
C-STRM-22_(C-STRM)	CONDUIT	3.307	0	01:41	2.07	1.21	1.00	
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.348	0	01:43	0.97	1.03	1.00	
C-STRM-26_(C-STRM)	CONDUIT	0.249	0	01:43	0.69	0.74	1.00	
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.804	0	01:44	1.82	1.02	1.00	
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.628	0	01:46	1.75	1.06	1.00	
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.621	0	01:46	1.74	1.05	1.00	
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.614	0	01:45	1.72	1.03	1.00	
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.610	0	01:45	1.70	1.08	1.00	
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.607	0	01:45	1.70	1.07	1.00	
C-STRM-33_(C-STRM)	CONDUIT	0.575	0	01:55	1.08	1.03	1.00	
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.210	0	01:42	1.08	1.22	1.00	
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.213	0	01:42	0.98	1.24	1.00	
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.251	0	01:42	1.00	1.02	1.00	
C-STRM-35_(C-STRM)	CONDUIT	0.208	0	01:42	0.80	0.84	1.00	
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.987	0	01:47	2.34	1.14	0.91	
C-STRM-4_(C-STRM)	CONDUIT	0.799	0	01:44	1.81	1.02	1.00	
C-STRM-49_(C-STRM)	CONDUIT	0.396	0	02:07	0.83	0.71	1.00	
C-STRM-50_(C-STRM)	CONDUIT	0.541	0	02:06	1.01	0.97	1.00	
C-STRM-51_(C-STRM)	CONDUIT	0.738	0	02:05	1.16	1.05	1.00	
C-STRM-52_(C-STRM)	CONDUIT	0.848	0	02:05	1.14	0.98	1.00	
C-STRM-53_(C-STRM)	CONDUIT	1.061	0	02:06	1.42	1.22	1.00	
C-STRM-57_(C-STRM)	CONDUIT	1.048	0	01:47	1.40	1.20	1.00	
C-STRM-62_(C-STRM)	CONDUIT	0.113	0	01:41	0.90	0.88	1.00	
C-STRM-63_(C-STRM)	CONDUIT	0.145	0	01:45	0.67	0.87	1.00	
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	01:38	1.07	1.00	0.70	
C-STRM-74_(C-STRM)	CONDUIT	4.223	0	01:42	1.66	0.82	1.00	
C-STRM-75_(C-STRM)	CONDUIT	4.224	0	01:43	1.66	0.82	1.00	
C-STRM-76_(C-STRM)	CONDUIT	1.273	0	02:05	1.71	1.27	1.00	
C-STRM-77_(C-STRM)	CONDUIT	2.605	0	01:44	3.10	1.35	0.93	
C-STRM-78_(C-STRM)	CONDUIT	1.381	0	01:44	1.85	1.13	1.00	
C-STRM-79_(1)_(C-STRM)	CONDUIT	5.261	0	01:44	2.07	0.84	0.99	
C-STRM-79_(C-STRM)	CONDUIT	4.967	0	01:43	1.95	0.86	1.00	
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.075	0	01:23	0.46	0.39	1.00	
C-STRM-8_(C-STRM)	CONDUIT	0.036	0	01:26	0.32	0.28	1.00	
C-STRM-80_(C-STRM)	CONDUIT	5.202	0	01:44	2.28	1.18	0.97	
C-STRM-81_(C-STRM)	CONDUIT	5.314	0	01:40	2.38	1.19	0.82	
C-STRM-82_(C-STRM)	CONDUIT	5.313	0	01:41	3.00	1.19	0.66	
C-STRM-83_(1)_(C-STRM)	CONDUIT	3.074	0	01:41	1.93	1.12	1.00	
C-STRM-84_(C-STRM)	CONDUIT	3.991	0	01:42	1.57	0.78	1.00	
CVR-C2	CONDUIT	0.112	0	01:36	2.09	0.42	0.37	
CVR-C3	CONDUIT	0.277	0	01:57	2.98	1.70	0.73	
CVR-C4	CONDUIT	0.835	0	01:43	2.81	0.27	0.31	
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	4.501	0	02:21	1.41	0.52	0.54	
W1	CHANNEL	4.299	0	01:43	1.11	0.02	0.05	
OR1	ORIFICE	0.356	0	02:17			1.00	
OR2	ORIFICE	0.145	0	02:20			0.74	
W10	WEIR	0.142	0	01:34			0.13	
W11	WEIR	0.078	0	01:34			0.08	
W12	WEIR	0.125	0	01:35			0.11	
W13	WEIR	0.115	0	01:34			0.21	
W14	WEIR	0.126	0	01:34			0.11	
W15	WEIR	0.369	0	01:40			0.26	
W2	WEIR	1.321	0	02:20			0.61	
W3	WEIR	0.046	0	01:36			0.05	
W4	WEIR	0.180	0	01:35			0.16	
W5	WEIR	0.133	0	01:36			0.13	
W6	WEIR	0.307	0	01:41			0.21	
W7	WEIR	0.167	0	01:40			0.13	
W8	WEIR	0.270	0	01:40			0.18	
W9	WEIR	0.088	0	01:33			0.10	
C1	DUMMY	0.249	0	01:15				
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:16				
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	01:15				
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:06				
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:12				
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	01:16				
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	01:16				
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:18				
C-STRM-83_(C-STRM)	DUMMY	2.438	0	01:22				
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	01:16				
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	01:16				
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	01:16				
OL1	DUMMY	0.097	0	01:17				
OL10	DUMMY	0.026	0	00:27				
OL11	DUMMY	0.046	0	01:20				
OL12	DUMMY	0.101	0	01:20				
OL13	DUMMY	0.084	0	01:20				
OL14	DUMMY	0.121	0	01:20				
OL15	DUMMY	0.088	0	01:20				
OL16	DUMMY	0.342	0	01:20				
OL17	DUMMY	0.215	0	01:20				
OL18	DUMMY	0.059	0	01:20				
OL19	DUMMY	0.238	0	01:20				
OL2	DUMMY	0.141	0	01:24				
OL20	DUMMY	0.068	0	01:20				
OL21	DUMMY	0.060	0	01:20				
OL22	DUMMY	0.184	0	01:46				
OL3	DUMMY	0.134	0	01:13				
OL4	DUMMY	0.110	0	01:16				
OL5	DUMMY	0.043	0	01:40				
OL6	DUMMY	0.029	0	01:15				
OL7	DUMMY	0.034	0	01:21				
OL8	DUMMY	0.018	0	01:20				
OL9	DUMMY	0.214	0	01:20				

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.77	0.00
BDR-C2	1.00	0.01	0.00	0.00	0.97	0.01	0.00	0.00	0.55	0.00
BDR-C3	1.00	0.01	0.00	0.00	0.67	0.31	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.01	0.00	0.00	0.67	0.32	0.00	0.00	0.86	0.00
C1_1	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.94	0.00
C1_17	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
C1_3	1.00	0.83	0.03	0.00	0.14	0.00	0.00	0.00	0.94	0.00
C1_30	1.00	0.06	0.00	0.00	0.53	0.41	0.00	0.00	0.05	0.00
C1_4	1.00	0.02	0.04	0.00	0.92	0.02	0.00	0.00	0.94	0.00
C14_1	1.00	0.84	0.04	0.00	0.12	0.00	0.00	0.00	0.98	0.00
C14_2	1.00	0.01	0.05	0.00	0.58	0.36	0.00	0.00	0.00	0.00
C14_4	1.00	0.85	0.01	0.00	0.14	0.00	0.00	0.00	0.98	0.00
C14_5	1.00	0.86	0.00	0.00	0.12	0.01	0.00	0.00	0.00	0.00
C15_1	1.00	0.81	0.03	0.00	0.16	0.00	0.00	0.00	0.94	0.00
C15_2	1.00	0.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C20_1	1.00	0.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.86	0.01	0.00	0.11	0.02	0.00	0.00	0.96	0.00
C20_3	1.00	0.83	0.01	0.00	0.14	0.02	0.00	0.00	0.04	0.00
C20_4	1.00	0.01	0.85	0.00	0.09	0.04	0.00	0.00	0.94	0.00
C20_5	1.00	0.01	0.01	0.00	0.70	0.27	0.00	0.00	0.94	0.00
C20_7	1.00	0.85	0.01	0.00	0.07	0.07	0.00	0.00	0.06	0.00
C23_5	1.00	0.04	0.03	0.00	0.81	0.13	0.00	0.00	0.01	0.00
C23_7	1.00	0.02	0.00	0.00	0.78	0.20	0.00	0.00	0.16	0.00
C3	1.00	0.72	0.09	0.00	0.19	0.00	0.00	0.00	0.93	0.00
C4	1.00	0.60	0.12	0.00	0.28	0.00	0.00	0.00	0.93	0.00
C4_1	1.00	0.06	0.00	0.00	0.93	0.00	0.00	0.00	0.93	0.00
C4_2	1.00	0.02	0.00	0.00	0.95	0.02	0.00	0.00	0.94	0.00
C4_3	1.00	0.04	0.02	0.00	0.94	0.00	0.00	0.00	0.94	0.00
C4_4	1.00	0.01	0.85	0.00	0.09	0.04	0.00	0.00	0.94	0.00
C4_5	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.48	0.13	0.00	0.40	0.00	0.00	0.00	0.93	0.00
C5_1	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.88	0.00
C5_10	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.90	0.00
C5_11	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.95	0.00
C5_12	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.02	0.00	0.00	0.33	0.65	0.00	0.00	0.02	0.00
C5_14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.64	0.00
C5_15	1.00	0.02	0.00	0.00	0.98	0.01	0.00	0.00	0.96	0.00
C5_16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.92	0.00
C5_19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.93	0.00
C5_2	1.00	0.02	0.00	0.00	0.62	0.36	0.00	0.00	0.00	0.00
C5_20	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C5_21	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.02	0.00	0.00	0.78	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.97	0.00
C5_4	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_5	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.14	0.00
C5_6	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.87	0.00
C5_7	1.00	0.01	0.03	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C5_8	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C5_9	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C6	1.00	0.06	0.42	0.00	0.52	0.00	0.00	0.00	0.94	0.00
C7	1.00	0.86	0.01	0.00	0.13	0.00	0.00	0.00	0.95	0.00
C9_1	1.00	0.84	0.00	0.00	0.15	0.00	0.00	0.00	0.91	0.00
C9_11	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.01	0.87	0.00	0.09	0.03	0.00	0.00	0.92	0.00
C9_5	1.00	0.01	0.01	0.00	0.05	0.93	0.00	0.00	0.04	0.00
C9_6	1.00	0.01	0.81	0.00	0.14	0.04	0.00	0.00	0.92	0.00
C9_7	1.00	0.01	0.86	0.00	0.09	0.04	0.00	0.00	0.94	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.14	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.41	0.00
C-STRM-1_(C-STRM)	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.92	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.66	0.18	0.00	0.12	0.00	0.00	0.04	0.82	0.00
C-STRM-101_(C-STRM)	1.00	0.47	0.19	0.00	0.30	0.00	0.00	0.03	0.64	0.00
C-STRM-102_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.04	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.82	0.00
C-STRM-104_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C-STRM-105_(C-STRM)	1.00	0.02	0.00	0.00	0.13	0.00	0.00	0.86	0.02	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.98	0.00	0.00	0.00	0.72	0.00
C-STRM-2_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.63	0.00
C-STRM-20_(C-STRM)	1.00	0.03	0.02	0.00	0.04	0.00	0.00	0.91	0.04	0.00
C-STRM-21_(C-STRM)	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.00
C-STRM-22_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.87	0.02	0.00
C-STRM-26_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.03	0.00	0.01	0.76	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.93	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.86	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.72	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.10	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.01	0.78	0.00
C-STRM-33_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.01	0.01	0.00	0.97	0.00	0.00	0.00	0.91	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.93	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.92	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C-STRM-49_(C-STRM)	1.00	0.02	0.39	0.00	0.59	0.00	0.00	0.00	0.87	0.00
C-STRM-50_(C-STRM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.91	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.01	0.00	0.00	0.08	0.00	0.00	0.91	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.60	0.00
C-STRM-53_(C-STRM)	1.00	0.01	0.16	0.00	0.83	0.00	0.00	0.00	0.64	0.00
C-STRM-57_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.58	0.00
C-STRM-62_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.90	0.02	0.00
C-STRM-64_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.83	0.00
C-STRM-75_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.01	0.00	0.00	0.54	0.00	0.00	0.44	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.31	0.00
C-STRM-78_(C-STRM)	1.00	0.01	0.00	0.00	0.54	0.00	0.00	0.45	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.86	0.00
C-STRM-79_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.02	0.02	0.00	0.04	0.00	0.00	0.91	0.00	0.00
C-STRM-8_(C-STRM)	1.00	0.05	0.01	0.00	0.03	0.00	0.00	0.91	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.67	0.00
C-STRM-81_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.53	0.00
C-STRM-82_(C-STRM)	1.00	0.01	0.00	0.00	0.48	0.00	0.00	0.51	0.05	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.83	0.00
C-STRM-84_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.86	0.00
CVR-C2	1.00	0.03	0.00	0.00	0.80	0.17	0.00	0.00	0.82	0.00
CVR-C3	1.00	0.04	0.00	0.00	0.61	0.36	0.00	0.00	0.06	0.00
CVR-C4	1.00	0.01	0.00	0.00	0.56	0.43	0.00	0.00	0.12	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.01	0.00	0.00

C-STRM-21_(C-STRM)	0.36	0.36	0.43	0.01	0.01
C-STRM-22_(1)_(C-STRM)	0.42	0.42	0.46	0.01	0.01
C-STRM-22_(C-STRM)	0.42	0.44	0.42	0.56	0.41
C-STRM-26_(1)_(C-STRM)	0.96	0.96	1.00	0.22	0.42
C-STRM-26_(C-STRM)	0.91	0.91	0.96	0.01	0.01
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	0.68	0.68	0.70	0.08	0.59
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.68	0.70	0.68	0.11	0.63
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.70	0.72	0.70	0.09	0.70
C-STRM-3_(1)_(1)_(C-STRM)	0.72	0.75	0.72	0.06	0.72
C-STRM-3_(1)_(2)_(C-STRM)	0.72	0.72	0.75	0.25	0.29
C-STRM-3_(1)_(C-STRM)	0.71	0.71	0.72	0.24	0.47
C-STRM-33_(C-STRM)	0.74	0.74	0.75	0.02	0.05
C-STRM-34_(1)_(1)_(C-STRM)	0.74	0.74	0.80	0.38	0.39
C-STRM-34_(1)_(C-STRM)	0.70	0.70	0.74	0.43	0.39
C-STRM-35_(1)_(C-STRM)	0.86	0.86	0.91	0.18	0.20
C-STRM-35_(C-STRM)	0.80	0.80	0.86	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.75	0.01	0.63	0.01
C-STRM-4_(C-STRM)	0.70	0.70	0.75	0.06	0.56
C-STRM-49_(C-STRM)	1.02	1.02	1.03	0.01	0.01
C-STRM-50_(C-STRM)	1.03	1.03	1.04	0.01	0.91
C-STRM-51_(C-STRM)	1.03	1.04	1.03	0.68	1.03
C-STRM-52_(C-STRM)	1.03	1.03	1.04	0.01	0.95
C-STRM-53_(C-STRM)	1.03	1.04	1.03	0.93	1.03
C-STRM-57_(C-STRM)	1.00	1.00	1.00	0.68	0.98
C-STRM-62_(C-STRM)	0.61	0.61	0.67	0.01	0.01
C-STRM-63_(C-STRM)	0.67	0.67	0.73	0.01	0.01
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.24	0.01
C-STRM-74_(C-STRM)	0.46	0.50	0.46	0.01	0.46
C-STRM-75_(C-STRM)	0.39	0.46	0.39	0.01	0.39
C-STRM-76_(C-STRM)	1.01	1.03	1.01	0.97	1.01
C-STRM-77_(C-STRM)	0.01	1.01	0.01	0.90	0.01
C-STRM-78_(C-STRM)	1.00	1.00	1.01	0.52	0.96
C-STRM-79_(1)_(C-STRM)	0.01	0.48	0.01	0.01	0.01
C-STRM-79_(C-STRM)	0.39	0.39	0.48	0.01	0.01
C-STRM-8_(1)_(C-STRM)	0.54	0.54	0.65	0.01	0.01
C-STRM-8_(C-STRM)	0.44	0.44	0.53	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.63	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.64	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.64	0.01
C-STRM-83_(1)_(C-STRM)	0.44	0.44	0.44	0.55	0.43
C-STRM-84_(C-STRM)	0.46	0.46	0.50	0.01	0.01
CVR-C3	0.01	0.50	0.01	0.94	0.01

Analysis begun on: Thu Apr 9 22:19:59 2026
Analysis ended on: Thu Apr 9 22:20:05 2026
Total elapsed time: 00:00:06

Post-Development HIST 1988

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

WARNING 03: negative offset ignored for Link C1_17
WARNING 04: minimum elevation drop used for Conduit W1
WARNING 03: negative offset ignored for Link OL1
WARNING 03: negative offset ignored for Link OL13
WARNING 03: negative offset ignored for Link OL15
WARNING 02: maximum depth increased for Node EXD_1
WARNING 02: maximum depth increased for Node EXD_10
WARNING 02: maximum depth increased for Node EXD_11
WARNING 02: maximum depth increased for Node EXD_12
WARNING 02: maximum depth increased for Node EXD_13
WARNING 02: maximum depth increased for Node EXD_14
WARNING 02: maximum depth increased for Node EXD_15
WARNING 02: maximum depth increased for Node EXD_16
WARNING 02: maximum depth increased for Node EXD_17
WARNING 02: maximum depth increased for Node EXD_18
WARNING 02: maximum depth increased for Node EXD_19
WARNING 02: maximum depth increased for Node EXD_20
WARNING 02: maximum depth increased for Node EXD_21
WARNING 02: maximum depth increased for Node EXD_22
WARNING 02: maximum depth increased for Node EXD_23
WARNING 02: maximum depth increased for Node EXD_24
WARNING 02: maximum depth increased for Node EXD_25
WARNING 02: maximum depth increased for Node EXD_26
WARNING 02: maximum depth increased for Node EXD_27
WARNING 02: maximum depth increased for Node EXD_5
WARNING 02: maximum depth increased for Node EXD_7
WARNING 02: maximum depth increased for Node EXD_8
WARNING 02: maximum depth increased for Node EXD_9
WARNING 02: maximum depth increased for Node J17
WARNING 02: maximum depth increased for Node J74

*************
Element Count
*************
Number of rain gages ...... 3
Number of subcatchments ... 43
Number of nodes ........... 139
Number of links ........... 170
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************

Name                Data Source                 Data       Recording
                                                Type       Interval
-----------------------------------------------------------------
24SCS100            24SCS100                    INTENSITY   15 min.
6SCS050             6SCS050                     INTENSITY   15 min.
Rainfall            AUG4-88                     INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                Area     Width   %Imperv    %Slope Rain Gage           Outlet
-----------------------------------------------------------------------------------
A15                 3.46     13.10     18.98    0.5000 Rainfall            EXD_12
A18                 0.59    338.21     39.12    0.5000 Rainfall            EXD_25
A19                 1.11    332.78     22.32    0.5000 Rainfall            EXD_20
A20                 4.83    279.76      8.37    1.5000 Rainfall            EXD_15
NULL3               0.57    312.75     83.33    1.4500 Rainfall            EXD_27
S1                  6.52   1467.98     66.38    2.0000 Rainfall            S_605-604
S1_1                0.12    118.05     71.43    2.0000 Rainfall            J19
S1_2                0.12    147.72     71.43    2.0000 Rainfall            J22
S1_4                0.19    154.58     71.43    2.0000 Rainfall            J21
S1_5                0.11    103.57     71.43    2.0000 Rainfall            J20
S10_1               1.84    414.84     64.29    2.0000 Rainfall            S_619-606
S10_2               2.12    478.11     64.29    2.0000 Rainfall            S_622-
619_2
S10_4               0.73    163.42     64.29    2.0000 Rainfall            S_627-630
S10_5               1.26    283.52     64.29    2.0000 Rainfall            S_629-622
S11                 3.30    287.00      0.00    2.0000 Rainfall            SU2
S12                 0.44    334.74     71.43    2.0000 Rainfall            J6
S14_1               0.60    367.10     71.43    2.0000 Rainfall            J28
S14_3               1.06    381.29     71.43    2.0000 Rainfall            J58
S14_4               0.30    171.63     71.43    2.0000 Rainfall            J44
S14_5               1.69    659.05     71.43    2.0000 Rainfall            J29
S14_6               0.29    153.64     71.43    2.0000 Rainfall            J59
S14_7               1.17    557.97     71.43    2.0000 Rainfall            J61
S14_8               0.34    171.63     71.43    2.0000 Rainfall            J48
S15                 1.64    368.26     64.29    2.0000 Rainfall            S_525-MTD
S16                 1.47     16.60    100.00    0.5000 Rainfall            EXD_10
S17                 6.26    202.00      3.33    0.5000 Rainfall            EXD_7
S18_2               3.35    754.05     64.29    2.0000 Rainfall            S_541-540
S18_3               1.66    372.76     64.29    2.0000 Rainfall            S_528-525
S18_4               0.88    197.06     64.29    2.0000 Rainfall            S_540-536
S18_5               1.83    412.02     71.43    2.0000 Rainfall            S_536-532
S18_6               0.84    188.96     64.29    2.0000 Rainfall            S_532-528
S19                 1.05    441.38     71.43    2.0000 Rainfall            J19
S2                  3.72    837.17     66.87    2.0000 Rainfall            S_622-619
S20_1               0.50    441.34     71.43    2.0000 Rainfall            J40
S20_2               0.23    441.34     71.43    2.0000 Rainfall            J36
S3                  2.48    557.29     64.29    2.0000 Rainfall            S_604-603
S32                 0.41    327.12     71.43    2.0000 Rainfall            J46
S36                 1.82     21.00    100.00    0.5000 Rainfall            EXD_10
S4                 13.22    348.80     85.71    2.0000 Rainfall            631_(C-
STRM)
S5                  3.19    291.50     85.71    1.0000 Rainfall            682_(C-
STRM)
S6                  0.34    260.95     57.14    2.0000 Rainfall            OF2
S7                  3.99    402.80     85.71    0.5000 Rainfall            POND_(C-
STRM)
S8                  1.92    119.90     35.71    2.0000 Rainfall            SU5


************
Node Summary
************

Name                Type                 Invert      Max.    Ponded    External
                                          Elev.      Depth      Area    Inflow
-----------------------------------------------------------------------------
EXD_1               JUNCTION            104.39       1.51       0.0
EXD_10              JUNCTION             98.65       1.20       0.0
EXD_11              JUNCTION             98.50       1.20       0.0
EXD_12              JUNCTION             98.31       1.20       0.0
EXD_13              JUNCTION            104.32       1.10       0.0
EXD_14              JUNCTION            102.49       0.80       0.0
EXD_15              JUNCTION            100.27       0.80       0.0
EXD_16              JUNCTION            100.20       0.80       0.0
EXD_17              JUNCTION             99.89       0.80       0.0
EXD_18              JUNCTION             99.40       0.84       0.0
EXD_19              JUNCTION             99.19       0.88       0.0
EXD_2               JUNCTION            103.47       1.93       0.0
EXD_20              JUNCTION             99.19       0.88       0.0
EXD_21              JUNCTION             99.18       0.88       0.0
EXD_22              JUNCTION             99.14       0.88       0.0
EXD_23              JUNCTION             98.75       1.14       0.0
EXD_24              JUNCTION             98.67       1.14       0.0
EXD_25              JUNCTION             98.52       1.13       0.0
EXD_26              JUNCTION             98.48       1.13       0.0
EXD_27              JUNCTION             98.17       1.20       0.0
EXD_3               JUNCTION            103.19       1.41       0.0
EXD_4               JUNCTION            102.64       1.20       0.0
EXD_5               JUNCTION            102.50       1.20       0.0
EXD_6               JUNCTION            102.32       1.08       0.0
EXD_7               JUNCTION            101.50       1.06       0.0
EXD_8               JUNCTION            100.48       1.06       0.0
EXD_9               JUNCTION            100.39       1.06       0.0
J10                 JUNCTION            103.60       0.50       0.0
J11                 JUNCTION            103.50       0.50       0.0
J12                 JUNCTION            103.40       0.50       0.0
J13                 JUNCTION            103.30       0.50       0.0
J17                 JUNCTION            104.37       0.50       0.0
J19                 JUNCTION            105.40       0.50       0.0
J20                 JUNCTION            105.45       0.50       0.0
J21                 JUNCTION            105.55       0.50       0.0
J22                 JUNCTION            105.70       0.50       0.0
J23                 JUNCTION            106.00       0.50       0.0
J24                 JUNCTION            106.20       0.50       0.0
J25                 JUNCTION            105.30       0.50       0.0
J26                 JUNCTION            105.70       0.50       0.0
J28                 JUNCTION            109.00       0.50       0.0
J29                 JUNCTION            108.80       0.50       0.0
J32                 JUNCTION            106.00       0.50       0.0
J36                 JUNCTION            104.70       0.50       0.0
J39                 JUNCTION            104.60       0.50       0.0
J40                 JUNCTION            104.45       0.50       0.0
J41                 JUNCTION            103.20       0.50       0.0
J43                 JUNCTION            104.20       0.50       0.0
J44                 JUNCTION            104.50       0.50       0.0
J46                 JUNCTION            104.60       0.50       0.0
J47                 JUNCTION            105.10       0.50       0.0
J48                 JUNCTION            105.75       0.50       0.0
J51                 JUNCTION            106.75       0.50       0.0
J52                 JUNCTION            109.75       0.50       0.0
J53                 JUNCTION            109.00       0.50       0.0
J56                 JUNCTION            109.10       0.50       0.0
J57                 JUNCTION            108.47       0.50       0.0
J58                 JUNCTION            108.40       0.50       0.0
J59                 JUNCTION            108.00       0.50       0.0
J6                  JUNCTION            109.83       0.30       0.0
J61                 JUNCTION            107.00       0.50       0.0
J62                 JUNCTION            106.50       0.50       0.0
J74                 JUNCTION             98.45       0.90       0.0
J9                  JUNCTION            103.70       0.50       0.0
OF1                 OUTFALL             100.80       0.00       0.0
OF2                 OUTFALL               0.00       0.00       0.0
OF3                 OUTFALL              98.00       1.06       0.0
ST4_108A_(P-Stm)    OUTFALL              98.02       1.19       0.0
500_(C-STRM)        STORAGE             100.31       2.84       0.0
500A_(C-STRM)       STORAGE             100.10       1.00       0.0
502_(C-STRM)        STORAGE             100.54       3.70       0.0
503_(C-STRM)        STORAGE             100.59       3.92       0.0
504_(C-STRM)        STORAGE             103.04       2.70       0.0
505_(C-STRM)        STORAGE             103.45       3.26       0.0
506_(C-STRM)        STORAGE             103.82       3.16       0.0
507_(C-STRM)        STORAGE             104.14       3.10       0.0
508_(C-STRM)        STORAGE             104.37       3.12       0.0
509_(C-STRM)        STORAGE             104.60       3.14       0.0
510_(C-STRM)        STORAGE             104.85       3.09       0.0
511_(C-STRM)        STORAGE             104.91       3.08       0.0
512_(C-STRM)        STORAGE             105.11       3.12       0.0
513_(C-STRM)        STORAGE             105.24       3.14       0.0
514_(C-STRM)        STORAGE             105.59       3.16       0.0
515_(C-STRM)        STORAGE             105.85       3.24       0.0
516_(C-STRM)        STORAGE             105.46       3.06       0.0
517_(C-STRM)        STORAGE             105.62       3.03       0.0
518_(C-STRM)        STORAGE             105.85       2.92       0.0
519_(C-STRM)        STORAGE             106.08       2.82       0.0
520_(C-STRM)        STORAGE             106.34       2.66       0.0
522_(C-STRM)        STORAGE             104.31       3.00       0.0
525_(C-STRM)        STORAGE             100.61       2.69       0.0
528_(C-STRM)        STORAGE             100.72       2.68       0.0
532_(C-STRM)        STORAGE             100.83       2.67       0.0
536_(C-STRM)        STORAGE             100.98       2.63       0.0
540_(C-STRM)        STORAGE             100.86       2.85       0.0
541_(C-STRM)        STORAGE             100.93       2.89       0.0
551_(C-STRM)        STORAGE             100.65       3.78       0.0
552_(C-STRM)        STORAGE             100.74       3.88       0.0
553_(C-STRM)        STORAGE             100.93       3.78       0.0
554_(C-STRM)        STORAGE             101.05       3.89       0.0
555_(C-STRM)        STORAGE             101.25       3.93       0.0
556_(C-STRM)        STORAGE             101.37       3.89       0.0
601_(C-STRM)        STORAGE             100.45       4.43       0.0
602_(C-STRM)        STORAGE             100.52       4.11       0.0
603_(C-STRM)        STORAGE             100.63       3.89       0.0
604_(C-STRM)        STORAGE             100.88       4.87       0.0
605_(C-STRM)        STORAGE             101.09       5.63       0.0
606_(C-STRM)        STORAGE             101.24       5.75       0.0
619_(C-STRM)        STORAGE             101.38       5.14       0.0
622_(C-STRM)        STORAGE             101.53       4.49       0.0
626_(C-STRM)        STORAGE             103.94       3.33       0.0
627_(C-STRM)        STORAGE             103.13       3.58       0.0
629_(C-STRM)        STORAGE             101.65       4.46       0.0
630_(C-STRM)        STORAGE             102.08       4.12       0.0
630A_(C-STRM)       STORAGE             102.12       3.90       0.0
631_(C-STRM)        STORAGE             106.00       0.50       0.0
645_(C-STRM)        STORAGE             102.03       3.69       0.0
647_(C-STRM)        STORAGE             102.14       3.40       0.0
650_(C-STRM)        STORAGE             102.22       3.19       0.0
651_(C-STRM)        STORAGE             102.31       3.03       0.0
682_(C-STRM)        STORAGE             105.40       0.50       0.0
MTD_(C-STRM)        STORAGE             100.37       3.19       0.0
OVERFLOW_(C-STRM)   STORAGE             100.18       2.76       0.0
POND_(C-STRM)       STORAGE              98.45       2.65       0.0    Yes
S_525-MTD           STORAGE             103.30       0.50       0.0
S_528-525           STORAGE             103.41       0.50       0.0
S_532-528           STORAGE             103.50       0.50       0.0
S_536-532           STORAGE             103.60       0.50       0.0
S_540-536           STORAGE             103.71       0.50       0.0
S_541-540           STORAGE             103.81       0.50       0.0
S_604-603           STORAGE             105.50       0.50       0.0
S_605-604           STORAGE             106.71       0.50       0.0
S_619-606           STORAGE             106.50       0.50       0.0
S_622-619           STORAGE             105.70       0.50       0.0
S_622-619_2         STORAGE             106.50       0.50       0.0
S_627-630           STORAGE             106.70       0.50       0.0
S_629-622           STORAGE             106.01       0.50       0.0
SU2                 STORAGE             106.75       0.50       0.0
SU5                 STORAGE             104.18       0.50       0.0


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Link Summary
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Name                From Node           To Node             Type           Length    %Slope
Roughness
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BDR-C1              EXD_15              EXD_16              CONDUIT          17.7    0.3844
0.0250
BDR-C2              EXD_20              EXD_21              CONDUIT           7.9    0.0632
0.0130
BDR-C3              EXD_25              EXD_26              CONDUIT          14.2    0.2683
0.0130
BDR-C4              EXD_12              EXD_27              CONDUIT          23.0    0.6077
0.0130
C1_1                J32                 J26                 CONDUIT          71.8    0.4181
0.0130
C1_17               J6                  EXD_1               CONDUIT         171.9    2.4608
0.0130
C1_3                J28                 J29                 CONDUIT         183.6    0.1090
0.0130
C1_30               J26                 J25                 CONDUIT          93.1    0.4296
0.0130
C1_4                J25                 J39                 CONDUIT          75.0    0.9329
0.0130
C14_1               J20                 J19                 CONDUIT          59.0    0.0847
0.0130
C14_2               J23                 J22                 CONDUIT          73.9    0.4062
0.0130
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C14_4	J22	J21	CONDUIT	77.3	0.1941
0.0130					
C14_5	J21	J20	CONDUIT	51.8	0.1931
0.0130					
C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					
OR1	POND_(C-STRM)	J74	ORIFICE		
OR2	POND_(C-STRM)	J74	ORIFICE		
W10	S_536-532	J10	WEIR		
W11	S_532-528	J11	WEIR		
W12	S_528-525	J12	WEIR		
W13	S_525-MTD	J13	WEIR		
W14	S_629-622	J32	WEIR		
W15	S_622-619	J26	WEIR		
W2	POND_(C-STRM)	OF1	WEIR		
W3	S_627-630	J24	WEIR		
W4	S_622-619_2	J32	WEIR		
W5	S_619-606	J62	WEIR		
W6	S_605-604	J51	WEIR		
W7	S_604-603	J25	WEIR		
W8	S_541-540	J9	WEIR		
W9	S_540-536	J9	WEIR		
C1	S_622-619_2	622_(C-STRM)	OUTLET		
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET		
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET		
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET		
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET		
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET		
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET		
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET		
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET		
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET		
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET		
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET		
OL1	S_627-630	627_(C-STRM)	OUTLET		
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET		
OL11	J36	553_(C-STRM)	OUTLET		
OL12	J40	551_(C-STRM)	OUTLET		
OL13	J46	602_(C-STRM)	OUTLET		
OL14	J28	520_(C-STRM)	OUTLET		
OL15	J6	522_(C-STRM)	OUTLET		
OL16	J29	518_(C-STRM)	OUTLET		
OL17	J58	513_(C-STRM)	OUTLET		
OL18	J59	511_(C-STRM)	OUTLET		
OL19	J61	506_(C-STRM)	OUTLET		
OL2	SU2	626_(C-STRM)	OUTLET		
OL20	J48	504_(C-STRM)	OUTLET		
OL21	J44	503_(C-STRM)	OUTLET		
OL22	SU5	504_(C-STRM)	OUTLET		
OL3	S_629-622	629_(C-STRM)	OUTLET		
OL4	S_540-536	540_(C-STRM)	OUTLET		
OL5	J22	645_(C-STRM)	OUTLET		
OL6	J21	647_(C-STRM)	OUTLET		
OL7	J20	650_(C-STRM)	OUTLET		
OL8	J19	651_(C-STRM)	OUTLET		
OL9	J19	556_(C-STRM)	OUTLET		

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56

C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1 0.33
C-STRM-1_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1 0.24
C-STRM-100_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1 0.43
C-STRM-101_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1 0.79
C-STRM-102_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1 2.51
C-STRM-103_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.55
C-STRM-104_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.56
C-STRM-105_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1 0.56
C-STRM-2_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1 0.56
C-STRM-200_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1 0.29
C-STRM-21_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1 0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1 2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1 0.34
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19 0.75
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17 0.68
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.68	0.36	0.17 0.68 1
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68 1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68 1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1 0.57
C-STRM-33_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53 1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53 1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR				0.60	0.28	0.15	0.60 1
0.25							
C-STRM-35_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1 0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1 0.86
C-STRM-4_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1 0.79
C-STRM-49_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.56
C-STRM-50_(C-STRM) CIRCULAR			0.82	0.53	0.21	0.82	1 0.56
C-STRM-51_(C-STRM) CIRCULAR			0.90	0.64	0.23	0.90	1 0.70
C-STRM-52_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1 0.87
C-STRM-53_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1 0.87
C-STRM-57_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1 0.88
C-STRM-62_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1 0.13
C-STRM-63_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1 0.17
C-STRM-64_(C-STRM) CIRCULAR			0.38	0.11	0.09	0.38	1 0.09
C-STRM-74_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 5.14
C-STRM-75_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 5.14
C-STRM-76_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1 1.00
C-STRM-77_(C-STRM) CIRCULAR			1.05	0.87	0.26	1.05	1 1.93
C-STRM-78_(C-STRM) CIRCULAR			0.97	0.75	0.24	0.97	1 1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR				1.80	2.54	0.45	1.80 1
6.30							
C-STRM-79_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR				0.53	0.22	0.13	0.53 1 0.19
C-STRM-8_(C-STRM) CIRCULAR			0.45	0.16	0.11	0.45	1 0.13
C-STRM-80_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 4.44
C-STRM-81_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 4.45
C-STRM-82_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR				1.50	1.77	0.38	1.50 1
2.74							
C-STRM-84_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1 5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2338	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3486	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5228	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605

0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929
0.4178	0.4430	0.4687	0.4947	0.5212
0.5482	0.5760	0.6046	0.6335	0.6626
0.6921	0.7218	0.7518	0.7820	0.8133
0.8461	0.8801	0.9163	0.9564	1.0000

Hrad:

0.0226	0.0600	0.0982	0.1332	0.1659
0.1974	0.2291	0.2613	0.2925	0.3228
0.3524	0.3813	0.4096	0.4373	0.4557
0.4729	0.4908	0.5133	0.5388	0.5667
0.5954	0.6238	0.6186	0.5790	0.5404
0.5828	0.6246	0.6659	0.7067	0.7469
0.7867	0.8189	0.8502	0.8811	0.9116
0.9331	0.9497	0.9763	1.0109	1.0452
1.0791	1.1126	1.1458	1.1787	1.1574
1.1642	1.1570	1.1256	1.0602	1.0000

Width:

0.0656	0.0958	0.1094	0.1231	0.1368
0.1501	0.1622	0.1729	0.1837	0.1944
0.2052	0.2159	0.2267	0.2377	0.2539
0.2715	0.2891	0.3043	0.3175	0.3291
0.3399	0.3507	0.3819	0.4435	0.5186
0.5219	0.5251	0.5284	0.5317	0.5350
0.5382	0.5468	0.5558	0.5647	0.5737
0.5886	0.6068	0.6185	0.6243	0.6301
0.6359	0.6417	0.6475	0.6534	0.6932
0.7170	0.7512	0.8061	0.8978	1.0000

Transect Barnsdale_UPST7

Area:

0.0031	0.0077	0.0135	0.0206	0.0292
0.0385	0.0485	0.0590	0.0699	0.0811
0.0928	0.1047	0.1170	0.1297	0.1427
0.1561	0.1700	0.1843	0.1992	0.2145
0.2304	0.2467	0.2636	0.2810	0.3005
0.3224	0.3708	0.3955	0.4204	0.4456
0.4456	0.4710	0.4972	0.5239	0.5510
0.5784	0.6060	0.6340	0.6622	0.6907
0.7195	0.7487	0.7782	0.8081	0.8383
0.8691	0.9003	0.9322	0.9647	1.0000

Hrad:

0.0323	0.0624	0.0905	0.1084	0.1375
0.1686	0.1997	0.2314	0.2650	0.2977
0.3296	0.3608	0.3913	0.4212	0.4493
0.4751	0.5005	0.5247	0.5476	0.5703
0.5929	0.6154	0.6378	0.6601	0.5891
0.5938	0.5928	0.6266	0.6599	0.6927
0.7252	0.7501	0.7705	0.7948	0.8255
0.8559	0.8860	0.9157	0.9452	0.9727
1.0000	1.0270	1.0538	1.0784	1.1003
1.1221	1.1420	1.1557	1.1624	1.0000

Width:

0.0999	0.1304	0.1570	0.1994	0.2229
0.2396	0.2541	0.2664	0.2751	0.2837
0.2923	0.3010	0.3096	0.3183	0.3279
0.3390	0.3501	0.3618	0.3745	0.3872
0.3998	0.4124	0.4251	0.4377	0.5266
0.5610	0.6032	0.6092	0.6153	0.6213
0.6274	0.6399	0.6563	0.6692	0.6761
0.6830	0.6899	0.6967	0.7036	0.7118
0.7199	0.7281	0.7362	0.7458	0.7573
0.7688	0.7817	0.7991	0.8220	1.0000

Transect GBR

Area:

0.0002	0.0008	0.0018	0.0032	0.0051
0.0073	0.0099	0.0130	0.0164	0.0203
0.0245	0.0292	0.0343	0.0401	0.0532
0.0756	0.1002	0.1249	0.1496	0.1742
0.1989	0.2235	0.2482	0.2729	0.2975
0.3222	0.3468	0.3715	0.3962	0.4209
0.4460	0.4715	0.4974	0.5237	0.5505
0.5776	0.6051	0.6331	0.6614	0.6902
0.7193	0.7489	0.7789	0.8092	0.8400
0.8712	0.9028	0.9348	0.9672	1.0000

Hrad:

0.0148	0.0296	0.0444	0.0592	0.0741
0.0889	0.1037	0.1185	0.1333	0.1481
0.1629	0.1777	0.1925	0.1451	0.0889
0.0921	0.1222	0.1523	0.1821	0.2121
0.2420	0.2720	0.3019	0.3318	0.3616
0.3915	0.4213	0.4511	0.4809	0.5106
0.5398	0.5684	0.5963	0.6237	0.6505
0.6768	0.7026	0.7280	0.7529	0.7773
0.8013	0.8249	0.8480	0.8708	0.8932
0.9153	0.9369	0.9583	0.9793	1.0000

Width:

0.0123	0.0246	0.0369	0.0492	0.0614
0.0737	0.0860	0.0983	0.1106	0.1229
0.1352	0.1475	0.1598	0.2496	0.5446
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7470
0.7470	0.7470	0.7470	0.7470	0.7542
0.7665	0.7788	0.7911	0.8034	0.8157
0.8280	0.8402	0.8525	0.8648	0.8771
0.8894	0.9017	0.9140	0.9263	0.9386
0.9508	0.9631	0.9754	0.9877	1.0000

Transect Pond_SpillWay

Area:

0.0040	0.0088	0.0142	0.0204	0.0274
0.0350	0.0434	0.0524	0.0622	0.0728
0.0840	0.0960	0.1087	0.1221	0.1362
0.1511	0.1666	0.1829	0.2000	0.2177
0.2362	0.2554	0.2753	0.2959	0.3173
0.3393	0.3621	0.3856	0.4099	0.4348
0.4600	0.4855	0.5113	0.5375	0.5640
0.5908	0.6180	0.6454	0.6732	0.7013
0.7297	0.7585	0.7875	0.8169	0.8466
0.8767	0.9070	0.9377	0.9687	1.0000

Hrad:

0.0187	0.0367	0.0543	0.0716	0.0888
0.1059	0.1230	0.1400	0.1570	0.1740
0.1910	0.2080	0.2251	0.2421	0.2592
0.2763	0.2935	0.3106	0.3278	0.3450
0.3622	0.3795	0.3967	0.4140	0.4313
0.4486	0.4660	0.4833	0.5007	0.5241
0.5500	0.5758	0.6013	0.6266	0.6517
0.6766	0.7013	0.7257	0.7498	0.7737
0.7974	0.8209	0.8441	0.8670	0.8898
0.9123	0.9345	0.9566	0.9784	1.0000

Width:

0.1394	0.1623	0.1853	0.2082	0.2311
0.2541	0.2770	0.2999	0.3229	0.3458
0.3687	0.3917	0.4146	0.4375	0.4605
0.4834	0.5063	0.5293	0.5522	0.5751
0.5981	0.6210	0.6439	0.6669	0.6898
0.7127	0.7357	0.7586	0.7815	0.7956
0.8059	0.8161	0.8263	0.8365	0.8467
0.8569	0.8672	0.8774	0.8876	0.8978
0.9080	0.9183	0.9285	0.9387	0.9489
0.9591	0.9693	0.9796	0.9898	1.0000

Transect ROW_14m

Area:

0.0004	0.0017	0.0038	0.0067	0.0104
0.0150	0.0204	0.0267	0.0338	0.0417
0.0504	0.0600	0.0704	0.0817	0.0938
0.1067	0.1204	0.1350	0.1504	0.1667
0.1838	0.2017	0.2204	0.2400	0.2605
0.2817	0.3038	0.3267	0.3502	0.3738
0.3973	0.4209	0.4446	0.4692	0.4952
0.5225	0.5510	0.5808	0.6118	0.6439
0.6767	0.7100	0.7440	0.7787	0.8140
0.8499	0.8865	0.9237	0.9615	1.0000

Hrad:

0.0169	0.0338	0.0507	0.0677	0.0846
0.1015	0.1184	0.1353	0.1522	0.1692
0.1861	0.2030	0.2199	0.2368	0.2537
0.2707	0.2876	0.3045	0.3214	0.3383
0.3552	0.3722	0.3891	0.4060	0.4229
0.4398	0.4567	0.4736	0.5027	0.5359
0.5691	0.6022	0.6353	0.6667	0.6957
0.7226	0.7474	0.7704	0.7918	0.8123
0.8326	0.8526	0.8721	0.8914	0.9103
0.9289	0.9471	0.9651	0.9827	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6200	0.6529	0.6857
0.7186	0.7514	0.7843	0.8171	0.8357
0.8521	0.8686	0.8850	0.9014	0.9179
0.9343	0.9507	0.9671	0.9836	1.0000

Transect ROW_14m_Mountable

Area:

0.0003	0.0012	0.0028	0.0049	0.0077
0.0111	0.0151	0.0197	0.0249	0.0307
0.0372	0.0442	0.0519	0.0602	0.0691
0.0787	0.0888	0.0996	0.1109	0.1229
0.1355	0.1487	0.1625	0.1770	0.1923
0.2092	0.2277	0.2477	0.2693	0.2924
0.3170	0.3433	0.3711	0.4004	0.4310
0.4626	0.4954	0.5293	0.5642	0.6002
0.6373	0.6755	0.7144	0.7538	0.7936
0.8340	0.8748	0.9160	0.9578	1.0000

Hrad:

0.0222	0.0445	0.0667	0.0889	0.1111
0.1334	0.1556	0.1778	0.2001	0.2223
0.2445	0.2667	0.2890	0.3112	0.3334
0.3556	0.3779	0.4001	0.4223	0.4446
0.4668	0.4890	0.5112	0.5335	0.5550
0.5733	0.5891	0.6029	0.6151	0.6263
0.6367	0.6465	0.6559	0.6653	0.6759
0.6872	0.6992	0.7116	0.7245	0.7378
0.7514	0.7663	0.7966	0.8266	0.8563
0.8856	0.9147	0.9434	0.9719	1.0000

Width:

0.0145	0.0290	0.0434	0.0579	0.0724
0.0869	0.1013	0.1158	0.1303	0.1448
0.1593	0.1737	0.1882	0.2027	0.2172
0.2316	0.2461	0.2606	0.2751	0.2896
0.3040	0.3185	0.3330	0.3475	0.3798
0.4164	0.4530	0.4897	0.5263	0.5629
0.5995	0.6362	0.6728	0.7080	0.7335
0.7591	0.7846	0.8102	0.8357	0.8613
0.8868	0.9114	0.9225	0.9336	0.9446
0.9557	0.9668	0.9779	0.9889	1.0000

Transect ROW_14m_PH3

Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0153	0.0209	0.0273	0.0345	0.0426
0.0516	0.0614	0.0721	0.0836	0.0959
0.1091	0.1232	0.1381	0.1539	0.1705
0.1880	0.2064	0.2255	0.2456	0.2665
0.2882	0.3108	0.3343	0.3583	0.3824
0.4065	0.4306	0.4548	0.4797	0.5055
0.5322	0.5598	0.5883	0.6176	0.6479
0.6791	0.7112	0.7441	0.7780	0.8127
0.8484	0.8850	0.9224	0.9608	1.0000

Hrad:

0.0166	0.0332	0.0498	0.0664	0.0830
0.0997	0.1163	0.1329	0.1495	0.1661
0.1827	0.1993	0.2159	0.2325	0.2491
0.2657	0.2823	0.2990	0.3156	0.3322
0.3488	0.3654	0.3820	0.3986	0.4152
0.4318	0.4484	0.4650	0.4935	0.5262
0.5588	0.5913	0.6238	0.6553	0.6853
0.7137	0.7407	0.7664	0.7909	0.8143
0.8366	0.8579	0.8783	0.8979	0.9166
0.9346	0.9519	0.9685	0.9845	1.0000

Width:

0.0215	0.0430	0.0645	0.0859	0.1074
0.1289	0.1504	0.1719	0.1934	0.2148
0.2363	0.2578	0.2793	0.3008	0.3223
0.3437	0.3652	0.3867	0.4082	0.4297
0.4512	0.4726	0.4941	0.5156	0.5371
0.5586	0.5801	0.6015	0.6071	0.6071
0.6071	0.6071	0.6160	0.6386	0.6612
0.6838	0.7063	0.7289	0.7515	0.7741
0.7967	0.8193	0.8419	0.8645	0.8871
0.9096	0.9322	0.9548	0.9774	1.0000

Transect ROW_14m-MB_1

Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0407	0.0484	0.0568	0.0659	0.0757
0.0861	0.0972	0.1089	0.1214	0.1345
0.1483	0.1631	0.1791	0.1963	0.2146
0.2342	0.2549	0.2768	0.2999	0.3242
0.3497	0.3764	0.4043	0.4333	0.4635
0.4949	0.5273	0.5601	0.5935	0.6274
0.6618	0.6967	0.7326	0.7693	0.8064
0.8441	0.8823	0.9210	0.9603	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0792	0.0990
0.1188	0.1386	0.1584	0.1782	0.1980
0.2178	0.2376	0.2574	0.2772	0.2971
0.3169	0.3367	0.3565	0.3763	0.3961
0.4159	0.4347	0.4520	0.4681	0.4834
0.4979	0.5119	0.5256	0.5389	0.5521
0.5650	0.5779	0.5907	0.6035	0.6162
0.6289	0.6560	0.6844	0.7123	0.7397
0.7667	0.7933	0.8190	0.8459	0.8726
0.8988	0.9247	0.9501	0.9752	1.0000

Width:

0.0168	0.0336	0.0504	0.0673	0.0841
0.1009	0.1177	0.1345	0.1513	0.1681
0.1849	0.2018	0.2186	0.2354	0.2522
0.2690	0.2858	0.3026	0.3195	0.3363
0.3552	0.3849	0.4146	0.4442	0.4739
0.5036	0.5332	0.5629	0.5926	0.6223
0.6519	0.6816	0.7113	0.7409	0.7706
0.8003	0.8150	0.8279	0.8407	0.8536
0.8664	0.8836	0.9093	0.9229	0.9357
0.9486	0.9614	0.9743	0.9871	1.0000

Transect ROW_16.5m_Mountable

Area:

0.0003	0.0012	0.0027	0.0048	0.0074
0.0107	0.0145	0.0190	0.0240	0.0297
0.0359	0.0428	0.0502	0.0582	0.0668
0.0760	0.0858	0.0962	0.1072	0.1188
0.1309	0.1436	0.1571	0.1710	0.1856
0.2012	0.2183	0.2369	0.2570	0.2786
0.3017	0.3263	0.3524	0.3800	0.4091
0.4397	0.4719	0.5055	0.5406	0.5772
0.6153	0.6544	0.6944	0.7354	0.7772
0.8199	0.8636	0.9082	0.9536	1.0000

Hrad:

0.0233	0.0465	0.0698	0.0931	0.1163
0.1396	0.1628	0.1861	0.2094	0.2326
0.2559	0.2792	0.3024	0.3257	0.3489
0.3722	0.3955	0.4187	0.4420	0.4653
0.4885	0.5118	0.5350	0.5583	0.5816
0.6036	0.6224	0.6386	0.6529	0.6657
0.6773	0.6882	0.6985	0.7084	0.7180
0.7275	0.7370	0.7464	0.7559	0.7655
0.7817	0.8084	0.8343	0.8597	0.8844

0.9085 0.9321 0.9552 0.9779 1.0000
Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268
0.1395 0.1522 0.1648 0.1775 0.1902
0.2029 0.2156 0.2283 0.2409 0.2536
0.2663 0.2790 0.2917 0.3043 0.3170
0.3491 0.3812 0.4132 0.4453 0.4774
0.5095 0.5415 0.5736 0.6057 0.6378
0.6698 0.7019 0.7340 0.7661 0.7981
0.8255 0.8448 0.8642 0.8836 0.9030
0.9224 0.9418 0.9612 0.9806 1.0000

Transect ROW_16.5m_PH3
Area:
0.0004 0.0017 0.0039 0.0069 0.0107
0.0154 0.0210 0.0275 0.0347 0.0429
0.0519 0.0618 0.0725 0.0841 0.0965
0.1098 0.1240 0.1390 0.1548 0.1716
0.1892 0.2076 0.2269 0.2471 0.2677
0.2884 0.3090 0.3297 0.3510 0.3731
0.3962 0.4201 0.4449 0.4705 0.4971
0.5245 0.5527 0.5819 0.6119 0.6428
0.6746 0.7073 0.7408 0.7752 0.8105
0.8466 0.8837 0.9216 0.9603 1.0000
Hrad:
0.0173 0.0347 0.0520 0.0694 0.0867
0.1041 0.1214 0.1388 0.1561 0.1735
0.1908 0.2082 0.2255 0.2429 0.2602
0.2776 0.2949 0.3123 0.3296 0.3470
0.3643 0.3817 0.3990 0.4164 0.4493
0.4834 0.5513 0.5844 0.6155 0.6465
0.6449 0.6727 0.6990 0.7239 0.7475
0.7699 0.7913 0.8116 0.8310 0.8496
0.8673 0.8843 0.9007 0.9164 0.9316
0.9462 0.9603 0.9739 0.9872 1.0000
Width:
0.0214 0.0428 0.0642 0.0856 0.1070
0.1284 0.1498 0.1712 0.1926 0.2140
0.2354 0.2568 0.2782 0.2996 0.3210
0.3424 0.3638 0.3852 0.4066 0.4280
0.4494 0.4708 0.4922 0.5136 0.5152
0.5152 0.5152 0.5200 0.5418 0.5636
0.5855 0.6073 0.6291 0.6509 0.6727
0.6945 0.7164 0.7382 0.7600 0.7818
0.8036 0.8255 0.8473 0.8691 0.8909
0.9127 0.9345 0.9564 0.9782 1.0000

Transect ROW_18m
Area:
0.0004 0.0016 0.0036 0.0064 0.0100
0.0144 0.0196 0.0255 0.0323 0.0399
0.0483 0.0575 0.0675 0.0782 0.0898
0.1022 0.1154 0.1293 0.1441 0.1597
0.1760 0.1932 0.2112 0.2299 0.2495
0.2698 0.2906 0.3114 0.3321 0.3529
0.3742 0.3967 0.4204 0.4452 0.4712
0.4983 0.5266 0.5560 0.5867 0.6184
0.6514 0.6855 0.7207 0.7571 0.7947
0.8335 0.8734 0.9144 0.9566 1.0000
Hrad:
0.0183 0.0366 0.0549 0.0732 0.0915
0.1098 0.1281 0.1464 0.1647 0.1829
0.2012 0.2195 0.2378 0.2561 0.2744
0.2927 0.3110 0.3293 0.3476 0.3659
0.3842 0.4025 0.4208 0.4391 0.4574
0.4757 0.5117 0.5476 0.5834 0.6192
0.6542 0.6864 0.7162 0.7437 0.7692
0.7927 0.8145 0.8348 0.8537 0.8713
0.8877 0.9031 0.9176 0.9313 0.9442
0.9565 0.9681 0.9792 0.9898 1.0000
Width:
0.0182 0.0363 0.0545 0.0726 0.0908
0.1090 0.1271 0.1453 0.1635 0.1816
0.1998 0.2179 0.2361 0.2543 0.2724
0.2906 0.3088 0.3269 0.3451 0.3632
0.3814 0.3996 0.4177 0.4359 0.4541
0.4722 0.4722 0.4722 0.4722 0.4722
0.4986 0.5250 0.5514 0.5778 0.6042
0.6306 0.6569 0.6833 0.7097 0.7361
0.7625 0.7889 0.8153 0.8417 0.8681
0.8944 0.9208 0.9472 0.9736 1.0000

Transect ROW_18m_MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0793 0.0991
0.1189 0.1387 0.1585 0.1783 0.1982
0.2180 0.2378 0.2576 0.2774 0.2972
0.3166 0.3340 0.3498 0.3646 0.3786
0.3921 0.4053 0.4183 0.4311 0.4439
0.4566 0.4770 0.5054 0.5332 0.5603
0.5869 0.6122 0.6360 0.6586 0.6807
0.7040 0.7271 0.7499 0.7723 0.7944
0.8163 0.8378 0.8591 0.8800 0.9007
0.9211 0.9412 0.9611 0.9807 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_MB_2
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0406 0.0484 0.0568 0.0658 0.0756
0.0861 0.0978 0.1107 0.1247 0.1400
0.1564 0.1740 0.1928 0.2128 0.2340
0.2564 0.2798 0.3039 0.3285 0.3536
0.3793 0.4059 0.4335 0.4621 0.4918
0.5221 0.5529 0.5842 0.6160 0.6484
0.6812 0.7146 0.7485 0.7828 0.8178
0.8532 0.8891 0.9256 0.9625 1.0000
Hrad:
0.0198 0.0395 0.0593 0.0791 0.0989
0.1186 0.1384 0.1582 0.1780 0.1977
0.2175 0.2373 0.2571 0.2768 0.2966
0.3160 0.3333 0.3491 0.3638 0.3778
0.3913 0.4045 0.4174 0.4302 0.4430
0.4557 0.4760 0.5044 0.5321 0.5592
0.5857 0.6109 0.6347 0.6572 0.6793
0.7027 0.7258 0.7486 0.7711 0.7933
0.8152 0.8368 0.8581 0.8792 0.9000
0.9205 0.9408 0.9608 0.9805 1.0000
Width:
0.0178 0.0356 0.0534 0.0712 0.0890
0.1068 0.1246 0.1424 0.1602 0.1780
0.1958 0.2136 0.2314 0.2492 0.2670
0.2942 0.3256 0.3571 0.3885 0.4199
0.4513 0.4827 0.5141 0.5455 0.5769
0.6083 0.6314 0.6450 0.6586 0.6722
0.6911 0.7183 0.7456 0.7728 0.7958
0.8094 0.8231 0.8367 0.8503 0.8639
0.8775 0.8911 0.9047 0.9183 0.9319
0.9456 0.9592 0.9728 0.9864 1.0000

Transect ROW_18m_Mountable
Area:
0.0003 0.0011 0.0026 0.0046 0.0072
0.0103 0.0140 0.0183 0.0232 0.0286
0.0346 0.0412 0.0484 0.0561 0.0644
0.0733 0.0827 0.0928 0.1034 0.1145
0.1263 0.1386 0.1515 0.1650 0.1799
0.1964 0.2143 0.2337 0.2546 0.2770
0.3009 0.3263 0.3532 0.3816 0.4115
0.4429 0.4758 0.5102 0.5459 0.5826
0.6202 0.6587 0.6981 0.7385 0.7797
0.8219 0.8651 0.9091 0.9541 1.0000
Hrad:
0.0235 0.0471 0.0706 0.0942 0.1177
0.1413 0.1648 0.1884 0.2119 0.2355
0.2590 0.2826 0.3061 0.3297 0.3532
0.3768 0.4003 0.4238 0.4474 0.4709
0.4945 0.5180 0.5416 0.5650 0.5852
0.6022 0.6168 0.6296 0.6410 0.6515
0.6613 0.6707 0.6799 0.6889 0.6979
0.7059 0.7141 0.7253 0.7478 0.7737
0.7989 0.8234 0.8474 0.8707 0.8935
0.9157 0.9375 0.9588 0.9796 1.0000
Width:
0.0124 0.0247 0.0371 0.0494 0.0618
0.0741 0.0865 0.0988 0.1112 0.1235
0.1359 0.1482 0.1606 0.1729 0.1853
0.1976 0.2100 0.2223 0.2347 0.2470
0.2594 0.2717 0.2841 0.3058 0.3381
0.3704 0.4027 0.4349 0.4672 0.4995
0.5318 0.5641 0.5964 0.6287 0.6610
0.6933 0.7255 0.7578 0.7807 0.8006
0.8206 0.8405 0.8604 0.8804 0.9003
0.9202 0.9402 0.9601 0.9801 1.0000

Transect ROW_18m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0154 0.0209 0.0273 0.0346 0.0427
0.0516 0.0614 0.0721 0.0836 0.0960
0.1092 0.1233 0.1382 0.1540 0.1707
0.1882 0.2065 0.2256 0.2447 0.2638
0.2830 0.3026 0.3232 0.3447 0.3670
0.3903 0.4144 0.4394 0.4653 0.4921
0.5197 0.5483 0.5777 0.6080 0.6392
0.6713 0.7043 0.7382 0.7729 0.8085
0.8451 0.8825 0.9208 0.9599 1.0000
Hrad:
0.0179 0.0359 0.0538 0.0717 0.0896
0.1076 0.1255 0.1434 0.1613 0.1793
0.1972 0.2151 0.2330 0.2510 0.2689
0.2868 0.3047 0.3227 0.3406 0.3585
0.3764 0.3944 0.4225 0.4577 0.4928
0.5279 0.5621 0.5942 0.6243 0.6525
0.6791 0.7042 0.7279 0.7504 0.7716
0.7918 0.8110 0.8292 0.8467 0.8634
0.8794 0.8948 0.9095 0.9238 0.9375
0.9508 0.9636 0.9761 0.9882 1.0000
Width:
0.0211 0.0421 0.0632 0.0843 0.1053
0.1264 0.1475 0.1685 0.1896 0.2107
0.2318 0.2528 0.2739 0.2950 0.3160
0.3371 0.3582 0.3792 0.4003 0.4214
0.4424 0.4635 0.4722 0.4722 0.4722
0.4722 0.4971 0.5190 0.5408 0.5627
0.5846 0.6064 0.6283 0.6502 0.6720
0.6939 0.7158 0.7376 0.7595 0.7813
0.8032 0.8251 0.8469 0.8688 0.8907
0.9125 0.9344 0.9563 0.9781 1.0000

Transect ROW_22m
Area:
0.0003 0.0014 0.0031 0.0055 0.0086
0.0124 0.0169 0.0221 0.0280 0.0346
0.0418 0.0498 0.0584 0.0678 0.0778
0.0885 0.0999 0.1120 0.1248 0.1383
0.1525 0.1674 0.1829 0.1992 0.2161
0.2337 0.2521 0.2711 0.2908 0.3119
0.3348 0.3594 0.3857 0.4133 0.4420
0.4717 0.5025 0.5343 0.5673 0.6013
0.6363 0.6725 0.7097 0.7479 0.7873
0.8277 0.8692 0.9117 0.9553 1.0000
Hrad:
0.0200 0.0399 0.0599 0.0798 0.0998
0.1198 0.1397 0.1597 0.1796 0.1996
0.2196 0.2395 0.2595 0.2794 0.2994
0.3194 0.3393 0.3593 0.3792 0.3992
0.4192 0.4391 0.4591 0.4790 0.4990
0.5190 0.5389 0.5589 0.5789 0.5976
0.6138 0.6280 0.6465 0.6764 0.7046
0.7312 0.7565 0.7804 0.8033 0.8250
0.8458 0.8656 0.8847 0.9030 0.9206
0.9376 0.9539 0.9698 0.9851 1.0000
Width:
0.0153 0.0306 0.0459 0.0612 0.0765
0.0918 0.1071 0.1224 0.1376 0.1529
0.1682 0.1835 0.1988 0.2141 0.2294
0.2447 0.2600 0.2753 0.2906 0.3059
0.3212 0.3365 0.3518 0.3671 0.3824
0.3976 0.4129 0.4282 0.4472 0.4861
0.5230 0.5640 0.5982 0.6218 0.6455
0.6691 0.6927 0.7164 0.7400 0.7636
0.7873 0.8109 0.8345 0.8582 0.8818
0.9055 0.9291 0.9527 0.9764 1.0000

Transect ROW_24m
Area:
0.0004 0.0017 0.0039 0.0069 0.0107
0.0155 0.0211 0.0275 0.0348 0.0430
0.0520 0.0619 0.0726 0.0843 0.0967
0.1100 0.1234 0.1369 0.1503 0.1637
0.1772 0.1906 0.2040 0.2176 0.2324
0.2484 0.2655 0.2840 0.3036 0.3245
0.3466 0.3699 0.3945 0.4203 0.4473
0.4756 0.5050 0.5357 0.5677 0.6008
0.6352 0.6708 0.7077 0.7458 0.7851
0.8256 0.8674 0.9103 0.9546 1.0000
Hrad:
0.0217 0.0434 0.0652 0.0869 0.1086
0.1303 0.1520 0.1737 0.1955 0.2172
0.2389 0.2606 0.2823 0.3041 0.3258
0.3554 0.3981 0.4407 0.4831 0.5253
0.5674 0.6094 0.6512 0.6926 0.7297
0.7620 0.7900 0.8143 0.8353 0.8535
0.8693 0.8830 0.8951 0.9057 0.9151
0.9235 0.9311 0.9381 0.9445 0.9505
0.9561 0.9614 0.9666 0.9716 0.9764
0.9812 0.9859 0.9906 0.9953 1.0000
Width:
0.0187 0.0373 0.0560 0.0747 0.0933
0.1120 0.1307 0.1493 0.1680 0.1867
0.2053 0.2240 0.2427 0.2613 0.2800
0.2917 0.2917 0.2917 0.2917 0.2917
0.2917 0.2917 0.2917 0.3067 0.3333
0.3600 0.3867 0.4133 0.4400 0.4667
0.4933 0.5200 0.5467 0.5733 0.6000
0.6267 0.6533 0.6800 0.7067 0.7333
0.7600 0.7867 0.8133 0.8400 0.8667
0.8933 0.9200 0.9467 0.9733 1.0000

Transect ROW_24m_1
Area:
0.0002 0.0009 0.0020 0.0036 0.0057
0.0081 0.0111 0.0145 0.0183 0.0227
0.0279 0.0340 0.0410 0.0489 0.0577

0.0675 0.0781 0.0897 0.1021 0.1158
0.1311 0.1479 0.1664 0.1857 0.2058
0.2265 0.2480 0.2700 0.2929 0.3171
0.3426 0.3694 0.3976 0.4272 0.4579
0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023
0.8405 0.8794 0.9189 0.9591 1.0000

Hrad:
0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000

Width:
0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5442 0.5692 0.6021 0.7531
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking
Area:
0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000

Hrad:
0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000

Width:
0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m
Area:
0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000

Hrad:
0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000

Width:
0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1
Area:
0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7086 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000

Hrad:
0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9876 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000

Width:
0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2
Area:
0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000

Hrad:
0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000

Width:
0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3
Area:
0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1213 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000

Hrad:
0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2047 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4018 0.4273 0.4351 0.4545
0.4665 0.5336 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8390 0.8745 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1067 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000

Width:
0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5831 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4
Area:
0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0302 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000

Hrad:
0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4302 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6869 0.6742 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000

Width:
0.0541 0.0732 0.0923 0.1110 0.1246
0.1374 0.1502 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5444 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6548 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5
Area:
0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2635 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000

Hrad:
0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3749 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6771 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8746 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000

Width:
0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6
Area:
0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2153 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000

Hrad:
0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000

```
Width:
          0.0616    0.0785    0.0947    0.1108    0.1267
          0.1418    0.1569    0.1666    0.1758    0.1850
          0.1952    0.2062    0.2171    0.2280    0.2365
          0.2466    0.2570    0.2674    0.2776    0.2853
          0.2930    0.3007    0.3084    0.3161    0.3238
          0.3379    0.3520    0.3661    0.3797    0.4163
          0.4379    0.4535    0.4707    0.4888    0.5050
          0.5264    0.5485    0.5718    0.6051    0.6237
          0.6417    0.6518    0.6637    0.6783    0.6930
          0.7329    0.7718    0.8002    0.8718    1.0000


***************
Analysis Options
***************
Flow Units ...............  CMS
Process Models:
  Rainfall/Runoff ........  YES
  RDII ...................  NO
  Snowmelt ...............  NO
  Groundwater ............  NO
  Flow Routing ...........  YES
  Ponding Allowed ........  NO
  Water Quality ..........  NO
Infiltration Method ......  HORTON
Flow Routing Method ......  DYNWAVE
Surcharge Method .........  EXTRAN
Starting Date ............  08/04/1988 00:00:00
Ending Date ..............  08/05/1988 00:00:00
Antecedent Dry Days ......  0.0
Report Time Step .........  00:01:00
Wet Time Step ............  00:01:00
Dry Time Step ............  00:01:00
Routing Time Step ........  1.00 sec
Variable Time Step .......  YES
Maximum Trials ...........  8
Number of Threads ........  18
Head Tolerance ...........  0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************   ---------       -------
Total Precipitation ......         6.732        80.592
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.330        27.896
Surface Runoff ...........         4.307        51.559
Final Storage ............         0.105         1.257
Continuity Error (%) .....        -0.150


**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************   ----------    ----------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         4.307        43.067
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         3.234        32.336
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.122         1.217
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.956         9.560
Continuity Error (%) .....        -0.106


*************************
Highest Continuity Errors
*************************
Node J24 (46.17%)
Node J23 (4.09%)
Node J51 (3.79%)
Node 519_(C-STRM) (-2.53%)
Node J36 (2.49%)


***************************
Time-Step Critical Elements
***************************
None


*********************************
Highest Flow Instability Indexes
*********************************
Link C-STRM-83_(C-STRM) (13)
Link OL9 (11)
Link OL15 (11)
Link OL16 (10)
Link C-STRM-71_(C-STRM) (8)


*********************************
Most Frequent Nonconverging Nodes
*********************************
Node OF1 (0.01%)
Node OF2 (0.01%)
Node OF3 (0.01%)
Node ST4_108A_(P-Stm) (0.01%)
Node 506_(C-STRM) (0.00%)


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.28 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.01
Time Step Frequencies       :
    1.000 -  0.871 sec      :    99.95 %
    0.871 -  0.758 sec      :     0.02 %
    0.758 -  0.660 sec      :     0.01 %
    0.660 -  0.574 sec      :     0.00 %
    0.574 -  0.500 sec      :     0.02 %


****************************
Subcatchment Runoff Summary
****************************

-----------------------------------------------------------------------------------------------------
                                  Total      Total      Total      Total     Imperv      Perv
Total      Total      Peak      Precip      Runon       Evap      Infil     Runoff     Runoff
Runoff     Runoff     Runoff     Coeff
Subcatchment                        mm         mm         mm         mm         mm         mm
mm    10^6 ltr        CMS
-----------------------------------------------------------------------------------------------------
  A15                            80.59       0.00       0.00      54.92      14.98       7.11
19.10       0.66       0.14      0.237
  A18                            80.59       0.00       0.00      34.42      31.06      20.88
45.73       0.27       0.19      0.567
  A19                            80.59       0.00       0.00      45.85      17.72      20.30
34.48       0.38       0.26      0.428
  A20                            80.59       0.00       0.00      62.88       6.64      11.14
16.45       0.80       0.21      0.204
  NULL3                          80.59       0.00       0.00      10.68      66.12      16.02
68.92       0.39       0.24      0.855
  S1                             80.59       0.00       0.00      23.91      52.62      40.05
55.84       3.64       2.32      0.693
  S1_1                           80.59       0.00       0.00      16.86      56.80      17.57
63.02       0.08       0.05      0.782
  S1_2                           80.59       0.00       0.00      16.77      56.84      17.68
63.15       0.07       0.05      0.784
  S1_4                           80.59       0.00       0.00      16.94      56.77      17.49
62.91       0.12       0.08      0.781
  S1_5                           80.59       0.00       0.00      16.87      56.80      17.57
63.01       0.07       0.05      0.782
  S10_1                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       1.01       0.65      0.678
  S10_2                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       1.16       0.75      0.678
  S10_4                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.40       0.26      0.678
  S10_5                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.69       0.44      0.678
  S11                            80.59       0.00       0.00      61.76       0.00      18.84
18.84       0.62       0.38      0.234
  S12                            80.59       0.00       0.00      16.96      56.77      17.46
62.87       0.27       0.18      0.780
  S14_1                          80.59       0.00       0.00      17.07      56.73      17.34
62.73       0.38       0.25      0.778
  S14_3                          80.59       0.00       0.00      17.38      56.66      17.00
62.33       0.66       0.43      0.773
  S14_4                          80.59       0.00       0.00      17.10      56.73      17.31
62.69       0.19       0.12      0.778
  S14_5                          80.59       0.00       0.00      17.33      56.68      17.06
62.40       1.05       0.68      0.774
  S14_6                          80.59       0.00       0.00      17.14      56.71      17.26
62.63       0.18       0.12      0.777
  S14_7                          80.59       0.00       0.00      17.20      56.70      17.19
62.55       0.73       0.48      0.776
  S14_8                          80.59       0.00       0.00      17.17      56.71      17.23
62.60       0.21       0.14      0.777
  S15                            80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.89       0.58      0.678
  S16                            80.59       0.00       0.00       0.00      78.84       0.00
78.84       1.16       0.32      0.978
  S17                            80.59       0.00       0.00      70.51       2.64      10.04
10.04       0.63       0.19      0.125
  S18_2                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       1.83       1.18      0.678
  S18_3                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.91       0.58      0.678
  S18_4                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.48       0.31      0.678
  S18_5                          80.59       0.00       0.00      20.87      56.61      41.83
58.81       1.08       0.67      0.730
  S18_6                          80.59       0.00       0.00      25.14      50.96      39.34
54.63       0.46       0.30      0.678
  S19                            80.59       0.00       0.00      17.28      56.68      17.11
62.45       0.66       0.43      0.775
  S2                             80.59       0.00       0.00      23.62      53.01      40.22
56.12       2.09       1.33      0.696
  S20_1                          80.59       0.00       0.00      16.90      56.79      17.53
62.96       0.31       0.21      0.781
  S20_2                          80.59       0.00       0.00      16.65      56.90      17.84
63.36       0.14       0.10      0.786
  S3                             80.59       0.00       0.00      25.14      50.96      39.34
54.63       1.35       0.87      0.678
  S32                            80.59       0.00       0.00      16.95      56.77      17.47
62.89       0.26       0.17      0.780
  S36                            80.59       0.00       0.00       0.00      78.85       0.00
78.85       1.43       0.40      0.978
  S4                             80.59       0.00       0.00       8.28      67.75       3.23
70.98       9.38       4.17      0.881
  S5                             80.59       0.00       0.00       7.73      67.80       3.79
71.59       2.28       1.19      0.888
  S6                             80.59       0.00       0.00      23.85      45.44      19.81
56.16       0.19       0.14      0.697
  S7                             80.59       0.00       0.00       7.86      67.79       3.65
71.44       2.85       1.43      0.886
  S8                             80.59       0.00       0.00      46.17      28.28      33.92
33.92       0.65       0.33      0.421


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------------------------
                                  Average    Maximum    Maximum  Time of Max      Reported
                                    Depth      Depth        HGL   Occurrence     Max Depth
Node                 Type          Meters     Meters     Meters  days hr:min        Meters
-----------------------------------------------------------------------------------------------
EXD_1                JUNCTION        0.01       0.16     104.55    0  02:05          0.16
EXD_10               JUNCTION        0.05       0.41      99.06    0  02:07          0.41
EXD_11               JUNCTION        0.04       0.30      98.79    0  02:08          0.30
EXD_12               JUNCTION        0.07       0.44      98.74    0  02:07          0.44
EXD_13               JUNCTION        0.01       0.17     104.49    0  02:07          0.17
EXD_14               JUNCTION        0.00       0.00     102.49    0  00:00          0.00
EXD_15               JUNCTION        0.06       0.42     100.69    0  02:06          0.42
EXD_16               JUNCTION        0.03       0.19     100.39    0  02:07          0.19
EXD_17               JUNCTION        0.04       0.18     100.06    0  02:10          0.18
EXD_18               JUNCTION        0.03       0.21      99.61    0  02:11          0.21
EXD_19               JUNCTION        0.06       0.40      99.59    0  02:09          0.40
EXD_2                JUNCTION        0.03       0.26     103.73    0  02:09          0.26
EXD_20               JUNCTION        0.06       0.41      99.59    0  02:09          0.41
EXD_21               JUNCTION        0.05       0.30      99.48    0  02:10          0.30
EXD_22               JUNCTION        0.03       0.19      99.34    0  02:11          0.19
EXD_23               JUNCTION        0.06       0.30      99.05    0  02:17          0.30
EXD_24               JUNCTION        0.03       0.26      98.93    0  02:06          0.26
EXD_25               JUNCTION        0.05       0.40      98.93    0  02:07          0.40
EXD_26               JUNCTION        0.03       0.20      98.68    0  02:09          0.20
EXD_27               JUNCTION        0.07       0.37      98.53    0  02:05          0.37
EXD_3                JUNCTION        0.01       0.14     103.33    0  02:10          0.14
EXD_4                JUNCTION        0.01       0.13     102.78    0  02:11          0.13
EXD_5                JUNCTION        0.02       0.21     102.70    0  02:11          0.21
EXD_6                JUNCTION        0.01       0.13     102.45    0  02:12          0.13
EXD_7                JUNCTION        0.02       0.19     101.68    0  02:13          0.19
EXD_8                JUNCTION        0.03       0.38     100.86    0  02:16          0.37
EXD_9                JUNCTION        0.02       0.18     100.57    0  02:19          0.18
J10                  JUNCTION        0.00       0.08     103.68    0  02:08          0.08
J11                  JUNCTION        0.00       0.10     103.60    0  02:09          0.10
J12                  JUNCTION        0.00       0.10     103.50    0  02:10          0.10
J13                  JUNCTION        0.01       0.15     103.45    0  02:11          0.15
J17                  JUNCTION        0.01       0.16     104.53    0  02:06          0.16
J19                  JUNCTION        0.00       0.10     105.50    0  02:05          0.09
J20                  JUNCTION        0.00       0.06     105.51    0  02:06          0.06
J21                  JUNCTION        0.00       0.07     105.62    0  02:05          0.07
J22                  JUNCTION        0.00       0.01     105.71    0  02:05          0.01
J23                  JUNCTION        0.00       0.01     106.01    0  02:18          0.01
J24                  JUNCTION        0.00       0.01     106.21    0  02:11          0.01
J25                  JUNCTION        0.00       0.14     105.44    0  02:10          0.14
J26                  JUNCTION        0.00       0.15     105.85    0  02:09          0.15
J28                  JUNCTION        0.00       0.08     109.08    0  02:05          0.08
J29                  JUNCTION        0.00       0.10     108.90    0  02:06          0.10
J32                  JUNCTION        0.00       0.11     106.11    0  02:09          0.11
J36                  JUNCTION        0.00       0.08     104.78    0  02:07          0.08
J39                  JUNCTION        0.01       0.16     104.76    0  02:10          0.16
J40                  JUNCTION        0.00       0.15     104.60    0  02:11          0.15
J41                  JUNCTION        0.00       0.14     103.34    0  02:12          0.14
J43                  JUNCTION        0.00       0.12     104.32    0  02:11          0.12
J44                  JUNCTION        0.00       0.07     104.57    0  02:05          0.07
J46                  JUNCTION        0.00       0.08     104.68    0  02:05          0.07
J47                  JUNCTION        0.00       0.00     105.10    0  00:00          0.00
J48                  JUNCTION        0.00       0.07     105.82    0  02:09          0.07
J51                  JUNCTION        0.00       0.08     106.83    0  02:08          0.08
J52                  JUNCTION        0.00       0.00     109.75    0  00:00          0.00
J53                  JUNCTION        0.00       0.00     109.00    0  00:00          0.00
J56                  JUNCTION        0.00       0.00     109.10    0  00:00          0.00
J57                  JUNCTION        0.00       0.00     108.47    0  00:00          0.00
J58                  JUNCTION        0.00       0.07     108.47    0  02:06          0.07
J59                  JUNCTION        0.00       0.06     108.06    0  02:06          0.06
J6                   JUNCTION        0.00       0.05     109.88    0  02:05          0.05
J61                  JUNCTION        0.00       0.07     107.07    0  02:05          0.07
J62                  JUNCTION        0.00       0.07     106.57    0  02:08          0.07
J74                  JUNCTION        0.41       0.46      98.91    0  03:41          0.46
J9                   JUNCTION        0.00       0.08     103.78    0  02:07          0.08
```

OF1	OUTFALL	0.00	0.00	100.80	0	00:00	0.00	0.000
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00	0.000
OF3	OUTFALL	0.05	0.33	98.33	0	02:05	0.33	0.000
ST4_108A_(P-Stm)	OUTFALL	0.00	0.00	98.02	0	00:00	0.00	0.000
500_(C-STRM)	STORAGE	0.32	0.54	100.85	0	03:34	0.54	0.000
500A_(C-STRM)	STORAGE	0.42	0.90	101.00	0	02:14	0.90	0.000
502_(C-STRM)	STORAGE	0.15	1.67	102.21	0	02:12	1.67	0.000
503_(C-STRM)	STORAGE	0.14	1.77	102.36	0	02:12	1.77	0.000
504_(C-STRM)	STORAGE	0.35	1.27	104.31	0	02:12	1.27	0.000
505_(C-STRM)	STORAGE	0.35	1.38	104.83	0	02:10	1.38	0.000
506_(C-STRM)	STORAGE	0.35	1.50	105.33	0	02:10	1.49	0.000
507_(C-STRM)	STORAGE	0.34	1.49	105.64	0	02:10	1.49	0.000
508_(C-STRM)	STORAGE	0.34	1.58	105.95	0	02:11	1.57	0.000
509_(C-STRM)	STORAGE	0.35	1.67	106.27	0	02:11	1.66	0.000
510_(C-STRM)	STORAGE	0.34	1.69	106.54	0	02:12	1.69	0.000
511_(C-STRM)	STORAGE	0.34	1.71	106.62	0	02:12	1.71	0.000
512_(C-STRM)	STORAGE	0.34	1.69	106.80	0	02:12	1.68	0.000
513_(C-STRM)	STORAGE	0.34	1.68	106.92	0	02:12	1.67	0.000
514_(C-STRM)	STORAGE	0.29	1.34	106.93	0	02:12	1.33	0.000
515_(C-STRM)	STORAGE	0.28	1.09	106.95	0	02:12	1.09	0.000
516_(C-STRM)	STORAGE	0.34	1.71	107.17	0	02:12	1.70	0.000
517_(C-STRM)	STORAGE	0.34	1.81	107.42	0	02:12	1.81	0.000
518_(C-STRM)	STORAGE	0.35	2.01	107.86	0	02:11	2.01	0.000
519_(C-STRM)	STORAGE	0.33	1.80	107.88	0	02:10	1.77	0.000
520_(C-STRM)	STORAGE	0.33	1.66	108.00	0	02:10	1.65	0.000
522_(C-STRM)	STORAGE	0.31	0.61	104.91	0	02:08	0.61	0.000
525_(C-STRM)	STORAGE	0.13	1.71	102.32	0	02:12	1.71	0.000
528_(C-STRM)	STORAGE	0.10	1.85	102.58	0	02:13	1.85	0.000
532_(C-STRM)	STORAGE	0.09	1.91	102.74	0	02:13	1.91	0.000
536_(C-STRM)	STORAGE	0.09	1.90	102.88	0	02:13	1.90	0.000
540_(C-STRM)	STORAGE	0.38	2.14	103.00	0	02:14	2.14	0.000
541_(C-STRM)	STORAGE	0.37	2.13	103.05	0	02:14	2.13	0.000
551_(C-STRM)	STORAGE	0.36	1.72	102.36	0	02:11	1.71	0.000
552_(C-STRM)	STORAGE	0.35	1.67	102.41	0	02:11	1.67	0.000
553_(C-STRM)	STORAGE	0.35	1.60	102.53	0	02:11	1.60	0.000
554_(C-STRM)	STORAGE	0.34	1.56	102.61	0	02:10	1.55	0.000
555_(C-STRM)	STORAGE	0.34	1.54	102.79	0	02:10	1.54	0.000
556_(C-STRM)	STORAGE	0.34	1.61	102.97	0	02:10	1.60	0.000
601_(C-STRM)	STORAGE	0.17	1.20	101.65	0	02:09	1.20	0.000
602_(C-STRM)	STORAGE	0.17	1.71	102.23	0	02:09	1.71	0.000
603_(C-STRM)	STORAGE	0.14	1.74	102.37	0	02:09	1.74	0.000
604_(C-STRM)	STORAGE	0.13	1.88	102.75	0	02:12	1.88	0.000
605_(C-STRM)	STORAGE	0.12	1.83	102.91	0	02:12	1.83	0.000
606_(C-STRM)	STORAGE	0.13	1.91	103.15	0	02:12	1.91	0.000
619_(C-STRM)	STORAGE	0.13	2.00	103.38	0	02:11	2.00	0.000
622_(C-STRM)	STORAGE	0.12	1.95	103.47	0	02:11	1.94	0.000 ltr
626_(C-STRM)	STORAGE	0.29	0.52	104.47	0	02:26	0.52	0.000
627_(C-STRM)	STORAGE	0.32	0.88	104.01	0	02:11	0.88	0.000
629_(C-STRM)	STORAGE	0.12	1.90	103.55	0	02:11	1.90	0.000
630_(C-STRM)	STORAGE	0.12	1.65	103.73	0	02:11	1.65	0.000
630A_(C-STRM)	STORAGE	0.11	1.66	103.78	0	02:11	1.66	0.000
631_(C-STRM)	STORAGE	0.00	0.09	106.09	0	02:08	0.09	0.000 ltr
645_(C-STRM)	STORAGE	0.38	1.92	103.95	0	02:10	1.92	0.000
647_(C-STRM)	STORAGE	0.37	1.94	104.08	0	02:09	1.94	0.000 ltr
650_(C-STRM)	STORAGE	0.37	1.96	104.18	0	02:10	1.96	0.000
651_(C-STRM)	STORAGE	0.36	1.96	104.27	0	02:10	1.95	0.000 ltr
682_(C-STRM)	STORAGE	0.00	0.14	105.54	0	02:07	0.14	0.000
MTD_(C-STRM)	STORAGE	0.25	1.56	101.93	0	02:12	1.56	0.000 ltr
OVERFLOW_(C-STRM)	STORAGE	0.36	0.88	101.06	0	02:13	0.88	0.000
POND_(C-STRM)	STORAGE	1.87	2.38	100.83	0	03:39	2.38	0.000
S_525-MTD	STORAGE	0.00	0.14	103.54	0	02:12	0.14	0.000
S_528-525	STORAGE	0.00	0.14	103.54	0	02:08	0.14	0.000
S_532-528	STORAGE	0.00	0.13	103.63	0	02:07	0.13	0.000
S_536-532	STORAGE	0.00	0.19	103.79	0	02:07	0.19	0.000
S_540-536	STORAGE	0.00	0.18	103.89	0	02:07	0.18	0.000
S_541-540	STORAGE	0.00	0.17	103.98	0	02:07	0.17	0.000
S_604-603	STORAGE	0.00	0.14	105.64	0	02:08	0.14	0.000
S_605-604	STORAGE	0.00	0.16	106.87	0	02:08	0.16	0.000
S_619-606	STORAGE	0.00	0.18	106.68	0	02:08	0.18	0.000
S_622-619	STORAGE	0.00	0.21	105.91	0	02:07	0.21	0.000
S_622-619_2	STORAGE	0.00	0.20	106.70	0	02:07	0.20	0.000
S_627-630	STORAGE	0.00	0.11	106.81	0	02:08	0.11	0.000
S_629-622	STORAGE	0.00	0.15	106.16	0	02:06	0.15	0.000
SU2	STORAGE	0.00	0.17	106.92	0	02:23	0.17	0.000
SU5	STORAGE	0.00	0.14	104.32	0	02:16	0.14	0.000

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.158	0	02:05	0	0.274	- 0.161
EXD_10	JUNCTION	0.720	0.833	0	02:05	2.59	3.49	- 0.184
EXD_11	JUNCTION	0.000	0.750	0	02:08	0	3.49	0.007
EXD_12	JUNCTION	0.141	0.862	0	02:07	0.662	4.15	0.003
EXD_13	JUNCTION	0.000	0.149	0	02:06	0	0.275	- 0.223
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.210	0.210	0	02:05	0.795	0.795	- 0.003
EXD_16	JUNCTION	0.000	0.116	0	02:06	0	0.795	- 0.136
EXD_17	JUNCTION	0.000	0.116	0	02:07	0	0.796	0.008
EXD_18	JUNCTION	0.000	0.113	0	02:10	0	0.796	0.293
EXD_19	JUNCTION	0.000	0.127	0	02:16	0	0.808	- 0.115
EXD_2	JUNCTION	0.000	0.136	0	02:07	0	0.276	0.514
EXD_20	JUNCTION	0.264	0.264	0	02:05	0.382	1.19	- 0.015
EXD_21	JUNCTION	0.000	0.231	0	02:09	0	1.18	- 0.044
EXD_22	JUNCTION	0.000	0.229	0	02:10	0	1.18	- 0.084
EXD_23	JUNCTION	0.000	0.228	0	02:11	0	1.18	0.179
EXD_24	JUNCTION	0.000	0.224	0	02:17	0	1.18	0.062
EXD_25	JUNCTION	0.195	0.300	0	02:05	0.271	1.45	0.015
EXD_26	JUNCTION	0.000	0.344	0	02:07	0	1.45	0.084
EXD_27	JUNCTION	0.239	1.278	0	02:05	0.389	5.99	- 0.007
EXD_3	JUNCTION	0.000	0.119	0	02:09	0	0.275	0.170
EXD_4	JUNCTION	0.000	0.117	0	02:10	0	0.274	0.052
EXD_5	JUNCTION	0.000	0.116	0	02:11	0	0.274	- 0.001
EXD_6	JUNCTION	0.000	0.116	0	02:11	0	0.274	- 0.633
EXD_7	JUNCTION	0.194	0.287	0	02:11	0.628	0.904	- 0.047
EXD_8	JUNCTION	0.000	0.282	0	02:13	0	0.904	0.303
EXD_9	JUNCTION	0.000	0.262	0	02:16	0	0.902	0.825
J10	JUNCTION	0.000	0.439	0	02:08	0	0.176	0.012
J11	JUNCTION	0.000	0.495	0	02:08	0	0.198	- 0.004
J12	JUNCTION	0.000	0.573	0	02:09	0	0.232	- 0.018
J13	JUNCTION	0.000	0.496	0	02:10	0	0.255	1.101
J17	JUNCTION	0.000	0.156	0	02:05	0	0.275	- 0.183
J19	JUNCTION	0.478	0.497	0	02:05	0.735	0.741	- 1.769
J20	JUNCTION	0.045	0.087	0	02:05	0.0681	0.0851	1.297
J21	JUNCTION	0.080	0.080	0	02:05	0.12	0.12	- 0.399
J22	JUNCTION	0.049	0.049	0	02:05	0.0737	0.0746	- 0.436
J23	JUNCTION	0.000	0.001	0	02:12	0	0.000985	4.269
J24	JUNCTION	0.000	0.014	0	02:08	0	0.00266	85.765
J25	JUNCTION	0.000	0.770	0	02:09	0	0.514	0.104
J26	JUNCTION	0.000	0.680	0	02:08	0	0.471	- 0.918
J28	JUNCTION	0.247	0.247	0	02:05	0.376	0.376	- 1.546
J29	JUNCTION	0.681	0.745	0	02:05	1.05	1.07	- 0.149
J32	JUNCTION	0.000	0.404	0	02:07	0	0.154	1.928
J36	JUNCTION	0.096	0.240	0	02:05	0.144	0.197	2.556
J39	JUNCTION	0.000	0.798	0	02:10	0	0.544	1.147
J40	JUNCTION	0.207	0.789	0	02:10	0.312	0.842	- 0.357
J41	JUNCTION	0.000	1.161	0	02:11	0	0.732	0.066
J43	JUNCTION	0.000	0.786	0	02:11	0	0.507	0.166
J44	JUNCTION	0.122	0.258	0	02:05	0.186	0.291	- 0.055
J46	JUNCTION	0.173	0.173	0	02:05	0.261	0.261	- 0.958
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.138	0.235	0	02:08	0.211	0.324	- 0.289
J51	JUNCTION	0.000	0.224	0	02:07	0	0.118	3.943
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.426	0.491	0	02:05	0.662	0.689	- 0.488
J59	JUNCTION	0.119	0.193	0	02:05	0.181	0.214	2.012
J6	JUNCTION	0.181	0.181	0	02:05	0.274	0.274	- 0.390
J61	JUNCTION	0.479	0.527	0	02:05	0.735	0.76	- 1.205
J62	JUNCTION	0.000	0.122	0	02:06	0	0.0466	0.037
J74	JUNCTION	0.000	0.359	0	03:39	0	26	0.054
J9	JUNCTION	0.000	0.333	0	02:07	0	0.15	0.020
OF1	OUTFALL	0.000	0.069	0	03:39	0	0.146	0.000
OF2	OUTFALL	0.137	0.137	0	02:05	0.192	0.192	0.000
OF3	OUTFALL	0.000	1.248	0	02:05	0	5.99	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.359	0	03:41	0	26	0.000
500_(C-STRM)	STORAGE	0.000	0.136	0	02:13	0	0.429	- 0.017
500A_(C-STRM)	STORAGE	0.000	3.523	0	02:13	0	11.1	0.023
502_(C-STRM)	STORAGE	0.000	1.333	0	02:11	0	5.29	0.078
503_(C-STRM)	STORAGE	0.000	0.990	0	02:12	0	4.05	- 0.007
504_(C-STRM)	STORAGE	0.000	0.933	0	02:11	0	3.84	- 0.230
505_(C-STRM)	STORAGE	0.000	0.758	0	02:10	0	2.94	- 0.272
506_(C-STRM)	STORAGE	0.000	0.765	0	02:10	0	2.96	0.510
507_(C-STRM)	STORAGE	0.000	0.605	0	02:13	0	2.23	- 0.621
508_(C-STRM)	STORAGE	0.000	0.596	0	02:12	0	2.23	- 0.000
509_(C-STRM)	STORAGE	0.000	0.589	0	02:12	0	2.23	- 0.066
510_(C-STRM)	STORAGE	0.000	0.586	0	02:12	0	2.23	0.146
511_(C-STRM)	STORAGE	0.000	0.584	0	02:12	0	2.23	0.106
512_(C-STRM)	STORAGE	0.000	0.528	0	01:36	0	2.04	- 0.234
513_(C-STRM)	STORAGE	0.000	0.577	0	01:36	0	2.11	0.924
514_(C-STRM)	STORAGE	0.000	0.065	0	01:59	0	0.0578	1.966
515_(C-STRM)	STORAGE	0.000	0.028	0	02:02	0	0.0107	- 8.766
516_(C-STRM)	STORAGE	0.000	0.382	0	02:11	0	1.38	- 1.494
517_(C-STRM)	STORAGE	0.000	0.408	0	02:10	0	1.39	0.044
518_(C-STRM)	STORAGE	0.000	0.432	0	02:10	0	1.41	1.632
519_(C-STRM)	STORAGE	0.000	0.121	0	01:33	0	0.354	- 2.466
520_(C-STRM)	STORAGE	0.000	0.121	0	01:32	0	0.362	2.421
522_(C-STRM)	STORAGE	0.000	0.088	0	01:32	0	0.255	0.028
525_(C-STRM)	STORAGE	0.000	1.273	0	02:20	0	5.42	- 0.000
528_(C-STRM)	STORAGE	0.000	1.060	0	02:20	0	4.52	0.000
532_(C-STRM)	STORAGE	0.000	0.846	0	02:20	0	3.64	- 0.141
536_(C-STRM)	STORAGE	0.000	0.735	0	02:20	0	3.21	0.146
540_(C-STRM)	STORAGE	0.000	0.504	0	02:24	0	2.16	- 0.064
541_(C-STRM)	STORAGE	0.000	0.368	0	01:33	0	1.7	0.083
551_(C-STRM)	STORAGE	0.000	0.347	0	02:11	0	1.24	0.133
552_(C-STRM)	STORAGE	0.000	0.249	0	02:10	0	0.815	- 0.365
553_(C-STRM)	STORAGE	0.000	0.252	0	02:10	0	0.816	0.052
554_(C-STRM)	STORAGE	0.000	0.212	0	01:37	0	0.648	- 0.919
555_(C-STRM)	STORAGE	0.000	0.213	0	01:37	0	0.648	- 0.111
556_(C-STRM)	STORAGE	0.000	0.214	0	01:32	0	0.654	0.989

601_(C-STRM)	STORAGE	0.000	5.213	0	02:09	0	21.4		0.035
602_(C-STRM)	STORAGE	0.000	5.217	0	02:09	0	21.4	-	0.002
603_(C-STRM)	STORAGE	0.000	5.198	0	02:12	0	21.2		0.007
604_(C-STRM)	STORAGE	0.000	5.199	0	02:12	0	21.2	-	0.006
605_(C-STRM)	STORAGE	0.000	4.906	0	02:11	0	20	-	0.010
606_(C-STRM)	STORAGE	0.000	4.166	0	02:11	0	16.9		0.017
619_(C-STRM)	STORAGE	0.000	4.170	0	02:11	0	16.9	-	0.003
622_(C-STRM)	STORAGE	0.000	3.940	0	02:11	0	16	-	0.004
626_(C-STRM)	STORAGE	0.000	0.141	0	01:56	0	0.621	-	0.432
627_(C-STRM)	STORAGE	0.000	0.238	0	02:03	0	0.96		0.083
629_(C-STRM)	STORAGE	0.000	3.388	0	02:11	0	13.5	-	0.278
630_(C-STRM)	STORAGE	0.000	3.258	0	02:10	0	13		0.237
630A_(C-STRM)	STORAGE	0.000	3.031	0	02:07	0	12		0.043
631_(C-STRM)	STORAGE	4.175	4.175	0	02:05	9.38	9.38	-	0.050
645_(C-STRM)	STORAGE	0.000	0.730	0	02:17	0	2.61	-	0.320
647_(C-STRM)	STORAGE	0.000	0.663	0	02:17	0	2.53	-	0.370
650_(C-STRM)	STORAGE	0.000	0.580	0	02:17	0	2.41	-	0.547
651_(C-STRM)	STORAGE	0.000	0.544	0	01:33	0	2.34		0.128
682_(C-STRM)	STORAGE	1.192	1.192	0	02:05	2.28	2.28	-	0.029
MTD_(C-STRM)	STORAGE	0.000	2.555	0	02:12	0	10.7	-	0.057
OVERFLOW_(C-STRM)	STORAGE	0.000	2.554	0	02:12	0	10.7		0.009
POND_(C-STRM)	STORAGE	1.433	9.018	0	02:05	2.85	35.7	-	0.018
S_525-MTD	STORAGE	0.575	0.575	0	02:05	0.894	0.92	-	0.017
S_528-525	STORAGE	0.582	0.582	0	02:05	0.905	0.905	-	0.017
S_532-528	STORAGE	0.295	0.295	0	02:05	0.459	0.459	-	0.017
S_536-532	STORAGE	0.674	0.674	0	02:05	1.08	1.08	-	0.018
S_540-536	STORAGE	0.308	0.308	0	02:05	0.478	0.478	-	0.018
S_541-540	STORAGE	1.178	1.178	0	02:05	1.83	1.83	-	0.015
S_604-603	STORAGE	0.870	0.870	0	02:05	1.35	1.35		0.000
S_605-604	STORAGE	2.323	2.323	0	02:05	3.64	3.64		0.000
S_619-606	STORAGE	0.648	0.648	0	02:05	1.01	1.01		0.000
S_622-619	STORAGE	1.329	1.329	0	02:05	2.09	2.09	-	0.000
S_622-619_2	STORAGE	0.747	0.747	0	02:05	1.16	1.16		0.000
S_627-630	STORAGE	0.255	0.255	0	02:05	0.397	0.397		0.000
S_629-622	STORAGE	0.443	0.443	0	02:05	0.688	0.688		0.000
SU2	STORAGE	0.384	0.384	0	02:05	0.621	0.621	-	0.000
SU5	STORAGE	0.332	0.332	0	02:05	0.65	0.65	-	0.000

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	11.4	0.0	0.0	0.001	19.0	0 03:34	0.136
500A_(C-STRM)	0.832	39.4	0.0	0.0	1.872	88.6	0 02:14	3.445
502_(C-STRM)	0.000	4.2	0.0	0.0	0.002	45.2	0 02:12	1.332
503_(C-STRM)	0.000	3.6	0.0	0.0	0.002	45.2	0 02:12	0.993
504_(C-STRM)	0.000	13.0	0.0	0.0	0.001	47.1	0 02:12	0.930
505_(C-STRM)	0.000	10.6	0.0	0.0	0.002	42.4	0 02:10	0.752
506_(C-STRM)	0.000	11.0	0.0	0.0	0.002	47.6	0 02:10	0.758
507_(C-STRM)	0.000	11.1	0.0	0.0	0.002	48.2	0 02:10	0.613
508_(C-STRM)	0.000	11.0	0.0	0.0	0.002	50.5	0 02:11	0.605
509_(C-STRM)	0.000	11.0	0.0	0.0	0.002	53.2	0 02:11	0.596
510_(C-STRM)	0.000	11.1	0.0	0.0	0.002	54.7	0 02:12	0.589
511_(C-STRM)	0.000	11.1	0.0	0.0	0.002	55.4	0 02:12	0.586
512_(C-STRM)	0.000	10.9	0.0	0.0	0.002	54.1	0 02:12	0.525
513_(C-STRM)	0.000	10.8	0.0	0.0	0.002	53.4	0 02:12	0.564
514_(C-STRM)	0.000	9.3	0.0	0.0	0.002	42.5	0 02:12	0.096
515_(C-STRM)	0.000	8.7	0.0	0.0	0.001	33.7	0 02:12	0.036
516_(C-STRM)	0.000	11.2	0.0	0.0	0.002	56.0	0 02:12	0.399
517_(C-STRM)	0.000	11.4	0.0	0.0	0.002	59.7	0 02:12	0.382
518_(C-STRM)	0.000	12.0	0.0	0.0	0.002	68.8	0 02:11	0.408
519_(C-STRM)	0.000	11.8	0.0	0.0	0.002	63.9	0 02:10	0.174
520_(C-STRM)	0.000	12.2	0.0	0.0	0.002	62.5	0 02:10	0.121
522_(C-STRM)	0.000	10.4	0.0	0.0	0.001	20.3	0 02:08	0.088
525_(C-STRM)	0.000	4.9	0.0	0.0	0.002	63.7	0 02:12	1.284
528_(C-STRM)	0.000	3.8	0.0	0.0	0.002	69.2	0 02:13	1.070
532_(C-STRM)	0.000	3.5	0.0	0.0	0.002	71.4	0 02:13	0.855
536_(C-STRM)	0.000	3.5	0.0	0.0	0.002	72.5	0 02:13	0.742
540_(C-STRM)	0.000	13.3	0.0	0.0	0.002	75.3	0 02:14	0.554
541_(C-STRM)	0.000	12.9	0.0	0.0	0.002	73.5	0 02:14	0.405
551_(C-STRM)	0.000	9.6	0.0	0.0	0.002	45.5	0 02:11	0.345
552_(C-STRM)	0.000	9.0	0.0	0.0	0.002	43.1	0 02:11	0.246
553_(C-STRM)	0.000	9.2	0.0	0.0	0.002	42.3	0 02:11	0.249
554_(C-STRM)	0.000	8.7	0.0	0.0	0.002	40.1	0 02:10	0.206
555_(C-STRM)	0.000	8.6	0.0	0.0	0.002	39.2	0 02:10	0.212
556_(C-STRM)	0.000	8.6	0.0	0.0	0.002	41.3	0 02:10	0.213
601_(C-STRM)	0.000	3.8	0.0	0.0	0.001	27.2	0 02:09	5.212
602_(C-STRM)	0.000	4.1	0.0	0.0	0.002	41.7	0 02:09	5.213
603_(C-STRM)	0.000	3.6	0.0	0.0	0.002	44.8	0 02:09	5.198
604_(C-STRM)	0.000	2.6	0.0	0.0	0.002	38.5	0 02:12	5.198
605_(C-STRM)	0.000	2.2	0.0	0.0	0.002	32.5	0 02:12	4.905
606_(C-STRM)	0.000	2.3	0.0	0.0	0.002	33.3	0 02:12	4.163
619_(C-STRM)	0.000	2.6	0.0	0.0	0.002	39.0	0 02:11	4.166
622_(C-STRM)	0.000	2.7	0.0	0.0	0.002	43.4	0 02:11	3.937
626_(C-STRM)	0.000	8.8	0.0	0.0	0.001	15.8	0 02:26	0.141
627_(C-STRM)	0.000	8.9	0.0	0.0	0.001	24.6	0 02:11	0.288
629_(C-STRM)	0.000	2.7	0.0	0.0	0.002	42.5	0 02:11	3.389
630_(C-STRM)	0.000	2.9	0.0	0.0	0.002	40.0	0 02:11	3.254
630A_(C-STRM)	0.000	2.9	0.0	0.0	0.002	42.7	0 02:11	3.026
631_(C-STRM)	0.005	0.2	0.0	0.0	0.456	18.2	0 02:08	2.438
645_(C-STRM)	0.000	10.2	0.0	0.0	0.002	52.1	0 02:10	0.790
647_(C-STRM)	0.000	10.8	0.0	0.0	0.002	57.0	0 02:09	0.730
650_(C-STRM)	0.000	11.5	0.0	0.0	0.002	61.3	0 02:10	0.663
651_(C-STRM)	0.000	12.0	0.0	0.0	0.002	64.5	0 02:10	0.580
682_(C-STRM)	0.002	0.3	0.0	0.0	0.204	27.2	0 02:07	0.526
MTD_(C-STRM)	0.000	7.7	0.0	0.0	0.002	49.0	0 02:12	2.554
OVERFLOW_(C-STRM)	0.000	12.9	0.0	0.0	0.001	32.0	0 02:13	2.551
POND_(C-STRM)	18.634	51.4	0.0	0.0	29.426	81.2	0 03:39	0.461
S_525-MTD	0.003	0.5	0.0	0.0	0.156	27.3	0 02:12	0.297
S_528-525	0.003	0.4	0.0	0.0	0.158	27.2	0 02:08	0.302
S_532-528	0.001	0.4	0.0	0.0	0.076	25.9	0 02:07	0.176
S_536-532	0.002	0.5	0.0	0.0	0.159	37.3	0 02:07	0.345
S_540-536	0.001	0.5	0.0	0.0	0.074	36.4	0 02:07	0.192
S_541-540	0.007	0.6	0.0	0.0	0.395	33.7	0 02:07	0.622
S_604-603	0.004	0.4	0.0	10.6	0.239	27.6	0 02:08	0.413
S_605-604	0.012	0.5	0.0	11.9	0.724	31.7	0 02:08	0.972
S_619-606	0.002	0.5	0.0	10.6	0.152	35.3	0 02:08	0.305
S_622-619	0.012	0.9	0.0	12.9	0.538	41.3	0 02:07	0.775
S_622-619_2	0.003	0.6	0.0	10.6	0.197	39.8	0 02:07	0.415
S_627-630	0.001	0.3	0.0	14.4	0.056	22.0	0 02:08	0.117
S_629-622	0.002	0.5	0.0	12.4	0.130	29.5	0 02:06	0.289
SU2	0.005	0.9	0.0	0.0	0.173	34.7	0 02:23	0.141
SU5	0.003	0.6	0.0	0.0	0.142	28.4	0 02:16	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	6.93	0.024	0.069	0.146
OF2	22.82	0.010	0.137	0.192
OF3	97.87	0.071	1.248	5.989
ST4_108A_(P-Stm)	97.88	0.308	0.359	26.008
System	56.37	0.413	1.659	32.335

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.116	0 02:06	1.16	1.72	0.74
BDR-C2	CONDUIT	0.231	0 02:09	2.00	4.41	0.88
BDR-C3	CONDUIT	0.344	0 02:07	2.82	1.76	0.60
BDR-C4	CONDUIT	0.861	0 02:07	2.62	0.28	0.33
C1_1	CHANNEL	0.295	0 02:09	0.52	0.11	0.53
C1_17	CHANNEL	0.070	0 02:05	0.97	0.01	0.16
C1_3	CHANNEL	0.068	0 02:05	0.25	0.03	0.31
C1_30	CHANNEL	0.674	0 02:09	1.02	0.25	0.57
C1_4	CHANNEL	0.756	0 02:10	1.07	0.19	0.59
C14_1	CHANNEL	0.024	0 02:06	0.14	0.02	0.31
C14_2	CHANNEL	0.001	0 02:18	0.37	0.00	0.03
C14_4	CHANNEL	0.001	0 02:05	0.02	0.00	0.16
C14_5	CHANNEL	0.044	0 02:05	0.47	0.02	0.25
C15_1	CHANNEL	0.079	0 02:06	0.33	0.03	0.29
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.12
C2	CONDUIT	1.117	0 02:13	1.33	0.12	0.27
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.11
C20_2	CHANNEL	0.067	0 02:06	0.82	0.01	0.21
C20_3	CHANNEL	0.093	0 02:06	0.63	0.02	0.20
C20_4	CHANNEL	0.082	0 02:05	0.63	0.02	0.22
C20_5	CHANNEL	0.212	0 02:08	1.08	0.03	0.24
C20_7	CHANNEL	0.155	0 02:09	0.98	0.02	0.21
C23_5	CHANNEL	0.375	0 02:12	0.59	0.23	0.56

C23_7	CHANNEL	0.794	0	02:11	2.03	0.14	0.51
C3	CONDUIT	0.341	0	02:08	0.70	0.05	0.16
C4	CONDUIT	0.433	0	02:08	0.79	0.05	0.18
C4_1	CHANNEL	0.001	0	02:12	0.38	0.00	0.05
C4_2	CHANNEL	0.109	0	02:08	0.65	0.03	0.36
C4_3	CHANNEL	0.001	0	02:11	0.01	0.00	0.25
C4_4	CHANNEL	0.108	0	02:05	0.75	0.03	0.27
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.15
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CHANNEL	0.492	0	02:09	0.83	0.07	0.20
C5_1	CHANNEL	0.156	0	02:05	0.36	0.04	0.15
C5_10	CHANNEL	0.116	0	02:07	0.54	0.03	0.23
C5_11	CHANNEL	0.127	0	02:16	0.22	0.05	0.36
C5_12	CHANNEL	1.248	0	02:05	1.31	0.11	0.33
C5_13	CHANNEL	0.113	0	02:10	0.73	0.03	0.25
C5_14	CHANNEL	0.155	0	02:16	0.35	0.10	0.46
C5_15	CHANNEL	0.228	0	02:11	0.45	0.06	0.31
C5_16	CHANNEL	0.224	0	02:17	0.44	0.05	0.24
C5_17	CHANNEL	0.232	0	02:18	0.25	0.02	0.29
C5_19	CHANNEL	0.229	0	02:10	0.48	0.15	0.28
C5_2	CHANNEL	0.119	0	02:09	0.60	0.02	0.18
C5_20	CHANNEL	0.275	0	02:09	0.34	0.03	0.25
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.26
C5_23	CHANNEL	0.149	0	02:06	0.34	0.03	0.16
C5_3	CHANNEL	0.136	0	02:07	0.73	0.01	0.19
C5_4	CHANNEL	0.116	0	02:11	0.52	0.01	0.14
C5_5	CHANNEL	0.114	0	02:12	0.63	0.01	0.15
C5_6	CHANNEL	0.117	0	02:10	0.74	0.01	0.11
C5_7	CHANNEL	0.258	0	02:19	0.40	0.02	0.27
C5_8	CHANNEL	0.282	0	02:13	0.48	0.02	0.26
C5_9	CHANNEL	0.749	0	02:08	0.73	0.06	0.35
C6	CONDUIT	0.496	0	02:10	0.66	0.08	0.25
C7	CHANNEL	0.061	0	02:05	0.32	0.02	0.23
C9_1	CHANNEL	0.161	0	02:05	0.65	0.04	0.26
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.12
C9_2	CHANNEL	0.085	0	02:07	0.35	0.03	0.35
C9_5	CHANNEL	0.778	0	02:10	1.04	0.19	0.49
C9_6	CHANNEL	0.681	0	02:11	1.11	0.17	0.43
C9_7	CHANNEL	0.156	0	02:05	0.65	0.02	0.29
C-STRM-1_(1)_(1)_(C-STRM) CONDUIT	0.399	0	02:12	1.20	1.06	1.00
C-STRM-1_(1)_(C-STRM) CONDUIT	0.382	0	02:11	1.13	1.17	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.408	0	02:10	1.44	1.72	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.136	0	02:13	1.25	0.31	0.41
C-STRM-101_(C-STRM)	CONDUIT	0.136	0	02:13	2.09	0.17	0.55
C-STRM-102_(C-STRM)	CONDUIT	2.418	0	02:12	5.45	0.96	0.85
C-STRM-103_(C-STRM)	CONDUIT	0.663	0	02:17	1.24	1.19	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.730	0	02:17	1.36	1.31	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.790	0	02:17	1.48	1.42	1.00
C-STRM-2_(1)_(C-STRM) CONDUIT	0.525	0	02:12	1.63	0.93	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.528	0	01:36	1.74	0.94	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.141	0	02:26	1.80	0.49	0.75
C-STRM-21_(C-STRM)	CONDUIT	0.288	0	02:16	1.53	0.95	1.00
C-STRM-22_(1)_(C-STRM) CONDUIT	3.389	0	02:11	1.52	0.76	1.00
C-STRM-22_(C-STRM)	CONDUIT	3.254	0	02:11	2.33	1.19	1.00
C-STRM-26_(1)_(C-STRM) CONDUIT	0.345	0	02:11	0.99	1.03	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.246	0	02:11	0.86	0.73	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT	0.758	0	02:10	1.71	0.96	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CONDUIT	0.613	0	02:13	1.71	1.03	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM) CONDUIT	0.605	0	02:13	1.69	1.02	1.00
C-STRM-3_(1)_(1)_(C-STRM) CONDUIT	0.596	0	02:12	1.67	1.00	1.00
C-STRM-3_(1)_(2)_(C-STRM) CONDUIT	0.589	0	02:12	1.65	1.05	1.00
C-STRM-3_(1)_(C-STRM) CONDUIT	0.586	0	02:12	1.73	1.03	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.580	0	02:17	1.17	1.04	1.00
C-STRM-34_(1)_(1)_(C-STRM) CONDUIT	0.212	0	01:37	1.21	1.24	1.00
C-STRM-34_(1)_(C-STRM) CONDUIT	0.213	0	01:37	1.17	1.24	1.00
C-STRM-35_(1)_(C-STRM) CONDUIT	0.249	0	02:10	1.15	1.01	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.206	0	02:10	0.97	0.83	1.00
C-STRM-4_(1)_(C-STRM) CONDUIT	0.930	0	02:12	2.22	1.08	0.90
C-STRM-4_(C-STRM)	CONDUIT	0.752	0	02:10	1.70	0.96	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.405	0	02:24	0.85	0.73	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.554	0	02:24	1.04	1.00	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.742	0	02:20	1.17	1.06	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.855	0	02:20	1.14	0.99	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.070	0	02:20	1.43	1.23	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.993	0	02:12	1.33	1.13	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.121	0	01:33	1.00	0.95	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.174	0	02:13	0.80	1.04	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	02:08	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	4.166	0	02:11	1.64	0.81	1.00
C-STRM-75_(C-STRM)	CONDUIT	4.163	0	02:11	1.64	0.81	1.00
C-STRM-76_(C-STRM)	CONDUIT	1.284	0	02:19	1.72	1.28	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.554	0	02:12	3.26	1.32	0.92
C-STRM-78_(C-STRM)	CONDUIT	1.332	0	02:11	1.78	1.09	1.00
C-STRM-79_(1)_(C-STRM) CONDUIT	5.198	0	02:12	2.05	0.83	0.98
C-STRM-79_(C-STRM)	CONDUIT	4.905	0	02:12	1.93	0.85	1.00
C-STRM-8_(1)_(C-STRM) CONDUIT	0.096	0	02:18	0.54	0.50	1.00
C-STRM-8_(C-STRM)	CONDUIT	0.036	0	02:13	0.37	0.28	1.00
C-STRM-80_(C-STRM)	CONDUIT	5.198	0	02:12	2.07	1.17	0.96
C-STRM-81_(C-STRM)	CONDUIT	5.213	0	02:09	2.36	1.17	0.81
C-STRM-82_(C-STRM)	CONDUIT	5.212	0	02:09	2.98	1.17	0.65
C-STRM-83_(1)_(C-STRM) CONDUIT	3.026	0	02:10	2.01	1.11	1.00
C-STRM-84_(C-STRM)	CONDUIT	3.937	0	02:11	1.58	0.77	1.00
CVR-C2	CONDUIT	0.116	0	02:11	2.13	0.43	0.38
CVR-C3	CONDUIT	0.262	0	02:16	2.96	1.61	0.69
CVR-C4	CONDUIT	0.750	0	02:08	2.72	0.25	0.29
ST4-Pipe_-_(99)_(P-Stm) CONDUIT	0.359	0	03:41	1.30	0.37	0.45
W1	CHANNEL	3.419	0	02:14	1.02	0.01	0.05
OR1	ORIFICE	0.351	0	03:39			1.00
OR2	ORIFICE	0.008	0	03:39			0.10
W10	WEIR	0.099	0	02:07			0.10
W11	WEIR	0.072	0	02:07			0.07
W12	WEIR	0.097	0	02:08			0.09
W13	WEIR	0.110	0	02:11			0.12
W14	WEIR	0.147	0	02:16			0.12
W15	WEIR	0.447	0	02:06			0.27
W2	WEIR	0.069	0	03:39			0.09
W3	WEIR	0.014	0	02:08			0.02
W4	WEIR	0.154	0	02:07			0.14
W5	WEIR	0.062	0	02:08			0.08
W6	WEIR	0.187	0	02:08			0.15
W7	WEIR	0.105	0	02:08			0.10
W8	WEIR	0.254	0	02:07			0.17
W9	WEIR	0.082	0	02:07			0.09
C1	DUMMY	0.249	0	01:33			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:33			
C-STRM-14_(1)_(C-STRM) DUMMY	0.743	0	01:33			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:32			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:33			
C-STRM-44_(1)_(C-STRM) DUMMY	0.203	0	01:33			
C-STRM-45_(1)_(C-STRM) DUMMY	0.233	0	01:33			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:33			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	02:00			
C-STRM-96_(1)_(C-STRM) DUMMY	0.246	0	01:33			
C-STRM-97_(1)_(C-STRM) DUMMY	0.104	0	01:33			
C-STRM-98_(1)_(C-STRM) DUMMY	0.205	0	01:33			
OL1	DUMMY	0.097	0	01:34			
OL10	DUMMY	0.026	0	00:33			
OL11	DUMMY	0.046	0	01:31			
OL12	DUMMY	0.101	0	01:31			
OL13	DUMMY	0.084	0	01:31			
OL14	DUMMY	0.121	0	01:32			
OL15	DUMMY	0.088	0	01:32			
OL16	DUMMY	0.342	0	01:32			
OL17	DUMMY	0.215	0	01:32			
OL18	DUMMY	0.059	0	01:32			
OL19	DUMMY	0.238	0	01:32			
OL2	DUMMY	0.141	0	01:56			
OL20	DUMMY	0.068	0	01:32			
OL21	DUMMY	0.060	0	01:32			
OL22	DUMMY	0.184	0	02:12			
OL3	DUMMY	0.134	0	01:33			
OL4	DUMMY	0.110	0	01:33			
OL5	DUMMY	0.046	0	02:02			
OL6	DUMMY	0.029	0	00:33			
OL7	DUMMY	0.034	0	01:34			
OL8	DUMMY	0.018	0	01:32			
OL9	DUMMY	0.214	0	01:32			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.63	0.00
BDR-C2	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.42	0.00
BDR-C3	1.00	0.02	0.00	0.00	0.53	0.45	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.02	0.00	0.00	0.61	0.37	0.00	0.00	0.81	0.00
C1_1	1.00	0.03	0.00	0.00	0.97	0.01	0.00	0.00	0.92	0.00
C1_17	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00
C1_3	1.00	0.74	0.05	0.00	0.20	0.00	0.00	0.00	0.92	0.00
C1_30	1.00	0.07	0.00	0.00	0.54	0.39	0.00	0.00	0.06	0.00
C1_4	1.00	0.02	0.05	0.00	0.91	0.02	0.00	0.00	0.92	0.00
C14_1	1.00	0.76	0.07	0.00	0.17	0.00	0.00	0.00	0.98	0.00
C14_2	1.00	0.02	0.07	0.00	0.57	0.35	0.00	0.00	0.00	0.00
C14_4	1.00	0.77	0.04	0.00	0.19	0.00	0.00	0.00	0.98	0.00
C14_5	1.00	0.77	0.01	0.00	0.18	0.03	0.00	0.00	0.00	0.00
C15_1	1.00	0.72	0.05	0.00	0.23	0.00	0.00	0.00	0.92	0.00
C15_2	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C20_1	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.77	0.02	0.00	0.18	0.03	0.00	0.00	0.19	0.00
C20_3	1.00	0.74	0.03	0.00	0.20	0.03	0.00	0.00	0.05	0.00
C20_4	1.00	0.02	0.78	0.00	0.16	0.04	0.00	0.00	0.93	0.00
C20_5	1.00	0.02	0.00	0.00	0.71	0.27	0.00	0.00	0.05	0.00
C20_7	1.00	0.78	0.02	0.00	0.11	0.09	0.00	0.00	0.05	0.00
C23_5	1.00	0.02	0.06	0.00	0.78	0.13	0.00	0.00	0.00	0.00
C23_7	1.00	0.02	0.00	0.00	0.74	0.24	0.00	0.00	0.15	0.00
C3	1.00	0.73	0.09	0.00	0.18	0.00	0.00	0.00	0.91	0.00
C4	1.00	0.61	0.12	0.00	0.27	0.00	0.00	0.00	0.91	0.00
C4_1	1.00	0.09	0.00	0.00	0.91	0.00	0.00	0.00	0.91	0.00
C4_2	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.92	0.00
C4_3	1.00	0.02	0.06	0.00	0.91	0.00	0.00	0.00	0.91	0.00
C4_4	1.00	0.02	0.78	0.00	0.16	0.03	0.00	0.00	0.94	0.00
C4_5	1.00	0.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.49	0.13	0.00	0.39	0.00	0.00	0.00	0.91	0.00
C5_1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.87	0.00
C5_10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.93	0.00
C5_11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.96	0.00
C5_12	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C5_13	1.00	0.02	0.00	0.00	0.47	0.51	0.00	0.00	0.02	0.00
C5_14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.55	0.00
C5_15	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.96	0.00
C5_16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.93	0.00
C5_19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.49	0.00
C5_2	1.00	0.02	0.00	0.00	0.73	0.25	0.00	0.00	0.00	0.00
C5_20	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C5_21	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.02	0.00	0.00	0.78	0.20	0.00	0.00	0.51	0.00
C5_3	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_4	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_5	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.12	0.00
C5_6	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C5_7	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C5_8	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.96	0.00
C5_9	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C6	1.00	0.09	0.40	0.00	0.51	0.00	0.00	0.00	0.91	0.00
C7	1.00	0.78	0.02	0.00	0.20	0.00	0.00	0.00	0.93	0.00
C9_1	1.00	0.76	0.01	0.00	0.22	0.01	0.00	0.00	0.08	0.00
C9_11	1.00	0.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.02	0.80	0.00	0.15	0.03	0.00	0.00	0.00	0.00
C9_5	1.00	0.02	0.00	0.00	0.06	0.92	0.00	0.00	0.04	0.00
C9_6	1.00	0.02	0.76	0.00	0.20	0.02	0.00	0.00	0.95	0.00
C9_7	1.00	0.02	0.79	0.00	0.16	0.03	0.00	0.00	0.96	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.13	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.45	0.00
C-STRM-1_(C-STRM)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.93	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.68	0.16	0.00	0.13	0.00	0.00	0.04	0.87	0.00
C-STRM-101_(C-STRM)	1.00	0.47	0.19	0.00	0.30	0.00	0.00	0.03	0.62	0.00
C-STRM-102_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.03	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.84	0.00
C-STRM-104_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.88	0.00
C-STRM-105_(C-STRM)	1.00	0.02	0.00	0.00	0.19	0.00	0.00	0.79	0.03	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.75	0.00
C-STRM-2_(C-STRM)	1.00	0.02	0.00	0.00	0.93	0.02	0.00	0.03	0.00	0.00
C-STRM-20_(C-STRM)	1.00	0.04	0.03	0.00	0.03	0.01	0.00	0.90	0.03	0.00
C-STRM-21_(C-STRM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.01	0.00
C-STRM-22_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.93	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.94	0.02	0.00	0.02	0.74	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.00	0.00	0.02	0.81	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.00	0.00	0.01	0.70	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.00	0.00	0.02	0.09	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.00	0.00	0.03	0.78	0.00
C-STRM-33_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.64	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.90	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.92	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.02	0.00	0.00	0.95	0.02	0.00	0.01	0.82	0.00
C-STRM-49_(C-STRM)	1.00	0.29	0.00	0.00	0.69	0.00	0.00	0.02	0.88	0.00
C-STRM-50_(C-STRM)	1.00	0.02	0.00	0.00	0.09	0.00	0.00	0.88	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.90	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.71	0.00
C-STRM-53_(C-STRM)	1.00	0.02	0.11	0.00	0.86	0.00	0.00	0.00	0.60	0.00
C-STRM-57_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.50	0.00
C-STRM-62_(C-STRM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.01	0.00
C-STRM-63_(C-STRM)	1.00	0.02	0.00	0.00	0.11	0.00	0.00	0.86	0.05	0.00
C-STRM-64_(C-STRM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.03	0.00
C-STRM-74_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.72	0.00
C-STRM-75_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.02	0.00	0.00	0.61	0.00	0.00	0.37	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.02	0.00	0.00	0.96	0.02	0.00	0.00	0.24	0.00
C-STRM-78_(C-STRM)	1.00	0.02	0.00	0.00	0.60	0.00	0.00	0.38	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.83	0.00
C-STRM-79_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.03	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.03	0.03	0.00	0.04	0.00	0.00	0.89	0.01	0.00
C-STRM-8_(C-STRM)	1.00	0.07	0.01	0.00	0.02	0.00	0.00	0.90	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.69	0.00
C-STRM-81_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.50	0.00
C-STRM-82_(C-STRM)	1.00	0.02	0.00	0.00	0.48	0.00	0.00	0.50	0.05	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.73	0.00
C-STRM-84_(C-STRM)	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.85	0.00
CVR-C2	1.00	0.03	0.00	0.00	0.73	0.24	0.00	0.00	0.80	0.00
CVR-C3	1.00	0.03	0.00	0.00	0.50	0.47	0.00	0.00	0.08	0.00
CVR-C4	1.00

C-STRM-103_(C-STRM)	0.57	0.57	0.61	0.16	0.45
C-STRM-104_(C-STRM)	0.61	0.61	0.69	0.34	0.36
C-STRM-105_(C-STRM)	0.69	0.69	0.75	0.39	0.58
C-STRM-2_(1)_(C-STRM)	0.35	0.35	0.38	0.01	0.01
C-STRM-2_(C-STRM)	0.32	0.32	0.35	0.01	0.01
C-STRM-20_(C-STRM)	0.01	0.01	0.12	0.01	0.01
C-STRM-21_(C-STRM)	0.12	0.12	0.19	0.01	0.01
C-STRM-22_(1)_(C-STRM)	0.18	0.18	0.22	0.01	0.01
C-STRM-22_(C-STRM)	0.18	0.20	0.18	0.35	0.18
C-STRM-26_(1)_(C-STRM)	0.85	0.85	0.86	0.11	0.29
C-STRM-26_(C-STRM)	0.84	0.84	0.85	0.01	0.01
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	0.36	0.36	0.40	0.01	0.28
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	0.35	0.38	0.36	0.07	0.29
C-STRM-3_(1)_(1)_(1)_(C-STRM)	0.38	0.40	0.38	0.03	0.37
C-STRM-3_(1)_(1)_(C-STRM)	0.40	0.46	0.40	0.01	0.40
C-STRM-3_(1)_(2)_(C-STRM)	0.39	0.39	0.46	0.03	0.04
C-STRM-3_(1)_(C-STRM)	0.38	0.38	0.39	0.02	0.18
C-STRM-33_(C-STRM)	0.54	0.54	0.57	0.02	0.05
C-STRM-34_(1)_(1)_(C-STRM)	0.52	0.52	0.63	0.36	0.29
C-STRM-34_(1)_(C-STRM)	0.41	0.41	0.52	0.40	0.31
C-STRM-35_(1)_(C-STRM)	0.76	0.76	0.84	0.06	0.09
C-STRM-35_(C-STRM)	0.63	0.63	0.76	0.01	0.01
C-STRM-4_(1)_(C-STRM)	0.01	0.45	0.01	0.32	0.01
C-STRM-4_(C-STRM)	0.40	0.40	0.45	0.01	0.24
C-STRM-49_(C-STRM)	0.87	0.87	0.87	0.01	0.01
C-STRM-50_(C-STRM)	0.87	0.87	0.88	0.01	0.79
C-STRM-51_(C-STRM)	0.88	0.88	0.88	0.66	0.87
C-STRM-52_(C-STRM)	0.88	0.88	0.88	0.01	0.80
C-STRM-53_(C-STRM)	0.88	0.88	0.88	0.79	0.87
C-STRM-57_(C-STRM)	0.86	0.86	0.86	0.39	0.84
C-STRM-62_(C-STRM)	0.37	0.37	0.44	0.01	0.01
C-STRM-63_(C-STRM)	0.44	0.44	0.53	0.01	0.02
C-STRM-64_(C-STRM)	0.01	0.01	0.01	0.06	0.01
C-STRM-74_(C-STRM)	0.22	0.25	0.22	0.01	0.22
C-STRM-75_(C-STRM)	0.15	0.22	0.15	0.01	0.15
C-STRM-76_(C-STRM)	0.87	0.88	0.87	0.83	0.87
C-STRM-77_(C-STRM)	0.01	0.87	0.01	0.81	0.01
C-STRM-78_(C-STRM)	0.86	0.86	0.87	0.24	0.84
C-STRM-79_(1)_(C-STRM)	0.01	0.23	0.01	0.01	0.01
C-STRM-79_(C-STRM)	0.15	0.15	0.23	0.01	0.01
C-STRM-8_(1)_(C-STRM)	0.23	0.23	0.32	0.01	0.01
C-STRM-8_(C-STRM)	0.15	0.15	0.23	0.01	0.01
C-STRM-80_(C-STRM)	0.01	0.01	0.01	0.38	0.01
C-STRM-81_(C-STRM)	0.01	0.01	0.01	0.39	0.01
C-STRM-82_(C-STRM)	0.01	0.01	0.01	0.39	0.01
C-STRM-83_(1)_(C-STRM)	0.19	0.20	0.20	0.30	0.19
C-STRM-84_(C-STRM)	0.22	0.22	0.25	0.01	0.01
CVR-C3	0.01	0.01	0.01	0.43	0.01

Analysis begun on: Thu Apr 9 22:15:35 2026
Analysis ended on: Thu Apr 9 22:15:41 2026
Total elapsed time: 00:00:06

Post-Development HIST 1996

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ---------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                  Data       Recording
  Name                 Data Source                Type       Interval
  ----------------------------------------------------------------------
  24SCS100             24SCS100                   INTENSITY   15 min.
  6SCS050              6SCS050                    INTENSITY   15 min.
  Rainfall             AUG8-96                    INTENSITY    5 min.


  *********************
  Subcatchment Summary
  *********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage           Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall            EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall            EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall            EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall            EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall            EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall            S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall            J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall            J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall            J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall            J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall            S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall            S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall            S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall            S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall            SU2
  S12                  0.44    334.74     71.43    2.0000 Rainfall            J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall            J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall            J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall            J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall            J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall            J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall            J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall            J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall            S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall            EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall            EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall            S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall            S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall            S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall            S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall            S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall            J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall            S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall            J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall            J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall            S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall            J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall            EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall            631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall            682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall            OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall            POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall            SU5


  ************
  Node Summary
  ************
                                        Invert      Max.    Ponded    External
  Name                 Type              Elev.     Depth      Area    Inflow
  ------------------------------------------------------------------------
  EXD_1                JUNCTION         104.39      1.51       0.0
  EXD_10               JUNCTION          98.65      1.20       0.0
  EXD_11               JUNCTION          98.50      1.20       0.0
  EXD_12               JUNCTION          98.31      1.20       0.0
  EXD_13               JUNCTION         104.32      1.10       0.0
  EXD_14               JUNCTION         102.49      0.80       0.0
  EXD_15               JUNCTION         100.27      0.80       0.0
  EXD_16               JUNCTION         100.20      0.80       0.0
  EXD_17               JUNCTION          99.89      0.80       0.0
  EXD_18               JUNCTION          99.40      0.84       0.0
  EXD_19               JUNCTION          99.19      0.88       0.0
  EXD_2                JUNCTION         103.47      1.93       0.0
  EXD_20               JUNCTION          99.19      0.88       0.0
  EXD_21               JUNCTION          99.18      0.88       0.0
  EXD_22               JUNCTION          99.14      0.88       0.0
  EXD_23               JUNCTION          98.75      1.14       0.0
  EXD_24               JUNCTION          98.67      1.14       0.0
  EXD_25               JUNCTION          98.52      1.13       0.0
  EXD_26               JUNCTION          98.48      1.13       0.0
  EXD_27               JUNCTION          98.17      1.20       0.0
  EXD_3                JUNCTION         103.19      1.41       0.0
  EXD_4                JUNCTION         102.64      1.20       0.0
  EXD_5                JUNCTION         102.50      1.20       0.0
  EXD_6                JUNCTION         102.32      1.08       0.0
  EXD_7                JUNCTION         101.50      1.06       0.0
  EXD_8                JUNCTION         100.48      1.06       0.0
  EXD_9                JUNCTION         100.39      1.06       0.0
  J10                  JUNCTION         103.60      0.50       0.0
  J11                  JUNCTION         103.50      0.50       0.0
  J12                  JUNCTION         103.40      0.50       0.0
  J13                  JUNCTION         103.30      0.50       0.0
  J17                  JUNCTION         104.37      1.04       0.0
  J19                  JUNCTION         105.40      0.50       0.0
  J20                  JUNCTION         105.45      0.50       0.0
  J21                  JUNCTION         105.55      0.50       0.0
  J22                  JUNCTION         105.70      0.50       0.0
  J23                  JUNCTION         106.00      0.50       0.0
  J24                  JUNCTION         106.20      0.50       0.0
  J25                  JUNCTION         105.30      0.50       0.0
  J26                  JUNCTION         105.70      0.50       0.0
  J28                  JUNCTION         109.00      0.50       0.0
  J29                  JUNCTION         108.80      0.50       0.0
  J32                  JUNCTION         106.00      0.50       0.0
  J36                  JUNCTION         104.70      0.50       0.0
  J39                  JUNCTION         104.60      0.50       0.0
  J40                  JUNCTION         104.45      0.50       0.0
  J41                  JUNCTION         103.20      0.50       0.0
  J43                  JUNCTION         104.20      0.50       0.0
  J44                  JUNCTION         104.50      0.50       0.0
  J46                  JUNCTION         104.60      0.50       0.0
  J47                  JUNCTION         105.10      0.50       0.0
  J48                  JUNCTION         105.75      0.50       0.0
  J51                  JUNCTION         106.75      0.50       0.0
  J52                  JUNCTION         109.75      0.50       0.0
  J53                  JUNCTION         109.00      0.50       0.0
  J56                  JUNCTION         109.10      0.50       0.0
  J57                  JUNCTION         108.47      0.50       0.0
  J58                  JUNCTION         108.40      0.50       0.0
  J59                  JUNCTION         108.00      0.50       0.0
  J6                   JUNCTION         109.83      0.30       0.0
  J61                  JUNCTION         107.00      0.50       0.0
  J62                  JUNCTION         106.50      0.50       0.0
  J74                  JUNCTION          98.45      0.90       0.0
  J9                   JUNCTION         103.70      0.50       0.0
  OF1                  OUTFALL          100.80      0.00       0.0
  OF2                  OUTFALL            0.00      0.00       0.0
  OF3                  OUTFALL           98.00      1.06       0.0
  ST4_108A_(P-Stm)     OUTFALL           98.02      1.19       0.0
  500_(C-STRM)         STORAGE          100.31      2.84       0.0
  500A_(C-STRM)        STORAGE          100.10      1.00       0.0
  502_(C-STRM)         STORAGE          100.54      3.70       0.0
  503_(C-STRM)         STORAGE          100.59      3.92       0.0
  504_(C-STRM)         STORAGE          103.04      2.70       0.0
  505_(C-STRM)         STORAGE          103.45      3.26       0.0
  506_(C-STRM)         STORAGE          103.82      3.16       0.0
  507_(C-STRM)         STORAGE          104.14      3.10       0.0
  508_(C-STRM)         STORAGE          104.37      3.12       0.0
  509_(C-STRM)         STORAGE          104.60      3.14       0.0
  510_(C-STRM)         STORAGE          104.85      3.09       0.0
  511_(C-STRM)         STORAGE          104.91      3.08       0.0
  512_(C-STRM)         STORAGE          105.11      3.12       0.0
  513_(C-STRM)         STORAGE          105.24      3.14       0.0
  514_(C-STRM)         STORAGE          105.59      3.16       0.0
  515_(C-STRM)         STORAGE          105.85      3.24       0.0
  516_(C-STRM)         STORAGE          105.46      3.06       0.0
  517_(C-STRM)         STORAGE          105.62      3.03       0.0
  518_(C-STRM)         STORAGE          105.85      2.92       0.0
  519_(C-STRM)         STORAGE          106.08      2.82       0.0
  520_(C-STRM)         STORAGE          106.34      2.66       0.0
  522_(C-STRM)         STORAGE          104.31      3.00       0.0
  525_(C-STRM)         STORAGE          100.61      2.69       0.0
  528_(C-STRM)         STORAGE          100.72      2.68       0.0
  532_(C-STRM)         STORAGE          100.83      2.67       0.0
  536_(C-STRM)         STORAGE          100.98      2.63       0.0
  540_(C-STRM)         STORAGE          100.86      2.85       0.0
  541_(C-STRM)         STORAGE          100.93      2.89       0.0
  551_(C-STRM)         STORAGE          100.65      3.78       0.0
  552_(C-STRM)         STORAGE          100.74      3.88       0.0
  553_(C-STRM)         STORAGE          100.93      3.78       0.0
  554_(C-STRM)         STORAGE          101.05      3.89       0.0
  555_(C-STRM)         STORAGE          101.25      3.93       0.0
  556_(C-STRM)         STORAGE          101.37      3.89       0.0
  601_(C-STRM)         STORAGE          100.45      4.43       0.0
  602_(C-STRM)         STORAGE          100.52      4.11       0.0
  603_(C-STRM)         STORAGE          100.63      3.89       0.0
  604_(C-STRM)         STORAGE          100.88      4.87       0.0
  605_(C-STRM)         STORAGE          101.09      5.63       0.0
  606_(C-STRM)         STORAGE          101.24      5.75       0.0
  619_(C-STRM)         STORAGE          101.38      5.14       0.0
  622_(C-STRM)         STORAGE          101.53      4.49       0.0
  626_(C-STRM)         STORAGE          103.94      3.33       0.0
  627_(C-STRM)         STORAGE          103.13      3.58       0.0
  629_(C-STRM)         STORAGE          101.65      4.46       0.0
  630_(C-STRM)         STORAGE          102.08      4.12       0.0
  630A_(C-STRM)        STORAGE          102.12      3.90       0.0
  631_(C-STRM)         STORAGE          106.00      0.50       0.0
  645_(C-STRM)         STORAGE          102.03      3.69       0.0
  647_(C-STRM)         STORAGE          102.14      3.40       0.0
  650_(C-STRM)         STORAGE          102.22      3.19       0.0
  651_(C-STRM)         STORAGE          102.31      3.03       0.0
  682_(C-STRM)         STORAGE          105.40      0.50       0.0
  MTD_(C-STRM)         STORAGE          100.37      3.19       0.0
  OVERFLOW_(C-STRM)    STORAGE          100.18      2.76       0.0
  POND_(C-STRM)        STORAGE           98.45      2.65       0.0    Yes
  S_525-MTD            STORAGE          103.30      0.50       0.0
  S_528-525            STORAGE          103.41      0.50       0.0
  S_532-528            STORAGE          103.50      0.50       0.0
  S_536-532            STORAGE          103.60      0.50       0.0
  S_540-536            STORAGE          103.71      0.50       0.0
  S_541-540            STORAGE          103.81      0.50       0.0
  S_604-603            STORAGE          105.50      0.50       0.0
  S_605-604            STORAGE          106.71      0.50       0.0
  S_619-606            STORAGE          106.50      0.50       0.0
  S_622-619            STORAGE          105.70      0.50       0.0
  S_622-619_2          STORAGE          106.50      0.50       0.0
  S_627-630            STORAGE          106.70      0.50       0.0
  S_629-622            STORAGE          106.01      0.50       0.0
  SU2                  STORAGE          106.75      0.50       0.0
  SU5                  STORAGE          104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                 From Node        To Node          Type          Length    %Slope
Roughness
  ---------------------------------------------------------------------------------------
-
  BDR-C1               EXD_15           EXD_16           CONDUIT         17.7    0.3844
0.0250
  BDR-C2               EXD_20           EXD_21           CONDUIT          7.9    0.0632
0.0130
  BDR-C3               EXD_25           EXD_26           CONDUIT         14.2    0.2683
0.0130
  BDR-C4               EXD_12           EXD_27           CONDUIT         23.0    0.6077
0.0130
  C1_1                 J32              J26              CONDUIT         71.8    0.4181
0.0130
  C1_17                J6               EXD_1            CONDUIT        171.9    2.4608
0.0130
  C1_3                 J28              J29              CONDUIT        183.6    0.1090
0.0130
  C1_30                J26              J25              CONDUIT         93.1    0.4296
0.0130
  C1_4                 J25              J39              CONDUIT         75.0    0.9329
0.0130
  C14_1                J20              J19              CONDUIT         59.0    0.0847
0.0130
  C14_2                J23              J22              CONDUIT         73.9    0.4062
0.0130
  C14_4                J22              J21              CONDUIT         77.3    0.1941
0.0130
  C14_5                J21              J20              CONDUIT         51.8    0.1931
0.0130
  C15_1                J29              J58              CONDUIT        329.5    0.1214
0.0130
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C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM) 516_(C-STRM)		513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM) 517_(C-STRM)		516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM) 518_(C-STRM)		517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM) OVERFLOW_(C-STRM) 500_(C-STRM)			CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM) 500_(C-STRM)		POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM) OVERFLOW_(C-STRM) 500A_(C-STRM)			CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM) 650_(C-STRM)		647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM) 647_(C-STRM)		645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM) 645_(C-STRM)		630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM) 512_(C-STRM)		511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM) 513_(C-STRM)		512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM) 626_(C-STRM)		627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM) 627_(C-STRM)		630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM) 629_(C-STRM)		622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM) 630_(C-STRM)		629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM) 551_(C-STRM)		502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM) 552_(C-STRM)		551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM) 506_(C-STRM)			505_(C-STRM)	CONDUIT	
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) 507_(C-STRM)			506_(C-STRM)	CONDUIT	48.8
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM) 508_(C-STRM)			507_(C-STRM)	CONDUIT	45.5
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM) 509_(C-STRM)			508_(C-STRM)	CONDUIT	45.5 0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM) 510_(C-STRM)			509_(C-STRM)	CONDUIT	55.7 0.4489
0.0130					
C-STRM-3_(1)_(C-STRM) 511_(C-STRM)			510_(C-STRM)	CONDUIT	14.5 0.4538
0.0130					
C-STRM-33_(C-STRM) 651_(C-STRM)			650_(C-STRM)	CONDUIT	57.0 0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM) 555_(C-STRM)			554_(C-STRM)	CONDUIT	75.2
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM) 556_(C-STRM)			555_(C-STRM)	CONDUIT	75.2 0.1596
0.0130					
C-STRM-35_(1)_(C-STRM) 553_(C-STRM)			552_(C-STRM)	CONDUIT	72.1 0.1596
0.0130					
C-STRM-35_(C-STRM) 554_(C-STRM)			553_(C-STRM)	CONDUIT	72.0 0.1611
0.0130					
C-STRM-4_(1)_(C-STRM) 504_(C-STRM)			503_(C-STRM)	CONDUIT	83.5 0.5997
0.0130					
C-STRM-4_(C-STRM) 505_(C-STRM)			504_(C-STRM)	CONDUIT	83.5 0.4992
0.0130					
C-STRM-49_(C-STRM) 541_(C-STRM)			540_(C-STRM)	CONDUIT	47.7 0.1508
0.0130					
C-STRM-50_(C-STRM) 540_(C-STRM)			536_(C-STRM)	CONDUIT	72.0 0.1500
0.0130					
C-STRM-51_(C-STRM) 536_(C-STRM)			532_(C-STRM)	CONDUIT	48.5 0.1505
0.0130					
C-STRM-52_(C-STRM) 532_(C-STRM)			528_(C-STRM)	CONDUIT	69.0 0.1493
0.0130					
C-STRM-53_(C-STRM) 528_(C-STRM)			525_(C-STRM)	CONDUIT	75.0 0.1507
0.0130					
C-STRM-57_(C-STRM) 503_(C-STRM)			502_(C-STRM)	CONDUIT	27.5 0.1525
0.0130					
C-STRM-62_(C-STRM) 520_(C-STRM)			519_(C-STRM)	CONDUIT	95.9 0.2003
0.0130					
C-STRM-63_(C-STRM) 519_(C-STRM)			518_(C-STRM)	CONDUIT	97.4 0.1509
0.0130					
C-STRM-64_(C-STRM) 522_(C-STRM)			EXD_1	CONDUIT	81.9 0.2504
0.0130					
C-STRM-74_(C-STRM) 619_(C-STRM)			606_(C-STRM)	CONDUIT	70.5 0.2000
0.0130					
C-STRM-75_(C-STRM) 606_(C-STRM)			605_(C-STRM)	CONDUIT	75.0 0.2000
0.0130					
C-STRM-76_(C-STRM) 525_(C-STRM)			MTD_(C-STRM)	CONDUIT	83.3 0.1993
0.0130					
C-STRM-77_(C-STRM) MTD_(C-STRM)			OVERFLOW_(C-STRM)	CONDUIT	38.5 0.5013
0.0130					
C-STRM-78_(C-STRM) 502_(C-STRM)			MTD_(C-STRM)	CONDUIT	33.2 0.2980
0.0130					
C-STRM-79_(1)_(C-STRM) 604_(C-STRM)			603_(C-STRM)	CONDUIT	82.3 0.3001
0.0130					
C-STRM-79_(C-STRM) 605_(C-STRM)			604_(C-STRM)	CONDUIT	83.5 0.2502
0.0130					
C-STRM-8_(1)_(C-STRM) 514_(C-STRM)			513_(C-STRM)	CONDUIT	95.2 0.2007
0.0130					
C-STRM-8_(C-STRM) 515_(C-STRM)			514_(C-STRM)	CONDUIT	95.1 0.1997
0.0130					
C-STRM-80_(C-STRM) 603_(C-STRM)			602_(C-STRM)	CONDUIT	74.3 0.1493
0.0130					
C-STRM-81_(C-STRM) 602_(C-STRM)			601_(C-STRM)	CONDUIT	46.7 0.1499
0.0130					
C-STRM-82_(C-STRM) 601_(C-STRM)			POND_(C-STRM)	CONDUIT	32.5 0.1508
0.0130					
C-STRM-83_(1)_(C-STRM) 630A_(C-STRM)			630_(C-STRM)	CONDUIT	27.4 0.1498
0.0130					
C-STRM-84_(C-STRM) 622_(C-STRM)			619_(C-STRM)	CONDUIT	75.0 0.2000
0.0130					
CVR-C2	EXD_5		EXD_6	CONDUIT	19.8 0.8875
0.0130					
CVR-C3	EXD_8		EXD_9	CONDUIT	16.4 0.6114
0.0130					
CVR-C4	EXD_10		EXD_11	CONDUIT	25.4 0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm) J74			ST4_108A_(P-Stm)	CONDUIT	49.3 0.2840
0.0130					
W1	500A_(C-STRM)		POND_(C-STRM)	CONDUIT	4.9 0.0063
0.0250					
OR1	POND_(C-STRM)		J74	ORIFICE	
OR2	POND_(C-STRM)		J74	ORIFICE	
W10	S_536-532		J10	WEIR	
W11	S_532-528		J11	WEIR	
W12	S_528-525		J12	WEIR	
W13	S_525-MTD		J13	WEIR	
W14	S_629-622		J32	WEIR	
W15	S_622-619		J26	WEIR	
W2	POND_(C-STRM)		OF1	WEIR	
W3	S_627-630		J24	WEIR	
W4	S_622-619_2		J32	WEIR	
W5	S_619-606		J62	WEIR	
W6	S_605-604		J51	WEIR	
W7	S_604-603		J25	WEIR	
W8	S_541-540		J9	WEIR	
W9	S_540-536		J9	WEIR	
C1	S_622-619_2		622_(C-STRM)	OUTLET	
C-STRM-107_(C-STRM) S_604-603			604_(C-STRM)	OUTLET	
C-STRM-14_(1)_(C-STRM) S_605-604			605_(C-STRM)	OUTLET	
C-STRM-23_(C-STRM) S_622-619			622_(C-STRM)	OUTLET	
C-STRM-42_(C-STRM) S_541-540			541_(C-STRM)	OUTLET	
C-STRM-44_(1)_(C-STRM) S_525-MTD			525_(C-STRM)	OUTLET	
C-STRM-45_(1)_(C-STRM) S_619-606			619_(C-STRM)	OUTLET	
C-STRM-71_(C-STRM) 682_(C-STRM)			651_(C-STRM)	OUTLET	
C-STRM-83_(C-STRM) 631_(C-STRM)			630A_(C-STRM)	OUTLET	
C-STRM-96_(1)_(C-STRM) S_536-532			536_(C-STRM)	OUTLET	
C-STRM-97_(1)_(C-STRM) S_532-528			532_(C-STRM)	OUTLET	
C-STRM-98_(1)_(C-STRM) S_528-525			528_(C-STRM)	OUTLET	
OL1	S_627-630		627_(C-STRM)	OUTLET	
OL10	500A_(C-STRM)		POND_(C-STRM)	OUTLET	
OL11	J36		553_(C-STRM)	OUTLET	
OL12	J40		551_(C-STRM)	OUTLET	
OL13	J46		602_(C-STRM)	OUTLET	
OL14	J28		520_(C-STRM)	OUTLET	
OL15	J6		522_(C-STRM)	OUTLET	
OL16	J29		518_(C-STRM)	OUTLET	
OL17	J58		513_(C-STRM)	OUTLET	
OL18	J59		511_(C-STRM)	OUTLET	
OL19	J61		506_(C-STRM)	OUTLET	
OL2	SU2		626_(C-STRM)	OUTLET	
OL20	J48		504_(C-STRM)	OUTLET	
OL21	J44		503_(C-STRM)	OUTLET	
OL22	SU5		504_(C-STRM)	OUTLET	
OL3	S_629-622		629_(C-STRM)	OUTLET	
OL4	S_540-536		540_(C-STRM)	OUTLET	
OL5	J22		645_(C-STRM)	OUTLET	
OL6	J21		647_(C-STRM)	OUTLET	
OL7	J20		650_(C-STRM)	OUTLET	
OL8	J19		651_(C-STRM)	OUTLET	
OL9	J19		556_(C-STRM)	OUTLET	

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_8m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C14_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47

C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.24
C-STRM-1U0_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-2_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR		1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR					0.75	0.44	0.19
1	0.79						
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
1	0.59						
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
0.25							
C-STRM-35_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-4_(C-STRM) CIRCULAR		0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM) CIRCULAR		0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM) CIRCULAR		0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
6.30							
C-STRM-79_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-8_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
2.74							
C-STRM-84_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

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Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1092	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7404	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0932	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1134	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1011	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3340	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929
0.4178	0.4430	0.4687	0.4947	0.5212
0.5482	0.5760	0.6046	0.6335	0.6626

0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000
Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000
Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6417 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000
Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000
Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3010 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000
Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6768 0.7026 0.7280 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000
Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000
Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000
Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000
Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000
Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2668 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6872 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000
Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000
Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000
Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000
Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000
Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0862 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6153 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000
Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000
Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268
0.1395 0.1522 0.1648 0.1775 0.1902
0.2029 0.2156 0.2283 0.2409 0.2536

0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4337
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4770	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1232	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5621	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0999	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579
0.4893	0.5214	0.5541	0.5875	0.6216
0.6564	0.6919	0.7280	0.7648	0.8023

0.8405 0.8794 0.9189 0.9591 1.0000
Hrad:
0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000
Width:
0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking
Area:
0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000
Hrad:
0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000
Width:
0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m
Area:
0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000
Hrad:
0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8699 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000
Width:
0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1
Area:
0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7088 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000
Hrad:
0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000
Width:
0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2
Area:
0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000
Hrad:
0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000
Width:
0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3
Area:
0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1213 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000
Hrad:
0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2047 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4018 0.4273 0.4351 0.4545
0.4946 0.5339 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8390 0.8745 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1067 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000
Width:
0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5931 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4
Area:
0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0302 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000
Hrad:
0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4302 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6659 0.6758 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000
Width:
0.0541 0.0732 0.0923 0.1110 0.1246
0.1474 0.1502 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5444 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6648 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5
Area:
0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2635 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000
Hrad:
0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3749 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6771 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8125 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000
Width:
0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6
Area:
0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2156 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000
Hrad:
0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000
Width:
0.0616 0.0785 0.0947 0.1108 0.1267
0.1418 0.1569 0.1666 0.1758 0.1850
0.1952 0.2062 0.2171 0.2280 0.2365
0.2466 0.2570 0.2674 0.2776 0.2853
0.2930 0.3007 0.3084 0.3161 0.3238

0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 08/08/1996 00:00:00
Ending Date 08/09/1996 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	6.173	73.900
Evaporation Loss	0.000	0.000
Infiltration Loss	2.202	26.364
Surface Runoff	3.829	45.843
Final Storage	0.146	1.751
Continuity Error (%)	-0.079	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.829	38.293
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.011	30.106
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.123	1.228
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.698	6.978
Continuity Error (%)	-0.051	

****
Highest Continuity Errors
****
Node J13 (17.71%)
Node J51 (10.26%)
Node J43 (2.69%)
Node J25 (2.60%)
Node J39 (2.19%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link OL9 (9)
Link OL16 (8)
Link C-STRM-71_(C-STRM) (8)
Link OL8 (7)

****
Most Frequent Nonconverging Nodes
****
Node OF1 (0.01%)
Node OF2 (0.01%)
Node OF3 (0.01%)
Node ST4_108A_(P-Stm) (0.01%)
Node 507_(C-STRM) (0.00%)

****
Routing Time Step Summary
****
Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.01
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.91 %
0.871 - 0.758 sec	:	0.02 %
0.758 - 0.660 sec	:	0.02 %
0.660 - 0.574 sec	:	0.02 %
0.574 - 0.500 sec	:	0.04 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	73.90	0.00	0.00	41.19	13.71	8.18	19.15	0.66	0.10	0.259
A18	73.90	0.00	0.00	34.02	28.35	16.66	39.34	0.23	0.11	0.532
A19	73.90	0.00	0.00	46.54	16.18	14.11	27.05	0.30	0.12	0.366
A20	73.90	0.00	0.00	52.98	6.06	11.26	16.12	0.78	0.11	0.218
NULL3	73.90	0.00	0.00	10.10	60.38	14.32	62.62	0.35	0.18	0.847
S1	73.90	0.00	0.00	23.21	48.08	35.32	49.74	3.25	1.65	0.673
S1_1	73.90	0.00	0.00	15.51	51.80	16.00	57.44	0.07	0.04	0.777
S1_2	73.90	0.00	0.00	15.41	51.81	16.11	57.55	0.07	0.04	0.779
S1_4	73.90	0.00	0.00	15.59	51.79	15.92	57.35	0.11	0.06	0.776
S1_5	73.90	0.00	0.00	15.51	51.80	16.00	57.43	0.06	0.03	0.777
S10_1	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.90	0.45	0.659
S10_2	73.90	0.00	0.00	24.30	46.56	34.72	48.69	1.03	0.52	0.659
S10_4	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.35	0.18	0.659
S10_5	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.61	0.31	0.659
S11	73.90	0.00	0.00	63.35	0.00	10.55	10.55	0.35	0.12	0.143
S12	73.90	0.00	0.00	15.61	51.79	15.89	57.32	0.25	0.14	0.776
S14_1	73.90	0.00	0.00	15.74	51.77	15.76	57.18	0.34	0.19	0.774
S14_3	73.90	0.00	0.00	16.15	51.75	15.34	56.74	0.60	0.31	0.768
S14_4	73.90	0.00	0.00	15.77	51.77	15.72	57.14	0.17	0.09	0.773
S14_5	73.90	0.00	0.00	16.07	51.75	15.42	56.82	0.96	0.50	0.769
S14_6	73.90	0.00	0.00	15.83	51.77	15.67	57.08	0.16	0.09	0.772
S14_7	73.90	0.00	0.00	15.91	51.76	15.58	56.99	0.67	0.36	0.771
S14_8	73.90	0.00	0.00	15.86	51.77	15.63	57.05	0.19	0.10	0.772
S15	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.80	0.40	0.659
S16	73.90	0.00	0.00	0.00	72.15	0.00	72.15	1.06	0.21	0.976
S17	73.90	0.00	0.00	69.43	2.41	4.42	4.42	0.28	0.06	0.060
S18_2	73.90	0.00	0.00	24.30	46.56	34.72	48.69	1.63	0.82	0.659
S18_3	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.81	0.41	0.659
S18_4	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.43	0.21	0.659
S18_5	73.90	0.00	0.00	20.26	51.73	37.10	52.62	0.96	0.50	0.712
S18_6	73.90	0.00	0.00	24.30	46.56	34.72	48.69	0.41	0.21	0.659
S19	73.90	0.00	0.00	16.01	51.76	15.48	56.89	0.60	0.32	0.770
S2	73.90	0.00	0.00	22.94	48.43	35.48	50.01	1.86	0.95	0.677
S20_1	73.90	0.00	0.00	15.55	51.79	15.96	57.40	0.28	0.16	0.777
S20_2	73.90	0.00	0.00	15.29	51.82	16.24	57.69	0.13	0.07	0.781
S3	73.90	0.00	0.00	24.30	46.56	34.72	48.69	1.21	0.61	0.659
S32	73.90	0.00	0.00	15.60	51.79	15.90	57.33	0.24	0.13	0.776
S36	73.90	0.00	0.00	0.00	72.16	0.00	72.16	1.31	0.26	0.976
S4	73.90	0.00	0.00	8.43	62.00	2.13	64.14	8.48	2.92	0.868
S5	73.90	0.00	0.00	7.74	62.03	2.82	64.85	2.07	0.85	0.878
S6	73.90	0.00	0.00	22.54	41.44	17.45	50.60	0.17	0.10	0.685
S7	73.90	0.00	0.00	7.92	62.02	2.64	64.67	2.58	1.01	0.875
S8	73.90	0.00	0.00	46.45	25.86	26.93	26.93	0.52	0.15	0.364

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.14	104.54	0 01:27	0.14
EXD_10	JUNCTION	0.05	0.31	98.96	0 01:32	0.31
EXD_11	JUNCTION	0.04	0.23	98.73	0 01:32	0.23
EXD_12	JUNCTION	0.07	0.33	98.64	0 01:32	0.33
EXD_13	JUNCTION	0.01	0.15	104.48	0 01:29	0.15
EXD_14	JUNCTION	0.00	0.00	102.49	0 00:00	0.00
EXD_15	JUNCTION	0.08	0.32	100.59	0 03:15	0.32
EXD_16	JUNCTION	0.05	0.17	100.37	0 03:16	0.17
EXD_17	JUNCTION	0.07	0.17	100.05	0 01:30	0.17
EXD_18	JUNCTION	0.04	0.15	99.55	0 03:21	0.15
EXD_19	JUNCTION	0.07	0.30	99.49	0 01:32	0.30
EXD_2	JUNCTION	0.03	0.25	103.71	0 01:32	0.25
EXD_20	JUNCTION	0.08	0.30	99.49	0 01:32	0.30
EXD_21	JUNCTION	0.07	0.26	99.44	0 01:32	0.26
EXD_22	JUNCTION	0.04	0.16	99.30	0 03:22	0.16
EXD_23	JUNCTION	0.07	0.25	99.00	0 03:26	0.25
EXD_24	JUNCTION	0.03	0.15	98.82	0 03:30	0.15
EXD_25	JUNCTION	0.07	0.28	98.81	0 03:30	0.28
EXD_26	JUNCTION	0.04	0.15	98.63	0 03:32	0.15
EXD_27	JUNCTION	0.07	0.29	98.45	0 01:30	0.29
EXD_3	JUNCTION	0.01	0.13	103.32	0 01:33	0.13
EXD_4	JUNCTION	0.01	0.13	102.77	0 01:34	0.13
EXD_5	JUNCTION	0.01	0.19	102.69	0 01:35	0.19
EXD_6	JUNCTION	0.01	0.13	102.45	0 01:35	0.13
EXD_7	JUNCTION	0.01	0.14	101.63	0 01:38	0.14
EXD_8	JUNCTION	0.03	0.24	100.73	0 01:43	0.24
EXD_9	JUNCTION	0.01	0.12	100.51	0 01:48	0.12
J10	JUNCTION	0.00	0.01	103.61	0 01:39	0.01
J11	JUNCTION	0.00	0.01	103.51	0 01:45	0.01
J12	JUNCTION	0.00	0.01	103.41	0 01:54	0.01
J13	JUNCTION	0.01	0.02	103.32	0 02:42	0.02
J17	JUNCTION	0.01	0.14	104.51	0 01:28	0.14
J19	JUNCTION	0.00	0.07	105.47	0 01:27	0.07
J20	JUNCTION	0.00	0.04	105.49	0 01:30	0.04
J21	JUNCTION	0.00	0.05	105.60	0 01:26	0.05
J22	JUNCTION	0.00	0.01	105.71	0 01:25	0.01
J23	JUNCTION	0.00	0.00	106.00	0 00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0 00:00	0.00
J25	JUNCTION	0.00	0.07	105.37	0 01:37	0.07
J26	JUNCTION	0.00	0.09	105.79	0 01:35	0.09
J28	JUNCTION	0.00	0.06	109.06	0 01:26	0.06
J29	JUNCTION	0.00	0.08	108.88	0 01:30	0.08
J32	JUNCTION	0.00	0.05	106.05	0 01:33	0.05
J36	JUNCTION	0.00	0.07	104.77	0 01:30	0.07
J39	JUNCTION	0.00	0.09	104.69	0 01:38	0.09
J40	JUNCTION	0.00	0.06	104.51	0 01:25	0.06
J41	JUNCTION	0.00	0.03	103.23	0 01:31	0.03
J43	JUNCTION	0.00	0.07	104.27	0 01:28	0.07
J44	JUNCTION	0.00	0.05	104.55	0 01:30	0.05
J46	JUNCTION	0.00	0.06	104.66	0 01:25	0.06
J47	JUNCTION	0.00	0.00	105.10	0 00:00	0.00
J48	JUNCTION	0.00	0.04	105.79	0 01:30	0.04
J51	JUNCTION	0.00	0.04	106.79	0 01:30	0.04
J52	JUNCTION	0.00	0.00	109.75	0 00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0 00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0 00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0 00:00	0.00
J58	JUNCTION	0.00	0.05	108.45	0 01:30	0.05
J59	JUNCTION	0.00	0.05	108.05	0 01:30	0.05
J6	JUNCTION	0.00	0.04	109.86	0 01:25	0.03
J61	JUNCTION	0.00	0.05	107.05	0 01:27	0.05
J62	JUNCTION	0.00	0.05	106.55	0 01:30	0.05
J74	JUNCTION	0.00	0.44	98.89	0 04:13	0.44
J9	JUNCTION	0.00	0.02	103.72	0 01:35	0.02
OF1	OUTFALL	0.00	0.00	100.80	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.05	0.25	98.25	0 01:30	0.25
ST4_108A_(P-Stm)	OUTFALL	0.00	0.00	98.02	0 00:00	0.00
500_(C-STRM)	STORAGE	0.29	0.45	100.76	0 01:35	0.45
500A_(C-STRM)	STORAGE	0.39	0.86	100.96	0 01:36	0.86

502_(C-STRM)	STORAGE	0.14	1.52	102.07	0	01:33	1.51	
503_(C-STRM)	STORAGE	0.13	1.61	102.20	0	01:33	1.60	0.128
504_(C-STRM)	STORAGE	0.35	1.16	104.20	0	01:33	1.16	
505_(C-STRM)	STORAGE	0.35	1.25	104.70	0	01:33	1.24	1.286
506_(C-STRM)	STORAGE	0.35	1.34	105.17	0	01:33	1.33	
507_(C-STRM)	STORAGE	0.34	1.31	105.45	0	01:33	1.29	0.640
508_(C-STRM)	STORAGE	0.34	1.37	105.74	0	01:33	1.37	
509_(C-STRM)	STORAGE	0.34	1.44	106.04	0	01:34	1.44	0.129
510_(C-STRM)	STORAGE	0.34	1.45	106.29	0	01:34	1.45	
511_(C-STRM)	STORAGE	0.34	1.46	106.37	0	01:34	1.46	0.308
512_(C-STRM)	STORAGE	0.34	1.43	106.54	0	01:34	1.40	
513_(C-STRM)	STORAGE	0.34	1.40	106.65	0	01:34	1.37	0.000 ltr
514_(C-STRM)	STORAGE	0.29	1.07	106.66	0	01:34	1.07	
515_(C-STRM)	STORAGE	0.29	0.83	106.68	0	01:35	0.81	0.000 ltr
516_(C-STRM)	STORAGE	0.34	1.44	106.90	0	01:35	1.44	
517_(C-STRM)	STORAGE	0.34	1.55	107.16	0	01:34	1.54	2.674
518_(C-STRM)	STORAGE	0.35	1.75	107.61	0	01:34	1.75	
519_(C-STRM)	STORAGE	0.33	1.55	107.62	0	01:33	1.53	1.325
520_(C-STRM)	STORAGE	0.33	1.41	107.75	0	01:33	1.40	
522_(C-STRM)	STORAGE	0.32	0.61	104.91	0	01:31	0.61	1.150
525_(C-STRM)	STORAGE	0.12	1.60	102.21	0	01:36	1.60	
528_(C-STRM)	STORAGE	0.09	1.74	102.47	0	01:36	1.74	0.164
532_(C-STRM)	STORAGE	0.09	1.80	102.62	0	01:37	1.80	
536_(C-STRM)	STORAGE	0.09	1.79	102.77	0	01:37	1.79	0.739
540_(C-STRM)	STORAGE	0.38	2.03	102.89	0	01:37	2.03	
541_(C-STRM)	STORAGE	0.37	2.01	102.95	0	01:37	2.01	1.710
551_(C-STRM)	STORAGE	0.36	1.54	102.19	0	01:33	1.53	
552_(C-STRM)	STORAGE	0.35	1.49	102.23	0	01:33	1.48	2.237
553_(C-STRM)	STORAGE	0.35	1.41	102.34	0	01:33	1.41	
554_(C-STRM)	STORAGE	0.34	1.36	102.41	0	01:33	1.36	0.681
555_(C-STRM)	STORAGE	0.34	1.31	102.56	0	01:33	1.30	
556_(C-STRM)	STORAGE	0.33	1.37	102.73	0	01:33	1.35	0.837
601_(C-STRM)	STORAGE	0.12	1.19	101.64	0	01:36	1.19	
602_(C-STRM)	STORAGE	0.13	1.69	102.20	0	01:36	1.69	2.760
603_(C-STRM)	STORAGE	0.13	1.71	102.34	0	01:36	1.71	
604_(C-STRM)	STORAGE	0.12	1.83	102.71	0	01:36	1.83	0.226
605_(C-STRM)	STORAGE	0.11	1.76	102.85	0	01:36	1.76	
606_(C-STRM)	STORAGE	0.12	1.83	103.07	0	01:36	1.83	0.506
619_(C-STRM)	STORAGE	0.12	1.91	103.29	0	01:36	1.91	
622_(C-STRM)	STORAGE	0.11	1.85	103.37	0	01:36	1.85	0.000 ltr
626_(C-STRM)	STORAGE	0.29	0.49	104.43	0	01:31	0.49	
627_(C-STRM)	STORAGE	0.31	0.63	103.76	0	01:31	0.63	0.471
629_(C-STRM)	STORAGE	0.11	1.79	103.44	0	01:35	1.79	
630_(C-STRM)	STORAGE	0.11	1.53	103.60	0	01:35	1.52	11.435
630A_(C-STRM)	STORAGE	0.10	1.54	103.66	0	01:35	1.53	
631_(C-STRM)	STORAGE	0.00	0.04	106.04	0	01:31	0.04	0.000 ltr
645_(C-STRM)	STORAGE	0.37	1.77	103.80	0	01:35	1.77	
647_(C-STRM)	STORAGE	0.36	1.76	103.90	0	01:36	1.76	0.000 ltr
650_(C-STRM)	STORAGE	0.36	1.77	103.99	0	01:36	1.76	
651_(C-STRM)	STORAGE	0.36	1.76	104.07	0	01:36	1.76	0.000 ltr
682_(C-STRM)	STORAGE	0.00	0.10	105.50	0	01:31	0.10	
MTD_(C-STRM)	STORAGE	0.23	1.46	101.83	0	01:33	1.46	0.000 ltr
OVERFLOW_(C-STRM)	STORAGE	0.33	0.85	101.03	0	01:35	0.85	
POND_(C-STRM)	STORAGE	1.72	2.22	101.67	0	04:13	2.22	0.483
S_525-MTD	STORAGE	0.00	0.10	103.40	0	01:33	0.10	
S_528-525	STORAGE	0.00	0.10	103.50	0	01:33	0.10	1.246
S_532-528	STORAGE	0.00	0.10	103.60	0	01:33	0.10	
S_536-532	STORAGE	0.00	0.16	103.76	0	01:32	0.16	0.302
S_540-536	STORAGE	0.00	0.14	103.85	0	01:33	0.14	
S_541-540	STORAGE	0.00	0.11	103.93	0	01:33	0.11	0.624
S_604-603	STORAGE	0.00	0.10	105.80	0	01:33	0.10	
S_605-604	STORAGE	0.00	0.11	106.82	0	01:33	0.11	0.342
S_619-606	STORAGE	0.00	0.13	106.63	0	01:33	0.13	
S_622-619	STORAGE	0.00	0.14	105.84	0	01:33	0.14	0.054
S_622-619_2	STORAGE	0.00	0.15	106.65	0	01:33	0.15	
S_627-630	STORAGE	0.00	0.08	106.78	0	01:32	0.08	0.023
S_629-622	STORAGE	0.00	0.11	106.12	0	01:33	0.11	
SU2	STORAGE	0.00	0.01	106.76	0	01:31	0.01	0.000 ltr
SU5	STORAGE	0.00	0.02	104.20	0	01:34	0.02	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.119	0	01:25	0	0.25	- 0.140
EXD_10	JUNCTION	0.475	0.479	0	01:30	2.37	2.89	- 0.289
EXD_11	JUNCTION	0.000	0.434	0	01:32	0	2.9	0.006
EXD_12	JUNCTION	0.099	0.517	0	01:31	0.663	3.56	0.013
EXD_13	JUNCTION	0.000	0.115	0	01:27	0	0.251	- 0.282
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.110	0.110	0	01:25	0.779	0.779	0.047
EXD_16	JUNCTION	0.000	0.085	0	03:15	0	0.779	- 0.089
EXD_17	JUNCTION	0.000	0.085	0	03:16	0	0.779	0.015
EXD_18	JUNCTION	0.000	0.086	0	03:17	0	0.779	0.388
EXD_19	JUNCTION	0.000	0.084	0	03:21	0	0.796	0.012
EXD_2	JUNCTION	0.000	0.111	0	01:29	0	0.251	0.468
EXD_20	JUNCTION	0.119	0.145	0	01:30	0.299	1.09	0.000
EXD_21	JUNCTION	0.000	0.142	0	01:30	0	1.08	- 0.023
EXD_22	JUNCTION	0.000	0.141	0	01:33	0	1.08	- 0.017
EXD_23	JUNCTION	0.000	0.138	0	03:22	0	1.08	0.327
EXD_24	JUNCTION	0.000	0.136	0	03:27	0	1.07	0.222
EXD_25	JUNCTION	0.106	0.147	0	03:28	0.233	1.3	- 0.023
EXD_26	JUNCTION	0.000	0.168	0	03:30	0	1.3	0.176
EXD_27	JUNCTION	0.184	0.730	0	01:30	0.354	5.21	0.015
EXD_3	JUNCTION	0.000	0.104	0	01:33	0	0.25	0.184
EXD_4	JUNCTION	0.000	0.103	0	01:34	0	0.25	0.080
EXD_5	JUNCTION	0.000	0.102	0	01:34	0	0.249	0.002
EXD_6	JUNCTION	0.000	0.102	0	01:35	0	0.249	- 0.454
EXD_7	JUNCTION	0.060	0.145	0	01:35	0.277	0.527	- 0.440
EXD_8	JUNCTION	0.000	0.136	0	01:38	0	0.53	0.749
EXD_9	JUNCTION	0.000	0.113	0	01:43	0	0.526	1.820
J10	JUNCTION	0.000	0.015	0	01:36	0	0.00696	0.110
J11	JUNCTION	0.000	0.009	0	01:38	0	0.00696	0.050
J12	JUNCTION	0.000	0.005	0	01:49	0	0.00695	0.097
J13	JUNCTION	0.000	0.005	0	01:56	0	0.00695	21.528
J17	JUNCTION	0.000	0.118	0	01:26	0	0.25	- 0.128
J18	JUNCTION	0.354	0.358	0	01:25	0.669	0.673	- 1.286
J20	JUNCTION	0.034	0.052	0	01:25	0.0621	0.0732	0.640
J21	JUNCTION	0.060	0.060	0	01:25	0.109	0.11	- 0.129
J22	JUNCTION	0.037	0.037	0	01:25	0.0672	0.0672	- 0.308
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.139	0	01:35	0	0.0829	2.674
J26	JUNCTION	0.000	0.147	0	01:33	0	0.0818	- 1.325
J28	JUNCTION	0.186	0.186	0	01:25	0.342	0.342	- 1.150
J29	JUNCTION	0.501	0.525	0	01:25	0.958	0.972	- 0.164
J32	JUNCTION	0.000	0.048	0	01:31	0	0.0236	0.739
J36	JUNCTION	0.073	0.121	0	01:29	0.131	0.16	1.710
J39	JUNCTION	0.000	0.126	0	01:37	0	0.103	2.237
J40	JUNCTION	0.157	0.159	0	01:25	0.285	0.385	- 0.681
J41	JUNCTION	0.000	0.109	0	01:30	0	0.0616	0.837
J43	JUNCTION	0.000	0.108	0	01:25	0	0.0574	2.760
J44	JUNCTION	0.092	0.139	0	01:25	0.17	0.198	0.226
J46	JUNCTION	0.131	0.131	0	01:25	0.238	0.238	- 0.506
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.103	0.109	0	01:30	0.193	0.207	- 0.471
J51	JUNCTION	0.000	0.032	0	01:29	0	0.0166	11.435
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.312	0.328	0	01:25	0.603	0.619	- 0.483
J59	JUNCTION	0.089	0.115	0	01:30	0.165	0.185	1.246
J6	JUNCTION	0.137	0.137	0	01:25	0.25	0.25	- 0.302
J61	JUNCTION	0.357	0.369	0	01:25	0.67	0.685	- 0.624
J62	JUNCTION	0.000	0.047	0	01:28	0	0.021	0.342
J74	JUNCTION	0.000	0.339	0	04:13	0	24.7	0.054
J9	JUNCTION	0.000	0.022	0	01:33	0	0.00628	- 0.023
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.097	0.097	0	01:25	0.173	0.173	0.000
OF3	OUTFALL	0.000	0.712	0	01:30	0	5.21	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.339	0	04:14	0	24.7	0.000
500_(C-STRM)	STORAGE	0.000	0.107	0	01:35	0	0.314	0.020
500A_(C-STRM)	STORAGE	0.000	2.365	0	01:33	0	9.47	0.004
502_(C-STRM)	STORAGE	0.000	1.231	0	01:33	0	4.68	- 0.026
503_(C-STRM)	STORAGE	0.000	0.928	0	01:33	0	3.58	- 0.004
504_(C-STRM)	STORAGE	0.000	0.880	0	01:29	0	3.41	- 0.199
505_(C-STRM)	STORAGE	0.000	0.735	0	01:33	0	2.7	- 0.159
506_(C-STRM)	STORAGE	0.000	0.742	0	01:33	0	2.71	0.720
507_(C-STRM)	STORAGE	0.000	0.580	0	01:35	0	2.04	- 0.864
508_(C-STRM)	STORAGE	0.000	0.572	0	01:35	0	2.04	- 0.032
509_(C-STRM)	STORAGE	0.000	0.568	0	01:35	0	2.04	- 0.089
510_(C-STRM)	STORAGE	0.000	0.565	0	01:34	0	2.04	0.105
511_(C-STRM)	STORAGE	0.000	0.578	0	01:25	0	2.05	0.093
512_(C-STRM)	STORAGE	0.000	0.535	0	01:25	0	1.88	- 0.218
513_(C-STRM)	STORAGE	0.000	0.596	0	01:26	0	1.93	0.919
514_(C-STRM)	STORAGE	0.000	0.072	0	01:27	0	0.0483	2.172
515_(C-STRM)	STORAGE	0.000	0.034	0	01:30	0	0.00807	- 11.576
516_(C-STRM)	STORAGE	0.000	0.395	0	01:26	0	1.27	- 1.753
517_(C-STRM)	STORAGE	0.000	0.415	0	01:27	0	1.27	0.405
518_(C-STRM)	STORAGE	0.000	0.437	0	01:27	0	1.29	1.208
519_(C-STRM)	STORAGE	0.000	0.122	0	01:21	0	0.327	- 2.071
520_(C-STRM)	STORAGE	0.000	0.121	0	01:20	0	0.333	1.621
522_(C-STRM)	STORAGE	0.000	0.088	0	01:20	0	0.237	0.024
525_(C-STRM)	STORAGE	0.000	1.274	0	01:47	0	5.03	0.077
528_(C-STRM)	STORAGE	0.000	1.060	0	01:46	0	4.23	- 0.003
532_(C-STRM)	STORAGE	0.000	0.846	0	01:46	0	3.42	- 0.217
536_(C-STRM)	STORAGE	0.000	0.734	0	01:46	0	3.01	0.147
540_(C-STRM)	STORAGE	0.000	0.494	0	01:47	0	2.05	- 0.076
541_(C-STRM)	STORAGE	0.000	0.368	0	01:21	0	1.63	0.057
551_(C-STRM)	STORAGE	0.000	0.313	0	01:33	0	1.1	0.670
552_(C-STRM)	STORAGE	0.000	0.240	0	01:34	0	0.736	- 1.005
553_(C-STRM)	STORAGE	0.000	0.247	0	01:24	0	0.74	0.514
554_(C-STRM)	STORAGE	0.000	0.214	0	01:25	0	0.596	- 1.431
555_(C-STRM)	STORAGE	0.000	0.215	0	01:22	0	0.595	- 0.114
556_(C-STRM)	STORAGE	0.000	0.214	0	01:21	0	0.601	0.946
601_(C-STRM)	STORAGE	0.000	5.091	0	01:36	0	19.3	0.023
602_(C-STRM)	STORAGE	0.000	5.091	0	01:36	0	19.3	- 0.002
603_(C-STRM)	STORAGE	0.000	5.081	0	01:36	0	19.1	0.005

604_(C-STRM)	STORAGE	0.000	5.082	0	01:36	0	19.1	- 0.004
605_(C-STRM)	STORAGE	0.000	4.792	0	01:35	0	18	- 0.007
606_(C-STRM)	STORAGE	0.000	4.056	0	01:35	0	15.2	0.011
619_(C-STRM)	STORAGE	0.000	4.065	0	01:34	0	15.2	- 0.000
622_(C-STRM)	STORAGE	0.000	3.845	0	01:34	0	14.4	0.001
626_(C-STRM)	STORAGE	0.000	0.108	0	01:31	0	0.348	- 0.905
627_(C-STRM)	STORAGE	0.000	0.204	0	01:31	0	0.646	0.463
629_(C-STRM)	STORAGE	0.000	3.297	0	01:34	0	12	- 0.237
630_(C-STRM)	STORAGE	0.000	3.198	0	01:30	0	11.5	0.403
630A_(C-STRM)	STORAGE	0.000	3.031	0	01:26	0	10.9	0.070
631_(C-STRM)	STORAGE	2.916	2.916	0	01:30	8.48	8.48	- 0.055
645_(C-STRM)	STORAGE	0.000	0.695	0	01:37	0	2.37	- 0.309
647_(C-STRM)	STORAGE	0.000	0.638	0	01:37	0	2.29	- 0.519
650_(C-STRM)	STORAGE	0.000	0.573	0	01:26	0	2.19	- 0.496
651_(C-STRM)	STORAGE	0.000	0.544	0	01:21	0	2.12	0.085
682_(C-STRM)	STORAGE	0.850	0.850	0	01:25	2.07	2.07	- 0.032
MTD_(C-STRM)	STORAGE	0.000	2.404	0	01:33	0	9.7	- 0.054
OVERFLOW_(C-STRM)	STORAGE	0.000	2.402	0	01:34	0	9.71	0.000
POND_(C-STRM)	STORAGE	1.013	7.839	0	01:34	2.58	31.7	- 0.010
S_525-MTD	STORAGE	0.401	0.401	0	01:26	0.797	0.797	- 0.0I2
S_528-525	STORAGE	0.406	0.406	0	01:26	0.807	0.807	- 0.0I2
S_532-528	STORAGE	0.206	0.206	0	01:26	0.409	0.409	- 0.0I2
S_536-532	STORAGE	0.498	0.498	0	01:25	0.964	0.964	- 0.0I1
S_540-536	STORAGE	0.215	0.215	0	01:26	0.426	0.426	- 0.0I2
S_541-540	STORAGE	0.822	0.822	0	01:26	1.63	1.63	- 0.0I0
S_604-603	STORAGE	0.607	0.607	0	01:26	1.21	1.21	0.000
S_605-604	STORAGE	1.651	1.651	0	01:25	3.25	3.25	0.000
S_619-606	STORAGE	0.452	0.452	0	01:26	0.898	0.898	0.000
S_622-619	STORAGE	0.949	0.949	0	01:25	1.86	1.86	- 0.000
S_622-619_2	STORAGE	0.521	0.521	0	01:26	1.03	1.03	0.000
S_627-630	STORAGE	0.178	0.178	0	01:26	0.354	0.354	0.000
S_629-622	STORAGE	0.309	0.309	0	01:26	0.614	0.614	0.000
SU2	STORAGE	0.116	0.116	0	01:30	0.348	0.348	- 0.000
SU5	STORAGE	0.148	0.148	0	01:30	0.516	0.516	- 0.001

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	10.3	0.0	0.0	0.001	15.8	0 01:35	0.108
500A_(C-STRM)	0.768	36.3	0.0	0.0	1.789	84.6	0 01:36	2.312
502_(C-STRM)	0.000	3.8	0.0	0.0	0.002	41.2	0 01:33	1.225
503_(C-STRM)	0.000	3.2	0.0	0.0	0.002	41.1	0 01:33	0.929
504_(C-STRM)	0.000	13.0	0.0	0.0	0.001	43.0	0 01:33	0.868
505_(C-STRM)	0.000	10.6	0.0	0.0	0.001	38.3	0 01:33	0.731
506_(C-STRM)	0.000	11.0	0.0	0.0	0.002	42.5	0 01:33	0.735
507_(C-STRM)	0.000	11.1	0.0	0.0	0.001	42.2	0 01:33	0.588
508_(C-STRM)	0.000	11.0	0.0	0.0	0.002	43.8	0 01:33	0.580
509_(C-STRM)	0.000	11.0	0.0	0.0	0.002	45.9	0 01:34	0.572
510_(C-STRM)	0.000	11.1	0.0	0.0	0.002	46.9	0 01:34	0.568
511_(C-STRM)	0.000	11.1	0.0	0.0	0.002	47.4	0 01:34	0.565
512_(C-STRM)	0.000	10.9	0.0	0.0	0.002	45.8	0 01:34	0.519
513_(C-STRM)	0.000	10.8	0.0	0.0	0.002	44.7	0 01:34	0.562
514_(C-STRM)	0.000	9.3	0.0	0.0	0.001	34.0	0 01:34	0.085
515_(C-STRM)	0.000	8.8	0.0	0.0	0.001	25.5	0 01:35	0.030
516_(C-STRM)	0.000	11.1	0.0	0.0	0.002	47.2	0 01:35	0.394
517_(C-STRM)	0.000	11.4	0.0	0.0	0.002	51.0	0 01:34	0.395
518_(C-STRM)	0.000	12.0	0.0	0.0	0.002	60.1	0 01:34	0.415
519_(C-STRM)	0.000	11.7	0.0	0.0	0.002	54.8	0 01:33	0.152
520_(C-STRM)	0.000	12.2	0.0	0.0	0.002	53.0	0 01:33	0.122
522_(C-STRM)	0.000	10.6	0.0	0.0	0.001	20.3	0 01:31	0.088
525_(C-STRM)	0.000	4.4	0.0	0.0	0.002	59.5	0 01:36	1.289
528_(C-STRM)	0.000	3.5	0.0	0.0	0.002	64.9	0 01:36	1.071
532_(C-STRM)	0.000	3.2	0.0	0.0	0.002	67.2	0 01:37	0.855
536_(C-STRM)	0.000	3.2	0.0	0.0	0.002	68.2	0 01:37	0.742
540_(C-STRM)	0.000	13.2	0.0	0.0	0.002	71.3	0 01:37	0.546
541_(C-STRM)	0.000	12.8	0.0	0.0	0.002	69.6	0 01:37	0.410
551_(C-STRM)	0.000	9.5	0.0	0.0	0.002	40.7	0 01:33	0.309
552_(C-STRM)	0.000	8.9	0.0	0.0	0.002	38.4	0 01:33	0.241
553_(C-STRM)	0.000	9.1	0.0	0.0	0.002	37.2	0 01:33	0.240
554_(C-STRM)	0.000	8.6	0.0	0.0	0.002	35.0	0 01:33	0.201
555_(C-STRM)	0.000	8.5	0.0	0.0	0.001	33.4	0 01:33	0.214
556_(C-STRM)	0.000	8.5	0.0	0.0	0.002	35.1	0 01:33	0.215
601_(C-STRM)	0.000	2.7	0.0	0.0	0.001	26.8	0 01:36	5.092
602_(C-STRM)	0.000	3.2	0.0	0.0	0.002	41.0	0 01:36	5.091
603_(C-STRM)	0.000	3.2	0.0	0.0	0.002	44.0	0 01:36	5.081
604_(C-STRM)	0.000	2.4	0.0	0.0	0.002	37.5	0 01:36	5.081
605_(C-STRM)	0.000	2.0	0.0	0.0	0.002	31.3	0 01:36	4.788
606_(C-STRM)	0.000	2.1	0.0	0.0	0.002	31.8	0 01:36	4.049
619_(C-STRM)	0.000	2.4	0.0	0.0	0.002	37.1	0 01:36	4.056
622_(C-STRM)	0.000	2.5	0.0	0.0	0.002	41.2	0 01:36	3.832
626_(C-STRM)	0.000	8.8	0.0	0.0	0.001	14.8	0 01:31	0.107
627_(C-STRM)	0.000	8.7	0.0	0.0	0.001	17.7	0 01:31	0.207
629_(C-STRM)	0.000	2.5	0.0	0.0	0.002	40.1	0 01:35	3.294
630_(C-STRM)	0.000	2.6	0.0	0.0	0.002	37.1	0 01:35	3.163
630A_(C-STRM)	0.000	2.6	0.0	0.0	0.002	39.5	0 01:35	3.016
631_(C-STRM)	0.003	0.1	0.0	0.0	0.219	8.7	0 01:31	2.438
645_(C-STRM)	0.000	10.1	0.0	0.0	0.002	47.9	0 01:35	0.737
647_(C-STRM)	0.000	10.7	0.0	0.0	0.002	51.8	0 01:36	0.693
650_(C-STRM)	0.000	11.4	0.0	0.0	0.002	55.3	0 01:36	0.634
651_(C-STRM)	0.000	11.9	0.0	0.0	0.002	58.0	0 01:36	0.567
682_(C-STRM)	0.002	0.2	0.0	0.0	0.148	19.7	0 01:31	0.526
MTD_(C-STRM)	0.000	7.1	0.0	0.0	0.002	45.8	0 01:33	2.402
OVERFLOW_(C-STRM)	0.000	12.0	0.0	0.0	0.001	30.8	0 01:35	2.402
POND_(C-STRM)	15.347	42.4	0.0	0.0	25.662	70.8	0 04:13	0.346
S_525-MTD	0.002	0.3	0.0	0.0	0.113	19.7	0 01:33	0.203
S_528-525	0.002	0.3	0.0	0.0	0.115	19.8	0 01:33	0.205
S_532-528	0.001	0.3	0.0	0.0	0.058	19.8	0 01:33	0.104
S_536-532	0.002	0.4	0.0	0.0	0.133	31.1	0 01:32	0.252
S_540-536	0.001	0.4	0.0	0.0	0.058	28.2	0 01:33	0.110
S_541-540	0.005	0.4	0.0	0.0	0.266	22.7	0 01:33	0.390
S_604-603	0.003	0.3	0.0	12.2	0.170	19.6	0 01:33	0.308
S_605-604	0.008	0.3	0.0	13.4	0.493	21.6	0 01:33	0.796
S_619-606	0.001	0.3	0.0	12.2	0.113	26.2	0 01:33	0.243
S_622-619	0.009	0.7	0.0	14.2	0.365	28.0	0 01:33	0.442
S_622-619_2	0.002	0.4	0.0	12.3	0.144	29.1	0 01:33	0.261
S_627-630	0.000	0.2	0.0	16.3	0.041	16.0	0 01:32	0.103
S_629-622	0.002	0.4	0.0	14.1	0.096	21.8	0 01:33	0.155
SU2	0.000	0.1	0.0	0.0	0.008	1.5	0 01:31	0.108
SU5	0.000	0.1	0.0	0.0	0.023	4.6	0 01:34	0.184

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	22.39	0.009	0.097	0.173
OF3	99.18	0.061	0.712	5.214
ST4_108A_(P-Stm)	99.23	0.288	0.339	24.719
System	55.20	0.358	0.991	30.106

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.085	0 03:15	1.07	1.27	0.61
BDR-C2	CONDUIT	0.142	0 01:30	1.53	2.70	0.70
BDR-C3	CONDUIT	0.168	0 03:30	2.09	0.86	0.43
BDR-C4	CONDUIT	0.517	0 01:32	2.24	0.17	0.26
C1_1	CHANNEL	0.033	0 01:33	0.46	0.01	0.27
C1_17	CHANNEL	0.032	0 01:25	0.79	0.00	0.12
C1_3	CHANNEL	0.031	0 01:26	0.24	0.01	0.23
C1_30	CHANNEL	0.139	0 01:35	0.78	0.05	0.31
C1_4	CHANNEL	0.126	0 01:37	0.64	0.03	0.32
C14_1	CHANNEL	0.009	0 01:30	0.10	0.01	0.22
C14_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.02
C14_4	CHANNEL	0.000	0 01:25	0.02	0.00	0.12
C14_5	CHANNEL	0.021	0 01:27	0.42	0.01	0.18
C15_1	CHANNEL	0.040	0 01:30	0.28	0.02	0.22
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.09
C2	CONDUIT	0.100	0 01:31	0.52	0.01	0.06
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.08
C20_2	CHANNEL	0.038	0 01:30	0.68	0.01	0.16
C20_3	CHANNEL	0.047	0 01:30	0.51	0.01	0.16
C20_4	CHANNEL	0.032	0 01:29	0.54	0.01	0.14
C20_5	CHANNEL	0.029	0 01:30	0.96	0.00	0.12
C20_7	CHANNEL	0.037	0 01:30	0.48	0.00	0.15
C23_5	CHANNEL	0.000	0 02:42	0.10	0.00	0.06
C23_7	CHANNEL	0.109	0 01:30	1.76	0.02	0.19
C3	CONDUIT	0.015	0 01:36	0.23	0.00	0.02
C4	CONDUIT	0.009	0 01:38	0.24	0.00	0.02
C4_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.047	0 01:30	0.71	0.01	0.19
C4_3	CHANNEL	0.000	0 00:00	0.00	0.00	0.10

C4_4	CHANNEL	0.047	0	01:28	0.62	0.01	0.21
C4_5	CHANNEL	0.000	0	00:00	0.00	0.00	0.10
C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.005	0	01:49	0.13	0.00	0.01
C5_1	CHANNEL	0.118	0	01:26	0.33	0.03	0.14
C5_10	CHANNEL	0.085	0	03:16	0.48	0.02	0.21
C5_11	CHANNEL	0.084	0	03:21	0.19	0.03	0.26
C5_12	CHANNEL	0.712	0	01:30	1.12	0.06	0.25
C5_13	CHANNEL	0.086	0	03:17	0.66	0.02	0.20
C5_14	CHANNEL	0.088	0	03:23	0.20	0.06	0.34
C5_15	CHANNEL	0.138	0	03:22	0.41	0.04	0.26
C5_16	CHANNEL	0.136	0	03:27	0.42	0.03	0.18
C5_17	CHANNEL	0.133	0	03:31	0.23	0.01	0.19
C5_19	CHANNEL	0.141	0	01:33	0.41	0.09	0.23
C5_2	CHANNEL	0.104	0	01:33	0.58	0.01	0.17
C5_20	CHANNEL	0.145	0	03:32	0.28	0.01	0.19
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.20
C5_23	CHANNEL	0.115	0	01:27	0.31	0.02	0.14
C5_3	CHANNEL	0.111	0	01:29	0.56	0.01	0.18
C5_4	CHANNEL	0.102	0	01:34	0.50	0.01	0.13
C5_5	CHANNEL	0.101	0	01:35	0.60	0.01	0.12
C5_6	CHANNEL	0.103	0	01:34	0.71	0.01	0.11
C5_7	CHANNEL	0.105	0	01:48	0.28	0.01	0.19
C5_8	CHANNEL	0.136	0	01:38	0.47	0.01	0.18
C5_9	CHANNEL	0.434	0	01:32	0.64	0.04	0.27
C6	CONDUIT	0.005	0	01:56	0.13	0.00	0.02
C7	CHANNEL	0.027	0	01:26	0.26	0.01	0.17
C9_1	CHANNEL	0.068	0	01:29	0.48	0.02	0.21
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.09
C9_2	CHANNEL	0.049	0	01:30	0.46	0.02	0.19
C9_5	CHANNEL	0.125	0	01:39	1.16	0.03	0.20
C9_6	CHANNEL	0.051	0	01:25	0.50	0.01	0.19
C9_7	CHANNEL	0.068	0	01:30	0.56	0.01	0.19
C-STRM-1_(1)_(1)_(C-STRM)	CONDUIT	0.394	0	01:35	1.13	1.05	1.00
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.395	0	01:26	1.11	1.21	1.00
C-STRM-1_(C-STRM)	CONDUIT	0.415	0	01:27	1.47	1.74	1.00
C-STRM-100_(C-STRM)	CONDUIT	0.107	0	01:35	1.18	0.25	0.36
C-STRM-101_(C-STRM)	CONDUIT	0.108	0	01:35	1.95	0.14	0.29
C-STRM-102_(C-STRM)	CONDUIT	2.296	0	01:34	3.80	0.91	0.82
C-STRM-103_(C-STRM)	CONDUIT	0.634	0	01:37	1.19	1.14	1.00
C-STRM-104_(C-STRM)	CONDUIT	0.693	0	01:37	1.30	1.25	1.00
C-STRM-105_(C-STRM)	CONDUIT	0.737	0	01:37	1.38	1.32	1.00
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.519	0	01:25	1.60	0.92	1.00
C-STRM-2_(C-STRM)	CONDUIT	0.535	0	01:25	1.72	0.95	1.00
C-STRM-20_(C-STRM)	CONDUIT	0.107	0	01:31	1.58	0.38	0.50
C-STRM-21_(C-STRM)	CONDUIT	0.207	0	01:32	1.41	0.68	0.80
C-STRM-22_(1)_(C-STRM)	CONDUIT	3.294	0	01:34	1.51	0.74	1.00
C-STRM-22_(C-STRM)	CONDUIT	3.163	0	01:34	2.34	1.16	1.00
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.309	0	01:34	1.04	0.92	1.00
C-STRM-26_(C-STRM)	CONDUIT	0.241	0	01:34	0.72	0.72	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.735	0	01:33	1.68	0.93	1.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.588	0	01:35	1.70	0.99	1.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.580	0	01:35	1.62	0.98	1.00
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.572	0	01:35	1.60	0.96	1.00
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.568	0	01:35	1.59	1.01	1.00
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.565	0	01:34	1.70	1.00	1.00
C-STRM-33_(C-STRM)	CONDUIT	0.567	0	01:37	1.11	1.02	1.00
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.214	0	01:25	1.21	1.25	1.00
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.215	0	01:22	1.12	1.25	1.00
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.240	0	01:34	1.11	0.98	1.00
C-STRM-35_(C-STRM)	CONDUIT	0.201	0	01:24	0.92	0.81	1.00
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.868	0	01:33	2.10	1.01	0.88
C-STRM-4_(C-STRM)	CONDUIT	0.731	0	01:33	1.66	0.93	1.00
C-STRM-49_(C-STRM)	CONDUIT	0.410	0	01:49	0.81	0.73	1.00
C-STRM-50_(C-STRM)	CONDUIT	0.546	0	01:47	1.02	0.98	1.00
C-STRM-51_(C-STRM)	CONDUIT	0.742	0	01:46	1.17	1.06	1.00
C-STRM-52_(C-STRM)	CONDUIT	0.855	0	01:46	1.15	0.99	1.00
C-STRM-53_(C-STRM)	CONDUIT	1.071	0	01:47	1.43	1.23	1.00
C-STRM-57_(C-STRM)	CONDUIT	0.929	0	01:33	1.24	1.06	1.00
C-STRM-62_(C-STRM)	CONDUIT	0.122	0	01:21	0.97	0.95	1.00
C-STRM-63_(C-STRM)	CONDUIT	0.152	0	01:35	0.70	0.91	1.00
C-STRM-64_(C-STRM)	CONDUIT	0.088	0	01:31	1.07	1.00	0.70
C-STRM-74_(C-STRM)	CONDUIT	4.056	0	01:35	1.61	0.79	1.00
C-STRM-75_(C-STRM)	CONDUIT	4.049	0	01:35	1.62	0.79	0.99
C-STRM-76_(C-STRM)	CONDUIT	1.289	0	01:47	1.73	1.29	1.00
C-STRM-77_(C-STRM)	CONDUIT	2.402	0	01:34	2.92	1.24	0.91
C-STRM-78_(C-STRM)	CONDUIT	1.225	0	01:33	1.64	1.00	1.00
C-STRM-79_(1)_(C-STRM)	CONDUIT	5.081	0	01:36	2.01	0.81	0.98
C-STRM-79_(C-STRM)	CONDUIT	4.788	0	01:36	1.89	0.83	0.99
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.085	0	01:39	0.48	0.44	1.00
C-STRM-8_(C-STRM)	CONDUIT	0.034	0	01:30	0.31	0.27	1.00
C-STRM-80_(C-STRM)	CONDUIT	5.081	0	01:36	2.04	1.14	0.94
C-STRM-81_(C-STRM)	CONDUIT	5.091	0	01:36	2.34	1.14	0.80
C-STRM-82_(C-STRM)	CONDUIT	5.092	0	01:36	2.96	1.14	0.64
C-STRM-83_(1)_(C-STRM)	CONDUIT	3.016	0	01:28	2.11	1.10	1.00
C-STRM-84_(C-STRM)	CONDUIT	3.832	0	01:34	1.58	0.75	1.00
CVR-C2	CONDUIT	0.102	0	01:35	2.03	0.38	0.35
CVR-C3	CONDUIT	0.113	0	01:43	2.17	0.69	0.45
CVR-C4	CONDUIT	0.434	0	01:32	2.30	0.14	0.22
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	1.339	0	04:14	1.28	0.35	0.43
W1	CHANNEL	2.286	0	01:36	0.89	0.01	0.04
OR1	ORIFICE	0.339	0	04:13			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.006	0	01:32			0.02
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.012	0	01:33			0.02
W15	WEIR	0.114	0	01:33			0.10
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.010	0	01:33			0.02
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.022	0	01:33			0.03
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.249	0	01:21			
C-STRM-107_(C-STRM)	DUMMY	0.294	0	01:21			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.743	0	01:21			
C-STRM-23_(C-STRM)	DUMMY	0.302	0	01:19			
C-STRM-42_(C-STRM)	DUMMY	0.368	0	01:21			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.203	0	01:21			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.233	0	01:21			
C-STRM-71_(C-STRM)	DUMMY	0.526	0	01:21			
C-STRM-83_(C-STRM)	DUMMY	2.438	0	01:23			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.246	0	01:20			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.104	0	01:21			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.205	0	01:21			
OL1	DUMMY	0.097	0	01:22			
OL10	DUMMY	0.026	0	00:15			
OL11	DUMMY	0.046	0	01:20			
OL12	DUMMY	0.101	0	01:20			
OL13	DUMMY	0.084	0	01:20			
OL14	DUMMY	0.121	0	01:20			
OL15	DUMMY	0.088	0	01:20			
OL16	DUMMY	0.342	0	01:21			
OL17	DUMMY	0.215	0	01:21			
OL18	DUMMY	0.059	0	01:21			
OL19	DUMMY	0.238	0	01:21			
OL2	DUMMY	0.108	0	01:31			
OL20	DUMMY	0.068	0	01:21			
OL21	DUMMY	0.060	0	01:21			
OL22	DUMMY	0.184	0	01:35			
OL3	DUMMY	0.134	0	01:21			
OL4	DUMMY	0.110	0	01:21			
OL5	DUMMY	0.037	0	01:25			
OL6	DUMMY	0.029	0	01:20			
OL7	DUMMY	0.034	0	01:22			
OL8	DUMMY	0.018	0	01:21			
OL9	DUMMY	0.214	0	01:21			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
BDR-C1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
BDR-C2	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
BDR-C3	1.00	0.01	0.00	0.00	0.01	0.99	0.00	0.00	0.01	0.00
BDR-C4	1.00	0.01	0.00	0.00	0.78	0.21	0.00	0.00	0.92	0.00
C1_1	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.92	0.00
C1_17	1.00	0.77	0.01	0.00	0.00	0.00	0.00	0.23	0.00	0.00
C1_3	1.00	0.73	0.05	0.00	0.22	0.00	0.00	0.00	0.95	0.00
C1_30	1.00	0.06	0.00	0.00	0.57	0.37	0.00	0.00	0.05	0.00
C1_4	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.94	0.00
C14_1	1.00	0.74	0.06	0.00	0.20	0.00	0.00	0.00	0.99	0.00
C14_2	1.00	0.81	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.77	0.04	0.00	0.19	0.00	0.00	0.00	0.99	0.00
C14_5	1.00	0.77	0.01	0.00	0.20	0.02	0.00	0.00	0.00	0.00
C15_1	1.00	0.70	0.05	0.00	0.25	0.00	0.00	0.00	0.95	0.00
C15_2	1.00	0.75	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00
C20_1	1.00	0.75	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.75	0.02	0.00	0.19	0.04	0.00	0.00	0.97	0.00
C20_3	1.00	0.73	0.02	0.00	0.21	0.04	0.00	0.00	0.04	0.00
C20_4	1.00	0.01	0.77	0.00	0.20	0.03	0.00	0.00	0.92	0.00
C20_5	1.00	0.01	0.03	0.00	0.69	0.28	0.00	0.00	0.04	0.00
C20_7	1.00	0.76	0.02	0.00	0.15	0.08	0.00	0.00	0.05	0.00
C23_5	1.00	0.05	0.02	0.00	0.93	0.00	0.00	0.00	0.01	0.00
C23_7	1.00	0.01	0.00	0.00	0.64	0.35	0.00	0.00	0.00	0.00
C3	1.00	0.74	0.09	0.00	0.17	0.00	0.00	0.00	0.93	0.00
C4	1.00	0.62	0.12	0.00	0.26	0.00	0.00	0.00	0.93	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.92	0.00
C4_3	1.00	0.06	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.01	0.77	0.00	0.18	0.04	0.00	0.00	0.92	0.00
C4_5	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.50	0.13	0.00	0.38	0.00	0.00	0.00	0.92	0.00
C5_1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.87	0.00
C5_10	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.95	0.00
C5_11	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
C5_12	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.01	0.00
C5_14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_15	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.96	0.00
C5_16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.94	0.00
C5_19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C5_2	1.00	0.01	0.00	0.00	0.74	0.25	0.00	0.00	0.00	0.00
C5_20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
C5_21	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.01	0.00	0.00	0.79	0.20	0.00	0.00	0.47	0.00
C5_3	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C5_4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.97	0.00
C5_5	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.13	0.00
C5_6	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.87	0.00
C5_7	1.00	0.01	0.04	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_8	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.95	0.00
C5_9	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
C6	1.00	0.07	0.43	0.00	0.50	0.00	0.00	0.00	0.92	0.00
C7	1.00	0.76	0.02	0.00	0.22	0.00	0.00	0.00	0.96	0.00
C9_1	1.00	0.74	0.01	0.00	0.23	0.02	0.00	0.00	0.04	0.00
C9_11	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.01	0.80	0.00	0.17	0.03	0.00	0.00	0.94	0.00
C9_5	1.00	0.01	0.00	0.00	0.07	0.92	0.00	0.00	0.05	0.00
C9_6	1.00	0.01	0.74	0.00	0.22	0.03	0.00	0.00	0.93	0.00
C9_7	1.00	0.01	0.77	0.00	0.18	0.04	0.00	0.00	0.93	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.12	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.46	0.00
C-STRM-1_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-100_(C-STRM)	1.00	0.79	0.04	0.00	0.09	0.00	0.00	0.08	0.84	0.00
C-STRM-101_(C-STRM)	1.00	0.60	0.19	0.00	0.13	0.00	0.00	0.08	0.77	0.00
C-STRM-102_(C-STRM)	1.00	0.01	0.00	0.00	0.93	0.06	0.00	0.00	0.11	0.00
C-STRM-103_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.83	0.00
C-STRM-104_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.90	0.00
C-STRM-105_(C-STRM)	1.00	0.01	0.00	0.00	0.19	0.00	0.00	0.80	0.04	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.74	0.00
C-STRM-2_(C-STRM)	1.00	0.01	0.00	0.00	0.96	0.01	0.00	0.02	0.63	0.00
C-STRM-20_(C-STRM)	1.00	0.05	0.01	0.00	0.02	0.01	0.00	0.91	0.04	0.00
C-STRM-21_(C-STRM)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.93	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.92	0.05	0.00	0.02	0.72	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.79	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.69	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.10	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.97	0.00	0.00	0.02	0.76	0.00
C-STRM-33_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.65	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.01	0.92	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.93	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.01	0.00	0.00	0.96	0.02	0.00	0.01	0.85	0.00
C-STRM-49_(C-STRM)	1.00	0.01	0.30	0.00	0.69	0.00	0.00	0.00	0.86	0.00
C-STRM-50_(C-STRM)	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00	0.00
C-STRM-51_(C-STRM)	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.73	0.00
C-STRM-53_(C-STRM)	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.65	0.00
C-STRM-57_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.54	0.00
C-STRM-62_(C-STRM)	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.01	0.00
C-STRM-63_(C-STRM)	1.00	0.01	0.00	0.00	0.10	0.00	0.00	0.89	0.04	0.00
C-STRM-64_(C-STRM)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.75	0.00
C-STRM-75_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.01	0.00	0.00	0.58	0.00	0.00	0.41	0.17	0.00
C-STRM-77_(C-STRM)	1.00	0.01	0.00	0.00	0.95	0.05	0.00	0.00	0.27	0.00
C-STRM-78_(C-STRM)	1.00	0.01	0.00	0.00	0.55	0.00	0.00	0.44	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.82	0.00
C-STRM-79_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.03	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.04	0.01	0.00	0.05	0.00	0.00	0.90	0.02	0.00
C-STRM-8_(C-STRM)	1.00	0.06	0.00	0.00	0.02	0.00	0.00	0.92	0.01	0.00
C-STRM-80_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.85	0.00
C-STRM-81_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.64	0.00
C-STRM-82_(C-STRM)	1.00	0.01	0.00	0.00	0.30	0.00	0.00	0.70	0.05	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.76	0.00
C-STRM-84_(C-STRM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.88	0.00
CVR-C2	1.00	0.02	0.00	0.00	0.76	0.21	0.00	0.00	0.81	0.00
CVR-C3	1.00	0.04	0.00	0.00	0.51	0.46	0.00	0.00	0.09	0.00
CVR-C4	1.00	0.01	0.00	0.00	0.49	0.50	0.00	0.00	0.13	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
W1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00

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Conduit Surcharge Summary
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| Conduit | Hours Full: Both Ends | Upstream | Dnstream | H

C-STRM-22 (C-STRM)	0.01	0.04	0.01	0.22	0.01
C-STRM-26 (1) (C-STRM)	0.75	0.75	0.78	0.01	0.09
C-STRM-26 (C-STRM)	0.68	0.68	0.75	0.01	0.01
C-STRM-3 (1) (1) (1) (1) (1) (C-STRM)	0.18	0.19	0.22	0.01	0.13
C-STRM-3 (1) (1) (1) (1) (C-STRM)	0.18	0.23	0.18	0.01	0.18
C-STRM-3 (1) (1) (1) (C-STRM)	0.23	0.38	0.23	0.01	0.23
C-STRM-3 (1) (1) (C-STRM)	0.38	0.49	0.38	0.01	0.38
C-STRM-3 (1) (2) (C-STRM)	0.38	0.38	0.49	0.01	0.01
C-STRM-3 (1) (C-STRM)	0.38	0.38	0.38	0.01	0.15
C-STRM-33 (C-STRM)	0.48	0.48	0.50	0.01	0.02
C-STRM-34 (1) (1) (C-STRM)	0.32	0.32	0.42	0.21	0.12
C-STRM-34 (1) (C-STRM)	0.25	0.25	0.32	0.24	0.12
C-STRM-35 (1) (C-STRM)	0.57	0.57	0.67	0.01	0.01
C-STRM-35 (C-STRM)	0.42	0.42	0.57	0.01	0.01
C-STRM-4 (1) (C-STRM)	0.01	0.34	0.01	0.08	0.01
C-STRM-4 (C-STRM)	0.22	0.22	0.34	0.01	0.13
C-STRM-49 (C-STRM)	0.82	0.82	0.82	0.01	0.01
C-STRM-50 (C-STRM)	0.82	0.82	0.84	0.01	0.64
C-STRM-51 (C-STRM)	0.83	0.84	0.83	0.34	0.83
C-STRM-52 (C-STRM)	0.83	0.83	0.84	0.01	0.77
C-STRM-53 (C-STRM)	0.82	0.84	0.82	0.69	0.82
C-STRM-57 (C-STRM)	0.78	0.79	0.79	0.14	0.74
C-STRM-62 (C-STRM)	0.22	0.22	0.26	0.01	0.01
C-STRM-63 (C-STRM)	0.26	0.26	0.51	0.01	0.01
C-STRM-64 (C-STRM)	0.01	0.01	0.01	0.10	0.01
C-STRM-74 (C-STRM)	0.06	0.11	0.06	0.01	0.06
C-STRM-75 (C-STRM)	0.01	0.06	0.01	0.01	0.01
C-STRM-76 (C-STRM)	0.79	0.82	0.79	0.72	0.79
C-STRM-77 (C-STRM)	0.01	0.79	0.01	0.67	0.01
C-STRM-78 (C-STRM)	0.78	0.79	0.79	0.01	0.70
C-STRM-79 (1) (C-STRM)	0.01	0.08	0.01	0.01	0.01
C-STRM-79 (C-STRM)	0.01	0.01	0.08	0.01	0.01
C-STRM-8 (1) (C-STRM)	0.11	0.11	0.21	0.01	0.01
C-STRM-8 (C-STRM)	0.04	0.04	0.11	0.01	0.01
C-STRM-80 (C-STRM)	0.01	0.01	0.01	0.23	0.01
C-STRM-81 (C-STRM)	0.01	0.01	0.01	0.23	0.01
C-STRM-82 (C-STRM)	0.01	0.01	0.01	0.23	0.01
C-STRM-83 (1) (C-STRM)	0.03	0.04	0.04	0.21	0.03
C-STRM-84 (C-STRM)	0.06	0.06	0.11	0.01	0.01

Analysis begun on: Thu Apr 9 22:17:41 2026
Analysis ended on: Thu Apr 9 22:17:47 2026
Total elapsed time: 00:00:06

4-hour 22MM Chicago Event

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------

  WARNING 03: negative offset ignored for Link C1_17
  WARNING 04: minimum elevation drop used for Conduit W1
  WARNING 03: negative offset ignored for Link OL1
  WARNING 03: negative offset ignored for Link OL13
  WARNING 03: negative offset ignored for Link OL15
  WARNING 02: maximum depth increased for Node EXD_1
  WARNING 02: maximum depth increased for Node EXD_10
  WARNING 02: maximum depth increased for Node EXD_11
  WARNING 02: maximum depth increased for Node EXD_12
  WARNING 02: maximum depth increased for Node EXD_13
  WARNING 02: maximum depth increased for Node EXD_14
  WARNING 02: maximum depth increased for Node EXD_15
  WARNING 02: maximum depth increased for Node EXD_16
  WARNING 02: maximum depth increased for Node EXD_17
  WARNING 02: maximum depth increased for Node EXD_18
  WARNING 02: maximum depth increased for Node EXD_19
  WARNING 02: maximum depth increased for Node EXD_20
  WARNING 02: maximum depth increased for Node EXD_21
  WARNING 02: maximum depth increased for Node EXD_22
  WARNING 02: maximum depth increased for Node EXD_23
  WARNING 02: maximum depth increased for Node EXD_24
  WARNING 02: maximum depth increased for Node EXD_25
  WARNING 02: maximum depth increased for Node EXD_26
  WARNING 02: maximum depth increased for Node EXD_27
  WARNING 02: maximum depth increased for Node EXD_5
  WARNING 02: maximum depth increased for Node EXD_7
  WARNING 02: maximum depth increased for Node EXD_8
  WARNING 02: maximum depth increased for Node EXD_9
  WARNING 02: maximum depth increased for Node J17
  WARNING 02: maximum depth increased for Node J74

  *************
  Element Count
  *************
  Number of rain gages ...... 3
  Number of subcatchments ... 43
  Number of nodes ........... 139
  Number of links ........... 170
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
  Name                 Data Source          Data       Recording
                                            Type       Interval
  ---------------------------------------------------------------
  24SCS100             24SCS100             INTENSITY   15 min.
  6SCS050              6SCS050              INTENSITY   15 min.
  Rainfall             4CHI22MM             INTENSITY   15 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------
  A15                  3.46     13.10     18.98    0.5000 Rainfall             EXD_12
  A18                  0.59    338.21     39.12    0.5000 Rainfall             EXD_25
  A19                  1.11    332.78     22.32    0.5000 Rainfall             EXD_20
  A20                  4.83    279.76      8.37    1.5000 Rainfall             EXD_15
  NULL3                0.57    312.75     83.33    1.4500 Rainfall             EXD_27
  S1                   6.52   1467.98     66.38    2.0000 Rainfall             S_605-604
  S1_1                 0.12    118.05     71.43    2.0000 Rainfall             J19
  S1_2                 0.12    147.72     71.43    2.0000 Rainfall             J22
  S1_4                 0.19    154.58     71.43    2.0000 Rainfall             J21
  S1_5                 0.11    103.57     71.43    2.0000 Rainfall             J20
  S10_1                1.84    414.84     64.29    2.0000 Rainfall             S_619-606
  S10_2                2.12    478.11     64.29    2.0000 Rainfall             S_622-
619_2
  S10_4                0.73    163.42     64.29    2.0000 Rainfall             S_627-630
  S10_5                1.26    283.52     64.29    2.0000 Rainfall             S_629-622
  S11                  3.30    287.00      0.00    2.0000 Rainfall             SU2
  S12                  0.44    334.74     71.43    2.0000 Rainfall             J6
  S14_1                0.60    367.10     71.43    2.0000 Rainfall             J28
  S14_3                1.06    381.29     71.43    2.0000 Rainfall             J58
  S14_4                0.30    171.63     71.43    2.0000 Rainfall             J44
  S14_5                1.69    659.05     71.43    2.0000 Rainfall             J29
  S14_6                0.29    153.64     71.43    2.0000 Rainfall             J59
  S14_7                1.17    557.97     71.43    2.0000 Rainfall             J61
  S14_8                0.34    171.63     71.43    2.0000 Rainfall             J48
  S15                  1.64    368.26     64.29    2.0000 Rainfall             S_525-MTD
  S16                  1.47     16.60    100.00    0.5000 Rainfall             EXD_10
  S17                  6.26    202.00      3.33    0.5000 Rainfall             EXD_7
  S18_2                3.35    754.05     64.29    2.0000 Rainfall             S_541-540
  S18_3                1.66    372.76     64.29    2.0000 Rainfall             S_528-525
  S18_4                0.88    197.06     64.29    2.0000 Rainfall             S_540-536
  S18_5                1.83    412.02     71.43    2.0000 Rainfall             S_536-532
  S18_6                0.84    188.96     64.29    2.0000 Rainfall             S_532-528
  S19                  1.05    441.38     71.43    2.0000 Rainfall             J19
  S2                   3.72    837.17     66.87    2.0000 Rainfall             S_622-619
  S20_1                0.50    441.34     71.43    2.0000 Rainfall             J40
  S20_2                0.23    441.34     71.43    2.0000 Rainfall             J36
  S3                   2.48    557.29     64.29    2.0000 Rainfall             S_604-603
  S32                  0.41    327.12     71.43    2.0000 Rainfall             J46
  S36                  1.82     21.00    100.00    0.5000 Rainfall             EXD_10
  S4                  13.22    348.80     85.71    2.0000 Rainfall             631_(C-
STRM)
  S5                   3.19    291.50     85.71    1.0000 Rainfall             682_(C-
STRM)
  S6                   0.34    260.95     57.14    2.0000 Rainfall             OF2
  S7                   3.99    402.80     85.71    0.5000 Rainfall             POND_(C-
STRM)
  S8                   1.92    119.90     35.71    2.0000 Rainfall             SU5


  ************
  Node Summary
  ************
  Name                 Type                 Invert      Max.    Ponded    External
                                             Elev.     Depth      Area    Inflow
  ---------------------------------------------------------------------------------
  EXD_1                JUNCTION            104.39      1.51       0.0
  EXD_10               JUNCTION             98.65      1.20       0.0
  EXD_11               JUNCTION             98.50      1.20       0.0
  EXD_12               JUNCTION             98.31      1.20       0.0
  EXD_13               JUNCTION            104.32      1.10       0.0
  EXD_14               JUNCTION            102.49      0.80       0.0
  EXD_15               JUNCTION            100.27      0.80       0.0
  EXD_16               JUNCTION            100.20      0.80       0.0
  EXD_17               JUNCTION             99.89      0.80       0.0
  EXD_18               JUNCTION             99.40      0.84       0.0
  EXD_19               JUNCTION             99.19      0.88       0.0
  EXD_2                JUNCTION            103.47      1.93       0.0
  EXD_20               JUNCTION             99.19      0.88       0.0
  EXD_21               JUNCTION             99.18      0.88       0.0
  EXD_22               JUNCTION             99.14      0.88       0.0
  EXD_23               JUNCTION             98.75      1.14       0.0
  EXD_24               JUNCTION             98.67      1.14       0.0
  EXD_25               JUNCTION             98.52      1.13       0.0
  EXD_26               JUNCTION             98.48      1.13       0.0
  EXD_27               JUNCTION             98.17      1.20       0.0
  EXD_3                JUNCTION            103.19      1.41       0.0
  EXD_4                JUNCTION            102.64      1.20       0.0
  EXD_5                JUNCTION            102.50      1.20       0.0
  EXD_6                JUNCTION            102.32      1.08       0.0
  EXD_7                JUNCTION            101.50      1.06       0.0
  EXD_8                JUNCTION            100.48      1.06       0.0
  EXD_9                JUNCTION            100.39      1.06       0.0
  J10                  JUNCTION            103.60      0.50       0.0
  J11                  JUNCTION            103.50      0.50       0.0
  J12                  JUNCTION            103.40      0.50       0.0
  J13                  JUNCTION            103.30      0.50       0.0
  J17                  JUNCTION            104.37      1.04       0.0
  J19                  JUNCTION            105.40      0.50       0.0
  J20                  JUNCTION            105.45      0.50       0.0
  J21                  JUNCTION            105.55      0.50       0.0
  J22                  JUNCTION            105.70      0.50       0.0
  J23                  JUNCTION            106.00      0.50       0.0
  J24                  JUNCTION            106.20      0.50       0.0
  J25                  JUNCTION            105.30      0.50       0.0
  J26                  JUNCTION            105.70      0.50       0.0
  J28                  JUNCTION            109.00      0.50       0.0
  J29                  JUNCTION            108.80      0.50       0.0
  J32                  JUNCTION            106.00      0.50       0.0
  J36                  JUNCTION            104.70      0.50       0.0
  J39                  JUNCTION            104.60      0.50       0.0
  J40                  JUNCTION            104.45      0.50       0.0
  J41                  JUNCTION            103.20      0.50       0.0
  J43                  JUNCTION            104.20      0.50       0.0
  J44                  JUNCTION            104.50      0.50       0.0
  J46                  JUNCTION            104.60      0.50       0.0
  J47                  JUNCTION            105.10      0.50       0.0
  J48                  JUNCTION            105.75      0.50       0.0
  J51                  JUNCTION            106.75      0.50       0.0
  J52                  JUNCTION            109.75      0.50       0.0
  J53                  JUNCTION            109.00      0.50       0.0
  J56                  JUNCTION            109.10      0.50       0.0
  J57                  JUNCTION            108.47      0.50       0.0
  J58                  JUNCTION            108.40      0.50       0.0
  J59                  JUNCTION            108.00      0.50       0.0
  J6                   JUNCTION            109.83      0.30       0.0
  J61                  JUNCTION            107.00      0.50       0.0
  J62                  JUNCTION            106.50      0.50       0.0
  J74                  JUNCTION             98.45      0.90       0.0
  J9                   JUNCTION            103.70      0.50       0.0
  OF1                  OUTFALL             100.80      0.00       0.0
  OF2                  OUTFALL               0.00      0.00       0.0
  OF3                  OUTFALL              98.00      1.06       0.0
  ST4_108A_(P-Stm)     OUTFALL              98.02      1.19       0.0
  500_(C-STRM)         STORAGE             100.31      2.84       0.0
  500A_(C-STRM)        STORAGE             100.10      1.00       0.0
  502_(C-STRM)         STORAGE             100.54      3.70       0.0
  503_(C-STRM)         STORAGE             100.59      3.92       0.0
  504_(C-STRM)         STORAGE             103.04      2.70       0.0
  505_(C-STRM)         STORAGE             103.45      3.26       0.0
  506_(C-STRM)         STORAGE             103.82      3.16       0.0
  507_(C-STRM)         STORAGE             104.14      3.10       0.0
  508_(C-STRM)         STORAGE             104.37      3.12       0.0
  509_(C-STRM)         STORAGE             104.60      3.14       0.0
  510_(C-STRM)         STORAGE             104.85      3.09       0.0
  511_(C-STRM)         STORAGE             104.91      3.08       0.0
  512_(C-STRM)         STORAGE             105.11      3.12       0.0
  513_(C-STRM)         STORAGE             105.24      3.14       0.0
  514_(C-STRM)         STORAGE             105.59      3.16       0.0
  515_(C-STRM)         STORAGE             105.85      3.24       0.0
  516_(C-STRM)         STORAGE             105.46      3.06       0.0
  517_(C-STRM)         STORAGE             105.62      3.03       0.0
  518_(C-STRM)         STORAGE             105.85      2.92       0.0
  519_(C-STRM)         STORAGE             106.08      2.82       0.0
  520_(C-STRM)         STORAGE             106.34      2.66       0.0
  522_(C-STRM)         STORAGE             104.31      3.00       0.0
  525_(C-STRM)         STORAGE             100.61      2.69       0.0
  528_(C-STRM)         STORAGE             100.72      2.68       0.0
  532_(C-STRM)         STORAGE             100.83      2.67       0.0
  536_(C-STRM)         STORAGE             100.98      2.63       0.0
  540_(C-STRM)         STORAGE             100.86      2.85       0.0
  541_(C-STRM)         STORAGE             100.93      2.89       0.0
  551_(C-STRM)         STORAGE             100.65      3.78       0.0
  552_(C-STRM)         STORAGE             100.74      3.88       0.0
  553_(C-STRM)         STORAGE             100.93      3.78       0.0
  554_(C-STRM)         STORAGE             101.05      3.89       0.0
  555_(C-STRM)         STORAGE             101.25      3.93       0.0
  556_(C-STRM)         STORAGE             101.37      3.89       0.0
  601_(C-STRM)         STORAGE             100.45      4.43       0.0
  602_(C-STRM)         STORAGE             100.52      4.11       0.0
  603_(C-STRM)         STORAGE             100.63      3.89       0.0
  604_(C-STRM)         STORAGE             100.88      4.87       0.0
  605_(C-STRM)         STORAGE             101.09      5.63       0.0
  606_(C-STRM)         STORAGE             101.24      5.75       0.0
  619_(C-STRM)         STORAGE             101.38      5.14       0.0
  622_(C-STRM)         STORAGE             101.53      4.49       0.0
  626_(C-STRM)         STORAGE             103.94      3.33       0.0
  627_(C-STRM)         STORAGE             103.13      3.58       0.0
  629_(C-STRM)         STORAGE             101.65      4.46       0.0
  630_(C-STRM)         STORAGE             102.08      4.12       0.0
  630A_(C-STRM)        STORAGE             102.12      3.90       0.0
  631_(C-STRM)         STORAGE             106.00      0.50       0.0
  645_(C-STRM)         STORAGE             102.03      3.69       0.0
  647_(C-STRM)         STORAGE             102.14      3.40       0.0
  650_(C-STRM)         STORAGE             102.22      3.19       0.0
  651_(C-STRM)         STORAGE             102.31      3.03       0.0
  682_(C-STRM)         STORAGE             105.40      0.50       0.0
  MTD_(C-STRM)         STORAGE             100.37      3.19       0.0
  OVERFLOW_(C-STRM)    STORAGE             100.18      2.76       0.0
  POND_(C-STRM)        STORAGE              98.45      2.65       0.0     Yes
  S_525-MTD            STORAGE             103.30      0.50       0.0
  S_528-525            STORAGE             103.41      0.50       0.0
  S_532-528            STORAGE             103.50      0.50       0.0
  S_536-532            STORAGE             103.60      0.50       0.0
  S_540-536            STORAGE             103.71      0.50       0.0
  S_541-540            STORAGE             103.81      0.50       0.0
  S_604-603            STORAGE             105.50      0.50       0.0
  S_605-604            STORAGE             106.71      0.50       0.0
  S_619-606            STORAGE             106.50      0.50       0.0
  S_622-619            STORAGE             105.70      0.50       0.0
  S_622-619_2          STORAGE             106.50      0.50       0.0
  S_627-630            STORAGE             106.70      0.50       0.0
  S_629-622            STORAGE             106.01      0.50       0.0
  SU2                  STORAGE             106.75      0.50       0.0
  SU5                  STORAGE             104.18      0.50       0.0


  ************
  Link Summary
  ************
  Name                 From Node        To Node          Type           Length    %Slope
Roughness
  ---------------------------------------------------------------------------------------
-
  BDR-C1               EXD_15           EXD_16           CONDUIT          17.7    0.3844
0.0250
  BDR-C2               EXD_20           EXD_21           CONDUIT           7.9    0.0632
0.0130
  BDR-C3               EXD_25           EXD_26           CONDUIT          14.2    0.2683
0.0130
  BDR-C4               EXD_12           EXD_27           CONDUIT          23.0    0.6077
0.0130
  C1_1                 J32              J26              CONDUIT          71.8    0.4181
0.0130
  C1_17                J6               EXD_1            CONDUIT         171.9    2.4608
0.0130
  C1_3                 J28              J29              CONDUIT         183.6    0.1090
0.0130
  C1_30                J26              J25              CONDUIT          93.1    0.4296
0.0130
  C1_4                 J25              J39              CONDUIT          75.0    0.9329
0.0130
  C14_1                J20              J19              CONDUIT          59.0    0.0847
0.0130
  C14_2                J23              J22              CONDUIT          73.9    0.4062
0.0130
  C14_4                J22              J21              CONDUIT          77.3    0.1941
0.0130
  C14_5                J21              J20              CONDUIT          51.8    0.1931
0.0130
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C15_1	J29	J58	CONDUIT	329.5	0.1214
0.0130					
C15_2	J56	J58	CONDUIT	190.6	0.3672
0.0130					
C2	J41	500A_(C-STRM)	CONDUIT	74.7	0.2679
0.0100					
C20_1	J57	J58	CONDUIT	40.0	0.1749
0.0130					
C20_2	J59	J61	CONDUIT	207.0	0.4831
0.0130					
C20_3	J58	J59	CONDUIT	76.8	0.5207
0.0130					
C20_4	J61	J51	CONDUIT	72.0	0.3472
0.0130					
C20_5	J51	J48	CONDUIT	85.8	1.1654
0.0130					
C20_7	J48	J44	CONDUIT	85.8	1.4568
0.0130					
C23_5	J13	J41	CONDUIT	64.4	0.1553
0.0130					
C23_7	J43	J41	CONDUIT	50.7	1.9737
0.0130					
C3	J9	J10	CONDUIT	72.0	0.1390
0.0100					
C4	J10	J11	CONDUIT	45.5	0.2196
0.0100					
C4_1	J24	J23	CONDUIT	27.6	0.7240
0.0130					
C4_2	J62	J32	CONDUIT	72.0	0.6944
0.0130					
C4_3	J24	J32	CONDUIT	163.0	0.1227
0.0130					
C4_4	J61	J62	CONDUIT	75.0	0.6666
0.0130					
C4_5	J53	J61	CONDUIT	165.5	1.2085
0.0130					
C4_7	J52	J53	CONDUIT	35.9	2.0894
0.0130					
C5	J11	J12	CONDUIT	72.0	0.1388
0.0100					
C5_1	EXD_1	J17	CONDUIT	19.0	0.1054
0.0250					
C5_10	EXD_16	EXD_17	CONDUIT	81.0	0.3866
0.0250					
C5_11	EXD_18	EXD_19	CONDUIT	109.9	0.1893
0.0250					
C5_12	EXD_27	OF3	CONDUIT	27.1	0.6098
0.0250					
C5_13	EXD_17	EXD_18	CONDUIT	99.9	0.4876
0.0250					
C5_14	EXD_19	EXD_20	CONDUIT	12.7	0.0550
0.0250					
C5_15	EXD_22	EXD_23	CONDUIT	101.7	0.3893
0.0250					
C5_16	EXD_23	EXD_24	CONDUIT	102.4	0.0781
0.0250					
C5_17	EXD_24	EXD_25	CONDUIT	54.8	0.2645
0.0250					
C5_19	EXD_21	EXD_22	CONDUIT	66.3	0.0558
0.0250					
C5_2	EXD_2	EXD_3	CONDUIT	95.1	0.2933
0.0250					
C5_20	EXD_26	EXD_27	CONDUIT	121.0	0.2645
0.0250					
C5_21	EXD_14	EXD_15	CONDUIT	142.1	1.5626
0.0250					
C5_23	J17	EXD_13	CONDUIT	37.0	0.1299
0.0250					
C5_3	EXD_13	EXD_2	CONDUIT	104.3	0.8195
0.0250					
C5_4	EXD_4	EXD_5	CONDUIT	16.6	0.8880
0.0250					
C5_5	EXD_6	EXD_7	CONDUIT	104.5	0.7893
0.0250					
C5_6	EXD_3	EXD_4	CONDUIT	61.7	0.8871
0.0250					
C5_7	EXD_9	EXD_10	CONDUIT	284.4	0.6091
0.0250					
C5_8	EXD_7	EXD_8	CONDUIT	165.7	0.6095
0.0250					
C5_9	EXD_11	EXD_12	CONDUIT	31.7	0.6087
0.0250					
C6	J12	J13	CONDUIT	71.9	0.1390
0.0100					
C7	J46	J44	CONDUIT	70.2	0.1425
0.0130					
C9_1	J19	J36	CONDUIT	220.7	0.3172
0.0130					
C9_11	J47	J46	CONDUIT	93.4	0.5355
0.0130					
C9_2	J36	J39	CONDUIT	45.5	0.2197
0.0130					
C9_5	J39	J40	CONDUIT	44.0	0.3411
0.0130					
C9_6	J40	J43	CONDUIT	72.0	0.3471
0.0130					
C9_7	J44	J43	CONDUIT	31.1	0.9652
0.0130					
C-STRM-1_(1)_(1)_(C-STRM)	516_(C-STRM)	513_(C-STRM)	CONDUIT	106.6	0.1998
0.0130					
C-STRM-1_(1)_(C-STRM)	517_(C-STRM)	516_(C-STRM)	CONDUIT	106.0	0.1500
0.0130					
C-STRM-1_(C-STRM)	518_(C-STRM)	517_(C-STRM)	CONDUIT	106.6	0.1500
0.0130					
C-STRM-100_(C-STRM)	OVERFLOW_(C-STRM)	500_(C-STRM)	CONDUIT	37.1	0.5007
0.0130					
C-STRM-101_(C-STRM)	500_(C-STRM)	POND_(C-STRM)	CONDUIT	12.9	1.6531
0.0130					
C-STRM-102_(C-STRM)	OVERFLOW_(C-STRM)	500A_(C-STRM)	CONDUIT	15.2	0.4996
0.0100					
C-STRM-103_(C-STRM)	650_(C-STRM)	647_(C-STRM)	CONDUIT	56.9	0.1493
0.0130					
C-STRM-104_(C-STRM)	647_(C-STRM)	645_(C-STRM)	CONDUIT	74.2	0.1495
0.0130					
C-STRM-105_(C-STRM)	645_(C-STRM)	630A_(C-STRM)	CONDUIT	73.8	0.1504
0.0130					
C-STRM-2_(1)_(C-STRM)	512_(C-STRM)	511_(C-STRM)	CONDUIT	44.5	0.4498
0.0130					
C-STRM-2_(C-STRM)	513_(C-STRM)	512_(C-STRM)	CONDUIT	29.3	0.4502
0.0130					
C-STRM-20_(C-STRM)	626_(C-STRM)	627_(C-STRM)	CONDUIT	73.8	1.0000
0.0130					
C-STRM-21_(C-STRM)	627_(C-STRM)	630_(C-STRM)	CONDUIT	72.4	0.5001
0.0130					
C-STRM-22_(1)_(C-STRM)	629_(C-STRM)	622_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-22_(C-STRM)	630_(C-STRM)	629_(C-STRM)	CONDUIT	81.4	0.1499
0.0130					
C-STRM-26_(1)_(C-STRM)	551_(C-STRM)	502_(C-STRM)	CONDUIT	60.8	0.1596
0.0130					
C-STRM-26_(C-STRM)	552_(C-STRM)	551_(C-STRM)	CONDUIT	60.3	0.1610
0.0130					
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	506_(C-STRM)	505_(C-STRM)	CONDUIT		
73.5	0.5007	0.0130			
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	507_(C-STRM)	506_(C-STRM)	CONDUIT	48.8	
0.5003	0.0130				
C-STRM-3_(1)_(1)_(1)_(C-STRM)	508_(C-STRM)	507_(C-STRM)	CONDUIT	45.5	
0.4989	0.0130				
C-STRM-3_(1)_(1)_(C-STRM)	509_(C-STRM)	508_(C-STRM)	CONDUIT	45.5	0.5011
0.0130					
C-STRM-3_(1)_(2)_(C-STRM)	510_(C-STRM)	509_(C-STRM)	CONDUIT	55.7	0.4489
0.0130					
C-STRM-3_(1)_(C-STRM)	511_(C-STRM)	510_(C-STRM)	CONDUIT	14.5	0.4538
0.0130					
C-STRM-33_(C-STRM)	651_(C-STRM)	650_(C-STRM)	CONDUIT	57.0	0.1508
0.0130					
C-STRM-34_(1)_(1)_(C-STRM)	555_(C-STRM)	554_(C-STRM)	CONDUIT	75.2	
0.1596	0.0130				
C-STRM-34_(1)_(C-STRM)	556_(C-STRM)	555_(C-STRM)	CONDUIT	75.2	0.1596
0.0130					
C-STRM-35_(1)_(C-STRM)	553_(C-STRM)	552_(C-STRM)	CONDUIT	72.1	0.1596
0.0130					
C-STRM-35_(C-STRM)	554_(C-STRM)	553_(C-STRM)	CONDUIT	72.0	0.1611
0.0130					
C-STRM-4_(1)_(C-STRM)	504_(C-STRM)	503_(C-STRM)	CONDUIT	83.5	0.5997
0.0130					
C-STRM-4_(C-STRM)	505_(C-STRM)	504_(C-STRM)	CONDUIT	83.5	0.4992
0.0130					
C-STRM-49_(C-STRM)	541_(C-STRM)	540_(C-STRM)	CONDUIT	47.7	0.1508
0.0130					
C-STRM-50_(C-STRM)	540_(C-STRM)	536_(C-STRM)	CONDUIT	72.0	0.1500
0.0130					
C-STRM-51_(C-STRM)	536_(C-STRM)	532_(C-STRM)	CONDUIT	48.5	0.1505
0.0130					
C-STRM-52_(C-STRM)	532_(C-STRM)	528_(C-STRM)	CONDUIT	69.0	0.1493
0.0130					
C-STRM-53_(C-STRM)	528_(C-STRM)	525_(C-STRM)	CONDUIT	75.0	0.1507
0.0130					
C-STRM-57_(C-STRM)	503_(C-STRM)	502_(C-STRM)	CONDUIT	27.5	0.1525
0.0130					
C-STRM-62_(C-STRM)	520_(C-STRM)	519_(C-STRM)	CONDUIT	95.9	0.2003
0.0130					
C-STRM-63_(C-STRM)	519_(C-STRM)	518_(C-STRM)	CONDUIT	97.4	0.1509
0.0130					
C-STRM-64_(C-STRM)	522_(C-STRM)	EXD_1	CONDUIT	81.9	0.2504
0.0130					
C-STRM-74_(C-STRM)	619_(C-STRM)	606_(C-STRM)	CONDUIT	70.5	0.2000
0.0130					
C-STRM-75_(C-STRM)	606_(C-STRM)	605_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
C-STRM-76_(C-STRM)	525_(C-STRM)	MTD_(C-STRM)	CONDUIT	83.3	0.1993
0.0130					
C-STRM-77_(C-STRM)	MTD_(C-STRM)	OVERFLOW_(C-STRM)	CONDUIT	38.5	0.5013
0.0130					
C-STRM-78_(C-STRM)	502_(C-STRM)	MTD_(C-STRM)	CONDUIT	33.2	0.2980
0.0130					
C-STRM-79_(1)_(C-STRM)	604_(C-STRM)	603_(C-STRM)	CONDUIT	82.3	0.3001
0.0130					
C-STRM-79_(C-STRM)	605_(C-STRM)	604_(C-STRM)	CONDUIT	83.5	0.2502
0.0130					
C-STRM-8_(1)_(C-STRM)	514_(C-STRM)	513_(C-STRM)	CONDUIT	95.2	0.2007
0.0130					
C-STRM-8_(C-STRM)	515_(C-STRM)	514_(C-STRM)	CONDUIT	95.1	0.1997
0.0130					
C-STRM-80_(C-STRM)	603_(C-STRM)	602_(C-STRM)	CONDUIT	74.3	0.1493
0.0130					
C-STRM-81_(C-STRM)	602_(C-STRM)	601_(C-STRM)	CONDUIT	46.7	0.1499
0.0130					
C-STRM-82_(C-STRM)	601_(C-STRM)	POND_(C-STRM)	CONDUIT	32.5	0.1508
0.0130					
C-STRM-83_(1)_(C-STRM)	630A_(C-STRM)	630_(C-STRM)	CONDUIT	27.4	0.1498
0.0130					
C-STRM-84_(C-STRM)	622_(C-STRM)	619_(C-STRM)	CONDUIT	75.0	0.2000
0.0130					
CVR-C2	EXD_5	EXD_6	CONDUIT	19.8	0.8875
0.0130					
CVR-C3	EXD_8	EXD_9	CONDUIT	16.4	0.6114
0.0130					
CVR-C4	EXD_10	EXD_11	CONDUIT	25.4	0.6110
0.0130					
ST4-Pipe_-_(99)_(P-Stm)	J74	ST4_108A_(P-Stm)	CONDUIT	49.3	0.2840
0.0130					
W1	500A_(C-STRM)	POND_(C-STRM)	CONDUIT	4.9	0.0063
0.0250					

OR1	POND_(C-STRM)	J74	ORIFICE
OR2	POND_(C-STRM)	J74	ORIFICE
W10	S_536-532	J10	WEIR
W11	S_532-528	J11	WEIR
W12	S_528-525	J12	WEIR
W13	S_525-MTD	J13	WEIR
W14	S_629-622	J32	WEIR
W15	S_622-619	J26	WEIR
W2	POND_(C-STRM)	OF1	WEIR
W3	S_627-630	J24	WEIR
W4	S_622-619_2	J32	WEIR
W5	S_619-606	J62	WEIR
W6	S_605-604	J51	WEIR
W7	S_604-603	J25	WEIR
W8	S_541-540	J9	WEIR
W9	S_540-536	J9	WEIR
C1	S_622-619_2	622_(C-STRM)	OUTLET
C-STRM-107_(C-STRM)	S_604-603	604_(C-STRM)	OUTLET
C-STRM-14_(1)_(C-STRM)	S_605-604	605_(C-STRM)	OUTLET
C-STRM-23_(C-STRM)	S_622-619	622_(C-STRM)	OUTLET
C-STRM-42_(C-STRM)	S_541-540	541_(C-STRM)	OUTLET
C-STRM-44_(1)_(C-STRM)	S_525-MTD	525_(C-STRM)	OUTLET
C-STRM-45_(1)_(C-STRM)	S_619-606	619_(C-STRM)	OUTLET
C-STRM-71_(C-STRM)	682_(C-STRM)	651_(C-STRM)	OUTLET
C-STRM-83_(C-STRM)	631_(C-STRM)	630A_(C-STRM)	OUTLET
C-STRM-96_(1)_(C-STRM)	S_536-532	536_(C-STRM)	OUTLET
C-STRM-97_(1)_(C-STRM)	S_532-528	532_(C-STRM)	OUTLET
C-STRM-98_(1)_(C-STRM)	S_528-525	528_(C-STRM)	OUTLET
OL1	S_627-630	627_(C-STRM)	OUTLET
OL10	500A_(C-STRM)	POND_(C-STRM)	OUTLET
OL11	J36	553_(C-STRM)	OUTLET
OL12	J40	551_(C-STRM)	OUTLET
OL13	J46	602_(C-STRM)	OUTLET
OL14	J28	520_(C-STRM)	OUTLET
OL15	J6	522_(C-STRM)	OUTLET
OL16	J29	518_(C-STRM)	OUTLET
OL17	J58	513_(C-STRM)	OUTLET
OL18	J59	511_(C-STRM)	OUTLET
OL19	J61	506_(C-STRM)	OUTLET
OL2	SU2	626_(C-STRM)	OUTLET
OL20	J48	504_(C-STRM)	OUTLET
OL21	J44	503_(C-STRM)	OUTLET
OL22	SU5	504_(C-STRM)	OUTLET
OL3	S_629-622	629_(C-STRM)	OUTLET
OL4	S_540-536	540_(C-STRM)	OUTLET
OL5	J22	645_(C-STRM)	OUTLET
OL6	J21	647_(C-STRM)	OUTLET
OL7	J20	650_(C-STRM)	OUTLET
OL8	J19	651_(C-STRM)	OUTLET
OL9	J19	556_(C-STRM)	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
BDR-C1	CIRCULAR	0.40	0.13	0.10	0.40	1	0.07
BDR-C2	CIRCULAR	0.40	0.13	0.10	0.40	1	0.05
BDR-C3	CIRCULAR	0.50	0.20	0.12	0.50	1	0.20
BDR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.04
C1_1	ROW_18m	0.25	2.05	0.13	18.00	1	2.64
C1_17	ROW_26m	0.30	3.49	0.14	26.00	1	11.28
C1_3	ROW_26m	0.30	3.49	0.14	26.00	1	2.37
C1_30	ROW_18m	0.25	2.05	0.13	18.00	1	2.68
C1_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.94
C12_1	ROW_18m	0.25	2.05	0.13	18.00	1	1.19
C14_2	ROW_18m	0.25	2.05	0.13	18.00	1	2.60
C14_4	ROW_18m	0.25	2.05	0.13	18.00	1	1.80
C14_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.79
C15_1	ROW_26m	0.30	3.49	0.14	26.00	1	2.51
C15_2	ROW_26m	0.30	3.49	0.14	26.00	1	4.36
C2	RECT_OPEN	0.50	3.10	0.43	6.19	1	9.13
C20_1	ROW_24m	0.32	3.34	0.14	24.00	1	2.93
C20_2	ROW_24m	0.32	3.34	0.14	24.00	1	4.87
C20_3	ROW_24m	0.32	3.34	0.14	24.00	1	5.05
C20_4	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C20_5	ROW_24m	0.32	3.34	0.14	24.00	1	7.56
C20_7	ROW_24m	0.32	3.34	0.14	24.00	1	8.45
C23_5	ROW_18m	0.25	2.05	0.13	18.00	1	1.61
C23_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.74
C3	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58

C4	RECT_OPEN	0.50	3.10	0.43	6.19	1	8.27
C4_1	ROW_18m	0.25	2.05	0.13	18.00	1	3.47
C4_2	ROW_18m	0.25	2.05	0.13	18.00	1	3.40
C4_3	ROW_18m	0.25	2.05	0.13	18.00	1	1.43
C4_4	ROW_18m	0.25	2.05	0.13	18.00	1	3.33
C4_5	ROW_18m	0.25	2.05	0.13	18.00	1	4.49
C4_7	ROW_18m	0.25	2.05	0.13	18.00	1	5.90
C5	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.57
C5_1	Upstream1	1.04	5.92	0.43	13.00	1	4.37
C5_10	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	3.43
C5_11	Barnsdale_UPST3	0.84	3.40	0.32	10.00	1	2.77
C5_12	Upstream6	1.06	6.96	0.40	17.00	1	11.86
C5_13	Barnsdale_UPST2	0.77	3.01	0.30	9.50	1	3.74
C5_14	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.49
C5_15	Barnsdale_UPST5	0.80	3.10	0.32	9.00	1	3.61
C5_16	Barnsdale_UPST6	1.14	6.38	0.46	13.00	1	4.25
C5_17	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.23
C5_19	Barnsdale_UPST4	0.88	3.22	0.34	8.50	1	1.50
C5_2	Upstream3	1.07	5.77	0.42	13.00	1	6.98
C5_20	Barnsdale_UPST7	1.13	7.59	0.53	13.50	1	10.24
C5_21	Barnsdale_UPST1	0.80	3.11	0.29	10.00	1	6.89
C5_23	Upstream1	1.04	5.92	0.43	13.00	1	4.86
C5_3	Upstream2	1.10	6.55	0.44	14.00	1	13.83
C5_4	Upstream4	1.20	7.30	0.50	13.50	1	17.41
C5_5	Upstream5	1.06	6.46	0.42	15.00	1	12.79
C5_6	Upstream4	1.20	7.30	0.50	13.50	1	17.40
C5_7	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_8	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C5_9	Upstream6	1.06	6.96	0.40	17.00	1	11.85
C6	RECT_OPEN	0.50	3.10	0.43	6.19	1	6.58
C7	ROW_24m	0.32	3.34	0.14	24.00	1	2.64
C9_1	ROW_24m	0.32	3.34	0.14	24.00	1	3.94
C9_11	ROW_24m	0.32	3.34	0.14	24.00	1	5.13
C9_2	ROW_24m	0.32	3.34	0.14	24.00	1	3.28
C9_5	ROW_24m	0.32	3.34	0.14	24.00	1	4.09
C9_6	ROW_24m	0.32	3.34	0.14	24.00	1	4.13
C9_7	ROW_24m	0.32	3.34	0.14	24.00	1	6.88
C-STRM-1_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.38							
C-STRM-1_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-1_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.24
C-STRM-100_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.43
C-STRM-101_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.79
C-STRM-102_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	2.51
C-STRM-103_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.55
C-STRM-104_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-105_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-2_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-2_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.56
C-STRM-20_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.29
C-STRM-21_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.30
C-STRM-22_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
4.45							
C-STRM-22_(C-STRM) CIRCULAR		1.50	1.77	0.38	1.50	1	2.74
C-STRM-26_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.34							
C-STRM-26_(C-STRM) CIRCULAR		0.68	0.36	0.17	0.68	1	0.34
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.75	0.44	0.19	0.75
1 0.79							
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM) CIRCULAR				0.68	0.36	0.17	0.68
1 0.59							
C-STRM-3_(1)_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.59							
C-STRM-3_(1)_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.60							
C-STRM-3_(1)_(2)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
0.56							
C-STRM-3_(1)_(C-STRM) CIRCULAR			0.68	0.36	0.17	0.68	1
C-STRM-33_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-34_(1)_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-34_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
0.17							
C-STRM-35_(1)_(C-STRM) CIRCULAR			0.60	0.28	0.15	0.60	1
0.25							
C-STRM-35_(C-STRM) CIRCULAR		0.60	0.28	0.15	0.60	1	0.25
C-STRM-4_(1)_(C-STRM) CIRCULAR			0.75	0.44	0.19	0.75	1
C-STRM-4_(C-STRM) CIRCULAR		0.75	0.44	0.19	0.75	1	0.79
C-STRM-49_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-50_(C-STRM) CIRCULAR		0.82	0.53	0.21	0.82	1	0.56
C-STRM-51_(C-STRM) CIRCULAR		0.90	0.64	0.23	0.90	1	0.70
C-STRM-52_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-53_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.87
C-STRM-57_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	0.88
C-STRM-62_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-63_(C-STRM) CIRCULAR		0.53	0.22	0.13	0.53	1	0.17
C-STRM-64_(C-STRM) CIRCULAR		0.38	0.11	0.09	0.38	1	0.09
C-STRM-74_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-75_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
C-STRM-76_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.00
C-STRM-77_(C-STRM) CIRCULAR		1.05	0.87	0.26	1.05	1	1.93
C-STRM-78_(C-STRM) CIRCULAR		0.97	0.75	0.24	0.97	1	1.22
C-STRM-79_(1)_(C-STRM) CIRCULAR			1.80	2.54	0.45	1.80	1
6.30							
C-STRM-79_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.75
C-STRM-8_(1)_(C-STRM) CIRCULAR			0.53	0.22	0.13	0.53	1
C-STRM-8_(C-STRM) CIRCULAR		0.45	0.16	0.11	0.45	1	0.13
C-STRM-80_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.44
C-STRM-81_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.45
C-STRM-82_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	4.46
C-STRM-83_(1)_(C-STRM) CIRCULAR			1.50	1.77	0.38	1.50	1
2.74							
C-STRM-84_(C-STRM) CIRCULAR		1.80	2.54	0.45	1.80	1	5.14
CVR-C2	CIRCULAR	0.45	0.16	0.11	0.45	1	0.27
CVR-C3	CIRCULAR	0.40	0.13	0.10	0.40	1	0.16
CVR-C4	CIRCULAR	1.20	1.13	0.30	1.20	1	3.05
ST4-Pipe_-_(99)_(P-Stm) CIRCULAR			0.90	0.64	0.23	0.90	1
0.96							
W1	Pond_SpillWay	3.89	318.30	4.06	128.79	1	256.54

****
Transect Summary
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Transect Barnsdale_UPST1
Area:

0.0007	0.0026	0.0059	0.0100	0.0149
0.0207	0.0273	0.0348	0.0435	0.0533
0.0641	0.0755	0.0875	0.1001	0.1134
0.1273	0.1419	0.1570	0.1727	0.1890
0.2058	0.2232	0.2412	0.2598	0.2794
0.3002	0.3220	0.3442	0.3665	0.3891
0.4119	0.4349	0.4583	0.4822	0.5066
0.5315	0.5570	0.5831	0.6101	0.6380
0.6668	0.6965	0.7269	0.7591	0.7934
0.8297	0.8679	0.9090	0.9525	1.0000

Hrad:

0.0267	0.0534	0.0845	0.1173	0.1482
0.1779	0.2068	0.2287	0.2500	0.2739
0.3074	0.3422	0.3761	0.4092	0.4417
0.4735	0.5058	0.5384	0.5706	0.6022
0.6336	0.6645	0.6952	0.7211	0.7289
0.7389	0.7693	0.8107	0.8515	0.8918
0.9314	0.9705	0.9981	1.0255	1.0527
1.0797	1.1065	1.1183	1.1300	1.1430
1.1590	1.1755	1.1892	1.1587	1.1416
1.1348	1.1201	1.0963	1.0803	1.0000

Width:

0.0256	0.0512	0.0720	0.0882	0.1043
0.1204	0.1365	0.1575	0.1801	0.2014
0.2154	0.2277	0.2399	0.2522	0.2645
0.2767	0.2885	0.2997	0.3108	0.3220
0.3332	0.3444	0.3555	0.3691	0.3929
0.4167	0.4284	0.4327	0.4370	0.4414
0.4457	0.4500	0.4599	0.4698	0.4796
0.4895	0.4994	0.5167	0.5344	0.5520
0.5684	0.5847	0.6028	0.6472	0.6875
0.7239	0.7682	0.8237	0.8773	1.0000

Transect Barnsdale_UPST2
Area:

0.0005	0.0018	0.0041	0.0073	0.0120
0.0186	0.0260	0.0341	0.0428	0.0523
0.0626	0.0736	0.0854	0.0979	0.1110
0.1249	0.1397	0.1578	0.1780	0.1990
0.2203	0.2420	0.2642	0.2867	0.3095
0.3327	0.3562	0.3798	0.4037	0.4277
0.4520	0.4765	0.5012	0.5261	0.5512
0.5765	0.6020	0.6278	0.6540	0.6807
0.7080	0.7357	0.7640	0.7931	0.8231
0.8541	0.8865	0.9207	0.9573	1.0000

Hrad:

0.0256	0.0511	0.0767	0.1022	0.1074
0.1357	0.1722	0.2069	0.2401	0.2711
0.3004	0.3302	0.3603	0.3898	0.4189
0.4476	0.4415	0.4190	0.4388	0.4798
0.5199	0.5592	0.5977	0.6356	0.6728
0.7128	0.7535	0.7938	0.8334	0.8726
0.9113	0.9495	0.9872	1.0245	1.0613
1.0977	1.1337	1.1646	1.1879	1.2112
1.2344	1.2576	1.2751	1.2829	1.2917
1.2903	1.2812	1.2529	1.2104	1.0000

Width:

0.0187	0.0374	0.0561	0.0748	0.1175
0.1437	0.1580	0.1723	0.1866	0.2018
0.2178	0.2330	0.2475	0.2621	0.2767
0.2912	0.3305	0.3942	0.4243	0.4322
0.4400	0.4479	0.4557	0.4636	0.4714
0.4767	0.4810	0.4853	0.4895	0.4938
0.4981	0.5023	0.5066	0.5109	0.5152
0.5194	0.5237	0.5304	0.5408	0.5513
0.5617	0.5722	0.5855	0.6041	0.6226
0.6472	0.6774	0.7214	0.7794	1.0000

Transect Barnsdale_UPST3
Area:

0.0027	0.0069	0.0125	0.0193	0.0272
0.0363	0.0466	0.0579	0.0700	0.0826
0.0959	0.1097	0.1240	0.1388	0.1542
0.1700	0.1863	0.2031	0.2203	0.2379
0.2560	0.2747	0.2941	0.3141	0.3347
0.3558	0.3771	0.3985	0.4201	0.4418
0.4636	0.4856	0.5078	0.5301	0.5527
0.5758	0.5993	0.6232	0.6476	0.6725
0.6978	0.7237	0.7501	0.7771	0.8071
0.8402	0.8745	0.9118	0.9532	1.0000

Hrad:

0.0392	0.0744	0.1058	0.1366	0.1672
0.1959	0.2240	0.2580	0.2951	0.3310
0.3684	0.4055	0.4418	0.4773	0.5121
0.5462	0.5798	0.6159	0.6517	0.6870
0.7143	0.7405	0.7665	0.7925	0.8185
0.8566	0.8974	0.9376	0.9773	1.0164
1.0550	1.0931	1.1307	1.1674	1.1903
1.2133	1.2361	1.2590	1.2818	1.3028
1.3220	1.3414	1.3608	1.3804	1.2136
1.2174	1.2098	1.1515	1.0615	1.0000

Width:

0.0725	0.0983	0.1241	0.1486	0.1712
0.1949	0.2186	0.2358	0.2487	0.2616
0.2724	0.2826	0.2929	0.3031	0.3133
0.3235	0.3337	0.3419	0.3500	0.3580
0.3702	0.3830	0.3958	0.4086	0.4214
0.4264	0.4294	0.4323	0.4353	0.4382
0.4412	0.4442	0.4471	0.4503	0.4593
0.4683	0.4773	0.4863	0.4953	0.5050
0.5156	0.5261	0.5367	0.5473	0.6537
0.6785	0.7115	0.7829	0.8936	1.0000

Transect Barnsdale_UPST4
Area:

0.0019	0.0059	0.0112	0.0176	0.0253
0.0342	0.0443	0.0558	0.0685	0.0822
0.0971	0.1130	0.1308	0.1486	0.1667
0.1851	0.2037	0.2227	0.2420	0.2614
0.2810	0.3009	0.3209	0.3410	0.3614
0.3820	0.4028	0.4237	0.4448	0.4662
0.4877	0.5094	0.5313	0.5534	0.5759
0.5987	0.6218	0.6452	0.6689	0.6930
0.7173	0.7420	0.7676	0.7942	0.8219
0.8514	0.8839	0.9202	0.9581	1.0000

Hrad:

0.0280	0.0647	0.0967	0.1263	0.1549
0.1817	0.2078	0.2337	0.2601	0.2914
0.3149	0.3386	0.3726	0.4140	0.4543
0.4937	0.5323	0.5700	0.6090	0.6481
0.6864	0.7241	0.7612	0.7976	0.8335
0.8688	0.9036	0.9379	0.9716	1.0049
1.0377	1.0701	1.1013	1.1277	1.1541
1.1801	1.2060	1.2316	1.2570	1.2823
1.3073	1.3203	1.3149	1.3115	1.2912
1.2608	1.1459	1.1371	1.1279	1.0000

Width:

0.0734	0.0994	0.1255	0.1515	0.1772
0.2041	0.2314	0.2587	0.2854	0.3056
0.3240	0.3624	0.3786	0.3849	0.3912
0.3975	0.4038	0.4101	0.4147	0.4188
0.4228	0.4269	0.4309	0.4350	0.4390
0.4430	0.4471	0.4511	0.4552	0.4592
0.4633	0.4673	0.4719	0.4786	0.4852
0.4919	0.4986	0.5052	0.5119	0.5186
0.5252	0.5375	0.5591	0.5808	0.6126
0.6529	0.7560	0.7953	0.8372	1.0000

Transect Barnsdale_UPST5
Area:

0.0011	0.0046	0.0104	0.0185	0.0278
0.0383	0.0495	0.0612	0.0736	0.0865
0.1000	0.1141	0.1288	0.1443	0.1606
0.1778	0.1959	0.2143	0.2330	0.2518
0.2709	0.2903	0.3099	0.3296	0.3497
0.3699	0.3904	0.4111	0.4319	0.4530
0.4743	0.4958	0.5175	0.5395	0.5616
0.5839	0.6064	0.6292	0.6521	0.6753
0.6991	0.7235	0.7484	0.7740	0.8019
0.8364	0.8742	0.9142	0.9560	1.0000

Hrad:

0.0248	0.0493	0.0735	0.1040	0.1389
0.1735	0.2124	0.2498	0.2859	0.3209
0.3550	0.3881	0.4187	0.4434	0.4680
0.4924	0.5212	0.5606	0.5992	0.6372
0.6745	0.7111	0.7472	0.7827	0.8176
0.8520	0.8860	0.9202	0.9539	0.9872
1.0201	1.0525	1.0845	1.1162	1.1474
1.1784	1.2090	1.2392	1.2691	1.2876
1.2994	1.3117	1.3244	1.3163	1.1702
1.0461	1.0307	1.0260	1.0309	1.0000

Width:

0.0497	0.0999	0.1518	0.1903	0.2141
0.2355	0.2481	0.2607	0.2733	0.2859
0.2985	0.3111	0.3252	0.3438	0.3625
0.3813	0.3961	0.4010	0.4059	0.4108
0.4157	0.4206	0.4255	0.4303	0.4352
0.4401	0.4450	0.4494	0.4538	0.4583
0.4627	0.4672	0.4716	0.4761	0.4805
0.4850	0.4894	0.4938	0.4983	0.5078
0.5204	0.5330	0.5457	0.5684	0.6711
0.7919	0.8423	0.8866	0.9238	1.0000

Transect Barnsdale_UPST6
Area:

0.0014	0.0054	0.0102	0.0156	0.0217
0.0284	0.0356	0.0434	0.0517	0.0605
0.0698	0.0796	0.0899	0.1007	0.1121
0.1243	0.1373	0.1512	0.1656	0.1807
0.1962	0.2123	0.2291	0.2483	0.2703
0.2945	0.3189	0.3434	0.3680	0.3929

0.4178 0.4430 0.4687 0.4947 0.5212
0.5482 0.5760 0.6046 0.6335 0.6626
0.6921 0.7218 0.7518 0.7820 0.8133
0.8461 0.8801 0.9163 0.9564 1.0000

Hrad:
0.0226 0.0600 0.0982 0.1332 0.1659
0.1974 0.2291 0.2613 0.2925 0.3228
0.3524 0.3813 0.4096 0.4373 0.4557
0.4729 0.4908 0.5133 0.5388 0.5667
0.5954 0.6238 0.6186 0.5790 0.5404
0.5828 0.6246 0.6659 0.7067 0.7469
0.7867 0.8189 0.8502 0.8811 0.9116
0.9331 0.9497 0.9763 1.0109 1.0452
1.0791 1.1126 1.1458 1.1787 1.1574
1.1642 1.1570 1.1256 1.0602 1.0000

Width:
0.0656 0.0958 0.1094 0.1231 0.1368
0.1501 0.1622 0.1729 0.1837 0.1944
0.2052 0.2159 0.2267 0.2377 0.2539
0.2715 0.2891 0.3043 0.3175 0.3291
0.3399 0.3507 0.3819 0.4435 0.5186
0.5219 0.5251 0.5284 0.5317 0.5350
0.5382 0.5468 0.5558 0.5647 0.5737
0.5886 0.6068 0.6185 0.6243 0.6301
0.6359 0.6475 0.6475 0.6534 0.6932
0.7170 0.7512 0.8061 0.8978 1.0000

Transect Barnsdale_UPST7
Area:
0.0031 0.0077 0.0135 0.0206 0.0292
0.0385 0.0485 0.0590 0.0699 0.0811
0.0928 0.1047 0.1170 0.1297 0.1427
0.1561 0.1700 0.1843 0.1992 0.2145
0.2304 0.2467 0.2636 0.2810 0.3005
0.3224 0.3464 0.3708 0.3955 0.4204
0.4456 0.4710 0.4972 0.5239 0.5510
0.5784 0.6060 0.6340 0.6622 0.6907
0.7195 0.7487 0.7782 0.8081 0.8383
0.8691 0.9003 0.9322 0.9647 1.0000

Hrad:
0.0323 0.0624 0.0905 0.1084 0.1375
0.1686 0.1997 0.2314 0.2650 0.2977
0.3296 0.3608 0.3913 0.4212 0.4493
0.4751 0.5005 0.5247 0.5476 0.5703
0.5929 0.6154 0.6378 0.6601 0.5891
0.5938 0.5928 0.6266 0.6599 0.6927
0.7252 0.7501 0.7705 0.7948 0.8255
0.8559 0.8860 0.9157 0.9452 0.9727
1.0000 1.0270 1.0538 1.0784 1.1003
1.1221 1.1420 1.1557 1.1624 1.0000

Width:
0.0999 0.1304 0.1570 0.1994 0.2229
0.2396 0.2541 0.2664 0.2751 0.2837
0.2923 0.3110 0.3096 0.3183 0.3279
0.3390 0.3501 0.3618 0.3745 0.3872
0.3998 0.4124 0.4251 0.4377 0.5266
0.5610 0.6032 0.6092 0.6153 0.6213
0.6274 0.6399 0.6563 0.6692 0.6761
0.6830 0.6899 0.6967 0.7036 0.7118
0.7199 0.7281 0.7362 0.7458 0.7573
0.7688 0.7817 0.7991 0.8220 1.0000

Transect GBR
Area:
0.0002 0.0008 0.0018 0.0032 0.0051
0.0073 0.0099 0.0130 0.0164 0.0203
0.0245 0.0292 0.0343 0.0401 0.0532
0.0756 0.1002 0.1249 0.1496 0.1742
0.1989 0.2235 0.2482 0.2729 0.2975
0.3222 0.3468 0.3715 0.3962 0.4209
0.4460 0.4715 0.4974 0.5237 0.5505
0.5776 0.6051 0.6331 0.6614 0.6902
0.7193 0.7489 0.7789 0.8092 0.8400
0.8712 0.9028 0.9348 0.9672 1.0000

Hrad:
0.0148 0.0296 0.0444 0.0592 0.0741
0.0889 0.1037 0.1185 0.1333 0.1481
0.1629 0.1777 0.1925 0.1451 0.0889
0.0921 0.1222 0.1522 0.1821 0.2121
0.2420 0.2720 0.3019 0.3318 0.3616
0.3915 0.4213 0.4511 0.4809 0.5106
0.5398 0.5684 0.5963 0.6237 0.6505
0.6766 0.7280 0.7526 0.7529 0.7773
0.8013 0.8249 0.8480 0.8708 0.8932
0.9153 0.9369 0.9583 0.9793 1.0000

Width:
0.0123 0.0246 0.0369 0.0492 0.0614
0.0737 0.0860 0.0983 0.1106 0.1229
0.1352 0.1475 0.1598 0.2496 0.5446
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7470
0.7470 0.7470 0.7470 0.7470 0.7542
0.7665 0.7788 0.7911 0.8034 0.8157
0.8280 0.8402 0.8525 0.8648 0.8771
0.8894 0.9017 0.9140 0.9263 0.9386
0.9508 0.9631 0.9754 0.9877 1.0000

Transect Pond_SpillWay
Area:
0.0040 0.0088 0.0142 0.0204 0.0274
0.0350 0.0434 0.0524 0.0622 0.0728
0.0840 0.0960 0.1087 0.1221 0.1362
0.1511 0.1666 0.1829 0.2000 0.2177
0.2362 0.2554 0.2753 0.2959 0.3173
0.3393 0.3621 0.3856 0.4099 0.4348
0.4600 0.4855 0.5113 0.5375 0.5640
0.5908 0.6180 0.6454 0.6732 0.7013
0.7297 0.7585 0.7875 0.8169 0.8466
0.8767 0.9070 0.9377 0.9687 1.0000

Hrad:
0.0187 0.0367 0.0543 0.0716 0.0888
0.1059 0.1230 0.1400 0.1570 0.1740
0.1910 0.2080 0.2251 0.2421 0.2592
0.2763 0.2935 0.3106 0.3278 0.3450
0.3622 0.3795 0.3967 0.4140 0.4313
0.4486 0.4660 0.4833 0.5007 0.5241
0.5500 0.5758 0.6013 0.6266 0.6517
0.6766 0.7013 0.7257 0.7498 0.7737
0.7974 0.8209 0.8441 0.8670 0.8898
0.9123 0.9345 0.9566 0.9784 1.0000

Width:
0.1394 0.1623 0.1853 0.2082 0.2311
0.2541 0.2770 0.2999 0.3229 0.3458
0.3687 0.3917 0.4146 0.4375 0.4605
0.4834 0.5063 0.5293 0.5522 0.5751
0.5981 0.6210 0.6439 0.6669 0.6898
0.7127 0.7357 0.7586 0.7815 0.7956
0.8059 0.8161 0.8263 0.8365 0.8467
0.8569 0.8672 0.8774 0.8876 0.8978
0.9080 0.9183 0.9285 0.9387 0.9489
0.9591 0.9693 0.9796 0.9898 1.0000

Transect ROW_14m
Area:
0.0004 0.0017 0.0038 0.0067 0.0104
0.0150 0.0204 0.0267 0.0338 0.0417
0.0504 0.0600 0.0704 0.0817 0.0938
0.1067 0.1204 0.1350 0.1504 0.1667
0.1838 0.2017 0.2204 0.2400 0.2605
0.2817 0.3038 0.3267 0.3502 0.3738
0.3973 0.4209 0.4446 0.4692 0.4952
0.5225 0.5510 0.5808 0.6118 0.6439
0.6767 0.7100 0.7440 0.7787 0.8140
0.8499 0.8865 0.9237 0.9615 1.0000

Hrad:
0.0169 0.0338 0.0507 0.0677 0.0846
0.1015 0.1184 0.1353 0.1522 0.1692
0.1861 0.2030 0.2199 0.2368 0.2537
0.2707 0.2876 0.3045 0.3214 0.3383
0.3552 0.3722 0.3891 0.4060 0.4229
0.4398 0.4567 0.4736 0.5027 0.5359
0.5691 0.6022 0.6353 0.6667 0.6957
0.7226 0.7474 0.7704 0.7918 0.8123
0.8326 0.8526 0.8721 0.8914 0.9103
0.9289 0.9471 0.9651 0.9827 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6200 0.6529 0.6857
0.7186 0.7514 0.7843 0.8171 0.8357
0.8521 0.8686 0.8850 0.9014 0.9179
0.9343 0.9507 0.9671 0.9836 1.0000

Transect ROW_14m_Mountable
Area:
0.0003 0.0012 0.0028 0.0049 0.0077
0.0111 0.0151 0.0197 0.0249 0.0307
0.0372 0.0442 0.0519 0.0602 0.0691
0.0787 0.0888 0.0996 0.1109 0.1229
0.1355 0.1487 0.1625 0.1770 0.1923
0.2092 0.2277 0.2477 0.2693 0.2924
0.3170 0.3433 0.3711 0.4004 0.4310
0.4626 0.4954 0.5293 0.5642 0.6002
0.6373 0.6755 0.7144 0.7538 0.7936
0.8340 0.8748 0.9160 0.9578 1.0000

Hrad:
0.0222 0.0445 0.0667 0.0889 0.1111
0.1334 0.1556 0.1778 0.2001 0.2223
0.2445 0.2667 0.2890 0.3112 0.3334
0.3556 0.3779 0.4001 0.4223 0.4446
0.4668 0.4890 0.5112 0.5335 0.5550
0.5733 0.5891 0.6029 0.6151 0.6263
0.6367 0.6465 0.6559 0.6653 0.6759
0.6922 0.6992 0.7116 0.7245 0.7378
0.7514 0.7663 0.7966 0.8266 0.8563
0.8856 0.9147 0.9434 0.9719 1.0000

Width:
0.0145 0.0290 0.0434 0.0579 0.0724
0.0869 0.1013 0.1158 0.1303 0.1448
0.1593 0.1737 0.1882 0.2027 0.2172
0.2316 0.2461 0.2606 0.2751 0.2896
0.3040 0.3185 0.3330 0.3475 0.3798
0.4164 0.4530 0.4897 0.5263 0.5629
0.5995 0.6362 0.6728 0.7080 0.7335
0.7591 0.7846 0.8102 0.8357 0.8613
0.8868 0.9114 0.9225 0.9336 0.9446
0.9557 0.9668 0.9779 0.9889 1.0000

Transect ROW_14m_PH3
Area:
0.0004 0.0017 0.0038 0.0068 0.0107
0.0153 0.0209 0.0273 0.0345 0.0426
0.0516 0.0614 0.0721 0.0836 0.0959
0.1091 0.1232 0.1381 0.1539 0.1705
0.1880 0.2064 0.2255 0.2456 0.2665
0.2882 0.3108 0.3343 0.3583 0.3824
0.4065 0.4306 0.4548 0.4797 0.5055
0.5322 0.5598 0.5883 0.6176 0.6479
0.6791 0.7112 0.7441 0.7780 0.8127
0.8484 0.8850 0.9224 0.9608 1.0000

Hrad:
0.0166 0.0332 0.0498 0.0664 0.0830
0.0997 0.1163 0.1329 0.1495 0.1661
0.1827 0.1993 0.2159 0.2325 0.2491
0.2657 0.2823 0.2990 0.3156 0.3322
0.3488 0.3654 0.3820 0.3986 0.4152
0.4318 0.4484 0.4650 0.4935 0.5262
0.5588 0.5913 0.6238 0.6553 0.6853
0.7137 0.7407 0.7664 0.7909 0.8143
0.8366 0.8579 0.8783 0.8979 0.9166
0.9346 0.9519 0.9685 0.9845 1.0000

Width:
0.0215 0.0430 0.0645 0.0859 0.1074
0.1289 0.1504 0.1719 0.1934 0.2148
0.2363 0.2578 0.2793 0.3008 0.3223
0.3437 0.3652 0.3867 0.4082 0.4297
0.4512 0.4726 0.4941 0.5156 0.5371
0.5586 0.5801 0.6015 0.6071 0.6071
0.6071 0.6071 0.6160 0.6386 0.6612
0.6838 0.7063 0.7289 0.7515 0.7741
0.7967 0.8193 0.8419 0.8645 0.8871
0.9096 0.9322 0.9548 0.9774 1.0000

Transect ROW_14m-MB_1
Area:
0.0003 0.0013 0.0030 0.0054 0.0084
0.0121 0.0165 0.0215 0.0272 0.0336
0.0407 0.0484 0.0568 0.0659 0.0757
0.0861 0.0972 0.1089 0.1214 0.1345
0.1483 0.1631 0.1791 0.1963 0.2146
0.2342 0.2549 0.2768 0.2999 0.3242
0.3497 0.3764 0.4043 0.4333 0.4635
0.4949 0.5273 0.5601 0.5935 0.6274
0.6618 0.6967 0.7326 0.7693 0.8064
0.8441 0.8823 0.9210 0.9603 1.0000

Hrad:
0.0198 0.0396 0.0594 0.0792 0.0990
0.1188 0.1386 0.1584 0.1782 0.1980
0.2178 0.2376 0.2574 0.2772 0.2971
0.3169 0.3367 0.3565 0.3763 0.3961
0.4159 0.4347 0.4520 0.4681 0.4834
0.4979 0.5119 0.5256 0.5389 0.5521
0.5650 0.5779 0.5907 0.6035 0.6162
0.6289 0.6560 0.6844 0.7123 0.7397
0.7667 0.7933 0.8190 0.8459 0.8726
0.8988 0.9247 0.9501 0.9752 1.0000

Width:
0.0168 0.0336 0.0504 0.0673 0.0841
0.1009 0.1177 0.1345 0.1513 0.1681
0.1849 0.2018 0.2186 0.2354 0.2522
0.2690 0.2858 0.3026 0.3195 0.3363
0.3552 0.3849 0.4146 0.4442 0.4739
0.5036 0.5332 0.5629 0.5926 0.6223
0.6519 0.6816 0.7113 0.7409 0.7706
0.8003 0.8150 0.8279 0.8407 0.8536
0.8664 0.8836 0.9093 0.9229 0.9357
0.9486 0.9614 0.9743 0.9871 1.0000

Transect ROW_16.5m_Mountable
Area:
0.0003 0.0012 0.0027 0.0048 0.0074
0.0107 0.0145 0.0190 0.0240 0.0297
0.0359 0.0428 0.0502 0.0582 0.0668
0.0760 0.0858 0.0962 0.1072 0.1188
0.1309 0.1437 0.1571 0.1710 0.1856
0.2012 0.2183 0.2369 0.2570 0.2786
0.3017 0.3263 0.3524 0.3800 0.4091
0.4397 0.4719 0.5055 0.5406 0.5772
0.6533 0.6544 0.6944 0.7354 0.7772
0.8199 0.8636 0.9082 0.9536 1.0000

Hrad:
0.0233 0.0465 0.0698 0.0931 0.1163
0.1396 0.1628 0.1861 0.2094 0.2326
0.2559 0.2792 0.3024 0.3257 0.3489
0.3722 0.3955 0.4187 0.4420 0.4653
0.4885 0.5118 0.5350 0.5583 0.5816
0.6036 0.6224 0.6386 0.6529 0.6657
0.6773 0.6882 0.6985 0.7084 0.7180
0.7275 0.7370 0.7464 0.7559 0.7655
0.7817 0.8084 0.8343 0.8597 0.8844
0.9085 0.9321 0.9552 0.9779 1.0000

Width:
0.0127 0.0254 0.0380 0.0507 0.0634
0.0761 0.0888 0.1014 0.1141 0.1268

0.1395	0.1522	0.1648	0.1775	0.1902
0.2029	0.2156	0.2283	0.2409	0.2536
0.2663	0.2790	0.2917	0.3043	0.3170
0.3491	0.3812	0.4132	0.4453	0.4774
0.5095	0.5415	0.5736	0.6057	0.6378
0.6698	0.7019	0.7340	0.7661	0.7981
0.8255	0.8448	0.8642	0.8836	0.9030
0.9224	0.9418	0.9612	0.9806	1.0000

Transect ROW_16.5m_PH3
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0154	0.0210	0.0275	0.0347	0.0429
0.0519	0.0618	0.0725	0.0841	0.0965
0.1098	0.1240	0.1390	0.1548	0.1716
0.1892	0.2076	0.2269	0.2471	0.2677
0.2884	0.3090	0.3297	0.3510	0.3731
0.3962	0.4201	0.4449	0.4705	0.4971
0.5245	0.5527	0.5819	0.6119	0.6428
0.6746	0.7073	0.7408	0.7752	0.8105
0.8466	0.8837	0.9216	0.9603	1.0000

Hrad:

0.0173	0.0347	0.0520	0.0694	0.0867
0.1041	0.1214	0.1388	0.1561	0.1735
0.1908	0.2082	0.2255	0.2429	0.2602
0.2776	0.2949	0.3123	0.3296	0.3470
0.3643	0.3817	0.3990	0.4164	0.4493
0.4834	0.5173	0.5513	0.5844	0.6155
0.6449	0.6727	0.6990	0.7239	0.7475
0.7699	0.7913	0.8116	0.8310	0.8496
0.8673	0.8843	0.9007	0.9164	0.9316
0.9462	0.9603	0.9739	0.9872	1.0000

Width:

0.0214	0.0428	0.0642	0.0856	0.1070
0.1284	0.1498	0.1712	0.1926	0.2140
0.2354	0.2568	0.2782	0.2996	0.3210
0.3424	0.3638	0.3852	0.4066	0.4280
0.4494	0.4708	0.4922	0.5136	0.5152
0.5152	0.5152	0.5200	0.5418	0.5636
0.5855	0.6073	0.6291	0.6509	0.6727
0.6945	0.7164	0.7382	0.7600	0.7818
0.8036	0.8255	0.8473	0.8691	0.8909
0.9127	0.9345	0.9564	0.9782	1.0000

Transect ROW_18m
Area:

0.0004	0.0016	0.0036	0.0064	0.0100
0.0144	0.0196	0.0255	0.0323	0.0399
0.0483	0.0575	0.0675	0.0782	0.0898
0.1022	0.1154	0.1293	0.1441	0.1597
0.1760	0.1932	0.2112	0.2299	0.2495
0.2698	0.2906	0.3114	0.3321	0.3529
0.3742	0.3967	0.4204	0.4452	0.4712
0.4983	0.5266	0.5560	0.5867	0.6184
0.6514	0.6855	0.7207	0.7571	0.7947
0.8335	0.8734	0.9144	0.9566	1.0000

Hrad:

0.0183	0.0366	0.0549	0.0732	0.0915
0.1098	0.1281	0.1464	0.1647	0.1829
0.2012	0.2195	0.2378	0.2561	0.2744
0.2927	0.3110	0.3293	0.3476	0.3659
0.3842	0.4025	0.4208	0.4391	0.4574
0.4757	0.5117	0.5476	0.5834	0.6192
0.6542	0.6864	0.7162	0.7437	0.7692
0.7927	0.8145	0.8348	0.8537	0.8713
0.8877	0.9031	0.9176	0.9313	0.9442
0.9565	0.9681	0.9792	0.9898	1.0000

Width:

0.0182	0.0363	0.0545	0.0726	0.0908
0.1090	0.1271	0.1453	0.1635	0.1816
0.1998	0.2179	0.2361	0.2543	0.2724
0.2906	0.3088	0.3269	0.3451	0.3632
0.3814	0.3996	0.4177	0.4359	0.4541
0.4722	0.4722	0.4722	0.4722	0.4722
0.4986	0.5250	0.5514	0.5778	0.6042
0.6306	0.6569	0.6833	0.7097	0.7361
0.7625	0.7889	0.8153	0.8417	0.8681
0.8944	0.9208	0.9472	0.9736	1.0000

Transect ROW_18m_MB_1
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0396	0.0594	0.0793	0.0991
0.1189	0.1387	0.1585	0.1783	0.1982
0.2180	0.2378	0.2576	0.2774	0.2972
0.3166	0.3340	0.3498	0.3646	0.3786
0.3921	0.4053	0.4183	0.4311	0.4439
0.4566	0.4700	0.5054	0.5332	0.5603
0.5869	0.6122	0.6360	0.6586	0.6807
0.7040	0.7271	0.7499	0.7723	0.7944
0.8163	0.8378	0.8591	0.8800	0.9007
0.9211	0.9412	0.9611	0.9807	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_MB_2
Area:

0.0003	0.0013	0.0030	0.0054	0.0084
0.0121	0.0165	0.0215	0.0272	0.0336
0.0406	0.0484	0.0568	0.0658	0.0756
0.0861	0.0978	0.1107	0.1247	0.1400
0.1564	0.1740	0.1928	0.2128	0.2340
0.2564	0.2798	0.3039	0.3285	0.3536
0.3793	0.4059	0.4335	0.4621	0.4918
0.5221	0.5529	0.5842	0.6160	0.6484
0.6812	0.7146	0.7485	0.7828	0.8178
0.8532	0.8891	0.9256	0.9625	1.0000

Hrad:

0.0198	0.0395	0.0593	0.0791	0.0989
0.1186	0.1384	0.1582	0.1780	0.1977
0.2175	0.2373	0.2571	0.2768	0.2966
0.3160	0.3333	0.3491	0.3638	0.3778
0.3913	0.4045	0.4174	0.4302	0.4430
0.4557	0.4760	0.5044	0.5321	0.5592
0.5857	0.6109	0.6347	0.6572	0.6793
0.7027	0.7258	0.7486	0.7711	0.7933
0.8152	0.8368	0.8581	0.8792	0.9000
0.9205	0.9408	0.9608	0.9805	1.0000

Width:

0.0178	0.0356	0.0534	0.0712	0.0890
0.1068	0.1246	0.1424	0.1602	0.1780
0.1958	0.2136	0.2314	0.2492	0.2670
0.2942	0.3256	0.3571	0.3885	0.4199
0.4513	0.4827	0.5141	0.5455	0.5769
0.6083	0.6314	0.6450	0.6586	0.6722
0.6911	0.7183	0.7456	0.7728	0.7958
0.8094	0.8231	0.8367	0.8503	0.8639
0.8775	0.8911	0.9047	0.9183	0.9319
0.9456	0.9592	0.9728	0.9864	1.0000

Transect ROW_18m_Mountable
Area:

0.0003	0.0011	0.0026	0.0046	0.0072
0.0103	0.0140	0.0183	0.0232	0.0286
0.0346	0.0412	0.0484	0.0561	0.0644
0.0733	0.0827	0.0928	0.1034	0.1145
0.1263	0.1386	0.1515	0.1650	0.1799
0.1964	0.2143	0.2337	0.2546	0.2770
0.3009	0.3263	0.3532	0.3816	0.4115
0.4429	0.4758	0.5102	0.5459	0.5826
0.6202	0.6587	0.6981	0.7385	0.7797
0.8219	0.8651	0.9091	0.9541	1.0000

Hrad:

0.0235	0.0471	0.0706	0.0942	0.1177
0.1413	0.1648	0.1884	0.2119	0.2355
0.2590	0.2826	0.3061	0.3297	0.3532
0.3768	0.4003	0.4238	0.4474	0.4709
0.4945	0.5180	0.5416	0.5650	0.5852
0.6022	0.6168	0.6296	0.6410	0.6515
0.6613	0.6707	0.6799	0.6889	0.6979
0.7069	0.7161	0.7253	0.7478	0.7737
0.7989	0.8234	0.8474	0.8707	0.8935
0.9157	0.9375	0.9588	0.9796	1.0000

Width:

0.0124	0.0247	0.0371	0.0494	0.0618
0.0741	0.0865	0.0988	0.1112	0.1235
0.1359	0.1482	0.1606	0.1729	0.1853
0.1976	0.2100	0.2223	0.2347	0.2470
0.2594	0.2717	0.2841	0.3058	0.3381
0.3704	0.4027	0.4349	0.4672	0.4995
0.5318	0.5641	0.5964	0.6287	0.6610
0.6933	0.7255	0.7578	0.7807	0.8006
0.8206	0.8405	0.8604	0.8804	0.9003
0.9202	0.9402	0.9601	0.9801	1.0000

Transect ROW_18m_PH3
Area:

0.0004	0.0017	0.0038	0.0068	0.0107
0.0154	0.0209	0.0273	0.0346	0.0427
0.0516	0.0614	0.0721	0.0836	0.0960
0.1092	0.1233	0.1382	0.1540	0.1707
0.1882	0.2065	0.2256	0.2447	0.2638
0.2830	0.3026	0.3232	0.3447	0.3670
0.3903	0.4144	0.4394	0.4653	0.4921
0.5197	0.5483	0.5777	0.6080	0.6392
0.6713	0.7043	0.7382	0.7729	0.8085
0.8451	0.8825	0.9208	0.9599	1.0000

Hrad:

0.0179	0.0359	0.0538	0.0717	0.0896
0.1076	0.1255	0.1434	0.1613	0.1793
0.1972	0.2151	0.2330	0.2510	0.2689
0.2868	0.3047	0.3227	0.3406	0.3585
0.3764	0.3944	0.4225	0.4577	0.4928
0.5279	0.5631	0.5942	0.6243	0.6525
0.6791	0.7042	0.7279	0.7504	0.7716
0.7918	0.8110	0.8292	0.8467	0.8634
0.8794	0.8948	0.9095	0.9238	0.9375
0.9508	0.9636	0.9761	0.9882	1.0000

Width:

0.0211	0.0421	0.0632	0.0843	0.1053
0.1264	0.1475	0.1685	0.1896	0.2107
0.2318	0.2528	0.2739	0.2950	0.3160
0.3371	0.3582	0.3792	0.4003	0.4214
0.4424	0.4635	0.4722	0.4722	0.4722
0.4752	0.4971	0.5190	0.5408	0.5627
0.5846	0.6064	0.6283	0.6502	0.6720
0.6939	0.7158	0.7376	0.7595	0.7813
0.8032	0.8251	0.8469	0.8688	0.8907
0.9125	0.9344	0.9563	0.9781	1.0000

Transect ROW_22m
Area:

0.0003	0.0014	0.0031	0.0055	0.0086
0.0124	0.0169	0.0221	0.0280	0.0346
0.0418	0.0498	0.0584	0.0678	0.0778
0.0885	0.0998	0.1120	0.1248	0.1383
0.1525	0.1674	0.1829	0.1992	0.2161
0.2337	0.2521	0.2711	0.2908	0.3119
0.3348	0.3594	0.3857	0.4133	0.4420
0.4717	0.5025	0.5343	0.5673	0.6013
0.6363	0.6725	0.7097	0.7479	0.7873
0.8277	0.8692	0.9117	0.9553	1.0000

Hrad:

0.0200	0.0399	0.0599	0.0798	0.0998
0.1198	0.1397	0.1597	0.1796	0.1996
0.2196	0.2395	0.2595	0.2794	0.2994
0.3194	0.3393	0.3593	0.3792	0.3992
0.4192	0.4391	0.4591	0.4790	0.4990
0.5190	0.5389	0.5589	0.5789	0.5976
0.6138	0.6280	0.6465	0.6764	0.7046
0.7312	0.7565	0.7804	0.8033	0.8250
0.8458	0.8656	0.8847	0.9030	0.9206
0.9376	0.9539	0.9698	0.9851	1.0000

Width:

0.0153	0.0306	0.0459	0.0612	0.0765
0.0918	0.1071	0.1224	0.1376	0.1529
0.1682	0.1835	0.1988	0.2141	0.2294
0.2447	0.2600	0.2753	0.2906	0.3059
0.3212	0.3365	0.3518	0.3671	0.3824
0.3976	0.4129	0.4282	0.4472	0.4861
0.5250	0.5640	0.5982	0.6218	0.6455
0.6691	0.6927	0.7164	0.7400	0.7636
0.7873	0.8109	0.8345	0.8582	0.8818
0.9055	0.9291	0.9527	0.9764	1.0000

Transect ROW_24m
Area:

0.0004	0.0017	0.0039	0.0069	0.0107
0.0155	0.0211	0.0275	0.0348	0.0430
0.0520	0.0619	0.0726	0.0843	0.0967
0.1100	0.1234	0.1369	0.1503	0.1637
0.1772	0.1906	0.2040	0.2176	0.2324
0.2484	0.2655	0.2840	0.3036	0.3245
0.3466	0.3699	0.3945	0.4203	0.4473
0.4756	0.5050	0.5357	0.5677	0.6008
0.6352	0.6708	0.7077	0.7458	0.7851
0.8256	0.8674	0.9103	0.9546	1.0000

Hrad:

0.0217	0.0434	0.0652	0.0869	0.1086
0.1303	0.1520	0.1737	0.1955	0.2172
0.2389	0.2606	0.2823	0.3041	0.3258
0.3554	0.3981	0.4407	0.4831	0.5253
0.5674	0.6094	0.6512	0.6926	0.7297
0.7620	0.7900	0.8143	0.8353	0.8535
0.8693	0.8830	0.8951	0.9057	0.9151
0.9235	0.9311	0.9381	0.9445	0.9505
0.9561	0.9614	0.9666	0.9716	0.9764
0.9812	0.9859	0.9906	0.9953	1.0000

Width:

0.0187	0.0373	0.0560	0.0747	0.0933
0.1120	0.1307	0.1493	0.1680	0.1867
0.2053	0.2240	0.2427	0.2613	0.2800
0.2917	0.2917	0.2917	0.2917	0.2917
0.2917	0.2917	0.2917	0.3067	0.3333
0.3600	0.3867	0.4133	0.4400	0.4667
0.4933	0.5200	0.5467	0.5733	0.6000
0.6267	0.6533	0.6800	0.7067	0.7333
0.7600	0.7867	0.8133	0.8400	0.8667
0.8933	0.9200	0.9467	0.9733	1.0000

Transect ROW_24m_1
Area:

0.0002	0.0009	0.0020	0.0036	0.0057
0.0081	0.0111	0.0145	0.0183	0.0227
0.0279	0.0340	0.0410	0.0489	0.0577
0.0675	0.0781	0.0897	0.1021	0.1158
0.1311	0.1479	0.1664	0.1857	0.2058
0.2265	0.2480	0.2700	0.2929	0.3171
0.3426	0.3694	0.3976	0.4272	0.4579

0.4893 0.5214 0.5541 0.5875 0.6216
0.6564 0.6919 0.7280 0.7648 0.8023
0.8405 0.8794 0.9189 0.9591 1.0000

Hrad:

0.0217 0.0433 0.0650 0.0866 0.1083
0.1299 0.1516 0.1732 0.1949 0.2158
0.2334 0.2493 0.2650 0.2808 0.2970
0.3137 0.3309 0.3485 0.3666 0.3838
0.3990 0.4128 0.4110 0.4455 0.4784
0.5099 0.5402 0.5694 0.5973 0.6230
0.6462 0.6674 0.6867 0.7046 0.7237
0.7433 0.7628 0.7822 0.8014 0.8205
0.8393 0.8580 0.8765 0.8948 0.9128
0.9307 0.9483 0.9657 0.9830 1.0000

Width:

0.0110 0.0219 0.0329 0.0439 0.0549
0.0658 0.0768 0.0878 0.0987 0.1153
0.1372 0.1592 0.1811 0.2031 0.2250
0.2469 0.2689 0.2908 0.3130 0.3514
0.3898 0.4282 0.4619 0.4783 0.4948
0.5112 0.5277 0.5442 0.5692 0.6021
0.6350 0.6679 0.7008 0.7337 0.7531
0.7696 0.7860 0.8025 0.8190 0.8354
0.8519 0.8683 0.8848 0.9013 0.9177
0.9342 0.9506 0.9671 0.9835 1.0000

Transect ROW_24m_Parking

Area:

0.0004 0.0014 0.0032 0.0056 0.0088
0.0126 0.0172 0.0225 0.0285 0.0351
0.0425 0.0506 0.0594 0.0689 0.0790
0.0899 0.1015 0.1138 0.1268 0.1410
0.1566 0.1735 0.1918 0.2107 0.2304
0.2507 0.2716 0.2933 0.3156 0.3391
0.3638 0.3900 0.4174 0.4462 0.4758
0.5061 0.5371 0.5687 0.6010 0.6339
0.6675 0.7018 0.7367 0.7724 0.8086
0.8456 0.8832 0.9215 0.9604 1.0000

Hrad:

0.0204 0.0408 0.0612 0.0816 0.1020
0.1224 0.1428 0.1632 0.1836 0.2040
0.2244 0.2448 0.2652 0.2856 0.3060
0.3264 0.3469 0.3673 0.3877 0.4065
0.4232 0.4385 0.4621 0.4937 0.5239
0.5528 0.5805 0.6070 0.6326 0.6563
0.6776 0.6968 0.7143 0.7308 0.7488
0.7668 0.7846 0.8023 0.8198 0.8372
0.8543 0.8713 0.8880 0.9046 0.9210
0.9372 0.9532 0.9690 0.9846 1.0000

Width:

0.0176 0.0352 0.0528 0.0704 0.0880
0.1056 0.1231 0.1407 0.1583 0.1759
0.1935 0.2111 0.2287 0.2463 0.2639
0.2815 0.2991 0.3167 0.3384 0.3727
0.4069 0.4412 0.4667 0.4833 0.5000
0.5167 0.5333 0.5500 0.5708 0.6042
0.6375 0.6708 0.7042 0.7333 0.7500
0.7667 0.7833 0.8000 0.8167 0.8333
0.8500 0.8667 0.8833 0.9000 0.9167
0.9333 0.9500 0.9667 0.9833 1.0000

Transect ROW_26m

Area:

0.0003 0.0013 0.0030 0.0053 0.0083
0.0120 0.0164 0.0214 0.0270 0.0334
0.0404 0.0481 0.0564 0.0654 0.0751
0.0854 0.0964 0.1081 0.1205 0.1335
0.1472 0.1615 0.1765 0.1922 0.2086
0.2261 0.2453 0.2663 0.2888 0.3123
0.3369 0.3625 0.3892 0.4168 0.4456
0.4753 0.5061 0.5379 0.5707 0.6046
0.6395 0.6754 0.7124 0.7504 0.7894
0.8295 0.8705 0.9127 0.9558 1.0000

Hrad:

0.0209 0.0418 0.0627 0.0836 0.1045
0.1254 0.1463 0.1672 0.1880 0.2089
0.2298 0.2507 0.2716 0.2925 0.3134
0.3343 0.3552 0.3761 0.3970 0.4179
0.4388 0.4597 0.4806 0.5015 0.5223
0.5421 0.5589 0.5735 0.5992 0.6295
0.6579 0.6846 0.7097 0.7334 0.7558
0.7771 0.7974 0.8167 0.8352 0.8529
0.8693 0.8863 0.9021 0.9173 0.9321
0.9464 0.9604 0.9739 0.9871 1.0000

Width:

0.0149 0.0299 0.0448 0.0597 0.0747
0.0896 0.1045 0.1195 0.1344 0.1493
0.1643 0.1792 0.1941 0.2090 0.2240
0.2389 0.2538 0.2688 0.2837 0.2986
0.3136 0.3285 0.3434 0.3584 0.3733
0.4113 0.4493 0.4873 0.5154 0.5385
0.5615 0.5846 0.6077 0.6308 0.6538
0.6769 0.7000 0.7231 0.7462 0.7692
0.7923 0.8154 0.8385 0.8615 0.8846
0.9077 0.9308 0.9538 0.9769 1.0000

Transect Upstream1

Area:

0.0025 0.0106 0.0203 0.0306 0.0413
0.0526 0.0643 0.0765 0.0889 0.1016
0.1146 0.1277 0.1411 0.1547 0.1685
0.1826 0.1968 0.2113 0.2260 0.2410
0.2562 0.2716 0.2875 0.3036 0.3201
0.3370 0.3541 0.3718 0.3916 0.4132
0.4352 0.4574 0.4798 0.5024 0.5256
0.5499 0.5749 0.6004 0.6263 0.6529
0.6803 0.7086 0.7388 0.7719 0.8061
0.8411 0.8773 0.9158 0.9566 1.0000

Hrad:

0.0236 0.0542 0.0978 0.1394 0.1791
0.2172 0.2558 0.2953 0.3343 0.3743
0.4135 0.4519 0.4897 0.5268 0.5632
0.5991 0.6344 0.6691 0.7034 0.7372
0.7686 0.7966 0.8243 0.8517 0.8789
0.9059 0.9305 0.9395 0.8568 0.8707
0.9044 0.9376 0.9705 1.0029 1.0032
1.0093 1.0327 1.0560 1.0792 1.0918
1.1023 1.1020 1.0403 1.0362 1.0565
1.0711 1.0710 1.0500 1.0287 1.0000

Width:

0.1112 0.2068 0.2183 0.2299 0.2414
0.2530 0.2625 0.2696 0.2763 0.2812
0.2861 0.2910 0.2959 0.3008 0.3057
0.3106 0.3155 0.3204 0.3253 0.3301
0.3360 0.3434 0.3508 0.3582 0.3656
0.3731 0.3815 0.3971 0.4616 0.4787
0.4839 0.4890 0.4941 0.4992 0.5218
0.5423 0.5531 0.5639 0.5747 0.5916
0.6102 0.6359 0.7052 0.7403 0.7577
0.7795 0.8137 0.8682 0.9276 1.0000

Transect Upstream2

Area:

0.0010 0.0033 0.0061 0.0095 0.0135
0.0180 0.0231 0.0287 0.0349 0.0417
0.0491 0.0571 0.0658 0.0753 0.0857
0.0969 0.1089 0.1216 0.1350 0.1491
0.1643 0.1807 0.1983 0.2174 0.2378
0.2598 0.2837 0.3085 0.3337 0.3593
0.3851 0.4112 0.4375 0.4641 0.4910
0.5185 0.5468 0.5756 0.6049 0.6346
0.6647 0.6958 0.7278 0.7609 0.7954
0.8324 0.8717 0.9124 0.9551 1.0000

Hrad:

0.0245 0.0622 0.0947 0.1245 0.1527
0.1802 0.2071 0.2329 0.2579 0.2827
0.3074 0.3275 0.3469 0.3639 0.3812
0.4022 0.4237 0.4479 0.4730 0.4917
0.5021 0.5129 0.5218 0.5312 0.5437
0.5471 0.5612 0.5918 0.6316 0.6711
0.7100 0.7484 0.7864 0.8238 0.8538
0.8769 0.9017 0.9331 0.9642 0.9950
1.0193 1.0315 1.0445 1.0569 1.0476
1.0094 1.0241 1.0243 1.0266 1.0000

Width:

0.0422 0.0543 0.0664 0.0785 0.0905
0.1024 0.1141 0.1261 0.1385 0.1508
0.1631 0.1781 0.1939 0.2117 0.2302
0.2467 0.2633 0.2781 0.2924 0.3107
0.3356 0.3615 0.3904 0.4208 0.4502
0.4893 0.5205 0.5353 0.5411 0.5466
0.5522 0.5577 0.5632 0.5687 0.5793
0.5947 0.6089 0.6182 0.6274 0.6366
0.6500 0.6718 0.6936 0.7162 0.7558
0.8227 0.8489 0.8887 0.9286 1.0000

Transect Upstream3

Area:

0.0006 0.0023 0.0050 0.0083 0.0121
0.0165 0.0214 0.0269 0.0329 0.0397
0.0479 0.0574 0.0681 0.0800 0.0928
0.1066 0.1213 0.1370 0.1537 0.1724
0.1916 0.2112 0.2310 0.2512 0.2719
0.2933 0.3154 0.3379 0.3607 0.3838
0.4072 0.4308 0.4548 0.4792 0.5043
0.5302 0.5566 0.5834 0.6106 0.6382
0.6665 0.6955 0.7273 0.7625 0.7988
0.8362 0.8744 0.9141 0.9558 1.0000

Hrad:

0.0253 0.0506 0.0845 0.1172 0.1476
0.1766 0.2049 0.2322 0.2591 0.2672
0.2667 0.2864 0.3020 0.3243 0.3504
0.3762 0.4018 0.4273 0.4351 0.4545
0.4946 0.5339 0.5724 0.6101 0.6377
0.6626 0.6916 0.7293 0.7664 0.8029
0.8390 0.8745 0.9096 0.9307 0.9485
0.9716 1.0018 1.0317 1.0613 1.0906
1.1167 1.1229 1.0191 1.0199 1.0379
1.0594 1.0820 1.0709 1.0785 1.0000

Width:

0.0239 0.0478 0.0617 0.0733 0.0849
0.0965 0.1081 0.1196 0.1312 0.1535
0.1863 0.2081 0.2344 0.2566 0.2757
0.2950 0.3144 0.3339 0.3682 0.3946
0.4014 0.4082 0.4149 0.4217 0.4354
0.4510 0.4634 0.4693 0.4752 0.4811
0.4870 0.4929 0.4988 0.5128 0.5290
0.5420 0.5507 0.5594 0.5681 0.5768
0.5931 0.6096 0.7080 0.7423 0.7640
0.7831 0.8014 0.8479 0.8809 1.0000

Transect Upstream4

Area:

0.0018 0.0046 0.0083 0.0128 0.0180
0.0238 0.0302 0.0371 0.0448 0.0547
0.0662 0.0782 0.0907 0.1038 0.1174
0.1319 0.1472 0.1638 0.1825 0.2018
0.2212 0.2408 0.2608 0.2810 0.3017
0.3227 0.3453 0.3685 0.3919 0.4155
0.4393 0.4633 0.4875 0.5118 0.5364
0.5615 0.5871 0.6133 0.6408 0.6690
0.6977 0.7269 0.7568 0.7876 0.8192
0.8516 0.8851 0.9205 0.9583 1.0000

Hrad:

0.0356 0.0671 0.0952 0.1219 0.1526
0.1825 0.2111 0.2388 0.2457 0.2281
0.2626 0.2959 0.3290 0.3614 0.3872
0.4105 0.4302 0.4402 0.4405 0.4805
0.5198 0.5573 0.5905 0.6232 0.6553
0.6869 0.6742 0.7110 0.7474 0.7833
0.8187 0.8537 0.8883 0.9224 0.9509
0.9733 0.9956 1.0049 1.0036 1.0287
1.0536 1.0784 1.0896 1.1008 1.1169
1.1330 1.1274 1.1025 1.0707 1.0000

Width:

0.0541 0.0732 0.0923 0.1110 0.1246
0.1374 0.1502 0.1630 0.1916 0.2527
0.2652 0.2777 0.2895 0.3012 0.3179
0.3368 0.3586 0.3902 0.4339 0.4377
0.4416 0.4466 0.4547 0.4628 0.4709
0.4791 0.5224 0.5268 0.5312 0.5356
0.5400 0.5488 0.5488 0.5532 0.5611
0.5729 0.5847 0.6049 0.6332 0.6440
0.6548 0.6656 0.6857 0.7062 0.7236
0.7412 0.7753 0.8268 0.8894 1.0000

Transect Upstream5

Area:

0.0012 0.0039 0.0075 0.0122 0.0185
0.0256 0.0332 0.0413 0.0500 0.0592
0.0689 0.0792 0.0900 0.1012 0.1130
0.1251 0.1375 0.1502 0.1632 0.1765
0.1902 0.2041 0.2184 0.2330 0.2480
0.2635 0.2798 0.2968 0.3145 0.3331
0.3525 0.3727 0.3942 0.4178 0.4431
0.4698 0.4988 0.5309 0.5639 0.5984
0.6349 0.6722 0.7101 0.7485 0.7872
0.8265 0.8666 0.9084 0.9530 1.0000

Hrad:

0.0281 0.0626 0.0927 0.1114 0.1369
0.1752 0.2115 0.2463 0.2799 0.3124
0.3424 0.3749 0.4068 0.4379 0.4694
0.5056 0.5411 0.5759 0.6102 0.6439
0.6711 0.7099 0.7421 0.7699 0.7956
0.8104 0.8232 0.8370 0.8495 0.8616
0.8746 0.8886 0.8484 0.8428 0.8418
0.8363 0.8155 0.8068 0.8309 0.8203
0.8497 0.8801 0.9176 0.9547 0.9913
1.0230 1.0475 1.0267 1.0168 1.0000

Width:

0.0449 0.0640 0.0831 0.1124 0.1386
0.1495 0.1603 0.1712 0.1820 0.1929
0.2048 0.2146 0.2243 0.2341 0.2433
0.2496 0.2559 0.2622 0.2684 0.2747
0.2810 0.2873 0.2936 0.3016 0.3105
0.3241 0.3390 0.3539 0.3698 0.3865
0.4032 0.4199 0.4663 0.4984 0.5298
0.5663 0.6178 0.6645 0.6844 0.7354
0.7522 0.7679 0.7768 0.7857 0.7946
0.8074 0.8259 0.8838 0.9366 1.0000

Transect Upstream6

Area:

0.0020 0.0057 0.0101 0.0154 0.0216
0.0285 0.0362 0.0446 0.0534 0.0628
0.0726 0.0829 0.0939 0.1054 0.1174
0.1299 0.1429 0.1564 0.1705 0.1850
0.2000 0.2153 0.2310 0.2472 0.2637
0.2808 0.2986 0.3172 0.3364 0.3564
0.3786 0.4016 0.4255 0.4503 0.4760
0.5026 0.5304 0.5593 0.5897 0.6214
0.6541 0.6875 0.7215 0.7561 0.7915
0.8280 0.8671 0.9077 0.9506 1.0000

Hrad:

0.0333 0.0728 0.1080 0.1404 0.1714
0.2022 0.2321 0.2687 0.3047 0.3396
0.3717 0.4020 0.4318 0.4612 0.4948
0.5246 0.5534 0.5820 0.6106 0.6442
0.6773 0.7100 0.7423 0.7742 0.8057
0.8224 0.8398 0.8578 0.8777 0.8995
0.8582 0.8792 0.8979 0.9152 0.9365
0.9490 0.9612 0.9727 0.9697 0.9916
1.0145 1.0496 1.0816 1.1092 1.1367
1.1540 1.1196 1.1309 1.0883 1.0000

Width:

0.0616 0.0785 0.0947 0.1108 0.1267
0.1418 0.1569 0.1666 0.1758 0.1850
0.1952 0.2062 0.2171 0.2280 0.2365

0.2466	0.2570	0.2674	0.2776	0.2853
0.2930	0.3007	0.3084	0.3161	0.3238
0.3379	0.3520	0.3661	0.3797	0.4163
0.4379	0.4535	0.4707	0.4888	0.5050
0.5264	0.5485	0.5718	0.6051	0.6237
0.6417	0.6518	0.6637	0.6783	0.6930
0.7329	0.7718	0.8002	0.8718	1.0000

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/02/2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 18
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	1.838	21.999
Evaporation Loss	0.000	0.000
Infiltration Loss	1.007	12.060
Surface Runoff	0.744	8.907
Final Storage	0.087	1.039
Continuity Error (%)	-0.033	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.744	7.440
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.688	6.877
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.056	0.563
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.001	0.012
Continuity Error (%)	-0.157	

****
Highest Continuity Errors
****
Node J43 (100.00%)
Node J62 (100.00%)
Node J39 (99.63%)
Node J51 (99.37%)
Node EXD_9 (2.78%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link C-STRM-83_(C-STRM) (13)
Link C-STRM-71_(C-STRM) (8)
Link OL9_(6)
Link OL16 (6)
Link OL17 (4)

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Most Frequent Nonconverging Nodes
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Convergence obtained at all time steps.

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Routing Time Step Summary
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Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	100.00 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.00 %
0.660 - 0.574 sec	:	0.00 %
0.574 - 0.500 sec	:	0.00 %

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A15	22.00	0.00	0.00	17.55	3.86	0.00	3.09	0.11	0.03
A18	22.00	0.00	0.00	14.99	8.00	0.00	6.40	0.04	0.02
A19	22.00	0.00	0.00	18.00	4.56	0.00	3.65	0.04	0.02
A20	22.00	0.00	0.00	19.35	1.71	0.00	1.37	0.07	0.04
NULL3	22.00	0.00	0.00	6.44	17.04	0.64	14.27	0.08	0.05
S1	22.00	0.00	0.00	14.39	13.57	2.51	6.58	0.43	0.30
S1_1	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.01	0.01
S1_2	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.01	0.01
S1_4	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.02	0.01
S1_5	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.01	0.01
S10_1	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.11	0.08
S10_2	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.13	0.09
S10_4	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.04	0.03
S10_5	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.08	0.05
S11	22.00	0.00	0.00	22.00	0.00	0.00	0.00	0.00	0.00
S12	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.05	0.03
S14_1	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.07	0.04
S14_3	22.00	0.00	0.00	9.21	14.60	0.00	11.68	0.12	0.07
S14_4	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.03	0.02
S14_5	22.00	0.00	0.00	9.21	14.60	0.00	11.68	0.20	0.11
S14_6	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.03	0.02
S14_7	22.00	0.00	0.00	9.21	14.61	0.00	11.68	0.14	0.07
S14_8	22.00	0.00	0.00	9.21	14.61	0.00	11.68	0.04	0.02
S15	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.10	0.07
S16	22.00	0.00	0.00	0.00	20.27	0.00	20.27	0.30	0.05
S17	22.00	0.00	0.00	21.95	0.68	0.00	0.00	0.00	0.00
S18_2	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.20	0.14
S18_3	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.10	0.07
S18_4	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.05	0.04
S18_5	22.00	0.00	0.00	12.82	14.60	3.69	8.07	0.15	0.11
S18_6	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.05	0.03
S19	22.00	0.00	0.00	9.21	14.60	0.00	11.68	0.12	0.07
S2	22.00	0.00	0.00	14.24	13.67	2.62	6.72	0.25	0.18
S20_1	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.06	0.03
S20_2	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.03	0.01
S3	22.00	0.00	0.00	15.01	13.14	2.05	6.00	0.15	0.10
S32	22.00	0.00	0.00	9.21	14.61	0.00	11.69	0.05	0.03
S36	22.00	0.00	0.00	0.00	20.27	0.00	20.27	0.37	0.06
S4	22.00	0.00	0.00	3.14	17.50	0.00	17.50	2.31	0.99
S5	22.00	0.00	0.00	3.14	17.51	0.00	17.51	0.56	0.29
S6	22.00	0.00	0.00	11.77	11.69	0.00	9.35	0.03	0.02
S7	22.00	0.00	0.00	3.14	17.51	0.00	17.51	0.70	0.35
S8	22.00	0.00	0.00	21.44	7.30	0.00	0.00	0.00	0.00

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
EXD_1	JUNCTION	0.01	0.07	104.47	0	01:08	0.07
EXD_10	JUNCTION	0.03	0.15	98.80	0	01:29	0.15
EXD_11	JUNCTION	0.02	0.12	98.62	0	01:29	0.12
EXD_12	JUNCTION	0.03	0.16	98.47	0	01:27	0.16
EXD_13	JUNCTION	0.01	0.08	104.41	0	01:11	0.08
EXD_14	JUNCTION	0.00	0.00	102.49	0	00:00	0.00
EXD_15	JUNCTION	0.01	0.20	100.46	0	01:15	0.19
EXD_16	JUNCTION	0.01	0.11	100.31	0	01:16	0.11
EXD_17	JUNCTION	0.01	0.13	100.02	0	01:18	0.13
EXD_18	JUNCTION	0.01	0.09	99.49	0	01:24	0.09
EXD_19	JUNCTION	0.02	0.15	99.34	0	01:29	0.15
EXD_2	JUNCTION	0.02	0.14	103.61	0	01:20	0.14
EXD_20	JUNCTION	0.02	0.16	99.34	0	01:29	0.16
EXD_21	JUNCTION	0.02	0.14	99.32	0	01:30	0.14
EXD_22	JUNCTION	0.01	0.09	99.23	0	01:19	0.09
EXD_23	JUNCTION	0.02	0.13	98.88	0	01:37	0.13
EXD_24	JUNCTION	0.01	0.07	98.73	0	01:43	0.07
EXD_25	JUNCTION	0.02	0.11	98.64	0	01:45	0.11
EXD_26	JUNCTION	0.01	0.07	98.55	0	01:49	0.07
EXD_27	JUNCTION	0.03	0.15	98.31	0	01:19	0.15
EXD_3	JUNCTION	0.00	0.06	103.25	0	01:22	0.06
EXD_4	JUNCTION	0.00	0.06	102.70	0	01:24	0.06
EXD_5	JUNCTION	0.01	0.09	102.58	0	01:24	0.09
EXD_6	JUNCTION	0.01	0.08	102.40	0	01:26	0.08
EXD_7	JUNCTION	0.01	0.06	101.56	0	01:32	0.06
EXD_8	JUNCTION	0.01	0.08	100.57	0	01:41	0.08
EXD_9	JUNCTION	0.01	0.04	100.43	0	01:54	0.04
J10	JUNCTION	0.00	0.00	103.60	0	00:00	0.00
J11	JUNCTION	0.00	0.00	103.50	0	00:00	0.00
J12	JUNCTION	0.00	0.00	103.40	0	00:00	0.00
J13	JUNCTION	0.00	0.00	103.30	0	00:00	0.00
J17	JUNCTION	0.01	0.07	104.45	0	01:07	0.07
J19	JUNCTION	0.00	0.00	105.40	0	01:15	0.00
J20	JUNCTION	0.00	0.00	105.45	0	01:15	0.00
J21	JUNCTION	0.00	0.00	105.55	0	01:15	0.00
J22	JUNCTION	0.00	0.00	105.70	0	01:15	0.00
J23	JUNCTION	0.00	0.00	106.00	0	00:00	0.00
J24	JUNCTION	0.00	0.00	106.20	0	00:00	0.00
J25	JUNCTION	0.00	0.00	105.30	0	00:00	0.00
J26	JUNCTION	0.00	0.00	105.70	0	00:00	0.00
J28	JUNCTION	0.00	0.00	109.00	0	01:15	0.00
J29	JUNCTION	0.00	0.00	108.80	0	01:15	0.00
J32	JUNCTION	0.00	0.00	106.10	0	00:00	0.00
J36	JUNCTION	0.00	0.00	104.70	0	01:08	0.00
J39	JUNCTION	0.00	0.00	104.60	0	01:30	0.00
J40	JUNCTION	0.00	0.00	104.45	0	01:10	0.00
J41	JUNCTION	0.00	0.00	103.20	0	00:00	0.00
J43	JUNCTION	0.00	0.00	104.20	0	04:01	0.00
J44	JUNCTION	0.00	0.00	104.50	0	01:11	0.00
J46	JUNCTION	0.00	0.00	104.60	0	01:15	0.00
J47	JUNCTION	0.00	0.00	105.10	0	00:00	0.00
J48	JUNCTION	0.00	0.00	105.75	0	01:15	0.00
J51	JUNCTION	0.00	0.00	106.75	0	01:30	0.00
J52	JUNCTION	0.00	0.00	109.75	0	00:00	0.00
J53	JUNCTION	0.00	0.00	109.00	0	00:00	0.00
J56	JUNCTION	0.00	0.00	109.10	0	00:00	0.00
J57	JUNCTION	0.00	0.00	108.47	0	00:00	0.00
J58	JUNCTION	0.00	0.00	108.40	0	01:15	0.00
J59	JUNCTION	0.00	0.00	108.00	0	01:15	0.00
J6	JUNCTION	0.00	0.00	109.83	0	01:15	0.00
J61	JUNCTION	0.00	0.00	107.00	0	01:15	0.00
J62	JUNCTION	0.00	0.00	106.50	0	01:33	0.00
J74	JUNCTION	0.14	0.33	98.78	0	02:26	0.33
J9	JUNCTION	0.00	0.00	103.70	0	00:00	0.00
OF1	OUTFALL	0.00	0.00	100.80	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
OF3	OUTFALL	0.02	0.12	98.12	0	01:19	0.12
ST4_108A_(P-Stm)	OUTFALL	0.15	0.55	98.57	0	02:26	0.55
500_(C-STRM)	STORAGE	0.00	0.00	100.31	0	00:00	0.00
500A_(C-STRM)	STORAGE	0.22	0.57	100.67	0	03:19	0.57
502_(C-STRM)	STORAGE	0.03	0.50	101.04	0	01:16	0.50
503_(C-STRM)	STORAGE	0.03	0.52	101.10	0	01:16	0.52

504_(C-STRM)	STORAGE	0.31	0.64	103.68	0	01:15	0.64	
505_(C-STRM)	STORAGE	0.31	0.65	104.10	0	01:15	0.65	
506_(C-STRM)	STORAGE	0.31	0.66	104.48	0	01:15	0.66	
507_(C-STRM)	STORAGE	0.31	0.63	104.77	0	01:16	0.63	
508_(C-STRM)	STORAGE	0.31	0.64	105.00	0	01:16	0.64	
509_(C-STRM)	STORAGE	0.31	0.63	105.23	0	01:15	0.63	
510_(C-STRM)	STORAGE	0.31	0.60	105.45	0	01:15	0.60	
511_(C-STRM)	STORAGE	0.31	0.61	105.52	0	01:15	0.61	
512_(C-STRM)	STORAGE	0.31	0.59	105.70	0	01:15	0.59	
513_(C-STRM)	STORAGE	0.31	0.59	105.83	0	01:15	0.59	
514_(C-STRM)	STORAGE	0.00	0.00	105.59	0	00:00	0.00	
515_(C-STRM)	STORAGE	0.00	0.00	105.85	0	00:00	0.00	
516_(C-STRM)	STORAGE	0.31	0.62	106.07	0	01:16	0.62	
517_(C-STRM)	STORAGE	0.31	0.64	106.26	0	01:15	0.64	
518_(C-STRM)	STORAGE	0.31	0.64	106.49	0	01:15	0.64	
519_(C-STRM)	STORAGE	0.30	0.47	106.55	0	01:15	0.47	
520_(C-STRM)	STORAGE	0.30	0.48	106.82	0	01:15	0.48	
522_(C-STRM)	STORAGE	0.30	0.45	104.76	0	01:15	0.45	
525_(C-STRM)	STORAGE	0.02	0.46	101.07	0	01:18	0.46	
528_(C-STRM)	STORAGE	0.02	0.46	101.19	0	01:18	0.46	
532_(C-STRM)	STORAGE	0.02	0.44	101.26	0	01:17	0.44	
536_(C-STRM)	STORAGE	0.02	0.41	101.39	0	01:17	0.41	
540_(C-STRM)	STORAGE	0.31	0.62	101.48	0	01:16	0.62	
541_(C-STRM)	STORAGE	0.30	0.60	101.54	0	01:16	0.60	
551_(C-STRM)	STORAGE	0.31	0.60	101.24	0	01:15	0.60	
552_(C-STRM)	STORAGE	0.30	0.54	101.29	0	01:15	0.54	
553_(C-STRM)	STORAGE	0.31	0.54	101.48	0	01:15	0.54	
554_(C-STRM)	STORAGE	0.30	0.52	101.57	0	01:15	0.52	
555_(C-STRM)	STORAGE	0.30	0.53	101.78	0	01:15	0.53	
556_(C-STRM)	STORAGE	0.30	0.53	101.90	0	01:15	0.53	
601_(C-STRM)	STORAGE	0.05	0.68	101.13	0	01:20	0.68	
602_(C-STRM)	STORAGE	0.06	0.89	101.24	0	01:19	0.89	
603_(C-STRM)	STORAGE	0.05	0.85	101.48	0	01:19	0.85	
604_(C-STRM)	STORAGE	0.04	0.81	101.69	0	01:18	0.81	
605_(C-STRM)	STORAGE	0.04	0.72	101.80	0	01:18	0.71	
606_(C-STRM)	STORAGE	0.05	0.81	102.04	0	01:18	0.81	
619_(C-STRM)	STORAGE	0.05	0.84	102.21	0	01:17	0.83	
622_(C-STRM)	STORAGE	0.05	0.74	102.27	0	01:17	0.74	
626_(C-STRM)	STORAGE	0.00	0.00	103.94	0	00:00	0.00	
627_(C-STRM)	STORAGE	0.29	0.39	103.52	0	01:16	0.39	
629_(C-STRM)	STORAGE	0.05	0.70	102.35	0	01:16	0.70	
630_(C-STRM)	STORAGE	0.06	0.67	102.74	0	01:15	0.67	
630A_(C-STRM)	STORAGE	0.05	0.69	102.80	0	01:15	0.68	
631_(C-STRM)	STORAGE	0.00	0.00	106.00	0	01:15	0.00	
645_(C-STRM)	STORAGE	0.32	0.84	102.87	0	01:16	0.84	
647_(C-STRM)	STORAGE	0.32	0.79	102.93	0	01:16	0.79	
650_(C-STRM)	STORAGE	0.31	0.76	102.99	0	01:15	0.76	
651_(C-STRM)	STORAGE	0.31	0.74	103.05	0	01:15	0.74	
682_(C-STRM)	STORAGE	0.00	0.01	105.41	0	01:15	0.01	
MTD_(C-STRM)	STORAGE	0.09	0.55	100.92	0	01:17	0.55	
OVERFLOW_(C-STRM)	STORAGE	0.18	0.59	100.77	0	02:23	0.59	
POND_(C-STRM)	STORAGE	0.32	0.95	99.40	0	02:26	0.95	
S_525-MTD	STORAGE	0.00	0.00	103.30	0	01:15	0.00	
S_528-525	STORAGE	0.00	0.00	103.41	0	01:15	0.00	
S_532-528	STORAGE	0.00	0.00	103.50	0	01:15	0.00	
S_536-532	STORAGE	0.00	0.00	103.61	0	01:15	0.00	
S_540-536	STORAGE	0.00	0.00	103.71	0	01:15	0.00	
S_541-540	STORAGE	0.00	0.00	103.82	0	01:15	0.00	
S_604-603	STORAGE	0.00	0.00	105.50	0	01:15	0.00	
S_605-604	STORAGE	0.00	0.00	106.72	0	01:15	0.00	
S_619-606	STORAGE	0.00	0.00	106.50	0	01:15	0.00	
S_622-619	STORAGE	0.00	0.00	105.70	0	01:15	0.00	
S_622-619_2	STORAGE	0.00	0.00	106.50	0	01:15	0.00	
S_627-630	STORAGE	0.00	0.00	106.70	0	01:15	0.00	
S_629-622	STORAGE	0.00	0.00	106.01	0	01:15	0.00	
SU2	STORAGE	0.00	0.00	106.75	0	00:00	0.00	
SU5	STORAGE	0.00	0.00	104.18	0	00:00	0.00	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
EXD_1	JUNCTION	0.000	0.028	0	01:15	0	0.0508	- 0.124
EXD_10	JUNCTION	0.106	0.106	0	01:15	0.666	0.715	- 0.069
EXD_11	JUNCTION	0.000	0.102	0	01:29	0	0.715	0.020
EXD_12	JUNCTION	0.026	0.123	0	01:26	0.107	0.822	0.009
EXD_13	JUNCTION	0.000	0.030	0	01:08	0	0.0509	- 0.447
EXD_14	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
EXD_15	JUNCTION	0.036	0.036	0	01:15	0.0662	0.0662	- 0.019
EXD_16	JUNCTION	0.000	0.032	0	01:15	0	0.0662	- 0.795
EXD_17	JUNCTION	0.000	0.032	0	01:16	0	0.0667	- 0.015
EXD_18	JUNCTION	0.000	0.030	0	01:19	0	0.0667	1.442
EXD_19	JUNCTION	0.000	0.026	0	01:24	0	0.0735	- 0.280
EXD_2	JUNCTION	0.000	0.029	0	01:11	0	0.0511	1.229
EXD_20	JUNCTION	0.022	0.029	0	01:27	0.0404	0.114	- 0.041
EXD_21	JUNCTION	0.000	0.029	0	01:28	0	0.106	- 0.130
EXD_22	JUNCTION	0.000	0.028	0	01:30	0	0.107	- 1.057
EXD_23	JUNCTION	0.000	0.033	0	01:22	0	0.108	1.596
EXD_24	JUNCTION	0.000	0.027	0	01:39	0	0.106	0.443
EXD_25	JUNCTION	0.021	0.029	0	01:43	0.038	0.144	0.052
EXD_26	JUNCTION	0.000	0.029	0	01:45	0	0.143	- 0.001
EXD_27	JUNCTION	0.050	0.156	0	01:15	0.0806	1.05	0.070
EXD_3	JUNCTION	0.000	0.023	0	01:20	0	0.0505	0.296
EXD_4	JUNCTION	0.000	0.023	0	01:23	0	0.0504	0.117
EXD_5	JUNCTION	0.000	0.022	0	01:24	0	0.0503	- 0.018
EXD_6	JUNCTION	0.000	0.022	0	01:24	0	0.0503	- 0.457
EXD_7	JUNCTION	0.000	0.022	0	01:27	0	0.0506	- 0.381
EXD_8	JUNCTION	0.000	0.023	0	01:33	0	0.0508	1.755
EXD_9	JUNCTION	0.000	0.014	0	01:42	0	0.0499	2.859
J10	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J11	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J12	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J13	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J17	JUNCTION	0.000	0.028	0	01:09	0	0.0508	- 0.203
J19	JUNCTION	0.075	0.075	0	01:15	0.137	0.137	- 1.333
J20	JUNCTION	0.007	0.007	0	01:15	0.0126	0.0126	- 0.075
J21	JUNCTION	0.012	0.012	0	01:15	0.0223	0.0223	- 0.136
J22	JUNCTION	0.007	0.007	0	01:15	0.0136	0.0136	- 0.126
J23	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J24	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J25	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J26	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J28	JUNCTION	0.038	0.038	0	01:15	0.07	0.07	- 0.449
J29	JUNCTION	0.107	0.108	0	01:15	0.197	0.197	- 1.405
J32	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J36	JUNCTION	0.014	0.014	0	01:15	0.0265	0.0265	- 0.046
J39	JUNCTION	0.000	0.000	0	01:15	0	7.8e-06	7.767 ltr
J40	JUNCTION	0.032	0.032	0	01:15	0.058	0.058	- 0.047
J41	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J43	JUNCTION	0.000	0.000	0	01:15	0	2.85e-05	28.484 ltr
J44	JUNCTION	0.019	0.019	0	01:15	0.0347	0.0348	- 0.101
J46	JUNCTION	0.026	0.026	0	01:15	0.0484	0.0484	- 0.364
J47	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J48	JUNCTION	0.022	0.022	0	01:15	0.0394	0.0394	- 0.087
J51	JUNCTION	0.000	0.000	0	01:15	0	9.24e-06	9.185 ltr
J52	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J53	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J56	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J57	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
J58	JUNCTION	0.068	0.068	0	01:15	0.124	0.124	- 1.358
J59	JUNCTION	0.018	0.018	0	01:15	0.0338	0.0338	- 0.285
J6	JUNCTION	0.028	0.028	0	01:15	0.0509	0.0509	- 0.472
J61	JUNCTION	0.075	0.075	0	01:15	0.137	0.137	- 0.138
J62	JUNCTION	0.000	0.000	0	01:15	0	1.26e-05	12.574 ltr
J74	JUNCTION	0.000	0.201	0	02:26	0	5.8	- 0.023
J9	JUNCTION	0.000	0.000	0	00:00	0	0	0.000 ltr
OF1	OUTFALL	0.000	0.000	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.017	0.017	0	01:15	0.032	0.032	0.000
OF3	OUTFALL	0.000	0.148	0	01:19	0	1.05	0.000
ST4_108A_(P-Stm)	OUTFALL	0.000	0.201	0	02:26	0	5.8	0.000 ltr
500_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0	0.088
500A_(C-STRM)	STORAGE	0.000	0.768	0	01:18	0	1.97	- 0.361
502_(C-STRM)	STORAGE	0.000	0.436	0	01:15	0	0.843	0.013
503_(C-STRM)	STORAGE	0.000	0.325	0	01:15	0	0.631	- 0.490
504_(C-STRM)	STORAGE	0.000	0.317	0	01:15	0	0.594	- 0.267
505_(C-STRM)	STORAGE	0.000	0.300	0	01:15	0	0.553	- 0.590
506_(C-STRM)	STORAGE	0.000	0.301	0	01:15	0	0.557	0.439
507_(C-STRM)	STORAGE	0.000	0.230	0	01:16	0	0.418	- 0.046
508_(C-STRM)	STORAGE	0.000	0.230	0	01:15	0	0.418	0.032
509_(C-STRM)	STORAGE	0.000	0.230	0	01:15	0	0.419	- 0.353
510_(C-STRM)	STORAGE	0.000	0.230	0	01:15	0	0.42	0.147
511_(C-STRM)	STORAGE	0.000	0.230	0	01:15	0	0.421	0.361
512_(C-STRM)	STORAGE	0.000	0.212	0	01:15	0	0.386	- 1.582
513_(C-STRM)	STORAGE	0.000	0.212	0	01:15	0	0.393	0.847
514_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0	0.000 ltr
515_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0	0.000 ltr
516_(C-STRM)	STORAGE	0.000	0.145	0	01:15	0	0.265	- 0.320
517_(C-STRM)	STORAGE	0.000	0.146	0	01:15	0	0.266	1.234
518_(C-STRM)	STORAGE	0.000	0.146	0	01:15	0	0.27	0.848
519_(C-STRM)	STORAGE	0.000	0.038	0	01:15	0	0.0699	- 0.050
520_(C-STRM)	STORAGE	0.000	0.038	0	01:15	0	0.0703	0.068
522_(C-STRM)	STORAGE	0.000	0.028	0	01:15	0	0.0511	0.198
525_(C-STRM)	STORAGE	0.000	0.370	0	01:17	0	0.648	0.001
528_(C-STRM)	STORAGE	0.000	0.326	0	01:17	0	0.55	0.136
532_(C-STRM)	STORAGE	0.000	0.274	0	01:16	0	0.45	- 0.266
536_(C-STRM)	STORAGE	0.000	0.250	0	01:16	0	0.4	0.027
540_(C-STRM)	STORAGE	0.000	0.157	0	01:15	0	0.253	- 0.223
541_(C-STRM)	STORAGE	0.000	0.126	0	01:15	0	0.201	0.021
551_(C-STRM)	STORAGE	0.000	0.115	0	01:15	0	0.212	- 0.047
552_(C-STRM)	STORAGE	0.000	0.083	0	01:15	0	0.155	0.509
553_(C-STRM)	STORAGE	0.000	0.084	0	01:15	0	0.154	- 0.014
554_(C-STRM)	STORAGE	0.000	0.069	0	01:15	0	0.128	- 1.261
555_(C-STRM)	STORAGE	0.000	0.069	0	01:15	0	0.127	- 0.856
556_(C-STRM)	STORAGE	0.000	0.069	0	01:15	0	0.128	0.005
601_(C-STRM)	STORAGE	0.000	1.747	0	01:20	0	3.61	0.006
602_(C-STRM)	STORAGE	0.000	1.751	0	01:19	0	3.61	- 0.032
603_(C-STRM)	STORAGE	0.000	1.757	0	01:18	0	3.56	0.018
604_(C-STRM)	STORAGE	0.000	1.770	0	01:18	0	3.56	-

605_(C-STRM)	STORAGE	0.000	1.715	0	01:17	0	3.48	-	0.007
606_(C-STRM)	STORAGE	0.000	1.527	0	01:17	0	3.25	-	0.010
619_(C-STRM)	STORAGE	0.000	1.546	0	01:16	0	3.25	-	0.004
622_(C-STRM)	STORAGE	0.000	1.514	0	01:16	0	3.2	-	0.001
626_(C-STRM)	STORAGE	0.000	0.000	0	00:00	0	0		0.000 ltr
627_(C-STRM)	STORAGE	0.000	0.021	0	01:15	0	0.0186		0.014
629_(C-STRM)	STORAGE	0.000	1.325	0	01:16	0	3	-	0.016
630_(C-STRM)	STORAGE	0.000	1.292	0	01:15	0	2.96	-	0.003
630A_(C-STRM)	STORAGE	0.000	1.276	0	01:15	0	2.95		0.167
631_(C-STRM)	STORAGE	0.994	0.994	0	01:15	2.31	2.31	-	0.206
645_(C-STRM)	STORAGE	0.000	0.303	0	01:15	0	0.623	-	0.722
647_(C-STRM)	STORAGE	0.000	0.305	0	01:15	0	0.606	-	0.570
650_(C-STRM)	STORAGE	0.000	0.300	0	01:15	0	0.581	-	0.572
651_(C-STRM)	STORAGE	0.000	0.295	0	01:15	0	0.57		0.206
682_(C-STRM)	STORAGE	0.291	0.291	0	01:15	0.558	0.558	-	0.118
MTD_(C-STRM)	STORAGE	0.000	0.770	0	01:17	0	1.55	-	0.260
OVERFLOW_(C-STRM)	STORAGE	0.000	0.768	0	01:17	0	2.04		0.156
POND_(C-STRM)	STORAGE	0.352	1.976	0	01:20	0.698	5.8		0.002
S_525-MTD	STORAGE	0.067	0.067	0	01:15	0.0981	0.0981	-	0.067
S_528-525	STORAGE	0.067	0.067	0	01:15	0.0993	0.0993	-	0.068
S_532-528	STORAGE	0.034	0.034	0	01:15	0.0504	0.0504	-	0.068
S_536-532	STORAGE	0.111	0.111	0	01:15	0.148	0.148	-	0.057
S_540-536	STORAGE	0.036	0.036	0	01:15	0.0525	0.0525	-	0.068
S_541-540	STORAGE	0.137	0.137	0	01:15	0.201	0.201	-	0.054
S_604-603	STORAGE	0.101	0.101	0	01:15	0.149	0.149		0.000
S_605-604	STORAGE	0.300	0.300	0	01:15	0.429	0.429		0.000
S_619-606	STORAGE	0.075	0.075	0	01:15	0.111	0.111	-	0.001
S_622-619	STORAGE	0.176	0.176	0	01:15	0.25	0.25		0.000
S_622-619_2	STORAGE	0.087	0.087	0	01:15	0.127	0.127	-	0.000
S_627-630	STORAGE	0.030	0.030	0	01:15	0.0435	0.0435	-	0.000
S_629-622	STORAGE	0.051	0.051	0	01:15	0.0756	0.0756		0.000
SU2	STORAGE	0.000	0.000	0	00:00	0	0		0.000 ltr
SU5	STORAGE	0.000	0.000	0	00:00	0	0		0.000 ltr

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
500_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
500A_(C-STRM)	0.434	20.6	0.0	0.0	1.139	53.9	0 03:19	0.241
502_(C-STRM)	0.000	0.9	0.0	0.0	0.001	13.5	0 01:16	0.434
503_(C-STRM)	0.000	0.7	0.0	0.0	0.001	13.2	0 01:16	0.324
504_(C-STRM)	0.000	11.5	0.0	0.0	0.001	23.8	0 01:15	0.312
505_(C-STRM)	0.000	9.5	0.0	0.0	0.001	20.0	0 01:15	0.299
506_(C-STRM)	0.000	9.8	0.0	0.0	0.001	20.7	0 01:15	0.300
507_(C-STRM)	0.000	9.9	0.0	0.0	0.001	20.3	0 01:16	0.229
508_(C-STRM)	0.000	9.8	0.0	0.0	0.001	20.3	0 01:16	0.230
509_(C-STRM)	0.000	9.7	0.0	0.0	0.001	20.2	0 01:15	0.230
510_(C-STRM)	0.000	9.9	0.0	0.0	0.001	19.6	0 01:15	0.230
511_(C-STRM)	0.000	10.0	0.0	0.0	0.001	19.7	0 01:15	0.230
512_(C-STRM)	0.000	9.8	0.0	0.0	0.001	19.0	0 01:15	0.212
513_(C-STRM)	0.000	9.8	0.0	0.0	0.001	18.8	0 01:15	0.212
514_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
515_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
516_(C-STRM)	0.000	10.0	0.0	0.0	0.001	20.1	0 01:16	0.145
517_(C-STRM)	0.000	10.2	0.0	0.0	0.001	21.2	0 01:15	0.145
518_(C-STRM)	0.000	10.7	0.0	0.0	0.001	22.0	0 01:15	0.146
519_(C-STRM)	0.000	10.7	0.0	0.0	0.001	16.7	0 01:15	0.038
520_(C-STRM)	0.000	11.3	0.0	0.0	0.001	18.0	0 01:15	0.038
522_(C-STRM)	0.000	10.0	0.0	0.0	0.001	15.0	0 01:15	0.028
525_(C-STRM)	0.000	0.8	0.0	0.0	0.001	17.2	0 01:18	0.366
528_(C-STRM)	0.000	0.7	0.0	0.0	0.001	17.3	0 01:18	0.318
532_(C-STRM)	0.000	0.7	0.0	0.0	0.000	16.4	0 01:17	0.270
536_(C-STRM)	0.000	0.7	0.0	0.0	0.000	15.6	0 01:17	0.245
540_(C-STRM)	0.000	10.8	0.0	0.0	0.001	21.9	0 01:16	0.151
541_(C-STRM)	0.000	10.5	0.0	0.0	0.001	20.9	0 01:16	0.124
551_(C-STRM)	0.000	8.2	0.0	0.0	0.001	15.8	0 01:15	0.114
552_(C-STRM)	0.000	7.8	0.0	0.0	0.001	14.0	0 01:15	0.083
553_(C-STRM)	0.000	8.1	0.0	0.0	0.001	14.3	0 01:15	0.083
554_(C-STRM)	0.000	7.7	0.0	0.0	0.001	13.3	0 01:15	0.069
555_(C-STRM)	0.000	7.8	0.0	0.0	0.001	13.6	0 01:15	0.069
556_(C-STRM)	0.000	7.8	0.0	0.0	0.001	13.7	0 01:15	0.069
601_(C-STRM)	0.000	1.2	0.0	0.0	0.001	15.4	0 01:20	1.748
602_(C-STRM)	0.000	1.3	0.0	0.0	0.001	21.7	0 01:19	1.747
603_(C-STRM)	0.000	1.3	0.0	0.0	0.001	21.8	0 01:19	1.743
604_(C-STRM)	0.000	0.9	0.0	0.0	0.001	16.6	0 01:18	1.757
605_(C-STRM)	0.000	0.8	0.0	0.0	0.001	12.7	0 01:18	1.708
606_(C-STRM)	0.000	0.9	0.0	0.0	0.001	14.0	0 01:18	1.520
619_(C-STRM)	0.000	0.9	0.0	0.0	0.001	16.3	0 01:17	1.527
622_(C-STRM)	0.000	1.0	0.0	0.0	0.001	16.5	0 01:17	1.493
626_(C-STRM)	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
627_(C-STRM)	0.000	8.1	0.0	0.0	0.000	11.0	0 01:16	0.020
629_(C-STRM)	0.000	1.1	0.0	0.0	0.001	15.7	0 01:16	1.318
630_(C-STRM)	0.000	1.3	0.0	0.0	0.001	16.2	0 01:15	1.287
630A_(C-STRM)	0.000	1.3	0.0	0.0	0.001	17.6	0 01:15	1.274
631_(C-STRM)	0.001	0.0	0.0	0.0	0.020	0.8	0 01:15	0.984
645_(C-STRM)	0.000	8.7	0.0	0.0	0.001	22.9	0 01:16	0.308
647_(C-STRM)	0.000	9.3	0.0	0.0	0.001	23.1	0 01:16	0.298
650_(C-STRM)	0.000	9.9	0.0	0.0	0.001	23.9	0 01:15	0.295
651_(C-STRM)	0.000	10.4	0.0	0.0	0.001	24.4	0 01:15	0.293
682_(C-STRM)	0.000	0.0	0.0	0.0	0.008	1.1	0 01:15	0.289
MTD_(C-STRM)	0.000	2.8	0.0	0.0	0.001	17.3	0 01:17	0.768
OVERFLOW_(C-STRM)	0.000	6.5	0.0	0.0	0.001	21.4	0 02:23	0.768
POND_(C-STRM)	0.537	1.5	0.0	0.0	2.738	7.6	0 02:26	0.201
S_525-MTD	0.000	0.0	0.0	0.0	0.003	0.6	0 01:15	0.062
S_528-525	0.000	0.0	0.0	0.0	0.004	0.6	0 01:15	0.063
S_532-528	0.000	0.0	0.0	0.0	0.002	0.6	0 01:15	0.032
S_536-532	0.000	0.0	0.0	0.0	0.004	0.9	0 01:15	0.107
S_540-536	0.000	0.0	0.0	0.0	0.001	0.6	0 01:15	0.034
S_541-540	0.000	0.0	0.0	0.0	0.008	0.7	0 01:15	0.126
S_604-603	0.000	0.0	0.0	46.3	0.005	0.5	0 01:15	0.093
S_605-604	0.000	0.0	0.0	46.8	0.014	0.6	0 01:15	0.278
S_619-606	0.000	0.0	0.0	46.5	0.002	0.5	0 01:15	0.072
S_622-619	0.000	0.0	0.0	47.4	0.011	0.9	0 01:15	0.159
S_622-619_2	0.000	0.0	0.0	46.5	0.003	0.6	0 01:15	0.082
S_627-630	0.000	0.0	0.0	57.3	0.001	0.4	0 01:15	0.028
S_629-622	0.000	0.0	0.0	51.3	0.003	0.6	0 01:15	0.047
SU2	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000
SU5	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000
OF2	14.89	0.002	0.017	0.032
OF3	96.74	0.013	0.148	1.046
ST4_108A_(P-Stm)	96.89	0.069	0.201	5.799
System	52.13	0.084	0.337	6.877

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
BDR-C1	CONDUIT	0.032	0 01:15	0.74	0.48	0.38
BDR-C2	CONDUIT	0.029	0 01:28	0.69	0.55	0.37
BDR-C3	CONDUIT	0.029	0 01:45	1.19	0.15	0.18
BDR-C4	CONDUIT	0.123	0 01:27	1.43	0.04	0.13
C1_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C1_17	CHANNEL	0.000	0 01:15	0.00	0.00	0.01
C1_3	CHANNEL	0.000	0 01:15	0.03	0.00	0.01
C1_30	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C1_4	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C14_1	CHANNEL	0.000	0 01:15	0.00	0.00	0.01
C14_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C14_4	CHANNEL	0.000	0 01:15	0.00	0.00	0.01
C14_5	CHANNEL	0.000	0 01:15	0.04	0.00	0.01
C15_1	CHANNEL	0.000	0 01:15	0.04	0.00	0.01
C15_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
C2	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C20_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C20_2	CHANNEL	0.000	0 01:15	0.07	0.00	0.01
C20_3	CHANNEL	0.000	0 01:15	0.07	0.00	0.01
C20_4	CHANNEL	0.000	0 01:15	0.00	0.00	0.01
C20_5	CHANNEL	0.000	0 01:30	0.00	0.00	0.01
C20_7	CHANNEL	0.000	0 01:15	0.12	0.00	0.01
C23_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C23_7	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C4_1	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_2	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_3	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
C4_4	CHANNEL	0.000	0 01:15	0.00	0.00	0.01
C4_5	CHANNEL	0.000	0 00:00	0.00	0.00	0.01

C4_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C5_1	CHANNEL	0.028	0	01:09	0.23	0.01	0.07
C5_10	CHANNEL	0.032	0	01:16	0.37	0.01	0.15
C5_11	CHANNEL	0.026	0	01:24	0.16	0.01	0.14
C5_12	CHANNEL	0.148	0	01:19	0.70	0.01	0.12
C5_13	CHANNEL	0.030	0	01:19	0.60	0.01	0.14
C5_14	CHANNEL	0.023	0	01:31	0.21	0.02	0.17
C5_15	CHANNEL	0.033	0	01:22	0.35	0.01	0.13
C5_16	CHANNEL	0.027	0	01:09	0.24	0.01	0.09
C5_17	CHANNEL	0.026	0	01:43	0.17	0.00	0.08
C5_19	CHANNEL	0.028	0	01:30	0.24	0.02	0.12
C5_2	CHANNEL	0.023	0	01:20	0.47	0.00	0.09
C5_20	CHANNEL	0.028	0	01:49	0.14	0.00	0.09
C5_21	CHANNEL	0.000	0	00:00	0.00	0.00	0.12
C5_23	CHANNEL	0.030	0	01:08	0.21	0.01	0.07
C5_3	CHANNEL	0.029	0	01:11	0.58	0.01	0.10
C5_4	CHANNEL	0.022	0	01:24	0.34	0.00	0.06
C5_5	CHANNEL	0.022	0	01:27	0.64	0.00	0.06
C5_6	CHANNEL	0.023	0	01:23	0.46	0.00	0.05
C5_7	CHANNEL	0.010	0	01:54	0.09	0.00	0.09
C5_8	CHANNEL	0.023	0	01:33	0.49	0.00	0.06
C5_9	CHANNEL	0.102	0	01:29	0.43	0.01	0.13
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C7	CONDUIT	0.000	0	01:15	0.04	0.00	0.01
C9_1	CHANNEL	0.000	0	01:15	0.06	0.00	0.01
C9_11	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
C9_2	CHANNEL	0.000	0	01:15	0.00	0.00	0.01
C9_5	CHANNEL	0.000	0	01:30	0.00	0.00	0.01
C9_6	CHANNEL	0.000	0	01:15	0.00	0.00	0.01
C9_7	CHANNEL	0.000	0	01:15	0.00	0.00	0.01
C-STRM-1_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.145	0	01:15	0.97	0.39	0.45
C-STRM-1_(1)_(C-STRM)	CONDUIT	0.145	0	01:15	0.86	0.45	0.48
C-STRM-1_(C-STRM)	CONDUIT	0.146	0	01:15	1.03	0.61	0.51
C-STRM-100_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C-STRM-101_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C-STRM-102_(C-STRM)	CONDUIT	0.768	0	01:18	4.60	0.31	0.55
C-STRM-103_(C-STRM)	CONDUIT	0.295	0	01:15	0.97	0.53	0.57
C-STRM-104_(C-STRM)	CONDUIT	0.298	0	01:15	0.91	0.54	0.63
C-STRM-105_(C-STRM)	CONDUIT	0.308	0	01:17	0.82	0.55	0.68
C-STRM-2_(1)_(C-STRM)	CONDUIT	0.212	0	01:15	1.39	0.38	0.44
C-STRM-2_(C-STRM)	CONDUIT	0.212	0	01:15	1.44	0.38	0.43
C-STRM-20_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.02
C-STRM-21_(C-STRM)	CONDUIT	0.020	0	01:16	0.78	0.07	0.18
C-STRM-22_(1)_(C-STRM)	CONDUIT	1.318	0	01:16	1.40	0.30	0.40
C-STRM-22_(C-STRM)	CONDUIT	1.287	0	01:16	1.87	0.47	0.41
C-STRM-26_(1)_(C-STRM)	CONDUIT	0.114	0	01:15	0.93	0.34	0.37
C-STRM-26_(C-STRM)	CONDUIT	0.083	0	01:16	0.65	0.25	0.40
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.300	0	01:15	1.47	0.38	0.47
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.229	0	01:16	1.43	0.39	0.46
C-STRM-3_(1)_(1)_(1)_(C-STRM)	CONDUIT	0.230	0	01:16	1.31	0.39	0.49
C-STRM-3_(1)_(1)_(C-STRM)	CONDUIT	0.230	0	01:15	1.30	0.39	0.50
C-STRM-3_(1)_(2)_(C-STRM)	CONDUIT	0.230	0	01:15	1.38	0.41	0.47
C-STRM-3_(1)_(C-STRM)	CONDUIT	0.230	0	01:15	1.46	0.41	0.45
C-STRM-33_(C-STRM)	CONDUIT	0.293	0	01:15	1.00	0.53	0.55
C-STRM-34_(1)_(1)_(C-STRM)	CONDUIT	0.069	0	01:15	0.89	0.40	0.39
C-STRM-34_(1)_(C-STRM)	CONDUIT	0.069	0	01:15	0.82	0.40	0.44
C-STRM-35_(1)_(C-STRM)	CONDUIT	0.083	0	01:15	0.93	0.34	0.35
C-STRM-35_(C-STRM)	CONDUIT	0.069	0	01:15	0.72	0.28	0.38
C-STRM-4_(1)_(C-STRM)	CONDUIT	0.312	0	01:16	1.69	0.36	0.44
C-STRM-4_(C-STRM)	CONDUIT	0.299	0	01:15	1.50	0.38	0.46
C-STRM-49_(C-STRM)	CONDUIT	0.124	0	01:16	0.68	0.22	0.38
C-STRM-50_(C-STRM)	CONDUIT	0.151	0	01:16	0.76	0.27	0.40
C-STRM-51_(C-STRM)	CONDUIT	0.245	0	01:17	0.95	0.35	0.43
C-STRM-52_(C-STRM)	CONDUIT	0.270	0	01:17	0.81	0.31	0.46
C-STRM-53_(C-STRM)	CONDUIT	0.318	0	01:18	0.91	0.37	0.48
C-STRM-57_(C-STRM)	CONDUIT	0.324	0	01:15	0.83	0.37	0.52
C-STRM-62_(C-STRM)	CONDUIT	0.038	0	01:15	0.78	0.30	0.35
C-STRM-63_(C-STRM)	CONDUIT	0.038	0	01:15	0.49	0.23	0.42
C-STRM-64_(C-STRM)	CONDUIT	0.028	0	01:15	0.78	0.32	0.36
C-STRM-74_(C-STRM)	CONDUIT	1.527	0	01:17	1.36	0.30	0.46
C-STRM-75_(C-STRM)	CONDUIT	1.520	0	01:18	1.49	0.30	0.42
C-STRM-76_(C-STRM)	CONDUIT	0.366	0	01:18	1.05	0.37	0.48
C-STRM-77_(C-STRM)	CONDUIT	0.768	0	01:17	2.02	0.40	0.45
C-STRM-78_(C-STRM)	CONDUIT	0.434	0	01:15	1.21	0.35	0.50
C-STRM-79_(1)_(C-STRM)	CONDUIT	1.757	0	01:18	1.55	0.28	0.46
C-STRM-79_(C-STRM)	CONDUIT	1.708	0	01:18	1.67	0.30	0.42
C-STRM-8_(1)_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.13
C-STRM-8_(C-STRM)	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C-STRM-80_(C-STRM)	CONDUIT	1.743	0	01:19	1.44	0.39	0.48
C-STRM-81_(C-STRM)	CONDUIT	1.747	0	01:20	1.64	0.39	0.44
C-STRM-82_(C-STRM)	CONDUIT	1.748	0	01:20	2.06	0.39	0.37
C-STRM-83_(1)_(C-STRM)	CONDUIT	1.274	0	01:15	1.65	0.47	0.45
C-STRM-84_(C-STRM)	CONDUIT	1.493	0	01:16	1.40	0.29	0.44
CVR-C2	CONDUIT	0.022	0	01:24	1.24	0.08	0.18
CVR-C3	CONDUIT	0.014	0	01:42	1.46	0.09	0.14
CVR-C4	CONDUIT	0.102	0	01:29	1.46	0.03	0.11
ST4-Pipe_-_(99)_(P-Stm)	CONDUIT	0.201	0	02:26	1.12	0.21	0.32
W1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
OR1	ORIFICE	0.201	0	02:26			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
W9	WEIR	0.000	0	00:00			0.00
C1	DUMMY	0.070	0	01:15			
C-STRM-107_(C-STRM)	DUMMY	0.080	0	01:15			
C-STRM-14_(1)_(C-STRM)	DUMMY	0.236	0	01:15			
C-STRM-23_(C-STRM)	DUMMY	0.133	0	01:15			
C-STRM-42_(C-STRM)	DUMMY	0.126	0	01:15			
C-STRM-44_(1)_(C-STRM)	DUMMY	0.062	0	01:15			
C-STRM-45_(1)_(C-STRM)	DUMMY	0.061	0	01:15			
C-STRM-71_(C-STRM)	DUMMY	0.289	0	01:15			
C-STRM-83_(C-STRM)	DUMMY	0.984	0	01:15			
C-STRM-96_(1)_(C-STRM)	DUMMY	0.107	0	01:15			
C-STRM-97_(1)_(C-STRM)	DUMMY	0.032	0	01:15			
C-STRM-98_(1)_(C-STRM)	DUMMY	0.063	0	01:15			
OL1	DUMMY	0.021	0	01:15			
OL10	DUMMY	0.026	0	00:53			
OL11	DUMMY	0.014	0	01:08			
OL12	DUMMY	0.032	0	01:10			
OL13	DUMMY	0.026	0	01:15			
OL14	DUMMY	0.038	0	01:15			
OL15	DUMMY	0.028	0	01:15			
OL16	DUMMY	0.107	0	01:15			
OL17	DUMMY	0.068	0	01:15			
OL18	DUMMY	0.018	0	01:15			
OL19	DUMMY	0.075	0	01:15			
OL2	DUMMY	0.000	0	00:00			
OL20	DUMMY	0.021	0	01:15			
OL21	DUMMY	0.019	0	01:11			
OL22	DUMMY	0.000	0	00:00			
OL3	DUMMY	0.038	0	01:15			
OL4	DUMMY	0.034	0	01:15			
OL5	DUMMY	0.007	0	01:15			
OL6	DUMMY	0.012	0	01:15			
OL7	DUMMY	0.007	0	01:15			
OL8	DUMMY	0.006	0	01:15			
OL9	DUMMY	0.069	0	01:15			

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Flow Classification Summary
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Conduit	Adjusted /Actual	Up	Down	Sub	Sup	Up	Down	Norm	Inlet
BDR-C1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.82	0.00
BDR-C2	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.58	0.00
BDR-C3	1.00	0.03	0.00	0.00	0.71	0.26	0.00	0.00	0.00	0.00
BDR-C4	1.00	0.03	0.00	0.00	0.74	0.23	0.00	0.00	0.84	0.00
C1_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_17	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
C1_3	1.00	0.81	0.03	0.00	0.16	0.00	0.00	0.00	0.95	0.00
C1_30	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1_4	1.00	0.04	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_1	1.00	0.82	0.03	0.00	0.15	0.00	0.00	0.00	0.96	0.00
C14_2	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14_4	1.00	0.84	0.01	0.00	0.14	0.00	0.00	0.00	0.97	0.00
C14_5	1.00	0.84	0.00	0.00	0.14	0.02	0.00	0.00	0.00	0.00
C15_1	1.00	0.79	0.03	0.00	0.18	0.00	0.00	0.00	0.95	0.00
C15_2	1.00	0.82	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_1	1.00	0.82	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C20_2	1.00	0.83	0.01	0.00	0.14	0.02	0.00	0.00	0.96	0.00
C20_3	1.00	0.81	0.01	0.00	0.16	0.02	0.00	0.00	0.01	0.00
C20_4	1.00	0.03	0.81	0.00	0.13	0.02	0.00	0.00	0.00	0.00
C20_5	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C20_7	1.00	0.84	0.01	0.00	0.12	0.03	0.00	0.00	0.02	0.00
C23_5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C23_7	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_2	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
C4_3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_4	1.00	0.03	0.81	0.00	0.13	0.02	0.00	0.00	0.00	0.00
C4_5	1.00	0.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4_7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.85	0.00
C5_10	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_11	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C5_12	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C5_13	1.00	0.04	0.00	0.00	0.28	0.69	0.00	0.00	0.00	0.00
C5_14	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.66	0.00
C5_15	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.94	0.00
C5_16	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
C5_17	1.00	0.03	0.02	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_19	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.67	0.00
C5_2	1.00	0.04	0.00	0.00	0.64	0.32	0.00	0.00	0.00	0.00
C5_20	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C5_21	1.00	0.03	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5_23	1.00	0.03	0.00	0.00	0.76	0.20	0.00	0.00	0.57	0.00
C5_3	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C5_4	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C5_5	1.00	0.05	0.00	0.00	0.94	0.01	0.00	0.00	0.00	0.00
C5_6	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.88	0.00
C5_7	1.00	0.03	0.00	0.00	0.94	0.03	0.00	0.00	0.94	0.00
C5_8	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.93	0.00
C5_9	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.97	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.84	0.01	0.00	0.16	0.00	0.00	0.00	0.96	0.00
C9_1	1.00	0.82	0.00	0.00	0.16	0.02	0.00	0.00	0.01	0.00
C9_11	1.00	0.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9_2	1.00	0.03	0.83	0.00	0.12	0.02	0.00	0.00	0.00	0.00
C9_5	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C9_6	1.00	0.03	0.82	0.00	0.14	0.01	0.00	0.00	0.95	0.00
C9_7	1.00	0.03	0.82	0.00	0.13	0.02	0.00	0.00	0.94	0.00
C-STRM-1_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.12	0.00
C-STRM-1_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.39	0.00
C-STRM-1_(C-STRM)	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
C-STRM-100_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-101_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-102_(C-STRM)	1.00	0.03	0.00	0.00	0.94	0.03	0.00	0.00	0.08	0.00
C-STRM-103_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.86	0.00
C-STRM-104_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.94	0.00
C-STRM-105_(C-STRM)	1.00	0.03	0.00	0.00	0.10	0.00	0.00	0.86	0.02	0.00
C-STRM-2_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.77	0.00
C-STRM-2_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.01	0.00	0.01	0.60	0.00
C-STRM-20_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-21_(C-STRM)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C-STRM-22_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C-STRM-22_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-26_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-26_(C-STRM)	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.95	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.01	0.74	0.00
C-STRM-3_(1)_(1)_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
C-STRM-3_(1)_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.01	0.83	0.00
C-STRM-3_(1)_(1)_(C-STRM)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.01	0.71	0.00
C-STRM-3_(1)_(2)_(C-STRM)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.01	0.09	0.00
C-STRM-3_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.00	0.00	0.01	0.77	0.00
C-STRM-33_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.66	0.00
C-STRM-34_(1)_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-34_(1)_(C-STRM)	1.00	0.03	0.01	0.00	0.95	0.00	0.00	0.00	0.95	0.00
C-STRM-35_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-35_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.96	0.00
C-STRM-4_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-4_(C-STRM)	1.00	0.03	0.00	0.00	0.95	0.01	0.00	0.01	0.82	0.00
C-STRM-49_(C-STRM)	1.00	0.03	0.36	0.00	0.61	0.00	0.00	0.00	0.90	0.00
C-STRM-50_(C-STRM)	1.00	0.03	0.00	0.00	0.03	0.94	0.00	0.00	0.94	0.00
C-STRM-51_(C-STRM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.00	0.00
C-STRM-52_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.77	0.00
C-STRM-53_(C-STRM)	1.00	0.03	0.17	0.00	0.79	0.00	0.00	0.00	0.78	0.00
C-STRM-57_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.75	0.00
C-STRM-62_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-63_(C-STRM)	1.00	0.03	0.00	0.00	0.04	0.00	0.00	0.92	0.02	0.00
C-STRM-64_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-74_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.81	0.00
C-STRM-75_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
C-STRM-76_(C-STRM)	1.00	0.03	0.00	0.00	0.35	0.00	0.00	0.61	0.23	0.00
C-STRM-77_(C-STRM)	1.00	0.03	0.00	0.00	0.94	0.03	0.00	0.00	0.48	0.00
C-STRM-78_(C-STRM)	1.00	0.03	0.00	0.00	0.35	0.00	0.00	0.62	0.10	0.00
C-STRM-79_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.89	0.00
C-STRM-79_(C-STRM)	1.00	0.03	0.00	0.00	0.96	0.00	0.00	0.00	0.02	0.00
C-STRM-8_(1)_(C-STRM)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-8_(C-STRM)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-STRM-80_(C-STRM)	1.00	0.03	0.01	0.00	0.96	0.00	0.00	0.00	0.91	0.00
C-STRM-81_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.74	0.00
C-STRM-82_(C-STRM)	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
C-STRM-83_(1)_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.80	0.00
C-STRM-84_(C-STRM)	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.92	0.00
CVR-C2	1.00	0.05	0.00	0.00	0.82	0.13	0.00	0.00	0.88	0.00
CVR-C3	1.00	0.06	0.00	0.00	0.57	0.37	0.00	0.00	0.00	0.00
CVR-C4	1.00	0.03	0.00	0.00	0.56	0.41	0.00	0.00	0.04	0.00
ST4-Pipe_-_(99)_(P-Stm)	1.00	0.03	0.00	0.00	0.16	0.00	0.00	0.81	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 9 10:32:29 2026
Analysis ended on: Thu Apr 9 10:32:35 2026
Total elapsed time: 00:00:06

Post-Development Continuous Simulation

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option             Value
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           04/19/2004
START_TIME           00:00:00
REPORT_START_DATE    04/19/2004
REPORT_START_TIME    00:00:00
END_DATE             04/10/2024
END_TIME             04:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         60
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              18

[EVAPORATION]
;;Data Source    Parameters
;;--------------- ----------
MONTHLY          0.0    0.0    0.0    0.0    4.0    4.7    5.0    4.1    2.6    1.5    0.0
0.0
DRY_ONLY         NO

[TEMPERATURE]
FILE        "V:\26000\26610-300 - Barrhaven South C1-C2 Lands\02-Design\01-Civil\10.
SWM\PCSWMM\Climate Data\Climate Data Excel.dat" 04/19/2004 C
WINDSPEED    MONTHLY    0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
SNOWMELT                0 0.5 0.6 107 45 0.0
ADC          IMPERVIOUS 0.10 0.35 0.53 0.66 0.75 0.82 0.87 0.92 0.95 0.98
ADC          PERVIOUS   0.10 0.35 0.53 0.66 0.75 0.82 0.87 0.92 0.95 0.98

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- -------- -------- ----------
CDA_RCS_262_2014-2024 INTENSITY 01:00    1.0      TIMESERIES CDA_RCS_262_2014-2024
OTTRAIN          VOLUME    1:00     1.0      TIMESERIES OTTRAIN_C

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen
SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------
- ----------------
A11a_Jock_1      CDA_RCS_262_2014-2024 Mud_Creek   0.483    3.33     108.676  3.2      0
Existing_OpenSpace
A11a_Jock_2      CDA_RCS_262_2014-2024 Mud_Creek   0.6262   71.429   140.896  3.2      0
Existing_OpenSpace
;INDUSTRIAL
A11a_Jock_3      CDA_RCS_262_2014-2024 Mud_Creek   0.00602  85.714   1.355    3.2      0
Existing_OpenSpace
;INDUSTRIAL
A11a_Jock_5      CDA_RCS_262_2014-2024 Mud_Creek   5.4726   85.714   1231.347 3.2      0
Existing_OpenSpace
;INDUSTRIAL
A11a_Jock_EES_1  CDA_RCS_262_2014-2024 EES         2.3454   85.714   527.72   3.2      0
Existing_OpenSpace
;INDUSTRIAL
A11a_Jock_EES_2  CDA_RCS_262_2014-2024 EES         0.00258  85.714   0.581    3.2      0
Existing_OpenSpace
A11b_Jock_1      CDA_RCS_262_2014-2024 Mud_Creek   2.1736   3.33     489.065  3.952    0
Existing_OpenSpace
A11b_Jock_2      CDA_RCS_262_2014-2024 Mud_Creek   0.0127   3.33     2.858    3.952    0
Existing_OpenSpace
;INDUSTRIAL
A11b_Jock_5      CDA_RCS_262_2014-2024 Mud_Creek   1.57738  85.714   354.914  3.952    0
Existing_OpenSpace
;INDUSTRIAL
A11b_Jock_EES_1  CDA_RCS_262_2014-2024 EES         0.67602  85.714   152.106  3.952    0
Existing_OpenSpace
A11b_Mud_1       CDA_RCS_262_2014-2024 Mud_Creek   1.4946   3.33     336.288  2.79     0
Existing_OpenSpace
A11b_Mud_2       CDA_RCS_262_2014-2024 Mud_Creek   0.0017   64.286   0.383    2.79     0
Existing_OpenSpace
A11b_Mud_3       CDA_RCS_262_2014-2024 Mud_Creek   0.0089   64.286   2.003    2.79     0
Existing_OpenSpace
;INDUSTRIAL
A11b_Mud_5       CDA_RCS_262_2014-2024 Mud_Creek   2.05968  85.714   463.433  2.79     0
Existing_OpenSpace
;INDUSTRIAL
A11b_Mud_EES_1   CDA_RCS_262_2014-2024 EES         0.88272  85.714   198.614  2.79     0
Existing_OpenSpace
A12b_Jock_2      CDA_RCS_262_2014-2024 Mud_Creek   7.2702   39.053   1635.811 3.578    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Jock_3      CDA_RCS_262_2014-2024 Mud_Creek   2.98494  85.714   671.618  3.578    0
Existing_OpenSpace
A12b_Jock_4      CDA_RCS_262_2014-2024 Mud_Creek   1.5024   3.33     338.043  3.578    0
Existing_OpenSpace
A12b_Jock_5      CDA_RCS_262_2014-2024 Mud_Creek   0.013    71.429   2.925    3.578    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Jock_7      CDA_RCS_262_2014-2024 Mud_Creek   0.02107  85.714   4.741    3.578    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Jock_EES_1  CDA_RCS_262_2014-2024 EES         1.27926  85.714   287.836  3.578    0
Existing_OpenSpace
A12b_Jock_EES_2  CDA_RCS_262_2014-2024 EES         2.1317   66.38    479.637  3.578    0
Existing_OpenSpace
A12b_Jock_EES_3  CDA_RCS_262_2014-2024 EES         11.1585  65.388   2510.688 3.578    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Jock_EES_4  CDA_RCS_262_2014-2024 EES         0.00903  85.714   2.032    3.578    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_1       CDA_RCS_262_2014-2024 Mud_Creek   0.13153  85.714   29.595   1.789    0
Existing_OpenSpace
A12b_Mud_2       CDA_RCS_262_2014-2024 Mud_Creek   6.8965   61.282   1551.728 1.789    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_4       CDA_RCS_262_2014-2024 Mud_Creek   0.00056  85.712   0.126    1.789    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_5       CDA_RCS_262_2014-2024 Mud_Creek   0.03136  85.714   7.056    1.789    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_EES     CDA_RCS_262_2014-2024 EES         0.0001   85.707   0.023    1.789    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_EES_1   CDA_RCS_262_2014-2024 EES         0.01344  85.714   3.024    1.789    0
Existing_OpenSpace
A12b_Mud_EES_2   CDA_RCS_262_2014-2024 EES         0.2369   68.694   53.303   1.789    0
Existing_OpenSpace
;INDUSTRIAL
A12b_Mud_EES_3   CDA_RCS_262_2014-2024 EES         0.05637  85.714   12.683   1.789    0
Existing_OpenSpace
A12b_Rideau_2    CDA_RCS_262_2014-2024 Mud_Creek   11.9545  67.995   2689.789 2.348    0
Existing_OpenSpace
A12b_Rideau_3    CDA_RCS_262_2014-2024 Mud_Creek   0.798    71.429   179.552  2.348    0
Existing_OpenSpace
A12b_Rideau_EES_1 CDA_RCS_262_2014-2024 EES        0.0526   66.866   11.835   2.348    0
Existing_OpenSpace
A12b_Rideau_EES_2 CDA_RCS_262_2014-2024 EES        2.7047   66.38    608.564  2.348    0
Existing_OpenSpace
A12b_Rideau_EES_4 CDA_RCS_262_2014-2024 EES        1.2415   64.286   279.34   2.348    0
Existing_OpenSpace
A13_Jock_1       CDA_RCS_262_2014-2024 Jock_River  0.6927   71.429   155.859  4.578    0
Existing_OpenSpace
A13_Jock_2       CDA_RCS_262_2014-2024 Jock_River  0.1379   57.143   31.028   4.578    0
Existing_OpenSpace
A13_Jock_EES_1   CDA_RCS_262_2014-2024 EES         0.8933   66.38    200.995  4.578    0
Existing_OpenSpace
A13_Rideau_1     CDA_RCS_262_2014-2024 Jock_River  0.195    57.143   43.875   4.045    0
Existing_OpenSpace
A13_Rideau_EES_2 CDA_RCS_262_2014-2024 EES         0.7937   66.38    178.584  4.045    0
Existing_OpenSpace

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A11a_Jock_1      0.013      0.25       1.57       4.67       0          OUTLET
A11a_Jock_2      0.013      0.25       1.57       4.67       0          OUTLET
A11a_Jock_3      0.013      0.25       1.57       4.67       0          OUTLET
A11a_Jock_5      0.013      0.25       1.57       4.67       0          OUTLET
A11a_Jock_EES_1  0.013      0.25       1.57       4.67       0          OUTLET
A11a_Jock_EES_2  0.013      0.25       1.57       4.67       0          OUTLET
A11b_Jock_1      0.013      0.25       1.57       4.67       0          OUTLET
A11b_Jock_2      0.013      0.25       1.57       4.67       0          OUTLET
A11b_Jock_5      0.013      0.25       1.57       4.67       0          OUTLET
A11b_Jock_EES_1  0.013      0.25       1.57       4.67       0          OUTLET
A11b_Mud_1       0.013      0.25       1.57       4.67       0          OUTLET
A11b_Mud_2       0.013      0.25       1.57       4.67       0          OUTLET
A11b_Mud_3       0.013      0.25       1.57       4.67       0          OUTLET
A11b_Mud_5       0.013      0.25       1.57       4.67       0          OUTLET
A11b_Mud_EES_1   0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_2      0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_3      0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_4      0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_5      0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_7      0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_EES_1  0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_EES_2  0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_EES_3  0.013      0.25       1.57       4.67       0          OUTLET
A12b_Jock_EES_4  0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_1       0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_2       0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_4       0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_5       0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_EES     0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_EES_1   0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_EES_2   0.013      0.25       1.57       4.67       0          OUTLET
A12b_Mud_EES_3   0.013      0.25       1.57       4.67       0          OUTLET
A12b_Rideau_2    0.013      0.25       1.57       4.67       0          OUTLET
A12b_Rideau_3    0.013      0.25       1.57       4.67       0          OUTLET
A12b_Rideau_EES_1 0.013     0.25       1.57       4.67       0          OUTLET
A12b_Rideau_EES_2 0.013     0.25       1.57       4.67       0          OUTLET
A12b_Rideau_EES_4 0.013     0.25       1.57       4.67       0          OUTLET
A13_Jock_1       0.013      0.25       1.57       4.67       0          OUTLET
A13_Jock_2       0.013      0.25       1.57       4.67       0          OUTLET
A13_Jock_EES_1   0.013      0.25       1.57       4.67       0          OUTLET
A13_Rideau_1     0.013      0.25       1.57       4.67       0          OUTLET
A13_Rideau_EES_2 0.013      0.25       1.57       4.67       0          OUTLET

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
A11a_Jock_1      84.531     9.429      4.14       7          0
A11a_Jock_2      84.531     9.429      4.14       7          0
A11a_Jock_3      84.531     9.429      4.14       7          0
A11a_Jock_5      84.531     9.429      4.14       7          0
A11a_Jock_EES_1  84.531     9.429      4.14       7          0
A11a_Jock_EES_2  84.531     9.429      4.14       7          0
A11b_Jock_1      65.142     7.993      4.14       7          0
A11b_Jock_2      65.142     7.993      4.14       7          0
A11b_Jock_5      65.142     7.993      4.14       7          0
A11b_Jock_EES_1  65.142     7.993      4.14       7          0
A11b_Mud_1       42.265     5.823      4.14       7          0
A11b_Mud_2       42.265     5.823      4.14       7          0
A11b_Mud_3       42.265     5.823      4.14       7          0
A11b_Mud_5       42.265     5.823      4.14       7          0
A11b_Mud_EES_1   42.265     5.823      4.14       7          0
A12b_Jock_2      87.853     9.752      4.14       7          0
A12b_Jock_3      87.853     9.752      4.14       7          0
A12b_Jock_4      87.853     9.752      4.14       7          0
A12b_Jock_5      87.853     9.752      4.14       7          0
A12b_Jock_7      87.853     9.752      4.14       7          0
A12b_Jock_EES_1  87.853     9.752      4.14       7          0
A12b_Jock_EES_2  87.853     9.752      4.14       7          0
A12b_Jock_EES_3  87.853     9.752      4.14       7          0
A12b_Jock_EES_4  87.853     9.752      4.14       7          0
A12b_Mud_1       63.68      6.985      4.14       7          0
A12b_Mud_2       63.68      6.985      4.14       7          0
A12b_Mud_4       63.68      6.985      4.14       7          0
A12b_Mud_5       63.68      6.985      4.14       7          0
A12b_Mud_EES     63.68      6.985      4.14       7          0
A12b_Mud_EES_1   63.68      6.985      4.14       7          0
A12b_Mud_EES_2   63.68      6.985      4.14       7          0
A12b_Mud_EES_3   63.68      6.985      4.14       7          0
A12b_Rideau_2    72.16      7.644      4.14       7          0
A12b_Rideau_3    72.16      7.644      4.14       7          0
A12b_Rideau_EES_1 72.16     7.644      4.14       7          0
A12b_Rideau_EES_2 72.16     7.644      4.14       7          0
A12b_Rideau_EES_4 72.16     7.644      4.14       7          0
A13_Jock_1       75         7.6        4.14       7          0
A13_Jock_2       75         7.6        4.14       7          0
A13_Jock_EES_1   75         7.6        4.14       7          0
A13_Rideau_1     75         7.6        4.14       7          0
A13_Rideau_EES_2 75         7.6        4.14       7          0

[AQUIFERS]
;;Name           Por    WP     FC     Ksat   Kslope Tslope ETu    ETs    Seep   Ebot   Egw
Umc    ETupat
;;-------------- ------ ------ ------ ------ ------ ------ ------ ------ ------ ------ ------
------ ------
A                0.436  0.05   0.094  114    48     0      0.8    1.5    0.004  85     95.5
0.25
B                0.45   0.081  0.179  50.3   40     0      0.8    2.4    0.004  85     95.5
0.22
C                0.432  0.183  0.283  7.8    53     0      0.8    3      0.004  85     95.5
0.32
D                0.472  0.213  0.35   4.6    45     0      0.8    5.2    0.004  85     95.5
0.35

[GROUNDWATER]
;;Subcatchment   Aquifer          Node             Esurf  A1     B1     A2     B2     A3
Dsw    Egw    Ebot   Wgr    Umc
;;-------------- ---------------- ---------------- ------ ------ ------ ------ ------ ------ -
------ ------ ------ ------ ------
A11a_Jock_1      B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11a_Jock_2      B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11a_Jock_3      B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11a_Jock_5      B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11a_Jock_EES_1  B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11a_Jock_EES_2  B                Jock_River       104.538 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
```

```
A11b_Jock_1      B                   Jock_River       102.623 0.5   1      0.5    1      0
0.5    99     95     99     *
A11b_Jock_2      B                   Jock_River       102.623 0.5   1      0.5    1      0
0.5    99     95     99     *
A11b_Jock_5      B                   Jock_River       102.623 0.5   1      0.5    1      0
0.5    99     95     99     *
A11b_Jock_EES_1  B                   Jock_River       102.623 0.5   1      0.5    1      0
0.5    99     95     99     *
A11b_Mud_1       C                   Mud_Creek        99.792 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11b_Mud_2       C                   Mud_Creek        99.792 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11b_Mud_3       C                   Mud_Creek        99.792 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11b_Mud_5       C                   Mud_Creek        99.792 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A11b_Mud_EES_1   C                   Mud_Creek        99.792 0.5    1      0.5    1      0
0.5    98.5   95     98.5   *
A12b_Jock_2      A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_3      A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_4      A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_5      A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_7      A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_EES_1  A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_EES_2  A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_EES_3  A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Jock_EES_4  A                   Jock_River       105.808 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Mud_1       B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_2       B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_4       B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_5       B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_EES     B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_EES_1   B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_EES_2   B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Mud_EES_3   B                   Mud_Creek        99.916 0.5    1      0.5    1      0
0.5    97.5   95     97.5   *
A12b_Rideau_2    B                   Rideau_River     102.284 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Rideau_3    B                   Rideau_River     102.284 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Rideau_EES_1 B                  Rideau_River     102.284 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Rideau_EES_2 B                  Rideau_River     102.284 0.5   1      0.5    1      0
0.5    99     95     99     *
A12b_Rideau_EES_4 B                  Rideau_River     102.284 0.5   1      0.5    1      0
0.5    99     95     99     *
A13_Jock_1       B                   Jock_River       111.128 0.5   1      0.5    1      0
0.5    98.5   95     98.5   *
A13_Jock_2       B                   Jock_River       111.128 0.5   1      0.5    1      0
0.5    98.5   95     98.5   *
A13_Jock_EES_1   B                   Jock_River       111.128 0.5   1      0.5    1      0
0.5    98.5   95     98.5   *
A13_Rideau_1     B                   Rideau_River     110.078 0.5   1      0.5    1      0
0.5    98.5   95     98.5   *
A13_Rideau_EES_2 B                   Rideau_River     110.078 0.5   1      0.5    1      0
0.5    98.5   95     98.5   *

[SNOWPACKS]
;;Name           Surface    Parameters
;;-------------- ---------- ----------
Existing_OpenSpace PLOWABLE   0.153      0.153      0.0        0.05       0.00       0.00
0.0
Existing_OpenSpace IMPERVIOUS 0.153      0.153      0.0        0.05       0.00       0.00
25
Existing_OpenSpace PERVIOUS   0.153      0.153      0.0        0.05       0.00       0.00
25
Existing_OpenSpace REMOVAL    999999     0.0        0.0        0.5        0.0        0.0
Future           PLOWABLE   0.153      0.153      0.0        0.05       0.00       0.00
0.2
Future           IMPERVIOUS 0.153      0.153      0.0        0.05       0.00       0.00
25
Future           PERVIOUS   0.153      0.153      0.0        0.05       0.00       0.00
25
Future           REMOVAL    25.4       0.6        0.1        0.3        0.0        0.0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
Jock_River       95         FREE                        NO
Mud_Creek        95         FREE                        NO
Rideau_River     95         FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape       Curve Name/Params
SurDepth Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ----------- ---------------------------- -----
--- -------- --------- --------- --------
EES              103.7    0.8        0          FUNCTIONAL  0          0          8225.961 0
0        0         36.021   0

[WEIRS]
;;Name           From Node        To Node          Type         CrestHt    Qcoeff     Gated
EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf   Coeff. Curve
;;-------------- ---------------- ---------------- ------------ ---------- ---------- --------
-------- ---------- ---------- ---------- ----------------
Major            EES              Jock_River       TRANSVERSE   104        1.84       NO
0          0           NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels
Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ---
-------
Major            RECT_OPEN    0.5              100        0          0

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Rainfall (mm/hr)
CDA_RCS_262_2014-2024 04/19/2004 00:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 01:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 02:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 03:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 04:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 05:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 06:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 07:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 08:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 09:00:00   0
CDA_RCS_262_2014-2024 04/19/2004 10:00:00   0
.....
Too many data points (173121 in total).

;Rainfall (mm)
OTTRAIN_C        01/01/1960 00:00:00   0
OTTRAIN_C        01/01/1960 01:00:00   0
OTTRAIN_C        01/01/1960 02:00:00   0
OTTRAIN_C        01/01/1960 03:00:00   0
OTTRAIN_C        01/01/1960 04:00:00   0
OTTRAIN_C        01/01/1960 05:00:00   0
OTTRAIN_C        01/01/1960 06:00:00   0
OTTRAIN_C        01/01/1960 07:00:00   0
OTTRAIN_C        01/01/1960 08:00:00   0
OTTRAIN_C        01/01/1960 09:00:00   0
OTTRAIN_C        01/01/1960 10:00:00   0
.....
Too many data points (270264 in total).

[PATTERNS]
;;Name           Type       Multipliers
;;-------------- ---------- -----------
Monthly          MONTHLY    0    0.1   0.2   0.6   1.0   1.0
Monthly                     1.0   1.0   1.0   0.8   0.4   0.1

[REPORT]
;;Reporting Options
INPUT     YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[ADJUSTMENTS]
;;Parameter    Subcatchment     Monthly Adjustments
INFIL          A11a_Jock_1      Monthly
INFIL          A11a_Jock_2      Monthly
INFIL          A11a_Jock_3      Monthly
INFIL          A11a_Jock_5      Monthly
INFIL          A11a_Jock_EES_1  Monthly
INFIL          A11a_Jock_EES_2  Monthly
INFIL          A11b_Jock_1      Monthly
INFIL          A11b_Jock_2      Monthly
INFIL          A11b_Jock_5      Monthly
INFIL          A11b_Jock_EES_1  Monthly
INFIL          A11b_Mud_1       Monthly
INFIL          A11b_Mud_2       Monthly
INFIL          A11b_Mud_3       Monthly
INFIL          A11b_Mud_5       Monthly
INFIL          A11b_Mud_EES_1   Monthly
INFIL          A12b_Jock_2      Monthly
INFIL          A12b_Jock_3      Monthly
INFIL          A12b_Jock_4      Monthly
INFIL          A12b_Jock_5      Monthly
INFIL          A12b_Jock_7      Monthly
INFIL          A12b_Jock_EES_1  Monthly
INFIL          A12b_Jock_EES_2  Monthly
INFIL          A12b_Jock_EES_3  Monthly
INFIL          A12b_Jock_EES_4  Monthly
INFIL          A12b_Mud_1       Monthly
INFIL          A12b_Mud_2       Monthly
INFIL          A12b_Mud_4       Monthly
INFIL          A12b_Mud_5       Monthly
INFIL          A12b_Mud_EES     Monthly
INFIL          A12b_Mud_EES_1   Monthly
INFIL          A12b_Mud_EES_2   Monthly
INFIL          A12b_Mud_EES_3   Monthly
INFIL          A12b_Rideau_2    Monthly
INFIL          A12b_Rideau_3    Monthly
INFIL          A12b_Rideau_EES_1 Monthly
INFIL          A12b_Rideau_EES_2 Monthly
INFIL          A12b_Rideau_EES_4 Monthly
INFIL          A13_Jock_1       Monthly
INFIL          A13_Jock_2       Monthly
INFIL          A13_Jock_EES_1   Monthly
INFIL          A13_Rideau_1     Monthly
INFIL          A13_Rideau_EES_2 Monthly

[TAGS]
Subcatch   A11a_Jock_1      Jock_River
Subcatch   A11a_Jock_2      Jock_River
Subcatch   A11a_Jock_3      Jock_River
Subcatch   A11a_Jock_5      Jock_River
Subcatch   A11a_Jock_EES_1  Jock_River
Subcatch   A11a_Jock_EES_2  Jock_River
Subcatch   A11b_Jock_1      Jock_River
Subcatch   A11b_Jock_2      Jock_River
Subcatch   A11b_Jock_5      Jock_River
Subcatch   A11b_Jock_EES_1  Jock_River
Subcatch   A11b_Mud_1       Mud_Creek
Subcatch   A11b_Mud_2       Mud_Creek
Subcatch   A11b_Mud_3       Mud_Creek
Subcatch   A11b_Mud_5       Mud_Creek
Subcatch   A11b_Mud_EES_1   Mud_Creek
Subcatch   A12b_Jock_2      Jock_River
Subcatch   A12b_Jock_3      Jock_River
Subcatch   A12b_Jock_4      Jock_River
Subcatch   A12b_Jock_5      Jock_River
Subcatch   A12b_Jock_7      Jock_River
Subcatch   A12b_Jock_EES_1  Jock_River
Subcatch   A12b_Jock_EES_2  Jock_River
Subcatch   A12b_Jock_EES_3  Jock_River
Subcatch   A12b_Jock_EES_4  Jock_River
Subcatch   A12b_Mud_1       Mud_Creek
Subcatch   A12b_Mud_2       Mud_Creek
Subcatch   A12b_Mud_4       Mud_Creek
Subcatch   A12b_Mud_5       Mud_Creek
Subcatch   A12b_Mud_EES     Mud_Creek
Subcatch   A12b_Mud_EES_1   Mud_Creek
Subcatch   A12b_Mud_EES_2   Mud_Creek
Subcatch   A12b_Mud_EES_3   Mud_Creek
Subcatch   A12b_Rideau_2    Rideau_River
Subcatch   A12b_Rideau_3    Rideau_River
Subcatch   A12b_Rideau_EES_1 Rideau_River
Subcatch   A12b_Rideau_EES_2 Rideau_River
Subcatch   A12b_Rideau_EES_4 Rideau_River
Subcatch   A13_Jock_1       Jock_River
Subcatch   A13_Jock_2       Jock_River
Subcatch   A13_Jock_EES_1   Jock_River
Subcatch   A13_Rideau_1     Rideau_River
Subcatch   A13_Rideau_EES_2 Rideau_River

[MAP]
DIMENSIONS       363416.5226      5009971.52045    365750.4894      5011909.79855
UNITS            Meters

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Jock_River       364372.741         5011821.695
Mud_Creek        364449.617         5010213.703
Rideau_River     365644.4           5011261.14
EES              364084.988         5010641.154

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[POLYGONS]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
A11a_Jock_1      363777.852         5010134.072
A11a_Jock_1      363777.364         5010134.174
A11a_Jock_1      363776.873         5010134.258
A11a_Jock_1      363776.379         5010134.326
A11a_Jock_1      363775.883         5010134.376
A11a_Jock_1      363775.385         5010134.409
A11a_Jock_1      363774.886         5010134.425
A11a_Jock_1      363774.388         5010134.423
A11a_Jock_1      363773.889         5010134.404
A11a_Jock_1      363773.392         5010134.367
A11a_Jock_1      363772.896         5010134.313
A11a_Jock_1      363772.403         5010134.242
A11a_Jock_1      363771.912         5010134.154
A11a_Jock_1      363771.424         5010134.049
A11a_Jock_1      363770.941         5010133.926
A11a_Jock_1      363770.462         5010133.787
A11a_Jock_1      363769.988         5010133.631
A11a_Jock_1      363769.52          5010133.459
A11a_Jock_1      363769.059         5010133.271
A11a_Jock_1      363706.211         5010275.408
A11a_Jock_1      363701.612         5010285.812
A11a_Jock_1      363691.544         5010308.586
```

A1la_Jock_1	363687.168	5010318.484
A1la_Jock_1	363755.962	5010358.127
A1la_Jock_1	363755.677	5010354.192
A1la_Jock_1	363759.62	5010346.838
A1la_Jock_1	363763.536	5010343.414
A1la_Jock_1	363768.232	5010335.945
A1la_Jock_1	363764.952	5010319.82
A1la_Jock_1	363764.058	5010318.545
A1la_Jock_1	363759.433	5010316.869
A1la_Jock_1	363755.977	5010313.044
A1la_Jock_1	363755.042	5010309.838
A1la_Jock_1	363753.219	5010309.326
A1la_Jock_1	363749.816	5010305.406
A1la_Jock_1	363748.816	5010301.193
A1la_Jock_1	363745.418	5010298.894
A1la_Jock_1	363745.585	5010292.473
A1la_Jock_1	363735.613	5010289.189
A1la_Jock_1	363729.316	5010281.804
A1la_Jock_1	363726.797	5010271.757
A1la_Jock_1	363724.268	5010266.37
A1la_Jock_1	363724.58	5010262.884
A1la_Jock_1	363720.446	5010260.09
A1la_Jock_1	363719.097	5010254.924
A1la_Jock_1	363720.003	5010252.253
A1la_Jock_1	363723.297	5010249.303
A1la_Jock_1	363723.087	5010245.931
A1la_Jock_1	363727.61	5010243.794
A1la_Jock_1	363732.43	5010243.834
A1la_Jock_1	363735.428	5010236.851
A1la_Jock_1	363740.373	5010231.61
A1la_Jock_1	363740.887	5010228.816
A1la_Jock_1	363739.464	5010222.963
A1la_Jock_1	363741.002	5010209.069
A1la_Jock_1	363747.778	5010202.46
A1la_Jock_1	363747.825	5010195.369
A1la_Jock_1	363753.784	5010186.745
A1la_Jock_1	363752.669	5010182.169
A1la_Jock_1	363754.871	5010174.657
A1la_Jock_1	363755.263	5010173.321
A1la_Jock_1	363754.931	5010168.409
A1la_Jock_1	363758.18	5010163.838
A1la_Jock_1	363758.451	5010159.25
A1la_Jock_1	363760.356	5010155.537
A1la_Jock_1	363762.488	5010152.821
A1la_Jock_1	363768.276	5010151.103
A1la_Jock_1	363770.129	5010145.785
A1la_Jock_1	363772.433	5010144.56
A1la_Jock_1	363775.12	5010145.731
A1la_Jock_1	363775.846	5010144.882
A1la_Jock_1	363778.663	5010138.522
A1la_Jock_1	363777.906	5010134.059
A1la_Jock_1	363777.852	5010134.072
A1la_Jock_2	363679.786	5010751.454
A1la_Jock_2	363533.057	5010667.089
A1la_Jock_2	363522.612	5010690.717
A1la_Jock_2	363532.704	5010696.573
A1la_Jock_2	363666.727	5010774.111
A1la_Jock_2	363723.874	5010807.173
A1la_Jock_2	363730.412	5010810.832
A1la_Jock_2	363737.28	5010805.044
A1la_Jock_2	363736.877	5010799.305
A1la_Jock_2	363738.777	5010793.241
A1la_Jock_2	363737.09	5010790.061
A1la_Jock_2	363736.918	5010786.705
A1la_Jock_2	363737.625	5010784.71
A1la_Jock_2	363679.786	5010751.454
A1la_Jock_3	363789.735	5010111.162
A1la_Jock_3	363787.126	5010112.561
A1la_Jock_3	363787.232	5010112.79
A1la_Jock_3	363787.454	5010113.321
A1la_Jock_3	363787.658	5010113.859
A1la_Jock_3	363787.843	5010114.403
A1la_Jock_3	363788.009	5010114.954
A1la_Jock_3	363788.156	5010115.51
A1la_Jock_3	363788.284	5010116.071
A1la_Jock_3	363788.392	5010116.636
A1la_Jock_3	363788.48	5010117.204
A1la_Jock_3	363788.549	5010117.776
A1la_Jock_3	363788.598	5010118.349
A1la_Jock_3	363788.627	5010118.923
A1la_Jock_3	363788.636	5010119.498
A1la_Jock_3	363788.625	5010120.074
A1la_Jock_3	363788.594	5010120.648
A1la_Jock_3	363788.543	5010121.221
A1la_Jock_3	363788.473	5010121.792
A1la_Jock_3	363788.383	5010122.36
A1la_Jock_3	363788.273	5010122.925
A1la_Jock_3	363788.143	5010123.485
A1la_Jock_3	363787.995	5010124.041
A1la_Jock_3	363787.827	5010124.591
A1la_Jock_3	363787.64	5010125.135
A1la_Jock_3	363787.435	5010125.672
A1la_Jock_3	363787.211	5010126.202
A1la_Jock_3	363786.969	5010126.724
A1la_Jock_3	363786.708	5010127.237
A1la_Jock_3	363786.431	5010127.741
A1la_Jock_3	363786.136	5010128.235
A1la_Jock_3	363785.824	5010128.718
A1la_Jock_3	363785.495	5010129.19
A1la_Jock_3	363785.151	5010129.651
A1la_Jock_3	363785.061	5010129.763
A1la_Jock_3	363787.346	5010128.956
A1la_Jock_3	363791.686	5010124.198
A1la_Jock_3	363792.599	5010119.164
A1la_Jock_3	363791.883	5010114.644
A1la_Jock_3	363789.735	5010111.162
A1la_Jock_5	363781.266	5010481.606
A1la_Jock_5	363645.358	5010413.061
A1la_Jock_5	363633.973	5010438.815
A1la_Jock_5	363618.673	5010473.423
A1la_Jock_5	363606.41	5010501.164
A1la_Jock_5	363605.765	5010502.622
A1la_Jock_5	363563.455	5010598.328
A1la_Jock_5	363556.199	5010614.742
A1la_Jock_5	363533.057	5010667.089
A1la_Jock_5	363679.786	5010751.454
A1la_Jock_5	363737.625	5010784.71
A1la_Jock_5	363739.737	5010778.748
A1la_Jock_5	363746.517	5010767.393
A1la_Jock_5	363746.217	5010765.152
A1la_Jock_5	363744.395	5010763.207
A1la_Jock_5	363744.452	5010760.762
A1la_Jock_5	363746.834	5010756.517
A1la_Jock_5	363746.97	5010751.068
A1la_Jock_5	363748.89	5010743.417
A1la_Jock_5	363753.638	5010736.495
A1la_Jock_5	363755.843	5010729.786
A1la_Jock_5	363753.154	5010721.16
A1la_Jock_5	363753.886	5010713.749
A1la_Jock_5	363755.301	5010706.619
A1la_Jock_5	363758.458	5010703.576
A1la_Jock_5	363757.596	5010684.181
A1la_Jock_5	363759.517	5010676.533
A1la_Jock_5	363762.488	5010670.323
A1la_Jock_5	363759.485	5010665.455
A1la_Jock_5	363758.807	5010658.008
A1la_Jock_5	363760.528	5010654.485
A1la_Jock_5	363763.948	5010654.363
A1la_Jock_5	363767.909	5010651.05
A1la_Jock_5	363770.507	5010646.919
A1la_Jock_5	363773.885	5010637.684
A1la_Jock_5	363774.847	5010627.155
A1la_Jock_5	363776.257	5010625.026
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A1la_Jock_5	363777.379	5010617.553
A1la_Jock_5	363773.217	5010610.233
A1la_Jock_5	363777.36	5010605.623
A1la_Jock_5	363776.388	5010604.492
A1la_Jock_5	363771.349	5010603.587
A1la_Jock_5	363764.425	5010598.873
A1la_Jock_5	363763.496	5010594.527
A1la_Jock_5	363760.937	5010590.431
A1la_Jock_5	363761.457	5010587.656
A1la_Jock_5	363759.114	5010582.423
A1la_Jock_5	363759.001	5010578.435
A1la_Jock_5	363760.996	5010573.982
A1la_Jock_5	363767.423	5010567.545
A1la_Jock_5	363763.579	5010566.583
A1la_Jock_5	363761.844	5010564.094
A1la_Jock_5	363761.847	5010557.082
A1la_Jock_5	363764.269	5010552.858
A1la_Jock_5	363761.637	5010546.697
A1la_Jock_5	363763.801	5010537.618
A1la_Jock_5	363768.023	5010531.991
A1la_Jock_5	363767.957	5010528.799
A1la_Jock_5	363772.633	5010513.16
A1la_Jock_5	363772.902	5010507.782
A1la_Jock_5	363775.903	5010501.517
A1la_Jock_5	363775.619	5010498.71
A1la_Jock_5	363779.432	5010495.503
A1la_Jock_5	363779.166	5010485.104
A1la_Jock_5	363781.266	5010481.606
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A1la_Jock_EES_1	363784.86	5010475.62
A1la_Jock_EES_1	363781.301	5010471.759
A1la_Jock_EES_1	363779.639	5010467.502
A1la_Jock_EES_1	363775.482	5010462.013
A1la_Jock_EES_1	363768.473	5010463.31
A1la_Jock_EES_1	363766.686	5010462.731
A1la_Jock_EES_1	363764.453	5010454.619
A1la_Jock_EES_1	363761.1	5010451.08
A1la_Jock_EES_1	363757.569	5010444.077
A1la_Jock_EES_1	363755.048	5010434.049
A1la_Jock_EES_1	363755.384	5010431.616
A1la_Jock_EES_1	363749.532	5010423.391
A1la_Jock_EES_1	363753.157	5010415.164
A1la_Jock_EES_1	363760.627	5010412.065
A1la_Jock_EES_1	363765.536	5010406.805
A1la_Jock_EES_1	363766.531	5010399.45
A1la_Jock_EES_1	363769.023	5010397.715
A1la_Jock_EES_1	363771.99	5010397.369
A1la_Jock_EES_1	363776.121	5010393.559
A1la_Jock_EES_1	363776.27	5010392.332
A1la_Jock_EES_1	363773.222	5010389.729
A1la_Jock_EES_1	363772.384	5010387.579
A1la_Jock_EES_1	363773.034	5010386.366
A1la_Jock_EES_1	363777.151	5010384.644
A1la_Jock_EES_1	363777.487	5010383.053
A1la_Jock_EES_1	363772.431	5010380.934
A1la_Jock_EES_1	363771.46	5010376.668
A1la_Jock_EES_1	363769.017	5010374.063
A1la_Jock_EES_1	363767.949	5010373.746
A1la_Jock_EES_1	363766.367	5010376.196
A1la_Jock_EES_1	363762.071	5010375.208
A1la_Jock_EES_1	363756.569	5010366.502
A1la_Jock_EES_1	363755.962	5010358.127
A1la_Jock_EES_1	363687.168	5010318.484
A1la_Jock_EES_1	363657.922	5010384.641
A1la_Jock_EES_1	363657.427	5010385.761
A1la_Jock_EES_1	363654.527	5010392.32
A1la_Jock_EES_1	363645.358	5010413.061
A1la_Jock_EES_2	363787.126	5010112.561
A1la_Jock_EES_2	363789.735	5010111.162
A1la_Jock_EES_2	363789.074	5010110.09
A1la_Jock_EES_2	363786.552	5010103.051
A1la_Jock_EES_2	363784.85	5010105.149
A1la_Jock_EES_2	363783.327	5010107.304
A1la_Jock_EES_2	363783.656	5010107.616
A1la_Jock_EES_2	363784.06	5010108.025
A1la_Jock_EES_2	363784.449	5010108.449
A1la_Jock_EES_2	363784.823	5010108.886
A1la_Jock_EES_2	363785.182	5010109.335
A1la_Jock_EES_2	363785.526	5010109.797
A1la_Jock_EES_2	363785.853	5010110.27
A1la_Jock_EES_2	363786.163	5010110.754
A1la_Jock_EES_2	363786.457	5010111.249
A1la_Jock_EES_2	363786.733	5010111.754
A1la_Jock_EES_2	363786.991	5010112.268
A1la_Jock_EES_2	363787.126	5010112.561
A1lb_Jock_1	363858.304	5010417.101
A1lb_Jock_1	363858.29	5010417.041
A1lb_Jock_1	363859.143	5010414.344
A1lb_Jock_1	363861.65	5010413.213
A1lb_Jock_1	363867.02	5010415.906
A1lb_Jock_1	363871.9	5010412.497
A1lb_Jock_1	363869.682	5010402.116
A1lb_Jock_1	363864.511	5010396.619
A1lb_Jock_1	363865.823	5010392.964
A1lb_Jock_1	363863.896	5010390.567
A1lb_Jock_1	363868.464	5010381.556
A1lb_Jock_1	363867.633	5010379.929
A1lb_Jock_1	363863.574	5010378.702
A1lb_Jock_1	363862.171	5010377.096
A1lb_Jock_1	363862.95	5010369.926
A1lb_Jock_1	363860.474	5010366.059
A1lb_Jock_1	363861.705	5010364.727
A1lb_Jock_1	363866.161	5010364.713
A1lb_Jock_1	363865.16	5010361.539
A1lb_Jock_1	363865.487	5010354.717
A1lb_Jock_1	363867.769	5010354.003
A1lb_Jock_1	363869.122	5010350.538
A1lb_Jock_1	363872.22	5010349.543
A1lb_Jock_1	363874.948	5010345.498
A1lb_Jock_1	363880.704	5010341.482
A1lb_Jock_1	363883.361	5010335.016
A1lb_Jock_1	363886.176	5010333.656
A1lb_Jock_1	363891.868	5010334.751
A1lb_Jock_1	363895.805	5010332.215
A1lb_Jock_1	363898.602	5010326.613
A1lb_Jock_1	363898.58	5010318.194
A1lb_Jock_1	363903.868	5010316.794
A1lb_Jock_1	363908.359	5010309.751
A1lb_Jock_1	363908.486	5010308.48
A1lb_Jock_1	363889.376	5010293.779
A1lb_Jock_1	363850.834	5010262.423
A1lb_Jock_1	363795.96	5010215.388
A1lb_Jock_1	363759.378	5010179.459
A1lb_Jock_1	363754.871	5010174.657
A1lb_Jock_1	363752.669	5010182.169
A1lb_Jock_1	363753.784	5010186.745
A1lb_Jock_1	363747.825	5010195.369
A1lb_Jock_1	363747.778	5010202.46
A1lb_Jock_1	363741.002	5010209.069
A1lb_Jock_1	363739.464	5010222.963
A1lb_Jock_1	363740.887	5010228.816
A1lb_Jock_1	363740.373	5010231.61
A1lb_Jock_1	363735.428	5010236.851
A1lb_Jock_1	363732.43	5010243.834
A1lb_Jock_1	363727.61	5010243.794
A1lb_Jock_1	363723.087	5010245.931
A1lb_Jock_1	363723.297	5010249.303
A1lb_Jock_1	363720.003	5010252.253
A1lb_Jock_1	363719.097	5010254.924
A1lb_Jock_1	363720.446	5010260.09
A1lb_Jock_1	363724.58	5010262.884
A1lb_Jock_1	363724.268	5010266.37
A1lb_Jock_1	363726.797	5010271.757
A1lb_Jock_1	363729.316	5010281.804
A1lb_Jock_1	363735.613	5010289.189
A1lb_Jock_1	363745.585	5010292.473
A1lb_Jock_1	363745.418	5010298.894
A1lb_Jock_1	363748.816	5010301.193
A1lb_Jock_1	363749.816	5010305.406
A1lb_Jock_1	363753.219	5010309.326
A1lb_Jock_1	363755.042	5010309.838
A1lb_Jock_1	363755.977	5010313.044
A1lb_Jock_1	363759.433	5010316.869

A11b_Jock_1	363764.058	5010318.545
A11b_Jock_1	363764.952	5010319.82
A11b_Jock_1	363768.232	5010335.945
A11b_Jock_1	363763.536	5010343.414
A11b_Jock_1	363759.62	5010346.838
A11b_Jock_1	363755.677	5010354.192
A11b_Jock_1	363755.962	5010358.127
A11b_Jock_1	363858.304	5010417.101
A11b_Jock_2	363913.355	5010448.824
A11b_Jock_2	363916.605	5010445.408
A11b_Jock_2	363915.238	5010444.21
A11b_Jock_2	363908.898	5010442.79
A11b_Jock_2	363895.983	5010433.032
A11b_Jock_2	363893.473	5010431.931
A11b_Jock_2	363890.305	5010430.541
A11b_Jock_2	363886.995	5010433.634
A11b_Jock_2	363913.355	5010448.824
A11b_Jock_5	363772.725	5010511.318
A11b_Jock_5	363853.474	5010550.402
A11b_Jock_5	363855.036	5010547.04
A11b_Jock_5	363867.294	5010531.788
A11b_Jock_5	363874.244	5010532.6
A11b_Jock_5	363877.363	5010528.995
A11b_Jock_5	363877.653	5010528.659
A11b_Jock_5	363880.819	5010527.7
A11b_Jock_5	363883.531	5010524.454
A11b_Jock_5	363886.792	5010523.546
A11b_Jock_5	363890.239	5010518.563
A11b_Jock_5	363896.616	5010513.3
A11b_Jock_5	363905.413	5010509.607
A11b_Jock_5	363911.425	5010511.475
A11b_Jock_5	363914.753	5010508.814
A11b_Jock_5	363915.114	5010499.542
A11b_Jock_5	363917.354	5010491.563
A11b_Jock_5	363914.203	5010488.805
A11b_Jock_5	363910.326	5010487.204
A11b_Jock_5	363902.464	5010487.149
A11b_Jock_5	363899.607	5010482.339
A11b_Jock_5	363897.639	5010482.4
A11b_Jock_5	363896.242	5010481.255
A11b_Jock_5	363894.864	5010475.014
A11b_Jock_5	363896.077	5010472.779
A11b_Jock_5	363896.098	5010466.48
A11b_Jock_5	363899.54	5010460.434
A11b_Jock_5	363898.538	5010453.586
A11b_Jock_5	363903.744	5010447.784
A11b_Jock_5	363913.185	5010449.003
A11b_Jock_5	363913.355	5010448.824
A11b_Jock_5	363886.995	5010433.634
A11b_Jock_5	363885.736	5010434.811
A11b_Jock_5	363881.471	5010435.252
A11b_Jock_5	363879.278	5010438.627
A11b_Jock_5	363873.862	5010433.078
A11b_Jock_5	363870.859	5010431.355
A11b_Jock_5	363869.663	5010431.309
A11b_Jock_5	363869.001	5010434.611
A11b_Jock_5	363866.356	5010438.443
A11b_Jock_5	363861.743	5010438.017
A11b_Jock_5	363856.002	5010435.644
A11b_Jock_5	363856.587	5010431.117
A11b_Jock_5	363859.032	5010427.694
A11b_Jock_5	363859.548	5010422.448
A11b_Jock_5	363858.304	5010417.101
A11b_Jock_5	363755.962	5010358.127
A11b_Jock_5	363756.569	5010366.502
A11b_Jock_5	363762.071	5010375.208
A11b_Jock_5	363766.367	5010376.196
A11b_Jock_5	363767.949	5010373.746
A11b_Jock_5	363769.017	5010374.063
A11b_Jock_5	363771.46	5010376.668
A11b_Jock_5	363772.431	5010380.934
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A11b_Jock_5	363777.151	5010384.644
A11b_Jock_5	363773.034	5010386.366
A11b_Jock_5	363772.384	5010387.579
A11b_Jock_5	363773.222	5010389.729
A11b_Jock_5	363776.27	5010392.332
A11b_Jock_5	363776.121	5010393.559
A11b_Jock_5	363771.99	5010397.369
A11b_Jock_5	363769.023	5010397.715
A11b_Jock_5	363766.531	5010399.45
A11b_Jock_5	363765.536	5010406.805
A11b_Jock_5	363760.627	5010412.065
A11b_Jock_5	363753.157	5010415.164
A11b_Jock_5	363749.532	5010423.391
A11b_Jock_5	363755.384	5010431.616
A11b_Jock_5	363755.048	5010434.049
A11b_Jock_5	363757.569	5010444.077
A11b_Jock_5	363761.1	5010451.08
A11b_Jock_5	363764.453	5010454.619
A11b_Jock_5	363766.686	5010462.731
A11b_Jock_5	363768.473	5010463.31
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A11b_Jock_5	363784.86	5010475.62
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A11b_Jock_5	363779.432	5010495.503
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A11b_Jock_5	363775.903	5010501.517
A11b_Jock_5	363772.902	5010507.782
A11b_Jock_5	363772.725	5010511.318
A11b_Jock_EES_1	363853.474	5010550.402
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A11b_Jock_EES_1	363772.633	5010513.16
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A11b_Jock_EES_1	363768.023	5010531.991
A11b_Jock_EES_1	363763.801	5010537.618
A11b_Jock_EES_1	363761.637	5010546.697
A11b_Jock_EES_1	363764.269	5010552.858
A11b_Jock_EES_1	363761.847	5010557.082
A11b_Jock_EES_1	363761.844	5010564.094
A11b_Jock_EES_1	363763.579	5010566.583
A11b_Jock_EES_1	363767.423	5010567.545
A11b_Jock_EES_1	363760.996	5010573.982
A11b_Jock_EES_1	363759.001	5010578.435
A11b_Jock_EES_1	363759.114	5010582.423
A11b_Jock_EES_1	363761.457	5010587.656
A11b_Jock_EES_1	363760.937	5010590.431
A11b_Jock_EES_1	363763.496	5010594.527
A11b_Jock_EES_1	363764.425	5010598.873
A11b_Jock_EES_1	363771.349	5010603.587
A11b_Jock_EES_1	363776.388	5010604.492
A11b_Jock_EES_1	363777.36	5010605.623
A11b_Jock_EES_1	363790.074	5010612.813
A11b_Jock_EES_1	363798.854	5010615.541
A11b_Jock_EES_1	363802.661	5010614.028
A11b_Jock_EES_1	363806.967	5010616.466
A11b_Jock_EES_1	363814.272	5010612.772
A11b_Jock_EES_1	363817.363	5010608.117
A11b_Jock_EES_1	363817.46	5010604.224
A11b_Jock_EES_1	363819.336	5010598.918
A11b_Jock_EES_1	363818.309	5010595.485
A11b_Jock_EES_1	363814.284	5010590.418
A11b_Jock_EES_1	363817.416	5010586.056
A11b_Jock_EES_1	363819.398	5010580.018
A11b_Jock_EES_1	363830.635	5010575.78
A11b_Jock_EES_1	363836.519	5010569.466
A11b_Jock_EES_1	363839.157	5010563.779
A11b_Jock_EES_1	363846.591	5010561.364
A11b_Jock_EES_1	363849.754	5010558.41
A11b_Jock_EES_1	363853.474	5010550.402
A11b_Mud_1	363954.496	5010229.758
A11b_Mud_1	363846.573	5010167.209
A11b_Mud_1	363784.024	5010130.957
A11b_Mud_1	363783.641	5010131.276
A11b_Mud_1	363783.246	5010131.582
A11b_Mud_1	363782.842	5010131.873
A11b_Mud_1	363782.427	5010132.15
A11b_Mud_1	363782.003	5010132.413
A11b_Mud_1	363781.57	5010132.661
A11b_Mud_1	363781.129	5010132.893
A11b_Mud_1	363780.68	5010133.11
A11b_Mud_1	363780.224	5010133.311
A11b_Mud_1	363779.761	5010133.496
A11b_Mud_1	363779.291	5010133.665
A11b_Mud_1	363778.817	5010133.817
A11b_Mud_1	363778.337	5010133.953
A11b_Mud_1	363777.906	5010134.059
A11b_Mud_1	363778.663	5010138.522
A11b_Mud_1	363775.846	5010144.882
A11b_Mud_1	363775.12	5010145.731
A11b_Mud_1	363772.433	5010144.56
A11b_Mud_1	363770.129	5010145.785
A11b_Mud_1	363768.276	5010151.103
A11b_Mud_1	363762.488	5010152.821
A11b_Mud_1	363760.356	5010155.537
A11b_Mud_1	363758.451	5010159.25
A11b_Mud_1	363758.18	5010163.838
A11b_Mud_1	363754.931	5010168.409
A11b_Mud_1	363755.263	5010173.321
A11b_Mud_1	363754.871	5010174.657
A11b_Mud_1	363759.378	5010179.459
A11b_Mud_1	363795.96	5010215.388
A11b_Mud_1	363850.834	5010262.423
A11b_Mud_1	363889.376	5010293.779
A11b_Mud_1	363908.486	5010308.48
A11b_Mud_1	363908.659	5010306.756
A11b_Mud_1	363912.588	5010303.338
A11b_Mud_1	363914.118	5010297.863
A11b_Mud_1	363914.622	5010297.826
A11b_Mud_1	363917.858	5010297.591
A11b_Mud_1	363920.227	5010295.596
A11b_Mud_1	363922.647	5010283.481
A11b_Mud_1	363927.281	5010278.163
A11b_Mud_1	363923.321	5010273.712
A11b_Mud_1	363921.034	5010267.358
A11b_Mud_1	363921.297	5010265.404
A11b_Mud_1	363927.278	5010263.084
A11b_Mud_1	363931.306	5010257.354
A11b_Mud_1	363936.352	5010253.832
A11b_Mud_1	363942.922	5010254.286
A11b_Mud_1	363946.083	5010253.344
A11b_Mud_1	363949.25	5010255.222
A11b_Mud_1	363954.406	5010251.855
A11b_Mud_1	363951.939	5010247.809
A11b_Mud_1	363951.294	5010244.394
A11b_Mud_1	363952.792	5010240.462
A11b_Mud_1	363957.735	5010235.223
A11b_Mud_1	363957.489	5010233.011
A11b_Mud_1	363954.496	5010229.758
A11b_Mud_2	364041.137	5010172.358
A11b_Mud_2	364032.544	5010187.27
A11b_Mud_2	364040.692	5010177.101
A11b_Mud_2	364041.137	5010172.358
A11b_Mud_3	364062.746	5010134.862
A11b_Mud_3	364047.539	5010161.25
A11b_Mud_3	364052.213	5010159.605
A11b_Mud_3	364060.293	5010146.578
A11b_Mud_3	364062.551	5010141.477
A11b_Mud_3	364063.207	5010135.605
A11b_Mud_3	364062.746	5010134.862
A11b_Mud_5	363909.095	5010064.349
A11b_Mud_5	363849.302	5010168.791
A11b_Mud_5	363954.496	5010229.758
A11b_Mud_5	363953.944	5010229.159
A11b_Mud_5	363956.045	5010224.867
A11b_Mud_5	363958.94	5010224.461
A11b_Mud_5	363972.4	5010233.2
A11b_Mud_5	363995.081	5010244.68
A11b_Mud_5	364000.021	5010235.78
A11b_Mud_5	364009.619	5010225.934
A11b_Mud_5	364011.246	5010220.494
A11b_Mud_5	364015.848	5010211.915
A11b_Mud_5	364029.193	5010191.452
A11b_Mud_5	364032.543	5010187.271
A11b_Mud_5	364041.137	5010172.358
A11b_Mud_5	364041.468	5010168.839
A11b_Mud_5	364045.402	5010164.635
A11b_Mud_5	364046.861	5010161.489
A11b_Mud_5	364047.539	5010161.25
A11b_Mud_5	364062.746	5010134.862
A11b_Mud_5	364057.82	5010126.917
A11b_Mud_5	364033.151	5010114.061
A11b_Mud_5	364029.207	5010114.057
A11b_Mud_5	364014.867	5010108.427
A11b_Mud_5	364005.644	5010102.083
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A11b_Mud_5	363999.13	5010098.042
A11b_Mud_5	363995.618	5010093.553
A11b_Mud_5	363989.783	5010094.33
A11b_Mud_5	363983.901	5010094.531
A11b_Mud_5	363978.026	5010094.155
A11b_Mud_5	363972.217	5010093.205
A11b_Mud_5	363969.836	5010092.57
A11b_Mud_5	363966.529	5010091.69
A11b_Mud_5	363961.017	5010089.625
A11b_Mud_5	363955.734	5010087.03
A11b_Mud_5	363932.252	5010074.01
A11b_Mud_5	363925.17	5010070.399
A11b_Mud_5	363917.855	5010067.286
A11b_Mud_5	363910.343	5010064.686
A11b_Mud_5	363909.095	5010064.349
A11b_Mud_EES_1	363849.302	5010168.791
A11b_Mud_EES_1	363909.095	5010064.349
A11b_Mud_EES_1	363902.669	5010062.611
A11b_Mud_EES_1	363894.87	5010061.071
A11b_Mud_EES_1	363886.984	5010060.074
A11b_Mud_EES_1	363879.047	5010059.624
A11b_Mud_EES_1	363871.098	5010059.723
A11b_Mud_EES_1	363863.175	5010060.371
A11b_Mud_EES_1	363855.316	5010061.565
A11b_Mud_EES_1	363847.558	5010063.3
A11b_Mud_EES_1	363839.939	5010065.566
A11b_Mud_EES_1	363832.771	5010068.238
A11b_Mud_EES_1	363825.797	5010071.382
A11b_Mud_EES_1	363819.048	5010074.982
A11b_Mud_EES_1	363812.553	5010079.023
A11b_Mud_EES_1	363806.34	5010083.486
A11b_Mud_EES_1	363800.439	5010088.353
A11b_Mud_EES_1	363794.874	5010093.601
A11b_Mud_EES_1	363792.061	5010096.632
A11b_Mud_EES_1	363790.334	5010098.493
A11b_Mud_EES_1	363789.67	5010099.208
A11b_Mud_EES_1	363786.552	5010103.051
A11b_Mud_EES_1	363789.074	5010110.09
A11b_Mud_EES_1	363791.883	5010114.644
A11b_Mud_EES_1	363792.599	5010119.164
A11b_Mud_EES_1	363791.686	5010124.198
A11b_Mud_EES_1	363787.346	5010128.956
A11b_Mud_EES_1	363785.061	5010129.763
A11b_Mud_EES_1	363784.79	5010130.099
A11b_Mud_EES_1	363784.414	5010130.535
A11b_Mud_EES_1	363784.024	5010130.957
A11b_Mud_EES_1	363849.302	5010168.791
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A12b_Jock_2	364157.602	5010923.619
A12b_Jock_2	364180.695	5010922.303
A12b_Jock_2	364203.199	5010883.462
A12b_Jock_2	364190.824	5010861.972
A12b_Jock_2	364213.447	5010857.717
A12b_Jock_2	364221.202	5010844.272
A12b_Jock_2	364213.597	5010822.581
A12b_Jock_2	364235.854	5010818.114
A12b_Jock_2	364243.609	5010804.67
A12b_Jock_2	364236.369	5010783.189
A12b_Jock_2	364263.917	5010781.774

A12b_Jock_2	364271.671	5010768.33
A12b_Jock_2	364259.289	5010743.561
A12b_Jock_2	364279.963	5010739.126
A12b_Jock_2	364278.717	5010730.155
A12b_Jock_2	364275.451	5010717.743
A12b_Jock_2	364270.878	5010700.105
A12b_Jock_2	364264.486	5010680.47
A12b_Jock_2	364243.148	5010717.328
A12b_Jock_2	364136.255	5010901.967
A12b_Jock_2	364115.907	5010960.958
A12b_Jock_2	364098.17	5010962.067
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A12b_Jock_2	364145.357	5010854.705
A12b_Jock_2	363896.533	5010712.715
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A12b_Jock_2	363847.229	5010817.445
A12b_Jock_2	363844.822	5010816.283
A12b_Jock_2	363842.376	5010815.207
A12b_Jock_2	363839.894	5010814.217
A12b_Jock_2	363837.378	5010813.314
A12b_Jock_2	363834.832	5010812.501
A12b_Jock_2	363832.26	5010811.777
A12b_Jock_2	363829.663	5010811.144
A12b_Jock_2	363827.046	5010810.602
A12b_Jock_2	363824.412	5010810.153
A12b_Jock_2	363821.763	5010809.796
A12b_Jock_2	363819.103	5010809.533
A12b_Jock_2	363816.436	5010809.363
A12b_Jock_2	363813.765	5010809.286
A12b_Jock_2	363811.092	5010809.304
A12b_Jock_2	363788.366	5010809.857
A12b_Jock_2	363787.545	5010809.863
A12b_Jock_2	363786.724	5010809.841
A12b_Jock_2	363785.905	5010809.791
A12b_Jock_2	363785.088	5010809.712
A12b_Jock_2	363784.274	5010809.606
A12b_Jock_2	363783.464	5010809.473
A12b_Jock_2	363782.66	5010809.311
A12b_Jock_2	363781.861	5010809.122
A12b_Jock_2	363781.069	5010808.906
A12b_Jock_2	363780.285	5010808.663
A12b_Jock_2	363779.51	5010808.394
A12b_Jock_2	363778.744	5010808.098
A12b_Jock_2	363777.989	5010807.776
A12b_Jock_2	363777.246	5010807.428
A12b_Jock_2	363776.514	5010807.055
A12b_Jock_2	363775.796	5010806.657
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A12b_Jock_2	363736.918	5010786.705
A12b_Jock_2	363737.09	5010790.061
A12b_Jock_2	363738.777	5010793.241
A12b_Jock_2	363736.877	5010799.305
A12b_Jock_2	363737.28	5010805.044
A12b_Jock_2	363730.412	5010810.832
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A12b_Jock_2	364063.49	5010999.035
A12b_Jock_2	364066.232	5010999.807
A12b_Jock_2	364072.422	5010998.57
A12b_Jock_2	364077.303	5011005.682
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A12b_Jock_2	364090.157	5011011.112
A12b_Jock_2	364095.216	5011011.47
A12b_Jock_2	364098.364	5011009.562
A12b_Jock_2	364112.17	5011012.578
A12b_Jock_2	364120.674	5011011.091
A12b_Jock_2	364126.601	5011007.935
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A12b_Jock_2	364137.261	5011013.04
A12b_Jock_2	364139.978	5011015.295
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A12b_Jock_2	364148.326	5011013.008
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A12b_Jock_2	364169.187	5011032.427
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A12b_Jock_2	364173.232	5011041.606
A12b_Jock_2	364175.196	5011041.853
A12b_Jock_2	364181.381	5011039.657
A12b_Jock_2	364182.995	5011040.901
A12b_Jock_2	364183.601	5011044.504
A12b_Jock_2	364184.695	5011045.09
A12b_Jock_2	364188.499	5011042.77
A12b_Jock_2	364190.338	5011039.811
A12b_Jock_2	364193.782	5011038.604
A12b_Jock_2	364195.837	5011039.187
A12b_Jock_2	364203.962	5011057.879
A12b_Jock_2	364209.516	5011065.179
A12b_Jock_2	364215.791	5011069.503
A12b_Jock_2	364217.13	5011076.155
A12b_Jock_2	364224.538	5011079.837
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A12b_Jock_2	364237.2	5011082.747
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A12b_Jock_2	364250.942	5011089.461
A12b_Jock_2	364255.868	5011088.141
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A12b_Jock_2	364265.407	5011090.449
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A12b_Jock_2	364275.928	5011082.6
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A12b_Jock_2	364256.056	5011066.848
A12b_Jock_2	364255.5	5011063.148
A12b_Jock_2	364252.92	5011057.822
A12b_Jock_2	364250.811	5011054.397
A12b_Jock_2	364247.464	5011051.972
A12b_Jock_2	364247.433	5011049.09
A12b_Jock_2	364253.157	5011039.55
A12b_Jock_2	364253.087	5011038.191
A12b_Jock_2	364248.444	5011033.96
A12b_Jock_2	364248.162	5011033
A12b_Jock_2	364157.936	5010980.956
A12b_Jock_3	363955.536	5010578.79
A12b_Jock_3	363866.428	5010532.865
A12b_Jock_3	363855.036	5010547.04
A12b_Jock_3	363849.754	5010558.41
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A12b_Jock_3	363819.398	5010580.018
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A12b_Jock_3	363818.309	5010595.485
A12b_Jock_3	363819.336	5010598.918
A12b_Jock_3	363817.46	5010604.224
A12b_Jock_3	363817.363	5010608.117
A12b_Jock_3	363814.272	5010612.772
A12b_Jock_3	363806.967	5010616.466
A12b_Jock_3	363802.661	5010614.028
A12b_Jock_3	363798.854	5010615.541
A12b_Jock_3	363790.074	5010612.813
A12b_Jock_3	363777.36	5010605.623
A12b_Jock_3	363773.217	5010610.233
A12b_Jock_3	363777.379	5010617.553
A12b_Jock_3	363775.569	5010622.003
A12b_Jock_3	363776.257	5010625.026
A12b_Jock_3	363774.847	5010627.155
A12b_Jock_3	363773.885	5010637.684
A12b_Jock_3	363770.507	5010646.919
A12b_Jock_3	363767.909	5010651.05
A12b_Jock_3	363763.948	5010654.363
A12b_Jock_3	363760.528	5010654.485
A12b_Jock_3	363758.807	5010658.008
A12b_Jock_3	363759.485	5010665.455
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A12b_Jock_3	363759.517	5010676.533
A12b_Jock_3	363757.596	5010684.181
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A12b_Jock_3	363755.843	5010729.786
A12b_Jock_3	363753.638	5010736.495
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A12b_Jock_3	363746.834	5010756.517
A12b_Jock_3	363744.452	5010760.762
A12b_Jock_3	363744.395	5010763.207
A12b_Jock_3	363746.217	5010765.152
A12b_Jock_3	363746.517	5010767.393
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A12b_Jock_3	363737.625	5010784.71
A12b_Jock_3	363775.796	5010806.657
A12b_Jock_3	363776.514	5010807.055
A12b_Jock_3	363777.246	5010807.428
A12b_Jock_3	363777.989	5010807.776
A12b_Jock_3	363778.744	5010808.098
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A12b_Jock_3	363781.069	5010808.906
A12b_Jock_3	363781.861	5010809.122
A12b_Jock_3	363782.66	5010809.311
A12b_Jock_3	363783.464	5010809.473
A12b_Jock_3	363784.274	5010809.606
A12b_Jock_3	363785.088	5010809.712
A12b_Jock_3	363785.905	5010809.791
A12b_Jock_3	363786.724	5010809.841
A12b_Jock_3	363787.545	5010809.863
A12b_Jock_3	363788.366	5010809.857
A12b_Jock_3	363811.092	5010809.304
A12b_Jock_3	363813.765	5010809.286
A12b_Jock_3	363816.436	5010809.363
A12b_Jock_3	363819.103	5010809.533
A12b_Jock_3	363821.763	5010809.796
A12b_Jock_3	363824.412	5010810.153
A12b_Jock_3	363827.046	5010810.602
A12b_Jock_3	363829.663	5010811.144
A12b_Jock_3	363832.26	5010811.777
A12b_Jock_3	363834.832	5010812.501
A12b_Jock_3	363837.378	5010813.314
A12b_Jock_3	363839.894	5010814.217
A12b_Jock_3	363842.376	5010815.207
A12b_Jock_3	363844.822	5010816.283
A12b_Jock_3	363847.229	5010817.445
A12b_Jock_3	363849.594	5010818.69
A12b_Jock_3	363896.533	5010712.715
A12b_Jock_3	363930.156	5010636.805
A12b_Jock_3	363948.718	5010595.005
A12b_Jock_3	363953.667	5010583.472
A12b_Jock_3	363955.536	5010578.79
A12b_Jock_4	363991.345	5010376.925
A12b_Jock_4	363990.58	5010360.911
A12b_Jock_4	363990.338	5010357.886
A12b_Jock_4	363948.822	5010334.934
A12b_Jock_4	363914.853	5010313.377
A12b_Jock_4	363908.486	5010308.48
A12b_Jock_4	363908.359	5010309.751
A12b_Jock_4	363903.868	5010316.794
A12b_Jock_4	363898.58	5010318.194
A12b_Jock_4	363898.602	5010326.613
A12b_Jock_4	363895.805	5010332.215
A12b_Jock_4	363891.868	5010334.751
A12b_Jock_4	363886.176	5010333.656
A12b_Jock_4	363883.361	5010335.016
A12b_Jock_4	363880.704	5010341.482
A12b_Jock_4	363874.948	5010345.498
A12b_Jock_4	363872.22	5010349.543
A12b_Jock_4	363869.122	5010350.538
A12b_Jock_4	363867.769	5010354.003
A12b_Jock_4	363865.487	5010354.717
A12b_Jock_4	363865.16	5010361.539
A12b_Jock_4	363866.161	5010364.713
A12b_Jock_4	363861.705	5010364.727
A12b_Jock_4	363860.474	5010366.059
A12b_Jock_4	363862.95	5010369.926
A12b_Jock_4	363862.171	5010377.096
A12b_Jock_4	363863.574	5010378.702
A12b_Jock_4	363867.633	5010379.929
A12b_Jock_4	363868.464	5010381.556
A12b_Jock_4	363863.896	5010390.567
A12b_Jock_4	363865.823	5010392.964
A12b_Jock_4	363864.511	5010396.619
A12b_Jock_4	363869.682	5010402.116
A12b_Jock_4	363871.9	5010412.497
A12b_Jock_4	363867.02	5010415.906
A12b_Jock_4	363861.65	5010413.213
A12b_Jock_4	363859.143	5010414.344
A12b_Jock_4	363858.29	5010417.041
A12b_Jock_4	363858.304	5010417.101
A12b_Jock_4	363886.995	5010433.634
A12b_Jock_4	363890.305	5010430.541
A12b_Jock_4	363893.473	5010431.931
A12b_Jock_4	363895.983	5010433.032
A12b_Jock_4	363908.898	5010442.79
A12b_Jock_4	363915.238	5010444.21
A12b_Jock_4	363916.605	5010445.408
A12b_Jock_4	363913.355	5010448.824
A12b_Jock_4	363982.298	5010488.552
A12b_Jock_4	363985.126	5010472.771
A12b_Jock_4	363987.446	5010456.908
A12b_Jock_4	363989.254	5010440.978
A12b_Jock_4	363990.549	5010424.998
A12b_Jock_4	363991.33	5010408.985
A12b_Jock_4	363991.595	5010392.955
A12b_Jock_4	363991.345	5010376.925
A12b_Jock_5	364225.617	5010470.782
A12b_Jock_5	364233.174	5010468.477
A12b_Jock_5	364232.989	5010468.199
A12b_Jock_5	364224.497	5010462.973
A12b_Jock_5	364198.084	5010455.007
A12b_Jock_5	364225.617	5010470.782
A12b_Jock_7	363872.445	5010432.265
A12b_Jock_7	363875.601	5010427.068
A12b_Jock_7	363858.304	5010417.101
A12b_Jock_7	363859.548	5010422.448
A12b_Jock_7	363859.032	5010427.694
A12b_Jock_7	363856.587	5010431.117
A12b_Jock_7	363856.002	5010435.644
A12b_Jock_7	363861.743	5010438.017
A12b_Jock_7	363866.356	5010438.443
A12b_Jock_7	363869.001	5010434.611
A12b_Jock_7	363869.663	5010431.309
A12b_Jock_7	363870.859	5010431.355
A12b_Jock_7	363872.445	5010432.265
A12b_Jock_EES_1	363866.428	5010532.865
A12b_Jock_EES_1	363955.536	5010578.79
A12b_Jock_EES_1	363958.32	5010571.815
A12b_Jock_EES_1	363964.273	5010555.518
A12b_Jock_EES_1	363969.654	5010539.023
A12b_Jock_EES_1	363974.455	5010522.35
A12b_Jock_EES_1	363978.672	5010505.519
A12b_Jock_EES_1	363982.298	5010488.552
A12b_Jock_EES_1	363913.355	5010448.824
A12b_Jock_EES_1	363913.185	5010449.003
A12b_Jock_EES_1	363903.744	5010447.784
A12b_Jock_EES_1	363898.538	5010453.586
A12b_Jock_EES_1	363899.54	5010460.434
A12b_Jock_EES_1	363896.098	5010466.48
A12b_Jock_EES_1	363896.077	5010472.779
A12b_Jock_EES_1	363894.864	5010475.014
A12b_Jock_EES_1	363896.242	5010481.255

A12b_Jock_EES_1	363897.639	5010482.4
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A12b_Jock_EES_1	363902.464	5010487.149
A12b_Jock_EES_1	363910.326	5010487.204
A12b_Jock_EES_1	363914.203	5010488.805
A12b_Jock_EES_1	363917.354	5010491.563
A12b_Jock_EES_1	363915.114	5010499.542
A12b_Jock_EES_1	363914.753	5010508.814
A12b_Jock_EES_1	363911.425	5010511.475
A12b_Jock_EES_1	363905.413	5010509.607
A12b_Jock_EES_1	363896.616	5010513.3
A12b_Jock_EES_1	363890.239	5010518.563
A12b_Jock_EES_1	363886.792	5010523.546
A12b_Jock_EES_1	363883.531	5010524.454
A12b_Jock_EES_1	363880.819	5010527.7
A12b_Jock_EES_1	363877.653	5010528.659
A12b_Jock_EES_1	363877.363	5010528.995
A12b_Jock_EES_1	363874.244	5010532.6
A12b_Jock_EES_1	363867.294	5010531.788
A12b_Jock_EES_1	363866.428	5010532.865
A12b_Jock_EES_2	364259.289	5010743.561
A12b_Jock_EES_2	364271.671	5010768.33
A12b_Jock_EES_2	364263.917	5010781.774
A12b_Jock_EES_2	364236.369	5010783.189
A12b_Jock_EES_2	364243.609	5010804.67
A12b_Jock_EES_2	364235.854	5010818.114
A12b_Jock_EES_2	364213.597	5010822.581
A12b_Jock_EES_2	364221.202	5010844.272
A12b_Jock_EES_2	364213.447	5010857.717
A12b_Jock_EES_2	364190.824	5010861.972
A12b_Jock_EES_2	364203.199	5010883.462
A12b_Jock_EES_2	364180.695	5010922.303
A12b_Jock_EES_2	364157.602	5010923.619
A12b_Jock_EES_2	364171.416	5010957.587
A12b_Jock_EES_2	364157.936	5010980.956
A12b_Jock_EES_2	364248.162	5011033
A12b_Jock_EES_2	364247.546	5011030.9
A12b_Jock_EES_2	364244.226	5011028.422
A12b_Jock_EES_2	364235.407	5011018.386
A12b_Jock_EES_2	364234.59	5011016.161
A12b_Jock_EES_2	364235.905	5011013.21
A12b_Jock_EES_2	364234.644	5011010.975
A12b_Jock_EES_2	364228.591	5011010.494
A12b_Jock_EES_2	364224.204	5011005.595
A12b_Jock_EES_2	364224.952	5011000.761
A12b_Jock_EES_2	364226.795	5010997.102
A12b_Jock_EES_2	364223.153	5010992.679
A12b_Jock_EES_2	364222.219	5010989.042
A12b_Jock_EES_2	364222.821	5010984.63
A12b_Jock_EES_2	364227.512	5010978.465
A12b_Jock_EES_2	364230.702	5010976.23
A12b_Jock_EES_2	364237.014	5010962.254
A12b_Jock_EES_2	364241.315	5010959.928
A12b_Jock_EES_2	364244.863	5010961.027
A12b_Jock_EES_2	364247.129	5010960.554
A12b_Jock_EES_2	364252.387	5010955.5
A12b_Jock_EES_2	364257.032	5010953.254
A12b_Jock_EES_2	364260.273	5010948.679
A12b_Jock_EES_2	364264.617	5010947.743
A12b_Jock_EES_2	364270.848	5010949.336
A12b_Jock_EES_2	364275.984	5010945.348
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A12b_Jock_EES_2	364299.907	5010955.514
A12b_Jock_EES_2	364301.625	5010957.688
A12b_Jock_EES_2	364302.166	5010964.7
A12b_Jock_EES_2	364303.511	5010965.938
A12b_Jock_EES_2	364306.787	5010962.546
A12b_Jock_EES_2	364310.665	5010955.157
A12b_Jock_EES_2	364311.702	5010950.979
A12b_Jock_EES_2	364314.858	5010948.742
A12b_Jock_EES_2	364319.501	5010947.115
A12b_Jock_EES_2	364323.781	5010945.614
A12b_Jock_EES_2	364324.495	5010941.534
A12b_Jock_EES_2	364321.229	5010935.553
A12b_Jock_EES_2	364323.318	5010925.176
A12b_Jock_EES_2	364323.504	5010924.254
A12b_Jock_EES_2	364322.339	5010922.518
A12b_Jock_EES_2	364318.238	5010921.338
A12b_Jock_EES_2	364313.531	5010918.343
A12b_Jock_EES_2	364310.466	5010913.759
A12b_Jock_EES_2	364307.953	5010908.652
A12b_Jock_EES_2	364308.184	5010904.917
A12b_Jock_EES_2	364310.172	5010901.266
A12b_Jock_EES_2	364309.056	5010897.41
A12b_Jock_EES_2	364312.128	5010892.041
A12b_Jock_EES_2	364312.487	5010891.849
A12b_Jock_EES_2	364308.767	5010880.404
A12b_Jock_EES_2	364291.456	5010808.873
A12b_Jock_EES_2	364285.25	5010776.536
A12b_Jock_EES_2	364281.984	5010753.672
A12b_Jock_EES_2	364279.963	5010739.126
A12b_Jock_EES_2	364259.289	5010743.561
A12b_Jock_EES_3	364225.617	5010470.782
A12b_Jock_EES_3	364198.084	5010455.007
A12b_Jock_EES_3	364142.187	5010438.149
A12b_Jock_EES_3	364074.901	5010408.099
A12b_Jock_EES_3	364029.173	5010379.356
A12b_Jock_EES_3	363990.338	5010357.886
A12b_Jock_EES_3	363990.58	5010360.911
A12b_Jock_EES_3	363991.345	5010376.925
A12b_Jock_EES_3	363991.595	5010392.955
A12b_Jock_EES_3	363991.33	5010408.985
A12b_Jock_EES_3	363990.549	5010424.998
A12b_Jock_EES_3	363989.254	5010440.978
A12b_Jock_EES_3	363987.446	5010456.908
A12b_Jock_EES_3	363985.126	5010472.771
A12b_Jock_EES_3	363982.298	5010488.552
A12b_Jock_EES_3	363979.111	5010503.611
A12b_Jock_EES_3	363975.458	5010518.565
A12b_Jock_EES_3	363971.344	5010533.398
A12b_Jock_EES_3	363966.773	5010548.097
A12b_Jock_EES_3	363961.748	5010562.647
A12b_Jock_EES_3	363958.32	5010571.815
A12b_Jock_EES_3	363930.156	5010636.805
A12b_Jock_EES_3	363896.533	5010712.715
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A12b_Jock_EES_3	364122.356	5010894.492
A12b_Jock_EES_3	364098.17	5010962.067
A12b_Jock_EES_3	364115.907	5010960.958
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A12b_Jock_EES_3	364243.148	5010717.328
A12b_Jock_EES_3	364264.486	5010680.47
A12b_Jock_EES_3	364261.733	5010672.015
A12b_Jock_EES_3	364250.627	5010645.232
A12b_Jock_EES_3	364242.788	5010624.981
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A12b_Jock_EES_3	364230.376	5010535.484
A12b_Jock_EES_3	364232.989	5010517.847
A12b_Jock_EES_3	364236.256	5010502.168
A12b_Jock_EES_3	364238.215	5010487.797
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A12b_Jock_EES_3	364233.174	5010468.477
A12b_Jock_EES_3	364225.617	5010470.782
A12b_Jock_EES_4	363875.601	5010427.068
A12b_Jock_EES_4	363872.445	5010432.265
A12b_Jock_EES_4	363873.862	5010433.078
A12b_Jock_EES_4	363879.278	5010438.627
A12b_Jock_EES_4	363881.471	5010435.252
A12b_Jock_EES_4	363885.736	5010434.811
A12b_Jock_EES_4	363886.995	5010433.634
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A12b_Mud_1	364033.821	5010084.915
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A12b_Mud_1	364062.746	5010134.862
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A12b_Mud_1	364075.332	5010105.006
A12b_Mud_1	364033.821	5010084.915
A12b_Mud_2	363989.301	5010344.93
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A12b_Mud_2	363985.204	5010313.132
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A12b_Mud_2	363952.792	5010240.462
A12b_Mud_2	363951.294	5010244.394
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A12b_Mud_2	363914.622	5010297.826
A12b_Mud_2	363914.118	5010297.863
A12b_Mud_2	363912.588	5010303.338
A12b_Mud_2	363908.659	5010306.756
A12b_Mud_2	363908.486	5010308.48
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A12b_Mud_2	363948.822	5010334.934
A12b_Mud_2	363990.338	5010357.886
A12b_Mud_2	363989.301	5010344.93
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A12b_Mud_4	364045.471	5010164.487
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A12b_Mud_5	363975.925	5010242.178
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A12b_Mud_5	364032.543	5010187.271
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A12b_Mud_5	363979.07	5010236.576
A12b_Mud_EES	364045.471	5010164.487
A12b_Mud_EES	364045.63	5010164.563
A12b_Mud_EES	364047.539	5010161.25
A12b_Mud_EES	364046.861	5010161.489
A12b_Mud_EES	364045.471	5010164.487
A12b_Mud_EES_1	363975.925	5010242.178
A12b_Mud_EES_1	363979.07	5010236.576
A12b_Mud_EES_1	363972.4	5010233.2
A12b_Mud_EES_1	363958.94	5010224.461
A12b_Mud_EES_1	363956.045	5010224.867
A12b_Mud_EES_1	363953.944	5010229.159
A12b_Mud_EES_1	363954.496	5010229.758
A12b_Mud_EES_1	363975.925	5010242.178
A12b_Mud_EES_2	364027.869	5010367.127
A12b_Mud_EES_2	364022.775	5010361.041
A12b_Mud_EES_2	364007.101	5010342.316
A12b_Mud_EES_2	363995.184	5010318.827
A12b_Mud_EES_2	363985.204	5010313.132
A12b_Mud_EES_2	363987.508	5010328.998
A12b_Mud_EES_2	363989.301	5010344.93
A12b_Mud_EES_2	363990.338	5010357.886
A12b_Mud_EES_2	364029.173	5010379.356
A12b_Mud_EES_2	364074.901	5010408.099
A12b_Mud_EES_2	364142.187	5010438.149
A12b_Mud_EES_2	364147.035	5010438.353
A12b_Mud_EES_2	364151.395	5010437.639
A12b_Mud_EES_2	364027.869	5010367.127
A12b_Mud_EES_3	364020.344	5010110.577
A12b_Mud_EES_3	364033.821	5010084.915
A12b_Mud_EES_3	364024.904	5010080.6
A12b_Mud_EES_3	364023.124	5010081.932
A12b_Mud_EES_3	364021.299	5010083.203
A12b_Mud_EES_3	364019.432	5010084.409
A12b_Mud_EES_3	364017.525	5010085.551
A12b_Mud_EES_3	364015.579	5010086.627
A12b_Mud_EES_3	364013.597	5010087.635
A12b_Mud_EES_3	364011.582	5010088.574
A12b_Mud_EES_3	364009.535	5010089.443
A12b_Mud_EES_3	364007.46	5010090.241
A12b_Mud_EES_3	364005.359	5010090.967
A12b_Mud_EES_3	364003.234	5010091.621
A12b_Mud_EES_3	364002.468	5010091.827
A12b_Mud_EES_3	364001.349	5010092.209
A12b_Mud_EES_3	363995.618	5010093.553
A12b_Mud_EES_3	363999.13	5010098.042
A12b_Mud_EES_3	364000.345	5010100.192
A12b_Mud_EES_3	364005.644	5010102.083
A12b_Mud_EES_3	364014.867	5010108.427
A12b_Mud_EES_3	364020.344	5010110.577
A12b_Rideau_Z	364195.779	5010453.686
A12b_Rideau_2	364198.084	5010455.007
A12b_Rideau_2	364224.497	5010462.973
A12b_Rideau_2	364232.989	5010468.199
A12b_Rideau_2	364233.174	5010468.477
A12b_Rideau_2	364251.791	5010462.799
A12b_Rideau_2	364247.462	5010488.271
A12b_Rideau_2	364345.624	5010540.328
A12b_Rideau_2	364381.226	5010532.652
A12b_Rideau_2	364387.353	5010553.493
A12b_Rideau_2	364378.472	5010561.358
A12b_Rideau_2	364325.76	5010652.538
A12b_Rideau_2	364489.722	5010746.104
A12b_Rideau_2	364503.482	5010721.973
A12b_Rideau_2	364471.467	5010703.429
A12b_Rideau_2	364517.322	5010624.109
A12b_Rideau_2	364529.321	5010603.324
A12b_Rideau_2	364644.753	5010403.592
A12b_Rideau_2	364494.568	5010317.776

A12b_Rideau_2	364432.474	5010282.34
A12b_Rideau_2	364420.872	5010275.665
A12b_Rideau_2	364405.263	5010266.689
A12b_Rideau_2	364367.951	5010248.149
A12b_Rideau_2	364284.244	5010206.554
A12b_Rideau_2	364277.85	5010229.311
A12b_Rideau_2	364259.559	5010299.863
A12b_Rideau_2	364236.041	5010357.349
A12b_Rideau_2	364209.911	5010397.851
A12b_Rideau_2	364191.62	5010418.756
A12b_Rideau_2	364162.55	5010434.597
A12b_Rideau_2	364156.017	5010436.883
A12b_Rideau_2	364151.395	5010437.639
A12b_Rideau_2	364156.524	5010440.567
A12b_Rideau_2	364187.041	5010427.855
A12b_Rideau_2	364195.779	5010453.686
A12b_Rideau_3	364288.325	5010737.332
A12b_Rideau_3	364304.896	5010708.725
A12b_Rideau_3	364295.32	5010681.224
A12b_Rideau_3	364324.071	5010670.93
A12b_Rideau_3	364325.76	5010652.538
A12b_Rideau_3	364378.472	5010561.358
A12b_Rideau_3	364387.353	5010553.493
A12b_Rideau_3	364381.226	5010532.652
A12b_Rideau_3	364345.624	5010540.328
A12b_Rideau_3	364306.485	5010607.928
A12b_Rideau_3	364271.899	5010667.664
A12b_Rideau_3	364264.486	5010680.47
A12b_Rideau_3	364270.878	5010700.105
A12b_Rideau_3	364275.451	5010717.743
A12b_Rideau_3	364278.717	5010730.155
A12b_Rideau_3	364279.963	5010739.126
A12b_Rideau_3	364288.325	5010737.332
A12b_Rideau_EES_1	364195.779	5010453.686
A12b_Rideau_EES_1	364195.779	5010453.687
A12b_Rideau_EES_1	364187.041	5010427.855
A12b_Rideau_EES_1	364156.524	5010440.567
A12b_Rideau_EES_1	364151.395	5010437.639
A12b_Rideau_EES_1	364147.035	5010438.353
A12b_Rideau_EES_1	364142.187	5010438.149
A12b_Rideau_EES_1	364198.084	5010455.007
A12b_Rideau_EES_1	364195.779	5010453.686
A12b_Rideau_EES_2	364304.896	5010708.725
A12b_Rideau_EES_2	364288.325	5010737.332
A12b_Rideau_EES_2	364279.963	5010739.126
A12b_Rideau_EES_2	364281.984	5010753.672
A12b_Rideau_EES_2	364285.25	5010776.536
A12b_Rideau_EES_2	364291.456	5010808.873
A12b_Rideau_EES_2	364308.767	5010880.404
A12b_Rideau_EES_2	364312.487	5010891.849
A12b_Rideau_EES_2	364316.296	5010889.811
A12b_Rideau_EES_2	364326.251	5010889.076
A12b_Rideau_EES_2	364334.053	5010882.501
A12b_Rideau_EES_2	364334.491	5010880.547
A12b_Rideau_EES_2	364331.402	5010873.088
A12b_Rideau_EES_2	364335.241	5010864.187
A12b_Rideau_EES_2	364343.461	5010858.334
A12b_Rideau_EES_2	364348.43	5010852.317
A12b_Rideau_EES_2	364354.244	5010849.801
A12b_Rideau_EES_2	364364.238	5010854.2
A12b_Rideau_EES_2	364370.432	5010851.48
A12b_Rideau_EES_2	364376.136	5010844.279
A12b_Rideau_EES_2	364376.521	5010838.962
A12b_Rideau_EES_2	364378.812	5010833.09
A12b_Rideau_EES_2	364382.738	5010830.547
A12b_Rideau_EES_2	364387.441	5010831.507
A12b_Rideau_EES_2	364393.56	5010825.213
A12b_Rideau_EES_2	364396.976	5010824.567
A12b_Rideau_EES_2	364400.214	5010825.725
A12b_Rideau_EES_2	364405.092	5010822.711
A12b_Rideau_EES_2	364415.11	5010821.492
A12b_Rideau_EES_2	364418.863	5010819.236
A12b_Rideau_EES_2	364432.325	5010820.457
A12b_Rideau_EES_2	364440.641	5010818.355
A12b_Rideau_EES_2	364445.524	5010819.228
A12b_Rideau_EES_2	364448.994	5010817.338
A12b_Rideau_EES_2	364483.227	5010757.497
A12b_Rideau_EES_2	364489.722	5010746.104
A12b_Rideau_EES_2	364325.76	5010652.538
A12b_Rideau_EES_2	364324.071	5010670.93
A12b_Rideau_EES_2	364295.32	5010681.224
A12b_Rideau_EES_2	364304.896	5010708.725
A12b_Rideau_EES_4	364345.624	5010540.328
A12b_Rideau_EES_4	364247.462	5010488.271
A12b_Rideau_EES_4	364251.791	5010462.799
A12b_Rideau_EES_4	364233.174	5010468.477
A12b_Rideau_EES_4	364238.215	5010476.038
A12b_Rideau_EES_4	364238.215	5010487.797
A12b_Rideau_EES_4	364236.256	5010502.168
A12b_Rideau_EES_4	364232.989	5010517.847
A12b_Rideau_EES_4	364230.376	5010535.484
A12b_Rideau_EES_4	364230.376	5010555.735
A12b_Rideau_EES_4	364232.336	5010582.519
A12b_Rideau_EES_4	364236.909	5010607.343
A12b_Rideau_EES_4	364242.788	5010624.981
A12b_Rideau_EES_4	364250.627	5010645.232
A12b_Rideau_EES_4	364261.733	5010672.015
A12b_Rideau_EES_4	364264.486	5010680.47
A12b_Rideau_EES_4	364271.899	5010667.664
A12b_Rideau_EES_4	364345.624	5010540.328
A13_Jock_1	364296.407	5011060.828
A13_Jock_1	364248.162	5011033
A13_Jock_1	364248.444	5011033.96
A13_Jock_1	364253.087	5011038.191
A13_Jock_1	364253.157	5011039.55
A13_Jock_1	364247.433	5011049.09
A13_Jock_1	364247.464	5011051.972
A13_Jock_1	364250.811	5011054.397
A13_Jock_1	364252.92	5011057.822
A13_Jock_1	364255.5	5011063.148
A13_Jock_1	364256.056	5011066.848
A13_Jock_1	364258.685	5011070.613
A13_Jock_1	364269.993	5011080.428
A13_Jock_1	364275	5011081.39
A13_Jock_1	364275.928	5011082.6
A13_Jock_1	364276.601	5011085.222
A13_Jock_1	364275.91	5011087.219
A13_Jock_1	364268.375	5011090.8
A13_Jock_1	364265.407	5011090.449
A13_Jock_1	364261.841	5011088.269
A13_Jock_1	364255.868	5011088.141
A13_Jock_1	364250.942	5011089.461
A13_Jock_1	364244.457	5011085.369
A13_Jock_1	364237.2	5011082.747
A13_Jock_1	364228.382	5011082.969
A13_Jock_1	364224.538	5011079.837
A13_Jock_1	364217.13	5011076.155
A13_Jock_1	364215.791	5011069.503
A13_Jock_1	364209.516	5011065.179
A13_Jock_1	364203.962	5011057.879
A13_Jock_1	364195.837	5011039.187
A13_Jock_1	364193.782	5011038.604
A13_Jock_1	364190.338	5011039.811
A13_Jock_1	364188.499	5011042.77
A13_Jock_1	364184.695	5011045.09
A13_Jock_1	364183.601	5011044.504
A13_Jock_1	364182.995	5011040.901
A13_Jock_1	364181.381	5011039.657
A13_Jock_1	364175.196	5011041.853
A13_Jock_1	364173.232	5011041.606
A13_Jock_1	364169.076	5011037.617
A13_Jock_1	364169.187	5011032.427
A13_Jock_1	364167.834	5011028.132
A13_Jock_1	364159.771	5011025.509
A13_Jock_1	364157.457	5011021.14
A13_Jock_1	364158.066	5011017.277
A13_Jock_1	364154.069	5011012.6
A13_Jock_1	364148.326	5011013.008
A13_Jock_1	364144.15	5011012.13
A13_Jock_1	364139.978	5011015.295
A13_Jock_1	364137.261	5011013.04
A13_Jock_1	364132.522	5011011.576
A13_Jock_1	364126.601	5011007.935
A13_Jock_1	364120.674	5011011.091
A13_Jock_1	364112.17	5011012.578
A13_Jock_1	364098.364	5011009.562
A13_Jock_1	364095.216	5011011.47
A13_Jock_1	364090.157	5011011.112
A13_Jock_1	364084.954	5011007.57
A13_Jock_1	364077.303	5011005.682
A13_Jock_1	364072.422	5010998.57
A13_Jock_1	364066.232	5010999.807
A13_Jock_1	364063.49	5010999.035
A13_Jock_1	364057.005	5010999.465
A13_Jock_1	364273.411	5011124.269
A13_Jock_1	364299.992	5011077.804
A13_Jock_1	364296.407	5011060.828
A13_Jock_2	364301.877	5011048.398
A13_Jock_2	364303.152	5011049.134
A13_Jock_2	364296.407	5011060.828
A13_Jock_2	364299.992	5011077.804
A13_Jock_2	364356.256	5010979.451
A13_Jock_2	364353.865	5010977.459
A13_Jock_2	364347.406	5010972.162
A13_Jock_2	364346.109	5010970.709
A13_Jock_2	364301.877	5011048.398
A13_Jock_EES_1	364296.407	5011060.828
A13_Jock_EES_1	364303.152	5011049.134
A13_Jock_EES_1	364301.877	5011048.398
A13_Jock_EES_1	364346.109	5010970.709
A13_Jock_EES_1	364341.226	5010965.24
A13_Jock_EES_1	364336.204	5010957.815
A13_Jock_EES_1	364329.998	5010945.73
A13_Jock_EES_1	364323.318	5010925.176
A13_Jock_EES_1	364321.229	5010935.553
A13_Jock_EES_1	364324.495	5010941.534
A13_Jock_EES_1	364323.781	5010945.614
A13_Jock_EES_1	364319.501	5010947.115
A13_Jock_EES_1	364314.858	5010948.742
A13_Jock_EES_1	364311.702	5010950.979
A13_Jock_EES_1	364310.665	5010955.157
A13_Jock_EES_1	364306.787	5010962.546
A13_Jock_EES_1	364303.511	5010965.938
A13_Jock_EES_1	364302.166	5010964.7
A13_Jock_EES_1	364301.625	5010957.688
A13_Jock_EES_1	364299.907	5010955.514
A13_Jock_EES_1	364281.242	5010946.175
A13_Jock_EES_1	364275.984	5010945.348
A13_Jock_EES_1	364270.848	5010949.336
A13_Jock_EES_1	364264.617	5010947.743
A13_Jock_EES_1	364260.273	5010948.679
A13_Jock_EES_1	364257.032	5010953.254
A13_Jock_EES_1	364252.387	5010955.5
A13_Jock_EES_1	364247.129	5010960.554
A13_Jock_EES_1	364244.863	5010961.027
A13_Jock_EES_1	364241.315	5010959.928
A13_Jock_EES_1	364237.014	5010962.254
A13_Jock_EES_1	364230.702	5010976.23
A13_Jock_EES_1	364227.512	5010978.465
A13_Jock_EES_1	364222.821	5010984.63
A13_Jock_EES_1	364222.219	5010989.042
A13_Jock_EES_1	364223.153	5010992.679
A13_Jock_EES_1	364226.795	5010997.102
A13_Jock_EES_1	364224.952	5011000.761
A13_Jock_EES_1	364224.204	5011005.595
A13_Jock_EES_1	364228.591	5011010.494
A13_Jock_EES_1	364234.644	5011010.975
A13_Jock_EES_1	364235.905	5011013.21
A13_Jock_EES_1	364234.59	5011016.161
A13_Jock_EES_1	364235.407	5011018.386
A13_Jock_EES_1	364244.226	5011028.422
A13_Jock_EES_1	364247.546	5011030.9
A13_Jock_EES_1	364248.162	5011033
A13_Jock_EES_1	364296.407	5011060.828
A13_Rideau_1	364417.982	5010844.474
A13_Rideau_1	364346.109	5010970.709
A13_Rideau_1	364347.406	5010972.162
A13_Rideau_1	364353.865	5010977.459
A13_Rideau_1	364356.256	5010979.451
A13_Rideau_1	364429.659	5010851.137
A13_Rideau_1	364417.982	5010844.474
A13_Rideau_EES_2	364417.982	5010844.474
A13_Rideau_EES_2	364429.659	5010851.137
A13_Rideau_EES_2	364448.994	5010817.338
A13_Rideau_EES_2	364445.524	5010819.228
A13_Rideau_EES_2	364440.641	5010818.355
A13_Rideau_EES_2	364432.325	5010820.457
A13_Rideau_EES_2	364418.863	5010819.236
A13_Rideau_EES_2	364415.11	5010821.492
A13_Rideau_EES_2	364405.092	5010822.711
A13_Rideau_EES_2	364400.214	5010825.725
A13_Rideau_EES_2	364396.976	5010824.567
A13_Rideau_EES_2	364393.56	5010825.213
A13_Rideau_EES_2	364387.441	5010831.507
A13_Rideau_EES_2	364382.738	5010830.547
A13_Rideau_EES_2	364378.812	5010833.09
A13_Rideau_EES_2	364376.521	5010838.962
A13_Rideau_EES_2	364376.136	5010844.279
A13_Rideau_EES_2	364370.432	5010851.48
A13_Rideau_EES_2	364364.238	5010854.2
A13_Rideau_EES_2	364354.244	5010849.801
A13_Rideau_EES_2	364348.43	5010852.317
A13_Rideau_EES_2	364343.461	5010858.334
A13_Rideau_EES_2	364335.241	5010864.187
A13_Rideau_EES_2	364331.402	5010873.088
A13_Rideau_EES_2	364334.491	5010880.547
A13_Rideau_EES_2	364334.053	5010882.501
A13_Rideau_EES_2	364326.251	5010889.076
A13_Rideau_EES_2	364316.296	5010889.811
A13_Rideau_EES_2	364312.487	5010891.849
A13_Rideau_EES_2	364312.128	5010892.041
A13_Rideau_EES_2	364309.056	5010897.41
A13_Rideau_EES_2	364310.172	5010901.266
A13_Rideau_EES_2	364308.184	5010904.917
A13_Rideau_EES_2	364307.953	5010908.652
A13_Rideau_EES_2	364310.466	5010913.759
A13_Rideau_EES_2	364313.531	5010918.343
A13_Rideau_EES_2	364318.238	5010921.338
A13_Rideau_EES_2	364322.339	5010922.518
A13_Rideau_EES_2	364322.562	5010922.851
A13_Rideau_EES_2	364323.504	5010924.254
A13_Rideau_EES_2	364323.318	5010925.176
A13_Rideau_EES_2	364329.998	5010945.73
A13_Rideau_EES_2	364336.204	5010957.815
A13_Rideau_EES_2	364341.226	5010965.24
A13_Rideau_EES_2	364346.109	5010970.709
A13_Rideau_EES_2	364417.982	5010844.474

;;Storage Node	X-Coord	Y-Coord
;;--------------	----------	----------

[SYMBOLS]

;;Gage	X-Coord	Y-Coord
;;--------------	----------	----------

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
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  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  ------------------------------------------------------------


  *************
  Element Count
  *************
  Number of rain gages ...... 2
  Number of subcatchments ... 42
  Number of nodes ........... 4
  Number of links ........... 1
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
  Name                 Data Source                    Data       Recording
                                                      Type       Interval
  ---------------------------------------------------------------------------
  CDA_RCS_262_2014-2024 CDA_RCS_262_2014-2024          INTENSITY   60 min.
  OTTRAIN              OTTRAIN_C                      VOLUME      60 min.


  ********************
  Subcatchment Summary
  ********************
  Name                 Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ---------------------------------------------------------------------------------------
  A11a_Jock_1          0.48    108.68      3.33    3.2000 CDA_RCS_262_2014-2024
Mud_Creek
  A11a_Jock_2          0.63    140.90     71.43    3.2000 CDA_RCS_262_2014-2024
Mud_Creek
  A11a_Jock_3          0.01      1.35     85.71    3.2000 CDA_RCS_262_2014-2024
Mud_Creek
  A11a_Jock_5          5.47   1231.35     85.71    3.2000 CDA_RCS_262_2014-2024
Mud_Creek
  A11a_Jock_EES_1      2.35    527.72     85.71    3.2000 CDA_RCS_262_2014-2024 EES
  A11a_Jock_EES_2      0.00      0.58     85.71    3.2000 CDA_RCS_262_2014-2024 EES
  A11b_Jock_1          2.17    489.06      3.33    3.9520 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Jock_2          0.01      2.86      3.33    3.9520 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Jock_5          1.58    354.91     85.71    3.9520 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Jock_EES_1      0.68    152.11     85.71    3.9520 CDA_RCS_262_2014-2024 EES
  A11b_Mud_1           1.49    336.29      3.33    2.7900 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Mud_2           0.00      0.38     64.29    2.7900 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Mud_3           0.01      2.00     64.29    2.7900 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Mud_5           2.06    463.43     85.71    2.7900 CDA_RCS_262_2014-2024
Mud_Creek
  A11b_Mud_EES_1       0.88    198.61     85.71    2.7900 CDA_RCS_262_2014-2024 EES
  A12b_Jock_2          7.27   1635.81     39.05    3.5780 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Jock_3          2.98    671.62     85.71    3.5780 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Jock_4          1.50    338.04      3.33    3.5780 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Jock_5          0.01      2.92     71.43    3.5780 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Jock_7          0.02      4.74     85.71    3.5780 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Jock_EES_1      1.28    287.84     85.71    3.5780 CDA_RCS_262_2014-2024 EES
  A12b_Jock_EES_2      2.13    479.64     66.38    3.5780 CDA_RCS_262_2014-2024 EES
  A12b_Jock_EES_3     11.16   2510.69     65.39    3.5780 CDA_RCS_262_2014-2024 EES
  A12b_Jock_EES_4      0.01      2.03     85.71    3.5780 CDA_RCS_262_2014-2024 EES
  A12b_Mud_1           0.13     29.59     85.71    1.7890 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Mud_2           6.90   1551.73     61.28    1.7890 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Mud_4           0.00      0.13     85.71    1.7890 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Mud_5           0.03      7.06     85.71    1.7890 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Mud_EES         0.00      0.02     85.71    1.7890 CDA_RCS_262_2014-2024 EES
  A12b_Mud_EES_1       0.01      3.02     85.71    1.7890 CDA_RCS_262_2014-2024 EES
  A12b_Mud_EES_2       0.24     53.30     68.69    1.7890 CDA_RCS_262_2014-2024 EES
  A12b_Mud_EES_3       0.06     12.68     85.71    1.7890 CDA_RCS_262_2014-2024 EES
  A12b_Rideau_2       11.95   2689.79     68.00    2.3480 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Rideau_3        0.80    179.55     71.43    2.3480 CDA_RCS_262_2014-2024
Mud_Creek
  A12b_Rideau_EES_1    0.05     11.84     66.87    2.3480 CDA_RCS_262_2014-2024 EES
  A12b_Rideau_EES_2    2.70    608.56     66.38    2.3480 CDA_RCS_262_2014-2024 EES
  A12b_Rideau_EES_4    1.24    279.34     64.29    2.3480 CDA_RCS_262_2014-2024 EES
  A13_Jock_1           0.69    155.86     71.43    4.5780 CDA_RCS_262_2014-2024
Jock_River
  A13_Jock_2           0.14     31.03     57.14    4.5780 CDA_RCS_262_2014-2024
Jock_River
  A13_Jock_EES_1       0.89    201.00     66.38    4.5780 CDA_RCS_262_2014-2024 EES
  A13_Rideau_1         0.20     43.88     57.14    4.0450 CDA_RCS_262_2014-2024
Jock_River
  A13_Rideau_EES_2     0.79    178.58     66.38    4.0450 CDA_RCS_262_2014-2024 EES


  ************
  Node Summary
  ************
  Name                 Type                Invert      Max.    Ponded    External
                                            Elev.      Depth      Area    Inflow
  ---------------------------------------------------------------------------
  Jock_River           OUTFALL             95.00       0.00       0.0
  Mud_Creek            OUTFALL             95.00       0.00       0.0
  Rideau_River         OUTFALL             95.00       0.00       0.0
  EES                  STORAGE            103.70       0.80       0.0


  ************
  Link Summary
  ************
  Name            From Node        To Node          Type            Length    %Slope
Roughness
  ---------------------------------------------------------------------------------
-
  Major           EES              Jock_River       WEIR


  **********************
  Cross Section Summary
  **********************
  Conduit          Shape               Full     Full     Hyd.     Max.   No. of     Full
                                       Depth     Area     Rad.    Width  Barrels     Flow
  ---------------------------------------------------------------------------


  ***************
  Analysis Options
  ***************
  Flow Units ............... CMS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
    Snowmelt ............... YES
    Groundwater ............ YES
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 04/19/2004 00:00:00
  Ending Date .............. 04/10/2024 04:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 01:00:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 60.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 1
  Head Tolerance ........... 0.001500 m


  *************************       Volume          Depth
  Runoff Quantity Continuity     hectare-m            mm
  *************************     ---------       -------
  Initial Snow Cover .....          0.000           0.000
  Total Precipitation ......     1226.568       17269.800
  Evaporation Loss .........      113.943        1604.287
  Infiltration Loss ........      413.595        5823.326
  Surface Runoff ...........      701.189        9872.587
  Snow Removed .............        0.000           0.000
  Final Snow Cover .........        0.000           0.000
  Final Storage ............        0.070           0.990
  Continuity Error (%) .....       -0.182


  *************************       Volume          Depth
  Groundwater Continuity         hectare-m            mm
  *************************     ---------       -------
  Initial Storage ..........      202.947        2857.448
  Infiltration .............      413.595        5823.326
  Upper Zone ET ............      239.265        3368.791
  Lower Zone ET ............        2.394          33.709
  Deep Percolation .........       22.462         316.265
  Groundwater Flow .........      144.133        2029.362
  Final Storage ............      208.288        2932.646
  Continuity Error (%) .....        0.000


  *************************       Volume          Volume
  Flow Routing Continuity        hectare-m       10^6 ltr
  *************************     ---------       --------
  Dry Weather Inflow .......        0.000           0.000
  Wet Weather Inflow .......      701.189        7011.965
  Groundwater Inflow .......      144.088        1440.892
  RDII Inflow ..............        0.000           0.000
  External Inflow ..........        0.000           0.000
  External Outflow .........      597.499        5975.049
  Flooding Loss ............        0.000           0.000
  Evaporation Loss .........        0.000           0.000
  Exfiltration Loss ........      247.953        2479.556
  Initial Stored Volume ....        0.000           0.000
  Final Stored Volume ......        0.000           0.000
  Continuity Error (%) .....       -0.021


  ***************************
  Time-Step Critical Elements
  ***************************
  None


  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.


  *********************************
  Most Frequent Nonconverging Nodes
  *********************************
  Convergence obtained at all time steps.


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :    58.50 sec
  Average Time Step           :    60.00 sec
  Maximum Time Step           :    60.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
     60.000 - 23.031 sec      :   100.00 %
     23.031 -  8.841 sec      :     0.00 %
      8.841 -  3.393 sec      :     0.00 %
      3.393 -  1.303 sec      :     0.00 %
      1.303 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------------------------
  ----------------------------------
                             Total      Total      Total      Total      Imperv       Perv
Total       Total      Peak  Runoff
                          Precip      Runon       Evap      Infil     Runoff     Runoff
Runoff      Runoff    Runoff   Coeff
  Subcatchment              mm         mm         mm         mm         mm         mm
mm     10^6 ltr       CMS
  ---------------------------------------------------------------------------------------------------------------------------------
----------------------------------
  A11a_Jock_1          17269.80       0.00      95.10   15382.91     496.19    1301.35
1797.55       8.68      0.05   0.104
  A11a_Jock_2          17269.80       0.00    1812.85    4534.49   10559.31     397.08
10956.39      68.61      0.08   0.634
  A11a_Jock_3          17269.80       0.00    2178.20    2265.32   12662.36     200.78
12863.14       0.77      0.00   0.745
  A11a_Jock_5          17269.80       0.00    2178.22    2265.32   12662.35     200.78
12863.12     703.95      0.72   0.745
  A11a_Jock_EES_1      17269.80       0.00    2178.22    2265.32   12662.35     200.78
12863.12     301.69      0.31   0.745
  A11a_Jock_EES_2      17269.80       0.00    2178.19    2265.31   12662.39     200.78
12863.17       0.33      0.00   0.745
  A11b_Jock_1          17269.80       0.00      104.55   15208.11     496.33    1467.65
1963.97       42.69      0.23   0.114
  A11b_Jock_2          17269.80       0.00      104.55   15208.10     496.37    1467.66
1964.03        0.25      0.00   0.114
  A11b_Jock_5          17269.80       0.00    2176.41    2236.66   12667.44     228.41
12895.85     203.42      0.21   0.747
  A11b_Jock_EES_1      17269.80       0.00    2176.41    2236.66   12667.44     228.41
12895.85      87.18      0.09   0.747
  A11b_Mud_1           17269.80       0.00      134.19   14777.15     496.15    1870.73
2366.87       35.38      0.17   0.137
  A11b_Mud_2           17269.80       0.00    1645.97    5428.84    9504.69     722.92
10227.62       0.17      0.00   0.592
  A11b_Mud_3           17269.80       0.00    1645.99    5428.86    9504.66     722.90
10227.55       0.91      0.00   0.592
  A11b_Mud_5           17269.80       0.00    2185.81    2164.48   12658.96     296.90
12955.86     266.85      0.27   0.750
  A11b_Mud_EES_1       17269.80       0.00    2185.81    2164.48   12658.96     296.90
12955.86     114.36      0.12   0.750
  A12b_Jock_2          17269.80       0.00      989.12    9704.78    5786.09     815.22
6601.31      479.93      0.83   0.382
  A12b_Jock_3          17269.80       0.00    2176.33    2269.99   12665.06     196.27
12861.33     383.91      0.39   0.745
  A12b_Jock_4          17269.80       0.00       93.62   15409.96     496.23    1275.65
1771.88       26.62      0.15   0.103
  A12b_Jock_5          17269.80       0.00    1811.17    4543.51   10561.56     388.45
10950.00       1.42      0.00   0.634
  A12b_Jock_7          17269.80       0.00    2176.33    2269.99   12665.07     196.27
12861.34       2.71      0.00   0.745
  A12b_Jock_EES_1      17269.80       0.00    2176.33    2269.99   12665.06     196.27
12861.33     164.53      0.17   0.745
```

A12b_Jock_EES_2	17269.80	0.00	1682.45	5347.68	9817.51	455.72	10273.24
279.00	0.27	0.595					
A12b_Jock_EES_3	17269.80	0.00	1657.19	5505.72	9671.31	468.91	10140.72
1131.50	1.39	0.587					
A12b_Jock_EES_4	17269.80	0.00	2176.33	2269.99	12665.07	196.27	12861.34
1.16	0.00	0.745					
A12b_Mud_1	17269.80	0.00	2190.15	2217.00	12647.54	247.14	12894.68
16.96	0.02	0.747					
A12b_Mud_2	17269.80	0.00	1566.07	6025.65	9054.62	651.52	9706.14
669.39	0.87	0.562					
A12b_Mud_4	17269.80	0.00	2190.10	2217.31	12647.24	247.18	12894.42
0.07	0.00	0.747					
A12b_Mud_5	17269.80	0.00	2190.15	2217.00	12647.53	247.14	12894.68
4.04	0.00	0.747					
A12b_Mud_EES	17269.80	0.00	2189.17	2217.98	12647.67	247.38	12895.05
0.01	0.00	0.747					
A12b_Mud_EES_1	17269.80	0.00	2190.15	2217.00	12647.53	247.14	12894.68
1.73	0.00	0.747					
A12b_Mud_EES_2	17269.80	0.00	1754.83	4868.58	10145.27	530.50	10675.78
25.29	0.03	0.618					
A12b_Mud_EES_3	17269.80	0.00	2190.15	2217.00	12647.53	247.14	12894.68
7.27	0.01	0.747					
A12b_Rideau_2	17269.80	0.00	1731.60	5015.12	10047.71	506.46	10554.16
1261.71	1.52	0.611					
A12b_Rideau_3	17269.80	0.00	1819.17	4475.77	10553.18	453.44	11006.62
87.83	0.10	0.637					
A12b_Rideau_EES_1	17269.80	0.00	1702.83	5192.49	9881.50	523.84	10405.34
5.47	0.01	0.603					
A12b_Rideau_EES_2	17269.80	0.00	1690.44	5268.85	9809.94	531.32	10341.26
279.70	0.34	0.599					
A12b_Rideau_EES_4	17269.80	0.00	1637.12	5597.91	9501.62	563.47	10065.10
124.96	0.16	0.583					
A13_Jock_1	17269.80	0.00	1811.30	4473.59	10566.12	456.02	11022.15
76.35	0.09	0.638					
A13_Jock_2	17269.80	0.00	1449.79	6716.41	8459.37	677.68	9137.05
12.60	0.02	0.529					
A13_Jock_EES_1	17269.80	0.00	1683.37	5265.91	9821.82	534.71	10356.53
92.52	0.11	0.600					
A13_Rideau_1	17269.80	0.00	1450.71	6717.41	8457.57	676.61	9134.17
17.81	0.02	0.529					
A13_Rideau_EES_2	17269.80	0.00	1684.53	5266.62	9819.64	533.96	10353.60
82.18	0.10	0.600					

****
Groundwater Summary
****

Subcatchment	Total Infil mm	Total Evap mm	Total Lower Seepage mm	Total Lateral Outflow mm	Maximum Lateral Outflow CMS	Average Upper Moist.	Average Water Table m	Final Upper Moist. m
A11a_Jock_1	15382.91	9819.13	257.04	4963.85	0.00	0.26	98.50	0.28
A11a_Jock_2	4534.49	2485.87	257.03	1627.74	0.00	0.24	98.50	0.25
A11a_Jock_3	2265.32	1241.99	257.03	716.18	0.00	0.22	98.50	0.23
A11a_Jock_5	2265.32	1241.99	257.03	716.18	0.00	0.22	98.50	0.23
A11a_Jock_EES_1	2265.32	1241.99	257.03	716.18	0.00	0.22	98.50	0.23
A11a_Jock_EES_2	2265.31	1241.99	257.03	716.18	0.00	0.22	98.50	0.23
A11b_Jock_1	15208.11	9817.97	367.55	4814.67	0.00	0.25	99.00	0.28
A11b_Jock_2	15208.10	9817.97	367.55	4814.66	0.00	0.25	99.00	0.28
A11b_Jock_5	2236.66	1242.40	367.54	595.77	0.00	0.22	99.00	0.23
A11b_Jock_EES_1	2236.66	1242.40	367.54	595.77	0.00	0.22	99.00	0.23
A11b_Mud_1	14777.15	11007.92	484.82	3255.85	0.00	0.30	98.32	0.34
A11b_Mud_2	5428.84	3541.89	506.27	1382.07	0.00	0.31	98.46	0.32
A11b_Mud_3	5428.86	3541.88	506.27	1382.11	0.00	0.31	98.46	0.32
A11b_Mud_5	2164.48	1412.06	502.18	276.16	0.00	0.29	98.44	0.30
A11b_Mud_EES_1	2164.48	1412.06	502.18	276.16	0.00	0.29	98.44	0.30
A12b_Jock_2	9704.78	5708.09	259.23	3630.64	0.00	0.26	99.00	0.27
A12b_Jock_3	2269.99	1242.21	259.23	874.36	0.00	0.23	99.00	0.23
A12b_Jock_4	15409.96	9819.28	259.24	5162.86	0.00	0.26	99.00	0.27
A12b_Jock_5	4543.51	2486.29	259.23	1797.31	0.00	0.24	99.00	0.25
A12b_Jock_7	2269.99	1242.21	259.23	874.36	0.00	0.23	99.00	0.23
A12b_Jock_EES_1	2269.99	1242.21	259.23	874.36	0.00	0.23	99.00	0.23
A12b_Jock_EES_2	5347.68	2926.58	259.23	2136.56	0.00	0.25	99.00	0.25
A12b_Jock_EES_3	5505.72	3013.12	259.23	2203.70	0.00	0.25	99.00	0.25
A12b_Jock_EES_4	2269.99	1242.21	259.23	874.36	0.00	0.23	99.00	0.23
A12b_Mud_1	2217.00	1240.71	356.20	598.90	0.00	0.22	97.50	0.23
A12b_Mud_2	6025.65	3368.12	356.21	2217.44	0.00	0.24	97.50	0.25
A12b_Mud_4	2217.31	1240.88	356.20	599.03	0.00	0.22	97.50	0.23
A12b_Mud_5	2217.00	1240.71	356.20	598.90	0.00	0.22	97.50	0.23
A12b_Mud_EES	2217.98	1241.42	356.20	599.15	0.00	0.22	97.50	0.23
A12b_Mud_EES_1	2217.00	1240.71	356.20	598.90	0.00	0.22	97.50	0.23
A12b_Mud_EES_2	4868.58	2721.86	356.21	1719.74	0.00	0.24	97.50	0.25
A12b_Mud_EES_3	2217.00	1240.71	356.20	598.90	0.00	0.22	97.50	0.23
A12b_Rideau_2	5015.12	2783.99	384.65	1747.56	0.00	0.24	99.00	0.25
A12b_Rideau_3	4475.77	2484.74	384.65	1517.08	0.00	0.24	99.00	0.25
A12b_Rideau_EES_1	5192.49	2882.40	384.65	1823.60	0.00	0.24	99.00	0.25
A12b_Rideau_EES_2	5268.85	2924.77	384.65	1856.36	0.00	0.24	99.00	0.25
A12b_Rideau_EES_4	5597.91	3107.39	384.65	1997.73	0.00	0.24	99.00	0.25
A13_Jock_1	4473.59	2487.12	152.01	1523.93	0.00	0.23	98.50	0.24
A13_Jock_2	6716.41	3734.07	152.01	2378.68	0.00	0.24	98.50	0.26
A13_Jock_EES_1	5265.91	2927.50	152.01	1818.74	0.00	0.24	98.50	0.25
A13_Rideau_1	6717.41	3733.53	162.59	2404.94	0.00	0.24	98.50	0.26
A13_Rideau_EES_2	5266.62	2927.05	162.59	1837.26	0.00	0.24	98.50	0.25

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
Jock_River	OUTFALL	0.00	0.00	95.00	0 00:00	0.00
Mud_Creek	OUTFALL	0.00	0.00	95.00	0 00:00	0.00
Rideau_River	OUTFALL	0.00	0.00	95.00	0 00:00	0.00
EES	STORAGE	0.00	0.36	104.06	7052 18:01	0.36

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
Jock_River	OUTFALL	0.132	3.138	7052 18:01	1.02e+03	1.18e+03	0.000
Mud_Creek	OUTFALL	5.614	5.614	7052 18:00	4.48e+03	4.48e+03	0.000
Rideau_River	OUTFALL	0.001	0.001	5486 07:00	316	316	0.000
EES	STORAGE	3.092	3.092	7052 18:00	2.64e+03	2.64e+03	-0.066

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
EES	0.024	0.4	0.0	94.0	2.997	45.5	7052 18:01	3.088

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Jock_River	100.00	0.002	3.138	1177.355
Mud_Creek	98.49	0.007	5.614	4481.407
Rideau_River	100.00	0.001	0.001	316.260
System	99.50	0.010	8.750	5975.022

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
Major	WEIR	3.006	7052 18:01			0.13

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Wed Apr 8 16:05:34 2026
Analysis ended on: Wed Apr 8 16:06:32 2026
Total elapsed time: 00:00:58

Appendix I

Sanitary Sewer Design Sheets and Calculations

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

SANITARY DESIGN SHEET

BARRHAVEN SOUTH PHASE 3 - S1 AREA

JLR NO.: 26610-300

Prepared By: KF
Reviewed By: WR

Apr-26

LOCATION			RESIDENTIAL FLOWS							COMMERCIAL/INDUSTRIAL FLOWS				INFILTRATION FLOWS								SEWER DATA									UPSTREAM GEOMETRY				DOWNSTREAM GEOMETRY				
Street	From MH	To MH	Singles	Executive Towns	Avenue Towns	Pop.	Cumu. Pop.	Peaking Factor	Residential Flows	Area	Cumu. Area	Peaking Factor	Comm. and Inst. Flows	ROWs	Parks	Retained Woodlots	Commercial/Industrial	Pond	Cumu. Area	Infiltration Flows	Total Peak Flow (L/s)	Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity (L/s)	% Full	TG From	Obvert	Invert	Cover	TG To	Drop	Obvert	Invert	Cover
TO BARNSDALE ROAD																																							
Kilbirnie Drive	708	**707**	26			88	88	3.61	**1.03**		-	1.50	-	2.34					2.34	**0.77**	**1.81**	PVC	200	203.20	0.50%	322.35	24.19	0.75	**22.39**	**7%**	108.79	106.38	106.18	**2.41**	108.40		104.77	104.56	**3.63**
Kilbirnie Drive	709	**707**	28			95	95	3.60	**1.11**		-	1.50	-	1.51					1.51	**0.50**	**1.61**	PVC	200	203.20	0.50%	187.19	24.19	0.75	**22.59**	**7%**	109.09	105.70	105.50	**3.38**	108.40		104.77	104.56	**3.63**
Elevation Road	**707**	706A	20			68	252	3.49	**2.84**		-	1.50	-	1.42					5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	29.52	24.19	0.75	**19.61**	**19%**	108.40	104.77	104.56	**3.63**	108.25		104.62	104.42	**3.63**
Elevation Road	706A	706				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	47.30	24.19	0.75	**19.61**	**19%**	108.25	104.62	104.42	**3.63**	108.00		104.38	104.18	**3.62**
Elevation Road	706	705E				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	11.66	24.19	0.75	**19.61**	**19%**	108.00	104.38	104.18	**3.62**	107.96		104.32	104.12	**3.63**
Elevation Road	705E	705D				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	58.53	24.19	0.75	**19.61**	**19%**	107.96	104.32	104.12	**3.63**	107.75		104.03	103.83	**3.72**
Elevation Road	705D	705C				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	45.50	24.19	0.75	**19.61**	**19%**	107.75	104.03	103.83	**3.72**	107.50		103.80	103.60	**3.70**
Elevation Road	705C	705B				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	45.50	24.19	0.75	**19.61**	**19%**	107.50	103.80	103.60	**3.70**	107.25		103.58	103.37	**3.67**
Elevation Road	705B	**705A**				-	252	3.49	**2.84**		-	1.50	-						5.27	**1.74**	**4.58**	PVC	200	203.20	0.50%	45.78	24.19	0.75	**19.61**	**19%**	107.25	103.58	103.37	**3.67**	107.00	2.70	103.35	103.14	**3.65**
Street No. 5	713	714	69			235	235	3.50	**2.66**		-	1.50	-	3.48		3.29			6.77	**2.23**	**4.89**	PVC	200	203.20	0.35%	72.39	20.24	0.62	**15.35**	**24%**	107.23	105.21	105.00	**2.02**	106.70		104.95	104.75	**1.75**
Street No. 5	714	**716**				-	235	3.50	**2.66**		-	1.50	-						6.77	**2.23**	**4.89**	PVC	200	203.20	0.65%	72.39	27.59	0.85	**22.69**	**18%**	106.70	104.95	104.75	**1.75**	106.20	2.75	104.48	104.28	**1.72**
Industrial Lands North - Moyard Drive	715	**716**				-	-	3.80	-	13.22	13.22	1.50	**6.43**				13.22		13.22	**4.36**	**10.79**	PVC	200	203.20	0.35%	43.87	20.24	0.62	**9.45**	**53%**	105.98	101.89	101.68	**4.10**	106.20		101.73	101.53	**4.47**
Moyard Drive	**716**	717				-	235	3.50	**2.66**		13.22	1.50	**6.43**						19.99	**6.60**	**15.68**	PVC	200	203.20	0.35%	162.95	20.24	0.62	**4.56**	**77%**	106.20	101.73	101.53	**4.47**	106.00		101.16	100.96	**4.84**
Moyard Drive	717	**705A**	33			112	347	3.44	**3.67**		13.22	1.50	**6.43**	1.92					21.91	**7.23**	**17.52**	PVC	200	203.20	0.35%	147.01	20.24	0.62	**2.72**	**87%**	106.00	101.16	100.96	**4.84**	107.00		100.65	100.44	**6.35**
Elevation Road	**705A**	**705**	5			17	615	3.34	**6.66**		13.22	1.50	**6.43**	0.34					27.52	**9.08**	**22.17**	PVC	250	254.00	0.35%	72.00	36.70	0.72	**14.53**	**60%**	107.00	100.65	100.39	**6.35**	106.75		100.40	100.14	**6.35**
Street No. 1	710	711	18	130	118	731	731	3.31	**7.83**		-	1.50	-	6.72					6.72	**2.22**	**10.05**	PVC	200	203.20	0.35%	207.51	20.24	0.62	**10.19**	**50%**	109.00	106.35	106.15	**2.65**	109.00		105.63	105.42	**3.37**
Street No. 1	711	712				-	731	3.31	**7.83**		-	1.50	-						6.72	**2.22**	**10.05**	PVC	200	203.20	0.35%	72.00	20.24	0.62	**10.19**	**50%**	109.00	105.63	105.42	**3.37**	107.95		105.38	105.17	**2.58**
Street No. 1	712	**705**				-	731	3.31	**7.83**			1.50	-						6.72	**2.22**	**10.05**	PVC	200	203.20	1.20%	164.98	37.48	1.16	**27.43**	**27%**	107.95	105.38	105.17	**2.58**	106.75	3.00	103.40	103.19	**3.35**
Elevation Road	**705**	704A	12			41	1,387	3.16	**14.22**		13.22	1.50	**6.43**	1.25					35.49	**11.71**	**32.36**	PVC	250	254.00	0.35%	88.03	36.70	0.72	**4.35**	**88%**	106.75	100.40	100.14	**6.35**	105.75		100.09	99.83	**5.66**
Elevation Road	704A	**704**					1,387	3.16	**14.22**		13.22	1.50	**6.43**						35.49	**11.71**	**32.36**	PVC	250	254.00	0.35%	83.59	36.70	0.72	**4.35**	**88%**	105.75	100.09	99.83	**5.66**	104.50	0.10	99.79	99.54	**4.71**
Cappamore Drive	**704**	**703**				-	1,387	3.16	**14.22**		13.22	1.50	**6.43**		1.92				37.41	**12.35**	**32.99**	PVC	250	254.00	0.35%	31.05	36.70	0.72	**3.71**	**90%**	104.50	99.69	99.44	**4.80**	104.20	0.15	99.59	99.33	**4.61**
Street No.7	717	**721**	34	37	42	329	329	3.45	**3.68**		-	1.50	-	4.00					4.00	**1.32**	**5.00**	PVC	200	203.20	1.00%	239.89	34.22	1.06	**29.22**	**15%**	106.00	102.98	102.78	**3.02**	104.60	0.80	100.58	100.38	**4.02**
Industrial Lands South - Easement	722	723				-	-	3.80	-	3.19	3.19	1.50	**1.55**				3.19		3.19	**1.05**	**2.60**	PVC	200	203.20	0.35%	41.12	20.24	0.62	**17.64**	**13%**	104.50	101.30	101.10	**3.20**	104.05		101.16	100.95	**2.89**
Street No. 12	723	724	72	29		323	323	3.45	**3.61**		3.19	1.50	**1.55**	4.37					7.56	**2.49**	**7.66**	PVC	200	203.20	0.35%	27.56	20.24	0.62	**12.58**	**38%**	104.05	101.16	100.95	**2.89**	104.08		101.06	100.86	**3.02**
Street No. 12	724	725				-	323	3.45	**3.61**		3.19	1.50	**1.55**						7.56	**2.49**	**7.66**	PVC	200	203.20	0.35%	71.91	20.24	0.62	**12.58**	**38%**	104.08	101.06	100.86	**3.02**	103.90		100.81	100.60	**3.09**
Street No. 12	725	726				-	323	3.45	**3.61**		3.19	1.50	**1.55**						7.56	**2.49**	**7.66**	PVC	200	203.20	0.35%	72.00	20.24	0.62	**12.58**	**38%**	103.90	100.81	100.60	**3.09**	103.80		100.56	100.35	**3.24**
Street No. 13	726	**719**				-	323	3.45	**3.61**		3.19	1.50	**1.55**						7.56	**2.49**	**7.66**	PVC	200	203.20	0.35%	74.93	20.24	0.62	**12.58**	**38%**	103.80	100.56	100.35	**3.24**	104.93		100.29	100.09	**4.63**
Cappamore Drive	718	**719**	14	39	90	396	396	3.42	**4.39**		-	1.50	-	3.82					3.82	**1.26**	**5.65**	PVC	200	203.20	0.35%	148.67	20.24	0.62	**14.60**	**28%**	105.40	101.21	101.01	**4.19**	104.93	0.40	100.69	100.49	**4.23**
Cappamore Drive	719	720				-	719	3.31	**7.71**		3.19	1.50	**1.55**						11.38	**3.76**	**13.02**	PVC	200	203.20	0.35%	73.55	20.24	0.62	**7.22**	**64%**	104.93	100.29	100.09	**4.63**	104.70		100.04	99.83	**4.66**
Cappamore Drive	720	**721**		61	56	316	1,035	3.23	**10.84**		3.19	1.50	**1.55**	2.88					14.26	**4.71**	**17.10**	PVC	200	203.20	0.35%	72.03	20.24	0.62	**3.15**	**84%**	104.70	100.04	99.83	**4.66**	104.60		99.78	99.58	**4.82**
Cappamore Drive	**721**	**703**	44			150	1,513	3.14	**15.41**		3.19	1.50	**1.55**	2.19					20.45	**6.75**	**23.71**	PVC	250	254.00	0.30%	116.00	33.98	0.67	**10.27**	**70%**	104.60	99.78	99.53	**4.82**	104.20		99.44	99.18	**4.76**
Street No. 15	**703**	702	35			119	3,019	2.95	**28.89**		16.41	1.50	**7.98**	1.70					59.56	**19.65**	**56.52**	PVC	300	304.80	0.35%	234.07	59.68	0.82	**3.16**	**95%**	104.20	99.44	99.13	**4.76**	103.45	0.38	98.62	98.31	**4.83**
Street No. 15 / Barnsdale Road	702	701				-	3,019	2.95	**28.89**		16.41	1.50	**7.98**						59.56	**19.65**	**56.52**	PVC	300	304.80	2.00%	26.78	142.67	1.96	**86.15**	**40%**	103.45	98.24	97.93	**5.21**	100.58	0.50	97.70	97.40	**2.88**
Barnsdale Road	701	**STUB**				-	3,019	2.95	**28.89**		16.41	1.50	**7.98**					3.66	63.22	**20.86**	**57.73**	PVC	375	381.00	0.18%	349.71	77.60	0.68	**19.88**	**74%**	100.58	97.20	96.82	**3.38**	**102.50**	**0.10**	**96.57**	96.19	**5.93**
Barnsdale Road	STUB	EX04				-	3,019	2.95	**28.89**		16.41	1.50	**7.98**						63.22	**20.86**	**57.73**	PVC	375	381.00	0.18%	23.40	77.60	0.68	**19.88**	**74%**	**102.50**	**96.47**	**96.09**	**6.03**	**102.80**		**96.43**	**96.05**	**6.37**
TOTALS			410	296	306	3,019				16.41				37.94	1.92	3.29	16.41	3.66																					

Design Parameters (Per OSDG)		
Singles Density	3.4	Cap/Unit
Executive Towns Density	2.7	Cap/Unit
Avenue Towns Density	2.7	Cap/Unit
Residential Flows	280	L/Cap/Day
Commercial Flows	28000	L/ha/Day
Infiltration Flows	0.33	L/s/ha
Harmon's Correction Factor (K)	0.8	unitless
Manning's Coefficient	0.013	unitless

Legend	
75.43	Proposed
75.43	Existing

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S1 URBAN EXPANSION AREA - BARRHAVEN SOUTH
SANITARY DESIGN SHEET - EXISTING CONDITIONS WITH S1/S2 LANDS AND QUINNS POINTE STAGE 5 (REV. 2)
JLR NO: 26610-300

Prepared By: Mahad Musse

Design Parameters		
Singles	3.4	ppu
Towns	2.7	ppu
Apartments	1.8	ppu
Manning's Coefficient	0.013	
Residential Flow Rate	280	L/cap/day
Residential Peaking Factor	Harmon's Eqn	
Commercial/Institutional Flow Rate	28,000	L/ha/day
Commercial/Institutional Peaking Factor	1.0/1.5*	
Infiltration Peaking Factor	0.33	

SOURCE	PIPE REACH			SANITARY PEAK FLOW ESTIMATION																					SEWER DATA (AS-BUILT)							
				RESIDENTIAL								COMMERCIAL				INSTITUTIONAL				PARKS/ROADS		INFILTRATION			PLUG FLOW (L/s)	PEAK FLOW (L/s)	DIA. (mm)	ACT. DIA. (mm)	SLOPE (%)	LENGTH (m)	Q-FULL (L/s)	V-FULL (m/s)	RES. CAP. (L/s)	% FULL
	STREET NAME	FROM MH	TO MH	UNITS			POP.	AREA (ha)	CUMULATIVE POP.	CUMULATIVE AREA (ha)	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	PEAKING FACTOR	PEAK FLOW (L/s)	AREA (ha)	CUMUL. AREA	AREA (ha)	CUMUL. AREA	PEAK FLOW (L/s)									
				SINGLE	TOWNS	APART.																												
Quinn's Pointe Stage 4 - As Builts (JLR, 2022)	**TO MH260 ON GREENBANK ROAD VIA BARNSDALE ROAD**																																	
	TO MH204 ON BARNSDALE ROAD (VIA QUINN'S POINTE STAGE 4)																																	
	Barnsdale Road	UPSTREAM	**MH204**	69	112	-	536	8.05	536	8.05	3.37	5.85		-	1.00	-	-	-	1.00	-	1.04	1.04	9.09	9.09	3.00	-	8.85	**450**	**457**	**1.64%**	**97.8**	380.94	2.32	372.1	2%
							536	8.05					-				-				1.04		9.09											
Quinn's Pointe Stage 3 - As Builts (JLR, 2020)	**TO MH204 ON BARNSDALE ROAD (VIA QUINN'S POINTE STAGE 3)**																																	
	Finglas Court/ Barnsdale Road Connection	UPSTREAM	**MH204**	34	202	-	661	8.63	661	8.63	3.33	7.13	-	-	1.00	-	-	-	1.00	-	-	-	8.63	8.63	2.85	-	9.97	**200**	**203**	**1.93%**	**19.7**	47.49	1.46	37.5	21%
Future S1 Lands - (JLR, 2025)	**TO MH204 FROM PROPOSED S1 LANDS**																																	
	Barnsdale Road	UPSTREAM	**MH204**	410	602	-	3,019	46.81	3,019	46.81	2.95	28.89	16.41	16.41	1.50	7.98	-	-	-	-	-	-	63.22	63.22	20.86	-	57.73	**375**	**381**	**0.18%**		77.60	0.68	19.88	74%
Quinn's Pointe Stage 3 / 4 - As Builts (JLR, 2020)	**TO MH260 ON GREENBANK ROAD VIA BARNSDALE ROAD**																																	
	Barnsdale Road	**MH204**	MH203	-	-	-	-	0.29	4,216	63.78	2.85	38.95		16.41	1.50	7.98		-	1.50	-		1.04	0.29	81.23	26.81		73.73	**525**	**533**	**0.20%**	**97.3**	202.37	0.91	128.6	36%
	Barnsdale Road	MH203	MH202	-	-	-	-	0.22	4,216	64.00	2.85	38.95		16.41	1.50	7.98		-	1.50	-		1.04	0.22	81.45	26.88		73.80	**525**	**533**	**0.18%**	**95.4**	192.18	0.86	118.4	38%
	Barnsdale Road	MH202	MH201	-	-	-	-	0.36	4,216	64.36	2.85	38.95		16.41	1.50	7.98		-	1.50	`		1.04	0.36	81.81	27.00		73.92	**525**	**533**	**0.24%**	**92.9**	217.79	0.97	143.9	34%
							-	64.36					16.41				-				1.04		81.81											
	Greenbank Road	MH201	MH200	-	-	-	-	0.34	4,216	64.70	2.85	38.95		16.41	1.00	5.32		-	1.00	-		1.04	0.34	82.15	27.11		71.37	**600**	**610**	**0.19%**	**124.5**	281.83	0.97	210.5	25%
	Greenbank Road	MH200	MH260SE STUB	-	-	-	-	-	4,216	64.70	2.85	38.95		16.41	1.00	5.32		-	1.00	-		1.04	-	82.15	27.11		71.37	**600**	**610**	**0.18%**	**110.9**	274.12	0.94	202.7	26%
	Greenbank Road	MH260SE STUB	**MH260**	-	-	-	-	0.38	4,216	65.08	2.85	38.95		16.41	1.00	5.32		-	1.00	-		1.04	0.38	82.53	27.23		71.50	**600**	**610**	**0.48%**	**12.2**	444.73	1.52	373.2	16%
							4,216	65.08					16.41				-				1.04		82.53											
	TO MH260 ON GREENBANK ROAD VIA CAPPAMORE DRIVE																																	
	TO MH235 ON CAPPAMORE DRIVE (VIA QUINN'S POINTE STAGE 4)																																	
Quinn's Pointe Stage 5 - Conceptual Design (JLR, 2025)	Lynn Coulter Drive	UPSTREAM	MH127	-	133	-	359	3.75	359	3.75	3.44	4.00	-	-	1.50	-	2.63	2.63	1.50	1.28	1.13	1.13	7.51	7.51	2.48	0.10	7.85	**200**	**203**	**0.35%**	**10.0**	20.29	0.63	12.4	39%
													-																					
Quinn's Pointe Stage 4 - As Builts (JLR, 2022)	Cappamore Drive	MH127	**MH235**	45	111	-	453	5.28	812	9.03	3.29	8.64	-	-	1.00	-	-	-	1.00	-	2.06	3.19	7.34	14.85	4.90	3.00	16.55	**200**	**203**	**0.35%**	**81.1**	20.29	0.63	3.7	82%
							812	9.03					-				2.63				3.19		14.85											
Quinn's Pointe Stage 2 - As Builts (JLR, 2019)	**TO MH260 ON GREENBANK ROAD VIA CAPPAMORE DRIVE (QUINN'S POINTE STAGE 2)**																																	
	River Mist Rd.	UPSTREAM	**MH233**	118	132	-	758	9.50	758	9.50	3.30	8.11	-	-	1.00	-	0	0.34	1.00	0.11	-	-	9.84	9.84	3.25		11.46	**200**	**203**	**0.34%**	**98.6**	19.95	0.62	8.5	57%
							758	9.50					-				0.34				-		9.84											
	School	Stub	**MH233**				-		-	-	3.80	-		-	1.50	-	2.36	2.36	1.50	1.15		-	2.36	2.36	0.78		1.93	**200**	**203**	**0.35%**	**17.0**	20.24	0.62	18.3	10%
							-	-					-				2.36				-		2.36											
	Cappamore Drive	**MH235**	MH237	13	-		44	0.65	856	9.68	3.27	9.08		-	1.00	-		-	1.00	-		3.19	0.65	15.50	5.12	3.00	17.20	**200**	**203**	**0.35%**	**100.3**	20.24	0.62	3.0	85%
	Cappamore Drive	MH237	MH239	18	-		61	0.91	917	10.59	3.26	9.69		-	1.00	-		-	1.00	-		3.19	0.91	16.41	5.42	3.00	18.10	**200**	**203**	**0.35%**	**121.1**	20.24	0.62	2.1	89%
	Cappamore Drive	MH239	MH241	18	-		61	0.82	978	11.41	3.24	10.28		-	1.00	-		-	1.00	-		3.19	0.82	17.23	5.69	3.00	18.97	**200**	**203**	**0.78%**	**109.8**	30.22	0.93	11.2	63%
	Cappamore Drive	MH241	MH243	6	-		20	0.36	998	11.77	3.24	10.48		-	1.00	-		-	1.00	-		3.19	0.36	17.59	5.80	3.00	19.29	**200**	**203**	**0.35%**	**67.5**	20.24	0.62	1.0	95%
	Cappamore Drive	MH243	**MH233**	2	-		7	0.26	1,005	12.03	3.24	10.55		-	1.00	-		-	1.00	-		3.19	0.26	17.85	5.89	3.00	19.44	**200**	**203**	**0.35%**	**76.5**	20.24	0.62	0.8	96%
							1,005	12.03					-				2.63				3.19		17.85											
	Cappamore Drive	**MH233**	**MH260**	58	-	-	196	9.26	1,959	30.79	3.07	19.52	-	-	1.00	-	3.12	5.82	1.00	1.89	-	3.19	12.38	42.43	14.00	7.00	42.41	**250**	**254**	**0.89%**	**77.3**	58.61	1.16	16.2	72%
							1,959	30.79					-				8.45				3.19		34.92											
Future S2 Lands - (Arcadis/IBI Group, 2024)	**TO MH260 (EXMH 74401 on GeoOttawa) FROM PROPOSED S2 LANDS BY ARCADIS/IBI GROUP**																																	
	Cappamore Drive / Greenbank Road	MH 102A	**MH260**	544	560	142	3,617	70.15	3,617	70.15	2.90	33.97	-	-	-	-	-	-	-	-	-	-	70.15	70.15	23.15	-	57.12	**375**	**381**	**0.38%**	**615.70**	112.75	0.99	55.64	49%
Quinn's Pointe Stage 2 - As Builts (JLR, 2019)	**TO MH45 (SOUTH) ON GREENBANK ROAD**																																	
	TO EX120 ON GREENBANK ROAD (QUINN'S POINTE STAGES 2, 3 AND 4 + GREENBANK ROAD)																																	
	Greenbank Road	**MH260**	MH261	-	-	-	-	0.29	9,792	166.31	2.57	81.59		16.41	1.00	5.32		5.82	1.00	1.89		4.23	0.29	195.40	64.48	7.00	160.28	**600**	**610**	0.47%	**86.4**	439.15	1.50	278.9	36%
	Greenbank Road	MH261	**EX120**	-	-	-	-	0.29	9,792	166.60	2.57	81.59		16.41	1.00	5.32		5.82	1.00	1.89		4.23	0.29	195.69	64.58	7.00	160.37	**600**	**610**	0.38%	**79.2**	394.87	1.35	234.5	41%
							9,793	166.60					16.41				8.45				4.23		118.03											
Quinn's Pointe Stage 1 - As Builts (JLR, 2016)	**TO EX98A ON GREENBANK ROAD (QUINN'S POINTE STAGES 1, 2, 3 AND 4 + GREENBANK ROAD)**																																	
	Greenbank Road	**EX120**	**121**	-	-	-	-	0.22	9,792	166.82	2.57	81.59		16.41	1.00	5.32		5.82	1.00	1.89		4.23	0.22	195.91	64.65	7.00	160.44	**600**	**610**	**0.16%**	**58.1**	256.22	0.88	95.8	63%
							9,793	166.82					16.41				8.45				4.23		118.25											
	Easement	UPSTREAM	**121**	84	36	-	383	6.55	383	6.55	3.42	4.25	-	-	1.00	-	1.57	1.57	1.00	0.51	-	-	8.12	8.12	2.68	5.00	12.44	**300**	**305**	**0.20%**	**20.4**	44.67	0.61	32.2	28%
							383	6.55					-				1.57				-		8.12											
	Greenbank Road	**121**	123	-	-	-	-	0.73	10,175	174.10	2.56	84.34	-	16.41	1.00	5.32	-	7.39	1.00	2.39	-	4.23	0.73	204.76	67.57	12.00	171.63	**600**	**610**	**0.33%**	**75.3**	367.97	1.26	196.3	47%
							10,176	174.10					16.41				10.02				4.23		127.10											
	Easement	UPSTREAM	**123**	-	96	-	260	2.62	260	2.62	3.48	2.94	-	-	1.00	-	-	-	1.00	-	-	-	2.62	2.62	0.86	-	3.80	**300**	**305**	**0.35%**	**19.0**	59.68	0.82	55.9	6%
							260	2.62					-				-				-		2.62											
	Greenbank Road	**123**	**EX. 205A**	-	-	-	-	0.43	10,435	177.15	2.55	86.20		16.41	1.00	5.32		7.39	1.00	2.39		4.23	0.43	207.81	68.58	12.00	174.49	**600**	**610**	**0.25%**	**120.8**	320.28	1.10	145.8	54%
							10,436	177.15					16.41				10.02				4.23		130.15											
	Kilbirnie Drive	UPSTREAM	**EX. 205A**	-	83	-	224	2.15	224	2.15	3.50	2.54	-	-	1.00	-	-	-	1.00	-	-	-	2.15	2.15	0.71	-	3.25	**200**	**203**	**0.71%**	**28.7**	28.83	0.89	25.6	11%
							224	2.15					-				-				-		2.15											
	Greenbank Road	**EX. 205A**	**EX. 98A**	-	-		-	-	10,659	179.30	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	-	209.96	69.29	12.00	176.80	**600**	**610**	**0.25%**	**126.0**	320.28	1.10	143.5	55%
							10,660	179.30					16				10.02				4.23		132.30											

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TO MH45 (SOUTH) ON GREENBANK ROAD

Greenbank Road	**EX. 98A**	MH99A				-	2.71	10,659	182.01	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	2.71	212.67	70.18	12.00	177.69	600	610	0.25%	320.28	320.28	1.10	142.6	55%
Greenbank Road	MH99A	MH100A				-	-	10,659	182.01	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	-	212.67	70.18	12.00	177.69	600	610	0.25%	320.28	320.28	1.10	142.6	55%
Greenbank Road	MH100A	MH204A				-	-	10,659	182.01	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	-	212.67	70.18	12.00	177.69	600	610	0.25%	320.28	320.28	1.10	142.6	55%
Greenbank Road	MH204A	MH206A				-	-	10,659	182.01	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	-	212.67	70.18	12.00	177.69	600	610	0.25%	320.28	320.28	1.10	142.6	55%
Greenbank Road	MH206A	MH97A				-	-	10,659	182.01	2.54	87.80		16.41	1.00	5.32		7.39	1.00	2.39		4.23	-	212.67	70.18	12.00	177.69	600	610	0.25%	320.28	320.28	1.10	142.6	55%
Greenbank Road	MH97A	MH96A				1,631	19.95	12,290	201.96	2.49	99.26		16.41	1.00	5.32		7.39	1.00	2.39	0.81	5.04	20.76	233.43	77.03	12.00	196.01	600	610	0.30%	350.85	350.85	1.20	154.8	56%
Greenbank Road	MH96A	MH95A				-	-	12,290	201.96	2.49	99.26		16.41	1.00	5.32		7.39	1.00	2.39		5.04	-	233.43	77.03	12.00	196.01	600	610	0.30%	350.85	350.85	1.20	154.8	56%
Greenbank Road	MH95A	MH201A				-	-	12,290	201.96	2.49	99.26		16.41	1.00	5.32		7.39	1.00	2.39		5.04	-	233.43	77.03	12.00	196.01	600	610	0.30%	350.85	350.85	1.20	154.8	56%
Greenbank Road	MH201A	MH201B				787	12.13	13,077	214.09	2.47	104.70		16.41	1.00	5.32		7.39	1.00	2.39		5.04	12.13	245.56	81.04	12.00	205.45	600	610	0.30%	350.85	350.85	1.20	145.4	59%
Greenbank Road	MH201B	MH200A				-	-	13,077	214.09	2.47	104.70		16.41	1.00	5.32		7.39	1.00	2.39		5.04	-	245.56	81.04	12.00	205.45	600	610	0.30%	350.85	350.85	1.20	145.4	59%
Greenbank Road	MH200A	MH200C				-	-	13,077	214.09	2.47	104.70		16.41	1.00	5.32		7.39	1.00	2.39		5.04	-	245.56	81.04	12.00	205.45	600	610	0.50%	452.94	452.94	1.55	247.5	45%
Greenbank Road	MH200C	**MH45**				-	-	13,077	214.09	2.47	104.70		16.41	1.00	5.32	7.50	14.89	1.00	4.83		5.04	7.50	253.06	83.51	12.00	210.36	600	610	0.12%	221.90	221.90	0.76	11.5	95%
						13,078	214.09					16.41				17.52				5.04		175.40											

Quinn's Pointe Stage 1 & 2 As Builts (JLR, 2016 & 2019)

TO MH17A ON CAMBRIAN ROAD VIA RIVER MIST ROAD

TO EXMH165 ON RIVER MIST ROAD (QUINN'S POINTE STAGES 1 AND 2)

Kilbernie Dr	UPSTREAM	**10**	46	-	-	157	2.52	157	2.52	3.55	1.81	0.49	0.49	1.50	0.24	2.43	2.43	1.50	1.18	-	-	5.44	5.44	1.80		5.02	200	203	2.96%	117.3	58.87	1.82	53.8	9%
						157	2.52					0.49				2.43				-		5.44											
Alex Polowin Ave.	UPSTREAM	**10**	43	-	-	146	1.91	146	1.91	3.56	1.68	-	-	1.00	-	-	-	1.00	-	-	-	1.91	1.91	0.63	-	2.31	200	203	1.65%	104.0	43.95	1.36	41.6	5%
						146	1.91					-				-				-		1.91											
River Mist Road	UPSTREAM	**1**	114	14	-	424	5.54	424	5.54	3.41	4.68	-	-	1.00	-	-	-	1.00	-	-	-	5.54	5.54	1.83	-	6.51	200	203	1.77%	112.1	45.46	1.40	38.9	14%
						424	5.54					-				-				-		5.54											
Kilbirnie Drive	**10**	1	-	29	-	79	1.19	382	5.62	3.43	4.24	-	0.49	1.50	0.24	2.83	5.26	1.50	2.56	-	-	4.02	11.37	3.75		10.79	200	203	0.32%	119.0	19.36	0.60	8.6	56%
						382	5.62					0.49				5.26				-		11.37											
River Mist Road	**1**	**EX. MH163**	-	-		-		806	11.16	3.29	8.59		0.49	1.50	0.24		5.26	1.50	2.56		-	-	16.91	5.58		16.96	200	203	0.32%	39.4	19.36	0.60	2.4	88%
						806	11.16					0.49				5.26				-		16.91											

Barrhaven South MSS Addendum (Stantec 2017)

TO MH17A ON CAMBRIAN ROAD VIA RIVER MIST ROAD

River Mist Road	**EX. MH163**	162	-	-		-	-	806	11.16	3.29	8.59		0.49	1.50	0.24	2.77	8.03	1.50	3.90	1.38	1.38	4.15	21.06	6.95		19.68	200	203	1.15%	36.3	36.69	1.13	17.0	54%
River Mist Road	162	161				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	250	254	1.15%	87.2	66.53	1.31	46.9	30%
River Mist Road	161	EX151				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	250	254	1.15%	75.6	66.53	1.31	46.9	30%
River Mist Road	EX151	MH142				-	-	806	11.16	3.29	8.59		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	21.06	6.95		19.68	300	305	1.40%	44.4	119.37	1.64	99.7	16%
River Mist Road	MH142	EX139				825	8.20	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	8.20	29.26	9.66		30.30	300	305	0.40%	74.8	63.80	0.87	33.5	47%
River Mist Road	EX139	EX136				-	-	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	29.26	9.66		30.30	300	305	0.40%	64.7	63.80	0.87	33.5	47%
River Mist Road	EX136	MH126				-	-	1,631	19.36	3.12	16.50		0.49	1.50	0.24		8.03	1.50	3.90		1.38	-	29.26	9.66		30.30	300	305	0.41%	78.9	64.60	0.89	34.3	47%
River Mist Road	MH126	EX123				954	16.50	2,585	35.86	3.00	25.11		0.49	1.50	0.24	2.1	10.13	1.50	4.92		1.38	18.60	47.86	15.79		46.06	375	381	0.45%	81.3	122.70	1.08	76.6	38%
River Mist Road	EX123	MH112				-	-	2,585	35.86	3.00	25.11		0.49	1.50	0.24		10.13	1.50	4.92		1.38	-	47.86	15.79		46.06	375	381	0.42%	90.3	118.54	1.04	72.5	39%
River Mist Road	MH112	EX102				689	8.30	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	8.30	56.16	18.53		53.04	375	381	0.31%	68.0	101.84	0.89	48.8	52%
River Mist Road	EX102	EX101				-	-	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	56.16	18.53		53.04	375	381	0.29%	34.0	98.50	0.86	45.5	54%
River Mist Road	EX101	MH43A				-	-	3,274	44.16	2.93	31.07		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	56.16	18.53		53.04	375	381	0.30%	38.0	100.18	0.88	47.1	53%
River Mist Road	MH43A	MH44A				352	6.60	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	6.60	62.76	20.71		58.19	375	381	0.30%	81.0	100.18	0.88	42.0	58%
River Mist Road	MH44A	MH45A				-	-	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	62.76	20.71		58.19	375	381	0.30%	64.0	100.18	0.88	42.0	58%
River Mist Road	MH45A	MH46A				-	-	3,626	50.76	2.90	34.04		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	62.76	20.71		58.19	375	381	0.30%	85.0	100.18	0.88	42.0	58%
River Mist Road	MH46A	MH47A				562	8.40	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	8.40	71.16	23.48		65.64	375	381	0.30%	41.0	100.18	0.88	34.5	66%
River Mist Road	MH47A	MH101A				-	-	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	71.16	23.48		65.64	375	381	0.30%	64.0	100.18	0.88	34.5	66%
River Mist Road	MH101A	MH102A				-	-	4,188	59.16	2.85	38.71		0.49	1.00	0.16		10.13	1.00	3.28		1.38	-	71.16	23.48		65.64	375	381	0.30%	64.0	100.18	0.88	34.5	66%
River Mist Road	MH102A	**MH17A**				291	4.00	4,479	63.16	2.83	41.09		0.49	1.00	0.16		10.13	1.00	3.28		1.38	4.00	75.16	24.80		69.34	375	381	0.30%	81.0	100.18	0.88	30.8	69%
						4,479	63.16					0.49				10.13				1.38		75.16											

The Ridge Phase 1 to 4 (DSEL, 2019 and 2022)

TO MH57A ON CAMBRIAN ROAD VIA NEW GREENBANK

TO MH57A ON CAMBRIAN ROAD VIA NEW GREENBANK (THE RIDGE PHASE 1 TO 4)

New Greenbank	UPSTREAM	**MH57A**		-	-	3,892	48.06	3,892	48.06	2.88	36.26	24.22	24.22	1.50	11.77	6.06	6.06	1.50	2.95	3.17	3.17	81.51	81.51	26.90		77.88	375	381	0.50%	15.0	129.34	1.13	51.5	60%
						3,892	48.06					24.22				6.06				3.17		81.51											

The Meadows Subdivision Phase 7/8 (DSEL, 2020)

TO MH501A ON CAMBRIAN ROAD VIA ELEVATION ROAD

TO MH501A ON CAMBRIAN ROAD VIA ELEVATION ROAD (THE MEADOWS SUBDIVISION PHASE 7/8)

Elevation Road	UPSTREAM	**MH501A**		-	-	1,135	15.87	1,135	15.87	3.21	11.81	10.80	10.80	1.50	5.25	2.80	2.80	1.50	1.36	1.19	1.19	30.66	30.66	10.12		28.73	375	381	0.20%	14.5	81.80	0.72	53.1	35%
						1,135	15.87					10.80				2.80				1.19		30.66											

The Meadows Subdivision Phase 7/8 (DSEL, 2020)

TO MH45 (EAST) ON GREENBANK ROAD VIA CAMBRIAN ROAD

TO MH45 (EAST) ON GREENBANK ROAD VIA CAMBRIAN ROAD

Cambrian (via Apolune St.)	UPSTREAM	**MH501A**				417	4.21	417	4.21			-	-	1.00	-		-	1.00	-	3.19	3.19	7.40	7.40									
Fut. Residential + Woodlot	UPSTREAM	**MH501A**				141	2.24	141	2.24	3.56	1.63	-	-	1.00	-		-	1.00	-	13.44	13.44	15.68	15.68	5.17								
Cambrian	**MH501A**	5010A				91	2.24	1,784	24.56	3.10	17.92		10.80	1.50	5.25		2.80	1.50	1.36		17.82	2.24	55.98	18.47		43.00	500	508	0.12%	124.0	136.46	0.67	93.5	32%
Cambrian	5010A	502A				-		1,784	24.56	3.10	17.92		10.80	1.50	5.25		2.80	1.50	1.36		17.82	-	55.98	18.47		43.00	500	508	0.12%	124.0	136.46	0.67	93.5	32%
Cambrian	502A	503A				1,144	11.48	2,928	36.04	2.96	28.10		10.80	1.50	5.25	6.05	8.85	1.50	4.30	0.24	18.06	17.77	73.75	24.34		61.99	500	508	0.15%	111.5	152.57	0.75	90.6	41%
Cambrian	503A	504A				-	0.20	2,928	36.24	2.96	28.10	2.86	13.66	1.50	6.64		8.85	1.50	4.30		18.06	3.06	76.81	25.35		64.39	500	508	0.15%	29.5	152.57	0.75	88.2	42%
Cambrian	504A	**MH57A**				-		2,928	36.24	2.96	28.10		13.66	1.50	6.64		8.85	1.50	4.30		18.06	-	76.81	25.35		64.39	500	508	0.61%	26.0	307.66	1.52	243.3	21%
						2,928	36.24					13.66				8.85				18.06		76.81											

Barrhaven South MSS Addendum (Stantec 2017)

Cambrian	**MH57A**	MH13A				458	4.30	7,278	88.60	2.67	63.03	3.40	41.28	1.50	20.07		14.91	1.50	7.25		21.23	7.70	166.02	54.79		145.13	500	508	0.25%	216.5	196.96	0.97	51.8	74%
Cambrian	MH13A	MH15A				634	6.20	7,912	94.80	2.64	67.79		41.28	1.50	20.07		14.91	1.50	7.25		21.23	6.20	172.22	56.83		151.94	500	508	0.20%	165.2	176.17	0.87	24.2	86%
Cambrian	MH15A	**MH17A**				870	5.60	8,782	100.40	2.61	74.24		41.28	1.50	20.07		14.91	1.50	7.25		21.23	5.60	177.82	58.68		160.23	600	610	0.13%	202.0	230.96	0.79	70.7	69%
						8,782	100.40					41.28				14.91				21.23		177.82											
Cambrian	**MH17A**	MH21A				1,956	26.00	15,217	189.56	2.42	119.22		41.77	1.50	20.30	3.00	28.04	1.50	13.63	5.1	27.71	34.10	287.08	94.74		247.89	750	762	0.13%	204.3	418.75	0.92	170.9	59%
Cambrian	MH21A	**MH45**				408	7.00	15,625	196.56	2.41	121.95		41.77	1.50	20.30		28.04	1.50	13.63	2.9	30.61	9.90	296.98	98.00		253.89	750	762	0.13%	277.8	418.75	0.92	164.9	61%
						15,625	196.56					41.77				28.04				30.61		296.98											

TO MH435A (NORTH OF MH45) ON GREENBANK ROAD

TO MH435A (NORTH OF MH45) ON GREENBANK ROAD

Barrhaven South MSS Addendum (Stantec 2017)

Greenbank	**MH45**	**MH435A**				548	5.10	29,251	415.75	2.19	207.64	-	58.18	1.50	28.28	-	45.56	1.50	22.15	-	35.65	5.10	477.48	157.57	12.00	427.64	900	914	0.10%	296.6	597.22	0.91	169.6	72%
						29,251	415.75					58.18				45.56				35.65		477.48											

TO MH501A (NORTH OF MH45) ON GREENBANK ROAD

TO MH501A (NORTH OF MH45) ON GREENBANK ROAD

Barrhaven South MSS Addendum (Stantec 2017)

Local (North of Cambrian Road)	**MA9**	**MA8**				2,378	22.23	2,378	22.23	3.02	23.28		-	1.00	-	2.45	2.45	1.00	0.79	9.54	9.54	34.22	34.22	11.29		35.37	450	457	0.11%	507.50	98.65	0.60	63.3	36%
Local (North of Cambrian Road)	**MA8**	**MA7**				308	2.88	2,686	25.11	2.99	25.99		-	1.00	-		2.45	1.00	0.79	0.78	10.32	3.66	37.88	12.50		39.29	450	457	0.11%	317.10	98.65	0.60	59.4	40%
Local (North of Cambrian Road)	**MA7**	**MA6**				1,979	18.50	4,665	43.61	2.82	42.61		-	1.00	-		2.45	1.00	0.79	-	10.32	18.50	56.38	18.61		62.01	450	457	0.11%	573.10	98.65	0.60	36.6	63%
Local (North of Cambrian Road)	**MA6**	**MA5**				2,320	21.68	6,985	65.29	2.69	60.80		-	1.00	-		2.45	1.00	0.79	-	10.32	21.68	78.06	25.76		87.36	525	533	0.10%	473.90	141.88	0.63	54.5	62%
Local (North of Cambrian Road)	**MA5**	**MA4**				1,020	9.53	8,005	74.82	2.64	68.49		-	1.00	-		2.45	1.00	0.79	-	10.32	9.53	87.59	28.90		98.19	525	533	0.10%	439.40	141.88	0.63	43.7	69%
Local (North of Cambrian Road)	**MA4**	**MH521A**				863	8.07	8,868	82.89	2.61	74.87		-	1.00	-		2.45	1.00	0.79	2.42	12.74	10.49	98.08	32.37		108.03	525	533	0.10%	530.70	141.88	0.63	33.9	76%
Local (North of Cambrian Road)	**MH521A**	**MH522A**				231	3.80	9,099	86.69	2.60	76.56		-	1.00	-		2.45	1.00	0.79	0.02	12.76	3.82	101.90	33.63		110.98	600	610	0.10%	49.90	202.56	0.69	91.6	55%
Local (North of Cambrian Road)	**MH522A**	**MH435A**				-	-	9,099	86.69	2.60	76.56		-	1.00	-		2.45	1.00	0.79	-	12.76	-	101.90	33.63		110.98	600	610	0.10%	11.10	202.56	0.69	91.6	55%
Greenbank	**MH435A**	**MH501A**				-	-	38,350	502.44	2.10	260.84		58.18	1.00	18.85		48.01	1.00	15.56	-	48.41	-	579.38	191.20	12.00	498.45	900	914	0.10%	13.30	597.22	0.91	98.8	83%
						38,350	502.44					58.18				48.01				48.41		579.38											

Appendix J

Water Distribution

System-Level Demand Parameters

System Level Parameters for MSS (2024)	Consumption Rate[1]	Population Density cap/unit[3]	Average Day Demand (L/unit/day)	Residential Outdoor Water Demand (OWD) (L/unit/day)[4]	Maximum Day Demand (L/unit/day)	Peak Hour Demand
SFH	180	3.4	612	700	Average Day Demand + OWD	2.1 x Maximum Day Demand
MLT	198	2.7	535	350	Average Day Demand + OWD	2.1 x Maximum Day Demand
MLT without rear yards	198	2.7	535	0	Average Day Demand	1.6 x Maximum Day Demand
APT	219	1.8	394	0	Average Day Demand	1.6 x Maximum Day Demand
EMP[2]	138	1	138	N/A	1.5 x Average Day Demand[5]	1.8 x Maximum Day Demand
Water Loss per connection	N/A	N/A	80	N/A	Average Day Demand	Average Day Demand
Total Demand			**Sum above for Total Average Day**		**Sum above for Total Max Day**	**Sum above for Total Peak Hour**

[1] Values represent L/cap/day for residential land uses and L/emp/day for employment areas.

[2] Apply a rate of 17,000 l/h/day if employment totals are unknown. The rate represents the average demand for ICI areas at the 90th percentile.

[3] Occupancy factors should be chosen according to housing type. The values shown were extracted from Section 4.2.8 of the Ottawa Design Guidelines - Water Distribution (2010)

[4] Outdoor water demand is applied to single family, semi-detached and townhome units with rear yards.

[5] The 1.5 multiplier represents the additional outdoor water demand associated with employment areas.

Ally Marchese

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: Thursday, May 23, 2024 4:44 PM
To: Guy Forget
Cc: Karla Ferrey; Tatyana Roumie
Subject: System level demands for Master Planning
Attachments: DraftFinal_SystemLevelDemandParameters_24May2024(JB).xlsx

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Hi Guy,

As promised, I have attached the updated parameters to be used for expansion areas where the population exceeds 3000 persons. Please let me know if the attached table is unclear or if you have any questions or concerns. Kindly resubmit your demands using the updated parameters.

I'll be sending another message tomorrow regarding servicing the ICI areas fronting Borrisokane.

Thanks,

John

From: Guy Forget <gforget@jlrichards.ca>
Sent: Thursday, April 11, 2024 7:23 AM
To: Bougadis, John <John.Bougadis@ottawa.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>
Subject: RE: Municipal drainage information and updating existing drainage reports

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Hi John,

I am assuming that the MSS level demands are still in the works? Any thoughts on when we can expect those so that we can update demands and send another BC request?

Thanks

Guy

Guy Forget, P.Eng., LEED AP
Senior Water Resources Engineer

1000-343 Preston Street
Ottawa, ON, K1S 1N4
Work: 343-804-5363
gforget@jlrichards.ca

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: Tuesday, April 9, 2024 3:33 PM
To: Guy Forget <gforget@jlrichards.ca>; Bobby Pettigrew <bpettigrew@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>; Magladry, Ryan <ryan.magladry@arcadis.com>; Deir, Peter <peter.deir@arcadis.com>
Cc: van de Lande, Robin <Robin.vandeLande@ottawa.ca>; Zagorski, Joseph <Joseph.Zagorski@ottawa.ca>; Harrold, Eric <eric.harrold@ottawa.ca>; Moore, Erin Jennifer (Roger Stevens) <ErinJennifer.Moore@ottawa.ca>; Ryan, David W <David.Ryan@ottawa.ca>
Subject: Municipal drainage information and updating existing drainage reports

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Hi all,

After meeting with Erin Moore from the Municipal Drainage (MD) unit this afternoon, it has been clarified that only landowners within the MD's catchment area are eligible to request drainage reports. Therefore, Minto must directly send any requests for information to the MD unit (Erin and Dave). Additionally, the MD unit will meet with landowners to provide guidance on the necessary drainage act processes to accommodate the S1- and S2 lands.

Please copy Robin and Infrastructure Planning (Joe, Eric, and I) when emailing the MD group.

Thanks,

John Bougadis, M.A.Sc., P.Eng.
Senior Project Manager, Infrastructure Planning
Asset Management Service
Infrastructure and Water Services Department
City of Ottawa
613.580.2424 ext.14990

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'

Unit Type	Phase 6	Phase 7	Phase 8	Total	
Single - 36'	146	27	87	**260**	25.59%
Single - 43'	104	15	35	**154**	15.16%
Executive Towns	130	118	90	**338**	33.27%
Avenue Towns	118	90	56	**264**	25.98%
Total	**498**	**250**	**268**	**1016**	100.00%
Parkland Required	= Total Units / 600 units per ha			1.69 ha	4.18 ac
Parkland Dedicated	= Parkland Provided on plan			1.92 ha	4.74 ac

Title:

Concept 54 - Rev 13

Project:

S-1 - Barrhaven Urban Expansion

Legend

- Site Boundary
- Phase Line
- Singles
- Executive Towns
- Avenue Towns (Back to Backs)
- Rear Lane Towns
- Condos
- SWM Pond
- Parkland
- Open Space
- Industrial
- Woodlot

***Notes:**

- All roads are 18m ROW unless indicated on the plan.
- All singles and executive towns are 27m in depth
- All avenues are 27.5m in depth
- The unit count for Metro Town Condos is estimated at a rate of 70 units per 1.00 ha.
- Stage 5 unit count is not included in the park dedication.

No.	Description	Date	By
13	Woodlot Easement/SWMP Easement	2.10.2026	E.H
12	Phasing Limits/Easements	1.30.2026	E.H

Revisions

minto

Drawn By: G.T
Checked By: C.S

Minto Communities Inc
180 Kent Street,
Ottawa, ON
K1P 0B6

North

Scale: **NTS**

WATER DEMAND CALCULATION SHEET

PROJECT : **S1 URBAN EXPANSION AREA PHASE 6**
LOCATION : **CITY OF OTTAWA**
DEVELOPER : **MINTO COMMUNITIES INC.**

NODE	RESIDENTIAL				Park	Commercial	Industrial	AVERAGE DAY			MAXIMUM DAY			PEAK HOUR		
	UNITS			POP'N				DEMAND (L/S)			DEMAND (L/S)			DEMAND (L/S)		
	SFH	EXEC	AVE		(ha.)	(ha.)	(ha.)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
J-6	80	60		430				1.07	0.00	1.07	1.96	0.00	1.96	3.97	0.00	3.97
J-10	40	70	118	640				1.66	0.00	1.66	2.74	0.00	2.74	5.53	0.00	5.53
J-12 (PARK)					1.92			0.00	5.00	5.00	0.00	5.00	5.00	0.00	5.00	5.00
J-20	35			120				0.28	0.00	0.28	0.56	0.00	0.56	1.15	0.00	1.15
J-26 (IND.)							13.22	0.00	2.60	2.60	0.00	3.90	3.90	0.00	7.02	7.02
J-29	95			320				0.76	0.00	0.76	1.53	0.00	1.53	3.12	0.00	3.12
QP5 (J-58)		62	84					2.28	0.00	2.28	5.30	0.00	5.30	7.44	0.00	7.44
TOTAL	**250**	**192**	**202**	1,510	**1.92**	**0.00**	**13.22**	6.05	7.60	**13.65**	12.10	8.90	**21.00**	21.21	12.02	**33.23**

SYSTEM-LEVEL DEMAND PARAMETERS

RESIDENTIAL/COMMERCIAL TYPE

Type	Avg Usage (L/cap/d)	ppu	Avg Day Usage (L/unit/day)	Water Loss Per Connection (L/unit/day)	Avg. Day Demand (res: L/unit/day) (comm: L/ha/d)	Residential Outdoor Water Demand (OWD) (res: L/unit/day) (comm:	Max. Day Demand (res: L/unit/day) (comm: L/ha/d)	Peak Hour Peaking Factor	Peak Hour Demand (res: L/unit/day) (comm: L/ha/d)
Singles (SFH)	180	3.4	612	80	692	700	1,392	2.1 x MDD	2923
Executive and Avenue Towns (EXEC & AT)	198	2.7	535	80	615	350	965	2.1 x MDD	2026
Metro (w/o rear yards)/Stacked Towns/Duplex	219	2.3	504	80	584	0	584	1.6 x MDD	934
Commercial/EMP	N/A	N/A	N/A	N/A	17,000	N/A	25,500	1.8 x MDD	45900

PARK WITH SPLASH PAD 4 L / s
*Constant flow rate added to Junction

PARK AND RIDE 1 L / s

*Constant flow rate added to Junction

WATER DEMAND CALCULATION SHEET

PROJECT : S1 URBAN EXPANSION AREA PHASE 7
LOCATION : CITY OF OTTAWA
DEVELOPER : MINTO COMMUNITIES INC.

NODE	RESIDENTIAL				Park	Commercial	Industrial	AVERAGE DAY			MAXIMUM DAY			PEAK HOUR		
	UNITS			POP'N				DEMAND (L/S)			DEMAND (L/S)			DEMAND (L/S)		
	SFH	EXEC	AVE		(ha.)	(ha.)	(ha.)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
J-30		75	90	450				1.17	0.00	1.17	1.84	0.00	1.84	3.70	0.00	3.70
J-32	42	43		260				0.64	0.00	0.64	1.16	0.00	1.16	2.34	0.00	2.34
TOTAL	**42**	**118**	**90**	710	**0.00**	**0.00**	**0.00**	1.82	0.00	1.82	3.00	0.00	3.00	6.04	0.00	6.04
TOTAL PHASE 6-7										**15.46**			**24.00**			**39.27**

SYSTEM-LEVEL DEMAND PARAMETERS

RESIDENTIAL/COMMERCIAL TYPE

Type	Avg Usage (L/cap/d)	ppu	Avg Day Usage (L/unit/day)	Water Loss Per Connection (L/unit/day)	Avg. Day Demand (res: L/unit/day) (comm: L/ha/d)	Residential Outdoor Water Demand (OWD) (res: L/unit/day) (comm:	Max. Day Demand (res: L/unit/day) (comm: L/ha/d)	Peak Hour Peaking Factor	Peak Hour Demand (res: L/unit/day) (comm: L/ha/d)
Singles (SFH)	180	3.4	612	80	692	700	1,392	2.1 x MDD	2923
Executive and Avenue Towns (EXEC & AT)	198	2.7	535	80	615	350	965	2.1 x MDD	2026
Metro (w/o rear yards)/Stacked Towns/Duplex	219	2.3	504	80	584	0	584	1.6 x MDD	934
Commercial/EMP	N/A	N/A	N/A	N/A	17,000	N/A	25,500	1.8 x MDD	45900

PARK WITH SPLASH PAD 4 L / s
*Constant flow rate added to Junction

PARK AND RIDE 1 L / s

*Constant flow rate added to Junction

WATER DEMAND CALCULATION SHEET

PROJECT : S1 URBAN EXPANSION AREA PHASE 8
LOCATION : CITY OF OTTAWA
DEVELOPER : MINTO COMMUNITIES INC.

NODE	RESIDENTIAL				Park	Commercial	Industrial	AVERAGE DAY			MAXIMUM DAY			PEAK HOUR		
	UNITS			POP'N				DEMAND (L/S)			DEMAND (L/S)			DEMAND (L/S)		
	SFH	EXEC	AVE		(ha.)	(ha.)	(ha.)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
J-13	61	45	28	400				1.01	0.00	1.01	1.80	0.00	1.80	3.64	0.00	3.64
J-22	61	45	28	400				1.01	0.00	1.01	1.80	0.00	1.80	3.64	0.00	3.64
J-50 (IND.)							3.19	0.00	0.63	0.63	0.00	0.94	0.94	0.00	1.69	1.69
TOTAL	**122**	**90**	**56**	800	**0.00**	**0.00**	**3.19**	2.02	0.63	2.65	3.60	0.94	4.54	7.28	1.69	8.97
TOTAL PHASE 6-8										**18.11**			**28.53**			**48.24**

SYSTEM-LEVEL DEMAND PARAMETERS

RESIDENTIAL/COMMERCIAL TYPE

Type	Avg Usage (L/cap/d)	ppu	Avg Day Usage (L/unit/day)	Water Loss Per Connection (L/unit/day)	Avg. Day Demand (res: L/unit/day) (comm: L/ha/d)	Residential Outdoor Water Demand (OWD) (res: L/unit/day) (comm:	Max. Day Demand (res: L/unit/day) (comm: L/ha/d)	Peak Hour Peaking Factor	Peak Hour Demand (res: L/unit/day) (comm: L/ha/d)
Singles (SFH)	180	3.4	612	80	692	700	1,392	2.1 x MDD	2923
Executive and Avenue Towns (EXEC & AT)	198	2.7	535	80	615	350	965	2.1 x MDD	2026
Metro (w/o rear yards)/Stacked Towns/Duplex	219	2.3	504	80	584	0	584	1.6 x MDD	934
Commercial/EMP	N/A	N/A	N/A	N/A	17,000	N/A	25,500	1.8 x MDD	45900

PARK WITH SPLASH PAD 4 L / s
*Constant flow rate added to Junction

PARK AND RIDE 1 L / s

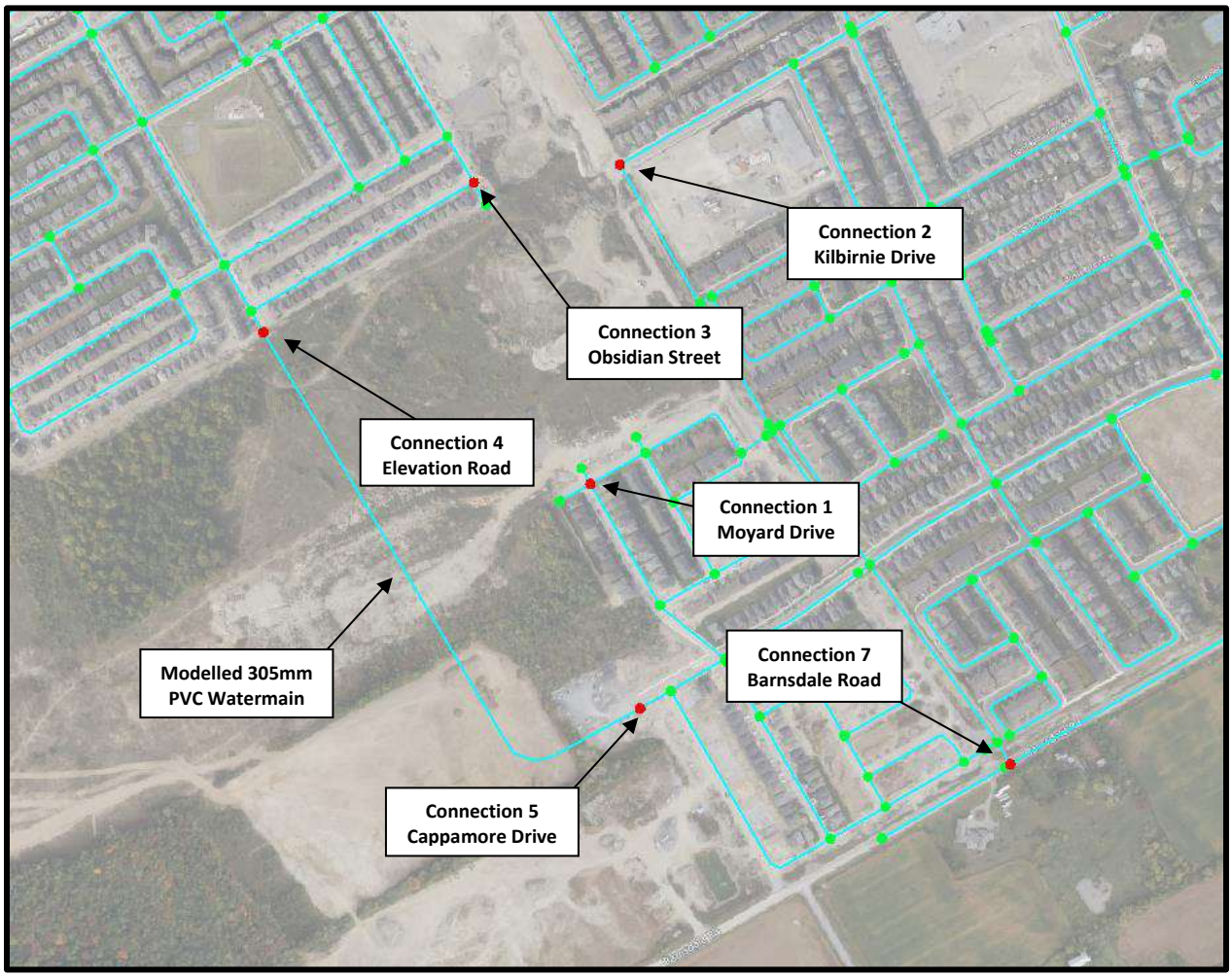
*Constant flow rate added to Junction

Boundary Conditions
S1 UEA – 2025 Update
November 2025

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	1,001	16.69
Maximum Daily Demand	1,474	24.56
Peak Hour	2,608	43.47
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	13,000	216.67

Location



Results

Scenario 1 – Existing Conditions – 5 connections

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.4	64.2
Peak Hour	135.3	36.9
Max Day plus Fire Flow #1	133.3	34.2
Max Day plus Fire Flow #2	127.1	25.3
[1] Ground Elevation =	109.3	m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.4	67.6
Peak Hour	135.3	40.4
Max Day plus Fire Flow #1	133.7	38.1
Max Day plus Fire Flow #2	127.6	29.4
[1] Ground Elevation =	106.9	m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.4	66.5
Peak Hour	135.3	39.3
Max Day plus Fire Flow #1	133.9	37.4
Max Day plus Fire Flow #2	128.0	29.0
[1] Ground Elevation =	107.7	m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.4	64.2
Peak Hour	135.3	37.0
Max Day plus Fire Flow #1	134.2	35.4
Max Day plus Fire Flow #2	128.5	27.3
[1] Ground Elevation =	109.3	m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.4	73.1
Peak Hour	135.3	45.8
Max Day plus Fire Flow #1	134.6	44.9
Max Day plus Fire Flow #2	129.1	37.1
[1] Ground Elevation =	103.0	m

Scenario 2 – Existing Conditions – 6 connections

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	62.3
Peak Hour	138.6	41.6
Max Day plus Fire Flow #1	133.6	34.6
Max Day plus Fire Flow #2	127.5	25.8

[1] Ground Elevation = 109.3 m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	65.7
Peak Hour	138.6	45.1
Max Day plus Fire Flow #1	133.9	38.4
Max Day plus Fire Flow #2	127.8	29.8

[1] Ground Elevation = 106.9 m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	64.7
Peak Hour	138.6	44.0
Max Day plus Fire Flow #1	134.2	37.8
Max Day plus Fire Flow #2	128.3	29.4

[1] Ground Elevation = 107.7 m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	62.3
Peak Hour	138.6	41.7
Max Day plus Fire Flow #1	134.5	35.9
Max Day plus Fire Flow #2	128.8	27.8

[1] Ground Elevation = 109.3 m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	71.2
Peak Hour	138.6	50.5
Max Day plus Fire Flow #1	134.9	45.3
Max Day plus Fire Flow #2	129.5	37.6

[1] Ground Elevation = 103.0 m

Connection 7 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	153.1	68.3
Peak Hour	138.6	47.6
Max Day plus Fire Flow #1	134.5	41.8
Max Day plus Fire Flow #2	128.8	33.8
[1] Ground Elevation =	105.1	m

Scenario 3 – Future SUC – 5 connections

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	53.1
Peak Hour	137.6	40.3
Max Day plus Fire Flow #1	133.8	34.9
Max Day plus Fire Flow #2	129.4	28.5
[1] Ground Elevation =	109.3	m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	56.6
Peak Hour	137.7	43.9
Max Day plus Fire Flow #1	134.2	38.8
Max Day plus Fire Flow #2	129.8	32.6
[1] Ground Elevation =	106.9	m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	55.5
Peak Hour	137.7	42.7
Max Day plus Fire Flow #1	134.4	38.1
Max Day plus Fire Flow #2	130.2	32.1
[1] Ground Elevation =	107.7	m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	53.2
Peak Hour	137.6	40.3
Max Day plus Fire Flow #1	134.7	36.1
Max Day plus Fire Flow #2	130.7	30.4
[1] Ground Elevation =	109.3	m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	62.1
Peak Hour	137.6	49.2
Max Day plus Fire Flow #1	135.1	45.6
Max Day plus Fire Flow #2	131.4	40.3
[1] Ground Elevation =	103.0	m

Scenario 4 – Future SUC – 6 connections

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	53.1
Peak Hour	137.8	40.5
Max Day plus Fire Flow #1	134.0	35.1
Max Day plus Fire Flow #2	129.6	28.8
[1] Ground Elevation =	109.3	m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	56.6
Peak Hour	137.9	44.1
Max Day plus Fire Flow #1	134.3	39.0
Max Day plus Fire Flow #2	130.0	32.8
[1] Ground Elevation =	106.9	m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	55.5
Peak Hour	137.8	42.9
Max Day plus Fire Flow #1	134.6	38.3
Max Day plus Fire Flow #2	130.5	32.4
[1] Ground Elevation =	107.7	m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	53.2
Peak Hour	137.8	40.6
Max Day plus Fire Flow #1	134.9	36.4
Max Day plus Fire Flow #2	130.9	30.8
[1] Ground Elevation =	109.3	m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	62.1
Peak Hour	137.8	49.4
Max Day plus Fire Flow #1	135.2	45.8
Max Day plus Fire Flow #2	131.6	40.6
[1] Ground Elevation =	103.0	m

Connection 7 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.7	59.1
Peak Hour	137.8	46.5
Max Day plus Fire Flow #1	134.9	42.3
Max Day plus Fire Flow #2	131.0	36.8
[1] Ground Elevation =	105.1	m

Notes

1. Only connections off the public looped system are eligible for boundary conditions. The engineer must calculate headloss off the dead-end main. Proposed Connections 1 & 6 at existing water stubs off Lynn Coulter Street & Moyard Drive are not looped. For the purposes of this boundary condition request, proposed Connections 1 & 6 were combined to a single **Connection 1 – Moyard Drive**, off the public looped watermains. Because of this change, Scenarios 1 & 3 were dropped from 6 to 5 total connections and Scenarios 2 & 4 were dropped from 7 to 6 total connections.
2. Demands for proposed Connection 7 at existing water main along Barnsdale Road were assigned to upstream junction at Realigned Greenbank Road & Barnsdale Road off the public looped watermains. The engineer must calculate headloss off the dead-end main.
3. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    - If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    - Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

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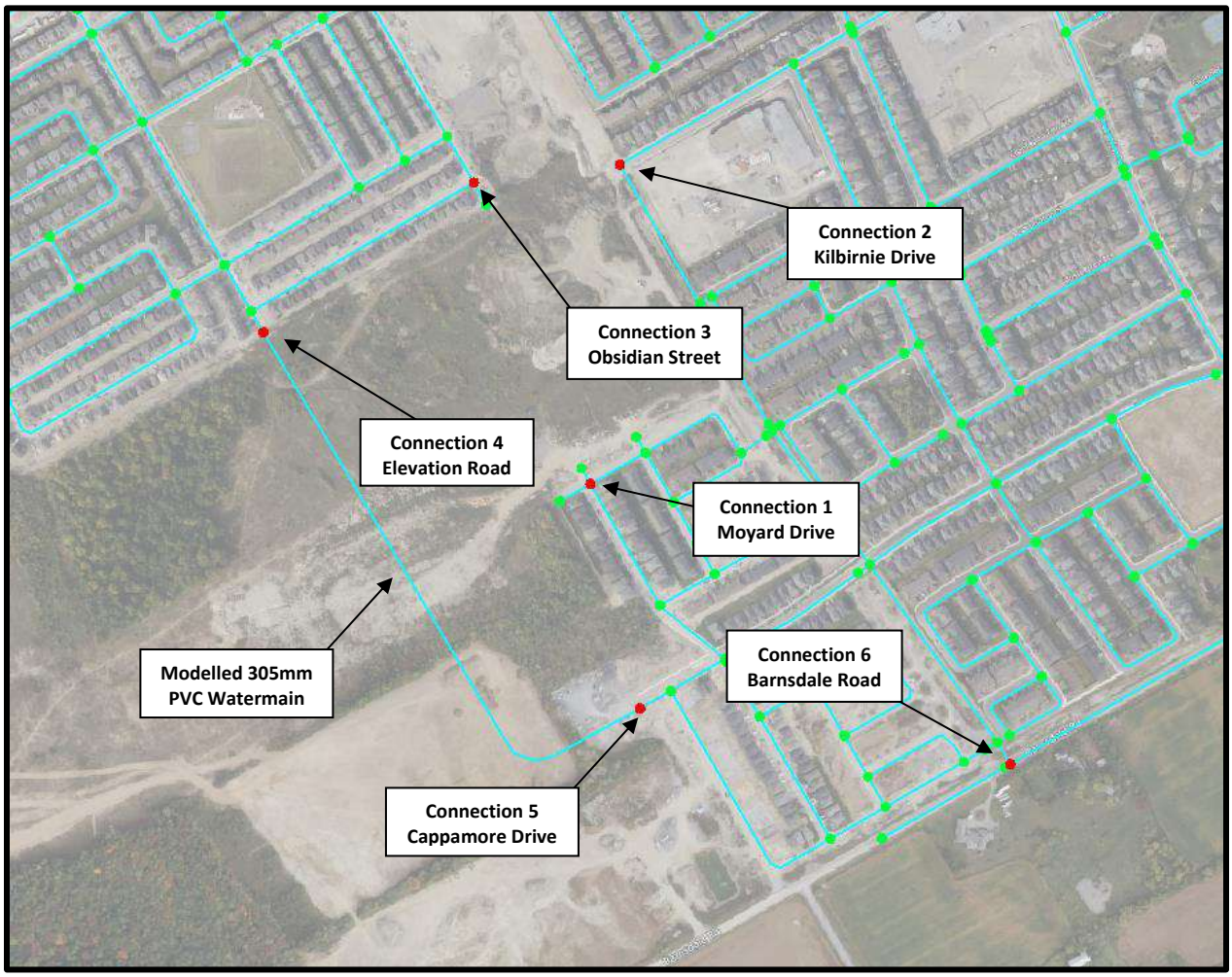
Boundary Conditions
S1 UEA – Stages 5-6
November 2025

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	569	9.49
Maximum Daily Demand	770	12.84
Peak Hour	1,250	20.84
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	13,000	216.67

Location



Results

Existing Conditions

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	64.9
Peak Hour	139.3	42.7
Max Day plus Fire Flow #1	135.1	36.6
Max Day plus Fire Flow #2	129.1	28.1

[1] Ground Elevation = 109.3 m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	68.4
Peak Hour	139.3	46.1
Max Day plus Fire Flow #1	135.3	40.3
Max Day plus Fire Flow #2	129.3	31.9

[1] Ground Elevation = 106.9 m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	67.3
Peak Hour	139.3	45.1
Max Day plus Fire Flow #1	135.6	39.7
Max Day plus Fire Flow #2	129.9	31.6

[1] Ground Elevation = 107.7 m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	65.0
Peak Hour	139.3	42.7
Max Day plus Fire Flow #1	135.9	37.8
Max Day plus Fire Flow #2	130.4	30.0

[1] Ground Elevation = 109.3 m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	73.8
Peak Hour	139.3	51.6
Max Day plus Fire Flow #1	136.3	47.3
Max Day plus Fire Flow #2	131.0	39.8

[1] Ground Elevation = 103.0 m

Connection 6 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	155.0	70.9
Peak Hour	139.3	48.7
Max Day plus Fire Flow #1	135.9	43.8
Max Day plus Fire Flow #2	130.4	36.0
[1] Ground Elevation =	105.1	m

Future SUC

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	53.7
Peak Hour	138.9	42.1
Max Day plus Fire Flow #1	134.8	36.2
Max Day plus Fire Flow #2	130.5	30.2
[1] Ground Elevation =	109.3	m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	57.2
Peak Hour	139.0	45.6
Max Day plus Fire Flow #1	135.0	39.9
Max Day plus Fire Flow #2	130.8	34.0
[1] Ground Elevation =	106.9	m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	56.1
Peak Hour	139.0	44.5
Max Day plus Fire Flow #1	135.3	39.3
Max Day plus Fire Flow #2	131.3	33.6
[1] Ground Elevation =	107.7	m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	53.8
Peak Hour	138.9	42.2
Max Day plus Fire Flow #1	135.6	37.4
Max Day plus Fire Flow #2	131.8	32.0
[1] Ground Elevation =	109.3	m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	62.7
Peak Hour	138.9	51.0
Max Day plus Fire Flow #1	136.0	46.9
Max Day plus Fire Flow #2	132.5	41.9
[1] Ground Elevation =	103.0	m

Connection 6 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	59.7
Peak Hour	138.9	48.1
Max Day plus Fire Flow #1	135.6	43.4
Max Day plus Fire Flow #2	131.9	38.1
[1] Ground Elevation =	105.1	m

Disclaimer

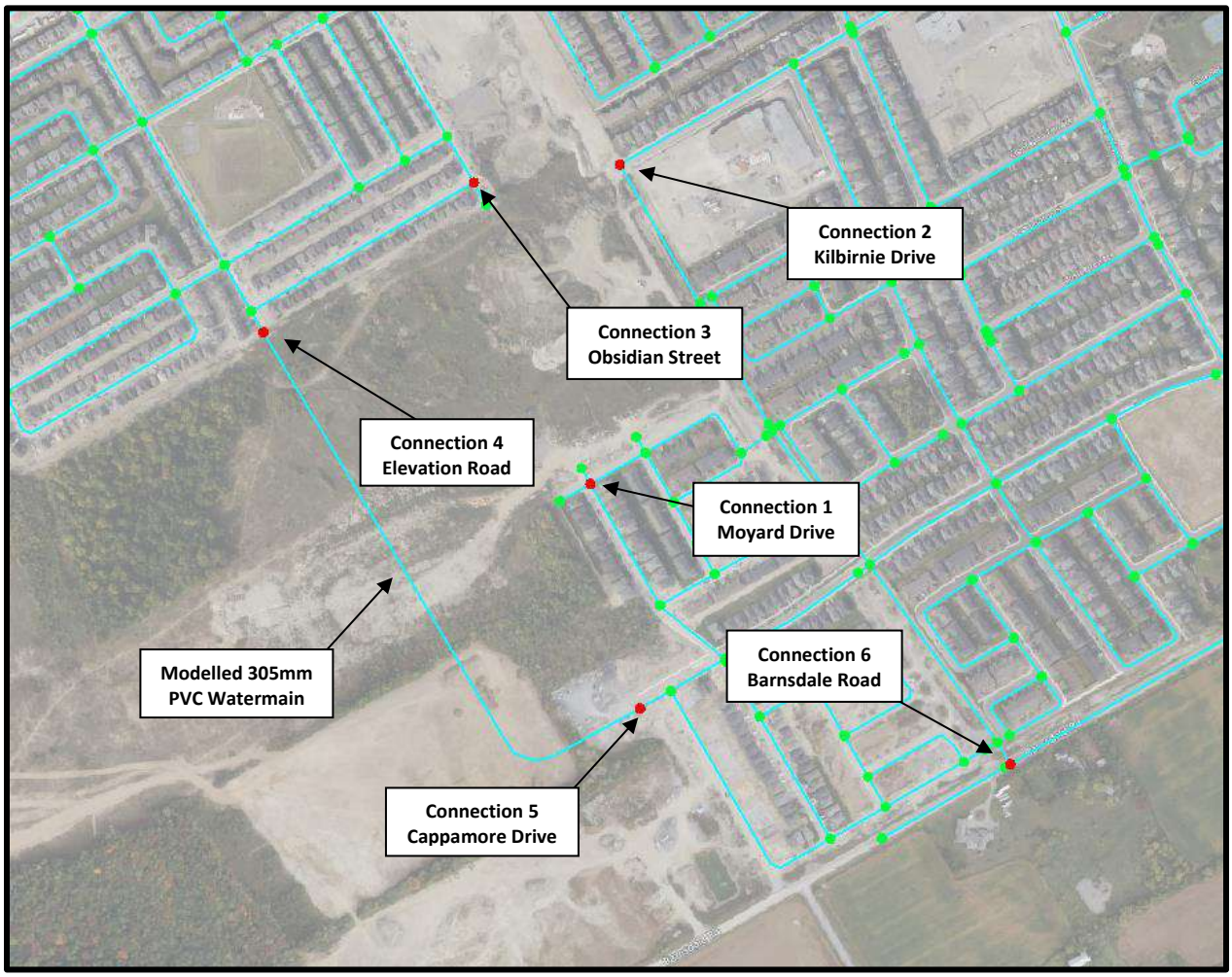
The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Boundary Conditions
S1 UEA – Stages 5-7
August 2025

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	679	11.31
Maximum Daily Demand	950	15.84
Peak Hour	1,613	26.89
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	13,000	216.67

Location



Results

Existing Conditions

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	64.0
Peak Hour	136.3	38.3
Max Day plus Fire Flow #1	134.7	36.1
Max Day plus Fire Flow #2	128.7	27.5

[1] Ground Elevation = 109.3 m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	67.4
Peak Hour	136.3	41.8
Max Day plus Fire Flow #1	134.9	39.8
Max Day plus Fire Flow #2	128.9	31.4

[1] Ground Elevation = 106.9 m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	66.3
Peak Hour	136.3	40.7
Max Day plus Fire Flow #1	135.2	39.2
Max Day plus Fire Flow #2	129.5	31.0

[1] Ground Elevation = 107.7 m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	64.0
Peak Hour	136.3	38.4
Max Day plus Fire Flow #1	135.5	37.3
Max Day plus Fire Flow #2	130.0	29.4

[1] Ground Elevation = 109.3 m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	72.9
Peak Hour	136.3	47.2
Max Day plus Fire Flow #1	135.9	46.8
Max Day plus Fire Flow #2	130.6	39.2

[1] Ground Elevation = 103.0 m

Connection 6 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	154.3	70.0
Peak Hour	136.3	44.3
Max Day plus Fire Flow #1	135.5	43.3
Max Day plus Fire Flow #2	130.0	35.4
[1] Ground Elevation =	105.1	m

Future SUC

Connection 1 - Moyard Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	53.7
Peak Hour	138.6	41.7
Max Day plus Fire Flow #1	134.6	35.9
Max Day plus Fire Flow #2	130.3	29.9
[1] Ground Elevation =	109.3	m

Connection 2 - Kilbirnie Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	57.2
Peak Hour	138.7	45.2
Max Day plus Fire Flow #1	134.8	39.7
Max Day plus Fire Flow #2	130.6	33.7
[1] Ground Elevation =	106.9	m

Connection 3 - Obsidian Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	56.1
Peak Hour	138.7	44.1
Max Day plus Fire Flow #1	135.1	39.0
Max Day plus Fire Flow #2	131.1	33.3
[1] Ground Elevation =	107.7	m

Connection 4 - Elevation Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	53.8
Peak Hour	138.7	41.8
Max Day plus Fire Flow #1	135.4	37.1
Max Day plus Fire Flow #2	131.6	31.7
[1] Ground Elevation =	109.3	m

Connection 5 - Cappamore Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	62.6
Peak Hour	138.6	50.6
Max Day plus Fire Flow #1	135.8	46.6
Max Day plus Fire Flow #2	132.3	41.6
[1] Ground Elevation =	103.0	m

Connection 6 - Barnsdale Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.1	59.7
Peak Hour	138.6	47.7
Max Day plus Fire Flow #1	135.4	43.1
Max Day plus Fire Flow #2	131.7	37.8
[1] Ground Elevation =	105.1	m

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Ally Marchese

From: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Sent: Friday, September 26, 2025 3:06 PM
To: Ally Marchese
Cc: Bougadis, John; Kader, Ryan; Mahad Musse
Subject: Re: S1 Lands - Boundary Condition Request
Attachments: R1_S1 UEA 2025 Update BC (26August2025).pdf

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Hi Ally,

Please find the updated BC results attached with the looped 300mm WM included as requested.

A couple of notes on the results:

- As the 300mm WM was included, the connection locations 4 & 5 were moved to their originally requested locations (because they are now part of the looped network).
- We see a generally higher HGL throughout the entire boundary condition except at connection 4's new location. This is due to the increase in node elevation compared to its previous location. The node elevations are pulled from our DEM.

Please let me know if you have any questions,

Gianmarco

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

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From: Ally Marchese <amarchese@jlrichards.ca>
Sent: Thursday, September 25, 2025 11:25 AM
To: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Kader, Ryan <ryan.kader@ottawa.ca>; Mahad Musse <mmusse@jlrichards.ca>
Subject: RE: S1 Lands - Boundary Condition Request

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Hi Gianmarco,

Thanks for the clarification.

I just wanted to follow up on the progress of the updated boundary conditions with the 300mm watermain in the model.

Appreciate your help with this.

Thank you,
Ally

Ally Marchese, B.A.Sc., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa ON K1S 1N4
Work: 343-492-2536
amarchese@jlrichards.ca

From: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Sent: Friday, September 12, 2025 4:47 PM
To: Ally Marchese <amarchese@jlrichards.ca>
Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Kader, Ryan <ryan.kader@ottawa.ca>; Mahad Musse <mmusse@jlrichards.ca>
Subject: Re: S1 Lands - Boundary Condition Request

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Good afternoon Ally,

Sorry for the confusion concerning the results. The differences in results comes down to the Infrastructure & Water Services Dept updating our base water boundary conditions (BC) model. The previous BC results were provided using the old BC model. These updated results are using the new updated BC model. The drop in HGLs can be entirely explained by these factors which were the result of our base model update:

- Under existing conditions scenarios, the pump control rules at Barrhaven PS were updated to better reflect the real-life configuration of the 3SW pressure zone and the relationship between the Moodie Tank and the Barrhaven PS. This resulted in around a 3-meter drop in HGLs throughout the zone during Max Day scenarios. This change only affected existing conditions scenarios (pre SUC zone reconfig) and the 3-meter drop in HGLs can be noticed by comparing the Max HGL results from the previous model results to the updated model results.
- The demands on all nodes throughout the model were updated with our most recent data. These updated demands influenced Max Day demand HGLs throughout the model, but especially in zone 3SW. The nodes surrounding the S1 UEA lands previously had zero demands (new developments growth). This updated model, thus, had a significant increase in neighboring demands. These increases were updated for pre SUC zone reconfig and post-SUC zone reconfig scenarios.

We've verified the previous boundary condition results model with this updated model and can attribute all the head loss, despite the decreased demands and the additional connection locations, to these stated factors above. Apologies for the confusion, I should've explained these changes when sharing the updated results.

Concerning your second point about the addition of the 300mm watermain in the model, I will run new results with this addition and share them with you.

Hopefully this clears things up. Have a great weekend,

Gianmarco

From: Ally Marchese <amarchese@jlrichards.ca>
Sent: Friday, September 12, 2025 9:04 AM
To: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Kader, Ryan <ryan.kader@ottawa.ca>; Mahad Musse <mmusse@jlrichards.ca>
Subject: RE: S1 Lands - Boundary Condition Request

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Hi Gianmarco,

Thank you for sending over the updated boundary conditions, we appreciate the quick turnaround from the City

We've had a chance to review the information and after comparing it with the boundary conditions we received in June 2024 (attached for your reference) for the same project, we just had a few follow-up comments that we would like to clarify. I've attached the previous boundary conditions for reference.

1. Upon comparing the two sets of boundary conditions, we observed a reduction in pressures in the updated boundary condition (from Sept 2025), summarized as follows:
    - An average decrease of approximately 4 psi (27 kPa) in the maximum HGL scenario
    - An average decrease of approximately 2 psi (14 kPa) in the peak hour scenario
    - An average decrease of approximately 10 psi (69 kPa) in the maximum day plus fire flow scenario

    We understand that the Tullaghan connection was removed in the latest boundary condition request, however, given its proximity to the Moyard connection, we were not expecting such a noticeable reduction in pressure. In addition, the total demands for the development have decreased.

2. As part of this development, Elevation Road and Cappamore Drive are proposed to be extended from the existing subdivisions. As both are classified as collector roads, it is anticipated that a 300 mm diameter trunk watermain will be required to service these extensions. If this has not already been taken into account, could you please consider it in the boundary conditions results?

We appreciate your help with this. If you have any questions please let me know.

Thank you,
Ally

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Ally Marchese, B.A.Sc., EIT
Civil Engineering Graduate

1000-343 Preston Street

Ottawa ON K1S 1N4
Work: 343-492-2536
amarchese@jlrichards.ca

From: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Sent: Tuesday, September 9, 2025 3:59 PM
To: Ally Marchese <amarchese@jlrichards.ca>
Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Kader, Ryan <ryan.kader@ottawa.ca>
Subject: Re: S1 Lands - Boundary Condition Request

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Good afternoon Ally,

Please find the completed BC attached. Please note, as mentioned in the notes, the combination of proposed connections 1 & 6 into a single connection since our group only completes BC results off the public looped watermains.

Please let me know if you have any questions.

Thanks,

Gianmarco

From: Ally Marchese <amarchese@jlrichards.ca>
Sent: Tuesday, September 9, 2025 3:12 PM
To: Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Cc: Curtiss Scarlett <cscarlett@minto.com>; EHarrington@minto.com <EHarrington@minto.com>; Mahad Musse <mmusse@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: S1 Lands - Boundary Condition Request

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Hi Gianmarco,

Kindly following up on our boundary conditions request. Do you have a timeline of when we could expect these results?

Appreciate your help on this.

Best Regards,

Ally

Ally Marchese, B.A.Sc., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa ON K1S 1N4
Work: 343-492-2536
amarchese@jlrichards.ca

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: Wednesday, August 27, 2025 12:44 PM
To: Ally Marchese <amarchese@jlrichards.ca>
Cc: Curtiss Scarlett <cscarlett@minto.com>; EHarrington@minto.com; Mahad Musse <mmusse@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>; Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Subject: Re: S1 Lands - Boundary Condition Request

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Hi Ally,

The request has been forwarded to Gianmarco, who will be updating the water boundary conditions. He will share the updated results with you once they are available.

For your reference, fire flow requirements typically govern the design of local watermains, while peak hourly demands often determine the sizing of watermains 400 mm and larger. If there have been no significant changes to the fire flow rates or peak hourly demands, the water boundary conditions are expected to remain largely unchanged.

Thanks,

John

A/Program Manager, Trunk System Planning

Advance notice: I'll be out of the office from Tuesday, September 2 until Thursday, September 10

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

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From: Ally Marchese <amarchese@jlrichards.ca>
Sent: Wednesday, August 27, 2025 11:40 AM
To: Bougadis, John <John.Bougadis@ottawa.ca>
Cc: Curtiss Scarlett <cscarlett@minto.com>; EHarrington@minto.com <EHarrington@minto.com>; Mahad Musse <mmusse@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>
Subject: RE: S1 Lands - Boundary Condition Request

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ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi John,

We received a bounce back email from Zoe. I just wanted to follow up and address this request to you.

Thank you,

Ally Marchese, B.A.Sc., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa ON K1S 1N4
Work: 343-492-2536
amarchese@jlrichards.ca

From: Ally Marchese <amarchese@jlrichards.ca>
Sent: Tuesday, August 26, 2025 3:14 PM
To: qiaoqiao.gong@ottawa.ca
Cc: John.Bougadis@ottawa.ca; CScarlett@minto.com; EHarrington@minto.com; Mahad Musse <mmusse@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Karla Ferrey <kferrey@jlrichards.ca>
Subject: RE: S1 Lands - Boundary Condition Request

Hi Zoe,

Following up on our previous boundary condition request (July 5th 2024, see attached), we are requesting updated boundary conditions for the Barrhaven S1 lands, based on a revised concept plan with updated population figures and revised connection points.

As with our previous boundary condition request, this document summarizes the upcoming potable water assessment that will be carried out as part of the upcoming Servicing Study for Minto's S1 Urban Expansion Area (S1 UEA). The subject site is located north of Barnsdale Road, east of Borrisokane Road, south of the existing The Ridge Subdivision and west of the existing Quinn's pointe Subdivision.

Given that the population for overall S1 UEA exceeds 3,000 equivalent population, the analysis is to be carried out based on system-level demand parameters as per the attached. The potable water assessment will identify water servicing requirements for the future stages of the S1 UEA as depicted on Minto's Concept Plan.

Please note that since Quinn's Pointe Stage 5 is still under review, its associated demands and connection points have been included in this request. The connection points have also been slightly revised from our previous submission to reflect updates to the servicing strategy for the subdivision.

We are requesting boundary conditions for the following scenarios. Note that each scenario will have the same demand assumptions:

- Scenario 1: Existing Pressure Zone without Connection to Barnsdale Road (Connection 7) on the attached figure

- Scenario 2: Existing Pressure Zone with Connection to Barnsdale Road (Connection 7) on the attached figure
- Scenario 3: Future "SUC Zone" Pressure Zone Reconfiguration without Connection to Barnsdale Road (Connection 7) on the attached figure
- Scenario 4: Future "SUC Zone" Pressure Zone Reconfiguration with Connection to Barnsdale Road (Connection 7) on the attached figure

Scenario 1 - Existing Pressure Zone without Connection to Barnsdale Road

The requested connections for scenario 1 are as follows:

1. Location 1 – Connection to existing 300 mm WM north of Moyard on Lynn Coulter Street;
2. Location 2 – Connection to existing 300 mm WM at Kilbirnie Drive;
3. Location 3 – Connection to existing 300 mm WM at Obsidian Street;
4. Location 4 – Connection to existing 300 mm WM at Elevation Road;
5. Location 5 – Connection to existing 300 mm WM at Cappamore Drive; and
6. Location 6 – Connection to existing 200 mm WM at Moyard Drive.

Scenario 2 Existing Pressure Zone with Connection to Barnsdale

The requested connections for scenario 2 are as follows:

6. Location 1 – Connection to existing 300 mm WM at North of Moyard on Lynn Coulter Street;
7. Location 2 – Connection to existing 300 mm WM at Kilbirnie Drive;
8. Location 3 – Connection to existing 300 mm WM at Obsidian Street;
9. Location 4 – Connection to existing 300 mm WM at Elevation Road.
10. Location 5 – Connection to existing 300 mm WM at Cappamore Drive;
11. Location 6 – Connection to existing 200 mm WM at Moyard Drive; and
12. Location 7 – Connection to existing 200 mm WM at Barnsdale Road.

Scenario 3 - Future "SUC Zone" Pressure Zone Reconfiguration without Connection to Barnsdale Road

The requested connections for scenario 3 are as follows:

13. Location 1 – Connection to existing 300 mm WM at North of Moyard on Lynn Coulter Street;
14. Location 2 – Connection to existing 300 mm WM at Kilbirnie Drive;
15. Location 3 – Connection to existing 300 mm WM at Obsidian Street;
16. Location 4 – Connection to existing 300 mm WM at Elevation Road.
17. Location 5 – Connection to existing 300 mm WM at Cappamore Drive; and
18. Location 6 – Connection to existing 200 mm WM at Moyard Drive.

Scenario 4 Future "SUC Zone" Pressure Zone Reconfiguration with Connection to Barnsdale Road

The requested connections for scenario 4 are as follows:

19. Location 1 – Connection to existing 300 mm WM at North of Moyard on Lynn Coulter Street;
20. Location 2 – Connection to existing 300 mm WM at Kilbirnie Drive;
21. Location 3 – Connection to existing 300 mm WM at Obsidian Street;
22. Location 4 – Connection to existing 300 mm WM at Elevation Road.
23. Location 5 – Connection to existing 300 mm Mat Cappamore Drive;
24. Location 6 – Connection to existing 200 mm WM at Moyard Drive; and
25. Location 7 – Connection to existing 200 mm WM at Barnsdale Road.

As previously noted, the water demands were calculated based on the provided system-level demand parameters. The estimated water demands for the proposed development are listed below (refer to the attachment for the breakdown):

Demands Including:

Average Day Demand = 16.69 L/s

Maximum Day Demand = 24.56 L/s

Peak Hour Demand = 43.47 L/s

Fire Flow 1 = 167 L/s

Fire Flow 2 = 217 L/s

If we could receive the requested boundary conditions at your earliest convenience it would be much appreciated.

Should you have any questions or require anything further, please do not hesitate to call.

Thank you,

Ally Marchese, B.A.Sc., EIT
Civil Engineering Graduate

Ottawa ON
Work: 343-492-2536

From: Gong, Qiaoqiao <qiaoqiao.gong@ottawa.ca>
Sent: Friday, July 5, 2024 1:13 PM
To: Tatyana Roumie <troumie@jlrichards.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Bobby Pettigrew <bpettigrew@jlrichards.ca>; Curtiss Scarlett <CScarlett@minto.com>; Guy Forget <gforget@jlrichards.ca>; EHarrington@minto.com; Bougadis, John <John.Bougadis@ottawa.ca>; van de Lande, Robin <Robin.vandeLande@ottawa.ca>; Maggiore, Gianmarco <gianmarco.maggiore@ottawa.ca>
Subject: RE: S1 Lands - Boundary Condition Request

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Good morning Tatyana,

Please see water boundary condition results attached for Stage 5 and Stage 5-9, as requested.

Let me know if you have any questions.

Happy Friday.

Zoe

Zoe (Qiaoqiao) Gong,M.Eng.,P.Eng.

Project Manager, Infrastructure Planning

Infrastructure and Water Services

qiaoqiao.gong@ottawa.ca
613-580-2400 ext. 22733

City of Ottawa

From: Tatyana Roumie <troumie@jlrichards.ca>
Sent: 2024/06/26 10:32 AM
To: Bougadis, John <John.Bougadis@ottawa.ca>; van de Lande, Robin <Robin.vandeLande@ottawa.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Bobby Pettigrew <bpettigrew@jlrichards.ca>; Curtiss Scarlett <CScarlett@minto.com>; Guy Forget <gforget@jlrichards.ca>; EHarrington@minto.com
Subject: S1 Lands - Boundary Condition Request

John & Robin,

We are requesting boundary conditions for the S1 Urban Expansion Area (S1 UEA). This request follows recent discussions held with John and was prepared based on the system-level parameters provided by the City of Ottawa given that Stage 5 and the S1 UEA exceed a population of 3,000.

As per the recent discussions, this request solely reflects Minto's Stage 5 and S1 UEA as a separate request was made by DSEL for the Logistics and Industrial/Commercial lands.

The upcoming potable water assessment that will be prepared as part of an upcoming MSS that will identify water servicing requirements for Stage 5 as well as the future stages of the S1 UEA as depicted on Minto's Concept Plan (see the phasing limit in red on the attached). It should be noted that Stage 5 as shown on the attached relates to the last stage of the previous expansion lands (BSUEA) while Stages 6-9 relates to the S1 UEA. As shown on the attached Concept Plan, the unit breakdown for each of the stages is shown in the upper left corner of the PDF. Also shown on this PDF, Stage 5 will connect to existing watermains at four (4) while future Stages 6-9 part of the S1 UEA will be connected with an additional four (4) connections to existing watermains, labelled as Connection 5 to 8 as shown on the attached Concept Plan. These connections are described below:

- Location 1 – Connection to existing 300 mm WM at North of Moyard and Lynn Coulter Street;
- Location 2 – Connection to existing 200 mm WM at North of Tullaghan Heights and Moyard Drive;
- Location 3 – Connection to existing 300 mm WM at Kilbernie Road;
- Location 4 – Connection to existing 300 mm WM at Obsidian Street;
- Location 5 – Connection to existing 200 mm WM at Barnsdale Road;
- Location 6 – Connection to existing 300 mm WM at Cappamore Drive;
- Location 7 – Connection to existing 200 mm WM at Moyard Drive; and
- Location 8 – Connection to existing 300 mm WM at Elevation Road.

The following provides the calculated demands and fire flow requirements for Stage 5 part of the approved BSUEA, as well as the cumulative demands for Stage 5 with Stages 6-9 using the system level parameters. The system level parameters and demand calculations are attached to this Email.

Stage 5:

Average Day Demand = 5.06 L/s

Maximum Day Demand = 5.38 L/s

Peak Hour Demand = 6.47 L/s

Fire Flow 1 = 167 L/s

Fire Flow 2 = 217 L/s

Fire Flow 3 = 250 L/s

Fire Flow 4 = 300 L/s

Stages 5 - 9:

Average Day Demand = 19.66 L/s

Maximum Day Demand = 27.63 L/s

Peak Hour Demand = 44.18 L/s

Fire Flow 1 = 167 L/s

Fire Flow 2 = 217 L/s

Fire Flow 3 = 250 L/s

Fire Flow 4 = 300 L/s

Based on the above information, can boundary conditions be provided at the connection points noted above under Stage 5, as well as for Stage 6, 7, 8 and 9 to reflect Minto's phasing Plan. The BC should be generated under Peak Hour, Max. Day plus Fire Flows and Maximum Pressure Check scenarios. We have also assumed that the BC will reflect current supply conditions as well as the future pressure zone reconfiguration.

If we could receive the requested boundary conditions at your earliest convenience it would be much appreciated.

Should you have any questions or require anything further, please do not hesitate to call.

Thanks,

Tatyana

Tatyana Roumie, M.Eng., B.Eng., EIT
Civil Engineering Graduate
Ottawa, ON
Work: 343-804-9370

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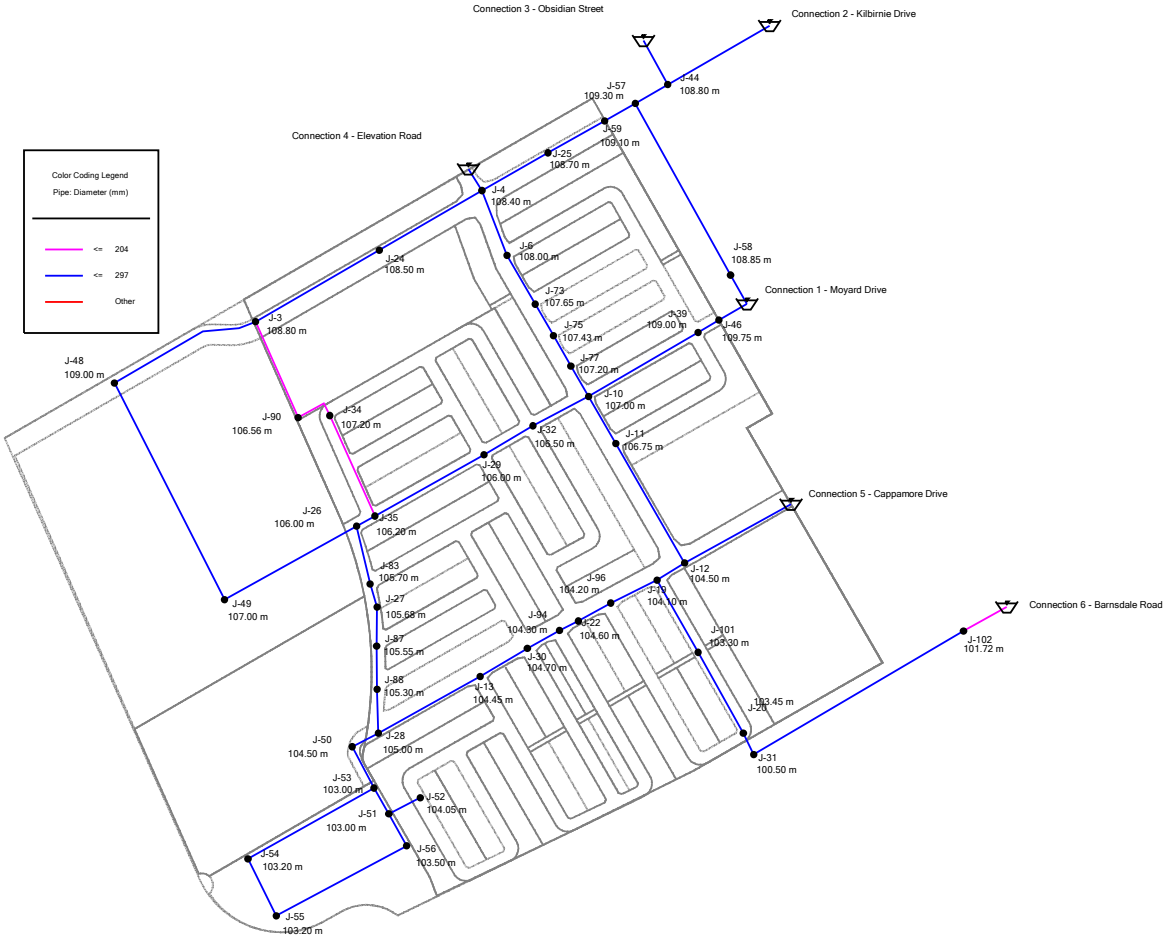
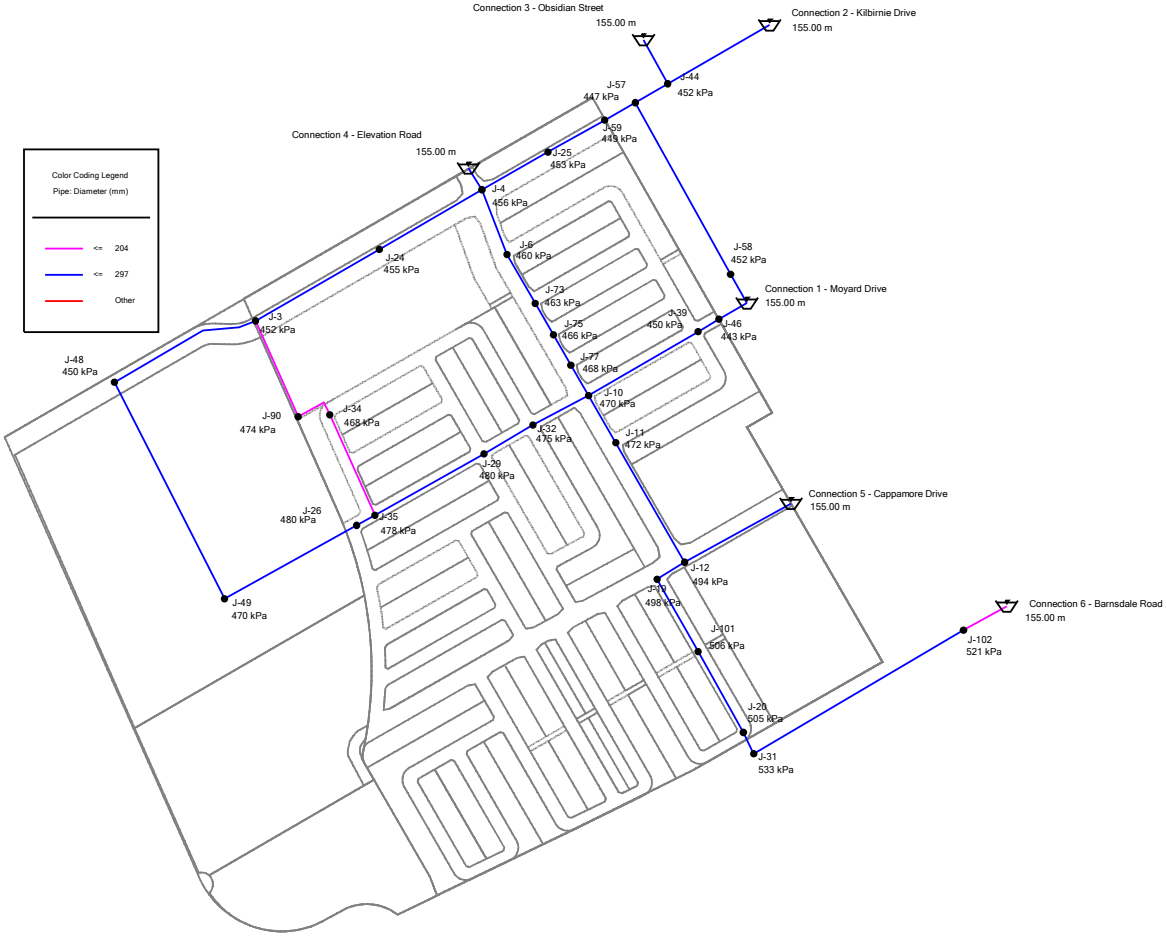
Barrhaven South Phase 3 - S1 Area
Elevation Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 6 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
152	J-46	443	109.75	0.00	155.00
239	J-58	452	108.85	0.00	155.00
131	J-39	450	109.00	0.00	155.00
235	J-57	447	109.30	0.00	155.00
242	J-59	449	109.10	0.00	155.00
144	J-44	452	108.80	0.00	155.00
205	J-48	450	109.00	0.00	155.00
90	J-25	453	108.70	0.00	155.00
34	J-3	452	108.80	0.00	155.00
87	J-24	455	108.50	0.00	155.00
35	J-4	456	108.40	0.00	155.00
39	J-6	460	108.00	0.00	155.00
319	J-73	463	107.65	0.00	155.00
326	J-75	466	107.43	0.00	155.00
333	J-77	468	107.20	0.00	155.00
117	J-34	468	107.20	0.00	155.00
47	J-10	470	107.00	0.00	155.00
208	J-49	470	107.00	0.00	155.00
49	J-11	472	106.75	0.00	155.00
392	J-90	474	106.56	0.00	155.00
112	J-32	475	106.50	0.00	155.00
119	J-35	478	106.20	0.00	155.00
100	J-29	480	106.00	0.00	155.00
93	J-26	480	106.00	0.00	155.00
51	J-12	494	104.50	0.00	155.00
70	J-19	498	104.10	0.00	155.00
73	J-20	505	103.45	0.00	155.00
447	J-101	506	103.30	0.00	155.00
108	J-31	533	100.50	0.00	155.00

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	155.00	155.00	0.00	0.00
P-2(2)	151.7	297	PVC	120	155.00	155.00	0.00	0.00
P-3(1)	97.2	297	PVC	120	155.00	155.00	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	155.00	155.00	0.00	0.00
P-4	88.7	297	PVC	120	155.00	155.00	0.00	0.00
P-9	69.5	297	PVC	120	155.00	155.00	0.00	0.00
P-10	176.3	297	PVC	120	155.00	155.00	0.00	0.00
P-11	155.2	297	PVC	120	155.00	155.00	0.00	0.00
P-12(1)	41.4	297	PVC	120	155.00	155.00	0.00	0.00
P-18(1)	106.2	297	PVC	120	155.00	155.00	0.00	0.00
P-18(2)	118.4	297	PVC	120	155.00	155.00	0.00	0.00
P-21(1)	162.2	297	PVC	120	155.00	155.00	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	155.00	155.00	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	155.00	155.00	0.00	0.00
P-23	32.5	297	PVC	120	155.00	155.00	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	155.00	155.00	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	155.00	155.00	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	155.00	155.00	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	155.00	155.00	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	155.00	155.00	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	155.00	155.00	0.00	0.00
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	155.00	155.00	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	155.00	155.00	0.00	0.00
P-30	30.3	297	PVC	120	155.00	155.00	0.00	0.00
P-34	140.7	204	PVC	110	155.00	155.00	0.00	0.00
P-43	150.5	297	PVC	120	155.00	155.00	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	155.00	155.00	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	155.00	155.00	0.00	0.00

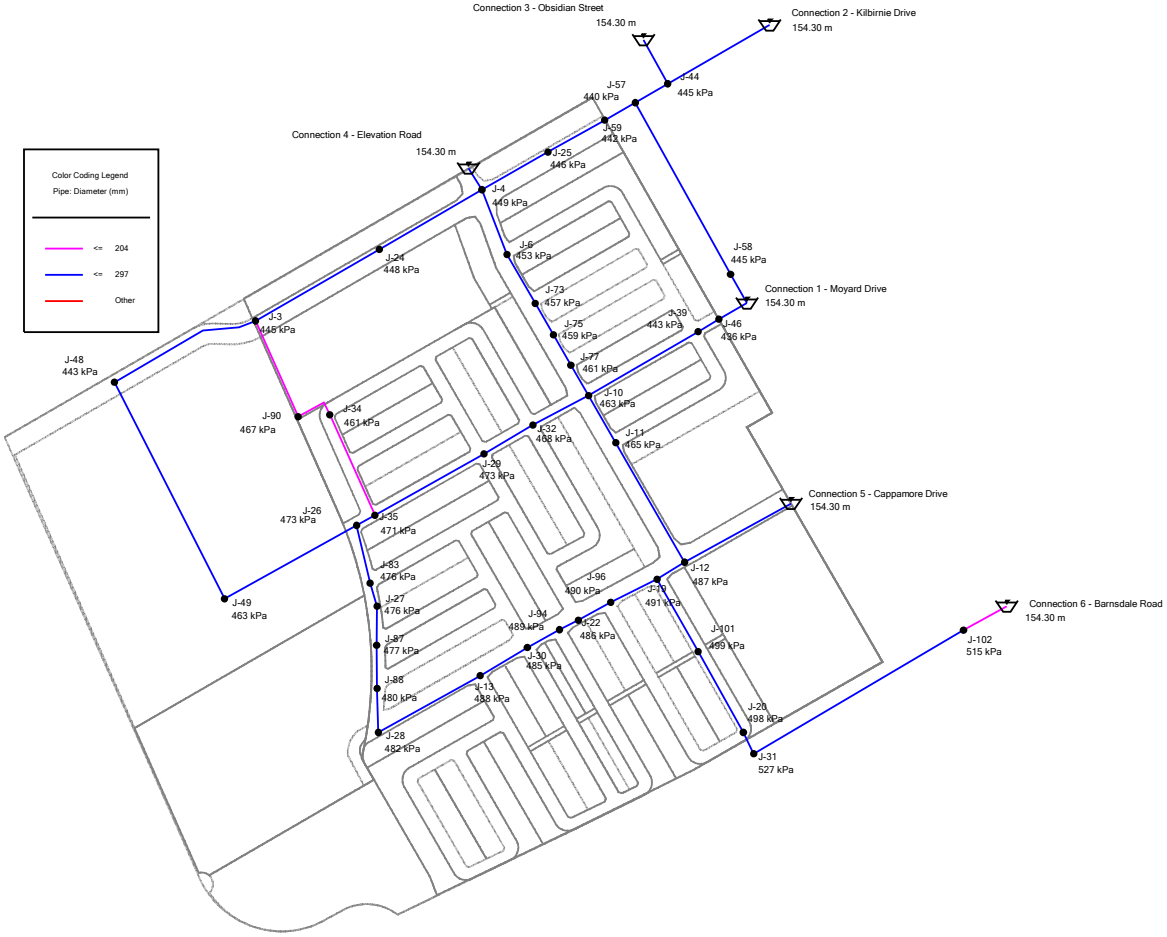
Barrhaven South Phase 3 - S1 Area

Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-44(2)	48.0	297	PVC	120	155.00	155.00	0.00	0.00
P-45	200.1	297	PVC	120	155.00	155.00	0.00	0.00
P-46(1)	310.4	297	PVC	120	155.00	155.00	0.00	0.00
P-46(2)	193.1	297	PVC	120	155.00	155.00	0.00	0.00
P-55(1)	250.8	297	PVC	120	155.00	155.00	0.00	0.00
P-55(2)	42.4	297	PVC	120	155.00	155.00	0.00	0.00
P-67(1)	54.8	204	PVC	110	155.00	155.00	0.00	0.00
P-67(2)	133.9	204	PVC	110	155.00	155.00	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	488	104.45	0.00	154.30
77	J-22	486	104.60	0.00	154.30
95	J-27	476	105.68	0.00	154.30
97	J-28	482	105.00	0.00	154.30
103	J-30	485	104.70	0.00	154.30
356	J-83	476	105.70	0.00	154.30
368	J-87	477	105.55	0.00	154.30
372	J-88	480	105.30	0.00	154.30
408	J-94	489	104.30	0.00	154.30
415	J-96	490	104.20	0.00	154.30
152	J-46	436	109.75	0.00	154.30
239	J-58	445	108.85	0.00	154.30
131	J-39	443	109.00	0.00	154.30
235	J-57	440	109.30	0.00	154.30
242	J-59	442	109.10	0.00	154.30
144	J-44	445	108.80	0.00	154.30
205	J-48	443	109.00	0.00	154.30
90	J-25	446	108.70	0.00	154.30
34	J-3	445	108.80	0.00	154.30
87	J-24	448	108.50	0.00	154.30
35	J-4	449	108.40	0.00	154.30
39	J-6	453	108.00	0.00	154.30
319	J-73	457	107.65	0.00	154.30
326	J-75	459	107.43	0.00	154.30
333	J-77	461	107.20	0.00	154.30
117	J-34	461	107.20	0.00	154.30
47	J-10	463	107.00	0.00	154.30
208	J-49	463	107.00	0.00	154.30
49	J-11	465	106.75	0.00	154.30
392	J-90	467	106.56	0.00	154.30
112	J-32	468	106.50	0.00	154.30

Barrhaven South Phase 3 - S1 Area

Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
119	J-35	471	106.20	0.00	154.30
100	J-29	473	106.00	0.00	154.30
93	J-26	473	106.00	0.00	154.30
51	J-12	487	104.50	0.00	154.30
70	J-19	491	104.10	0.00	154.30
73	J-20	498	103.45	0.00	154.30
447	J-101	499	103.30	0.00	154.30
108	J-31	527	100.50	0.00	154.30

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	154.30	154.30	0.00	0.00
P-2(2)	151.7	297	PVC	120	154.30	154.30	0.00	0.00
P-3(1)	97.2	297	PVC	120	154.30	154.30	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	154.30	154.30	0.00	0.00
P-4	88.7	297	PVC	120	154.30	154.30	0.00	0.00
P-9	69.5	297	PVC	120	154.30	154.30	0.00	0.00
P-10	176.3	297	PVC	120	154.30	154.30	0.00	0.00
P-11	155.2	297	PVC	120	154.30	154.30	0.00	0.00
P-12(1)	41.4	297	PVC	120	154.30	154.30	0.00	0.00
P-12(2)(1)(1)	66.0	297	PVC	120	154.30	154.30	0.00	0.00
P-12(2)(1)(2)	47.4	297	PVC	120	154.30	154.30	0.00	0.00
P-12(2)(2)(2)	70.2	297	PVC	120	154.30	154.30	0.00	0.00
P-18(1)	106.2	297	PVC	120	154.30	154.30	0.00	0.00
P-18(2)	118.4	297	PVC	120	154.30	154.30	0.00	0.00
P-21(1)	162.2	297	PVC	120	154.30	154.30	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	154.30	154.30	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	154.30	154.30	0.00	0.00
P-23	32.5	297	PVC	120	154.30	154.30	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	154.30	154.30	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	154.30	154.30	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	154.30	154.30	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	154.30	154.30	0.00	0.00
P-25(1)	75.8	297	PVC	120	154.30	154.30	0.00	0.00
P-25(2)	30.8	297	PVC	120	154.30	154.30	0.00	0.00
P-26(1)	49.9	297	PVC	120	154.30	154.30	0.00	0.00
P-26(2)(1)	55.3	297	PVC	120	154.30	154.30	0.00	0.00
P-26(2)(2)	56.1	297	PVC	120	154.30	154.30	0.00	0.00
P-27	149.0	297	PVC	120	154.30	154.30	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	154.30	154.30	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	154.30	154.30	0.00	0.00

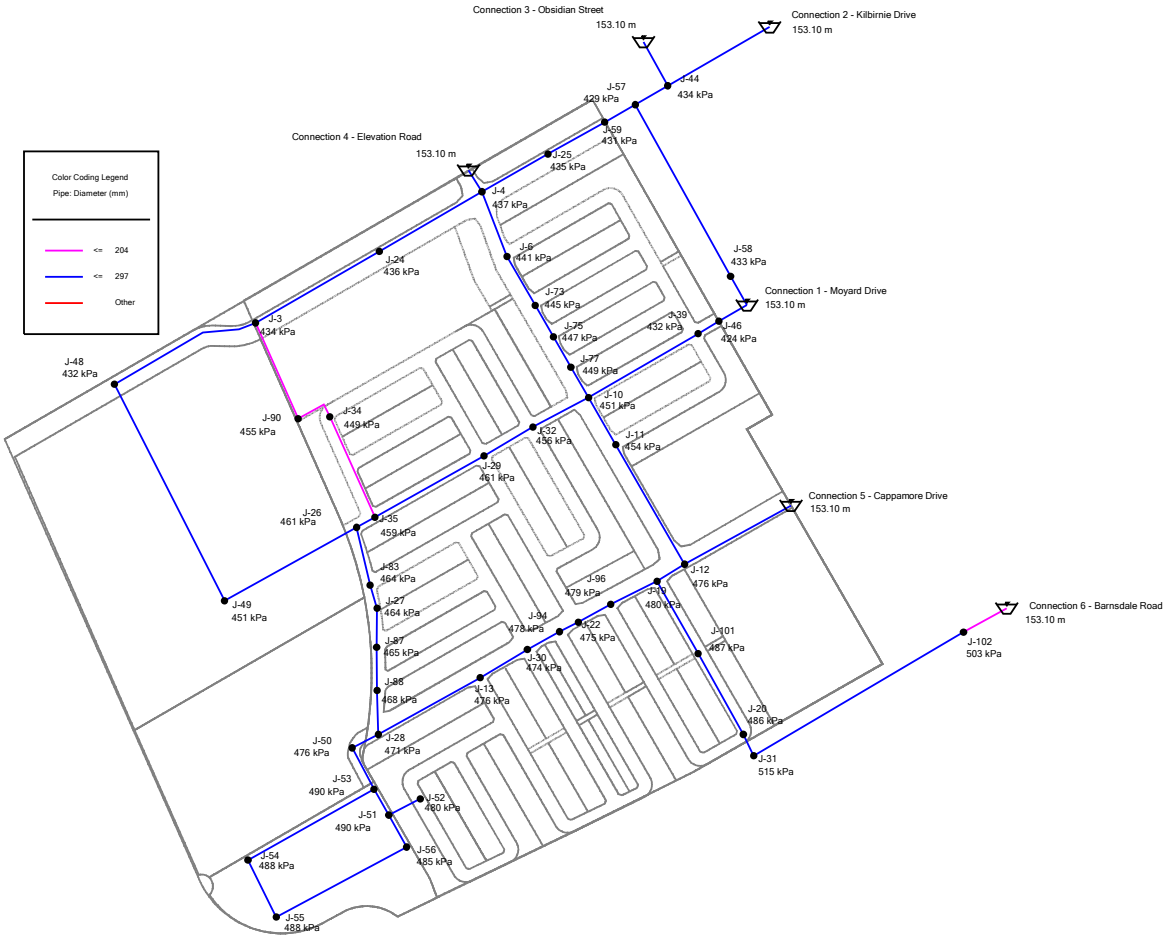
Barrhaven South Phase 3 - S1 Area

Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	154.30	154.30	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	154.30	154.30	0.00	0.00
P-30	30.3	297	PVC	120	154.30	154.30	0.00	0.00
P-34	140.7	204	PVC	110	154.30	154.30	0.00	0.00
P-43	150.5	297	PVC	120	154.30	154.30	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	154.30	154.30	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	154.30	154.30	0.00	0.00
P-44(2)	48.0	297	PVC	120	154.30	154.30	0.00	0.00
P-45	200.1	297	PVC	120	154.30	154.30	0.00	0.00
P-46(1)	310.4	297	PVC	120	154.30	154.30	0.00	0.00
P-46(2)	193.1	297	PVC	120	154.30	154.30	0.00	0.00
P-55(1)	250.8	297	PVC	120	154.30	154.30	0.00	0.00
P-55(2)	42.4	297	PVC	120	154.30	154.30	0.00	0.00
P-66(1)	46.9	297	PVC	120	154.30	154.30	0.00	0.00
P-66(2)	27.1	297	PVC	120	154.30	154.30	0.00	0.00
P-67(1)	54.8	204	PVC	110	154.30	154.30	0.00	0.00
P-67(2)	133.9	204	PVC	110	154.30	154.30	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	476	104.45	0.00	153.10
77	J-22	475	104.60	0.00	153.10
95	J-27	464	105.68	0.00	153.10
97	J-28	471	105.00	0.00	153.10
103	J-30	474	104.70	0.00	153.10
211	J-50	476	104.50	0.00	153.10
213	J-51	490	103.00	0.00	153.10
215	J-52	480	104.05	0.00	153.10
219	J-53	490	103.00	0.00	153.10
222	J-54	488	103.20	0.00	153.10
224	J-55	488	103.20	0.00	153.10
226	J-56	485	103.50	0.00	153.10
356	J-83	464	105.70	0.00	153.10
368	J-87	465	105.55	0.00	153.10
372	J-88	468	105.30	0.00	153.10
408	J-94	478	104.30	0.00	153.10
415	J-96	479	104.20	0.00	153.10
152	J-46	424	109.75	0.00	153.10
239	J-58	433	108.85	0.00	153.10
131	J-39	432	109.00	0.00	153.10
235	J-57	429	109.30	0.00	153.10
242	J-59	431	109.10	0.00	153.10
144	J-44	434	108.80	0.00	153.10
205	J-48	432	109.00	0.00	153.10
90	J-25	435	108.70	0.00	153.10
34	J-3	434	108.80	0.00	153.10
87	J-24	436	108.50	0.00	153.10
35	J-4	437	108.40	0.00	153.10
39	J-6	441	108.00	0.00	153.10
319	J-73	445	107.65	0.00	153.10
326	J-75	447	107.43	0.00	153.10

Barrhaven South Phase 3 - S1 Area

Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
333	J-77	449	107.20	0.00	153.10
117	J-34	449	107.20	0.00	153.10
47	J-10	451	107.00	0.00	153.10
208	J-49	451	107.00	0.00	153.10
49	J-11	454	106.75	0.00	153.10
392	J-90	455	106.56	0.00	153.10
112	J-32	456	106.50	0.00	153.10
119	J-35	459	106.20	0.00	153.10
100	J-29	461	106.00	0.00	153.10
93	J-26	461	106.00	0.00	153.10
51	J-12	476	104.50	0.00	153.10
70	J-19	480	104.10	0.00	153.10
73	J-20	486	103.45	0.00	153.10
447	J-101	487	103.30	0.00	153.10
108	J-31	515	100.50	0.00	153.10

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum HGL
Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	153.10	153.10	0.00	0.00
P-2(2)	151.7	297	PVC	120	153.10	153.10	0.00	0.00
P-3(1)	97.2	297	PVC	120	153.10	153.10	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	153.10	153.10	0.00	0.00
P-4	88.7	297	PVC	120	153.10	153.10	0.00	0.00
P-9	69.5	297	PVC	120	153.10	153.10	0.00	0.00
P-10	176.3	297	PVC	120	153.10	153.10	0.00	0.00
P-11	155.2	297	PVC	120	153.10	153.10	0.00	0.00
P-12(1)	41.4	297	PVC	120	153.10	153.10	0.00	0.00
P-12(2)(1)(1)	66.0	297	PVC	120	153.10	153.10	0.00	0.00
P-12(2)(1)(2)	47.4	297	PVC	120	153.10	153.10	0.00	0.00
P-12(2)(2)(2)	70.2	297	PVC	120	153.10	153.10	0.00	0.00
P-18(1)	106.2	297	PVC	120	153.10	153.10	0.00	0.00
P-18(2)	118.4	297	PVC	120	153.10	153.10	0.00	0.00
P-21(1)	162.2	297	PVC	120	153.10	153.10	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	153.10	153.10	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	153.10	153.10	0.00	0.00
P-23	32.5	297	PVC	120	153.10	153.10	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	153.10	153.10	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	153.10	153.10	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	153.10	153.10	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	153.10	153.10	0.00	0.00
P-25(1)	75.8	297	PVC	120	153.10	153.10	0.00	0.00
P-25(2)	30.8	297	PVC	120	153.10	153.10	0.00	0.00
P-26(1)	49.9	297	PVC	120	153.10	153.10	0.00	0.00
P-26(2)(1)	55.3	297	PVC	120	153.10	153.10	0.00	0.00
P-26(2)(2)	56.1	297	PVC	120	153.10	153.10	0.00	0.00
P-27	149.0	297	PVC	120	153.10	153.10	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	153.10	153.10	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	153.10	153.10	0.00	0.00

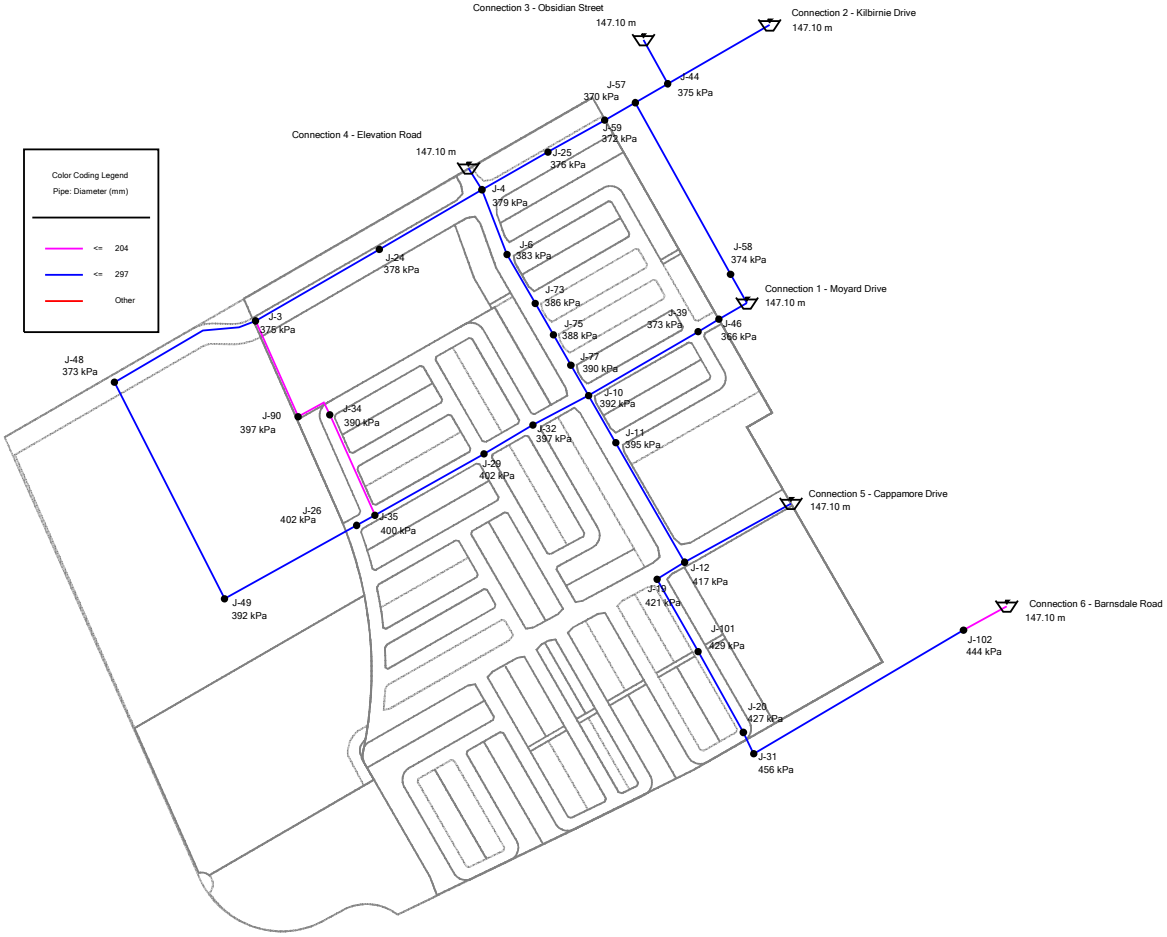
Barrhaven South Phase 3 - S1 Area

Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	153.10	153.10	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	153.10	153.10	0.00	0.00
P-30	30.3	297	PVC	120	153.10	153.10	0.00	0.00
P-34	140.7	204	PVC	110	153.10	153.10	0.00	0.00
P-43	150.5	297	PVC	120	153.10	153.10	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	153.10	153.10	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	153.10	153.10	0.00	0.00
P-44(2)	48.0	297	PVC	120	153.10	153.10	0.00	0.00
P-45	200.1	297	PVC	120	153.10	153.10	0.00	0.00
P-46(1)	310.4	297	PVC	120	153.10	153.10	0.00	0.00
P-46(2)	193.1	297	PVC	120	153.10	153.10	0.00	0.00
P-47	37.6	297	PVC	120	153.10	153.10	0.00	0.00
P-48(1)	59.6	297	PVC	120	153.10	153.10	0.00	0.00
P-48(2)	38.1	297	PVC	120	153.10	153.10	0.00	0.00
P-49	45.3	297	PVC	120	153.10	153.10	0.00	0.00
P-50	184.8	297	PVC	120	153.10	153.10	0.00	0.00
P-51	81.2	297	PVC	120	153.10	153.10	0.00	0.00
P-52	189.1	297	PVC	120	153.10	153.10	0.00	0.00
P-53	46.8	297	PVC	120	153.10	153.10	0.00	0.00
P-55(1)	250.8	297	PVC	120	153.10	153.10	0.00	0.00
P-55(2)	42.4	297	PVC	120	153.10	153.10	0.00	0.00
P-66(1)	46.9	297	PVC	120	153.10	153.10	0.00	0.00
P-66(2)	27.1	297	PVC	120	153.10	153.10	0.00	0.00
P-67(1)	54.8	204	PVC	110	153.10	153.10	0.00	0.00
P-67(2)	133.9	204	PVC	110	153.10	153.10	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 6 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
152	J-46	366	109.75	0.00	147.10
239	J-58	374	108.85	0.00	147.10
131	J-39	373	109.00	0.00	147.10
235	J-57	370	109.30	0.00	147.10
242	J-59	372	109.10	0.00	147.10
144	J-44	375	108.80	0.00	147.10
205	J-48	373	109.00	0.00	147.10
90	J-25	376	108.70	0.00	147.10
34	J-3	375	108.80	0.00	147.10
87	J-24	378	108.50	0.00	147.10
35	J-4	379	108.40	0.00	147.10
39	J-6	383	108.00	0.00	147.10
319	J-73	386	107.65	0.00	147.10
326	J-75	388	107.43	0.00	147.10
333	J-77	390	107.20	0.00	147.10
117	J-34	390	107.20	0.00	147.10
47	J-10	392	107.00	0.00	147.10
208	J-49	392	107.00	0.00	147.10
49	J-11	395	106.75	0.00	147.10
392	J-90	397	106.56	0.00	147.10
112	J-32	397	106.50	0.00	147.10
119	J-35	400	106.20	0.00	147.10
100	J-29	402	106.00	0.00	147.10
93	J-26	402	106.00	0.00	147.10
51	J-12	417	104.50	0.00	147.10
70	J-19	421	104.10	0.00	147.10
73	J-20	427	103.45	0.00	147.10
447	J-101	429	103.30	0.00	147.10
108	J-31	456	100.50	0.00	147.10

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	147.10	147.10	0.00	0.00
P-2(2)	151.7	297	PVC	120	147.10	147.10	0.00	0.00
P-3(1)	97.2	297	PVC	120	147.10	147.10	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	147.10	147.10	0.00	0.00
P-4	88.7	297	PVC	120	147.10	147.10	0.00	0.00
P-9	69.5	297	PVC	120	147.10	147.10	0.00	0.00
P-10	176.3	297	PVC	120	147.10	147.10	0.00	0.00
P-11	155.2	297	PVC	120	147.10	147.10	0.00	0.00
P-12(1)	41.4	297	PVC	120	147.10	147.10	0.00	0.00
P-18(1)	106.2	297	PVC	120	147.10	147.10	0.00	0.00
P-18(2)	118.4	297	PVC	120	147.10	147.10	0.00	0.00
P-21(1)	162.2	297	PVC	120	147.10	147.10	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	147.10	147.10	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	147.10	147.10	0.00	0.00
P-23	32.5	297	PVC	120	147.10	147.10	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	147.10	147.10	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	147.10	147.10	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	147.10	147.10	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	147.10	147.10	0.00	0.00
P-30	30.3	297	PVC	120	147.10	147.10	0.00	0.00
P-34	140.7	204	PVC	110	147.10	147.10	0.00	0.00
P-43	150.5	297	PVC	120	147.10	147.10	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	147.10	147.10	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	147.10	147.10	0.00	0.00

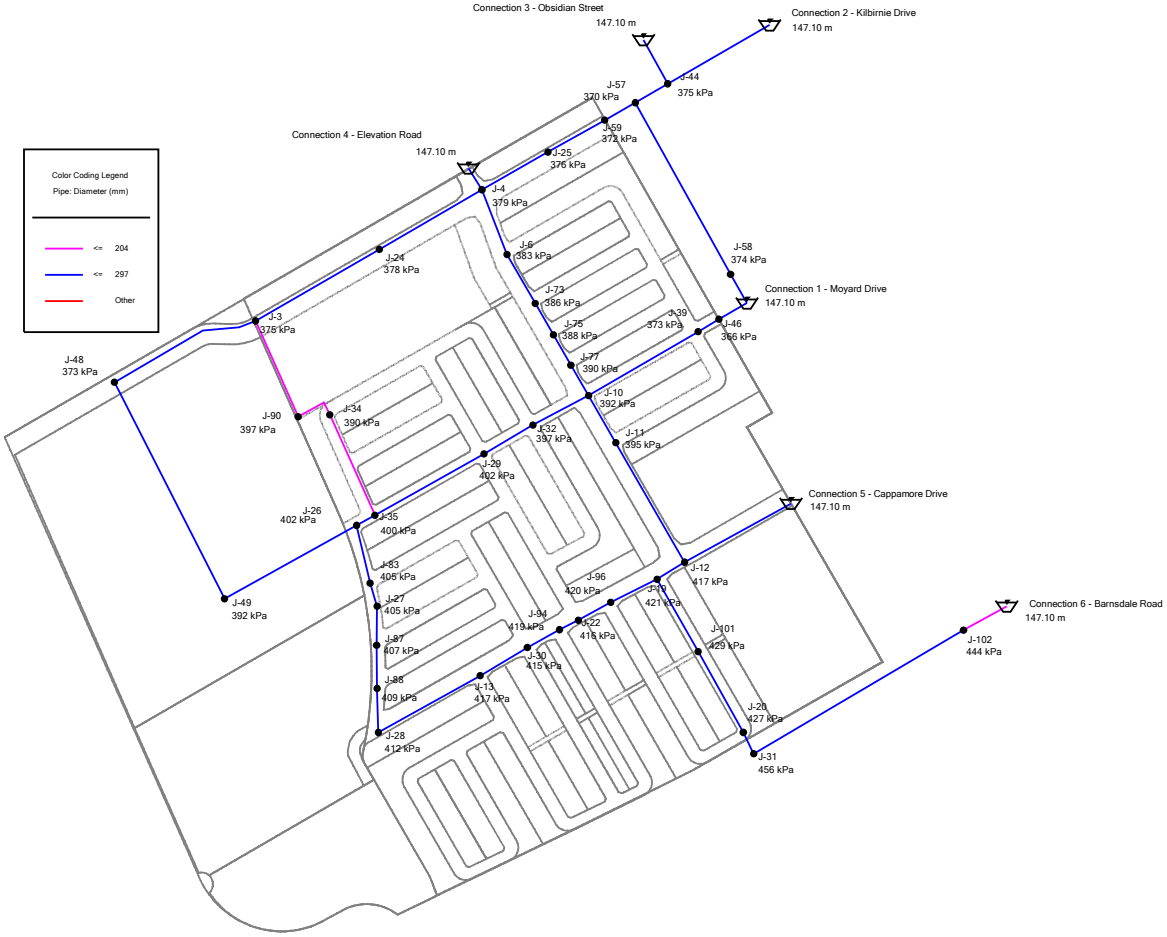
Barrhaven South Phase 3 - S1 Area

Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-44(2)	48.0	297	PVC	120	147.10	147.10	0.00	0.00
P-45	200.1	297	PVC	120	147.10	147.10	0.00	0.00
P-46(1)	310.4	297	PVC	120	147.10	147.10	0.00	0.00
P-46(2)	193.1	297	PVC	120	147.10	147.10	0.00	0.00
P-55(1)	250.8	297	PVC	120	147.10	147.10	0.00	0.00
P-55(2)	42.4	297	PVC	120	147.10	147.10	0.00	0.00
P-67(1)	54.8	204	PVC	110	147.10	147.10	0.00	0.00
P-67(2)	133.9	204	PVC	110	147.10	147.10	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	417	104.45	0.00	147.10
77	J-22	416	104.60	0.00	147.10
95	J-27	405	105.68	0.00	147.10
97	J-28	412	105.00	0.00	147.10
103	J-30	415	104.70	0.00	147.10
356	J-83	405	105.70	0.00	147.10
368	J-87	407	105.55	0.00	147.10
372	J-88	409	105.30	0.00	147.10
408	J-94	419	104.30	0.00	147.10
415	J-96	420	104.20	0.00	147.10
152	J-46	366	109.75	0.00	147.10
239	J-58	374	108.85	0.00	147.10
131	J-39	373	109.00	0.00	147.10
235	J-57	370	109.30	0.00	147.10
242	J-59	372	109.10	0.00	147.10
144	J-44	375	108.80	0.00	147.10
205	J-48	373	109.00	0.00	147.10
90	J-25	376	108.70	0.00	147.10
34	J-3	375	108.80	0.00	147.10
87	J-24	378	108.50	0.00	147.10
35	J-4	379	108.40	0.00	147.10
39	J-6	383	108.00	0.00	147.10
319	J-73	386	107.65	0.00	147.10
326	J-75	388	107.43	0.00	147.10
333	J-77	390	107.20	0.00	147.10
117	J-34	390	107.20	0.00	147.10
47	J-10	392	107.00	0.00	147.10
208	J-49	392	107.00	0.00	147.10
49	J-11	395	106.75	0.00	147.10
392	J-90	397	106.56	0.00	147.10
112	J-32	397	106.50	0.00	147.10

Barrhaven South Phase 3 - S1 Area

Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
119	J-35	400	106.20	0.00	147.10
100	J-29	402	106.00	0.00	147.10
93	J-26	402	106.00	0.00	147.10
51	J-12	417	104.50	0.00	147.10
70	J-19	421	104.10	0.00	147.10
73	J-20	427	103.45	0.00	147.10
447	J-101	429	103.30	0.00	147.10
108	J-31	456	100.50	0.00	147.10

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	147.10	147.10	0.00	0.00
P-2(2)	151.7	297	PVC	120	147.10	147.10	0.00	0.00
P-3(1)	97.2	297	PVC	120	147.10	147.10	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	147.10	147.10	0.00	0.00
P-4	88.7	297	PVC	120	147.10	147.10	0.00	0.00
P-9	69.5	297	PVC	120	147.10	147.10	0.00	0.00
P-10	176.3	297	PVC	120	147.10	147.10	0.00	0.00
P-11	155.2	297	PVC	120	147.10	147.10	0.00	0.00
P-12(1)	41.4	297	PVC	120	147.10	147.10	0.00	0.00
P-12(2)(1)(1)	66.0	297	PVC	120	147.10	147.10	0.00	0.00
P-12(2)(1)(2)	47.4	297	PVC	120	147.10	147.10	0.00	0.00
P-12(2)(2)(2)	70.2	297	PVC	120	147.10	147.10	0.00	0.00
P-18(1)	106.2	297	PVC	120	147.10	147.10	0.00	0.00
P-18(2)	118.4	297	PVC	120	147.10	147.10	0.00	0.00
P-21(1)	162.2	297	PVC	120	147.10	147.10	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	147.10	147.10	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	147.10	147.10	0.00	0.00
P-23	32.5	297	PVC	120	147.10	147.10	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	147.10	147.10	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	147.10	147.10	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	147.10	147.10	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	147.10	147.10	0.00	0.00
P-25(1)	75.8	297	PVC	120	147.10	147.10	0.00	0.00
P-25(2)	30.8	297	PVC	120	147.10	147.10	0.00	0.00
P-26(1)	49.9	297	PVC	120	147.10	147.10	0.00	0.00
P-26(2)(1)	55.3	297	PVC	120	147.10	147.10	0.00	0.00
P-26(2)(2)	56.1	297	PVC	120	147.10	147.10	0.00	0.00
P-27	149.0	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	147.10	147.10	0.00	0.00

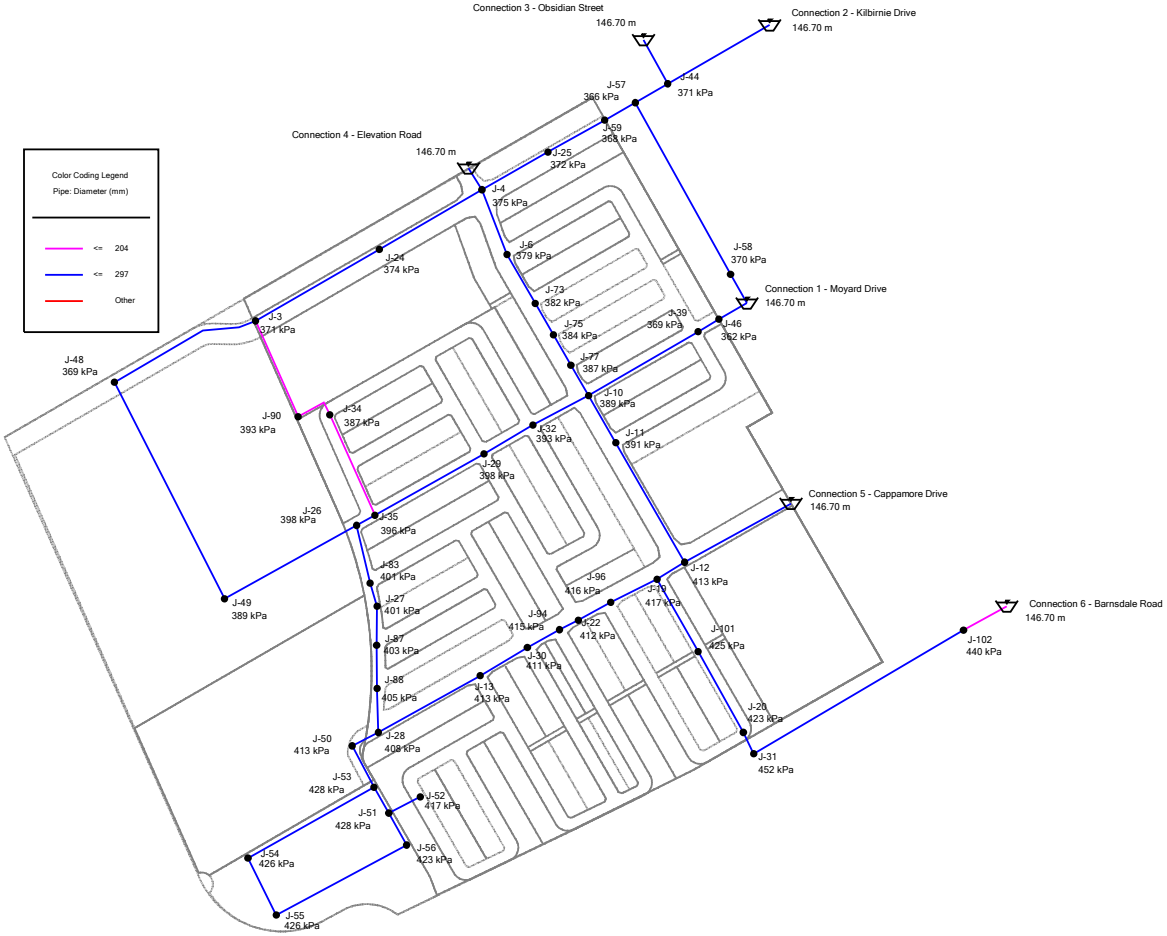
Barrhaven South Phase 3 - S1 Area

Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	147.10	147.10	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	147.10	147.10	0.00	0.00
P-30	30.3	297	PVC	120	147.10	147.10	0.00	0.00
P-34	140.7	204	PVC	110	147.10	147.10	0.00	0.00
P-43	150.5	297	PVC	120	147.10	147.10	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	147.10	147.10	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	147.10	147.10	0.00	0.00
P-44(2)	48.0	297	PVC	120	147.10	147.10	0.00	0.00
P-45	200.1	297	PVC	120	147.10	147.10	0.00	0.00
P-46(1)	310.4	297	PVC	120	147.10	147.10	0.00	0.00
P-46(2)	193.1	297	PVC	120	147.10	147.10	0.00	0.00
P-55(1)	250.8	297	PVC	120	147.10	147.10	0.00	0.00
P-55(2)	42.4	297	PVC	120	147.10	147.10	0.00	0.00
P-66(1)	46.9	297	PVC	120	147.10	147.10	0.00	0.00
P-66(2)	27.1	297	PVC	120	147.10	147.10	0.00	0.00
P-67(1)	54.8	204	PVC	110	147.10	147.10	0.00	0.00
P-67(2)	133.9	204	PVC	110	147.10	147.10	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	413	104.45	0.00	146.70
77	J-22	412	104.60	0.00	146.70
95	J-27	401	105.68	0.00	146.70
97	J-28	408	105.00	0.00	146.70
103	J-30	411	104.70	0.00	146.70
211	J-50	413	104.50	0.00	146.70
213	J-51	428	103.00	0.00	146.70
215	J-52	417	104.05	0.00	146.70
219	J-53	428	103.00	0.00	146.70
222	J-54	426	103.20	0.00	146.70
224	J-55	426	103.20	0.00	146.70
226	J-56	423	103.50	0.00	146.70
356	J-83	401	105.70	0.00	146.70
368	J-87	403	105.55	0.00	146.70
372	J-88	405	105.30	0.00	146.70
408	J-94	415	104.30	0.00	146.70
415	J-96	416	104.20	0.00	146.70
152	J-46	362	109.75	0.00	146.70
239	J-58	370	108.85	0.00	146.70
131	J-39	369	109.00	0.00	146.70
235	J-57	366	109.30	0.00	146.70
242	J-59	368	109.10	0.00	146.70
144	J-44	371	108.80	0.00	146.70
205	J-48	369	109.00	0.00	146.70
90	J-25	372	108.70	0.00	146.70
34	J-3	371	108.80	0.00	146.70
87	J-24	374	108.50	0.00	146.70
35	J-4	375	108.40	0.00	146.70
39	J-6	379	108.00	0.00	146.70
319	J-73	382	107.65	0.00	146.70
326	J-75	384	107.43	0.00	146.70

Barrhaven South Phase 3 - S1 Area

Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
333	J-77	387	107.20	0.00	146.70
117	J-34	387	107.20	0.00	146.70
47	J-10	389	107.00	0.00	146.70
208	J-49	389	107.00	0.00	146.70
49	J-11	391	106.75	0.00	146.70
392	J-90	393	106.56	0.00	146.70
112	J-32	393	106.50	0.00	146.70
119	J-35	396	106.20	0.00	146.70
100	J-29	398	106.00	0.00	146.70
93	J-26	398	106.00	0.00	146.70
51	J-12	413	104.50	0.00	146.70
70	J-19	417	104.10	0.00	146.70
73	J-20	423	103.45	0.00	146.70
447	J-101	425	103.30	0.00	146.70
108	J-31	452	100.50	0.00	146.70

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum HGL
Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	146.70	146.70	0.00	0.00
P-2(2)	151.7	297	PVC	120	146.70	146.70	0.00	0.00
P-3(1)	97.2	297	PVC	120	146.70	146.70	0.00	0.00
P-3(2)(2)(2)	64.1	297	PVC	120	146.70	146.70	0.00	0.00
P-4	88.7	297	PVC	120	146.70	146.70	0.00	0.00
P-9	69.5	297	PVC	120	146.70	146.70	0.00	0.00
P-10	176.3	297	PVC	120	146.70	146.70	0.00	0.00
P-11	155.2	297	PVC	120	146.70	146.70	0.00	0.00
P-12(1)	41.4	297	PVC	120	146.70	146.70	0.00	0.00
P-12(2)(1)(1)	66.0	297	PVC	120	146.70	146.70	0.00	0.00
P-12(2)(1)(2)	47.4	297	PVC	120	146.70	146.70	0.00	0.00
P-12(2)(2)(2)	70.2	297	PVC	120	146.70	146.70	0.00	0.00
P-18(1)	106.2	297	PVC	120	146.70	146.70	0.00	0.00
P-18(2)	118.4	297	PVC	120	146.70	146.70	0.00	0.00
P-21(1)	162.2	297	PVC	120	146.70	146.70	0.00	0.00
P-21(2)(1)	30.8	297	PVC	120	146.70	146.70	0.00	0.00
P-21(2)(2)	41.6	297	PVC	120	146.70	146.70	0.00	0.00
P-23	32.5	297	PVC	120	146.70	146.70	0.00	0.00
P-24(1)(1)	80.4	297	PVC	120	146.70	146.70	0.00	0.00
P-24(1)(2)	72.8	297	PVC	120	146.70	146.70	0.00	0.00
P-24(2)(1)	159.8	297	PVC	120	146.70	146.70	0.00	0.00
P-24(2)(2)	26.8	297	PVC	120	146.70	146.70	0.00	0.00
P-25(1)	75.8	297	PVC	120	146.70	146.70	0.00	0.00
P-25(2)	30.8	297	PVC	120	146.70	146.70	0.00	0.00
P-26(1)	49.9	297	PVC	120	146.70	146.70	0.00	0.00
P-26(2)(1)	55.3	297	PVC	120	146.70	146.70	0.00	0.00
P-26(2)(2)	56.1	297	PVC	120	146.70	146.70	0.00	0.00
P-27	149.0	297	PVC	120	146.70	146.70	0.00	0.00
P-29(1)(1)	72.2	297	PVC	120	146.70	146.70	0.00	0.00
P-29(1)(2)(2)(1)	46.5	297	PVC	120	146.70	146.70	0.00	0.00

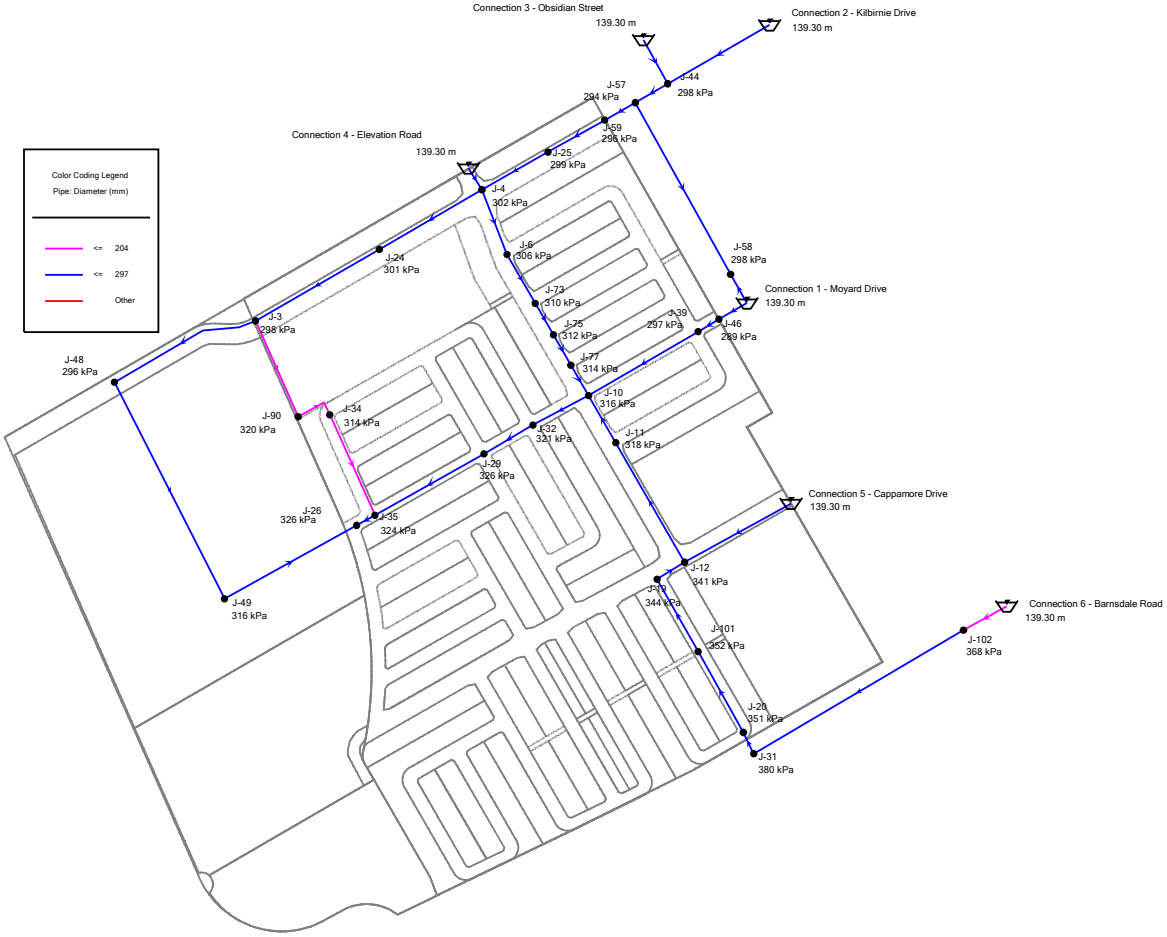
Barrhaven South Phase 3 - S1 Area

Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	146.70	146.70	0.00	0.00
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	146.70	146.70	0.00	0.00
P-30	30.3	297	PVC	120	146.70	146.70	0.00	0.00
P-34	140.7	204	PVC	110	146.70	146.70	0.00	0.00
P-43	150.5	297	PVC	120	146.70	146.70	0.00	0.00
P-44(1)(1)	83.2	297	PVC	120	146.70	146.70	0.00	0.00
P-44(1)(2)	45.0	297	PVC	120	146.70	146.70	0.00	0.00
P-44(2)	48.0	297	PVC	120	146.70	146.70	0.00	0.00
P-45	200.1	297	PVC	120	146.70	146.70	0.00	0.00
P-46(1)	310.4	297	PVC	120	146.70	146.70	0.00	0.00
P-46(2)	193.1	297	PVC	120	146.70	146.70	0.00	0.00
P-47	37.6	297	PVC	120	146.70	146.70	0.00	0.00
P-48(1)	59.6	297	PVC	120	146.70	146.70	0.00	0.00
P-48(2)	38.1	297	PVC	120	146.70	146.70	0.00	0.00
P-49	45.3	297	PVC	120	146.70	146.70	0.00	0.00
P-50	184.8	297	PVC	120	146.70	146.70	0.00	0.00
P-51	81.2	297	PVC	120	146.70	146.70	0.00	0.00
P-52	189.1	297	PVC	120	146.70	146.70	0.00	0.00
P-53	46.8	297	PVC	120	146.70	146.70	0.00	0.00
P-55(1)	250.8	297	PVC	120	146.70	146.70	0.00	0.00
P-55(2)	42.4	297	PVC	120	146.70	146.70	0.00	0.00
P-66(1)	46.9	297	PVC	120	146.70	146.70	0.00	0.00
P-66(2)	27.1	297	PVC	120	146.70	146.70	0.00	0.00
P-67(1)	54.8	204	PVC	110	146.70	146.70	0.00	0.00
P-67(2)	133.9	204	PVC	110	146.70	146.70	0.00	0.00

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 6 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
152	J-46	289	109.75	0.00	139.30
239	J-58	298	108.85	7.44	139.30
131	J-39	297	109.00	0.00	139.30
235	J-57	294	109.30	0.00	139.30
242	J-59	296	109.10	0.00	139.30
144	J-44	298	108.80	0.00	139.30
205	J-48	296	109.00	0.00	139.29
90	J-25	299	108.70	0.00	139.30
34	J-3	298	108.80	0.00	139.29
87	J-24	301	108.50	0.00	139.29
35	J-4	302	108.40	0.00	139.30
39	J-6	306	108.00	3.97	139.29
319	J-73	310	107.65	0.00	139.29
326	J-75	312	107.43	0.00	139.29
333	J-77	314	107.20	0.00	139.29
117	J-34	314	107.20	0.00	139.29
47	J-10	316	107.00	5.53	139.29
208	J-49	316	107.00	0.00	139.28
49	J-11	318	106.75	0.00	139.29
392	J-90	320	106.56	0.00	139.29
112	J-32	321	106.50	0.00	139.29
119	J-35	324	106.20	0.00	139.28
100	J-29	326	106.00	3.12	139.28
93	J-26	326	106.00	7.02	139.28
51	J-12	341	104.50	5.00	139.29
70	J-19	344	104.10	0.00	139.29
73	J-20	351	103.45	1.15	139.29
447	J-101	352	103.30	0.00	139.29
108	J-31	380	100.50	0.00	139.29

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	139.29	139.29	-4.32	0.06
P-2(2)	151.7	297	PVC	120	139.29	139.30	-4.32	0.06
P-3(1)	97.2	297	PVC	120	139.30	139.30	-2.30	0.03
P-3(2)(2)(2)	64.1	297	PVC	120	139.30	139.30	-2.22	0.03
P-4	88.7	297	PVC	120	139.30	139.29	6.88	0.10
P-9	69.5	297	PVC	120	139.29	139.29	-2.43	0.04
P-10	176.3	297	PVC	120	139.29	139.29	-2.43	0.04
P-11	155.2	297	PVC	120	139.29	139.30	-6.69	0.10
P-12(1)	41.4	297	PVC	120	139.29	139.29	-0.74	0.01
P-18(1)	106.2	297	PVC	120	139.29	139.29	-0.74	0.01
P-18(2)	118.4	297	PVC	120	139.29	139.29	-0.74	0.01
P-21(1)	162.2	297	PVC	120	139.29	139.30	-6.02	0.09
P-21(2)(1)	30.8	297	PVC	120	139.30	139.30	-6.02	0.09
P-21(2)(2)	41.6	297	PVC	120	139.30	139.30	-6.02	0.09
P-23	32.5	297	PVC	120	139.30	139.30	-8.89	0.13
P-24(1)(1)	80.4	297	PVC	120	139.29	139.29	5.82	0.08
P-24(1)(2)	72.8	297	PVC	120	139.29	139.28	5.82	0.08
P-24(2)(1)	159.8	297	PVC	120	139.28	139.28	2.70	0.04
P-24(2)(2)	26.8	297	PVC	120	139.28	139.28	4.13	0.06
P-29(1)(1)	72.2	297	PVC	120	139.29	139.29	2.91	0.04
P-29(1)(2)(2)(1)	46.5	297	PVC	120	139.29	139.29	2.91	0.04
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	139.29	139.29	2.91	0.04
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	139.29	139.29	2.91	0.04
P-30	30.3	297	PVC	120	139.29	139.29	-1.89	0.03
P-34	140.7	204	PVC	110	139.29	139.28	1.43	0.04
P-43	150.5	297	PVC	120	139.30	139.30	-1.40	0.02
P-44(1)(1)	83.2	297	PVC	120	139.30	139.30	-2.30	0.03
P-44(1)(2)	45.0	297	PVC	120	139.30	139.30	-2.30	0.03

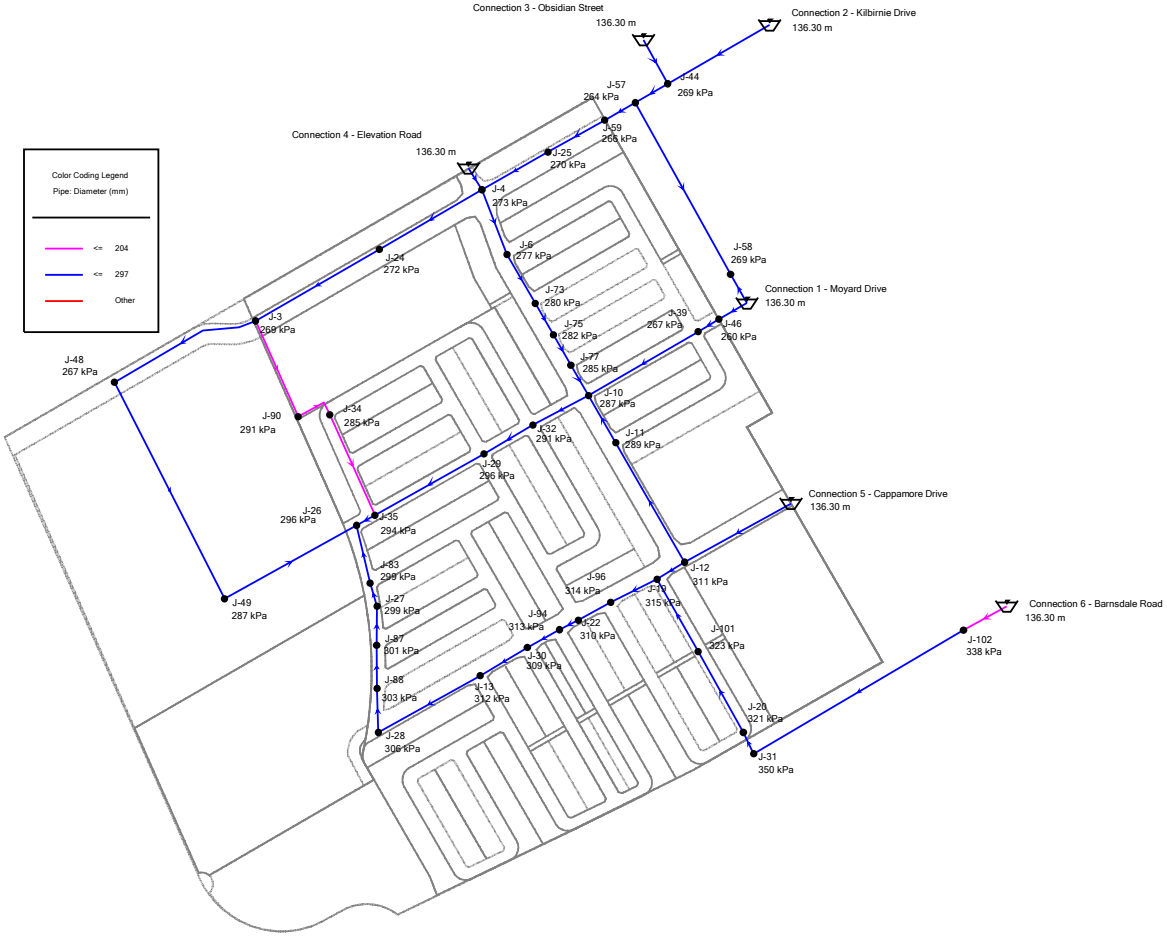
Barrhaven South Phase 3 - S1 Area

Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-44(2)	48.0	297	PVC	120	139.30	139.30	-3.62	0.05
P-45	200.1	297	PVC	120	139.29	139.29	2.89	0.04
P-46(1)	310.4	297	PVC	120	139.29	139.28	2.89	0.04
P-46(2)	193.1	297	PVC	120	139.28	139.28	2.89	0.04
P-55(1)	250.8	297	PVC	120	139.30	139.30	1.32	0.02
P-55(2)	42.4	297	PVC	120	139.30	139.30	-6.12	0.09
P-67(1)	54.8	204	PVC	110	139.29	139.29	-1.43	0.04
P-67(2)	133.9	204	PVC	110	139.29	139.29	-1.43	0.04

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	312	104.45	0.00	136.28
77	J-22	310	104.60	0.00	136.28
95	J-27	299	105.68	0.00	136.28
97	J-28	306	105.00	0.00	136.28
103	J-30	309	104.70	3.70	136.28
356	J-83	299	105.70	0.00	136.28
368	J-87	301	105.55	0.00	136.28
372	J-88	303	105.30	0.00	136.28
408	J-94	313	104.30	0.00	136.28
415	J-96	314	104.20	0.00	136.28
152	J-46	260	109.75	0.00	136.30
239	J-58	269	108.85	7.44	136.30
131	J-39	267	109.00	0.00	136.30
235	J-57	264	109.30	0.00	136.30
242	J-59	266	109.10	0.00	136.30
144	J-44	269	108.80	0.00	136.30
205	J-48	267	109.00	0.00	136.29
90	J-25	270	108.70	0.00	136.30
34	J-3	269	108.80	0.00	136.29
87	J-24	272	108.50	0.00	136.29
35	J-4	273	108.40	0.00	136.30
39	J-6	277	108.00	3.97	136.29
319	J-73	280	107.65	0.00	136.29
326	J-75	282	107.43	0.00	136.29
333	J-77	285	107.20	0.00	136.29
117	J-34	285	107.20	0.00	136.28
47	J-10	287	107.00	5.53	136.29
208	J-49	287	107.00	0.00	136.28
49	J-11	289	106.75	0.00	136.29
392	J-90	291	106.56	0.00	136.28
112	J-32	291	106.50	2.34	136.28

Barrhaven South Phase 3 - S1 Area

Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
119	J-35	294	106.20	0.00	136.28
100	J-29	296	106.00	3.12	136.28
93	J-26	296	106.00	7.02	136.28
51	J-12	311	104.50	5.00	136.29
70	J-19	315	104.10	0.00	136.28
73	J-20	321	103.45	1.15	136.29
447	J-101	323	103.30	0.00	136.29
108	J-31	350	100.50	0.00	136.29

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	136.29	136.29	-4.64	0.07
P-2(2)	151.7	297	PVC	120	136.29	136.30	-4.64	0.07
P-3(1)	97.2	297	PVC	120	136.30	136.30	-2.69	0.04
P-3(2)(2)(2)	64.1	297	PVC	120	136.30	136.30	-2.38	0.03
P-4	88.7	297	PVC	120	136.30	136.29	8.09	0.12
P-9	69.5	297	PVC	120	136.29	136.29	-0.76	0.01
P-10	176.3	297	PVC	120	136.29	136.29	-0.76	0.01
P-11	155.2	297	PVC	120	136.29	136.30	-9.12	0.13
P-12(1)	41.4	297	PVC	120	136.29	136.28	3.36	0.05
P-12(2)(1)(1)	66.0	297	PVC	120	136.28	136.28	4.82	0.07
P-12(2)(1)(2)	47.4	297	PVC	120	136.28	136.28	4.82	0.07
P-12(2)(2)(2)	70.2	297	PVC	120	136.28	136.28	1.12	0.02
P-18(1)	106.2	297	PVC	120	136.28	136.29	-1.46	0.02
P-18(2)	118.4	297	PVC	120	136.29	136.29	-1.46	0.02
P-21(1)	162.2	297	PVC	120	136.29	136.30	-7.36	0.11
P-21(2)(1)	30.8	297	PVC	120	136.30	136.30	-7.36	0.11
P-21(2)(2)	41.6	297	PVC	120	136.30	136.30	-7.36	0.11
P-23	32.5	297	PVC	120	136.30	136.30	-10.04	0.14
P-24(1)(1)	80.4	297	PVC	120	136.29	136.28	6.72	0.10
P-24(1)(2)	72.8	297	PVC	120	136.28	136.28	4.38	0.06
P-24(2)(1)	159.8	297	PVC	120	136.28	136.28	1.26	0.02
P-24(2)(2)	26.8	297	PVC	120	136.28	136.28	2.82	0.04
P-25(1)	75.8	297	PVC	120	136.28	136.28	-1.12	0.02
P-25(2)	30.8	297	PVC	120	136.28	136.28	-1.12	0.02
P-26(1)	49.9	297	PVC	120	136.28	136.28	-1.12	0.02
P-26(2)(1)	55.3	297	PVC	120	136.28	136.28	-1.12	0.02
P-26(2)(2)	56.1	297	PVC	120	136.28	136.28	-1.12	0.02
P-27	149.0	297	PVC	120	136.28	136.28	-1.12	0.02
P-29(1)(1)	72.2	297	PVC	120	136.29	136.29	4.12	0.06
P-29(1)(2)(2)(1)	46.5	297	PVC	120	136.29	136.29	4.12	0.06

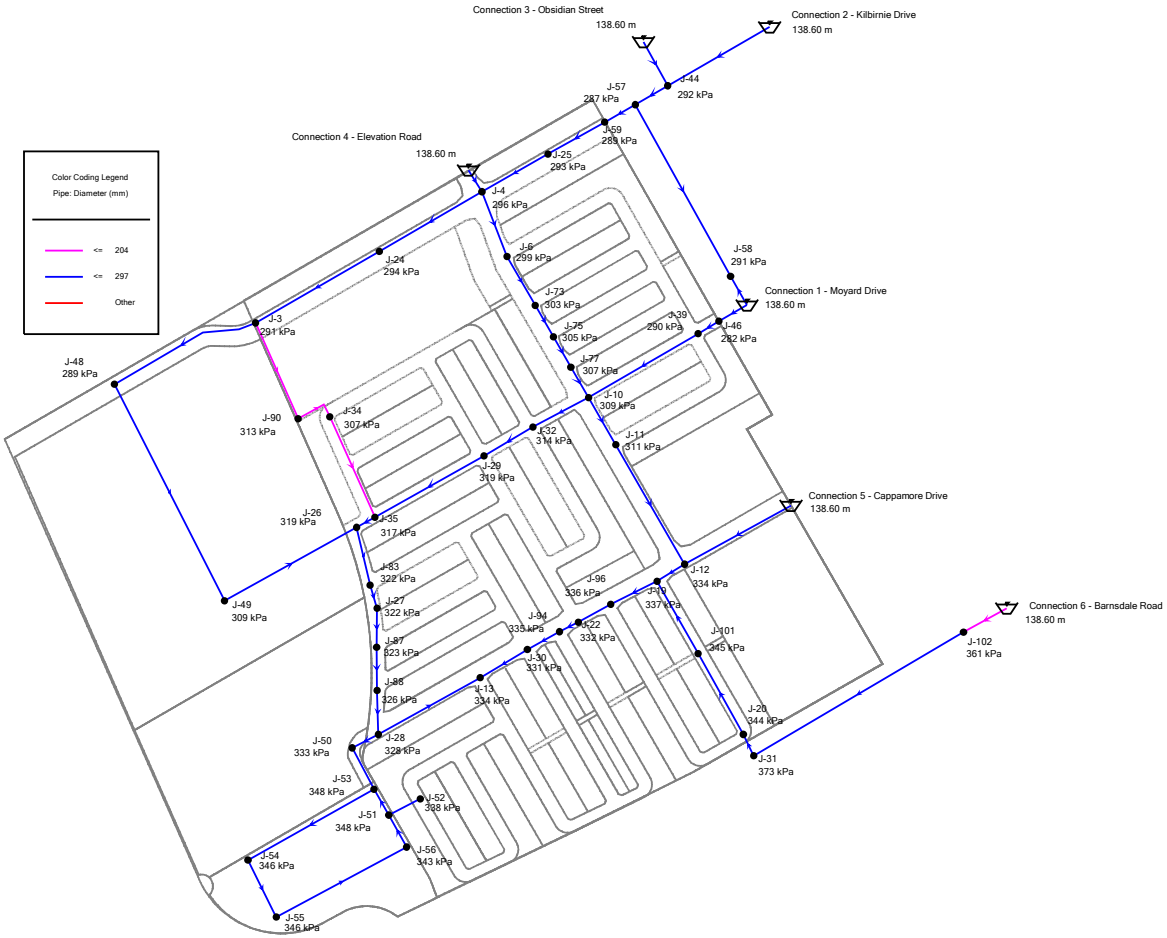
Barrhaven South Phase 3 - S1 Area

Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	136.29	136.29	4.12	0.06
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	136.29	136.29	4.12	0.06
P-30	30.3	297	PVC	120	136.29	136.29	-2.61	0.04
P-34	140.7	204	PVC	110	136.28	136.28	1.56	0.05
P-43	150.5	297	PVC	120	136.30	136.30	-1.50	0.02
P-44(1)(1)	83.2	297	PVC	120	136.30	136.30	-2.69	0.04
P-44(1)(2)	45.0	297	PVC	120	136.30	136.30	-2.69	0.04
P-44(2)	48.0	297	PVC	120	136.30	136.30	-3.89	0.06
P-45	200.1	297	PVC	120	136.29	136.29	3.09	0.04
P-46(1)	310.4	297	PVC	120	136.29	136.28	3.09	0.04
P-46(2)	193.1	297	PVC	120	136.28	136.28	3.09	0.04
P-55(1)	250.8	297	PVC	120	136.30	136.30	1.19	0.02
P-55(2)	42.4	297	PVC	120	136.30	136.30	-6.25	0.09
P-66(1)	46.9	297	PVC	120	136.28	136.28	-4.82	0.07
P-66(2)	27.1	297	PVC	120	136.28	136.28	-4.82	0.07
P-67(1)	54.8	204	PVC	110	136.28	136.28	-1.56	0.05
P-67(2)	133.9	204	PVC	110	136.28	136.29	-1.56	0.05

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	334	104.45	3.64	138.56
77	J-22	332	104.60	3.64	138.56
95	J-27	322	105.68	0.00	138.56
97	J-28	328	105.00	0.00	138.56
103	J-30	331	104.70	3.70	138.56
211	J-50	333	104.50	1.69	138.56
213	J-51	348	103.00	0.00	138.56
215	J-52	338	104.05	0.00	138.56
219	J-53	348	103.00	0.00	138.56
222	J-54	346	103.20	0.00	138.56
224	J-55	346	103.20	0.00	138.56
226	J-56	343	103.50	0.00	138.56
356	J-83	322	105.70	0.00	138.56
368	J-87	323	105.55	0.00	138.56
372	J-88	326	105.30	0.00	138.56
408	J-94	335	104.30	0.00	138.56
415	J-96	336	104.20	0.00	138.57
152	J-46	282	109.75	0.00	138.60
239	J-58	291	108.85	7.44	138.60
131	J-39	290	109.00	0.00	138.59
235	J-57	287	109.30	0.00	138.60
242	J-59	289	109.10	0.00	138.60
144	J-44	292	108.80	0.00	138.60
205	J-48	289	109.00	0.00	138.57
90	J-25	293	108.70	0.00	138.60
34	J-3	291	108.80	0.00	138.58
87	J-24	294	108.50	0.00	138.59
35	J-4	296	108.40	0.00	138.59
39	J-6	299	108.00	3.97	138.59
319	J-73	303	107.65	0.00	138.58
326	J-75	305	107.43	0.00	138.58

Barrhaven South Phase 3 - S1 Area

Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
333	J-77	307	107.20	0.00	138.58
117	J-34	307	107.20	0.00	138.57
47	J-10	309	107.00	5.53	138.58
208	J-49	309	107.00	0.00	138.57
49	J-11	311	106.75	0.00	138.58
392	J-90	313	106.56	0.00	138.57
112	J-32	314	106.50	2.34	138.57
119	J-35	317	106.20	0.00	138.56
100	J-29	319	106.00	3.12	138.57
93	J-26	319	106.00	7.02	138.56
51	J-12	334	104.50	5.00	138.58
70	J-19	337	104.10	0.00	138.57
73	J-20	344	103.45	1.15	138.58
447	J-101	345	103.30	0.00	138.58
108	J-31	373	100.50	0.00	138.58

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Peak Hour Demand
Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	138.58	138.59	-6.42	0.09
P-2(2)	151.7	297	PVC	120	138.59	138.59	-6.42	0.09
P-3(1)	97.2	297	PVC	120	138.59	138.60	-3.56	0.05
P-3(2)(2)(2)	64.1	297	PVC	120	138.60	138.60	-2.73	0.04
P-4	88.7	297	PVC	120	138.59	138.59	9.73	0.14
P-9	69.5	297	PVC	120	138.58	138.58	0.60	0.01
P-10	176.3	297	PVC	120	138.58	138.58	0.60	0.01
P-11	155.2	297	PVC	120	138.58	138.60	-11.79	0.17
P-12(1)	41.4	297	PVC	120	138.58	138.57	7.38	0.11
P-12(2)(1)(1)	66.0	297	PVC	120	138.57	138.57	9.70	0.14
P-12(2)(1)(2)	47.4	297	PVC	120	138.57	138.56	9.70	0.14
P-12(2)(2)(2)	70.2	297	PVC	120	138.56	138.56	2.36	0.03
P-18(1)	106.2	297	PVC	120	138.57	138.58	-2.31	0.03
P-18(2)	118.4	297	PVC	120	138.58	138.58	-2.31	0.03
P-21(1)	162.2	297	PVC	120	138.58	138.59	-9.40	0.14
P-21(2)(1)	30.8	297	PVC	120	138.59	138.60	-9.40	0.14
P-21(2)(2)	41.6	297	PVC	120	138.60	138.60	-9.40	0.14
P-23	32.5	297	PVC	120	138.59	138.60	-12.59	0.18
P-24(1)(1)	80.4	297	PVC	120	138.58	138.57	9.03	0.13
P-24(1)(2)	72.8	297	PVC	120	138.57	138.57	6.69	0.10
P-24(2)(1)	159.8	297	PVC	120	138.57	138.56	3.57	0.05
P-24(2)(2)	26.8	297	PVC	120	138.56	138.56	5.70	0.08
P-25(1)	75.8	297	PVC	120	138.56	138.56	2.97	0.04
P-25(2)	30.8	297	PVC	120	138.56	138.56	2.97	0.04
P-26(1)	49.9	297	PVC	120	138.56	138.56	2.97	0.04
P-26(2)(1)	55.3	297	PVC	120	138.56	138.56	2.97	0.04
P-26(2)(2)	56.1	297	PVC	120	138.56	138.56	2.97	0.04
P-27	149.0	297	PVC	120	138.56	138.56	1.28	0.02
P-29(1)(1)	72.2	297	PVC	120	138.59	138.58	5.76	0.08
P-29(1)(2)(2)(1)	46.5	297	PVC	120	138.58	138.58	5.76	0.08

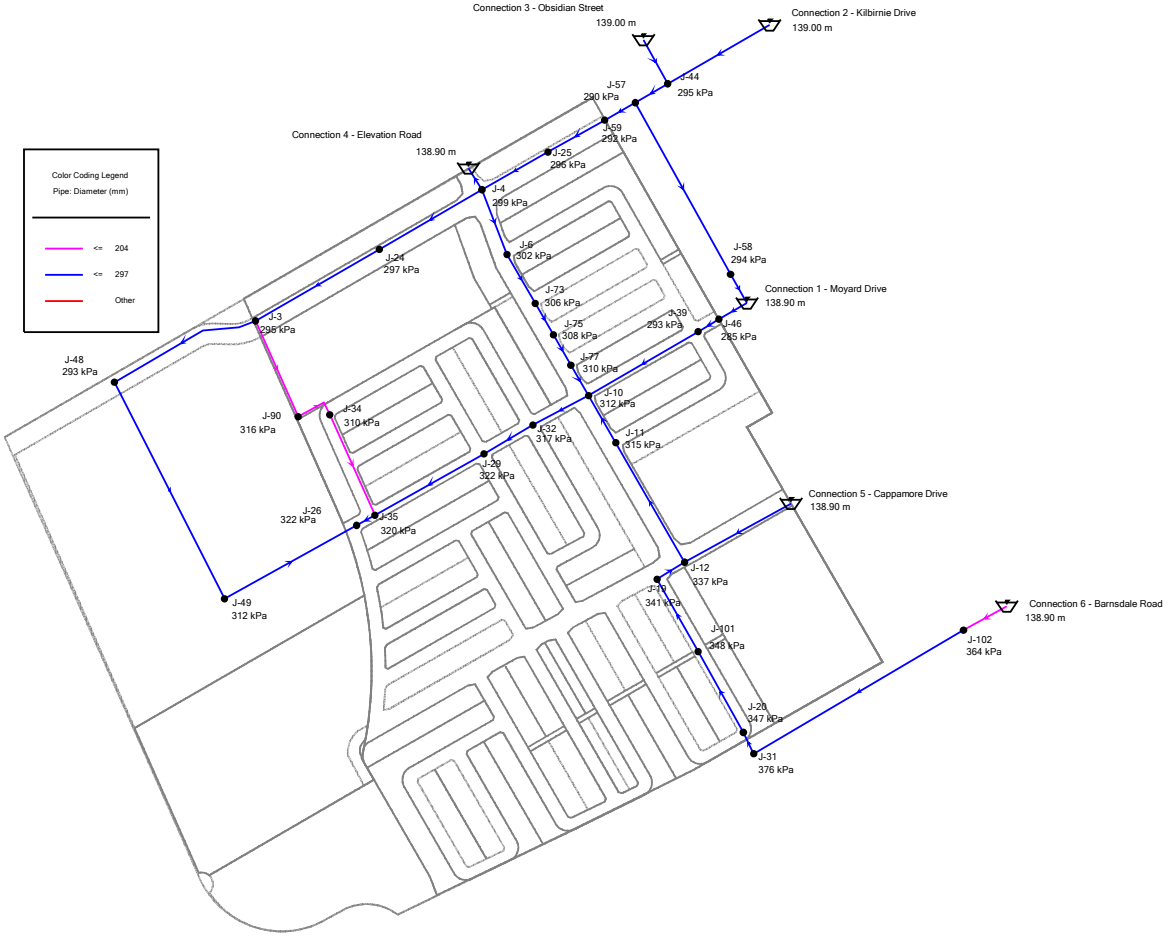
Barrhaven South Phase 3 - S1 Area

Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	138.58	138.58	5.76	0.08
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	138.58	138.58	5.76	0.08
P-30	30.3	297	PVC	120	138.58	138.58	-3.46	0.05
P-34	140.7	204	PVC	110	138.57	138.56	2.13	0.07
P-43	150.5	297	PVC	120	138.60	138.60	-1.72	0.02
P-44(1)(1)	83.2	297	PVC	120	138.60	138.60	-3.56	0.05
P-44(1)(2)	45.0	297	PVC	120	138.60	138.60	-3.56	0.05
P-44(2)	48.0	297	PVC	120	138.60	138.60	-4.45	0.06
P-45	200.1	297	PVC	120	138.58	138.57	4.29	0.06
P-46(1)	310.4	297	PVC	120	138.57	138.57	4.29	0.06
P-46(2)	193.1	297	PVC	120	138.57	138.56	4.29	0.06
P-47	37.6	297	PVC	120	138.56	138.56	1.69	0.02
P-48(1)	59.6	297	PVC	120	138.56	138.56	0.00	0.00
P-48(2)	38.1	297	PVC	120	138.56	138.56	-0.04	0.00
P-49	45.3	297	PVC	120	138.56	138.56	0.00	0.00
P-50	184.8	297	PVC	120	138.56	138.56	0.04	0.00
P-51	81.2	297	PVC	120	138.56	138.56	0.04	0.00
P-52	189.1	297	PVC	120	138.56	138.56	0.04	0.00
P-53	46.8	297	PVC	120	138.56	138.56	0.04	0.00
P-55(1)	250.8	297	PVC	120	138.60	138.60	0.89	0.01
P-55(2)	42.4	297	PVC	120	138.60	138.60	-6.55	0.09
P-66(1)	46.9	297	PVC	120	138.56	138.56	-6.06	0.09
P-66(2)	27.1	297	PVC	120	138.56	138.56	-6.06	0.09
P-67(1)	54.8	204	PVC	110	138.57	138.57	-2.13	0.07
P-67(2)	133.9	204	PVC	110	138.57	138.58	-2.13	0.07

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 6 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
152	J-46	285	109.75	0.00	138.90
239	J-58	294	108.85	7.44	138.90
131	J-39	293	109.00	0.00	138.90
235	J-57	290	109.30	0.00	138.95
242	J-59	292	109.10	0.00	138.94
144	J-44	295	108.80	0.00	138.98
205	J-48	293	109.00	0.00	138.89
90	J-25	296	108.70	0.00	138.92
34	J-3	295	108.80	0.00	138.89
87	J-24	297	108.50	0.00	138.90
35	J-4	299	108.40	0.00	138.90
39	J-6	302	108.00	3.97	138.89
319	J-73	306	107.65	0.00	138.89
326	J-75	308	107.43	0.00	138.89
333	J-77	310	107.20	0.00	138.89
117	J-34	310	107.20	0.00	138.89
47	J-10	312	107.00	5.53	138.89
208	J-49	312	107.00	0.00	138.89
49	J-11	315	106.75	0.00	138.89
392	J-90	316	106.56	0.00	138.89
112	J-32	317	106.50	0.00	138.89
119	J-35	320	106.20	0.00	138.88
100	J-29	322	106.00	3.12	138.89
93	J-26	322	106.00	7.02	138.88
51	J-12	337	104.50	5.00	138.89
70	J-19	341	104.10	0.00	138.89
73	J-20	347	103.45	1.15	138.89
447	J-101	348	103.30	0.00	138.89
108	J-31	376	100.50	0.00	138.89

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	138.89	138.90	-4.50	0.07
P-2(2)	151.7	297	PVC	120	138.90	138.90	-4.50	0.07
P-3(1)	97.2	297	PVC	120	138.90	138.92	-14.18	0.20
P-3(2)(2)(2)	64.1	297	PVC	120	138.98	139.00	-16.76	0.24
P-4	88.7	297	PVC	120	138.90	138.89	7.50	0.11
P-9	69.5	297	PVC	120	138.89	138.89	-2.03	0.03
P-10	176.3	297	PVC	120	138.89	138.89	-2.03	0.03
P-11	155.2	297	PVC	120	138.89	138.90	-6.38	0.09
P-12(1)	41.4	297	PVC	120	138.89	138.89	-0.66	0.01
P-18(1)	106.2	297	PVC	120	138.89	138.89	-0.66	0.01
P-18(2)	118.4	297	PVC	120	138.89	138.89	-0.66	0.01
P-21(1)	162.2	297	PVC	120	138.89	138.90	-5.61	0.08
P-21(2)(1)	30.8	297	PVC	120	138.90	138.90	-5.61	0.08
P-21(2)(2)	41.6	297	PVC	120	138.90	138.90	-5.61	0.08
P-23	32.5	297	PVC	120	138.90	138.90	2.18	0.03
P-24(1)(1)	80.4	297	PVC	120	138.89	138.89	5.64	0.08
P-24(1)(2)	72.8	297	PVC	120	138.89	138.89	5.64	0.08
P-24(2)(1)	159.8	297	PVC	120	138.89	138.88	2.52	0.04
P-24(2)(2)	26.8	297	PVC	120	138.88	138.88	4.01	0.06
P-29(1)(1)	72.2	297	PVC	120	138.89	138.89	3.53	0.05
P-29(1)(2)(2)(1)	46.5	297	PVC	120	138.89	138.89	3.53	0.05
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	138.89	138.89	3.53	0.05
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	138.89	138.89	3.53	0.05
P-30	30.3	297	PVC	120	138.89	138.89	-1.81	0.03
P-34	140.7	204	PVC	110	138.89	138.88	1.49	0.05
P-43	150.5	297	PVC	120	138.98	139.00	-10.58	0.15
P-44(1)(1)	83.2	297	PVC	120	138.92	138.94	-14.18	0.20
P-44(1)(2)	45.0	297	PVC	120	138.94	138.95	-14.18	0.20

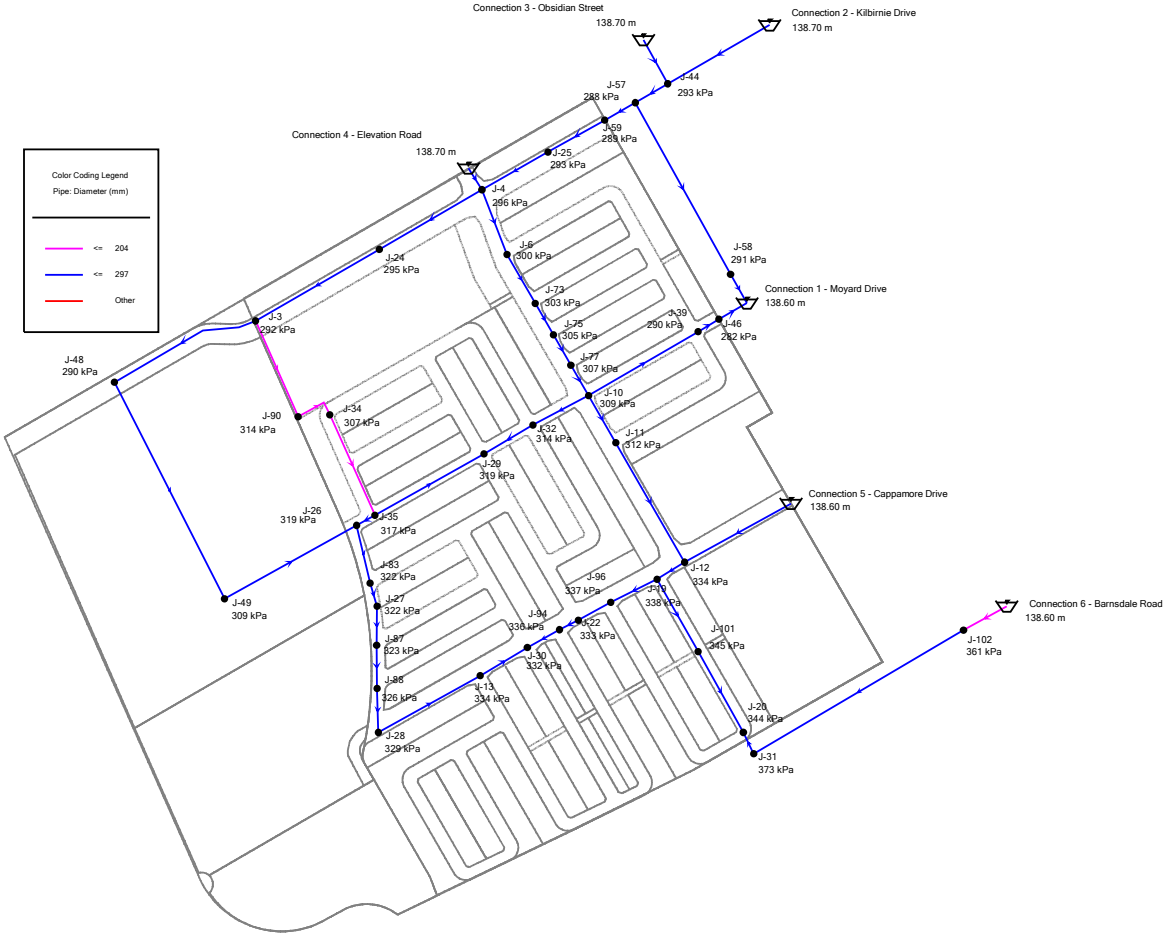
Barrhaven South Phase 3 - S1 Area

Phase 6 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-44(2)	48.0	297	PVC	120	138.95	138.98	-27.34	0.39
P-45	200.1	297	PVC	120	138.89	138.89	3.01	0.04
P-46(1)	310.4	297	PVC	120	138.89	138.89	3.01	0.04
P-46(2)	193.1	297	PVC	120	138.89	138.88	3.01	0.04
P-55(1)	250.8	297	PVC	120	138.95	138.90	13.16	0.19
P-55(2)	42.4	297	PVC	120	138.90	138.90	5.72	0.08
P-67(1)	54.8	204	PVC	110	138.89	138.89	-1.49	0.05
P-67(2)	133.9	204	PVC	110	138.89	138.89	-1.49	0.05

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	334	104.45	0.00	138.60
77	J-22	333	104.60	0.00	138.60
95	J-27	322	105.68	0.00	138.60
97	J-28	329	105.00	0.00	138.60
103	J-30	332	104.70	3.70	138.60
356	J-83	322	105.70	0.00	138.60
368	J-87	323	105.55	0.00	138.60
372	J-88	326	105.30	0.00	138.60
408	J-94	336	104.30	0.00	138.60
415	J-96	337	104.20	0.00	138.60
152	J-46	282	109.75	0.00	138.60
239	J-58	291	108.85	7.44	138.60
131	J-39	290	109.00	0.00	138.60
235	J-57	288	109.30	0.00	138.68
242	J-59	289	109.10	0.00	138.68
144	J-44	293	108.80	0.00	138.69
205	J-48	290	109.00	0.00	138.63
90	J-25	293	108.70	0.00	138.68
34	J-3	292	108.80	0.00	138.64
87	J-24	295	108.50	0.00	138.66
35	J-4	296	108.40	0.00	138.68
39	J-6	300	108.00	3.97	138.65
319	J-73	303	107.65	0.00	138.63
326	J-75	305	107.43	0.00	138.62
333	J-77	307	107.20	0.00	138.61
117	J-34	307	107.20	0.00	138.62
47	J-10	309	107.00	5.53	138.60
208	J-49	309	107.00	0.00	138.61
49	J-11	312	106.75	0.00	138.60
392	J-90	314	106.56	0.00	138.62
112	J-32	314	106.50	2.34	138.60

Barrhaven South Phase 3 - S1 Area

Phase 7 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
119	J-35	317	106.20	0.00	138.60
100	J-29	319	106.00	3.12	138.60
93	J-26	319	106.00	7.02	138.60
51	J-12	334	104.50	5.00	138.60
70	J-19	338	104.10	0.00	138.60
73	J-20	344	103.45	1.15	138.60
447	J-101	345	103.30	0.00	138.60
108	J-31	373	100.50	0.00	138.60

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	138.64	138.66	-10.32	0.15
P-2(2)	151.7	297	PVC	120	138.66	138.68	-10.32	0.15
P-3(1)	97.2	297	PVC	120	138.68	138.68	-0.90	0.01
P-3(2)(2)(2)	64.1	297	PVC	120	138.69	138.70	-10.87	0.16
P-4	88.7	297	PVC	120	138.68	138.65	18.40	0.27
P-9	69.5	297	PVC	120	138.60	138.60	3.24	0.05
P-10	176.3	297	PVC	120	138.60	138.60	3.24	0.05
P-11	155.2	297	PVC	120	138.60	138.60	-3.58	0.05
P-12(1)	41.4	297	PVC	120	138.60	138.60	1.83	0.03
P-12(2)(1)(1)	66.0	297	PVC	120	138.60	138.60	1.75	0.03
P-12(2)(1)(2)	47.4	297	PVC	120	138.60	138.60	1.75	0.03
P-12(2)(2)(2)	70.2	297	PVC	120	138.60	138.60	-1.95	0.03
P-18(1)	106.2	297	PVC	120	138.60	138.60	0.08	0.00
P-18(2)	118.4	297	PVC	120	138.60	138.60	0.08	0.00
P-21(1)	162.2	297	PVC	120	138.60	138.60	1.55	0.02
P-21(2)(1)	30.8	297	PVC	120	138.60	138.60	1.55	0.02
P-21(2)(2)	41.6	297	PVC	120	138.60	138.60	1.55	0.02
P-23	32.5	297	PVC	120	138.68	138.70	-27.82	0.40
P-24(1)(1)	80.4	297	PVC	120	138.60	138.60	4.11	0.06
P-24(1)(2)	72.8	297	PVC	120	138.60	138.60	1.77	0.03
P-24(2)(1)	159.8	297	PVC	120	138.60	138.60	-1.35	0.02
P-24(2)(2)	26.8	297	PVC	120	138.60	138.60	2.15	0.03
P-25(1)	75.8	297	PVC	120	138.60	138.60	1.95	0.03
P-25(2)	30.8	297	PVC	120	138.60	138.60	1.95	0.03
P-26(1)	49.9	297	PVC	120	138.60	138.60	1.95	0.03
P-26(2)(1)	55.3	297	PVC	120	138.60	138.60	1.95	0.03
P-26(2)(2)	56.1	297	PVC	120	138.60	138.60	1.95	0.03
P-27	149.0	297	PVC	120	138.60	138.60	1.95	0.03
P-29(1)(1)	72.2	297	PVC	120	138.65	138.63	14.43	0.21
P-29(1)(2)(2)(1)	46.5	297	PVC	120	138.63	138.62	14.43	0.21

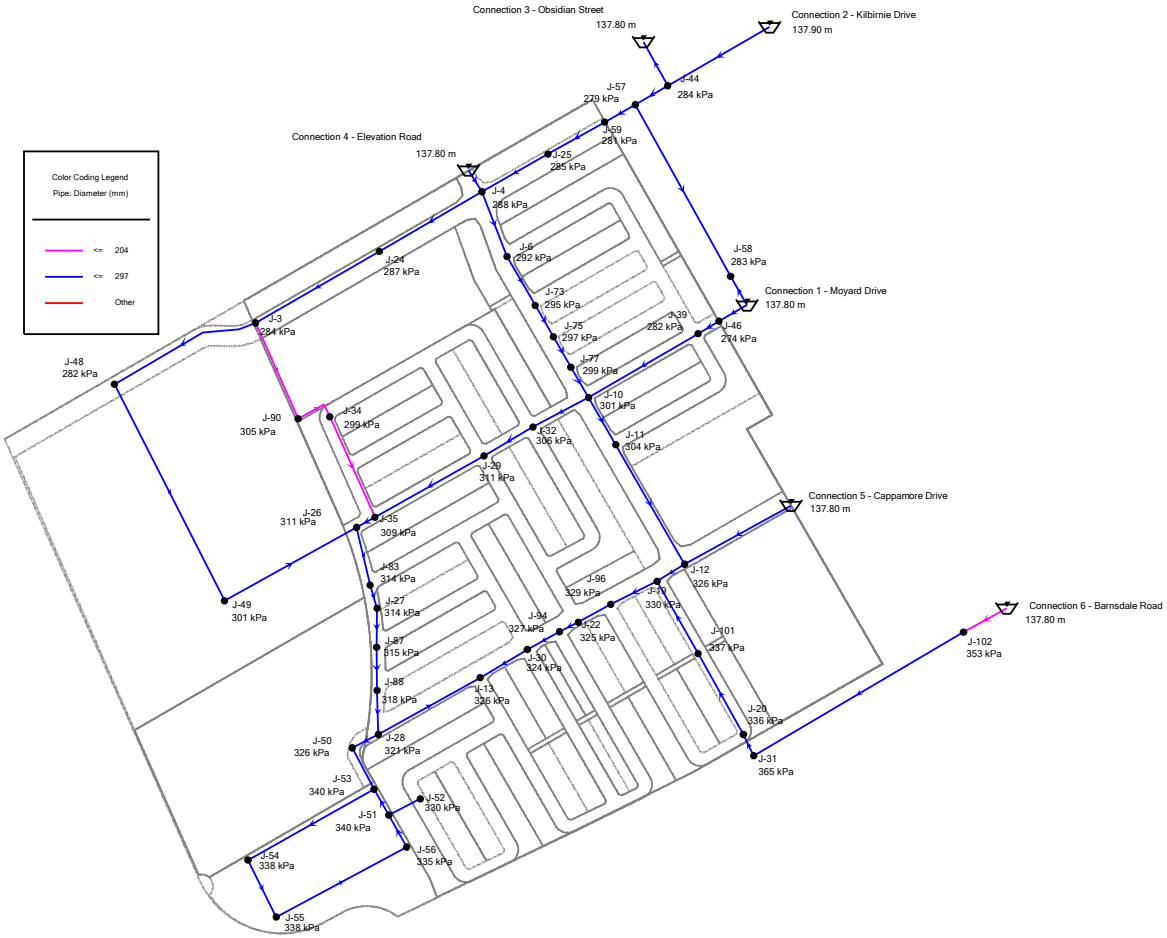
Barrhaven South Phase 3 - S1 Area

Phase 7 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	138.62	138.61	14.43	0.21
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	138.61	138.60	14.43	0.21
P-30	30.3	297	PVC	120	138.60	138.60	-1.07	0.02
P-34	140.7	204	PVC	110	138.62	138.60	3.50	0.11
P-43	150.5	297	PVC	120	138.69	138.70	-6.86	0.10
P-44(1)(1)	83.2	297	PVC	120	138.68	138.68	-0.90	0.01
P-44(1)(2)	45.0	297	PVC	120	138.68	138.68	-0.90	0.01
P-44(2)	48.0	297	PVC	120	138.68	138.69	-17.73	0.26
P-45	200.1	297	PVC	120	138.64	138.63	6.82	0.10
P-46(1)	310.4	297	PVC	120	138.63	138.61	6.82	0.10
P-46(2)	193.1	297	PVC	120	138.61	138.60	6.82	0.10
P-55(1)	250.8	297	PVC	120	138.68	138.60	16.83	0.24
P-55(2)	42.4	297	PVC	120	138.60	138.60	9.39	0.14
P-66(1)	46.9	297	PVC	120	138.60	138.60	-1.75	0.03
P-66(2)	27.1	297	PVC	120	138.60	138.60	-1.75	0.03
P-67(1)	54.8	204	PVC	110	138.62	138.62	-3.50	0.11
P-67(2)	133.9	204	PVC	110	138.62	138.64	-3.50	0.11

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
56	J-13	326	104.45	3.64	137.76
77	J-22	325	104.60	3.64	137.76
95	J-27	314	105.68	0.00	137.76
97	J-28	321	105.00	0.00	137.76
103	J-30	324	104.70	3.70	137.76
211	J-50	326	104.50	1.69	137.76
213	J-51	340	103.00	0.00	137.76
215	J-52	330	104.05	0.00	137.76
219	J-53	340	103.00	0.00	137.76
222	J-54	338	103.20	0.00	137.76
224	J-55	338	103.20	0.00	137.76
226	J-56	335	103.50	0.00	137.76
356	J-83	314	105.70	0.00	137.76
368	J-87	315	105.55	0.00	137.76
372	J-88	318	105.30	0.00	137.76
408	J-94	327	104.30	0.00	137.76
415	J-96	329	104.20	0.00	137.77
152	J-46	274	109.75	0.00	137.80
239	J-58	283	108.85	7.44	137.80
131	J-39	282	109.00	0.00	137.79
235	J-57	279	109.30	0.00	137.81
242	J-59	281	109.10	0.00	137.80
144	J-44	284	108.80	0.00	137.81
205	J-48	282	109.00	0.00	137.77
90	J-25	285	108.70	0.00	137.80
34	J-3	284	108.80	0.00	137.78
87	J-24	287	108.50	0.00	137.79
35	J-4	288	108.40	0.00	137.80
39	J-6	292	108.00	3.97	137.79
319	J-73	295	107.65	0.00	137.78
326	J-75	297	107.43	0.00	137.78

Barrhaven South Phase 3 - S1 Area

Phase 8 Junction Table

Junction Table - Time: 0.00 hours

ID	Label	Pressure (kPa)	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)
333	J-77	299	107.20	0.00	137.78
117	J-34	299	107.20	0.00	137.77
47	J-10	301	107.00	5.53	137.78
208	J-49	301	107.00	0.00	137.77
49	J-11	304	106.75	0.00	137.78
392	J-90	305	106.56	0.00	137.77
112	J-32	306	106.50	2.34	137.77
119	J-35	309	106.20	0.00	137.76
100	J-29	311	106.00	3.12	137.77
93	J-26	311	106.00	7.02	137.76
51	J-12	326	104.50	5.00	137.78
70	J-19	330	104.10	0.00	137.77
73	J-20	336	103.45	1.15	137.78
447	J-101	337	103.30	0.00	137.78
108	J-31	365	100.50	0.00	137.78

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Peak Hour Demand
Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-2(1)	182.6	297	PVC	120	137.78	137.79	-6.51	0.09
P-2(2)	151.7	297	PVC	120	137.79	137.80	-6.51	0.09
P-3(1)	97.2	297	PVC	120	137.80	137.80	-6.18	0.09
P-3(2)(2)(2)	64.1	297	PVC	120	137.81	137.80	13.67	0.20
P-4	88.7	297	PVC	120	137.80	137.79	9.97	0.14
P-9	69.5	297	PVC	120	137.78	137.78	0.75	0.01
P-10	176.3	297	PVC	120	137.78	137.78	0.75	0.01
P-11	155.2	297	PVC	120	137.78	137.80	-11.63	0.17
P-12(1)	41.4	297	PVC	120	137.78	137.77	7.38	0.11
P-12(2)(1)(1)	66.0	297	PVC	120	137.77	137.77	9.65	0.14
P-12(2)(1)(2)	47.4	297	PVC	120	137.77	137.76	9.65	0.14
P-12(2)(2)(2)	70.2	297	PVC	120	137.76	137.76	2.31	0.03
P-18(1)	106.2	297	PVC	120	137.77	137.78	-2.27	0.03
P-18(2)	118.4	297	PVC	120	137.78	137.78	-2.27	0.03
P-21(1)	162.2	297	PVC	120	137.78	137.79	-9.26	0.13
P-21(2)(1)	30.8	297	PVC	120	137.79	137.80	-9.26	0.13
P-21(2)(2)	41.6	297	PVC	120	137.80	137.80	-9.26	0.13
P-23	32.5	297	PVC	120	137.80	137.80	-10.30	0.15
P-24(1)(1)	80.4	297	PVC	120	137.78	137.77	8.98	0.13
P-24(1)(2)	72.8	297	PVC	120	137.77	137.77	6.64	0.10
P-24(2)(1)	159.8	297	PVC	120	137.77	137.76	3.52	0.05
P-24(2)(2)	26.8	297	PVC	120	137.76	137.76	5.69	0.08
P-25(1)	75.8	297	PVC	120	137.76	137.76	3.02	0.04
P-25(2)	30.8	297	PVC	120	137.76	137.76	3.02	0.04
P-26(1)	49.9	297	PVC	120	137.76	137.76	3.02	0.04
P-26(2)(1)	55.3	297	PVC	120	137.76	137.76	3.02	0.04
P-26(2)(2)	56.1	297	PVC	120	137.76	137.76	3.02	0.04
P-27	149.0	297	PVC	120	137.76	137.76	1.33	0.02
P-29(1)(1)	72.2	297	PVC	120	137.79	137.78	6.00	0.09
P-29(1)(2)(2)(1)	46.5	297	PVC	120	137.78	137.78	6.00	0.09

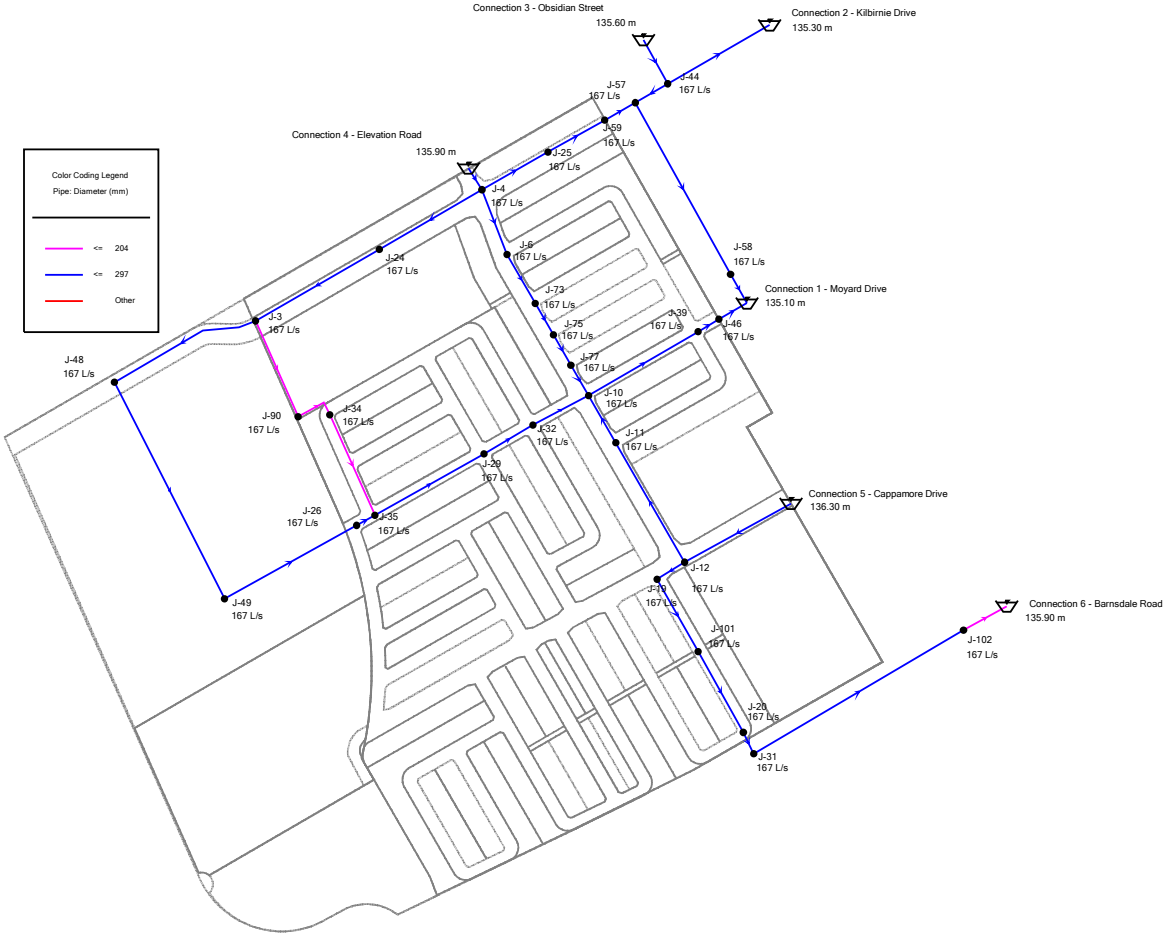
Barrhaven South Phase 3 - S1 Area

Phase 8 Pipe Table

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-29(1)(2)(2)(2)(1)	44.7	297	PVC	120	137.78	137.78	6.00	0.09
P-29(1)(2)(2)(2)(2)	45.0	297	PVC	120	137.78	137.78	6.00	0.09
P-30	30.3	297	PVC	120	137.78	137.78	-3.42	0.05
P-34	140.7	204	PVC	110	137.77	137.76	2.16	0.07
P-43	150.5	297	PVC	120	137.81	137.90	-24.56	0.35
P-44(1)(1)	83.2	297	PVC	120	137.80	137.80	-6.18	0.09
P-44(1)(2)	45.0	297	PVC	120	137.80	137.81	-6.18	0.09
P-44(2)	48.0	297	PVC	120	137.81	137.81	-10.89	0.16
P-45	200.1	297	PVC	120	137.78	137.77	4.35	0.06
P-46(1)	310.4	297	PVC	120	137.77	137.77	4.35	0.06
P-46(2)	193.1	297	PVC	120	137.77	137.76	4.35	0.06
P-47	37.6	297	PVC	120	137.76	137.76	1.69	0.02
P-48(1)	59.6	297	PVC	120	137.76	137.76	0.00	0.00
P-48(2)	38.1	297	PVC	120	137.76	137.76	-0.04	0.00
P-49	45.3	297	PVC	120	137.76	137.76	0.00	0.00
P-50	184.8	297	PVC	120	137.76	137.76	0.04	0.00
P-51	81.2	297	PVC	120	137.76	137.76	0.04	0.00
P-52	189.1	297	PVC	120	137.76	137.76	0.04	0.00
P-53	46.8	297	PVC	120	137.76	137.76	0.04	0.00
P-55(1)	250.8	297	PVC	120	137.81	137.80	4.70	0.07
P-55(2)	42.4	297	PVC	120	137.80	137.80	-2.74	0.04
P-66(1)	46.9	297	PVC	120	137.76	137.76	-6.01	0.09
P-66(2)	27.1	297	PVC	120	137.76	137.76	-6.01	0.09
P-67(1)	54.8	204	PVC	110	137.77	137.77	-2.16	0.07
P-67(2)	133.9	204	PVC	110	137.77	137.78	-2.16	0.07

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area

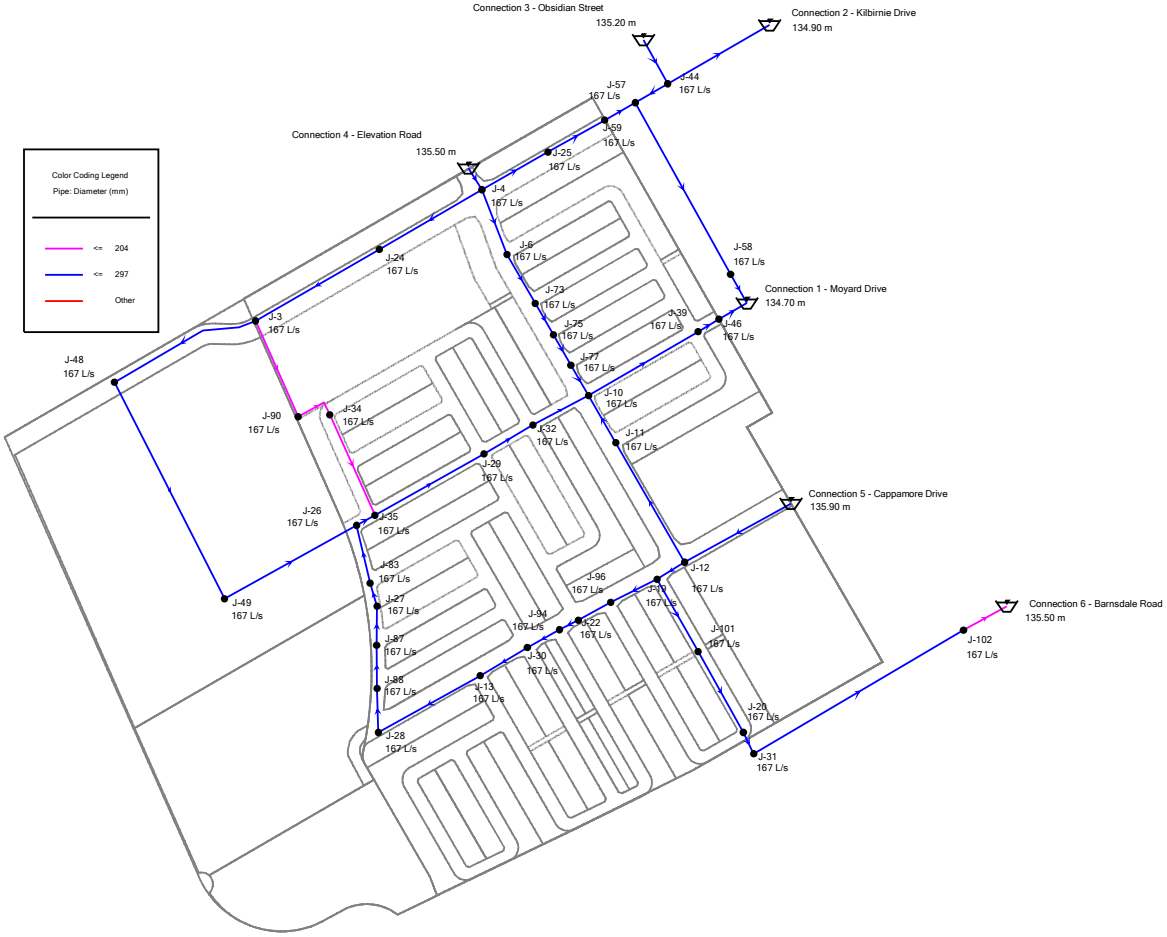
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 6 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	235	234	J-48
35	J-4	167	167	True	140	249	264	J-46
39	J-6	167	169	True	140	248	260	J-46
47	J-10	167	170	True	140	248	273	J-46
49	J-11	167	167	True	140	248	273	J-46
51	J-12	167	172	True	140	248	297	J-46
70	J-19	167	167	True	140	248	296	J-46
73	J-20	167	168	True	140	248	283	J-46
87	J-24	167	167	True	140	246	246	J-48
90	J-25	167	167	True	140	249	255	J-46
93	J-26	167	171	True	140	240	259	J-48
100	J-29	167	169	True	140	248	268	J-46
108	J-31	167	167	True	140	248	310	J-46
112	J-32	167	167	True	140	248	269	J-46
117	J-34	167	167	True	140	216	191	J-90
119	J-35	167	167	True	140	242	259	J-48
131	J-39	167	167	True	140	246	251	J-46
144	J-44	167	167	True	140	249	258	J-46
152	J-46	167	167	True	140	254	245	J-39
205	J-48	167	167	True	140	239	221	J-3
208	J-49	167	167	True	140	233	240	J-48
235	J-57	167	167	True	140	249	251	J-46
239	J-58	167	172	True	140	249	253	J-46
242	J-59	167	167	True	140	249	251	J-46
319	J-73	167	167	True	140	248	262	J-46
326	J-75	167	167	True	140	248	265	J-46
333	J-77	167	167	True	140	248	268	J-46
392	J-90	167	167	True	140	210	198	J-34
447	J-101	167	167	True	140	248	293	J-46

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	237	235	J-48
35	J-4	167	167	True	140	245	260	J-46
39	J-6	167	169	True	140	244	256	J-46
47	J-10	167	170	True	140	244	270	J-46
49	J-11	167	167	True	140	244	269	J-46
51	J-12	167	172	True	140	244	294	J-46
56	J-13	167	167	True	140	244	276	J-46
70	J-19	167	167	True	140	244	295	J-46
73	J-20	167	168	True	140	244	281	J-46
77	J-22	167	167	True	140	244	281	J-46
87	J-24	167	167	True	140	245	244	J-46
90	J-25	167	167	True	140	245	251	J-46
93	J-26	167	171	True	140	244	269	J-46
95	J-27	167	167	True	140	244	266	J-46
97	J-28	167	167	True	140	244	269	J-46
100	J-29	167	169	True	140	244	270	J-46
103	J-30	167	169	True	140	244	276	J-46
108	J-31	167	167	True	140	244	308	J-46
112	J-32	167	168	True	140	244	268	J-46
117	J-34	167	167	True	140	221	196	J-90
119	J-35	167	167	True	140	244	267	J-46
131	J-39	167	167	True	140	242	247	J-46
144	J-44	167	167	True	140	245	254	J-46
152	J-46	167	167	True	140	250	241	J-39
205	J-48	167	167	True	140	241	225	J-3
208	J-49	167	167	True	140	237	246	J-48
235	J-57	167	167	True	140	245	248	J-46
239	J-58	167	172	True	140	245	249	J-46
242	J-59	167	167	True	140	245	247	J-46
319	J-73	167	167	True	140	244	258	J-46

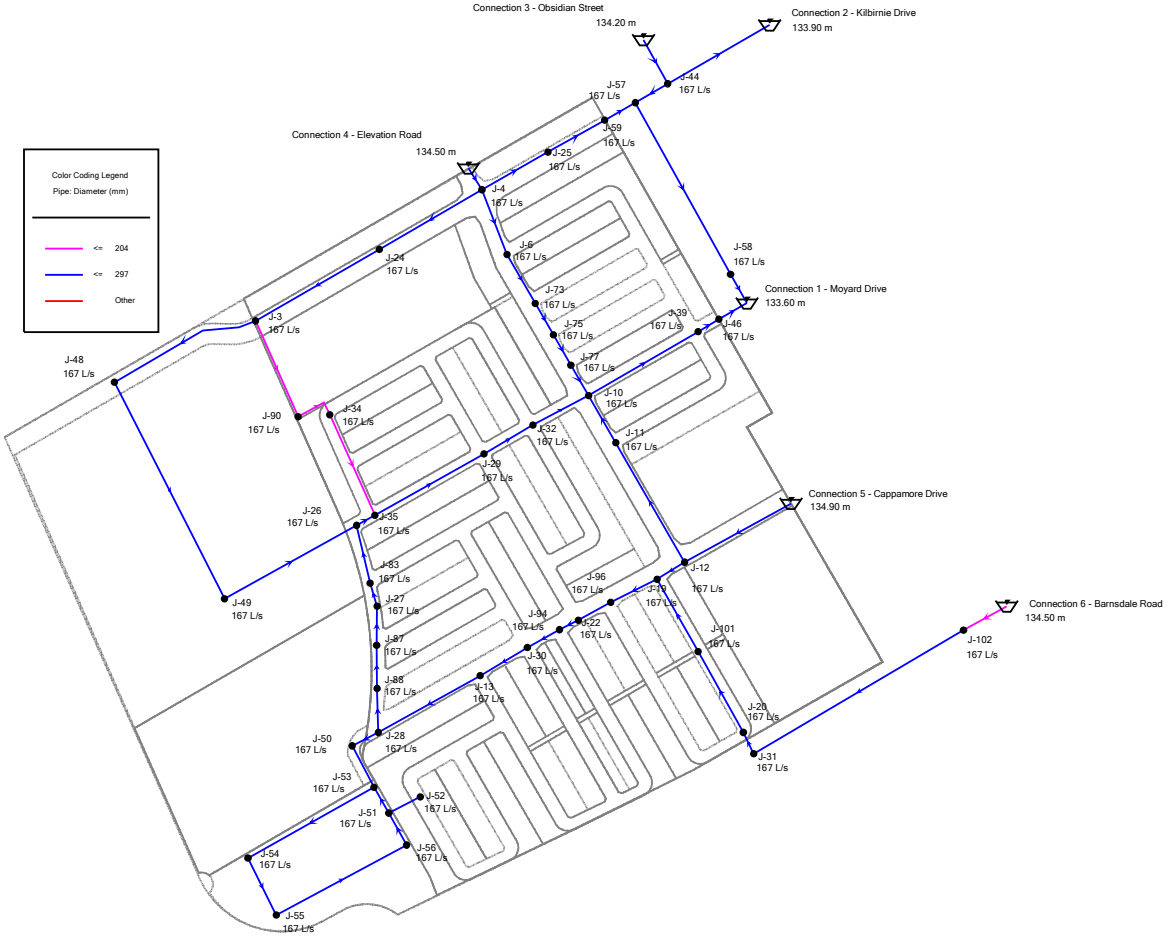
Barrhaven South Phase 3 - S1 Area

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
326	J-75	167	167	True	140	244	261	J-46
333	J-77	167	167	True	140	244	265	J-46
356	J-83	167	167	True	140	244	267	J-46
368	J-87	167	167	True	140	244	266	J-46
372	J-88	167	167	True	140	244	267	J-46
392	J-90	167	167	True	140	214	202	J-34
408	J-94	167	167	True	140	244	282	J-46
415	J-96	167	167	True	140	244	288	J-46
447	J-101	167	167	True	140	244	292	J-46

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	227	225	J-48
35	J-4	167	167	True	140	234	250	J-46
39	J-6	167	169	True	140	234	246	J-46
47	J-10	167	170	True	140	233	259	J-46
49	J-11	167	167	True	140	233	258	J-46
51	J-12	167	172	True	140	234	284	J-46
56	J-13	167	169	True	140	234	265	J-46
70	J-19	167	167	True	140	234	285	J-46
73	J-20	167	168	True	140	234	270	J-46
77	J-22	167	169	True	140	234	270	J-46
87	J-24	167	167	True	140	234	234	J-46
90	J-25	167	167	True	140	234	241	J-46
93	J-26	167	171	True	140	233	258	J-46
95	J-27	167	167	True	140	234	255	J-46
97	J-28	167	167	True	140	234	258	J-46
100	J-29	167	169	True	140	233	259	J-46
103	J-30	167	169	True	140	234	265	J-46
108	J-31	167	167	True	140	234	297	J-46
112	J-32	167	168	True	140	233	257	J-46
117	J-34	167	167	True	140	210	185	J-90
119	J-35	167	167	True	140	233	256	J-46
131	J-39	167	167	True	140	231	237	J-46
144	J-44	167	167	True	140	235	244	J-46
152	J-46	167	167	True	140	239	231	J-39
205	J-48	167	167	True	140	230	214	J-3
208	J-49	167	167	True	140	226	236	J-48
211	J-50	167	168	True	140	234	255	J-46
213	J-51	167	167	True	140	234	253	J-46
215	J-52	167	167	True	140	234	234	J-46
219	J-53	167	167	True	140	234	258	J-46

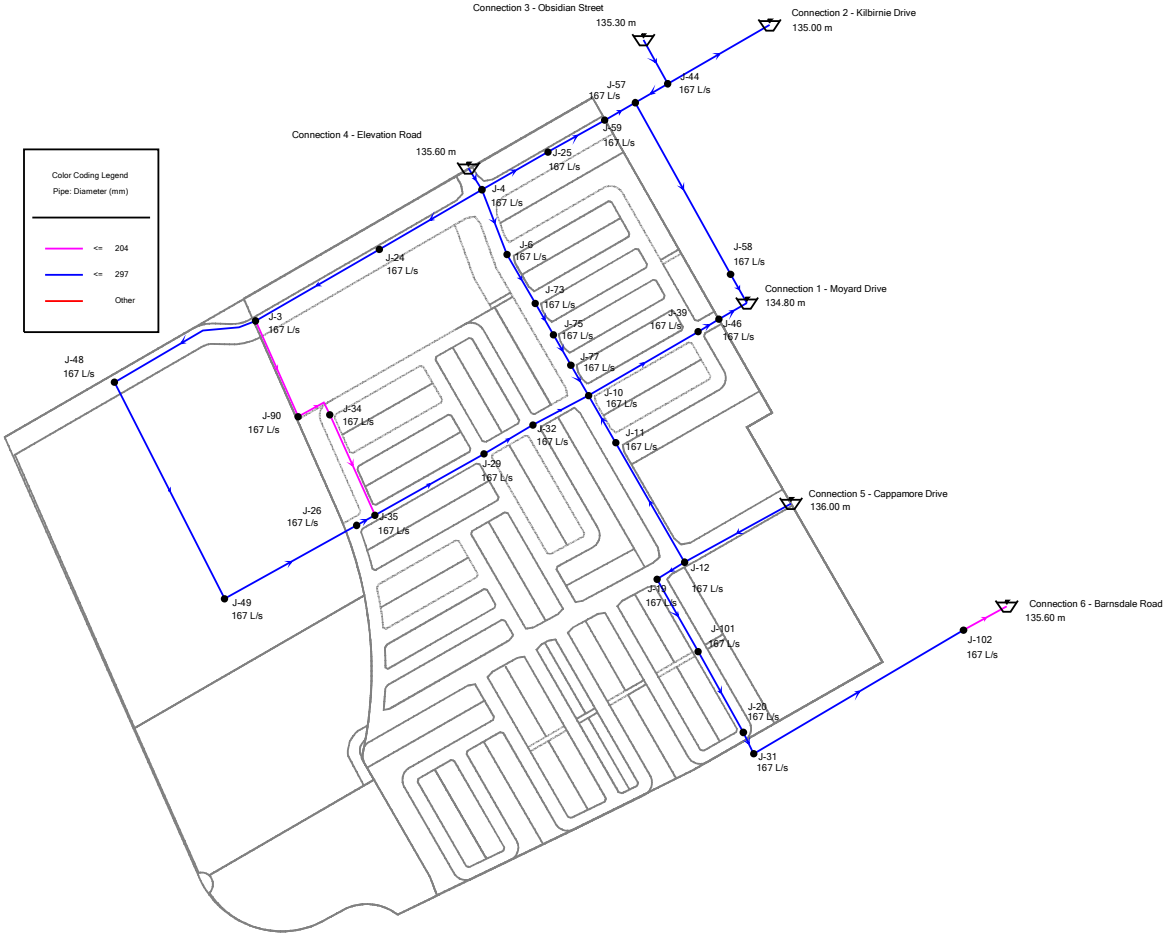
Barrhaven South Phase 3 - S1 Area

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
222	J-54	167	167	True	140	234	243	J-46
224	J-55	167	167	True	140	234	242	J-46
226	J-56	167	167	True	140	234	244	J-46
235	J-57	167	167	True	140	235	237	J-46
239	J-58	167	172	True	140	235	238	J-46
242	J-59	167	167	True	140	234	237	J-46
319	J-73	167	167	True	140	233	248	J-46
326	J-75	167	167	True	140	233	251	J-46
333	J-77	167	167	True	140	233	254	J-46
356	J-83	167	167	True	140	234	256	J-46
368	J-87	167	167	True	140	234	255	J-46
372	J-88	167	167	True	140	234	256	J-46
392	J-90	167	167	True	140	204	192	J-34
408	J-94	167	167	True	140	234	271	J-46
415	J-96	167	167	True	140	234	277	J-46
447	J-101	167	167	True	140	234	281	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area

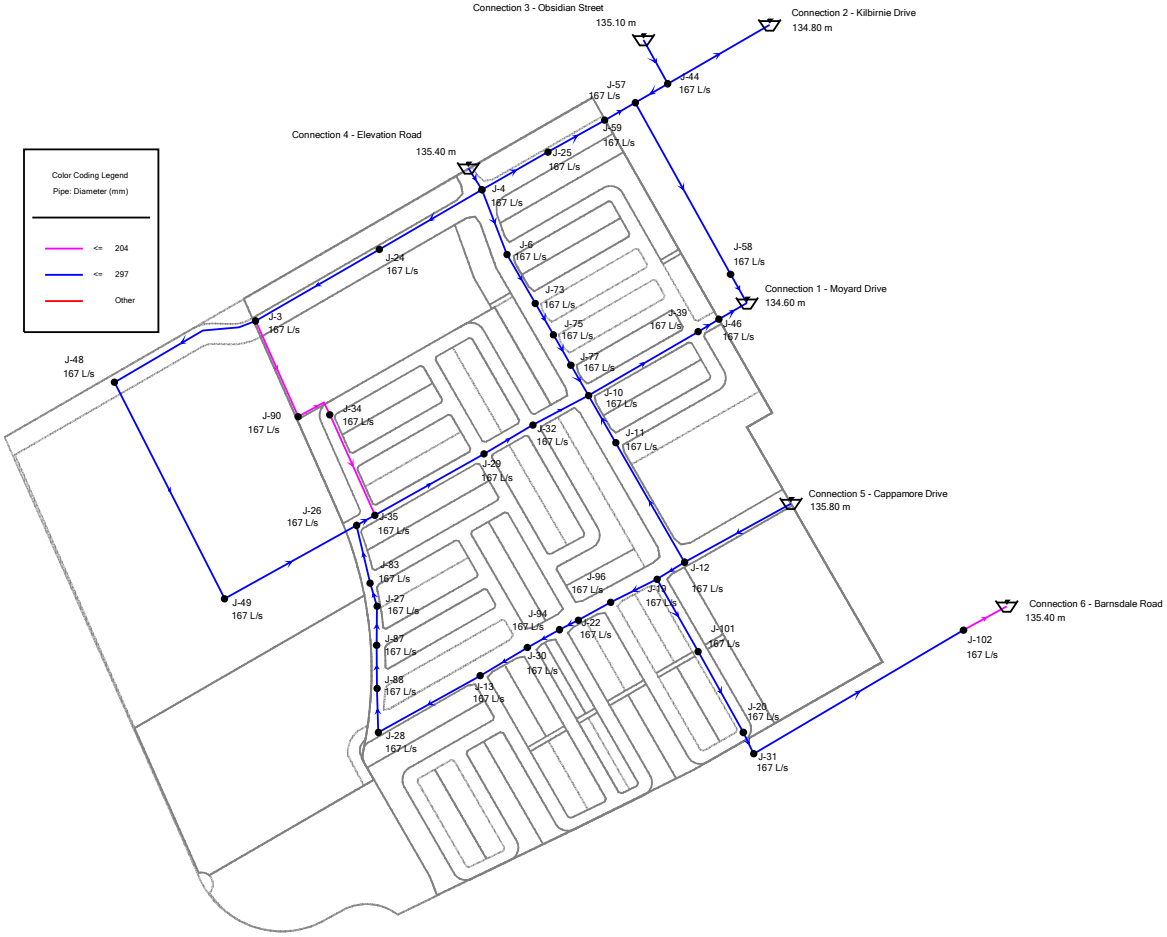
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 6 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	232	231	J-48
35	J-4	167	167	True	140	246	261	J-46
39	J-6	167	169	True	140	245	257	J-46
47	J-10	167	170	True	140	245	270	J-46
49	J-11	167	167	True	140	245	270	J-46
51	J-12	167	172	True	140	245	294	J-46
70	J-19	167	167	True	140	245	293	J-46
73	J-20	167	168	True	140	245	280	J-46
87	J-24	167	167	True	140	243	243	J-48
90	J-25	167	167	True	140	246	252	J-46
93	J-26	167	171	True	140	237	256	J-48
100	J-29	167	169	True	140	245	266	J-46
108	J-31	167	167	True	140	245	307	J-46
112	J-32	167	167	True	140	245	266	J-46
117	J-34	167	167	True	140	213	188	J-90
119	J-35	167	167	True	140	239	256	J-48
131	J-39	167	167	True	140	243	248	J-46
144	J-44	167	167	True	140	246	255	J-46
152	J-46	167	167	True	140	251	242	J-39
205	J-48	167	167	True	140	236	218	J-3
208	J-49	167	167	True	140	230	237	J-48
235	J-57	167	167	True	140	246	249	J-46
239	J-58	167	172	True	140	246	250	J-46
242	J-59	167	167	True	140	246	248	J-46
319	J-73	167	167	True	140	245	259	J-46
326	J-75	167	167	True	140	245	262	J-46
333	J-77	167	167	True	140	245	266	J-46
392	J-90	167	167	True	140	207	195	J-34
447	J-101	167	167	True	140	245	290	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	236	234	J-48
35	J-4	167	167	True	140	244	259	J-46
39	J-6	167	169	True	140	243	255	J-46
47	J-10	167	170	True	140	243	269	J-46
49	J-11	167	167	True	140	243	268	J-46
51	J-12	167	172	True	140	243	293	J-46
56	J-13	167	167	True	140	243	275	J-46
70	J-19	167	167	True	140	243	294	J-46
73	J-20	167	168	True	140	243	280	J-46
77	J-22	167	167	True	140	243	280	J-46
87	J-24	167	167	True	140	244	243	J-46
90	J-25	167	167	True	140	244	250	J-46
93	J-26	167	171	True	140	243	268	J-46
95	J-27	167	167	True	140	243	265	J-46
97	J-28	167	167	True	140	243	268	J-46
100	J-29	167	169	True	140	243	269	J-46
103	J-30	167	169	True	140	243	275	J-46
108	J-31	167	167	True	140	243	307	J-46
112	J-32	167	168	True	140	243	267	J-46
117	J-34	167	167	True	140	220	195	J-90
119	J-35	167	167	True	140	243	266	J-46
131	J-39	167	167	True	140	241	246	J-46
144	J-44	167	167	True	140	244	253	J-46
152	J-46	167	167	True	140	249	240	J-39
205	J-48	167	167	True	140	240	224	J-3
208	J-49	167	167	True	140	236	245	J-48
235	J-57	167	167	True	140	244	247	J-46
239	J-58	167	172	True	140	244	248	J-46
242	J-59	167	167	True	140	244	246	J-46
319	J-73	167	167	True	140	243	257	J-46

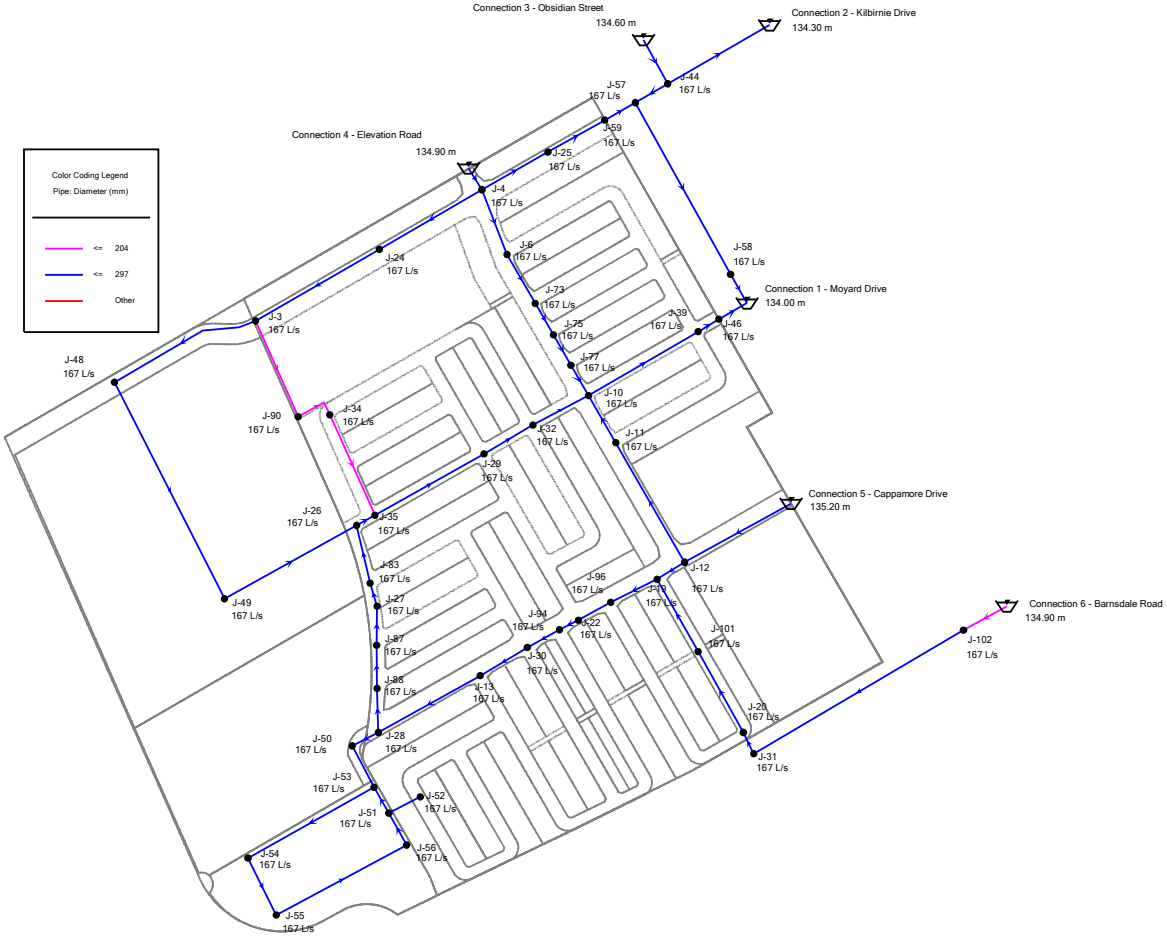
Barrhaven South Phase 3 - S1 Area

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
326	J-75	167	167	True	140	243	260	J-46
333	J-77	167	167	True	140	243	264	J-46
356	J-83	167	167	True	140	243	266	J-46
368	J-87	167	167	True	140	243	265	J-46
372	J-88	167	167	True	140	243	266	J-46
392	J-90	167	167	True	140	213	201	J-34
408	J-94	167	167	True	140	243	281	J-46
415	J-96	167	167	True	140	243	287	J-46
447	J-101	167	167	True	140	243	291	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 167 L/s)

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
34	J-3	167	167	True	140	231	229	J-48
35	J-4	167	167	True	140	238	254	J-46
39	J-6	167	169	True	140	237	250	J-46
47	J-10	167	170	True	140	237	263	J-46
49	J-11	167	167	True	140	237	262	J-46
51	J-12	167	172	True	140	237	287	J-46
56	J-13	167	169	True	140	237	268	J-46
70	J-19	167	167	True	140	237	288	J-46
73	J-20	167	168	True	140	238	274	J-46
77	J-22	167	169	True	140	237	273	J-46
87	J-24	167	167	True	140	238	238	J-46
90	J-25	167	167	True	140	238	245	J-46
93	J-26	167	171	True	140	237	262	J-46
95	J-27	167	167	True	140	237	259	J-46
97	J-28	167	167	True	140	237	262	J-46
100	J-29	167	169	True	140	237	263	J-46
103	J-30	167	169	True	140	237	268	J-46
108	J-31	167	167	True	140	238	301	J-46
112	J-32	167	168	True	140	237	261	J-46
117	J-34	167	167	True	140	214	189	J-90
119	J-35	167	167	True	140	237	260	J-46
131	J-39	167	167	True	140	235	241	J-46
144	J-44	167	167	True	140	238	248	J-46
152	J-46	167	167	True	140	243	235	J-39
205	J-48	167	167	True	140	234	218	J-3
208	J-49	167	167	True	140	230	239	J-48
211	J-50	167	168	True	140	237	259	J-46
213	J-51	167	167	True	140	237	257	J-46
215	J-52	167	167	True	140	237	238	J-46
219	J-53	167	167	True	140	237	262	J-46

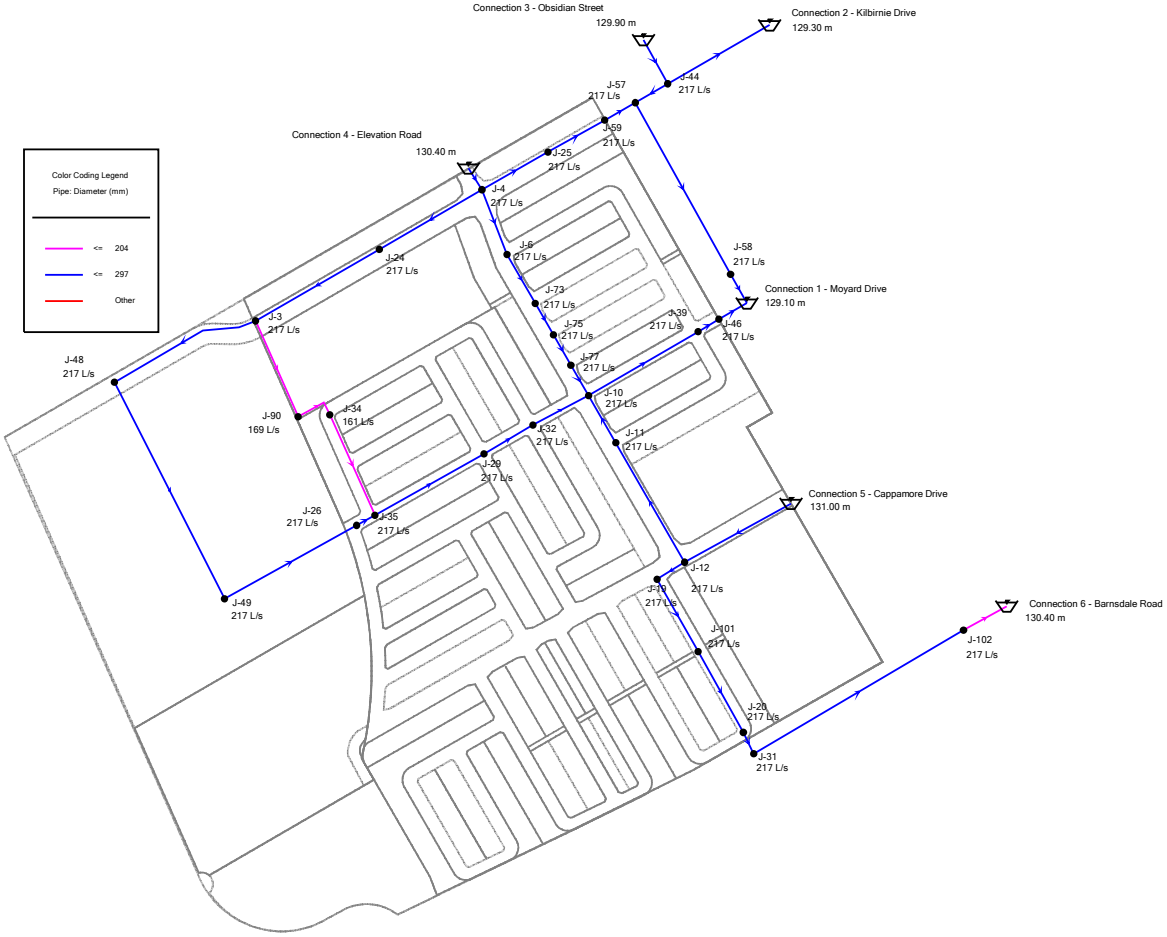
Barrhaven South Phase 3 - S1 Area

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
222	J-54	167	167	True	140	237	246	J-46
224	J-55	167	167	True	140	237	245	J-46
226	J-56	167	167	True	140	237	248	J-46
235	J-57	167	167	True	140	238	241	J-46
239	J-58	167	172	True	140	238	242	J-46
242	J-59	167	167	True	140	238	241	J-46
319	J-73	167	167	True	140	237	252	J-46
326	J-75	167	167	True	140	237	255	J-46
333	J-77	167	167	True	140	237	258	J-46
356	J-83	167	167	True	140	237	260	J-46
368	J-87	167	167	True	140	237	258	J-46
372	J-88	167	167	True	140	237	260	J-46
392	J-90	167	167	True	140	208	195	J-34
408	J-94	167	167	True	140	237	275	J-46
415	J-96	167	167	True	140	237	281	J-46
447	J-101	167	167	True	140	238	285	J-46

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 6 Model
Overall View

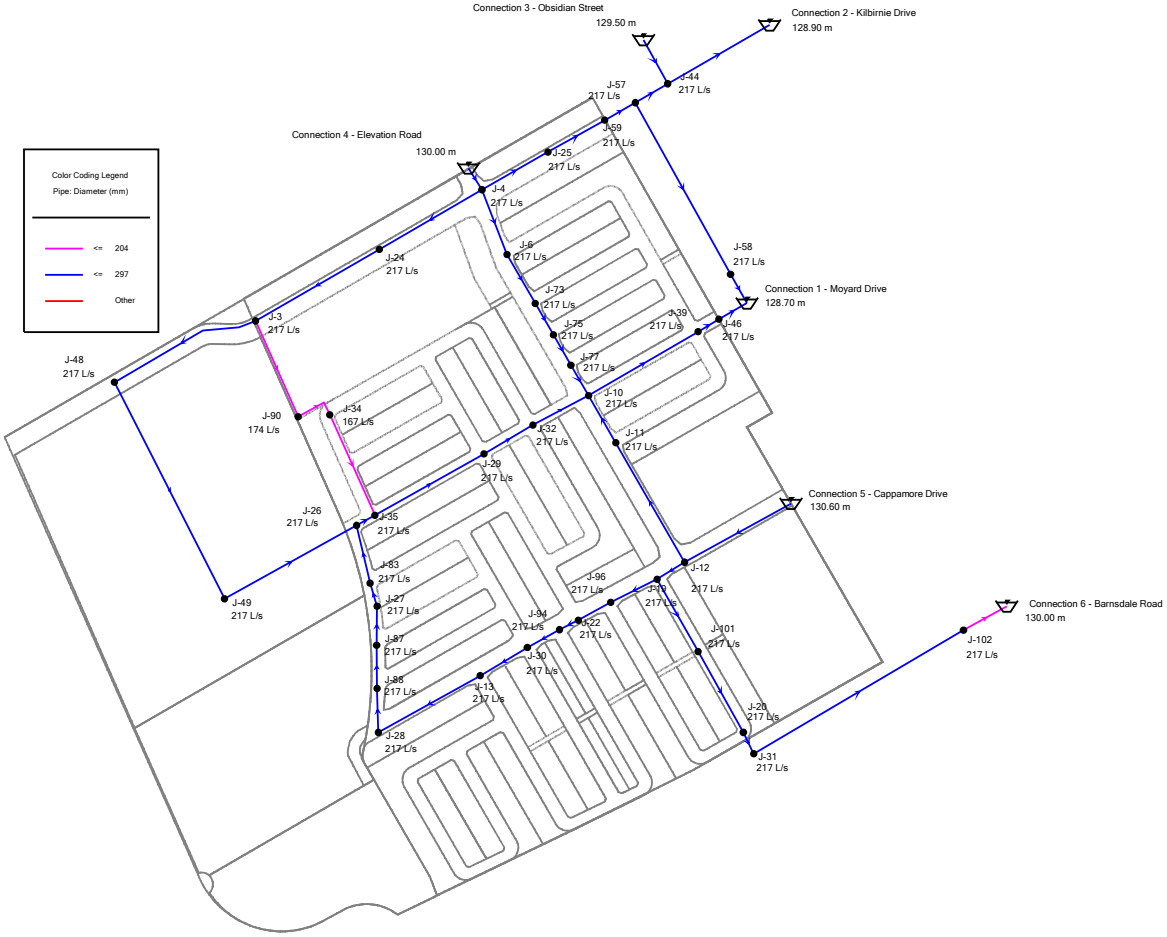


Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 6 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	161	161	True	140	164	140	J-90
392	J-90	169	169	True	140	152	140	J-34
34	J-3	217	217	True	140	164	161	J-48
35	J-4	217	217	True	140	190	206	J-46
39	J-6	217	219	True	140	189	198	J-46
47	J-10	217	220	True	140	189	213	J-46
49	J-11	217	217	True	140	189	211	J-46
51	J-12	217	222	True	140	190	237	J-46
70	J-19	217	217	True	140	190	233	J-46
73	J-20	217	218	True	140	190	208	J-46
87	J-24	217	217	True	140	181	179	J-3
90	J-25	217	217	True	140	191	193	J-46
93	J-26	217	221	True	140	172	184	J-48
100	J-29	217	219	True	140	186	200	J-48
108	J-31	217	217	True	140	190	234	J-46
112	J-32	217	217	True	140	189	204	J-46
119	J-35	217	217	True	140	174	186	J-48
131	J-39	217	217	True	140	185	190	J-46
144	J-44	217	217	True	140	191	199	J-46
152	J-46	217	217	True	140	194	185	J-39
205	J-48	217	217	True	140	169	141	J-3
208	J-49	217	217	True	140	160	160	J-48
235	J-57	217	217	True	140	191	192	J-46
239	J-58	217	222	True	140	191	192	J-46
242	J-59	217	217	True	140	191	190	J-46
319	J-73	217	217	True	140	189	199	J-46
326	J-75	217	217	True	140	189	202	J-46
333	J-77	217	217	True	140	189	207	J-46
447	J-101	217	217	True	140	190	224	J-46

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	167	167	True	140	165	140	J-90
392	J-90	174	174	True	140	154	140	J-34
34	J-3	217	217	True	140	170	165	J-48
35	J-4	217	217	True	140	186	203	J-46
39	J-6	217	219	True	140	186	195	J-46
47	J-10	217	220	True	140	185	210	J-46
49	J-11	217	217	True	140	185	207	J-46
51	J-12	217	222	True	140	186	235	J-46
56	J-13	217	217	True	140	186	205	J-46
70	J-19	217	217	True	140	186	234	J-46
73	J-20	217	218	True	140	186	207	J-46
77	J-22	217	217	True	140	186	213	J-46
87	J-24	217	217	True	140	182	178	J-3
90	J-25	217	217	True	140	187	190	J-46
93	J-26	217	221	True	140	183	202	J-48
95	J-27	217	217	True	140	186	196	J-46
97	J-28	217	217	True	140	186	197	J-46
100	J-29	217	219	True	140	185	204	J-46
103	J-30	217	219	True	140	186	206	J-46
108	J-31	217	217	True	140	186	232	J-46
112	J-32	217	218	True	140	185	204	J-46
119	J-35	217	217	True	140	184	201	J-48
131	J-39	217	217	True	140	182	186	J-46
144	J-44	217	217	True	140	187	195	J-46
152	J-46	217	217	True	140	190	181	J-39
205	J-48	217	217	True	140	174	149	J-3
208	J-49	217	217	True	140	169	172	J-48
235	J-57	217	217	True	140	187	188	J-46
239	J-58	217	222	True	140	187	188	J-46
242	J-59	217	217	True	140	187	186	J-46

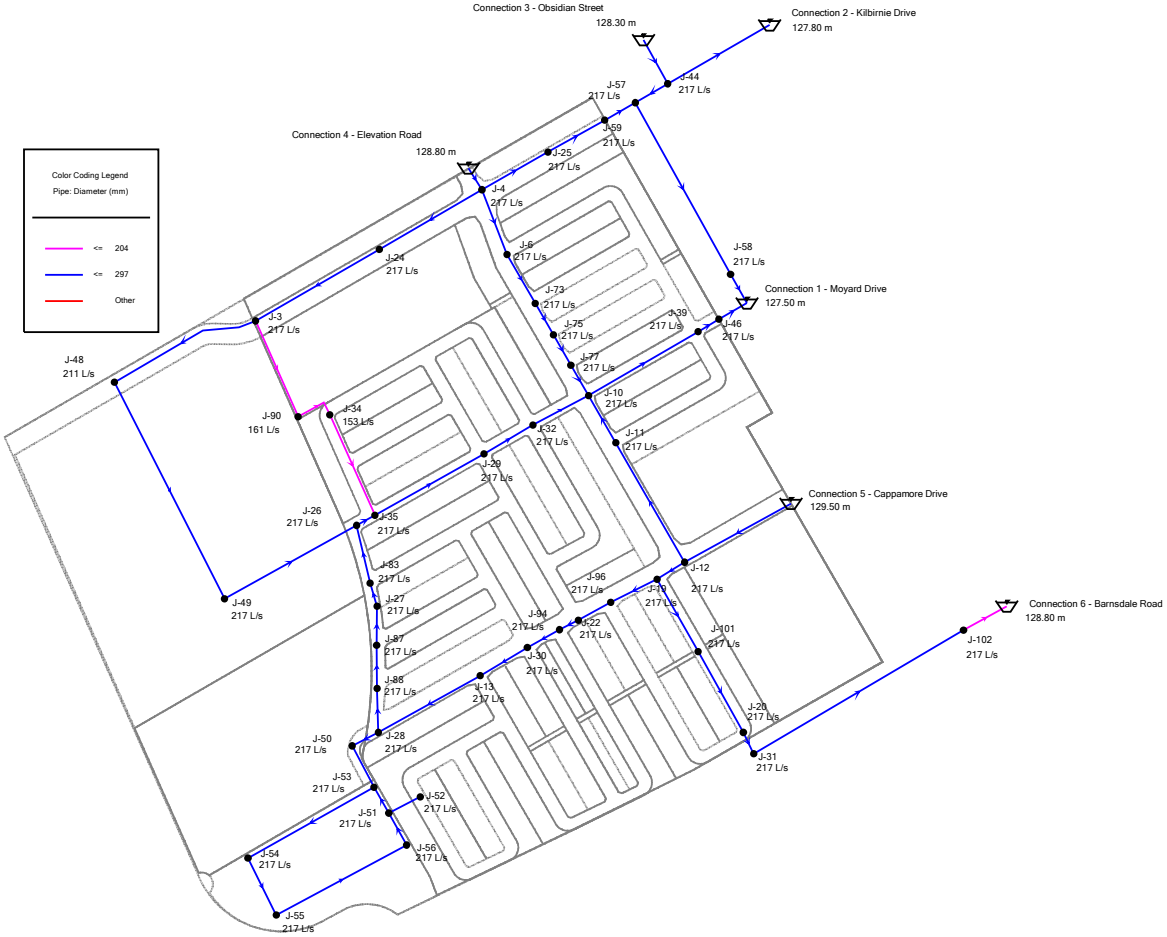
Barrhaven South Phase 3 - S1 Area

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
319	J-73	217	217	True	140	185	196	J-46
326	J-75	217	217	True	140	185	199	J-46
333	J-77	217	217	True	140	185	204	J-46
356	J-83	217	217	True	140	185	198	J-48
368	J-87	217	217	True	140	186	195	J-46
372	J-88	217	217	True	140	186	195	J-46
408	J-94	217	217	True	140	186	214	J-46
415	J-96	217	217	True	140	186	223	J-46
447	J-101	217	217	True	140	186	223	J-46

Barrhaven South Phase 3 - S1 Area
Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Existing Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	153	153	True	140	162	140	J-90
392	J-90	161	161	True	140	151	140	J-34
205	J-48	211	211	True	140	164	140	J-3
215	J-52	217	217	True	140	161	140	J-56
34	J-3	217	217	True	140	158	153	J-48
35	J-4	217	217	True	140	175	191	J-46
39	J-6	217	219	True	140	174	183	J-46
47	J-10	217	220	True	140	173	198	J-46
49	J-11	217	217	True	140	174	195	J-46
51	J-12	217	222	True	140	174	223	J-46
56	J-13	217	219	True	140	174	192	J-46
70	J-19	217	217	True	140	174	222	J-46
73	J-20	217	218	True	140	174	195	J-46
77	J-22	217	219	True	140	174	201	J-46
87	J-24	217	217	True	140	170	167	J-3
90	J-25	217	217	True	140	175	178	J-46
93	J-26	217	221	True	140	171	190	J-48
95	J-27	217	217	True	140	174	184	J-46
97	J-28	217	217	True	140	174	185	J-46
100	J-29	217	219	True	140	174	192	J-46
103	J-30	217	219	True	140	174	193	J-46
108	J-31	217	217	True	140	174	220	J-46
112	J-32	217	218	True	140	174	192	J-46
119	J-35	217	217	True	140	172	189	J-48
131	J-39	217	217	True	140	170	174	J-46
144	J-44	217	217	True	140	175	183	J-46
152	J-46	217	217	True	140	178	169	J-39
208	J-49	217	217	True	140	157	160	J-48
211	J-50	217	218	True	140	174	177	J-46
213	J-51	217	217	True	140	155	165	J-52

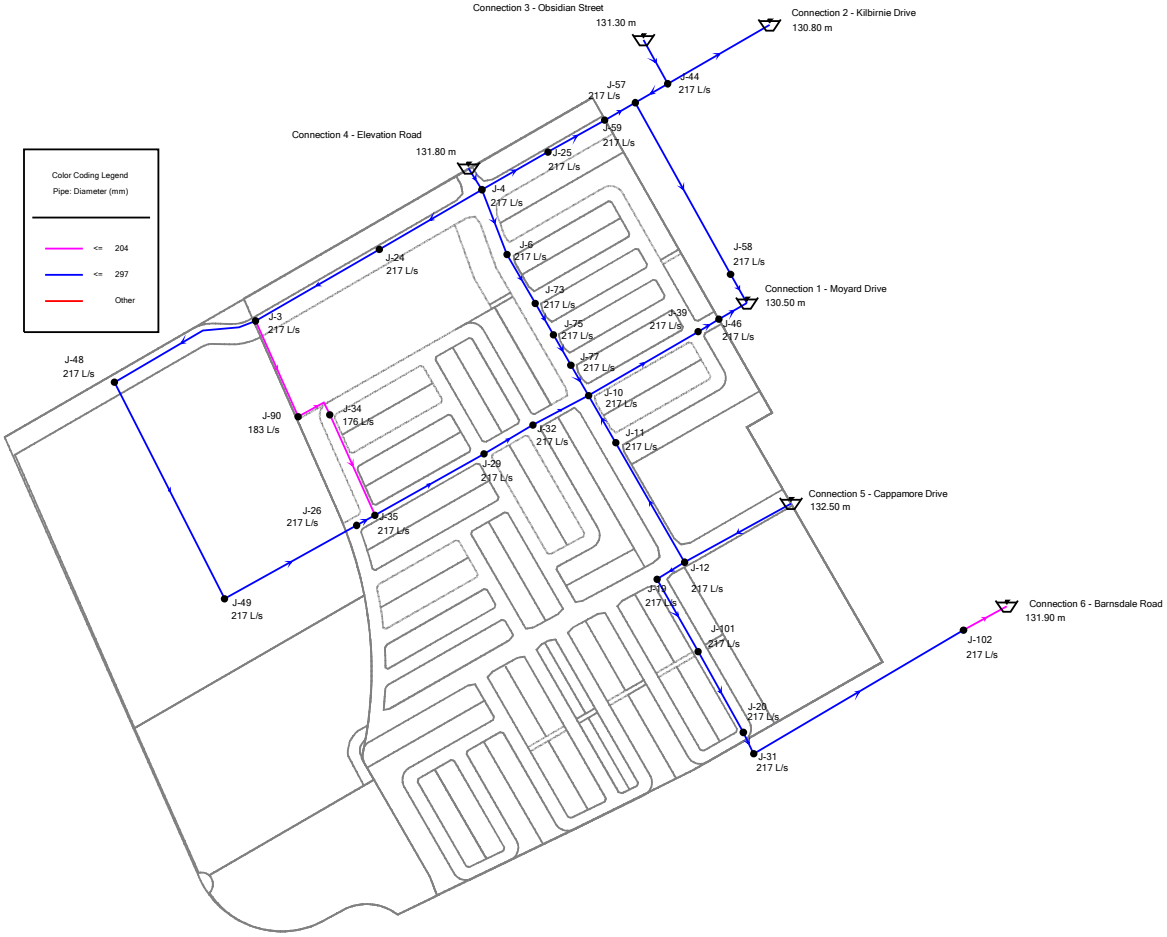
Barrhaven South Phase 3 - S1 Area

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
219	J-53	217	217	True	140	163	173	J-52
222	J-54	217	217	True	140	154	149	J-55
224	J-55	217	217	True	140	154	147	J-54
226	J-56	217	217	True	140	156	153	J-52
235	J-57	217	217	True	140	175	176	J-46
239	J-58	217	222	True	140	175	176	J-46
242	J-59	217	217	True	140	175	175	J-46
319	J-73	217	217	True	140	174	184	J-46
326	J-75	217	217	True	140	174	187	J-46
333	J-77	217	217	True	140	174	192	J-46
356	J-83	217	217	True	140	173	186	J-48
368	J-87	217	217	True	140	174	183	J-46
372	J-88	217	217	True	140	174	183	J-46
408	J-94	217	217	True	140	174	201	J-46
415	J-96	217	217	True	140	174	211	J-46
447	J-101	217	217	True	140	174	211	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 6 Model
Overall View



Barrhaven South Phase 3 - S1 Area

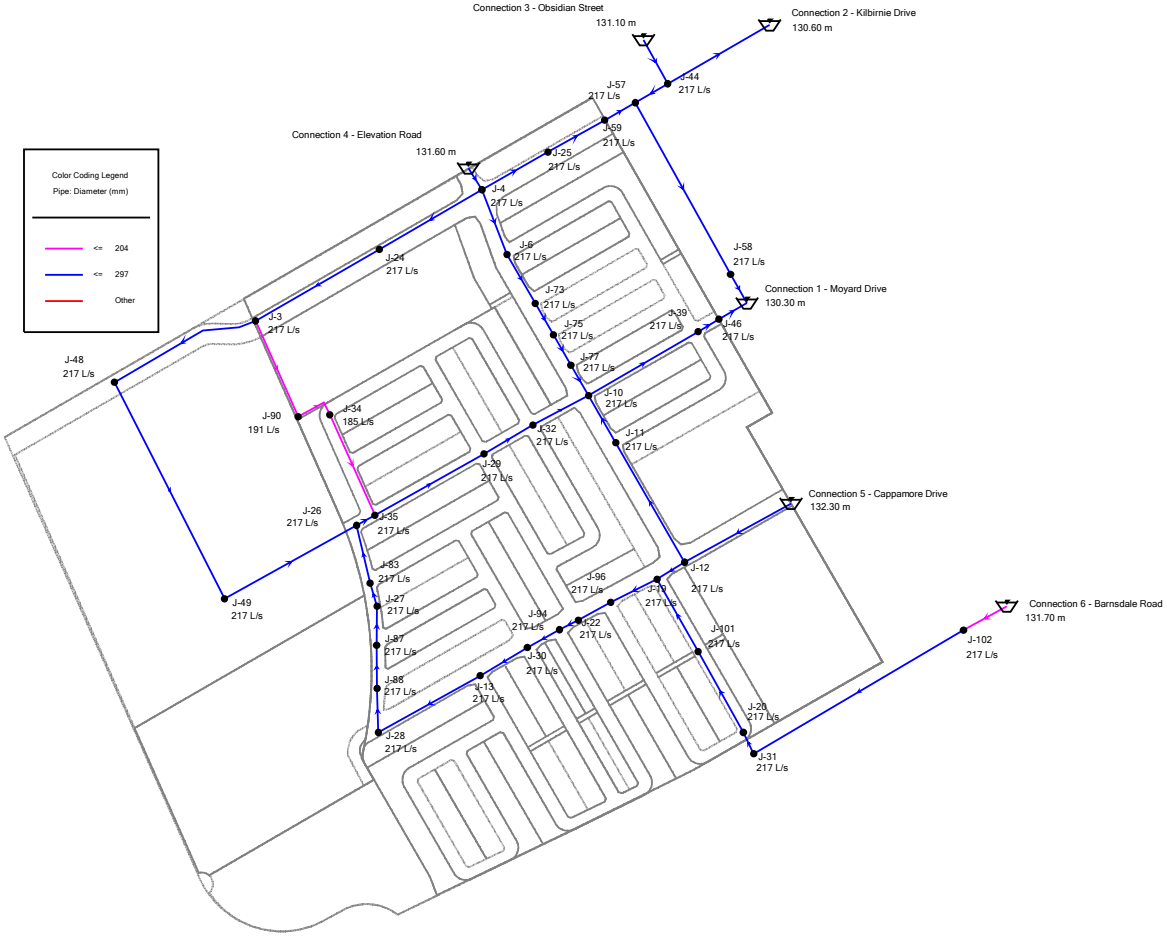
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)

Phase 6 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	176	176	True	140	167	140	J-90
392	J-90	183	183	True	140	155	140	J-34
34	J-3	217	217	True	140	178	175	J-48
35	J-4	217	217	True	140	204	220	J-46
39	J-6	217	219	True	140	203	212	J-46
47	J-10	217	220	True	140	203	227	J-46
49	J-11	217	217	True	140	203	225	J-46
51	J-12	217	222	True	140	203	251	J-46
70	J-19	217	217	True	140	203	247	J-46
73	J-20	217	218	True	140	204	222	J-46
87	J-24	217	217	True	140	195	193	J-3
90	J-25	217	217	True	140	204	207	J-46
93	J-26	217	221	True	140	186	198	J-48
100	J-29	217	219	True	140	200	214	J-48
108	J-31	217	217	True	140	204	248	J-46
112	J-32	217	217	True	140	203	218	J-46
119	J-35	217	217	True	140	188	199	J-48
131	J-39	217	217	True	140	199	204	J-46
144	J-44	217	217	True	140	205	213	J-46
152	J-46	217	217	True	140	208	198	J-39
205	J-48	217	217	True	140	183	155	J-3
208	J-49	217	217	True	140	174	174	J-48
235	J-57	217	217	True	140	205	206	J-46
239	J-58	217	222	True	140	205	205	J-46
242	J-59	217	217	True	140	205	204	J-46
319	J-73	217	217	True	140	203	213	J-46
326	J-75	217	217	True	140	203	216	J-46
333	J-77	217	217	True	140	203	221	J-46
447	J-101	217	217	True	140	204	238	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 7 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	185	185	True	140	169	140	J-90
392	J-90	191	191	True	140	157	140	J-34
34	J-3	217	217	True	140	186	181	J-48
35	J-4	217	217	True	140	202	219	J-46
39	J-6	217	219	True	140	201	210	J-46
47	J-10	217	220	True	140	201	226	J-46
49	J-11	217	217	True	140	201	223	J-46
51	J-12	217	222	True	140	201	251	J-46
56	J-13	217	217	True	140	201	221	J-46
70	J-19	217	217	True	140	201	250	J-46
73	J-20	217	218	True	140	202	223	J-46
77	J-22	217	217	True	140	201	229	J-46
87	J-24	217	217	True	140	198	194	J-3
90	J-25	217	217	True	140	203	206	J-46
93	J-26	217	221	True	140	199	218	J-48
95	J-27	217	217	True	140	201	212	J-46
97	J-28	217	217	True	140	201	213	J-46
100	J-29	217	219	True	140	201	220	J-46
103	J-30	217	219	True	140	201	222	J-46
108	J-31	217	217	True	140	202	248	J-46
112	J-32	217	218	True	140	201	220	J-46
119	J-35	217	217	True	140	200	217	J-48
131	J-39	217	217	True	140	197	202	J-46
144	J-44	217	217	True	140	203	211	J-46
152	J-46	217	217	True	140	206	196	J-39
205	J-48	217	217	True	140	190	165	J-3
208	J-49	217	217	True	140	185	188	J-48
235	J-57	217	217	True	140	203	204	J-46
239	J-58	217	222	True	140	203	203	J-46
242	J-59	217	217	True	140	203	202	J-46

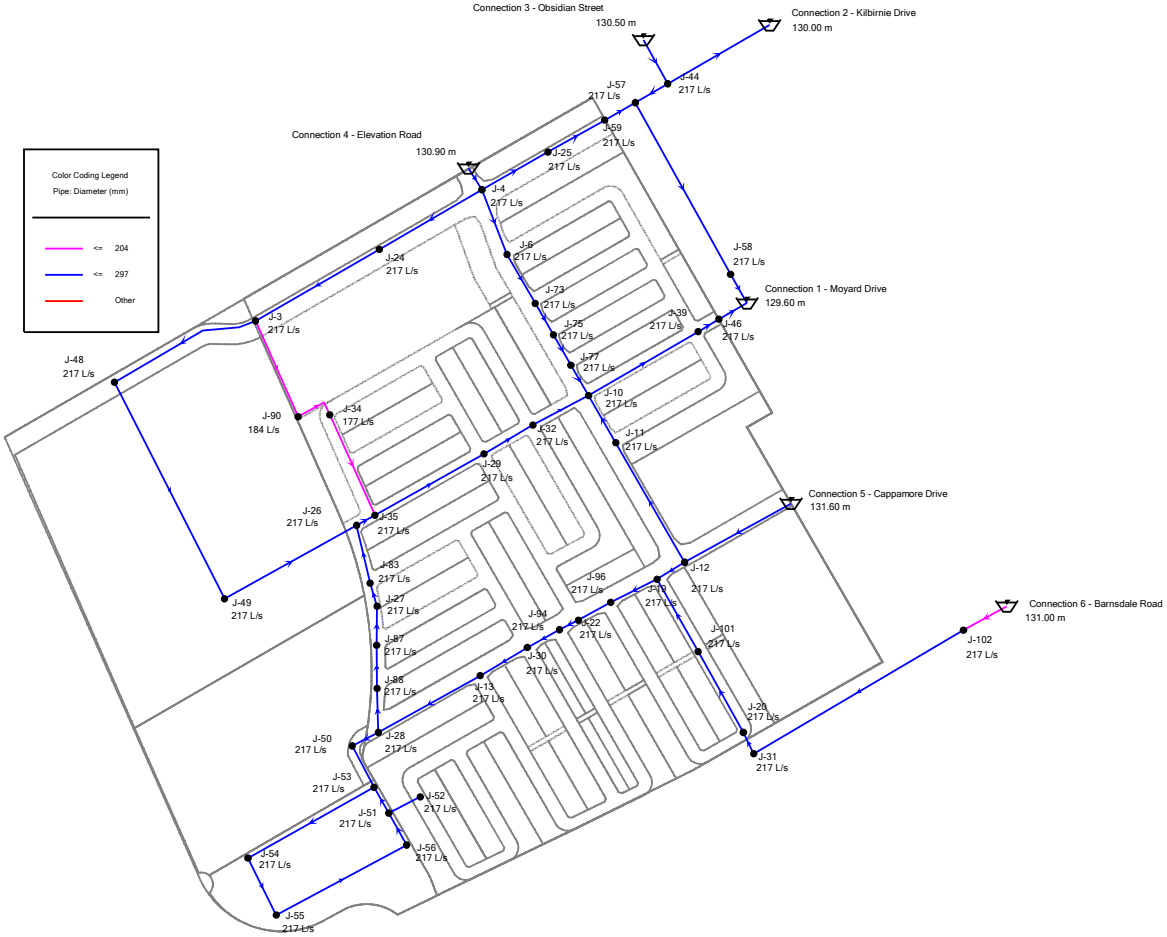
Barrhaven South Phase 3 - S1 Area

Phase 7 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
319	J-73	217	217	True	140	201	211	J-46
326	J-75	217	217	True	140	201	215	J-46
333	J-77	217	217	True	140	201	219	J-46
356	J-83	217	217	True	140	201	214	J-48
368	J-87	217	217	True	140	201	211	J-46
372	J-88	217	217	True	140	201	211	J-46
408	J-94	217	217	True	140	201	230	J-46
415	J-96	217	217	True	140	201	239	J-46
447	J-101	217	217	True	140	201	239	J-46

Barrhaven South Phase 3 - S1 Area
Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)
Phase 8 Model
Overall View



Barrhaven South Phase 3 - S1 Area

Future SUC Pressure Zone - Maximum Day + Fire Flow (RFF = 217 L/s)

Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
117	J-34	177	177	True	140	167	140	J-90
392	J-90	184	184	True	140	156	140	J-34
34	J-3	217	217	True	140	179	174	J-48
35	J-4	217	217	True	140	195	212	J-46
39	J-6	217	219	True	140	194	204	J-46
47	J-10	217	220	True	140	194	219	J-46
49	J-11	217	217	True	140	194	216	J-46
51	J-12	217	222	True	140	194	244	J-46
56	J-13	217	219	True	140	194	213	J-46
70	J-19	217	217	True	140	194	243	J-46
73	J-20	217	218	True	140	195	216	J-46
77	J-22	217	219	True	140	194	222	J-46
87	J-24	217	217	True	140	191	187	J-3
90	J-25	217	217	True	140	196	199	J-46
93	J-26	217	221	True	140	192	211	J-48
95	J-27	217	217	True	140	194	205	J-46
97	J-28	217	217	True	140	194	205	J-46
100	J-29	217	219	True	140	194	213	J-46
103	J-30	217	219	True	140	194	214	J-46
108	J-31	217	217	True	140	195	241	J-46
112	J-32	217	218	True	140	194	213	J-46
119	J-35	217	217	True	140	193	209	J-48
131	J-39	217	217	True	140	190	195	J-46
144	J-44	217	217	True	140	196	205	J-46
152	J-46	217	217	True	140	199	190	J-39
205	J-48	217	217	True	140	183	158	J-3
208	J-49	217	217	True	140	178	181	J-48
211	J-50	217	218	True	140	194	198	J-46
213	J-51	217	217	True	140	175	185	J-52
215	J-52	217	217	True	140	181	161	J-56

Barrhaven South Phase 3 - S1 Area

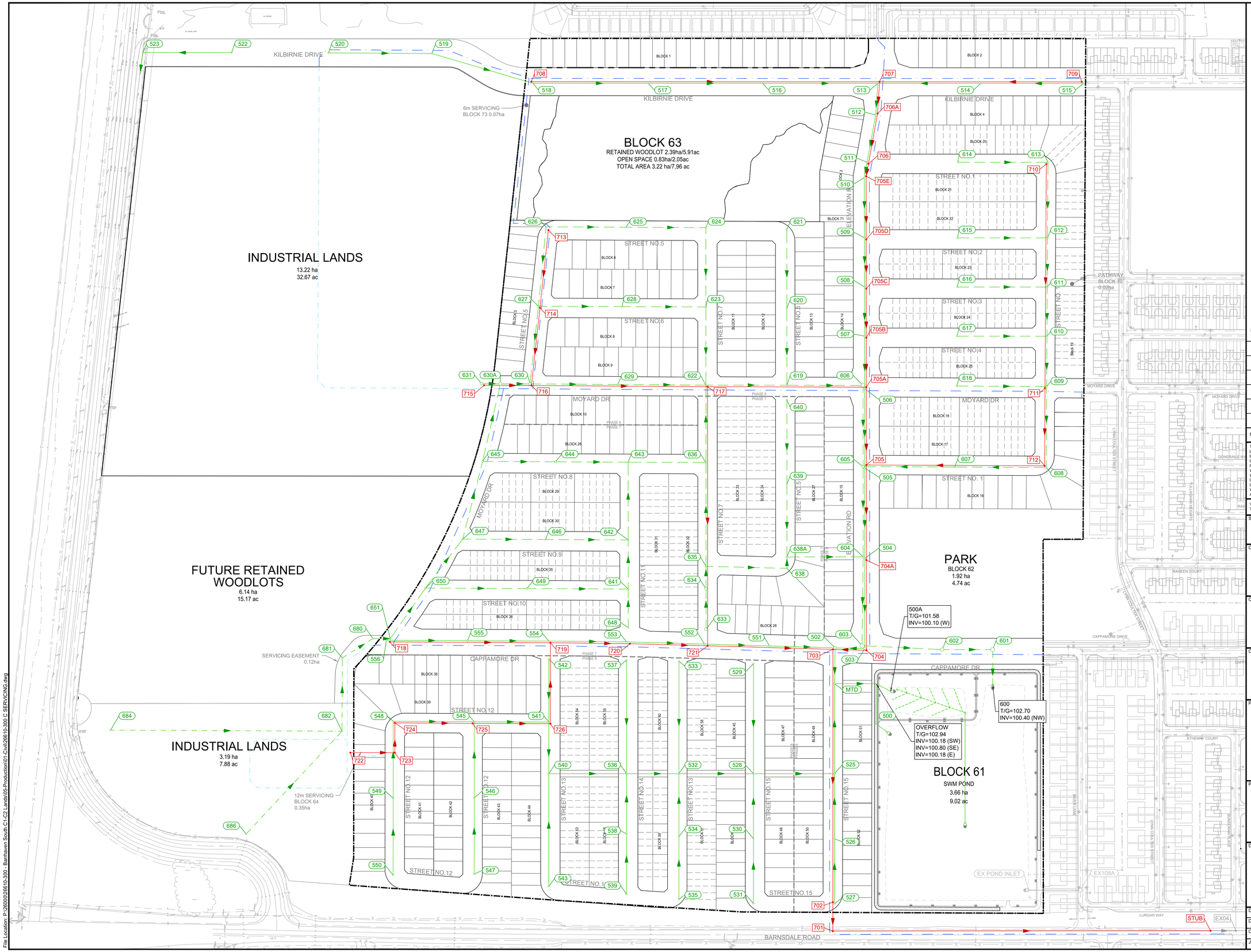
Phase 8 Fire Flow Results Table

Fire Flow Results Table - Time: 0.00 hours

ID	Label	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
219	J-53	217	217	True	140	183	194	J-52
222	J-54	217	217	True	140	175	169	J-55
224	J-55	217	217	True	140	175	168	J-54
226	J-56	217	217	True	140	177	174	J-52
235	J-57	217	217	True	140	196	197	J-46
239	J-58	217	222	True	140	196	197	J-46
242	J-59	217	217	True	140	196	196	J-46
319	J-73	217	217	True	140	194	205	J-46
326	J-75	217	217	True	140	194	208	J-46
333	J-77	217	217	True	140	194	213	J-46
356	J-83	217	217	True	140	194	207	J-48
368	J-87	217	217	True	140	194	203	J-46
372	J-88	217	217	True	140	194	204	J-46
408	J-94	217	217	True	140	194	222	J-46
415	J-96	217	217	True	140	194	231	J-46
447	J-101	217	217	True	140	195	232	J-46

Appendix K

Drawings


KILBIRNIE DRIVE
BLOCK 63
RETAINED WOODLOT 2.39ha/5.91ac
OPEN SPACE 0.83ha/2.05ac
TOTAL AREA 3.22 ha/7.96 ac
INDUSTRIAL LANDS
13.22 ha
32.67 ac
6m SERVICING
BLOCK 73 0.07ha
STREET NO.5
STREET NO.6
STREET NO.7
STREET NO.8
STREET NO.9
STREET NO.10
STREET NO.11
STREET NO.12
STREET NO.13
STREET NO.14
STREET NO.15
STREET NO.1
STREET NO.2
STREET NO.3
STREET NO.4
MOYARD DR
ELEVATION RD
CAPPAMORE DR
PARK
BLOCK 62
1.92 ha
4.74 ac
500A
T/G=101.58
INV=100.10 (W)
600
T/G=102.70
INV=100.40 (NW)
OVERFLOW
T/G=102.94
INV=100.18 (SW)
INV=100.80 (SE)
INV=100.18 (E)
BLOCK 61
SWM POND
3.66 ha
9.02 ac
PATHWAY
BLOCK 70
0.02ha
FUTURE RETAINED
WOODLOTS
6.14 ha
15.17 ac
INDUSTRIAL LANDS
3.19 ha
7.88 ac
SERVICING EASEMENT
0.12ha
12m SERVICING
BLOCK 64
0.35ha
EX POND INLET
EX108A
EX04
STUB
BARNSDALE ROAD
LURGAN WAY
RAHEEN COURT
ATHENRY COURT
DONNERAILE WAY
TULLAMAINE HEIGHTS
LITHIA CRESCENT
MONTCALM STREET
BRIDGEDALE PLACE
LEGEND:
LIMIT OF STUDY AREA
PHASING LIMITS
CONVENTIONAL STORM SEWER
EES STORM SEWER
INDUSTRIAL LANDS STORM SEWER
SANITARY SEWER
WATERMAIN
INDUSTRIAL LANDS WATERMAIN SERVICE
EXISTING STORM SEWER
EXISTING SANITARY SEWER
EXISTING WATERMAIN
NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.
3 RE-ISSUED AS PART OF FINAL MSS ADDENDUM 27/05/26
2 RE-ISSUED AS PART OF DRAFT MSS ADDENDUM 10/04/26
1 ISSUED AS PART OF DRAFT MSS ADDENDUM 23/10/25
No. ISSUE / REVISION DD/MM/YY
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PROJECT NORTH
PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD
DRAWING:
KEY SERVICING PLAN
DESIGN: KF/GF
DRAWN: KC
CHECKED: KF/GF
JLR #: 26610-300
DRAWING #:
KS1
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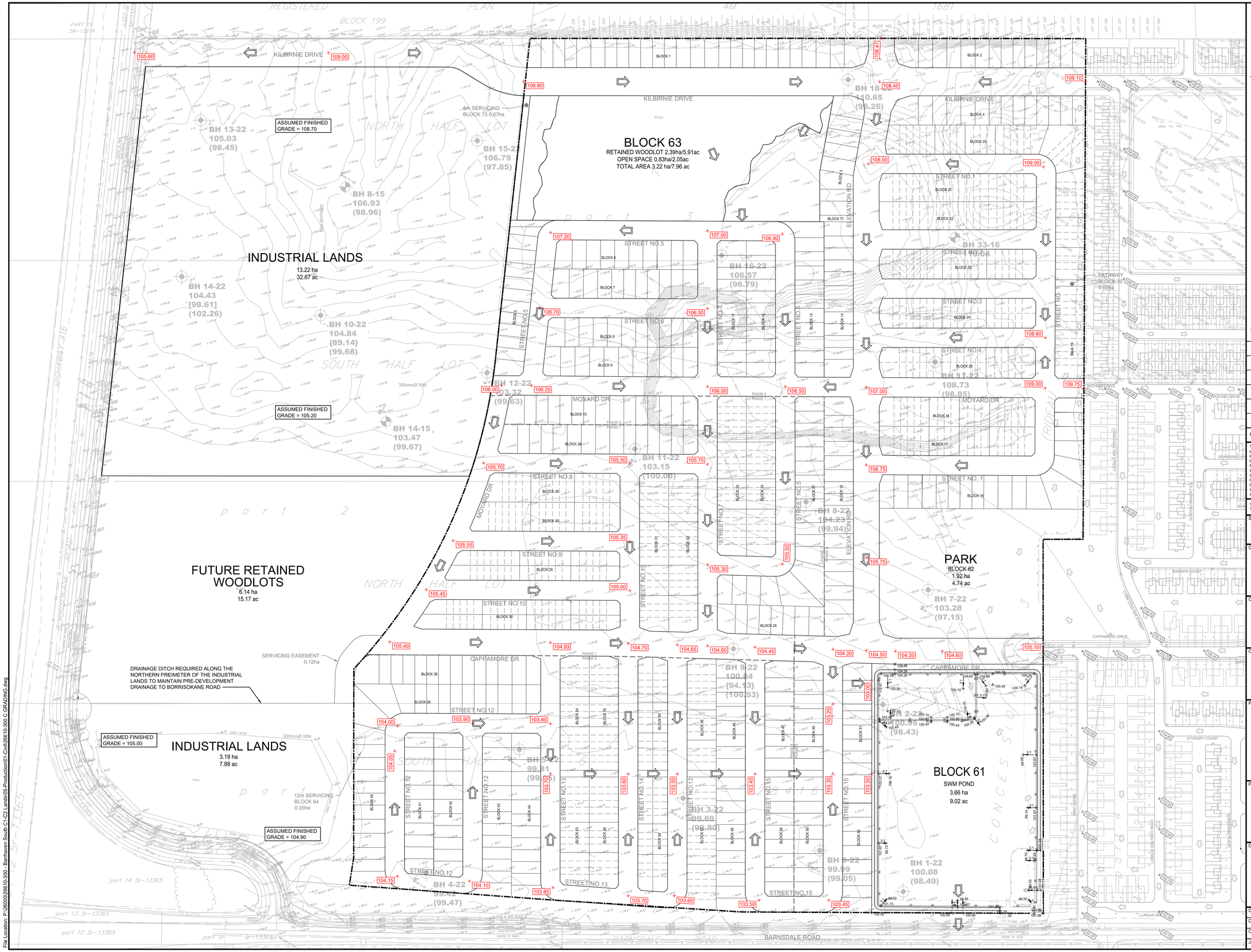

LEGEND:

- LIMIT OF STUDY AREA
- 108.40 PROPOSED CENTRELINE DESIGN GRADES
- + 108.40 PROPOSED DESIGN GRADES
- × 109.30 EXISTING/PROPOSED CENTRELINE DESIGN GRADES
- BH 8-15 106.93 (98.96) BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER K.R. FERREY MORENO 100122432 2026-05-28 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
MASTER GRADING PLAN

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MG1

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C GRADING.dwg

PLOT DATE: Wednesday, May 27, 2026, 3:33:23 PM

LEGEND:

- LIMIT OF STUDY AREA
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- INDUSTRIAL LANDS STORM SEWER
- PERFORATED PIPE
- EXISTING STORM SEWER
- STORM DRAINAGE BOUNDARY
- AREA IN HECTARES
- RUNOFF COEFFICIENT
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
522	523	375	0.25%	81.88	104.986	104.781
550	549	450	0.20%	71.20	102.571	102.429
549	548	525	0.20%	71.20	102.429	102.286
548	545	600	0.15%	75.02	102.286	102.174
547	546	450	0.20%	70.49	102.456	102.315
546	545	525	0.20%	70.49	102.315	102.174
545	541	750	0.15%	69.00	102.174	102.070
542	541	375	0.30%	58.34	102.245	102.070
541	540	825	0.15%	47.74	102.070	101.999
543	540	450	0.20%	104.45	102.208	101.999
540	536	825	0.15%	72.00	101.999	101.891
537	536	375	0.30%	165.23	102.206	101.891
539	538	450	0.20%	55.72	102.114	102.002
538	536	450	0.20%	55.72	102.002	101.891
536	532	900	0.15%	48.50	101.891	101.818
533	532	375	0.35%	103.93	102.182	101.818
535	534	450	0.20%	58.20	102.051	101.934
534	532	450	0.20%	58.20	101.934	101.818
532	528	975	0.15%	69.00	101.818	101.714
529	528	375	0.30%	101.87	102.020	101.714
531	530	450	0.20%	60.10	101.955	101.835
530	528	450	0.20%	60.10	101.835	101.714
528	525	975	0.15%	74.99	101.714	101.602
556	555	525	0.16%	75.20	102.200	102.079
555	554	525	0.16%	75.20	102.079	101.959
554	553	600	0.16%	72.01	101.959	101.844
553	552	600	0.16%	72.08	101.844	101.729
552	551	675	0.16%	69.25	101.729	101.632
551	502	675	0.16%	60.77	101.632	101.535
520	519	450	0.20%	95.85	107.100	106.908
519	518	525	0.15%	97.40	106.908	106.762
518	517	600	0.15%	106.64	106.762	106.602
517	516	675	0.15%	105.97	106.002	105.443
516	513	675	0.20%	106.63	106.443	106.230
515	514	450	0.20%	95.14	106.610	106.420
514	513	525	0.20%	95.15	106.420	106.230
513	512	675	0.45%	26.32	106.230	105.988
512	511	675	0.45%	44.46	106.098	105.898
511	510	675	0.45%	14.54	105.898	105.832
510	509	675	0.45%	55.69	105.832	105.582
509	508	675	0.50%	45.50	105.582	105.354
508	507	675	0.50%	45.50	105.354	105.127
507	506	675	0.50%	48.77	105.127	104.883
506	505	750	0.50%	73.50	104.883	104.515
505	504	750	0.50%	83.54	104.515	104.098
504	503	750	0.60%	83.54	104.098	103.596
503	502	975	0.13%	27.54	101.576	101.535
502	MTD	975	0.30%	33.22	101.535	101.435
527	526	375	0.25%	60.15	101.903	101.753
526	525	450	0.25%	60.33	101.753	101.602
525	MTD	975	0.20%	83.30	101.602	101.435
MTD	OVERFLOW	1050	0.50%	38.50	101.435	101.243
OVERFLOW	500A	1050	0.50%	10.21	101.243	101.167
OVERFLOW	500	600	0.50%	37.15	101.410	101.224
500	PONO	600	0.50%	12.95	101.224	101.159

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
686	682	675	0.15%	80.00	103.744	103.624
684	682	675	0.15%	80.00	103.744	103.624
682	681	825	0.15%	67.89	103.624	103.522
681	680	825	0.15%	33.43	103.522	103.472
680	651	825	0.15%	16.15	103.472	103.448
651	650	825	0.15%	57.03	103.448	103.363
650	647	825	0.15%	56.94	103.363	103.277
647	645	825	0.15%	74.23	103.277	103.166
645	630A	825	0.15%	73.79	103.166	103.055
650	649	375	0.25%	93.85	103.803	103.658
649	641	450	0.20%	93.85	103.658	103.470
648	641	300	0.35%	35.70	103.595	103.470
641	642	525	0.20%	45.50	103.470	103.379
647	640	450	0.20%	76.69	103.586	103.532
646	642	450	0.20%	76.69	103.532	103.379
642	643	750	0.15%	72.00	103.379	103.307
645	644	375	0.25%	67.58	103.644	103.475
644	643	450	0.22%	67.11	103.475	103.307
643	636	750	0.15%	72.00	103.307	103.199
635	636	450	0.20%	96.07	103.591	103.399
636	622	750	0.20%	71.72	103.199	103.056
640	639	375	0.45%	78.03	104.550	104.199
639	639A	450	0.50%	67.47	104.199	103.862
633	634	300	0.35%	37.40	103.603	103.472
634	635	300	0.35%	20.90	103.472	103.399
635	638	525	0.16%	74.97	103.399	103.279
638	638A	525	0.15%	76.56	103.279	103.262
638A	604	675	0.15%	70.56	103.262	103.156
626	627	450	1.00%	73.80	104.706	103.962
627	630	525	0.50%	72.39	103.962	103.600
631	630A	1500	0.15%	17.01	103.667	103.641
630A	630	1500	0.15%	27.37	103.641	103.600
630	629	1500	0.15%	81.40	103.600	103.478
629	622	1800	0.15%	81.40	103.478	103.356
626	625	375	0.70%	73.88	105.047	104.678
625	624	375	0.50%	74.01	104.678	104.308
624	623	375	1.00%	73.50	104.308	103.573
627	628	525	0.50%	77.46	104.347	103.960
628	623	525	0.50%	77.46	103.960	103.573
623	622	750	0.50%	72.39	103.573	103.356
622	619	1800	0.20%	75.00	103.356	103.206
621	620	375	0.50%	72.75	103.926	103.562
620	619	450	0.50%	71.26	103.562	103.206
619	606	1800	0.20%	70.51	103.206	103.065
606	605	1800	0.20%	75.01	103.065	102.915
614	613	450	1.00%	83.37	106.008	105.175
613	612	525	0.50%	69.95	105.175	104.825
615	612	375	0.50%	83.32	105.242	104.825
612	611	675	0.50%	45.50	104.825	104.597
616	611	375	0.50%	83.29	105.014	104.597
611	610	675	0.50%	45.50	104.597	104.370
617	610	375	0.50%	83.24	104.786	104.370
610	609	750	0.50%	46.56	104.370	104.137
618	609	450	0.50%	83.19	104.553	104.137
609	608	825	0.50%	75.00	104.137	103.762
608	607	825	0.50%	84.74	103.762	103.338
607	605	825	0.50%	84.74	103.338	102.915
605	604	1800	0.25%	83.52	102.915	102.706
604	603	1800	0.30%	82.32	102.706	102.459
603	602	1800	0.15%	74.34	102.459	102.348
602	601	1800	0.15%	46.69	102.348	102.278
601	600	1800	0.15%	32.50	102.278	102.229

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
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1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER — K.R. FERREY MORENO — 100122432 — 2026-05-28 — PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

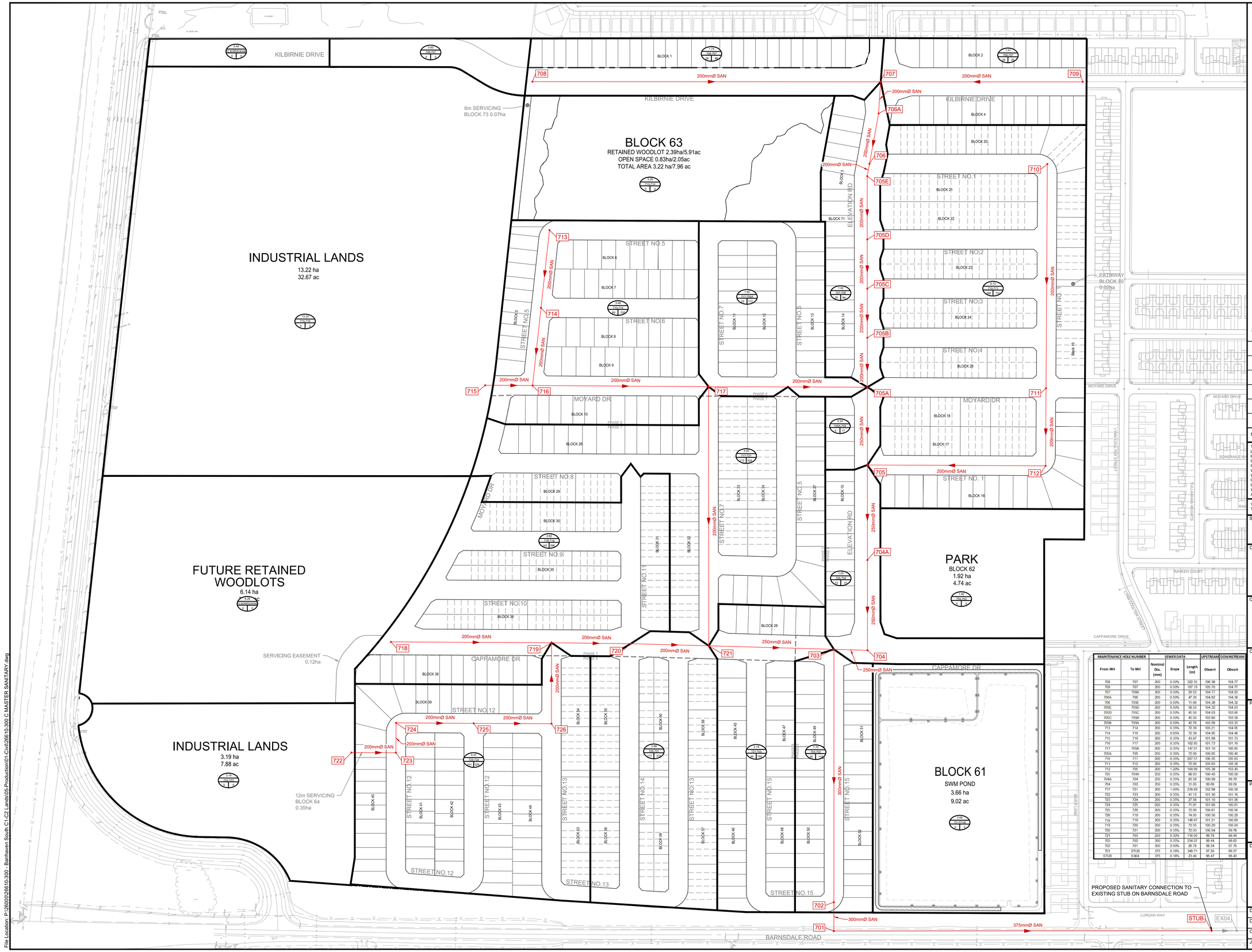
MASTER STORM

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MST

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C-MASTER STORM.dwg

PLOT DATE: Wednesday, May 27, 2026 3:33:50 PM



LEGEND:

- LIMIT OF STUDY AREA
- SANITARY SEWER
- EXISTING SANITARY SEWER
- SANITARY DRAINAGE BOUNDARY
- AREA IN HECTARES
- PIPE REACH UPSTREAM MAINTENANCE HOLE TO DOWNSTREAM MAINTENANCE HOLE
- POPULATION
- NUMBER OF UNITS

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

MAINTENANCE HOLE NUMBER		SEWER DATA			UPSTREAM	DOWNSTREAM
From MH	To MH	Nominal Dia. (mm)	Slope	Length (m)	Obvert	Obvert
708	707	200	0.50%	322.35	106.38	104.77
709	707	200	0.50%	187.19	105.70	104.77
707	709A	200	0.50%	29.52	104.77	104.62
706A	706	200	0.50%	47.30	104.62	104.38
706	705E	200	0.50%	11.66	104.38	104.32
705E	705D	200	0.50%	58.53	104.32	104.03
705D	705C	200	0.50%	45.50	104.03	103.80
705C	705B	200	0.50%	45.50	103.80	103.58
705B	705A	200	0.50%	45.78	103.58	103.35
713	714	200	0.35%	72.39	105.21	104.95
714	716	200	0.65%	72.39	104.95	104.48
715	716	200	0.35%	43.87	101.89	101.73
716	717	200	0.35%	162.65	101.73	101.16
717	705A	200	0.35%	147.01	101.16	100.65
705A	705	250	0.35%	72.55	100.65	100.40
710	711	200	0.35%	207.51	106.35	105.63
711	712	200	0.35%	72.00	105.63	105.38
712	705	200	1.20%	104.98	105.38	103.40
705	704A	250	0.35%	88.03	100.40	100.09
704A	704	250	0.35%	83.59	100.09	99.79
704	703	250	0.35%	31.05	99.69	99.59
717	721	200	1.00%	239.89	102.98	100.58
722	723	200	0.35%	41.12	101.30	101.16
723	724	200	0.35%	27.56	101.16	101.06
724	725	200	0.35%	71.91	101.06	100.81
725	726	200	0.35%	72.00	100.81	100.56
726	719	200	0.35%	74.93	100.56	100.29
718	719	200	0.35%	148.67	101.21	100.69
719	720	200	0.35%	73.55	100.29	100.04
720	721	200	0.35%	72.03	100.04	99.78
721	703	250	0.30%	116.00	99.78	99.44
703	702	300	0.35%	234.07	99.44	99.62
702	701	300	2.00%	26.78	98.24	97.70
701	STUB	375	0.18%	349.71	97.20	96.57
STUB	EX04	375	0.18%	23.40	96.47	96.43

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SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
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CONSULTANT:

PROFESSIONAL STAMP
LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

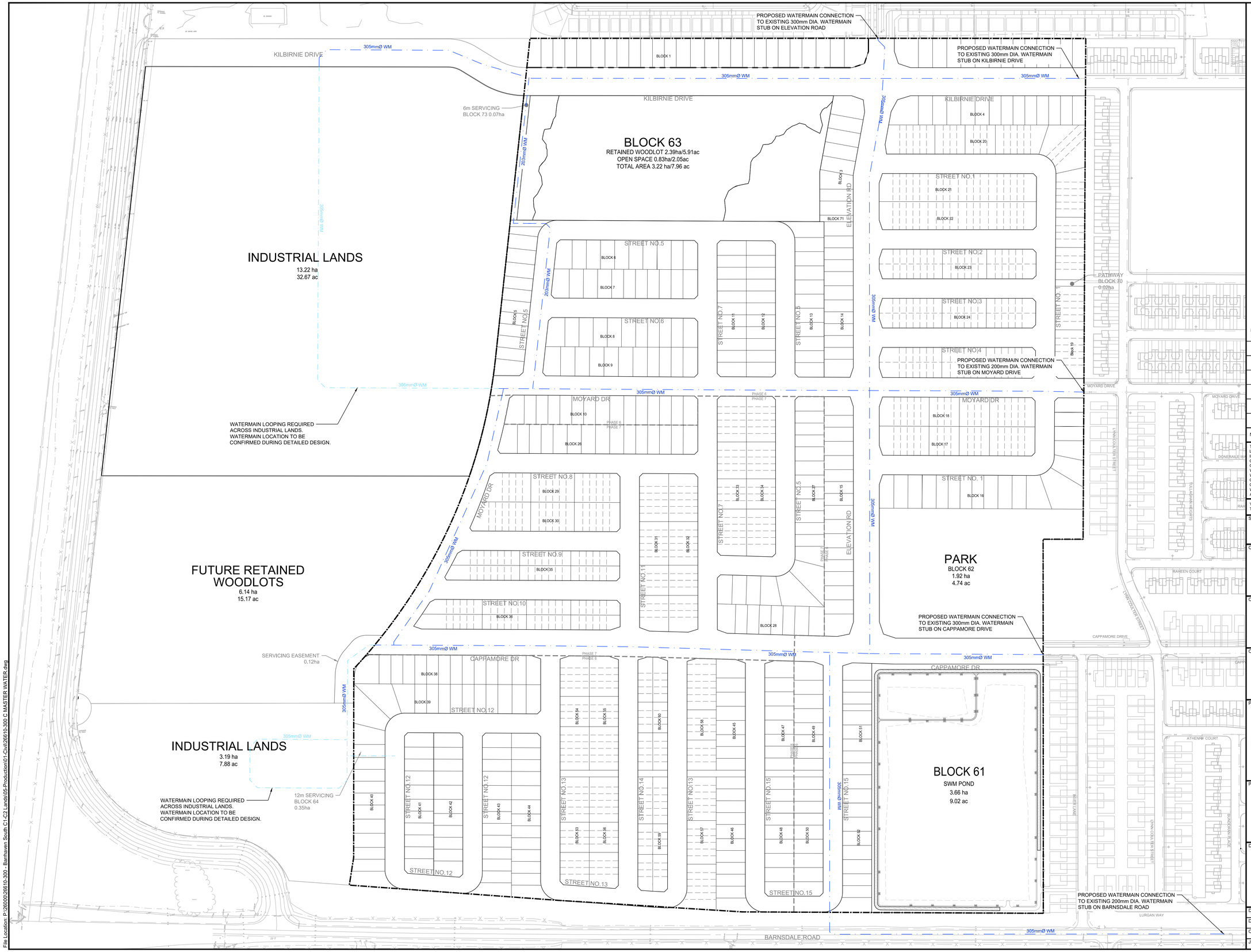
DRAWING:
MASTER SANITARY

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MSAN

File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C MASTER SANITARY.dwg

PLOT DATE: Wednesday, May 27, 2026 3:34:16 PM



LEGEND:

- LIMIT OF STUDY AREA
- WATERMAIN
- INDUSTRIAL LANDS WATERMAIN LOOPING
- EXISTING WATERMAIN

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
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CONSULTANT:

PROFESSIONAL STAMP
LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
MASTER WATERMAIN

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: MWM

File Location: P:\26\00\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C MASTER WATER.dwg

PLOT DATE: Wednesday, May 27, 2026 8:18:54 PM

BLOCK 61

SWM POND

3.66 ha

9.02 ac

CAPPAMORE DR

CAPPAMORE DRIVE

BARNSDALE ROAD

STREET NO.15

BLOCK 45

BLOCK 46

BLOCK 47

BLOCK 48

BLOCK 49

BLOCK 50

BLOCK 51

BLOCK 52

PHASE 8

PHASE 6

BH 9-22
100.84
(94.13)
(100.53)

BH 2-22
100.95
(98.43)

BH 6-22
99.99
(99.05)

BH 1-22
100.08
(98.49)

OUTLET STRUCTURE COMPLETE WITH RIP RAP AND PLUNGE POOL. DIMENSIONS TO BE FINALIZED AT DETAILED DESIGN.

OUTLET STRUCTURE COMPLETE WITH RIP RAP AND PLUNGE POOL. DIMENSIONS TO BE FINALIZED AT DETAILED DESIGN.

150mmØ PERFORATED PIPE. LAYOUT TO BE FINALIZED AT DETAILED DESIGN.

200mmØ PVC DR-35

3.0m ACCESS/MAINTENANCE ROAD

OUTLET STRUCTURE TO BE SIZED AT DETAILED DESIGN COMPLETE WITH
335mm ORIFICE AT 98.45m
250mm X 900mm RECTANGULAR ORIFICE AT 100.80m

EX POND INLET

EX108A

INVER LANE

TALBOT A

BARRIER CURB

TOP/BANK

DITCH

EDGE/GRAVEL

EDGE/ASPHALT

CENTRE OF ROAD

01 D2

02 D2

03 D2

LEGEND:

- LIMIT OF STUDY AREA
- 108.40 PROPOSED CENTRELINE DESIGN GRADES
- 108.40 PROPOSED DESIGN GRADES
- 109.30 EXISTING/PROPOSED CENTRELINE DESIGN GRADES
- BH 8-15 106.93 (98.96) BOREHOLE WITH MONITORING WELL FROM PATERSON REPORT PG6197-2 REVISION 1 DATED JUNE 27, 2025
- CONVENTIONAL STORM SEWER
- EES STORM SEWER
- PERFORATED PIPE
- EXISTING STORM SEWER
- 3m ACCESS/MAINTENANCE ROAD

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

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CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER — K.R. FERREY MORENO — 100122432 — 2026-05-28 — PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

FILTRATION AND DRY POND

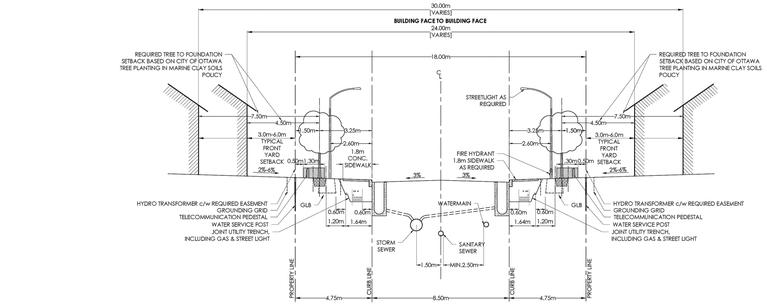
DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300

DRAWING #: POND

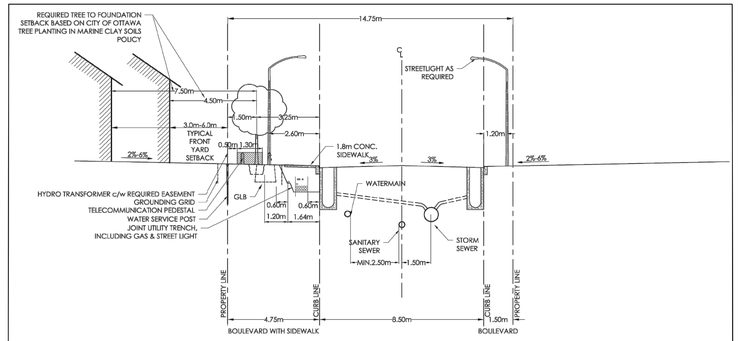
File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C POND.dwg

PLOT DATE: Tuesday, May 26, 2026 2:45:30 PM

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. 18M RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE.
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
4. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
5. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6M CLEARANCE FROM STRUCTURES E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
8. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049. HELD BY HYDRO OTTAWA.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038.
13. CLEARANCES SHOWN ARE MINIMUMS.



Ottawa	18.0m ROW CROSS SECTION
REV.DATE:	AUG. 2022
DWG. No.	ROW-18.0



NOTES:

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS
2. 14.75m RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS
4. TYPICAL FRONT YARD SETBACKS ARE TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS
5. FIRE HYDRANTS SHALL BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. STREETLIGHTS MAY BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
8. GAS MAIN SHALL HAVE A MINIMUM OF 0.6m CLEARANCE FROM STRUCTURES (E.G. CATCH BASINS AND HYDRANTS) AND 1.2m FROM TREE ROOT BALL
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049. HELD BY HYDRO OTTAWA
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038
13. BOULEVARD MAXIMUM SLOPE 1:3
14. NO RETAINING WALLS WITHIN 2.0m OF THE CURB LINE
15. CLEARANCES SHOWN ARE MINIMUMS

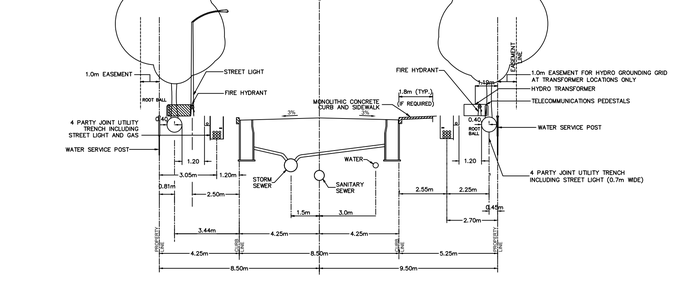
Ottawa	TITLE: 14.75m ROW CROSS SECTION
DATE:	AUG 2022
REV:	JULY 2024
DWG No:	ROW-14.75

NOTES:

1. THE STANDARD ROW CROSS SECTIONS INDICATE MINIMUM DIMENSIONS THAT ARE TO BE INCORPORATED INTO THE DESIGN OF ANY NEW DEVELOPMENTS INVOLVING NEW AND EXISTING STREETS. ANY VARIATIONS TO THE STANDARD ROW CROSS SECTIONS ARE SUBJECT TO THE INFRASTRUCTURE SERVICES DEVIATION PROCESS. CONTACT THE STANDARDS UNIT AT STANDARDSSECTION@OTTAWA.CA FOR MORE INFORMATION.
2. ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH APPLICABLE CITY STANDARDS, GUIDELINES, AND POLICES, INCLUDING COORDINATED UTILITY PLANS, GRADING PLANS AND LOCAL AREA PLANS. REFER ALSO TO UTILITY PARTNER STANDARD PLANT LOCATIONS.
3. ALL CROSS SECTIONS MAY BE SUBJECT TO SUBSEQUENT TRAFFIC CALMING MEASURES, TO BE DETERMINED THROUGH PLAN OF SUBDIVISION OR SEPARATE TRANSPORTATION STUDIES.
4. TYPICAL CROSS SECTION BOULEVARD WIDTH SHALL BE MAINTAINED WHEN CONSTRUCTING CUL-DE-SACS AND CORNER LOTS, REGARDLESS OF ROADWAY GEOMETRY.
5. WATERMAINS, WATER SERVICES, AND ASSOCIATED APPURTENANCES SHALL BE CONSTRUCTED PER THE WATER DESIGN GUIDELINES.
6. WATERMAIN AND HYDRANTS TO BE INSTALLED ON SOUTH AND EAST SIDE OF ROW, WHERE POSSIBLE.
7. SEWERS AND SEWER SERVICES SHALL BE CONSTRUCTED PER THE SEWER DESIGN GUIDELINES.
8. IN-ROAD CATCH BASINS SHALL ONLY BE USED ON RESIDENTIAL ROADS WITHOUT BUS TRAFFIC OR AS OTHERWISE DIRECTED BY THE SEWER DESIGN GUIDELINES.
9. BARRIER CURB SHALL BE USED ON ALL RESIDENTIAL ROADS WITH SINGLE FAMILY DWELLINGS. MOUNTABLE CURB MAY ONLY BE USED FOR AREAS WITH FREQUENT CURB-CUTS, SUCH AS TOWNHOME DEVELOPMENTS, WITH APPROVAL FROM THE CITY.
10. WATER AND SEWER SERVICES SHALL BE LAID AS PER CITY STANDARD DETAIL DRAWINGS, THE COORDINATED UTILITY PLAN, AND IN COORDINATION WITH ALL OTHER ELEMENTS IN THE ROW.
11. WHERE LOCATING WATER AND SEWER SERVICES UNDERNEATH LANDSCAPED AREAS WOULD PREVENT THE PLANTING OF A TREE, THEY MAY BE RUN UNDERNEATH THE DRIVEWAY OR OTHER HARDSCAPED AREAS.
12. MINIMUM 1.5 M CLEARANCE, AT-GRADE, TO BE MAINTAINED AROUND WATER SERVICE POST FROM TREE, TRANSFORMER, UTILITY PEDESTAL, TRAFFIC POLE, AND STREETLIGHT.
13. UTILITY PEDESTALS ARE TO BE GROUPED TOGETHER WITH THE HYDROELECTRIC TRANSFORMER, OR ON THE HOUSE SIDE OF THE UTILITY TRENCH.
14. STREETLIGHT CABLE SHALL BE LOCATED IN JOINT USE TRENCH (JUT). WHERE NO JUT EXISTS, ENSURE CLEARANCES TO TREE, HYDRANTS, AND WATER SERVICE POST.
15. TRAFFIC SIGNAL CABLE SHALL BE LOCATED IN THE JUT OR AT THE SAME OFFSET AS STREETLIGHT POLES IN A SEPARATE TRENCH.
16. TRAFFIC COMMUNICATIONS CABLE SHALL BE LOCATED IN THE JUT OR IN A TRENCH LOCATED AT THE SAME OFFSET AS THE STREETLIGHT POLES.
17. THE PREFERRED LOCATION FOR TRAFFIC HANDHOLES IS IN HARD SURFACES. WHEN HANDHOLES ARE PLACED IN THE BOULEVARD, A CONCRETE COLLAR SHALL BE PROVIDED.
18. THE DEVELOPER SHALL SUPPLY AND INSTALL DUCTS FOR UTILITY CROSSINGS AT INTERSECTIONS.
19. TREE PLACEMENT, NUMBER, AND SPECIES SHALL BE PER CITY POLICY, THE LANDSCAPE PLAN, COORDINATED-UTILITY-PLAN, AND THE DEVELOPMENT AGREEMENTS.
20. THE HYDRO TRANSFORMER BASE SHALL BE LOCATED A MINIMUM OF 2.0 M FROM THE DRIVEWAY EDGE.

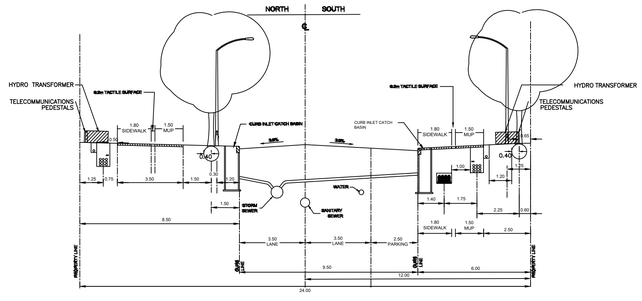
Ottawa	TITLE: STANDARD NOTES ROAD ALLOWANCE
DATE:	MAR 2009
REV:	SEPT 2022
DWG No:	ROW-NOTES

18.0m ROW WITH SIDEWALK

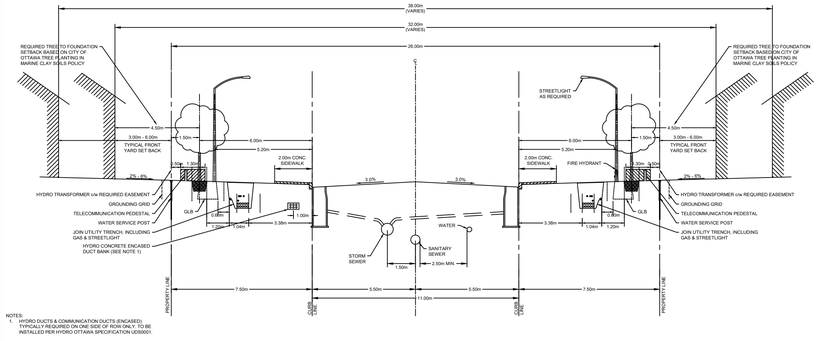


NOTES:
1. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6 m CLEARANCE FROM STRUCTURES.

24.0m ROW WITH PARKING LANE

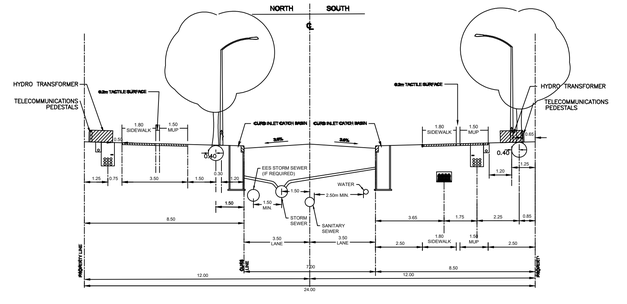


26.0m ROW



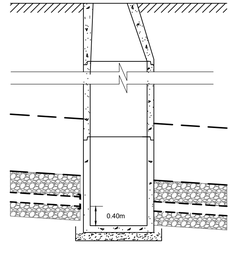
NOTES:
1. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED): TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. TO BE INSTALLED PER HYDRO OTTAWA SPECIFICATION UDS0001.

24.0m ROW TYPICAL

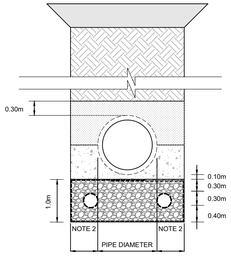


EES INSTALLATION DETAIL

APPLICABLE TO LOCAL ROWs ONLY (NON SALTED STREETS)



STORM MAINTENANCE HOLE DETAIL
N.T.S.



TRENCH FOR STORM SEWER
N.T.S.

NOTES
1. THE CONTRACTOR SHALL INSTALL EES PLUGS AT ALL EES PIPE MAINTENANCE HOLE CONNECTIONS. TEMPORARY PLUGS, WHICH ARE NOT SHOWN ON PROFILE DRAWINGS, SHALL BE REMOVED AT THE COMPLETION OF CONSTRUCTION. EES PLUGS SHOWN ON PROFILE DRAWINGS SHALL BE PERMANENT.
2. - 450mm CLEARANCE FOR PIPES 900mmØ OR LESS
   - 500mm CLEARANCE FOR PIPES OVER 900mmØ
3. PERFORATED PIPE TO BE HDPE N-12Ø WT IB AS PER MANUFACTURER WITH LONGITUDINAL SPACING OF 100mm AND ORIENTED AT 0, 2, 4, 6, 8 AND 10 O'CLOCK
4. INITIAL BACKFILL MATERIAL:
   4.1. CONCRETE PIPE - GRANULAR 'A' OR GRANULAR 'B' MATERIAL WITH 100% PASSING THE 37.5mm SIEVE
   4.2 PVC PIPE - GRANULAR 'A'
5. STORM SEWER MAINTENANCE HOLES SERVICING LOCAL SEWERS WHERE THE EES IS PRESENT SHALL BE CONSTRUCTED WITH A MINIMUM OF 400mm SUMP FOR SEDIMENT CAPTURE BELOW THE INVERT OF THE EES PERFORATED PIPES, REGARDLESS OF THE LOCAL SEWER PIPE SIZE.

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
2	RE-ISSUED AS PART OF DRAFT MSS ADDENDUM	10/04/26
1	ISSUED AS PART OF DRAFT MSS ADDENDUM	23/10/25

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 — 25mm

SCALE:

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca
J.L.Richards ENGINEERS-ARCHITECTS-PLANNERS

CONSULTANT:

PROFESSIONAL STAMP
LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

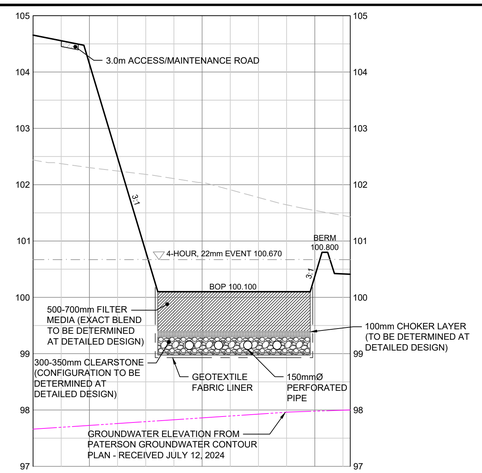
PROJECT:
BARRHAVEN SOUTH
PHASE 3 - S1 AREA
3882 BARNSDALE ROAD

DRAWING:
DETAILS

DESIGN:	KF/GF
DRAWN:	KC
CHECKED:	KF/GF
JLR #:	26610-300
DRAWING #:	D1

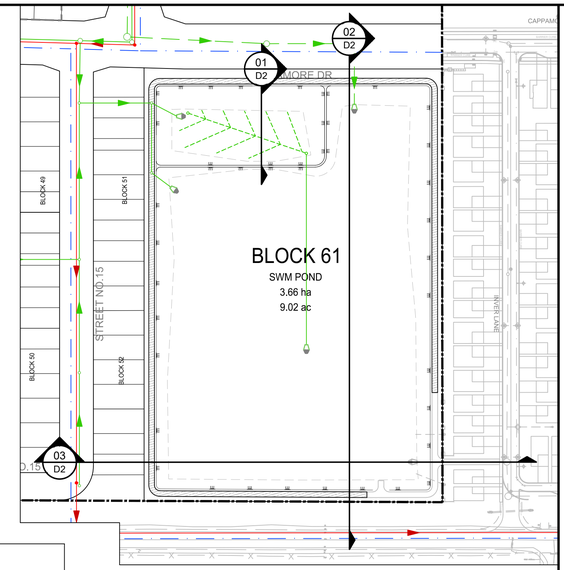
File Location: P:\26000\26610-300 - Barrhaven South C1-C2 Lands\05-Production\01-Civil\26610-300 C DETAILS.dwg

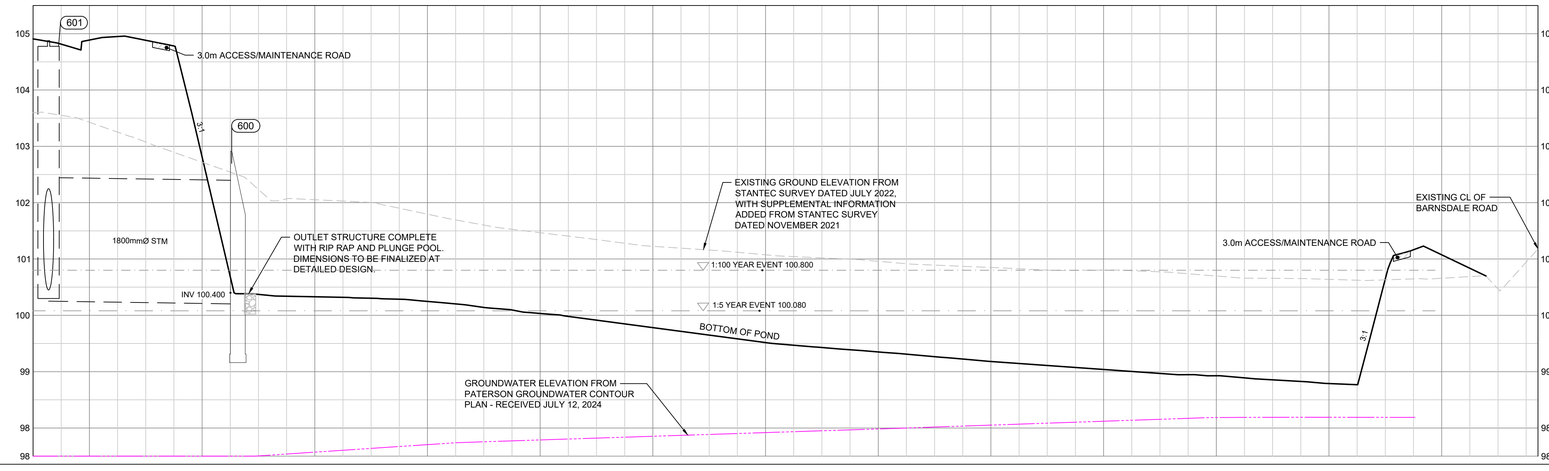
PLOT DATE: Tuesday, May 26, 2026 2:45:37 PM



01 D2 FILTRATION POND

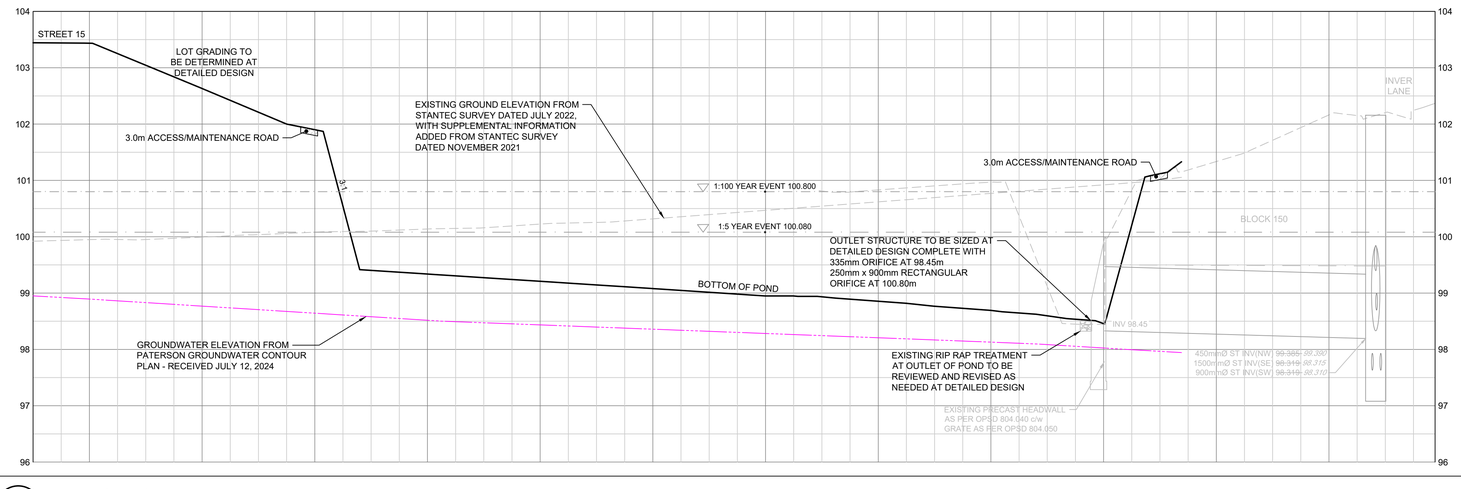
SCALE: 1:500H, 1:50V





02 D2 DRY POND EES INLET

SCALE: 1:500H, 1:50V



03 D2 DRY POND OUTLET

SCALE: 1:500H, 1:50V

NOTE: KILBIRNIE ROAD, CAPPAMORE DRIVE AND ELEVATION ROAD ARE COLLECTOR STREETS.

No.	ISSUE / REVISION	DD/MM/YY
3	RE-ISSUED AS PART OF FINAL MSS ADDENDUM	27/05/26
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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2026-05-28
PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

BARRHAVEN SOUTH
PHASE 3 - S1 AREA

3882 BARNSDALE ROAD

DRAWING:

POND SECTIONS

DESIGN: KF/GF	
DRAWN: KC	DRAWING #: D2
CHECKED: KF/GF	
JLR #: 26610-300	

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PLOT DATE: Tuesday, May 26, 2026 2:46:16 PM

Appendix L

Operation and Maintenance Manual (EES)
and Modelling Files

Operation & Maintenance Manual OMM)

Etobicoke Exfiltration System (EES) – Linear Exfiltration Collection Infrastructure

Prepared for: City of Ottawa | Wastewater/Stormwater Collection System

Date: 10-Apr-2026

Revision: Rev. 0 (Compiled as a DRAFT reference manual – to be Updated at Detailed Design)

DRAFT

Document Control

This Draft Manual was prepared to serve as guidance for the operation and maintenance of the Etobicoke Exfiltration System (EES), intended to be constructed within the S1 Area. Similar to the systems that are currently operational within the Quinn's Pointe Subdivision, the proposed EES will be part of the city's wastewater/stormwater collection system.

This Draft OMM includes: (i) a training program for City of Ottawa wastewater/stormwater operators; (ii) operation and maintenance requirements; and (iii) a project-specific monitoring plan template that must be completed and approved before implementation.

Project / Facility Name	[Insert]
Project Location	[Insert]
Sewer Shed / Service Area	[Insert]
Owner	City of Ottawa
Prepared By	[Insert Consultant/Engineer]
Issue/Revision	Rev. 1 – Integrated O&M, Training, and Monitoring Plan Template

How to Use This Manual

Sections 2–6 are intended for operations staff and field use. Section 7 provides the monitoring plan framework that must be developed prior to commissioning. Appendices include inspection forms, checklists, and maintenance record templates.

1. Background and System Overview

1.1 Background (Etobicoke Exfiltration System History)

The Etobicoke Exfiltration System (EES) was originally developed in 1993 in the former City of Etobicoke (now City of Toronto) and constructed in 1993–1994 as part of municipal road reconstruction projects. Three (3) systems totaling approximately 2.1 km were installed to provide water quality enhancement for existing serviced areas and were designed to capture runoff from a 15 mm, 1-hour AES rainfall event. Experience from these installations, together with broader guidance for underground infiltration practices, informs the recommended operation and maintenance procedures in this manual.

1.2 EES Details and Key Design Components

An EES is a linear perforated-pipe system installed within a clear stone trench (and filter separation where specified) to promote controlled exfiltration/infiltration to surrounding soils. Within the Quinn's Pointe Subdivision and future S1 Area, the EES consist of 2x300 mm diameter perforated sewer surrounded by a clear stone envelope varying in size depending on the storm sewer diameter.

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Where applied to wastewater/stormwater collection infrastructure, operations must ensure reliable conveyance while managing risks related to sediment accumulation, clogging, and unintended infiltration/inflow pathways. Its key design components are as follows:

- Upstream and downstream maintenance holes (MHs) / access chambers and cleanouts.
- Carrier sewer and associated perforated pipes within a granular stone envelope.
- Granular trench and any specified geotextile/filter separation.
- Catch basins/inlets (where connected) and inlet control devices (ICDs) where applicable.
- Mechanical plugs generally at the downstream end with manholes servicing as inspection points.
- Optional bypass, or overflow provisions where included in design.

1.3 Ottawa Operating Context and Constraints

- Seasonal groundwater fluctuations may reduce the exfiltration gradient and influence drawdown times.
- Winter conditions (frost) can reduce infiltration capacity and affect maintenance access.
- Construction-phase sediment loading is a principal cause of early clogging—sediment control during staged development is critical.
- Road works and utility conflicts can disturb trench materials and create preferential pathways for unintended I/I.
- Grease/biofilm accumulation and root intrusion can reduce perforation capacity in systems receiving sanitary flows.

2. Roles, Responsibilities, and Contacts

Prior to putting the EES into service, the following summarizes responsibilities and escalation pathways in Tabular format.

Role	Responsibility (Minimum)
Wastewater/Stormwater Collection Operations	Routine inspections, cleaning/jetting, work orders, and record keeping.
Collection System Engineering / Asset Management	Performance trending, CCTV program integration, renewal planning, and monitoring plan review.
Environmental Compliance	Review of any monitoring wells/sampling requirements and spill response coordination.
Design Engineer / Consultant (Turnover Period)	Commissioning support, baseline CCTV, monitoring plan finalization, and training support.

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Emergency / escalation contacts: [Insert City group, phone numbers, and after-hours procedures].

3. Training Program – City of Ottawa Wastewater/Stormwater Operators

A structured training program is required prior to assumption of operations. Training shall be documented, repeated for new staff, and refreshed periodically. The program also applies to the operator of the system prior to ownership being transferred to the Municipality.

3.1 Training Objectives

- Understand EES intent, limitations, and differences from conventional sewers.
- Safely access and inspect linear infrastructure (confined space, traffic control, PPE).
- Perform routine inspections including drawdown checks and sediment measurements.
- Execute cleaning/jetting procedures specific to perforated pipes (including plug handling where applicable).
- Recognize early warning signs of clogging, surcharge, and unintended infiltration/inflow.
- Collect monitoring data and maintain records suitable for compliance and asset management.

3.2 Training Delivery (Recommended)

1. Classroom module (2–3 hours): system concept, components, failure modes, and documentation requirements.
2. Field walkdown (2–4 hours): locate access points, identify ICDs (not applicable in the S1 Area), demonstrate tools and safe set-up.
3. Hands-on practicum (1 shift): supervised inspection and controlled jetting/flush of a representative segment.
4. Competency check: short written/field assessment; issue training record.
5. Annual refresher (1–2 hours) and post-incident debrief training if failures occur.

3.3 Required Competencies & Certifications

- Confined Space Entry (current).
- Traffic Control / Temporary Workplace Safety (as required).
- WHMIS and PPE training.
- Use of calibrated gas detectors and rescue equipment.
- Competency with CCTV inspection, jetting equipment, sediment measurement tools, and plug handling (where applicable).

DRAFT

4. Operation Requirements

4.1 Normal Operation

- Operate as a gravity collection system; no routine operator action is required under normal flow conditions.
- Maintain access points so they remain visible and accessible (no buried lids, no obstructions).
- Ensure upstream sources remain free of debris and illegal discharges.
- Confirm any bypasses/overflow provisions are unobstructed and configured per design.

4.2 Seasonal / Winter Operation

Some infiltration systems may require seasonal operational adjustments in areas of high salt/sand loading. However, for the proposed EES within the S1 Area, it will only be installed along local roads where winter salting inputs are very minimal. Thus, the system will not be installed in higher-risk winter maintenance zones. It is, however, recommended that the city's operation group consider the following:

Winter Operations Plan: where increase catch basin cleaning to free up catch basin grates from ice buildup to ensure that the system is operational all year round.

Spring Operations Plan: where street sweeping efforts are increased from the typical one time to minimum 2 times during springtime immediately after snowmelt followed by a second sweep within a 3-week span. This is intended to reduce grit from accessing the perforated sewers.

4.3 Operational Constraints

- Avoid aggressive cleaning chemicals unless reviewed by environmental compliance staff.
- Use controlled jetting pressures/nozzles to avoid damaging perforations or displacing stone bedding.
- Prevent construction sediment or slurry from entering the system; implement upstream protection during road works and building construction.
- Coordinate with winter operations to manage fine sediment loading near connected inlets.

5. Maintenance Program

5.1 Inspection and Maintenance Frequencies (Minimum)

Task	Frequency	Method / Notes	Record / Deliverable
System inspection and drawdown confirmation	1–2 times/year and after significant storm events	Inspect MHs; confirm catch basin's sump	Inspection form + photos + drawdown notes

DRAFT

	(especially first 2 years)	drawdown to below perforated pipe invert within ~48 hours after storm	
Remove trash/debris from catchbasin sumps and grates	2 times/year (spring/fall) and as needed	Coordinate with street sweeping and inlet maintenance.	Catch basin cleaning record
Measure accumulated sediment depth (catchbasins and accessible points)	1 time/year (more frequently during/after construction) to reduce loadings to the EES	Track deposition; apply trigger thresholds for cleaning.	Sediment log
Preventative jetting / flushing of carrier and perforated pipes	As needed based on triggers; otherwise included in long-term cycle	Standard flushing, radial washing, or jet flushing per SOP; capture and dispose of removed material.	Cleaning record
CCTV condition assessment	Baseline Year 1; targeted every ~5 years (risk-based); full reach at least every 20 years	Use PACP-compatible coding; prioritize segments with slow drawdown, high sedimentation, or complaints.	CCTV report + defect log

5.2 Sediment and Cleaning Triggers

Real-time monitoring of the EES, at three (3) locations, was made as a condition of approval within Quinn's Pointe Subdivisions, the existing development east of the S1 Area. To facilitate monitoring in Quinn's Pointe, the city advised that it should be completed using the SmartLevel™ technology supported by Link Utility Technology as it has been tested and adopted by the City's Operation Group. In parallel, monitoring of rainfall events was to be carried out using the SmartRain™ system to collect real-time precipitation data.

The objective of the monitoring was as follows:

- Initiate cleaning when sediment in perforated pipes or sumps is observed to be accumulating or when deposition approaches operational thresholds.
- A practical trigger for pipe cleaning is sediment depth on the order of ~100 mm (or per project-specific criteria) and/or when sediment occupies ~10–20% of pipe diameter.
- Clean catchbasins when there is visible accumulation of sediment in the sump or when sump water remains above normal levels 48 hours after a storm event.
- Increase inspection/cleaning frequency during early years of operation and during/after construction phases.

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5.3 Measures to Reduce Maintenance (Design Features)

Where specified in the design, inlet control devices (ICDs) fitted with goose necks can reduce maintenance by limiting the entry of floating debris and directing inflow from a deeper water column into the catch basin lead. These features must be included in operator training so staff can verify functionality during inspections.

6. Maintenance Procedures (SOPs)

6.1 Standard Cleaning Methods

6. Standard flushing: conventional sewer flushing from upstream to downstream access points.
7. Radial washing: pressurize the perforated pipe to force water through perforations to dislodge sediment within the stone envelope interface (where appropriate and safe).
8. Jet flushing: use a pressurized hose/nozzle designed to direct water through perforations to remove accumulated sediment (use controlled pressures and appropriate nozzle selection).

6.2 Plug Handling (Where Applicable)

Some EES configurations include mechanical plugs at downstream ends of perforated pipes. Operators must follow safe handling procedures, document plug locations, and ensure plugs are reinstalled correctly after cleaning.

6.3 Maintenance Effort Estimate (Planning Template)

The following planning approach may be used to estimate crew hours for jetting/flushing activities. Replace placeholders with project values.

Example estimate (template):
• Assumed jetting/flush productivity: [e.g., 150 m/hour].
• Total EES pipe length to flush (carrier + perforated pipes): [L_total, m].
• Time to flush = L_total / productivity.
• If mechanical plugs are present: time for plug removal/reinstallation = N_plugs × t_plug (e.g., 0.25 hours each).
• Total estimated crew time = flushing time + plug handling time + set-up/traffic control allowance.

7. Monitoring Plan (Must Be Developed Before Implementation)

A project-specific monitoring plan shall be developed, reviewed, and approved before the EES is placed into service. The Plan is to be developed during detailed design of linear infrastructure. It is intended to verify hydraulic performance, confirm drawdown behavior, track sedimentation/clogging trends, and support adaptive maintenance.

7.1 Minimum Monitoring Elements

- Baseline (pre-commissioning) CCTV survey and as-built verification.

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- Routine drawdown checks at representative access points (target: drawdown within ~48 hours after significant events, unless otherwise justified and approved).
- Sediment depth measurements in catchbasins and accessible segments.
- Complaints/backup tracking and correlation to asset IDs.
- Optional instrumentation (where feasible/required): water level loggers in MHs, flow monitoring, and/or groundwater level monitoring (piezometers).

7.2 Monitoring Schedule (Recommended)

Monitoring Item	Year 0–1 (Commissioning)	Years 1–2	Year 3+
CCTV	Baseline full reach	Targeted if issues; consider risk-based	Integrate into City CCTV cycle; full reach at least every 20 years
Drawdown checks	After significant storm events	After significant storm events; then 1–2x/year	1–2x/year (risk-based)
Sediment measurements	Initial + 2x/year if construction nearby	1x/year (min)	1x/year (min)
Cleaning/jetting	As needed based on baseline findings	Trigger-based	Trigger-based + long-term cycle

7.3 Data Management, QA/QC, and Reporting

- Assign asset IDs to EES segments and link inspections, cleanings, and CCTV results to the City's asset management system.
- Establish QA/QC procedures for CCTV coding consistency, logger calibration (if used), and record retention.
- Prepare a commissioning summary report and annual performance summaries for the first two years, then incorporate into routine collection system reporting.

Appendix A – Field Inspection Form (Template)

- Asset ID / Segment: _____
- Date/Time: _____ Crew: _____
- Weather / Recent Rainfall: _____
- Access Point (MH/CO) Condition (lid, frame, corrosion): _____
- Gas readings (O2, H2S, CO, LEL): _____
- Water level / surcharge evidence: _____
- Drawdown observed within 48 hours? Yes / No / N/A
- Sediment depth estimate (CB and/or pipe): _____
- Odours/unusual appearance: _____
- Photos taken: Y / N Photo IDs: _____
- Actions required / Work order #: _____
- Signature: _____

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Appendix B – Preventative Maintenance Checklist

- Confirm access points are visible and accessible (no obstructions).
- Confirm lids are seated and locked where required.
- Check ICD/goose neck (if present) for blockage and confirm function.
- Remove debris from grates and catchbasin sumps.
- Measure sediment and compare to trigger thresholds.
- Review complaints/backup logs and correlate to segment.
- Schedule CCTV/cleaning if trending indicates increased risk.

Appendix C – Cleaning Record (Template)

- Asset ID / Segment: _____
- Date: _____ Equipment: _____
- Cleaning method (flush/radial wash/jet): _____
- Jetting pressure/nozzle (if applicable): _____
- Debris/sediment volume removed and disposal method: _____
- Plug handling (if applicable): N_plugs = _____ ; issues noted: _____
- Post-cleaning observations / verification: _____
- Follow-up required: _____

Appendix D – Legacy Maintenance Schedule (Reference Table)

The table below summarizes a legacy maintenance schedule that has been applied to EES installations and is provided for reference and comparison.

Task	Frequency	Compared to conventional systems
Inspection to ensure adequate operation (including confirmation of sump drawdown below perforated pipe invert and goose neck function)	Once or twice per year – 48 hours or more after a significant storm event	Not required in conventional systems (preventative practice)
Removal of accumulated trash and debris from sumps and grates	Twice per year	Best practice in conventional systems
Monitoring of accumulated sediment depth in catch basins	Once a year	Best practice in conventional systems
Jet pressure wash and CCTV inspection of sewer and perforated pipes	At least every 20 years or when sediment levels reach ~150 mm depth	Comparable to conventional systems, but includes additional perforated pipes

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