

Hydrogeological Study

Proposed Residential Development

4795 Bank Street
Ottawa, Ontario

Prepared for Caivan Communities
Report PH5254-REP.01.R1
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Table of Contents

1.0 INTRODUCTION	1
1.1 Background	1
1.2 Scope of Work.....	1
2.0 RELATED REPORTS	2
3.0 METHOD OF INVESTIGATION	3
3.1 Records Review	3
3.2 Field Program.....	3
3.3 Laboratory Testing	5
3.4 Monitoring Well Installations.....	5
3.5 Water Level Measurements	5
3.6 Surveying	6
4.0 REVIEW AND EVALUATION	7
4.1 Physical Setting.....	7
4.2 Geology.....	8
4.3 Hydrogeological Setting (Conceptual Model)	9
5.0 SITE SPECIFIC WATER BUDGET ASSESSMENT.....	16
5.1 Calculations.....	16
5.2 Pre and Post-Development Water Budget	19
6.0 GROUNDWATER IMPACT ASSESSMENT	21
6.1 Impact of Proposed Development on Surrounding Infrastructure.....	21
6.2 Impact of Proposed Development on Existing Well Users	22
6.3 Impact of Proposed Development on the Environment	23
6.4 Adjacent PTTW/EASRs/ECAs	24
7.0 ASSESSMENT AND RECOMMENDATIONS.....	26
7.1 Sources of Contamination	26
7.2 Surface Water Features	26
7.3 Existing Wells.....	27
7.4 Water Taking Permitting Requirements	27
7.5 Infiltration Potential.....	27
8.0 CLOSURE.....	29
9.0 REFERENCES	30

Figures

Drawing PH5254-1 - Site Plan
Drawing PH5254-2 - MECP Water Well Location Plan
Drawing PH5254-3 - Surficial Geology Plan
Drawing PH5254-4 - Bedrock Geology Plan
Drawing PH5254-5 - Overburden Groundwater Contour Plan
Drawing PH5254-6 - Pre-Development Terrain Composition Plan
Drawing PH5254-7 - Post-Development Terrain Composition Plan
Monitoring Well Water Elevation Plots

Appendices

- Appendix 1 Soil Profile and Test Data Sheets
Drawing PG7301-1 - Test Hole Location Plan
- Appendix 2 Table 5 - Monthly Water Balance for Soil With 75 mm Water Holding Capacity at the Ottawa International Airport
Table 6 - Monthly Water Balance for Soil With 150 mm Water Holding Capacity at the Ottawa International Airport
Table 7 - Monthly Water Balance for Soil With 250 mm Water Holding Capacity at the Ottawa International Airport
Table 8 - Monthly Water Balance for Soil With 300 mm Water Holding Capacity at the Ottawa International Airport
Table 9 - Pre-Development Annual Water Budget Calculations
Table 10 - Post-Development Annual Water Budget Calculations
- Appendix 3 Hydraulic Conductivity Results - Falling and Rising Head Tests
Sample Calculations - Dupuit Forchheimer
- Appendix 4 Surrounding Water Well Records

1.0 INTRODUCTION

1.1 Background

Paterson Group (Paterson) was retained by Caivan Communities to conduct a hydrogeological study for the proposed residential development located at 4795 Bank Street in the City of Ottawa (hereinafter referred to as the “subject site”). The location of the subject site is shown on Drawing PH5254-1 - Site Plan appended to this report. This report incorporates the findings of Paterson Report PG7301-1 prepared concurrently.

1.2 Scope of Work

Paterson has completed this report in accordance with the scope prepared by Paterson. As per the agreed upon scope, the purpose of this study was to:

- ☐ Complete a groundwater impact assessment to determine potential impacts to adjacent infrastructure, well users and the surrounding environment.

Additionally, the study was to include the standard components of a Water Budget Assessment as per the City of Ottawa’s Water Budget Assessment Terms of Reference, which included the following:

- ☐ Review related higher-level studies.
- ☐ Conduct pre- and post-development water budget analyses, including water budget equations, to determine the hydrogeological function of the subject site in order to assess the need for supplemental stormwater management measures.
- ☐ Develop a conceptual model to characterize pre and post-development hydrologic and hydrogeologic site conditions.
- ☐ Identify sensitive hydrologic and hydrogeologic features (if any) within the study area.
- ☐ Identify water budget targets (if applicable) to mitigate post-development hydrologic and hydrogeologic impacts.
- ☐ Identify how climate change projections may impact the water budget.

2.0 RELATED REPORTS

In addition to a review of the general literature summarized in the following sections and in the 'References' section of this report (MECP water well mapping, available geological and physiographic mapping), Paterson reviewed the following site-specific/related reports:

- ❑ PG7301 Geotechnical Investigation - Proposed Residential Development - 4795 Bank Street and 3301 Blais Road - prepared by Paterson Group concurrently with this report.
- ❑ PE6876-1 Phase I Environmental Site Assessment - 4795 Bank Street and 3301 Blais Road - prepared by Paterson Group – January 28, 2025.

3.0 METHOD OF INVESTIGATION

3.1 Records Review

A review of available geological, and hydrogeological data was completed as a part of this assessment. However, the literature review and previous reports did not provide site-specific data regarding overburden and bedrock aquifers, recharge and discharge conditions or flow contributions to the nearby water features. Further detail is provided in the following sections.

3.2 Field Program

The geotechnical and hydrogeological field programs were developed to assess geology, groundwater conditions, hydraulic gradients and the overall hydrologic/hydrogeologic function of the subject site. The test holes were advanced to various depths across the site to assess hydrogeological and geotechnical conditions.

Geotechnical field investigations were completed by Paterson at the subject site between September 2024 and February 2026. During this time, 26 boreholes and 50 probe holes were advanced to a maximum depth of 10.26 m and 14.9 m below ground surface (bgs), respectively. The location of the test holes are shown on Drawing PG7301-1 - Test Hole Location Plan, included in Appendix 1.

Soil samples were obtained from the boreholes by means of split spoon sampling and the sampling of shallow soils directly from auger flights. Split-spoon samples were taken at approximate 0.76 m intervals. In addition to soil sampling, rock core samples were obtained with the use of a standard diamond drill bit. The depth at which split-spoon, auger samples and rock core samples were obtained from the test holes are shown as "**SS**", "**AU**" and "**RC**", respectively, on the Soil Profile and Test Data sheets, included in Appendix 1.

All samples were classified on site, placed in sealed plastic bags and were transported to our laboratory for further review and testing. Transportation of the samples was completed in accordance with ASTM D4220-95 (2007) - Standard Practice for Preserving and Transporting Soils. Rock core samples were recovered from select boreholes (BH1-22 and BH2-26) drilled during the February 2026 geotechnical investigation using a core barrel and diamond drilling techniques. The bedrock samples were classified on site, placed in hard cardboard core boxes and transported to Paterson's laboratory.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as "N" values on the Soil Profile and Test Data sheets. The "N" value is the number of blows required to drive the split-spoon sampler 300 mm into the ground after an initial penetration of 150 mm using a 63.5 kg hammer falling from a height of 760 mm. This test was done in accordance with ASTM D1586-11 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils.

The recovery value and a Rock Quality Designation (RQD) value were calculated for each drilled section of bedrock and are presented on the borehole logs. The recovery value is the length of the bedrock sample recovered over the length of the drilled section. The RQD value is the total length of intact rock pieces longer than 100 mm over the length of the core run. The values indicate the bedrock quality.

Reference should be made to the Soil Profile and Test Data sheets presented in Appendix 1 for specific details of the soil profiles encountered at the test hole locations.

Drawdown Analysis - Hydraulic Conductivity Testing

Hydraulic conductivity testing (slug testing) was completed at the monitoring wells installed during the geotechnical investigations completed during February 2026. Falling head and rising head tests (slug tests) were completed in accordance with ASTM Standard Test Method D 4404 - Field Procedure for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers.

Slug testing was completed on May 26, 2026 by Paterson personnel. The general test method consisted of measuring the static water level in the well, followed by inducing a near-instantaneous change of head in the well and subsequent monitoring of water level recovery with an electronic water level meter and a water level data logger. The change in head was induced by the introduction of either an acetel slug, 0.9 m in length and 38 mm in diameter, or an acetel slug, 1.0 m in length and 19 mm in diameter, depending on the well diameter. The slug was introduced to raise the groundwater level in the monitoring well, following which the decrease in water level over time was monitored (falling head test). Once the water level had stabilized (or nearly stabilized), the slug was then removed to lower the groundwater level, following which the increase in water level over time was monitored (rising head test).

Following the completion of the slug tests, the test data was analyzed using the AQTESOLV Pro Version 4.5 aquifer analysis software package by HydroSOLVE

Inc. and the results were processed as per the method set out by Hvorslev (1951). Assumptions inherent in the Hvorslev method include a homogeneous aquifer of infinite extent and a screen length significantly greater than the monitoring well diameter. The assumption regarding screen length and well diameter is considered to be met based upon a typical length of 1.52 m and a diameter of 0.03 to 0.05 m.

While the idealized assumptions regarding aquifer extent, homogeneity are not strictly met in this case (or in any real-world situation), it has been our experience that the Hvorslev method produces effective point estimates of hydraulic conductivity in conditions similar to those encountered at the subject site. Hvorslev analysis is based on the line of best fit through the field data (hydraulic head recovery vs. time), plotted on a semi-logarithmic scale.

3.3 Laboratory Testing

All soil samples were retained for laboratory review following the field portion of the subsurface investigation. The soils were classified in general accordance with ASTM D2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Based on the soil descriptions across the subject site during the geotechnical investigations, these samples are considered to be sufficiently representative of the site.

3.4 Monitoring Well Installations

As part of the geotechnical field programs completed between September 2024 and February 2026, monitoring wells were installed in select boreholes to permit the monitoring of groundwater levels and conduct drawdown analyses. The well installations were compliant with ASTM D5092 standards.

3.5 Water Level Measurements

Following the completion of the September 2024, October 2024 and February 2026 drilling programs, groundwater levels were measured at the monitoring well locations. Water levels were measured using an electronic water level meter relative to the ground surface elevation at each location and are noted on the Soil Profile and Test Data sheets, included in Appendix 1.

In addition to the manual groundwater level measurements, select wells were outfitted with dataloggers to record long-term fluctuations in monitoring well water elevations. The monitoring program began in October 2024 and continued until the spring freshet was captured in May 2026. Once the additional monitoring wells

were installed in February 2026, they were outfitted with dataloggers in March 2026. Groundwater monitoring data collected to date is presented in the Monitoring Well Water Elevation Plots in the Figures section of this report.

3.6 Surveying

The test hole locations and ground surface elevations at each test hole location completed by Paterson were surveyed using a GPS unit with respect to a geodetic datum. The locations and ground surface elevations for each test hole are presented on Drawing PG7301-1 - Test Hole Location Plan, included in Appendix 1.

4.0 REVIEW AND EVALUATION

4.1 Physical Setting

At the time of the field investigations, the majority of the subject site consists of agricultural lands with sparse areas of mature trees which generally follow the property boundary and/or subdivide the fields. Residential and agricultural buildings are located within the central and southeast limits of the property. The western portion of the property is bisected by Findlay Creek.

The property is bordered by an existing residential development to the north and associated stormwater managing system to the east, respectively. The property is bordered by Blais Road to the south, followed by unoccupied lands, a single residential property, and commercial developments, and by Bank Street to the west followed by existing residential developments. The ground surface across the property slopes gently downward from west to east at approximate geodetic elevations of 94 m to 89 m. The location of the subject site is shown on Drawing PH5254-1 - Site Plan, appended to this report.

Based on mapping provided by the Ministry of Conservation and Parks (MECP) Source Protection Information Atlas, the subject site is located within the Castor River subwatershed. There are several surface water features located within the subject site and within 500 m of the subject site. These include unnamed scratch ditches, drainage ditches and conveyance channels as well as an existing stormwater management pond and Findlay Creek, adjacent to the site. Also, the Findlay Creek Wetlands lies approximately 250 m south of the subject site. The site is generally at grade with adjacent roadways and properties. The site slopes from west to east with an elevation difference of approximately 4-5 m.

According to available mapping from the Ontario Geologic Survey (OGS; MRD 228), the majority of the subject site is located in the sand plains physiographic region. The sand plains region is characterized by silty sand deposits. This is generally consistent with field observations at the subject site.

4.2 Geology

Surficial Geology

Overburden mapping provided by the OGS was reviewed as part of this assessment. Available mapping (MRD 128) indicates that overburden soils throughout the subject site largely consist of till (stone-poor, sandy silt to silty sand-textured till on paleozoic terrain) with isolated areas within the west corner and eastern side consisting of coarse-textured glaciomarine deposits (sand, gravel, minor silt and clay). Overburden soil mapping is shown on Drawing PH5254-3 - Surficial Geology Plan, appended to this report.

Overburden soils identified during the geotechnical investigations by Paterson between September 2024 and February 2026 were generally consistent with the available mapping. Soils generally consisted of topsoil overlying a silty sand layer or glacial till underlain by bedrock. Fill material was encountered at select borehole locations and generally consisted of brown silty sand/silty clay with sand, gravel and cobbles, extending to a maximum depth of 2.6 m bgs. The glacial till deposit generally consisted of a silty sand/silty clay matrix with varying amounts of gravel, cobbles and boulders and trace clay, extending to a maximum observed depth of 6.1 m bgs.

Specific details are provided on the Soil Profile and Test Data Sheets included in Appendix 1 of this report. More details regarding the overburden soils can be found in Paterson Report PG7301-1.R1 prepared concurrently with this report.

Bedrock Geology

Bedrock was encountered between 4.1 to 6.7 m bgs during Paterson's 2026 geotechnical field investigation and cored to a maximum depth of 10.3 m bgs. The bedrock was observed to vary from poor to excellent quality. Based on available mapping, the overburden drift thickness at the subject site ranges between 1 and 10 m. A number of probe holes were completed across the subject site and encountered refusal on inferred bedrock at depths from 3.1 to 10.7 m bgs. Bedrock geology mapping is shown on Drawing PH5254-4 - Bedrock Geology Plan, appended to this report.

Karst Features

The term "karst" refers to a geologic formation characterized by the dissolution of carbonate bedrock, such as limestone or dolostone. In order for karstification to occur, precipitation must be able to infiltrate the top of the bedrock, causing

dissolution which enlarges previously existing joints and bedding planes. Based on available mapping by the OGS (GRS 005), the subject site is located within an area that does not contain karstic landforms.

4.3 Hydrogeological Setting (Conceptual Model)

Based on the field investigations at the subject site, Paterson used borehole data, existing water well records, topography, monitoring well water levels, hydraulic conductivity and infiltration rates to develop a conceptual model of the transport fate of surface water and groundwater at the subject site. Information related to the conceptual flow model is described below.

Existing Aquifer Systems

Aquifer systems may be defined as geological media, either overburden soils or fractured bedrock, which permit the movement of groundwater under hydraulic gradients. In general, aquifer systems may be present in overburden soils or bedrock. Groundwater was observed within the overburden soils at the subject site, and the soils were found to exhibit moderate hydraulic conductivities. Given the limited quantity of groundwater within the overburden aquifer, it is not considered an adequate source for water supply wells. If water supply wells are still in use in the vicinity of the subject site, it is anticipated that they are accessing bedrock aquifers.

Based on a review of the MECP water well record database, available geological mapping and field investigations, Paterson has identified four (4) aquifer systems in the vicinity of the study area which consist of the overburden aquifer and three underlying bedrock aquifers. The bedrock aquifer systems consist of dolostone/dolostone and sandstone, sandstone or shale of the Oxford and March Formations, the Nepean Formation or Queenston Formation, respectively. Surrounding water well records are included in Appendix 4.

Groundwater Levels

Piezometers and monitoring wells were installed across the subject site for the purpose of monitoring groundwater levels within the overburden and bedrock. Groundwater levels were observed to be dry in the piezometers ranged from 1.0 and 5.8 m bgs in the monitoring wells. The initial groundwater level measurements are shown on the Soil Profile and Test Data Sheets appended to this report in Appendix 1. Groundwater elevations that were collected on May 21, 2026 were used to determine hydraulic gradients and the general groundwater flow direction at the subject site which is shown on Drawing PH5254-5 - Groundwater Contour

Plan appended to this report. The manual groundwater level measurements are presented in Table 1 below.

Table 1 – Summary of Manual Groundwater Level Measurements				
Borehole ID	Ground Surface Elevation (m asl)	Manual Groundwater Level Measurement		Date Recorded
		Depth (m bgs)	Elevation (m asl)	
BH2-24*	92.85	2.23	90.62	21-May-26
BH4-24*	91.53	Dry	-	21-May-26
BH6-24*	92.00	Destroyed	-	21-May-26
BH9-24*	92.62	2.31	90.31	21-May-26
BH10-24*	91.64	Destroyed	-	21-May-26
BH11-24*	94.43	1.15	93.28	21-May-26
BH12-24*	89.26	1.77	87.49	21-May-26
BH13-24*	89.04	1.42	87.63	21-May-26
BH1-26*	89.47	1.80	87.67	21-May-26
BH2-26*	88.86	1.40	87.46	21-May-26
BH3-26*	89.19	1.39	87.81	21-May-26
BH4-26*	89.18	1.52	87.66	21-May-26
BH5-26*	89.25	1.65	87.61	21-May-26
BH6-26*	89.81	1.99	87.82	21-May-26
BH1-26*	89.47	1.51	87.96	20-Mar-26
BH2-26*	88.86	1.12	87.74	20-Mar-26
BH3-26*	89.19	1.00	88.19	20-Mar-26
BH4-26*	89.18	1.08	88.10	20-Mar-26
BH5-26*	89.25	1.36	87.89	20-Mar-26
BH6-26*	89.81	1.96	87.85	20-Mar-26
BH2-24*	92.85	3.45	89.40	22-Oct-25
BH4-24*	91.53	Dry	-	22-Oct-25
BH6-24*	92.00	Destroyed	-	22-Oct-25
BH9-24*	92.62	3.72	88.90	03-Nov-25
BH10-24*	91.64	Destroyed	-	22-Oct-25
BH11-24*	94.43	3.07	91.36	22-Oct-25
BH12-24*	89.26	2.02	87.24	22-Oct-25
BH13-24*	89.04	1.28	87.76	03-Nov-25
BH2-24*	92.85	2.74	90.11	20-Feb-25
BH4-24*	91.53	Dry	-	20-Feb-25
BH6-24*	92.00	Dry	-	20-Feb-25
BH9-24*	92.62	3.11	89.51	20-Feb-25
BH10-24*	91.64	2.81	88.83	20-Feb-25
BH11-24*	94.03	1.30	92.73	20-Feb-25
BH12-24*	89.26	2.04	87.22	20-Feb-25
BH13-24*	89.04	1.82	87.22	20-Feb-25
BH1-24	93.20	Dry	-	09-Oct-24
BH2-24*	92.85	2.90	89.95	09-Oct-24

BH3-24	91.20	Dry	-	09-Oct-24
BH4-24*	91.53	Dry	-	09-Oct-24
BH5-24	91.28	Dry	-	09-Oct-24
BH6-24*	92.00	Dry	-	09-Oct-24
BH7-24	91.33	Dry	-	09-Oct-24
BH8-24	93.41	Dry	-	09-Oct-24
BH9-24*	92.62	3.20	89.42	09-Oct-24
BH10-24*	91.64	5.76	85.88	09-Oct-24
BH11-24*	94.03	Dry	-	09-Oct-24
BH12-24*	89.26	2.05	87.21	09-Oct-24
BH13-24*	89.04	1.96	87.08	09-Oct-24
BH14-24	89.90	Dry	-	09-Oct-24
Note: The ground surface elevation at each borehole location was surveyed by Paterson using a handheld GPS and was referenced to a geodetic datum. * Borehole instrumented with groundwater monitoring well.				

Van Essen TD-Diver dataloggers were installed at all monitoring well locations to collect water level readings at a minimum of one (1) reading every 24 hours.

The long-term groundwater monitoring program began in October 2024 and lasted until spring high water levels were captured in May 2026. The monitoring data collected to date was compared with Environment and Natural Resources Canada precipitation data from the Ottawa International Airport over the same timeframe as part of the monitoring program. The monitoring data from each monitoring location is presented on the Monitoring Well Water Elevation Plots appended to this report.

Horizontal Hydraulic Gradients

Due to the nature of the water levels obtained from field work conducted at the subject site (groundwater monitoring wells), the absolute direction of horizontal hydraulic gradients in the vicinity of the subject site was not determined. However, using the available data, it was possible to approximate the horizontal hydraulic gradients in the overburden materials given that the horizontal hydraulic gradient between any 2 points is the slope of the hydraulic head between those points:

$$i = h_2 - h_1 / L$$

Where: i = horizontal gradient
 h = water elevation (m asl)
 L = horizontal distance between test hole locations

Using the above noted formula, the horizontal hydraulic gradients within the site were observed to be in an approximate easterly orientation with a magnitude of

approximately 0.011 to 0.018 m/m in the glacial till deposit within the study area. The approximate groundwater flow directions are presented on Drawing PH5254-5 – Overburden Groundwater Contour Plan, appended to this report. Regional groundwater flow in the overburden is expected to be in a southeasterly orientation towards Castor River which is consistent with available watershed mapping.

Hydraulic Conductivity

Hydraulic conductivity testing (slug testing) was completed by Paterson as part of the field investigations at the subject site. The test data was analyzed as per the method set out by Hvorslev (1951). The testing yielded hydraulic conductivity values of 5.4×10^{-6} to 9.0×10^{-6} m/sec for glacial till, 6.8×10^{-7} m/sec for silty clay to clayey silt, 9.3×10^{-6} to 2.6×10^{-5} m/sec for silty sand to sandy silt, and 1.2×10^{-4} to 5.7×10^{-3} m/sec for bedrock. Hydraulic conductivity results are summarized in Table 2 below and have been included in Appendix 3.

Table 2 – Summary of Hydraulic Conductivity (Slug) Testing Results					
Test Hole ID	Ground Surface Elevation (m asl)	Testing Elevation (m asl)	Hydraulic Conductivity (m/sec)	Test Type	Soil Type
BH1-26	89.47	80.76-82.28	1.67×10^{-4}	Falling Head	Bedrock
			1.22×10^{-4}	Rising Head	
BH2-26	88.86	78.75-80.27	1.23×10^{-5}	Falling Head	Bedrock
			1.63×10^{-5}	Rising Head	
BH3-26	89.19	83.09-84.61	8.97×10^{-6}	Falling Head	Glacial Till
			5.35×10^{-6}	Rising Head	
BH4-26	89.18	84.23-85.75	6.84×10^{-7}	Falling Head	Silty Clay to Clayey Silt
BH5-26	89.25	82.75-84.27	5.69×10^{-3}	Falling Head	Bedrock
			2.31×10^{-3}	Rising Head	
BH6-26	89.81	84.60-86.12	2.61×10^{-5}	Falling Head	Silty Sand to Sandy Silt
			9.26×10^{-6}	Rising Head	

Groundwater Recharge and Discharge

In general, groundwater will follow the path of least resistance from areas of higher hydraulic head to areas of lower hydraulic head. Upward and downward hydraulic gradients are typically indicative of areas of discharge and recharge, respectively.

It is our interpretation that there is recharge is occurring at the subject site due to the soils identified at the time of the field investigations. Recharge of the shallow overburden aquifer will occur as precipitation infiltrates the subsoils where it will flow vertically downward through the unsaturated surficial soils before intercepting

the overburden aquifer. Furthermore, the eastern portion of the site mapped as a significant groundwater recharge area (SGRA) by the MECP.

With regards to discharge zones, both the topography and the geological conditions would suggest that there is a potential for discharge to be occurring within the confines of the subject site. While the extent of the discharge was not considered as part of the current investigation, given the nature of the nearby watercourse (creek), the extent of discharge occurring is anticipated to be limited.

The subject site intersects one subwatershed as previously mentioned. However, within the confines of the subject site, shallow groundwater was found to have flow generally travelling in an eastward direction.

It should be noted that the subject site is identified by the MECP as an Intake Protection Zone 3.

Catchment Areas

The subject site is located within the Castor River subwatershed. As shown on Drawing PH5254 - 5 - Groundwater Contour Plan, the groundwater flows in an eastward direction within the eastern portion of the subject site towards the stormwater management pond and Findlay Creek. Therefore, it is Paterson's opinion that the subject site is predominantly characterized by one catchment area.

Groundwater Inflow/Dewatering Requirements

Four (4) potential sources of dewatering have been identified at the subject site. The sources consist of the excavation footprints related to the building foundations, condominium foundations, servicing trenches and eastern stormwater management pond (SWMP). Details regarding the excavation footprints and depths for each potential dewatering source were based on the information available at the time of report preparation. Therefore, the building, servicing and SWMP excavations are assumed to encompass areas of approximately 750 m², 20,400 m², 125 m² and 7,040 m², respectively, for a preliminary dewatering assessment. It should be noted that, although drift thickness is mapped to be shallow, probe holes across the site showed refusal at depths ranging from 3.05 to 10.67 m, with the overburden being shallowest in the western corner and deepest in the middle and eastern sections.

Based on available conceptual drawings for the site, excavation sizes were estimated based on proposed building footprints, typical servicing excavation sizes based on previous experience at similar sites and the proposed SWMP footprint.

The infiltration rates provided for the following sources were calculated using the Dupuit Forchheimer method:

$$Q = \pi k((h_o^2 - h_p^2)/\ln(R/r))$$

- ☐ k = hydraulic conductivity (m/sec)
- ☐ h_o = thickness of the aquifer (m)
- ☐ h_p = thickness of the aquifer from the base of the excavation to the base of the aquifer (m)
- ☐ R = effective drawdown radius for the excavation (m)
- ☐ r = equivalent radius of the excavation (m)

The groundwater infiltration calculations for the excavation footprints are provided in Appendix 3 of this report.

The stratigraphy within the anticipated saturated depth of the building excavations generally consists of a glacial till deposit. Specific design details were not available at the time of report preparation. For the purpose of this study, it has been assumed the buildings will consist of slab-on-grade construction or one basement level with a maximum excavation depth of 3 m bgs. Calculations are based on an excavation size of approximately 750 m² and a saturated depth of 2 m. Using a representative hydraulic conductivity of 6.0 x 10⁻⁶ m/sec (geometric mean of the calculated hydraulic conductivities from overburden wells), the steady state volume of groundwater inflow is estimated to be between approximately 90,000 to 100,000 L/day, per excavation.

The stratigraphy within the anticipated saturated depth of the condominium excavations generally consists of a glacial till deposit. Specific design details were not available at the time of report preparation. For the purpose of this study, it has been assumed the buildings will consist of slab-on-grade construction or one basement level with a maximum excavation depth of 3 m bgs. Calculations are based on an excavation size of approximately 20,500 m² and a saturated depth of 2 m. Using a representative hydraulic conductivity of 6.0 x 10⁻⁶ m/sec (geometric mean of the calculated hydraulic conductivities from overburden wells), the steady state volume of groundwater inflow is estimated to be between approximately 210,000 to 230,000 L/day, per excavation.

The servicing trench excavations are anticipated to primarily encounter saturated glacial till material with the potential to intercept shallow saturated bedrock in some locations. Specific design details were not available at the time of report

preparation. For the purpose of this study, it has been assumed the servicing trenches will have a maximum excavation depth of 5 m bgs. Calculations are based on an excavation size of approximately 125 m² and either a saturated depth of 4 m within the glacial till and up to 2 m within the bedrock where bedrock is present. Based on probe holes completed on site, it is anticipated that bedrock will only be encountered in the western corner of the site and servicing excavations at other locations will be only in the glacial till. Using a representative hydraulic conductivity of 6.0×10^{-6} m/sec and 1.9×10^{-4} (geometric mean of the calculated hydraulic conductivities from overburden and bedrock wells, respectively), the steady state volume of groundwater inflow is estimated to be between approximately 70,000 to 75,000 L/day and 1,700,000 to 1,800,000 L/day, per excavation within the glacial till and bedrock, respectively.

The stratigraphy within the anticipated saturated depth of the western SWMP excavation generally consists of a glacial till deposit. Based on available drawings at the time of report preparation, it is anticipated that the SWMP excavation will have a maximum excavation depth of approximately 3 m bgs. Calculations are based on an excavation size of approximately 7,040 m² and a saturated depth of 2 m. Using a representative hydraulic conductivity of 6.0×10^{-6} m/sec (geometric mean of the calculated hydraulic conductivities from overburden wells), the steady state groundwater inflow is anticipated to be between approximately 240,000 to 260,000 L/day.

It should be noted that the above estimated inflow values are unfactored. It is recommended that source specific dewatering calculations be completed once more specific development details are available.

5.0 SITE SPECIFIC WATER BUDGET ASSESSMENT

The site-specific water budget assessment (SSWB) was conducted to determine the hydrogeological function of the subject site, to identify infiltration potential and to identify opportunities for supplemental stormwater management measures. At the time of the field investigations the study area mainly consisted of mature trees, grass and shrubs. The pre and post-development terrain compositions are illustrated on Drawings PH5254-6 - Pre-Development Terrain Composition Plan and PH5254-7 - Post-Development Terrain Composition Plan, appended to this report.

5.1 Calculations

Thornthwaite and Mather Water Balance Calculations

When falling precipitation intercepts the ground, three possible outcomes arise. The water can either evaporate/transpire back into the atmosphere (evapotranspiration), infiltrate into the surface soils (infiltration) or leave the area as runoff.

The method employed by Thornthwaite and Mather (1957) was used along with modelling software by Environment Canada's Engineering Climate Services Unit (EC-ECS) to determine the partitioning of water throughout various portions of the hydrologic cycle. Inputs into the modelling program included monthly temperature, precipitation, water holding capacities and site latitude. Using the long-term averages of these variables, it was possible to calculate annual potential and actual evapotranspiration, change in soil moisture storage and the water surplus.

The formula employed by Thornthwaite and Mather is as follows:

$$S = R + I = P - ET$$

Where:

- S = surplus (mm/year)
- R = annual runoff (mm/year)
- I = annual infiltration (mm/year)
- P = annual precipitation (mm/year)
- ET = annual evapotranspiration (mm/year).

Shallow unsaturated soils within the study area generally consisted of topsoil overlying a silty sand- or silty clay- based glacial till deposit, dependent on the location across the site. Additionally, there is carrying amounts of treed areas,

shrubs and farmland across the site. Therefore, the above noted calculations were carried out for the soil moisture holding capacities of each material found on site.

Based on the location of the site within the Ottawa area, climatic data was obtained from the climate station located at the McDonald-Cartier International Airport covering the period of January 1939 to December 2022. The information was provided by Environment Canada's Engineering Climate Services Unit and is presented in Appendix 2 of the report.

Table 3, below, displays the soil types present within the study area and their associated water holding capacities (WHC) as well as the actual evapotranspiration (AET) and surplus data. For the purposes of this study, AET values were used as they account for accumulated soil moisture deficit. This deficit represents the volume of water retained within the available pore spaces of the soil and is subtracted from the potential evapotranspiration (PET) value to more accurately calculate the water surplus. The monthly/annual water balance data is presented in Tables 5 to 8 in Appendix 2 of this report. For the purpose of this study, 70% of the single and detached homes property footprints and 80% of the condominium footprints are considered to be impervious surfaces (100% of surplus will result in runoff) and 30% of the single and detached homes and 20% of the condominium footprints are considered to be urban lawns with the remainder (70 and 80%, respectively) is considered as impervious surfaces.

Table 3 - Site Specific Water Surplus Information			
Land Use Unit	Water Holding Capacity (mm)	Actual Evapotranspiration (mm/year)	Surplus Water (mm/year)
Impervious Surfaces	N/A	145*	759
Urban Lawn/Shallow Rooted Crops (Fine Sandy Loam)	75	525	378
Pasture and Shrubs (Fine Sandy Loam)	150	574	329
Pasture and Shrubs (Clay Loam)	250	600	304
Mature Forests (Fine Sandy Loam)	300	605	298
Table reproduced using WHC values from MOE (2003) - Stormwater Management Planning and Design Manual and modelling data from Environment Canada's Engineering Climate Services Unit. *Values based on evaporation information for urban areas (16% of precipitation) included in the Eastern Ontario Water Resources Management Study prepared by CH2M HILL Canada Limited (March 30, 2001).			

Infiltration Factors

In order to break down the surplus water values for the various materials into infiltration and runoff, various factors must be considered. The MOE Stormwater Management Planning and Design Manual (2003) lists three main factors that contribute to surface water infiltration rates.

The first factor is topography, which is broken down further into three sections: flat and average slope, rolling land and hilly land. Flat and average slope provides the greatest potential for infiltration and has the largest infiltration factor applied to it (0.3), while the other two have progressively lower infiltration factors (rolling land is 0.2 and hilly land is 0.1).

The second factor is soil, which is also broken down further into three sections: tight impervious clay, medium combinations of clay and loam and open sandy loam. Open sandy loam provides the greatest potential for infiltration (infiltration factor of 0.4) while the other two have progressively lower potential for infiltration to occur (infiltration factor for medium combinations of clay and loam is 0.2 and for tight impervious clay is 0.1).

The final factor the MOE manual uses to partition infiltration from runoff is land cover. It is broken down into two sections: open fields/cultivated lands and woodlands. Woodlands have greater infiltration potential and an infiltration factor of 0.2. Open fields and cultivated lands have lower potential and with an infiltration factor of 0.1. A summary of the MOE manual's descriptors and their associated infiltration factors is shown below in Table 4.

Table 4 - MOE (2003) Infiltration Factors	
Description of Area/Development Site	Value of Infiltration Factor
Topography	
Flat and average slope (<0.6 m/km)	0.30
Rolling land (slope of 2.8-3.8 m/km)	0.20
Hilly land (slope of 28-47 m/km)	0.10
Soil	
Tight impervious clay	0.10
Medium combinations of clay and loam	0.20
Open sandy loam	0.40
Cover	
Open fields/cultivated lands	0.10
Woodlands	0.20
Table reproduced from MOE (2003) - Stormwater Management Planning and Design Manual.	

The topography of the study area is classified as hilly land (slope of 28-47 m/km throughout the subject site) Therefore, a pre-development topography infiltration factor of 0.1 was given for the materials analysed on this property. In order for

development to proceed, it is expected that alterations will be made to the topography of the site. In general, it is expected that the overall slope of the site will be reduced to accommodate buildings and parking areas. Therefore, the topography of the subject site under post-development conditions will consist of a mix rolling and hilly land and was therefore assigned a post-development topography infiltration factor of 0.15. An infiltration factor of 0 was assigned to the impervious surfaces due to its negligible infiltration capacity.

As previously discussed, soils within the study area generally consisted of topsoil overlying a glacial till deposit of varying composition. Therefore, a pre-development soil infiltration factor of 0.3 was given for the sand-textured materials analysed on this property and 0.2 was given for the clay-textured materials analysed on this property. Under post-development conditions, the majority of the site will consist of either landscaped areas or impervious surfaces, with soil infiltration factors ranging from 0.3 for fine sandy loam to 0 for impervious surfaces.

At the time of the field investigations, the subject site generally consisted of shallow rooted crops (i.e soybeans) or overgrown with some forested areas. A pre-development vegetation infiltration factor of 0.1 was therefore used for the site. Post-development, it is expected the majority of the trees remaining on site will be removed to accommodate buildings, parking areas and roadways. As such, a post-development vegetation infiltration factor of 0.1 was assigned to the site, except for impervious surfaces, which were given an infiltration factor of 0 due to its negligible potential to benefit from vegetation cover.

The pre and post-development infiltration factors for all materials considered are included in the water budget calculations provided in Table 9 and Table 10 included in Appendix 2 of this report.

5.2 Pre and Post-Development Water Budget

The pre-development water budget analysis conducted for the study area determined that an estimated 25,966,399 L/year of surplus water currently infiltrates the surface soils. The remaining estimated 39,046,230 L/year of surplus leaves the site as runoff.

The post-development water budget analysis determined that an estimated 11,089,802 L/year of surplus water will infiltrate the surface soils and approximately 93,608,617 L/year will leave the site as runoff. These values equate to an approximate decrease in infiltration of 57% and an increase in runoff of 140%.

The main variable that changed from pre-development conditions to post-development conditions was the addition of approximately 9.6 hectares of impervious surfaces. This results in reducing the area of pervious materials throughout the subject site, therefore, reducing the overall infiltration potential of the subject site. The remaining areas that are not being converted to impervious surfaces will become landscaped surfaces characterized by urban lawn (fine sandy loam) material. Also, it should be noted that the SWMP area was excluded from the post-development water budget analysis given that this area is designed to manage stormwater runoff and does not contribute to the infiltration or runoff potential of the site.

It is important to note that the post-development water budget analysis for the subject site does not consider any potential infiltration of the impervious surfaces (100% runoff was taken as a conservative approach). In reality, some portion of surface water that lands on impervious surfaces infiltrates (asphalt is not 100% impervious) or is diverted to grassed areas where additional infiltration may occur. As such, the post-development runoff volumes should be considered a conservative estimate and not expected to definitively represent future conditions.

Details of the pre and post-development water budget analyses are presented in Tables 9 and 10, included in Appendix 2 of this report.

6.0 GROUNDWATER IMPACT ASSESSMENT

6.1 Impact of Proposed Development on Surrounding Infrastructure

As previously discussed, soils within the subject site generally consisted of topsoil, overlying a glacial till deposit. The expected groundwater infiltration will be encountered within the glacial till deposit.

The steady-state radius of influence calculations completed were based upon the Sichardt equation as shown below. The assumed setting for the analytical solution was one in which open cut trenches were used to install the services at the subject site, creating an unconfined condition which would allow use of the equation to determine the radius of influence.

$$R = 3000 * \Delta h(K^{0.5})$$

Where: R = radius of influence (m)
 Δh = expected groundwater drawdown (m)
 K = hydraulic conductivity (m/sec).

For the purposes of completing the calculations, the following values were used in the analysis for the glacial till:

- ☐ Δh = 2 to 4 m for the glacial till and 1 to 2 m for the bedrock.
- ☐ K = 6.0×10^{-6} m/sec for the glacial till and 1.9×10^{-4} m/sec for the bedrock.

Using the above equation and assumptions, a radius of influence of approximately 15 to 29 m will develop as a steady state condition within the glacial till, extending from the edge of the excavation, depending on the groundwater levels and hydraulic properties of the specific soils encountered. If shallow bedrock removal is required, a radius of influence of approximately 41 to 83 m will develop as a steady state condition based on the geometric mean hydraulic conductivity values measured at the bedrock well location.

The surrounding area consists of mostly low-rise residential homes and commercial properties. The buildings located within the theoretical radius of influence are generally expected to be founded on the glacial till deposit. The majority of the groundwater infiltration is expected to occur within the glacial till with minimal compressibility. Furthermore, water takings are also expected to be short term in duration, given the nature of the development. As such, adverse

effects to surrounding infrastructure related to dewatering activities at the subject site are expected to be negligible.

6.2 Impact of Proposed Development on Existing Well Users

A search of the Ontario Water Well Records online mapping database indicates there are a number of wells within 500 m of the site as depicted on Drawing PH5254-2 - MECP Water Well Location Plan, appended to this report. However, it is expected that the majority of these wells are either no longer in use due to their installation dates and developed nature of the region or are monitoring well installations. Additionally, the majority of properties surrounding the site are serviced by municipal water supplies. Any wells that may still be in use are cased well below the anticipated excavation depths associated with the proposed development and are accessing the deeper bedrock aquifer. Therefore, it is anticipated that the existing wells will either no longer be in use or have adequate vertical and horizontal separation from proposed construction activities. Therefore, dewatering activities at the subject site are not expected to cause any interference to the water supply of surrounding properties or other negative impacts.

However, as a precautionary measure, a Baseline Water Sampling Program has been recommended to be completed prior to commencing construction on site. The premise of the program is to obtain groundwater quality information from the water supply wells in the vicinity of the proposed development prior to the project commencing. This ensures that all parties involved (developer, homeowners, and City of Ottawa) are protected should a concern arise during or after construction.

Baseline Water Sampling Program

As mentioned above, the theoretical radius of influence that may develop as a result of dewatering activities associated with the proposed development is expected to be 25 to 97 m, from the edge of the excavations at the time of construction, depending on the hydraulic properties and groundwater levels across the site. The domestic wells in the area were completed at depths well below the anticipated municipal servicing depths with WWRs noting that the majority of water-bearing zones were encountered below the anticipated servicing depths at the subject site.

Based on the water service mapping provided by the City of Ottawa, as well as all the available information, a total of three (3) potential privately serviced lots have been identified to be included in the Baseline Water Sampling Program and are shown on the attached Drawing PH5254-2 MECP Water Well Location Plan. All privately serviced lots on Blais Road were included in the program, which provides

a sampling radius in excess of the potential theoretical radius of influence discussed above. Furthermore, given the size and layout of the proposed development, only servicing installations on the outer perimeter of the subject site will have a radius of influence that may intercept adjacent properties.

The following municipal addresses are proposed to be included in the Baseline Water Sampling Program:

- 3216 Blais Road
- 3238 Blais Road
- 3250 Blais Road

The available water well records that are mapped within the aforementioned properties are included with the historical water well records included in Appendix 4.

The homeowners of the aforementioned properties will be invited to participate in the Baseline Water Sampling Program by providing one registered letter delivered by Canada Post. Upon receipt of the letter, homeowners will have approximately two to four weeks to contact Paterson to participate in the sampling program. To avoid the harassment of homeowners, homeowners that do not contact Paterson within four weeks of receiving the notification letter will be considered to have elected not to participate in the program. Interested homeowners will be interviewed for the purpose of obtaining anecdotal baseline water quality/quantity information about their water supply well followed by the collection of a raw water sample that will be submitted to an accredited laboratory for analysis.

The parameters that are being analyzed as part of the sampling program consist of the "Subdivision Water Quality Package" offered by Eurofins Environmental Testing Canada Inc. This package includes; alkalinity, bacteria, colour, conductivity, pH, hardness, IC anions, NH₃, TKN, DOC, phenols, sulphide, trace metals (as listed in City of Ottawa's Hydrogeological and Terrain Analysis Guidelines), Tannin & Lignin, TDS and turbidity.

A draft copy of the registered letter will be submitted to the City of Ottawa for review prior to commencement of the Baseline Water Sampling Program outlined above.

If wells are found to remain in existence on the subject site, they should be decommissioned in accordance with Ontario Regulation 903 prior to construction.

6.3 Impact of Proposed Development on the Environment

A search of the MECP Environmental Site Registry for Records Site Condition (RSCs) was conducted as part of the assessment of the site, neighbouring

properties and the general area. No RSCs were identified within the 500 m of the subject site.

A Phase I Environmental Site Assessment (ESA) was completed by Paterson for the subject site. It was determined that there were no areas of potential environmental concern within the assessment area and it was Paterson's opinion that a Phase II ESA was not required for the property.

There are several surface water features located within the subject site and within 500 m of the subject site. These include unnamed scratch ditches, drainage ditches, conveyance channels and Findlay Creek. Also, the Findlay Creek Wetlands lies south of the subject site.

Based on the results of the water budget assessment, it is anticipated that there will be an increase in contribution of flow to Findlay Creek as a result of the increase in runoff under post-development conditions. To mitigate this increase, studies are currently being undertaken by both geomorphologists and stormwater engineers (Geomorphix and JSFA, respectively). Specific details were unavailable at the time of report preparation, however it is expected that the recommendations provided as part of their assessments will be incorporated into the overall stormwater management strategy for the subject site to mitigate potential impacts to the water feature.

6.4 Adjacent PTTW/EASRs/ECAs

A search of the MECP Permit to Take Water (PTTW) database provided one (1) PTTW within a 500 m radius of the subject site.

PTTW 7437-D73S6L is registered to Thomas Cavanagh Construction Limited and is located to the west and northwest of the subject site along Bank Street. The above noted permit contains 1 source (Servicing Trenches) with a maximum taking of 45,121,000 L/day.

A search of the MECP Environmental Activity and Sector Registry (EASR) database provided one (1) active EASR within a 500 m radius of the subject site.

EASR R-009-4295072770 is registered to Thomas Cavanagh Construction Limited and is located within the subject site associated with the street widening of Bank Street. The above noted permit contains 1 source (Construction Dewatering) with a maximum taking of 400,000 L/day, per source. It is anticipated that this EASR has been replaced by the aforementioned PTTW.

It is anticipated that the street widening will be completed prior to the commencement of construction and therefore, it is unlikely that dewatering between the two sites would be taking place concurrently. Cumulative impacts related to anticipated dewatering activities for the proposed development from adjacent water taking permits are not anticipated.

With respect to Environmental Compliance Approvals (ECAs), given the nature of the development in the area (residential and commercial), there are several ECAs that exist for various purposes in the areas bordering the site. Three (3) ECAs were found to be in relation to existing stormwater and sanitary management systems in the area, however they were stated to be expired in 2025. Upon review of the aforementioned ECAs, the ECAs generally relate to installations of new sanitary and storm sewers for new residential developments along with stormwater management facilities on the respective sites. As the ECAs relate to municipal stormwater infrastructure, no concerns were found from a hydrogeological perspective in relation to the subject site.

7.0 ASSESSMENT AND RECOMMENDATIONS

7.1 Sources of Contamination

Prior to and during site development, it is recommended that construction best management practices with respect to fuels and chemical handling, spill prevention, and erosion and sediment control be followed. This will minimize the potential for the introduction of contaminants to the soil, surface water, or groundwater at the subject site.

It is anticipated that the material on site will be disposed of as per Ontario Regulation 406/19 – On-site and Excess Soil Management.

With respect to stormwater runoff quality, it is recommended that best management practices with respect to operational standards be maintained for any stormwater management facilities constructed for the proposed development.

7.2 Surface Water Features

There are several surface water features located within the subject site and within 500 m of the subject site. These include unnamed scratch ditches, drainage ditches, conveyance channels and Findlay Creek. As previously noted, various studies were currently underway by others at the time of report preparation to assess the extent of effort required to mitigate potential impacts resulting from increased flows from the proposed development. Dependant on the outcome of these studies, additional measures may need to be incorporated into the overall stormwater management strategy for the site to limit the extent of increase in flows to the creek.

With respect to water discharge, water that is pumped from on site excavations must be managed in an appropriate manner. The contractor will be required to implement a water management program to dispose of the pumped water. If the discharge point for the pumped water is directed to overland drainage, it is expected that a multi-barrier approach (such as hay bales, geosocks, silt fence, etc.) to a non-frozen, well vegetated area will be utilized in order to promote re-infiltration prior to reaching a watercourse. Furthermore, if the discharged water is to be directed to overland drainage within 30 m of a water body/watercourse, the turbidity of the water shall not exceed 8 NTU above background levels of the nearest water body. The contractor will be required to maintain appropriate BMPs with respect to sediment and erosion control to ensure negative effects to the surrounding environment are minimized.

7.3 Existing Wells

Any wells within the subject site must be decommissioned prior to construction in accordance with Ontario Regulation 903.

If construction activities are shown to cause negative impacts to the water supplies of existing well users, the developer shall take action to make available a supply of water equivalent in quality and quantity of their typical takings, or shall compensate those affected for reasonable costs for doing so, or shall reduce water taking amounts to alleviate the negative impacts. The contractor shall provide temporary water supplies, to those affected, to meet their typical takings or compensate such persons for reasonable costs associated to do so until permanent restoration of the affected water supply or an equivalent source. As the potential to interfere with the water quality/quantity of existing well users in the area is negligible, a water well monitoring program is not recommended for the proposed development.

7.4 Water Taking Permitting Requirements

If water taking volumes are greater than 50,000 L/day, a MECP water taking Environmental Activity Sector Registry (EASR) or Permit to Take Water (PTTW) will be required. Depending on the nature of the proposed water takings, an additional hydrogeological investigation may be required.

7.5 Infiltration Potential

At the time of report preparation, site specific infiltration testing had not been completed based on the current stage of development approvals. As previously discussed, surficial soils within the study area generally consisted of topsoil overlying a glacial till deposit. From a theoretical perspective, K_{fs} values within the glacial till are anticipated to range from 1×10^{-8} to 1×10^{-5} m/sec., with the variation in the K_{fs} values dependent on the composition/compaction of the material at a given location. Should infiltration-based Low Impact Development (LID) measures be considered at the subject site, it is recommended that site-specific infiltration testing be completed once additional development details become available.

As noted above, the results of the water budget analyses completed at the subject site indicated that 25,966,399 L/year of infiltration and 39,046,230 L/year of surface runoff are occurring under pre-development conditions. Under post development conditions, it is expected that there will be a 57% infiltration deficit and a 140%

increase in runoff. Therefore, it will likely be necessary to incorporate various stormwater management measures into the design of the development. It should be noted that Paterson's water budget assessment is based on mean water budget values for the soil types at the subject site that were calculated by modeling conducted by EC-ECS. The EC-ECS model is calibrated to historical climate data and does not account for climate change predictions. Therefore, based on the National Capital Commission and City of Ottawa climate change predictions, the stormwater management design team could consider potential seasonal changes (longer spring and shorter winter) and increases in temperature and precipitation when developing their stormwater management strategy.

The stormwater management strategy should target methods best suited to mitigate the impacts that may arise due to the post-development decrease in infiltration and increase in runoff at the subject site, while maintaining consideration of site constraints as defined by the Appendix 10 of the City of Ottawa's Sewer Design Guideline and the MECP's Consolidated Linear Infrastructure Environmental Compliance Approval documentation. Based on the site constraints observed at the subject site (i.e., shallow water table, shallow bedrock), infiltration based Low Impact Development (LID) measures are not recommended at the time of report preparation. Given that infiltration based LID's are not feasible due to site constraints, it is anticipated that the stormwater management strategy for the site will include conventional stormwater management measures (i.e. end of pipe quality and quantity control) and Best Management Practices.

8.0 CLOSURE

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only, and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes.

A hydrogeological review of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. Should any conditions at the site be encountered which differ from those at the test locations, we request notification immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Caivan Communities or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.



Oliver Blume, P.Geo.



Michael Laflamme, P.Geo.



9.0 REFERENCES

Government of Ontario. Provincial Policy Statement 2020 Under the Planning Act.

Engineering Technologies Canada Ltd, "ETC Pask (Constant Head Well) Permeameter – User Guide", dated March 2016.

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"Characterization of Ottawa's Watersheds", Prepared for the City of Ottawa, dated March 2011.

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Chapman, L.J., and Putnam, D. F. "The Physiography of Southern Ontario, Third Edition". Ontario Ministry of Natural Resources, 1984.

Freeze, R.A., and Cherry, J.A. "Groundwater". Prentice-Hall, Inc., 1979.

FIGURES

DRAWING PH5254-1 - SITE PLAN

DRAWING PH5254-2 - MECP WATER WELL LOCATION PLAN

DRAWING PH5254-3 - SURFICIAL GEOLOGY PLAN

DRAWING PH5254-4 - BEDROCK GEOLOGY PLAN

DRAWING PH5254-5 - GROUNDWATER CONTOUR PLAN

DRAWING PH5254-6 - PRE-DEVELOPMENT TERRAIN COMPOSITION PLAN

DRAWING PH5254-7 - POST-DEVELOPMENT TERRAIN COMPOSITION PLAN

MONITORING WELL WATER ELEVATION PLOTS



LEGEND:

— SITE BOUNDARY

SCALE: 1:4000

0 50 100 150 200 250m

PATERSON GROUP

9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

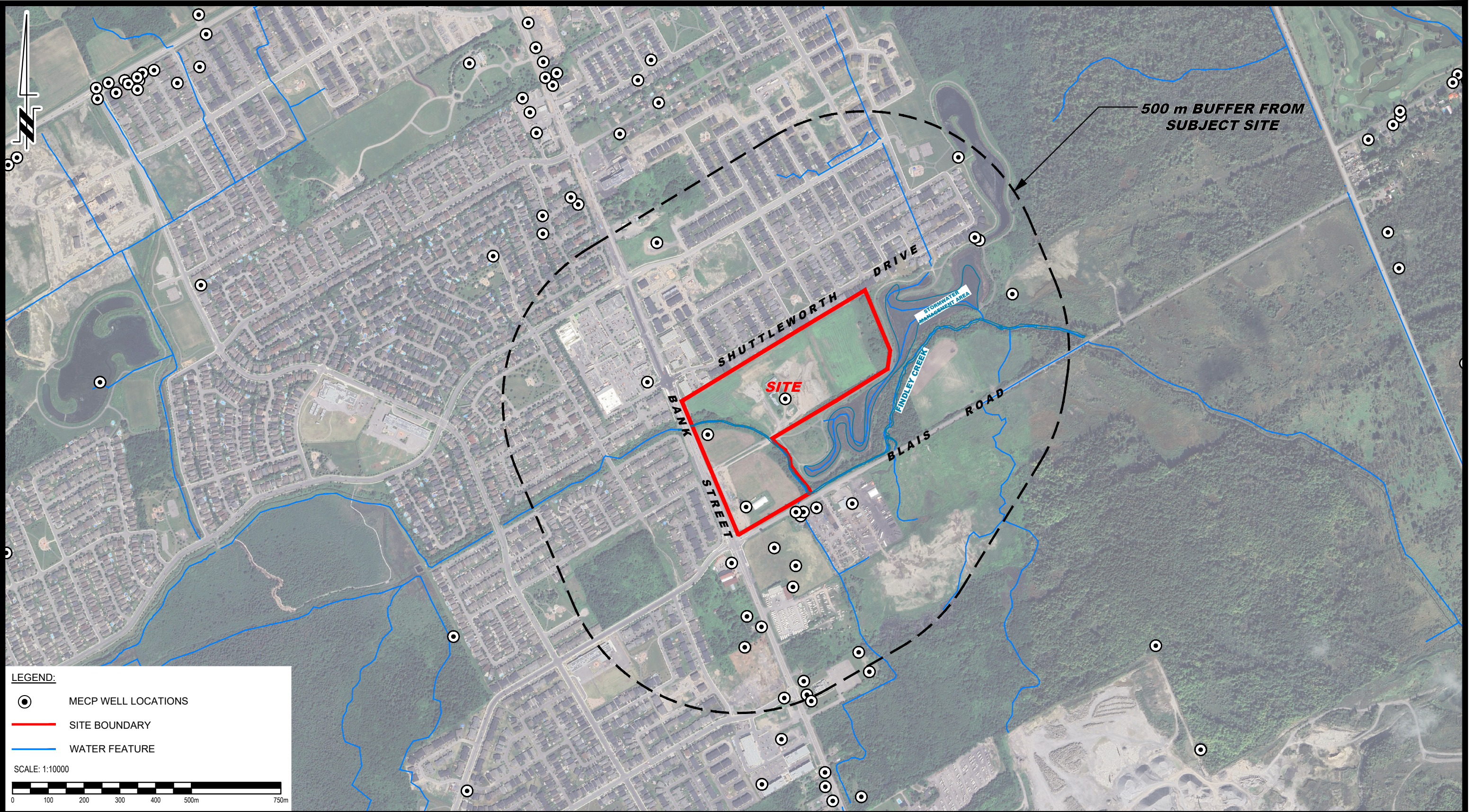
1	UPDATED CONCEPT PLAN	26/06/2026	OB
NO.	REVISIONS	DD/MM/YYYY	INITIAL

CAIVAN COMMUNITIES
HYDROGEOLOGICAL STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
4795 BANK STREET

OTTAWA, ONTARIO

Title: **SITE PLAN**

Scale:	1:4000	Date:	05/2026
Drawn by:	GK	Report No.:	PH5254-REP.01
Checked by:	AS	Dwg. No.:	PH5254-1
Approved by:	ML	Revision No.:	1

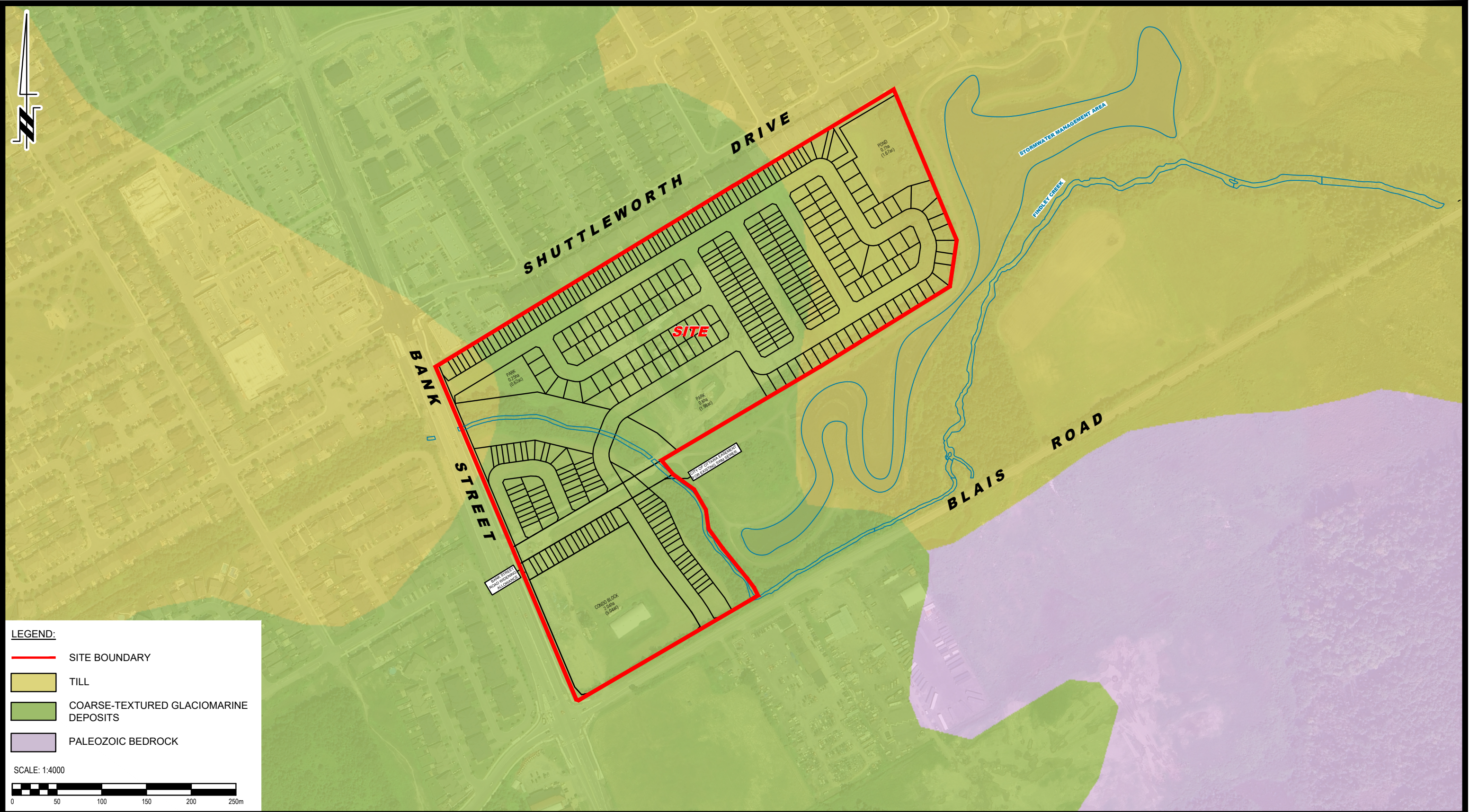


LEGEND:

- MECP WELL LOCATIONS
- SITE BOUNDARY
- WATER FEATURE

SCALE: 1:10000

 PATERSON GROUP 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381					OTTAWA, Title:	CAIVAN COMMUNITIES HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL DEVELOPMENT 4795 BANK STREET ONTARIO	Scale:	1:10000	Date:	05/2026		
							Drawn by:	GK	Report No.:	PH5254-REP.01		
							Checked by:	AS	Dwg. No.: PH5254-2			
							Approved by:	ML		Revision No.:		
	NO.	REVISIONS	DATE	INITIAL			SITE PLAN					

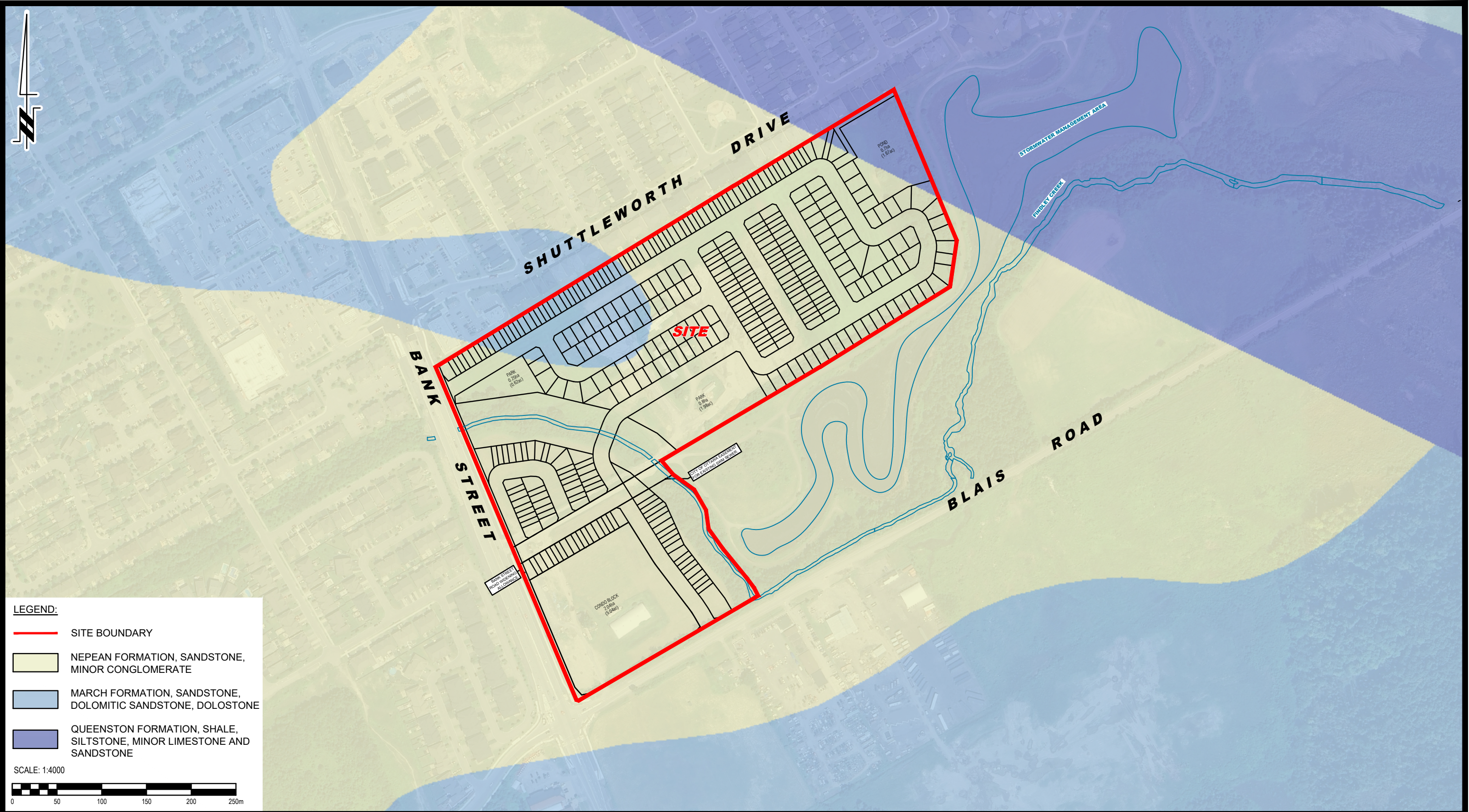


LEGEND:

- SITE BOUNDARY
- TILL
- COARSE-TEXTURED GLACIOMARINE DEPOSITS
- PALEOZOIC BEDROCK

SCALE: 1:4000

 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381					CAIVAN COMMUNITIES HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL DEVELOPMENT 4795 BANK STREET ONTARIO	Scale: 1:4000	Date: 05/2026	
						Drawn by: GK	Report No.: PH5254-REP.01	
						Checked by: AS	Dwg. No.: PH5254-3	
	1	UPDATED CONCEPT PLAN	26/06/2026	OB		Approved by: ML		Revision No.: 1
						OTTAWA, Title:		
						SURFICIAL GEOLOGY PLAN		
	NO.	REVISIONS	DD/MM/YYYY	INITIAL				



LEGEND:

- SITE BOUNDARY
- NEPEAN FORMATION, SANDSTONE, MINOR CONGLOMERATE
- MARCH FORMATION, SANDSTONE, DOLOMITIC SANDSTONE, DOLOSTONE
- QUEENSTON FORMATION, SHALE, SILTSTONE, MINOR LIMESTONE AND SANDSTONE

SCALE: 1:4000

0

50

100

150

200

250m

 PATERSON GROUP 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381					CAIVAN COMMUNITIES HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL DEVELOPMENT 4795 BANK STREET ONTARIO	Scale:	1:4000	Date:	05/2026
						Drawn by:	GK	Report No.:	PH5254-REP.01
						Checked by:	AS	Dwg. No.:	PH5254-4
						Approved by:	ML	Revision No.:	1
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NO.	REVISIONS	DD/MM/YYYY	INITIAL						



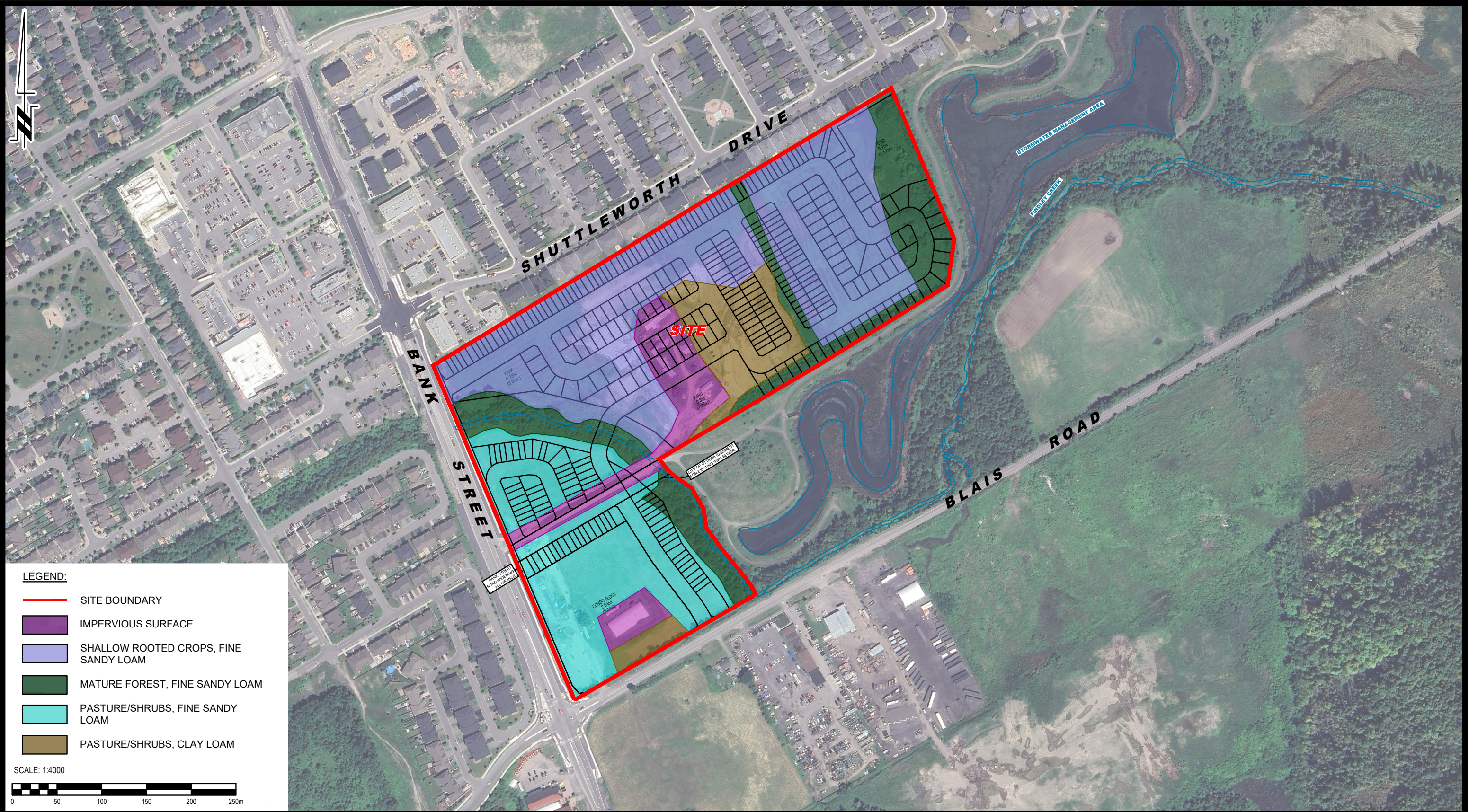
LEGEND:

- SITE BOUNDARY
-
-
-
-
-
- 91.20 GROUND SURFACE ELEVATION (m)
- [78.18] INFERRED BEDROCK ELEVATION, BASED ON PROBE HOLE (m)
- {84.46} PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- (86.22) PRACTICAL REFUSAL TO DCPT ELEVATION (m)
- (90.23) OVERBURDEN GROUNDWATER SURFACE ELEVATION (m) (MAY 21, 2026)
- 89 GROUNDWATER CONTOUR (m)
- APPROX. GROUNDWATER FLOW DIRECTION

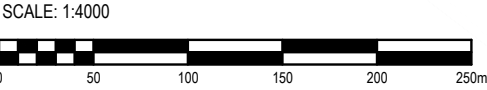
GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:4000

9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381				CAIVAN COMMUNITIES HYDROGEOLOGICAL STUDY PROPOSED RESIDENTIAL DEVELOPMENT 4795 BANK STREET ONTARIO			Scale: 1:4000	Date: 05/2026
				OTTAWA, Title:			Drawn by: GK	Report No.: PH5254-REP.01
				OVERBURDEN GROUNDWATER CONTOUR PLAN			Checked by: AS	Dwg. No.: PH5254-5
							Approved by: ML	Revision No.: 1
1	UPDATED CONCEPT PLAN	26/06/2026	OB					
NO.	REVISIONS	DD/MM/YYYY	INITIAL					



- LEGEND:
- SITE BOUNDARY
 - IMPERVIOUS SURFACE
 - SHALLOW ROOTED CROPS, FINE SANDY LOAM
 - MATURE FOREST, FINE SANDY LOAM
 - PASTURE/SHRUBS, FINE SANDY LOAM
 - PASTURE/SHRUBS, CLAY LOAM





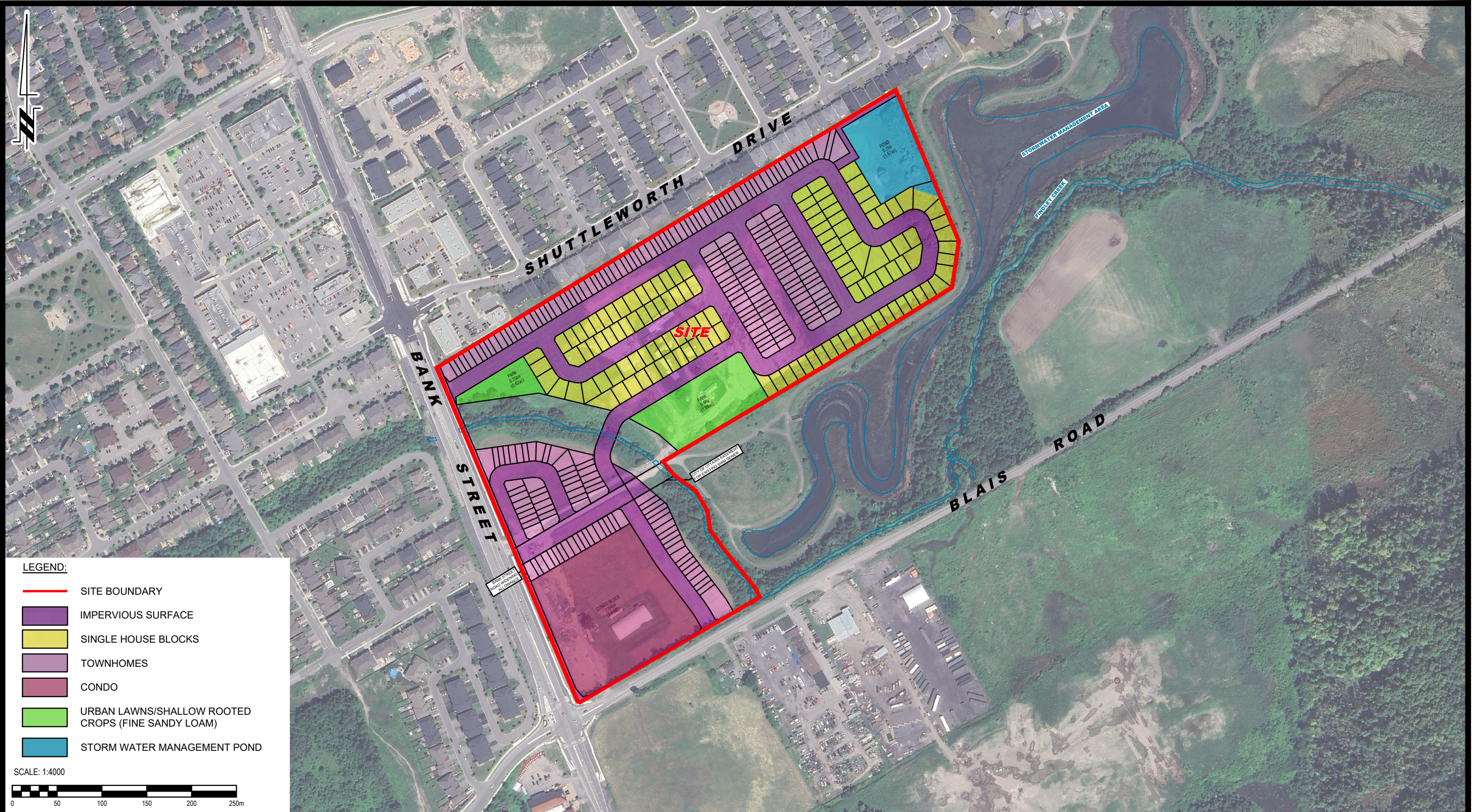
PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

1	UPDATED CONCEPT PLAN	26/06/2026	OB
NO.	REVISIONS	DD/MM/YYYY	INITIAL

CAIVAN COMMUNITIES
HYDROGEOLOGICAL STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
4795 BANK STREET

OTTAWA,
Title: **PRE-DEVELOPMENT TERRAIN COMPOSITION PLAN** ONTARIO

Scale:	1:4000	Date:	05/2026
Drawn by:	GK	Report No.:	PH5254-REP.01
Checked by:	AS	Dwg. No.:	PH5254-6
Approved by:	ML	Revision No.:	1



- LEGEND:**
- SITE BOUNDARY
 - IMPERVIOUS SURFACE
 - SINGLE HOUSE BLOCKS
 - TOWNHOMES
 - CONDO
 - URBAN LAWNs/SHALLOW ROOTED CROPS (FINE SANDY LOAM)
 - STORM WATER MANAGEMENT POND





PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

1	UPDATED CONCEPT PLAN	26/06/2026	OB
NO.	REVISIONS	DD/MM/YYYY	INITIAL

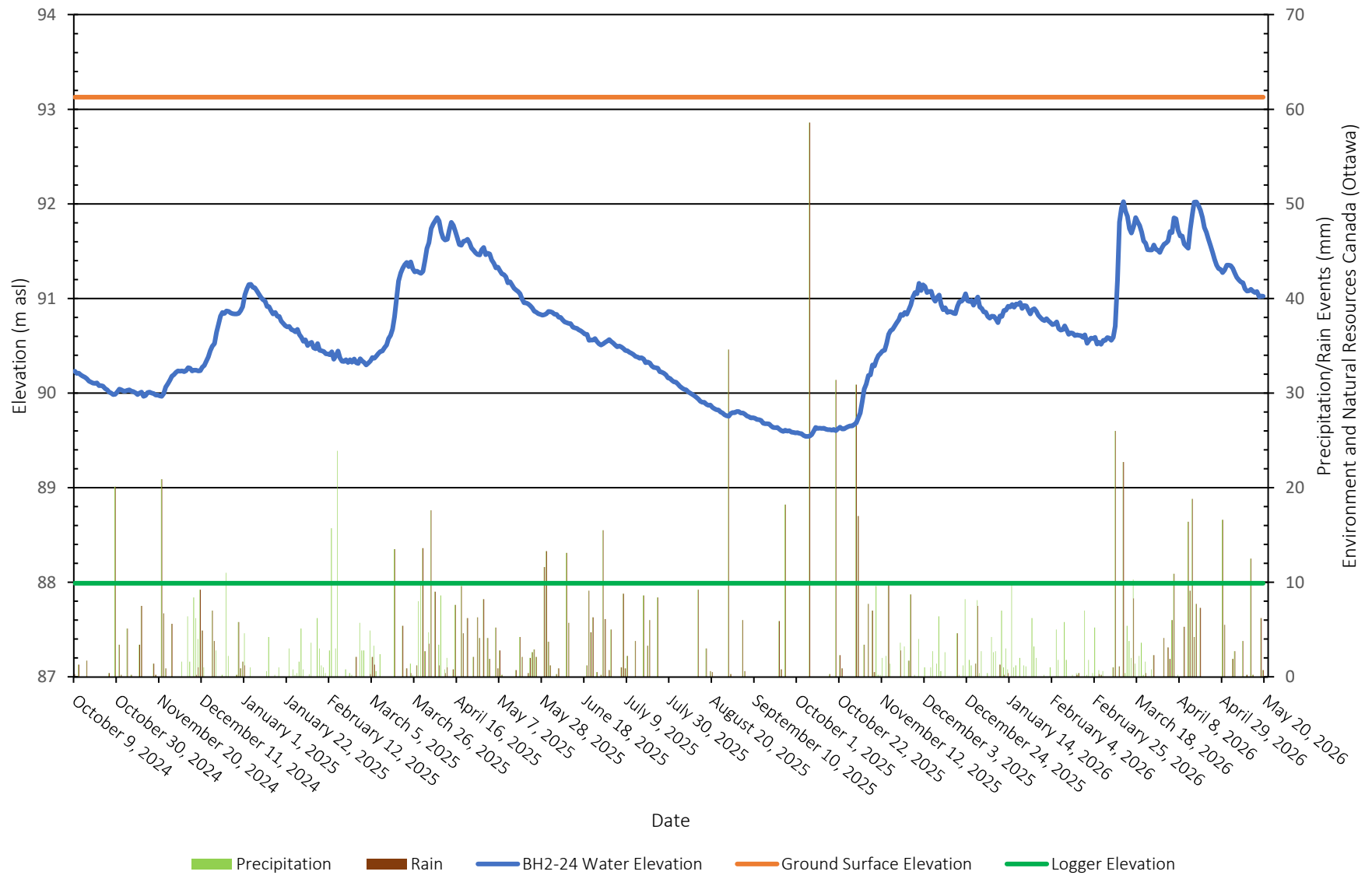
CAIVAN COMMUNITIES
HYDROGEOLOGICAL STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
4795 BANK STREET

OTTAWA,
Title:
POST-DEVELOPMENT TERRAIN COMPOSITION PLAN

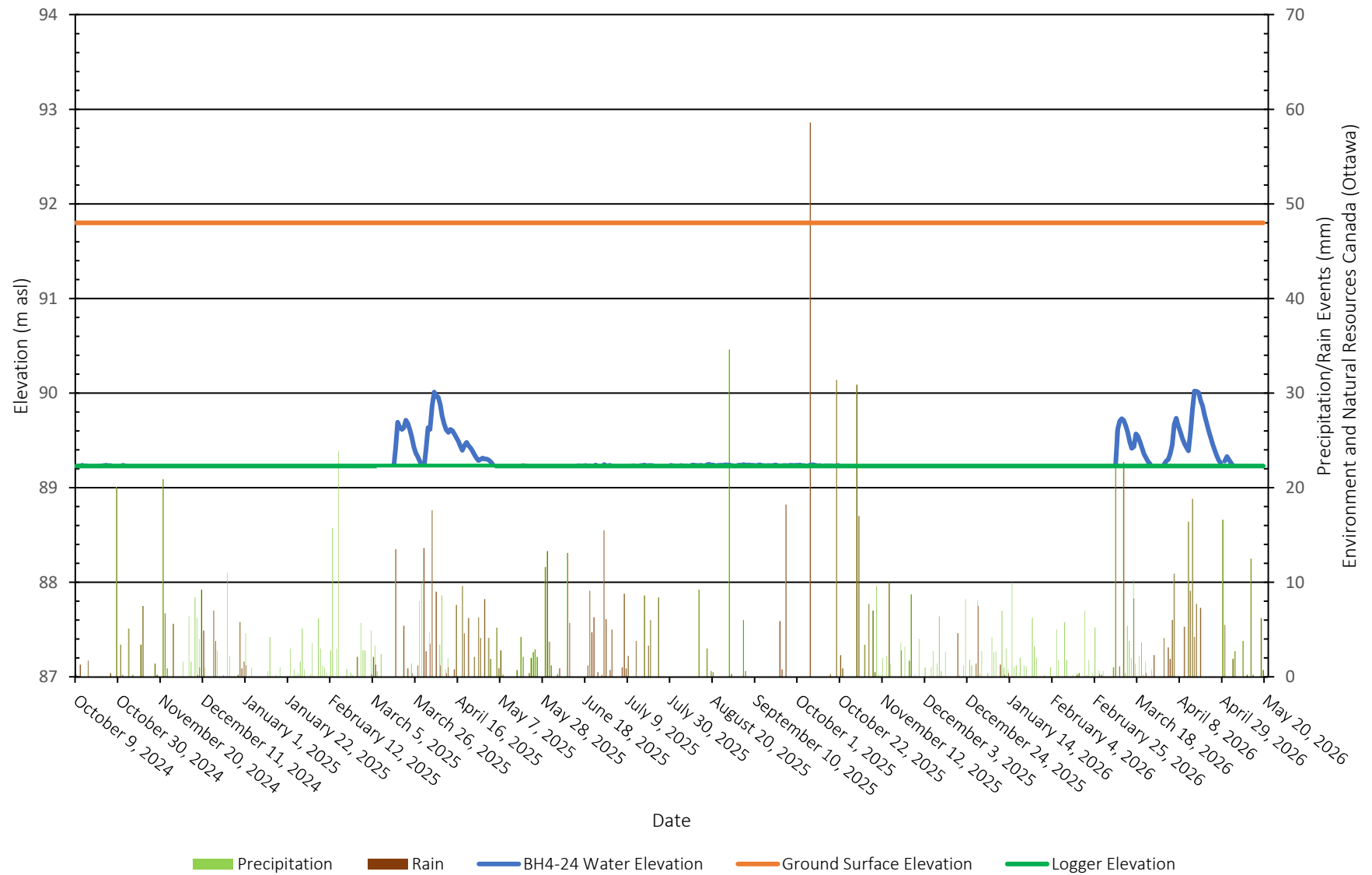
ONTARIO

Scale:	1:4000	Date:	05/2026
Drawn by:	GK	Report No.:	PH5254-REP.01
Checked by:	AS	Dwg. No.:	PH5254-7
Approved by:	ML	Revision No.:	1

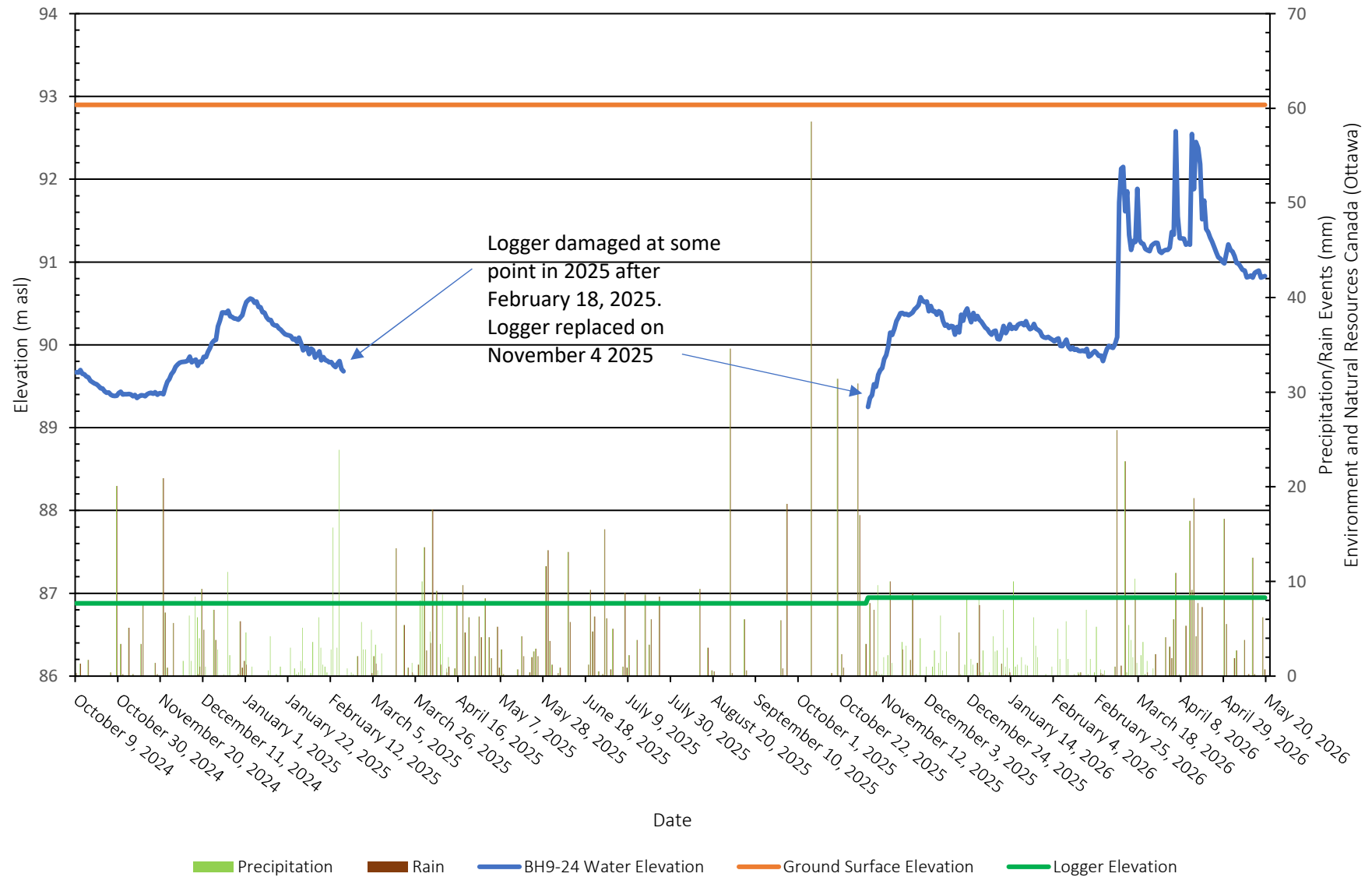
BH2-24 - Monitoring Well Water Elevations



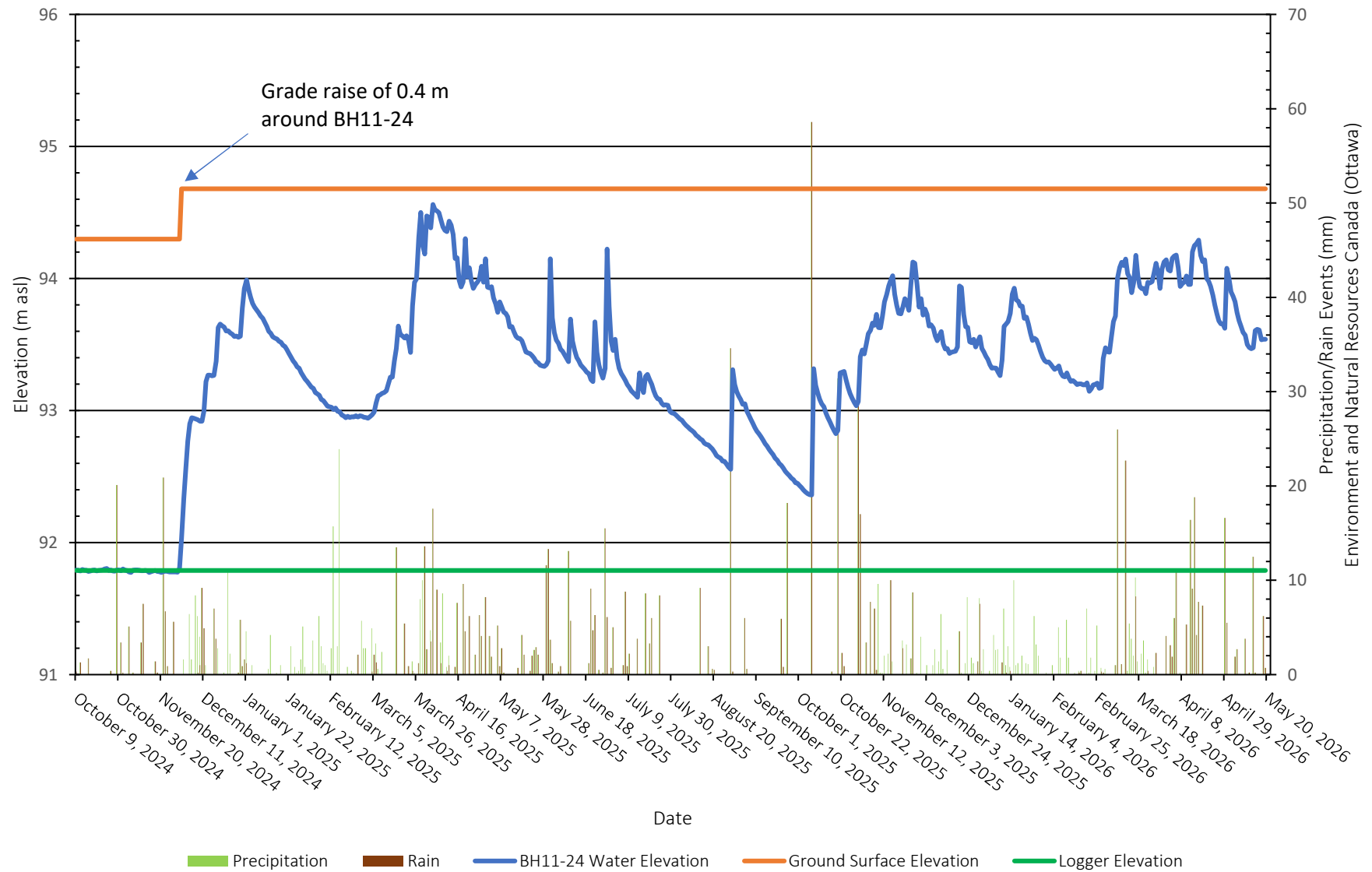
BH4-24 - Monitoring Well Water Elevations



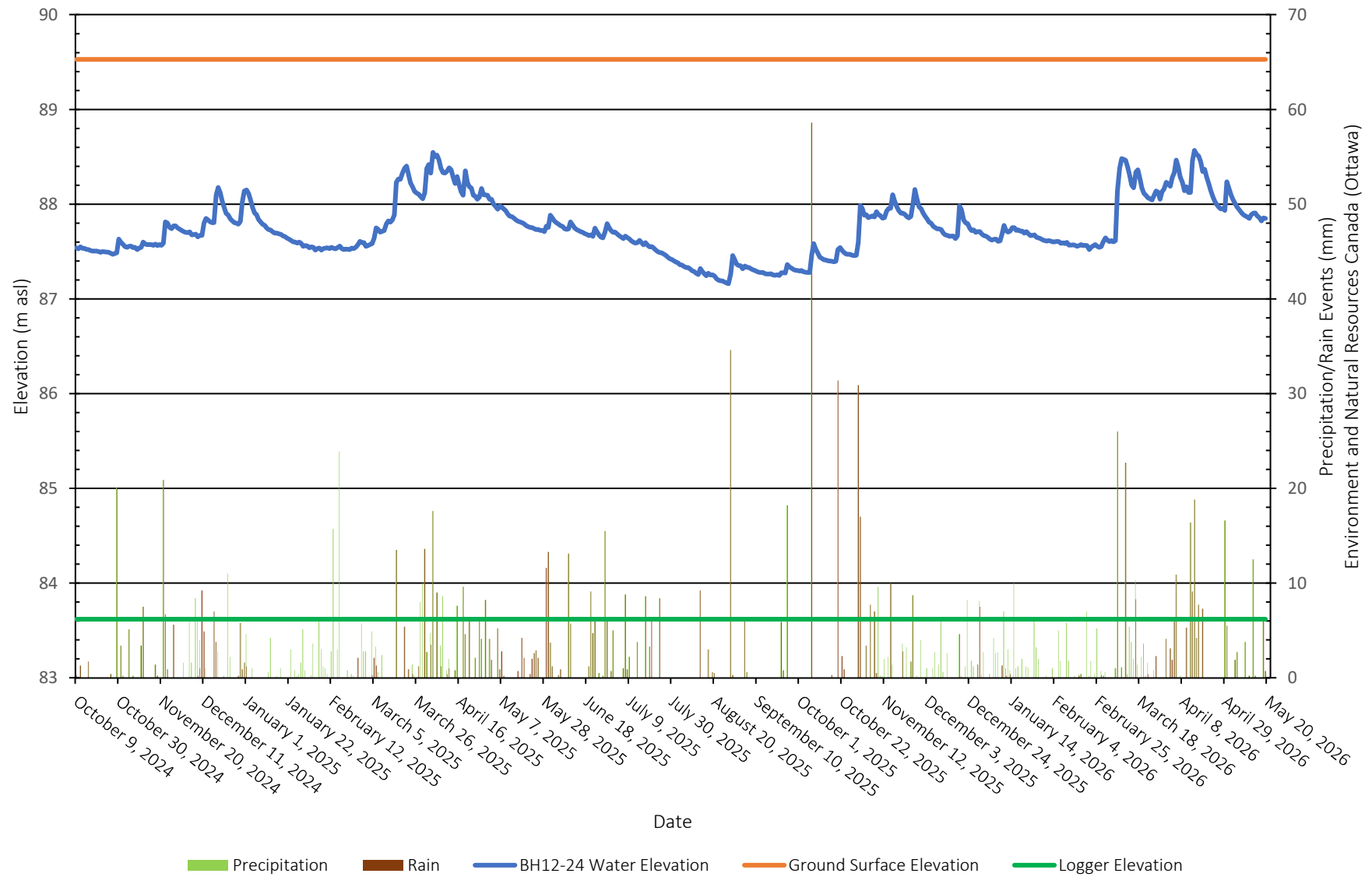
BH9-24 - Monitoring Well Water Elevations



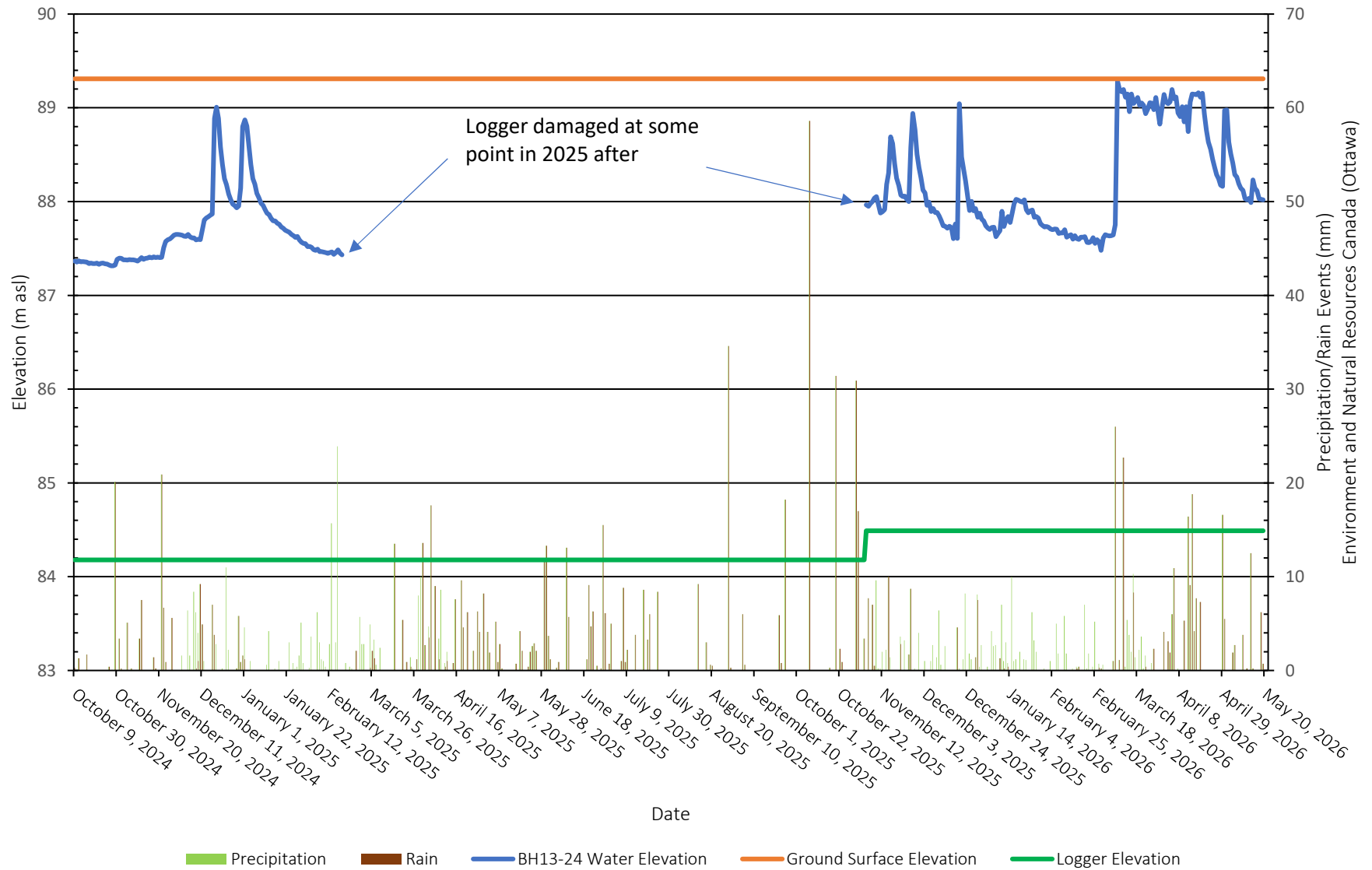
BH11-24 - Monitoring Well Water Elevations



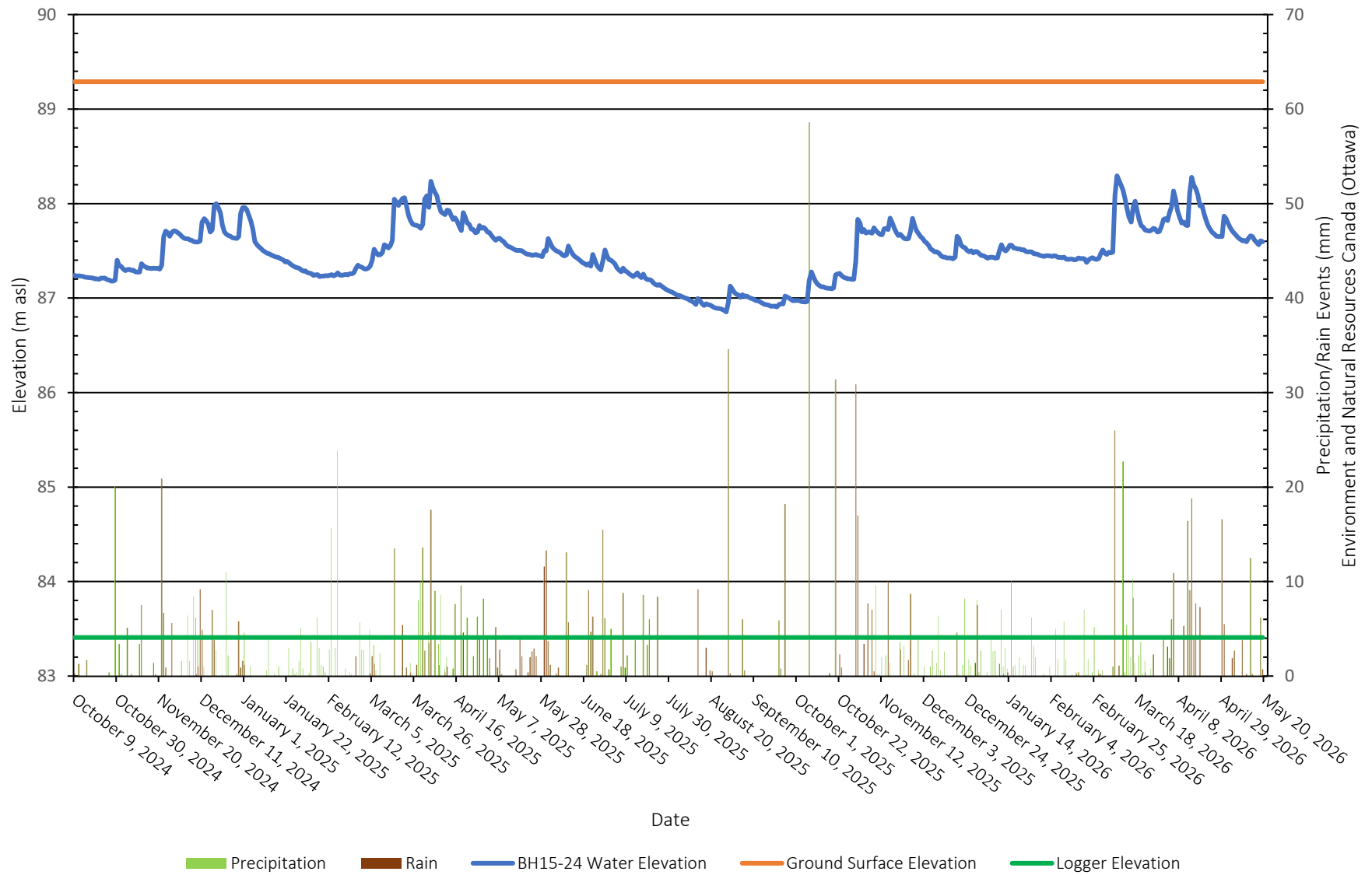
BH12-24 - Monitoring Well Water Elevations



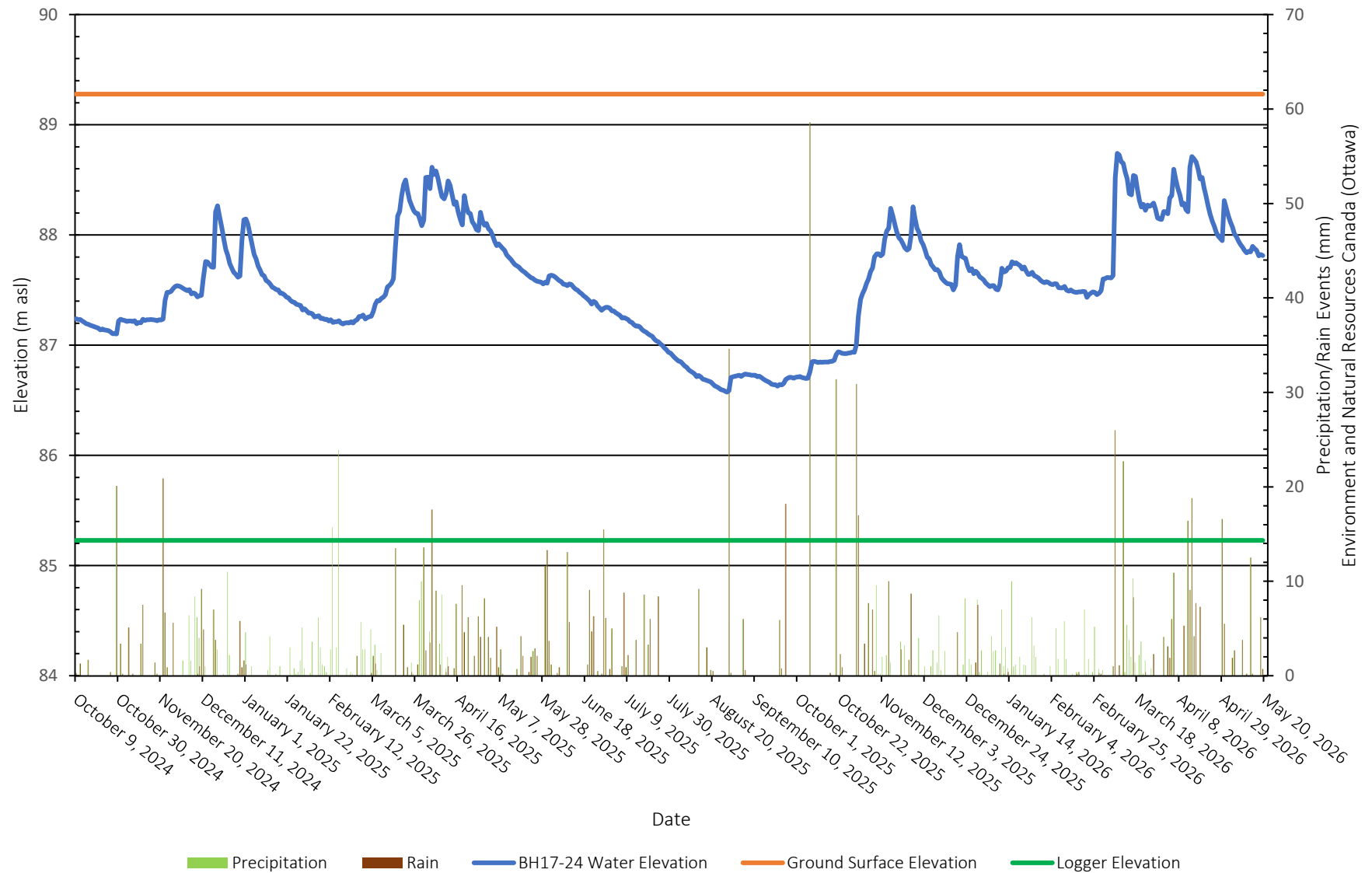
BH13-24 - Monitoring Well Water Elevations



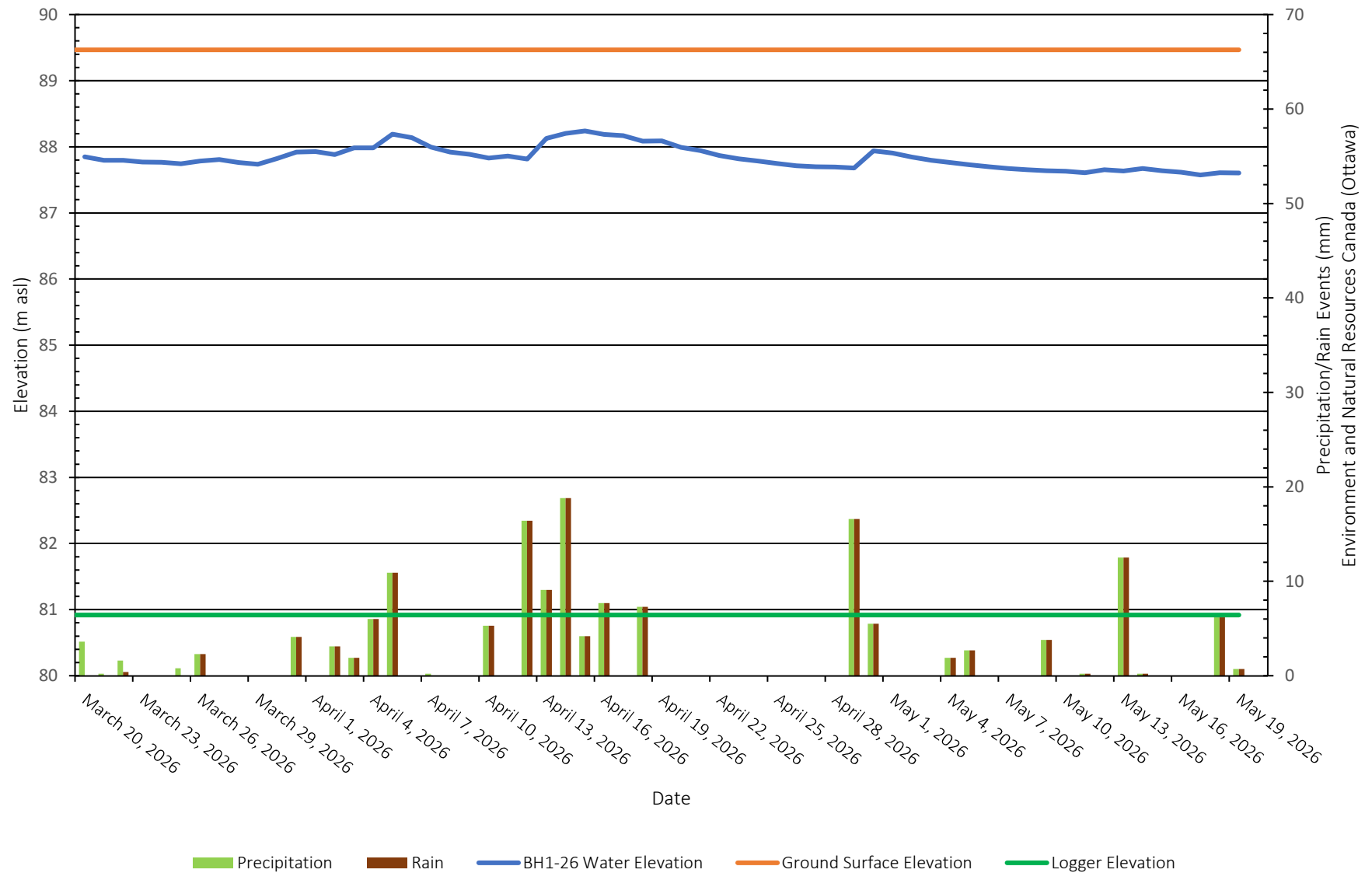
BH15-24 - Monitoring Well Water Elevations



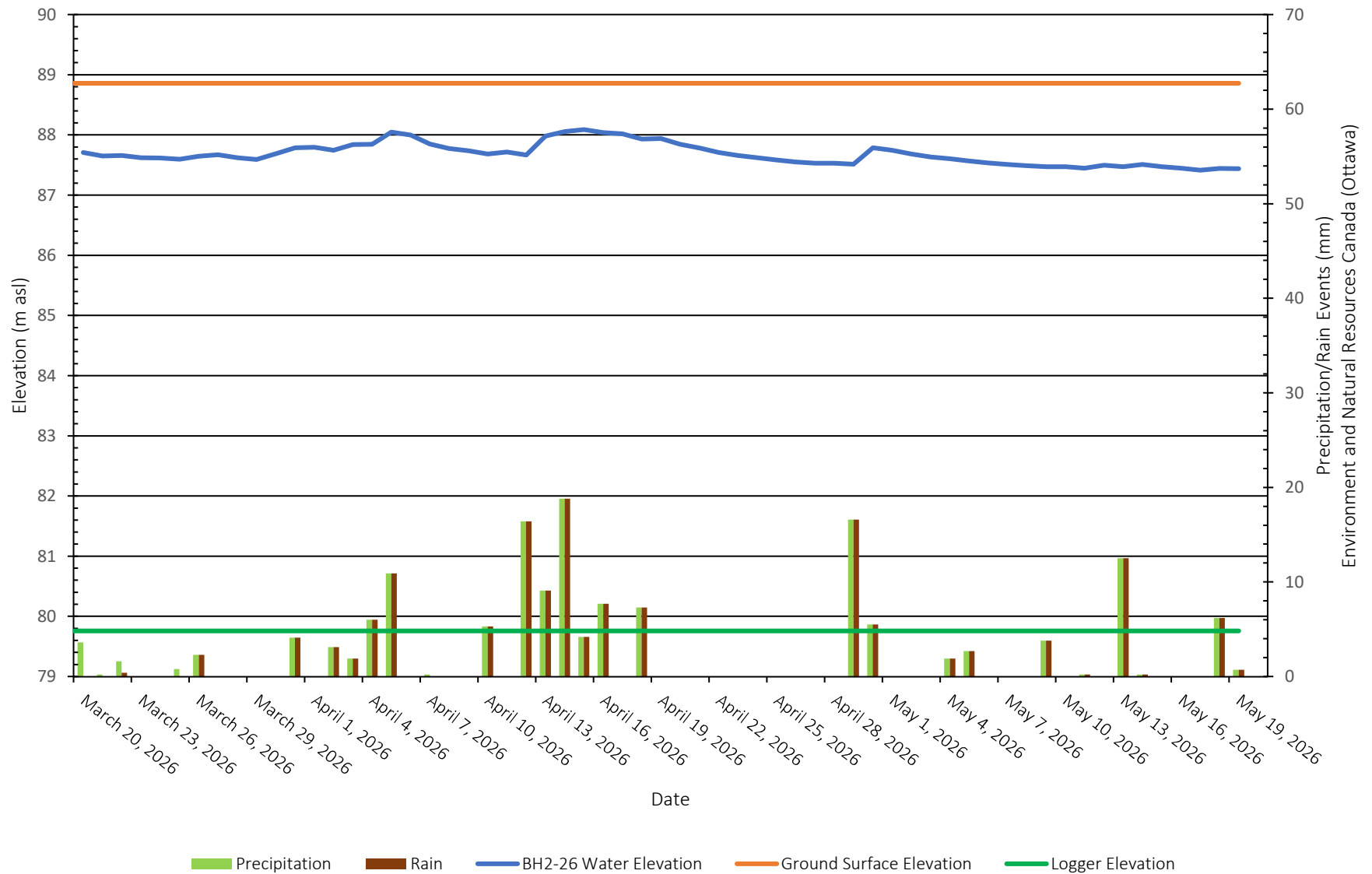
BH17-24 - Monitoring Well Water Elevations



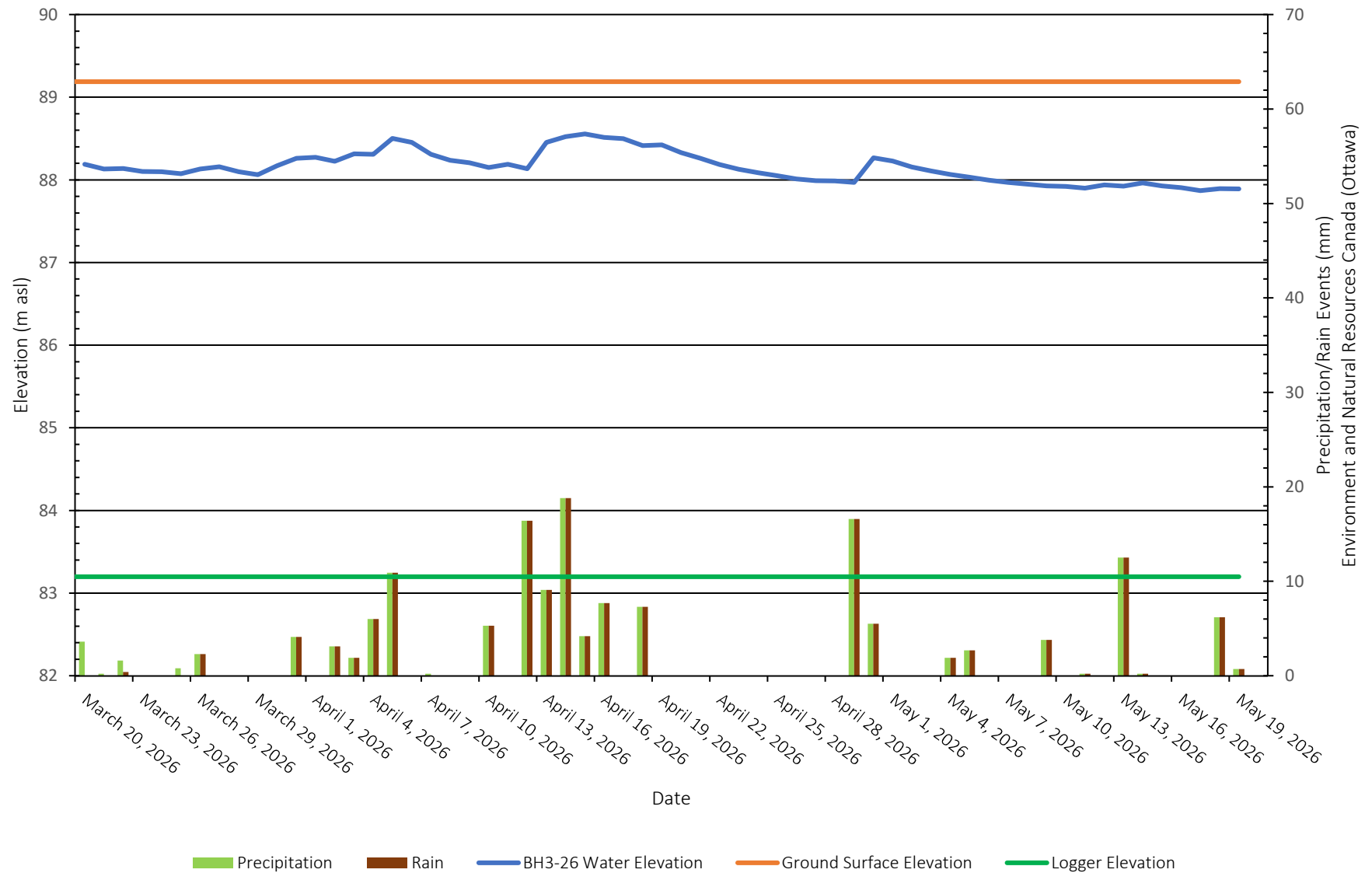
BH1-26 - Monitoring Well Water Elevations



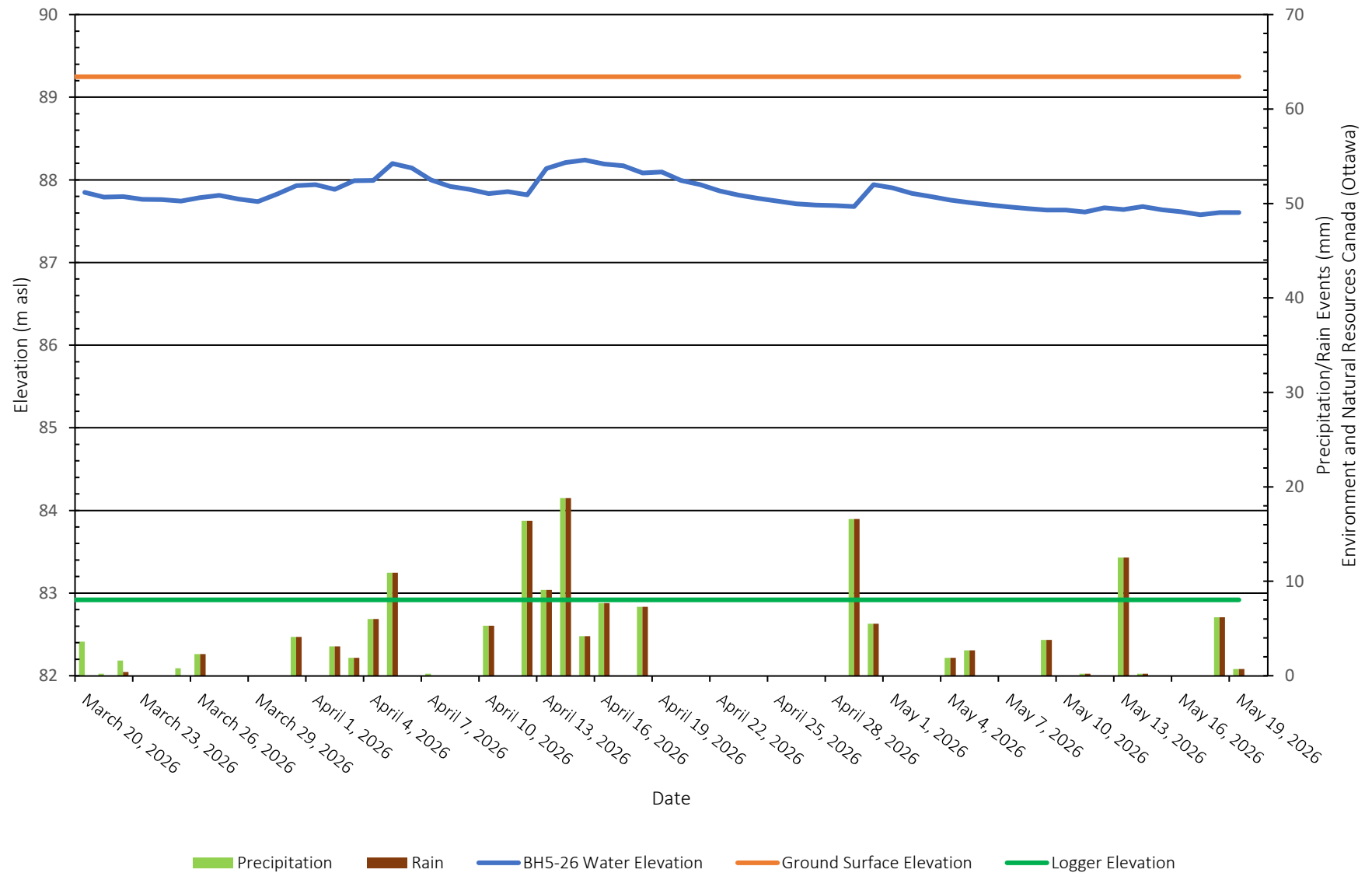
BH2-26 - Monitoring Well Water Elevations



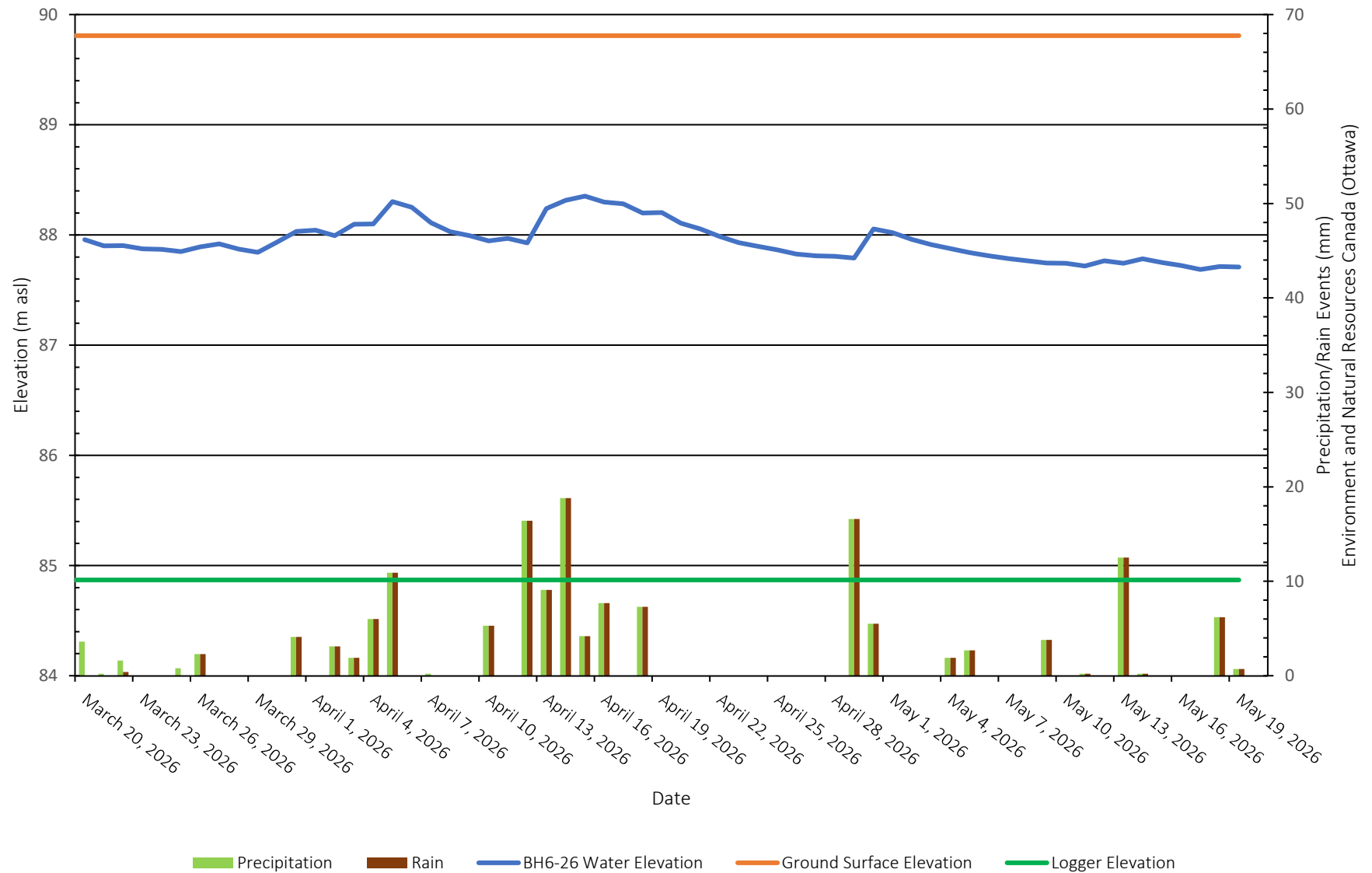
BH3-26 - Monitoring Well Water Elevations



BH5-26 - Monitoring Well Water Elevations



BH6-26 - Monitoring Well Water Elevations



APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

DRAWING PG7301-1 - TEST HOLE LOCATION PLAN

COORD. SYS.: MTM ZONE 9 EASTING: 376166.29 NORTHING: 5019808.33 ELEVATION: 93.47

PROJECT: Geotechnical Investigation FILE NO.: **PG7301**

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: **BH 1-24**

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		
	20	40	60	80								
GROUND SURFACE												
TOPSOIL and organics 0.15m [93.32m]		0		AU 1								
GLACIAL TILL: Loose brown silty sand with gravel, cobbles and boulders - Very dense by 0.80 m depth 1.17m [92.30m]				SS 2	74	6-23-50-/ 73/0.25	9.5					
End of Borehole												
Practical refusal to augering at 1.17 m depth												
(BH Dry - October 09, 2024)												

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COORD. SYS.: MTM ZONE 9 EASTING: 376261.50 NORTHING: 5019824.46 ELEVATION: 93.13

PROJECT: Geotechnical Investigation FILE NO.: PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							Δ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20 40 60 80					
PL (%)	WATER CONTENT (%)		LL (%)									
20 40 60 80												

GROUND SURFACE												
TOPSOIL and organics		0	AU 1									93
0.20m [92.93m]												
FILL: Very dense, brown silty clay, with sand, trace gravel, cobbles and asphalt		1	SS 2	92	17-31-35-42 66	9.89	○					92
1.45m [91.68m]												
GLACIAL TILL: Very dense, brown silty sand, trace clay, occasional gravel, cobbles and boulders		2	SS 3	92	28-28-35-27 63	7.06	○					91
		3	SS 4	79	10-12-14-17 26	16.49	○					90
		4	SS 5	4	10-9-8-10 17	21.47	○					89
3.89m [89.24m]												
GLACIAL TILL: Very stiff, grey silty clay, with gravel and cobbles		4	SS 6	42	7-6-26-12 32	13.79	○					88
		5	SS 7	43	7-5-23-50 28	10.56	○					87
5.23m [87.90m]												
End of Borehole												
Practical refusal to augering at 5.23 m depth		6										86
(GWL at 2.90 m depth - October 9, 2024)												
		7										85
		8										84
		9										
		10										

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COORD. SYS.: MTM ZONE 9 EASTING: 376312.22 NORTHING: 5019885.37 ELEVATION: 91.48

PROJECT: Geotechnical Investigation FILE NO.: PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE					■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
		DEPTH (m)	TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20	40	60	80		
PL (%)	WATER CONTENT (%)		LL (%)									
20	40	60	80									
GROUND SURFACE												
TOPSOIL and organics 0.15m [91.33m],		0										
GLACIAL TILL: Loose brown silty sand, trace clay, occasional gravel, cobbles and boulders - Very dense by 0.8 m depth 1.02m [90.46m]		1	AU 1	86	16-50-/-/ 50/0.3	10.19	○					91
End of Borehole												90
Practical refusal to augering at 1.02 m depth		2										89
(BH Dry - October 09, 2024)		3										88
		4										87
		5										86
		6										85
		7										84
		8										83
		9										82
		10										

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COORD. SYS.: MTM ZONE 9 EASTING: 376195.40 NORTHING: 5019922.75 ELEVATION: 91.80

PROJECT: Geotechnical Investigation FILE NO.: PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)			MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80				
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)				
							▲ PEAK SHEAR STRENGTH, Cu (kPa)				
							PL (%)	WATER CONTENT (%)	LL (%)		
							20 40 60 80				
GROUND SURFACE		0	AU 1								
FILL: Loose, brown silty sand, trace crushed stone											
0.69m [91.11m]											
GLACIAL TILL: Dense, brown silty sand, with gravel, trace cobbles and boulders		1	SS 2	71	13-22-23-16 45	6.4	○			91	
- Grey by 1.5 m depth											
		2	SS 3	50	6-15-27-50 42	7.04	○			90	
2.62m [89.18m]											
End of Borehole			SS 4	70	5-50-/-/ 50/0.1	9.27	○			89	
		3									
Practical refusal to augering at 2.62 m depth											
(BH Dry - October 09, 2024)		4								88	
		5								87	
		6								86	
		7								85	
		8								84	
		9								83	
		10								82	

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COORD. SYS.: MTM ZONE 9 EASTING: 376185.77 NORTHING: 5020018.09 ELEVATION: 91.56

PROJECT: Geotechnical Investigation FILE NO.: PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20	40	60	80		
PL (%)	WATER CONTENT (%)		LL (%)									
20	40	60	80									
GROUND SURFACE												
TOPSOIL and organics 0.18m [91.38m]		0										
GLACIAL TILL: Loose, brown silty sand, trace gravel, some cobbles, boulders			AU 1									91
- Compact by 1.10 m depth		1	SS 2	75	7-12-18-21 30	8.59	○					
						5.51	○					
1.83m [89.73m]			SS 3	84	9-18-50-/ 68/0.18	4.64	○					90
End of Borehole		2										
Practical refusal to augering at 1.83 m depth												89
(BH Dry - October 09, 2024)		3										88
		4										87
		5										86
		6										85
		7										84
		8										83
		9										82
		10										

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COORD. SYS.: MTM ZONE 9 **EASTING:** 376093.56 **NORTHING:** 502000.31 **ELEVATION:** 92.27

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 25, 2024 **HOLE NO. :** BH 6-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20	40	60	80		
PL (%)	WATER CONTENT (%)		LL (%)									
20	40	60	80									
GROUND SURFACE		0										
TOPSOIL and organics 0.28m [91.99m]			AU 1								92	
Loose, brown SILTY SAND 0.61m [91.66m]												
GLACIAL TILL: Very dense, brown silty sand, with gravel, cobbles and boulders		1	SS 2	92	15-29-37-30 66	8.91	○				91	
1.88m [90.39m]			SS 3	78	15-46-50-/ 96/0.2	8.82	○					
End of Borehole		2									90	
Practical refusal to augering at 1.88 m depth												
(BH Dry - October 09, 2024)		3									89	
		4									88	
		5									87	
		6									86	
		7									85	
		8									84	
		9									83	
		10										

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COORD. SYS.: MTM ZONE 9 EASTING: 376044.89 NORTHING: 5020116.72 ELEVATION: 91.61

PROJECT: Geotechnical Investigation FILE NO.: **PG7301**

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 25, 2024 HOLE NO.: **BH 7-24**

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20	40	60	80		
PL (%)	WATER CONTENT (%)		LL (%)									
20	40	60	80									
GROUND SURFACE												
TOPSOIL and organics		0										
0.30m [91.31m]												
Loose, brown SILTY SAND												
0.76m [90.85m]												
GLACIAL TILL: Compact, brown silty sand, occasional gravel, cobbles and boulders		1										
- Grey by 1.5 m depth												
2.13m [89.48m]		2										
End of Borehole												
Practical refusal to augering at 2.13 m depth												
(BH Dry - October 09, 2024)												
	</											

COORD. SYS.: MTM ZONE 9 **EASTING:** 376132.74 **NORTHING:** 5020181.66 **ELEVATION:** 93.69

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 26, 2024 **HOLE NO. :** BH 8-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
						20	40	60	80			
						PL (%)	WATER CONTENT (%)		LL (%)			
						20	40	60	80			
GROUND SURFACE		0										
TOPSOIL and organics 0.18m [93.51m]			AU 1									
Loose, brown SILTY SAND, trace gravel 0.69m [93.00m]											93	
GLACIAL TILL: Very dense, brown silty clay, with gravel, occasional cobbles and boulders - Grey by 1.5 m depth		1	SS 2	96	17-25-48-37 73	9.38	○					
		2	SS 3	92	16-21-26-24 47	7.14	○				92	
		3	SS 4	79	9-30-35-33 65	7.51	○				91	
		4	SS 5	42	15-37-29-10 66	7.74	○				90	
3.84m [89.85m]			SS 6	0	50-/-/-/ 50/0.03							
End of Borehole		4										
Practical refusal to augering at 3.84 m depth											89	
(BH Dry - October 09, 2024)		5									88	
		6									87	
		7									86	
		8									85	
		9									84	
		10										

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COORD. SYS.: MTM ZONE 9 **EASTING:** 376290.59 **NORTHING:** 5020275.07 **ELEVATION:** 92.90

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 26, 2024 **HOLE NO. :** BH 9-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		
GROUND SURFACE												
TOPSOIL and organics		0										
Loose, brown SILTY SAND , trace gravel												
		1										92
GLACIAL TILL: Very dense, brown silty sand, with gravel, cobbles and boulders												
GLACIAL TILL: Grey clayey silt, with gravel, cobbles and boulders		2										91
		3										90
		4										89
		5										88
GLACIAL TILL: Grey sandy silt, trace clay, with gravel, cobbles and boulders												
		6										87
Dynamic Cone Penetration Test												
Comenced at 6.10 m depth												
End of Borehole		7										86
Practical refusal to DCPT at 6.40 m depth												
(GWL at 3.20 m depth - October 9, 2024)		8										85
		9										84
		10										83

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COORD. SYS.: MTM ZONE 9

EASTING: 376347.34

NORTHING: 5020162.69

ELEVATION: 91.91

PROJECT: Geotechnical Investigation

FILE NO. : PG7301

BORINGS BY: CME-55 Low Clearance Drill

DATE: September 26, 2024

HOLE NO.: BH10-24

REMARKS:

[illegible]

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PAGE: 1 / 1

COORD. SYS.: MTM ZONE 9 **EASTING:** 376217.33 **NORTHING:** 5020152.31 **ELEVATION:** 94.30

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

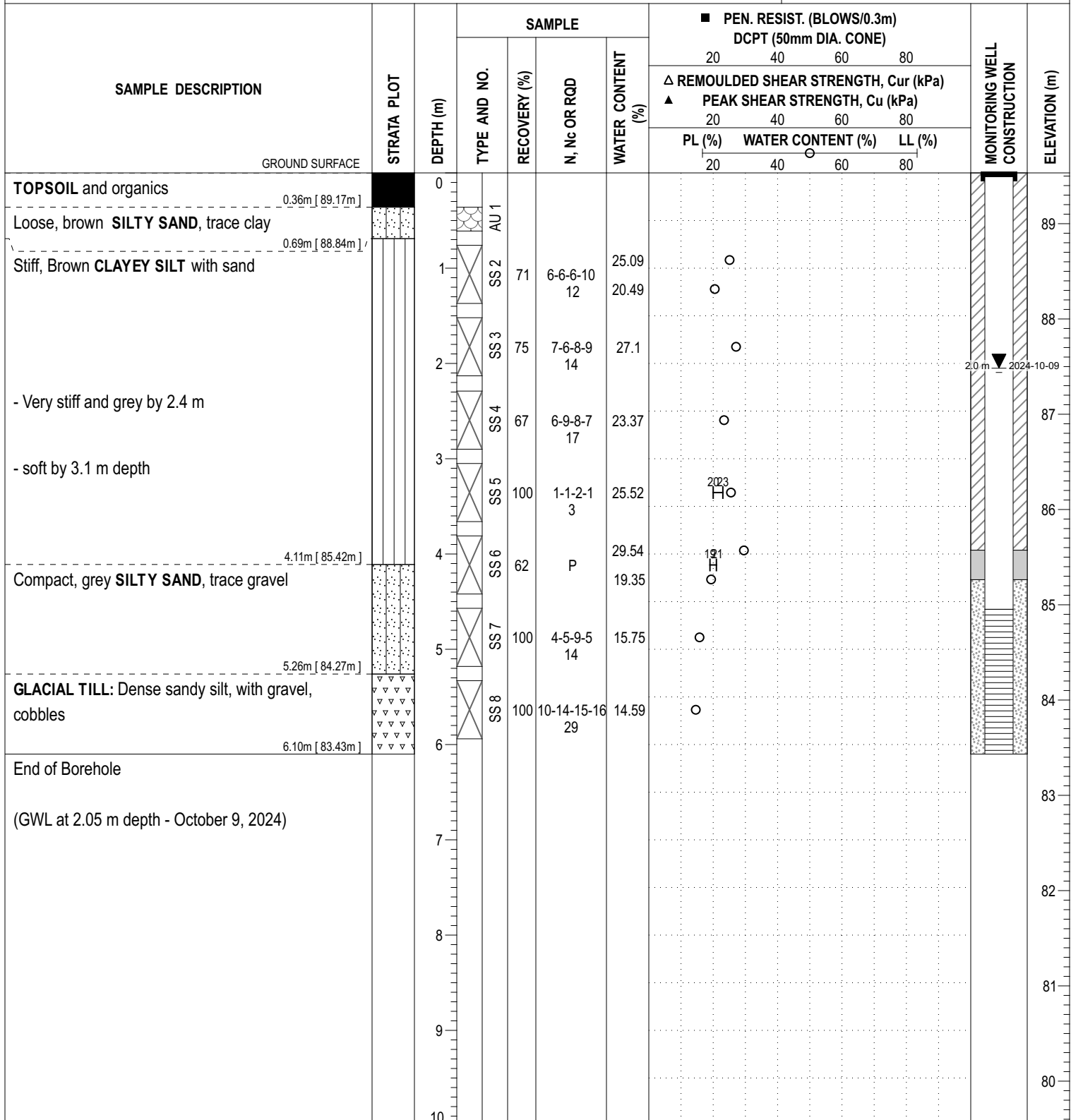
BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 26, 2024 **HOLE NO. :** BH11-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20	40	60	80		
PL (%)	WATER CONTENT (%)		LL (%)									
20	40	60	80									
GROUND SURFACE												
TOPSOIL and organics		0										94
Loose, brown SILTY SAND												
Very stiff, brown CLAYEY SILT												
		1										93
		2										92
GLACIAL TILL: Very dense, brown silty sand, trace clay, with gravel, occasional cobbles and boulders												
- Grey by 2.3 m depth												
End of Borehole												
		3										91
Practical refusal to augering at 2.62 m depth												
(BH Dry - October 09, 2024)		4										90
		5										89
		6										88
		7										87
		8										86
		9										85
		10										

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COORD. SYS.: MTM ZONE 9	EASTING: 376432.01	NORTHING: 5020344.88	ELEVATION: 89.53
PROJECT: Geotechnical Investigation			FILE NO. : PG7301
BORINGS BY: CME-55 Low Clearance Drill			HOLE NO. : BH12-24
REMARKS:			DATE: September 26, 2024



COORD. SYS.: MTM ZONE 9 **EASTING:** 376509.59 **NORTHING:** 5020188.33 **ELEVATION:** 89.31

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 27, 2024 **HOLE NO. :** BH13-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							Δ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20 40 60 80					
PL (%) WATER CONTENT (%) LL (%)				20 40 60 80								
GROUND SURFACE												
TOPSOIL and organics		0	AU 1								89	
Loose, brown SILTY SAND, trace clay												
GLACIAL TILL: Compact, brown silty sand, trace clay with gravel, occasional cobbles		1	SS 2	79	7-6-5-7 11	11.11	○				88	

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COORD. SYS.: MTM ZONE 9 **EASTING:** 376413.92 **NORTHING:** 5020249.09 **ELEVATION:** 90.17

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 27, 2024 **HOLE NO. :** BH14-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
				20	40	60	80	PL (%) WATER CONTENT (%) LL (%)				
				20	40	60	80					
GROUND SURFACE												
TOPSOIL and organics		0										90
Loose, brown SILTY SAND , trace clay			AU 1									
GLACIAL TILL: Dense to very dense, brown silty sand with gravel, cobbles and boulders		1	SS 2	67	5-24-24-18 48	8.75	○					89
- Grey by 1.5 m depth												
		2	SS 3	79	18-30-36-50 66	6.93	○					88
		3	SS 4	100	34-50-/-/ 50/0.13	6.56	○					87
		4	SS 5	100	39-50-/-/ 50/0.13	6.43	○					86
		5	SS 6	100	16-50-/-/ 50/0.1	6.13	○					85
		6	SS 7	100	23-50-/-/ 50/0.1	5.57	○					84
		7	SS 8	100	29-50-/-/ 50/0.03	5.37	○					83
		8										82
		9										81
		10										
End of Borehole												
(BH Dry - October 09, 2024)												

COORD. SYS.: MTM ZONE 9 **EASTING:** 376738.02 **NORTHING:** 5020086.71 **ELEVATION:** 89.29

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 27, 2024 **HOLE NO. :** BH15-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							20 40 60 80					
PL (%) WATER CONTENT (%) LL (%)				20 40 60 80								
GROUND SURFACE												
TOPSOIL and organics		0										89
Loose to compact, brown SANDY SILT		1	AU 1									88
		2	SS 2	75	6-12-12-13 24	21.05						87
		3	SS 3	71	9-12-14-14 26	20.87						86
		4	SS 4	75	8-3-2-3 5	25.5						85
		5	SS 5	83	1-1-0-0 1	28.75						84
		6	SS 6	83	0-2-1-0 3	33.96						83
		7	SS 7	100	P	30.81 37.87						82
		8	SS 8	100	0-0-3-9 3	29.94 12.47						81
Stiff, grey SILTY CLAY		9										80
Firm, grey CLAYEY SILT		10										79
GLACIAL TILL: Very loose, grey silty sand with gravel		11										78
End of Borehole		12										77
(GWL at 2.17 m depth - October 9, 2024)		13										76

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COORD. SYS.: MTM ZONE 9 EASTING: 376738.02 NORTHING: 5020086.71 ELEVATION: 89.29

PROJECT: Geotechnical Investigation FILE NO. : **PG7301**

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 30, 2024 HOLE NO. : **BH15A-24**

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							Δ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
				20 40 60 80		20 40 60 80		PL (%) WATER CONTENT (%) LL (%)				
				20 40 60 80		20 40 60 80						
GROUND SURFACE		0										89
OVERBURDEN		1										88
		2										87
		3										86
		4										85
		5										84
		6										83
		7										82
		8										81
		9										80
		10										

2.29m [87.00m]

Firm, grey CLAYEY SILT

4.57m [84.72m]

Dynamic Cone Penetration Test
Comenced at 4.57 m depth

7.62m [81.67m]

End of Borehole

Practical refusal to DCPT at 7.62 m depth

189.0 ▲

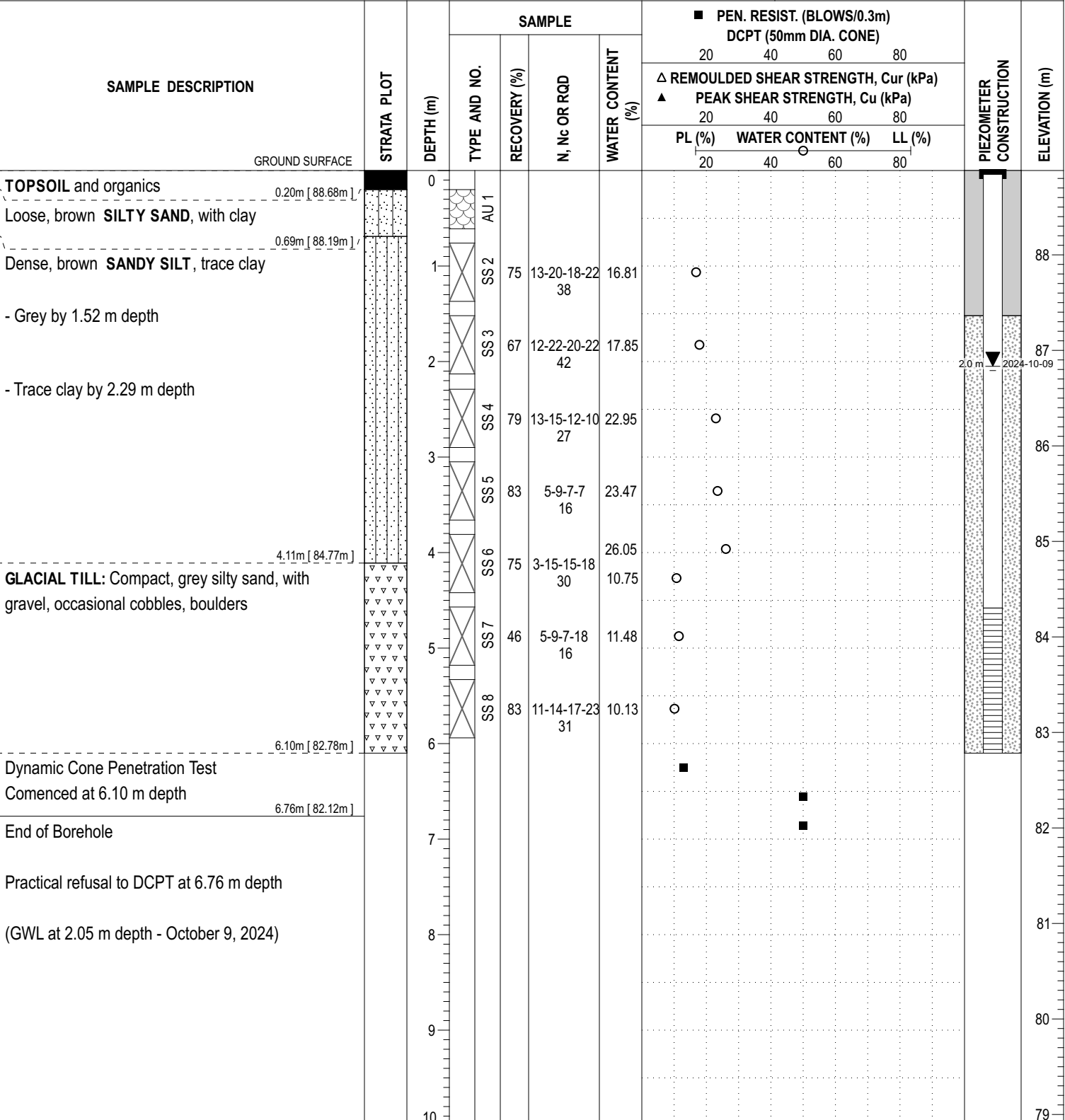
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COORD. SYS.: MTM ZONE 9 EASTING: 376652.26 NORTHING: 5020184.99 ELEVATION: 88.88

PROJECT: Geotechnical Investigation FILE NO.: PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: DATE: September 30, 2024 HOLE NO.: BH16-24



COORD. SYS.: MTM ZONE 9 **EASTING:** 376837.58 **NORTHING:** 5020217.72 **ELEVATION:** 89.28

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 30, 2024 **HOLE NO. :** BH17-24

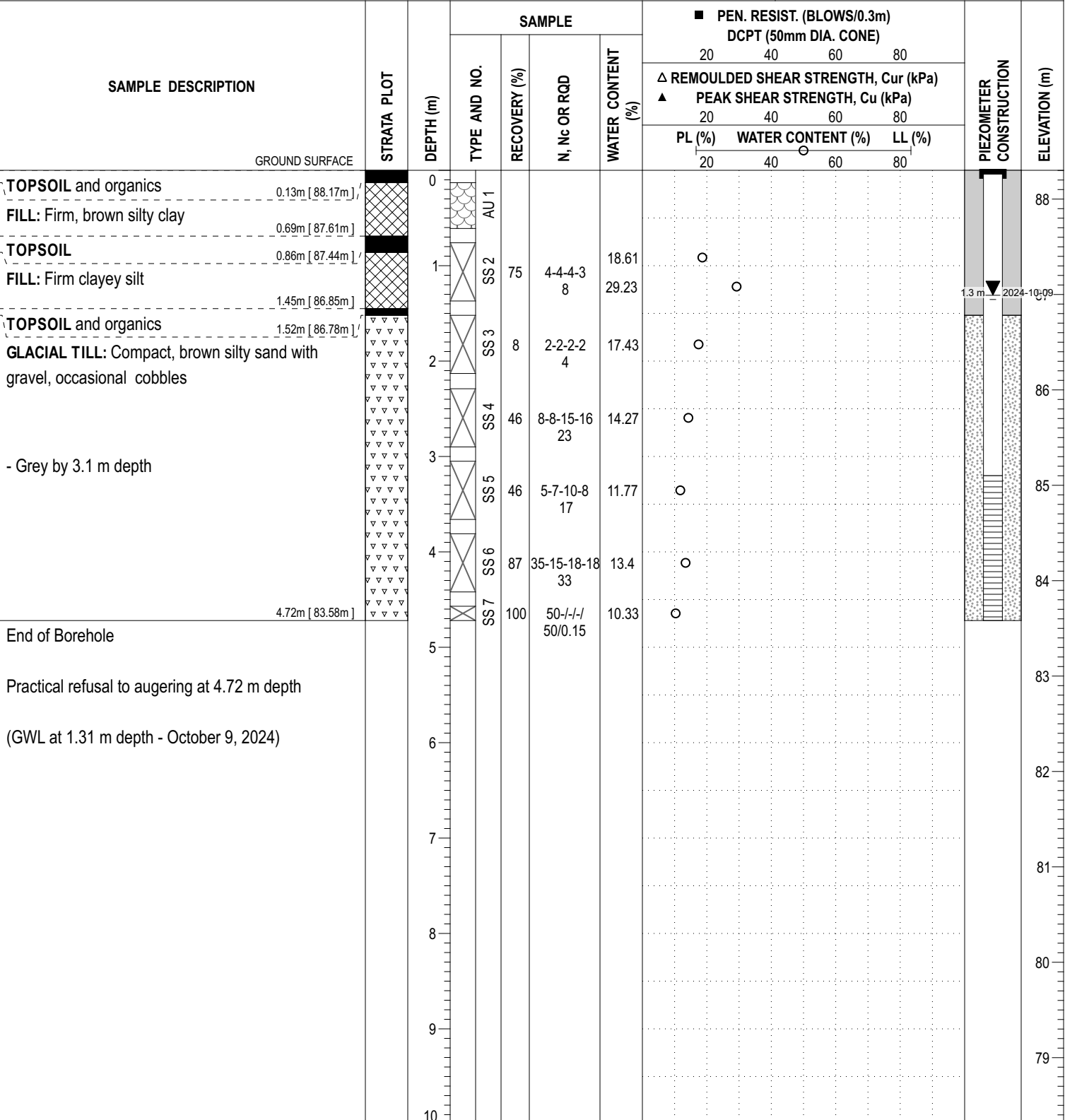
SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20 40 60 80					
							Δ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		

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COORD. SYS.: MTM ZONE 9 **EASTING:** 376938.22 **NORTHING:** 5020281.76 **ELEVATION:** 88.30

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 30, 2024 **HOLE NO. :** BH18-24


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COORD. SYS.: MTM ZONE 9	EASTING: 376684.09	NORTHING: 5020118.93	ELEVATION: 90.08
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PROJECT: Geotechnical Investigation BORINGS BY: CME-55 Low Clearance Drill REMARKS:	FILE NO. : PG7301 HOLE NO. : BH19-24
--	---

DATE: September 30, 2024

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							Δ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		
					20	40	60	80				
GROUND SURFACE		0									90	
OVERBURDEN		1									89	
		2									88	
		3									87	
		4									86	
		5									85	
		6									84	
		7									83	
		8									82	
		9									81	
		10										
3.89m [86.19m]												
End of Borehole												
Practical refusal to augering at 3.89 m depth												

COORD. SYS.: MTM ZONE 9 **EASTING:** 376740.96 **NORTHING:** 502042.35 **ELEVATION:** 88.78

PROJECT: Geotechnical Investigation **FILE NO. :** PG7301

BORINGS BY: CME-55 Low Clearance Drill

REMARKS: **DATE:** September 30, 2024 **HOLE NO. :** BH20-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				PIEZOMETER CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH, Cur (kPa)					
							▲ PEAK SHEAR STRENGTH, Cu (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		
					20	40	60	80				
GROUND SURFACE		0										
OVERBURDEN												
											88	
		1										
		2									87	
		3									86	
		4									85	
	5									84		
5.44m [83.34m]												
End of Borehole		6									83	
Practical refusal to augering at 5.44m depth												
		7									82	
		8									81	
		9									80	
		10									79	



4795 Bank St. & 3301 Blais Rd., Ottawa, Ontario

REMARKS: DATE: November 10, 2023

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**PATERSON
GROUP**

SOIL PROFILE AND TEST DATA

GEOTECHNICAL INVESTIGATION

4795 Bank St. & 3301 Blais Rd., Ottawa, Ontario

DATUM: Geodetic **EASTING:** 376495.134 **NORTHING:** 5020294.256 **ELEVATION:** 89.05 m

PROJECT: Proposed Development

FILE NO. PG6896

BORINGS BY: Excavator

REMARKS:

DATE: November 10, 2023

HOLE NO. TP 2-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Remoulded Shear Strength (kPa)			Peak Shear Strength (kPa)			Pen. Resist. Blows/0.3m (50 mm Dia. Cone)			Piezometer Construction
							0	50	100	0	50	100	0	50	100	
Ground Surface																
EL 89.05 m																
TOPSOIL		G1				30.4	0									
0.15 m																
EL 88.9 m		G2				16.5										
Loose, brown SILTY SAND, occasional cobbles		G3				17.3										
0.55 m																
EL 88.5 m		G4				24.4										
Compact, brown SANDY SILT																
- trace clay by 1.6m depth																
- thin interbedded layers of silty clay at 1.8m depth																
		G5				30										
		G6				27.7										
2.1 m																
EL 86.95 m		G7				34										
Loose, grey SANDY SILT with thin interbedded layers of silty clay																
2.5 m																
EL 86.55 m		G8				33										
Firm, grey SILTY CLAY to CLAYEY SILT with interbedded sandy silt layers																
		G9				14.1										
3.45 m																
EL 85.6 m		G10				11.2										
GLACIAL TILL: Grey silty sand with gravel																
4 m																
EL 85.05 m																
End of Test Pit																
(Groundwater infiltration at 1.7m depth)																

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4795 Bank St. & 3301 Blais Rd., Ottawa, Ontario

FILE NO. PG6896

HOLE NO. TP3-23

DATE: November 10, 2023

Ground Surface EL 89.07 m

TOPSOIL

0.3 m
EL 88.77 m

Compact, brown SANDY SILT with thin interbedded layers of silty sand

- trace clay by 0.7m depth

1.6 m
EL 87.47 m

Stiff, grey CLAYEY SILT with thin interbedded layers of silty clay

3.2 m
EL 85.87 m

GLACIAL TILL: Dense, grey clayey silt to sandy silt with gravel, occasional boulders

0.3 m
EL 85.77 m

End of Test Pit

Soil layers: G1, G2, G3, G4, G5, G6, G7

Vertical scale (m): 0, 13.9, 24.1, 22.9, 30.6, 28.9, 12.6

Horizontal scale: 0, 1, 2, 3

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ELEVATION: 89.47

FILE NO. : PG7301

HOLE NO.: BH 1-26

DATE: March 2, 2026

C:\AutoCAD Drawings\Test Hole Data Files\PG73xx\PG7301 (2026)\data.sqlite 2026-04-06, 17:06 Paterson_Template MR

PAGE: 1 / 1

COORD. SYS.: MTM ZONE 9

EASTING: 376514.79

NORTHING: 5020324.14

ELEVATION: 88.86

PROJECT: Geotechnical Investigation

FILE NO. : PG7301

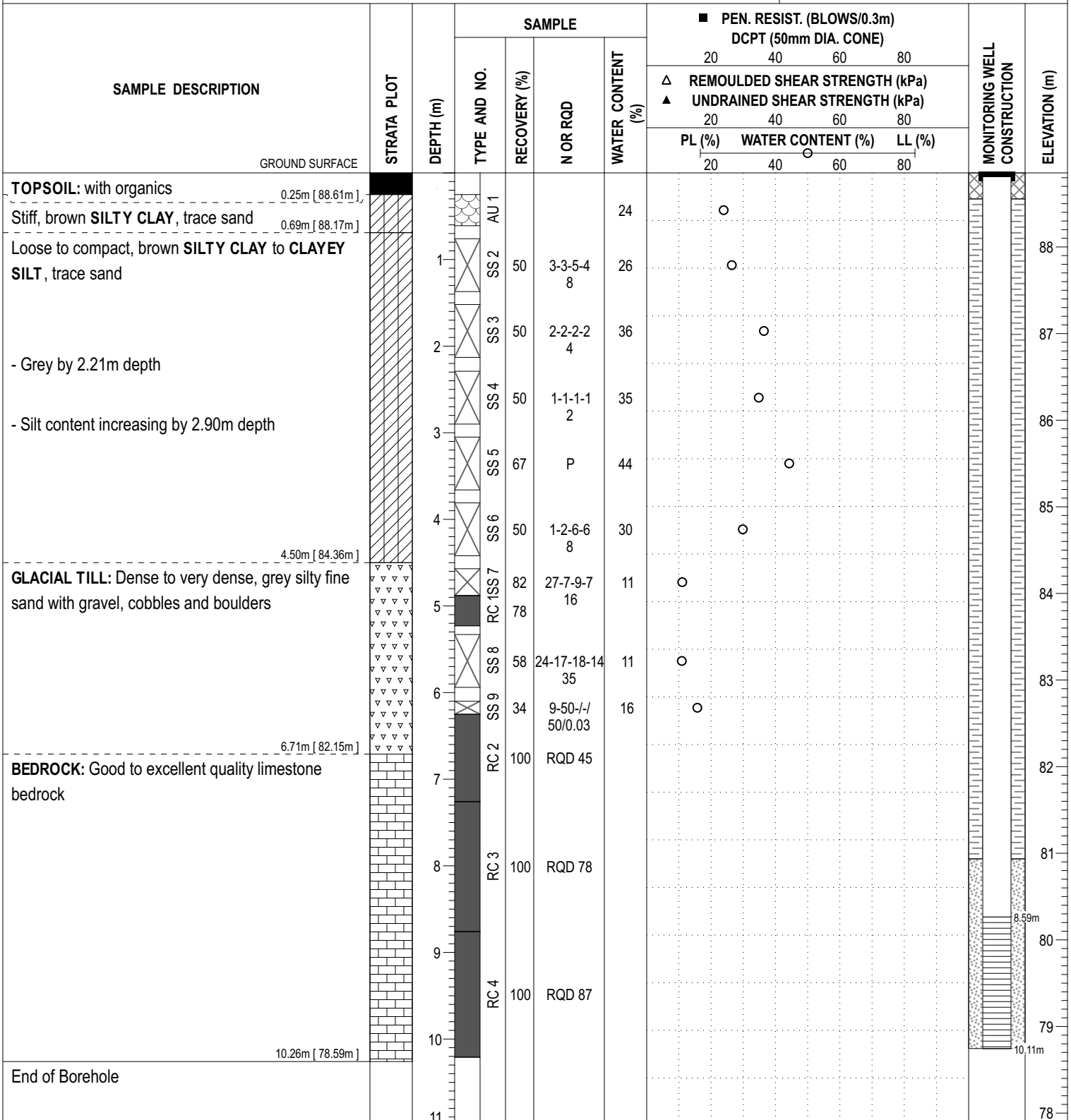
ADVANCED BY: Track Mounted Drill Rig

REMARKS: Datum: NAD1983 (Canada)

Geoid: HT2-2010

DATE: March 2, 2026

HOLE NO.: BH 2-26



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COORD. SYS.: MTM ZONE 9 EASTING: 376510.67 NORTHING: 5020331.96 ELEVATION: 89.19

PROJECT: Geotechnical Investigation FILE NO.: PG7301

ADVANCED BY: Track Mounted Drill Rig

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 DATE: March 3, 2026 HOLE NO.: BH 3-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)			MONITORING WELL CONSTRUCTION	ELEVATION (m)	
			TYPE AND NO.	RECOVERY (%)	N OR RQD	WATER CONTENT (%)	20	40	60			80
							△ REMOULDED SHEAR STRENGTH (kPa)					
							▲ UNDRAINED SHEAR STRENGTH (kPa)					
							PL (%) WATER CONTENT (%) LL (%)					
				20	40	60	80					
GROUND SURFACE												
For soil profile refer to BH 2-26												
		1										
		2										
		3										
		4										
		5										
6.10m [83.09m]												
		6										
		7										
		8										
		9										
		10										
End of Borehole												
		11										
		12										
		13										
		14										
		15										
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COORD. SYS.: MTM ZONE 9 EASTING: 376547.38 NORTHING: 5020340.33 ELEVATION: 89.18

PROJECT: Geotechnical Investigation

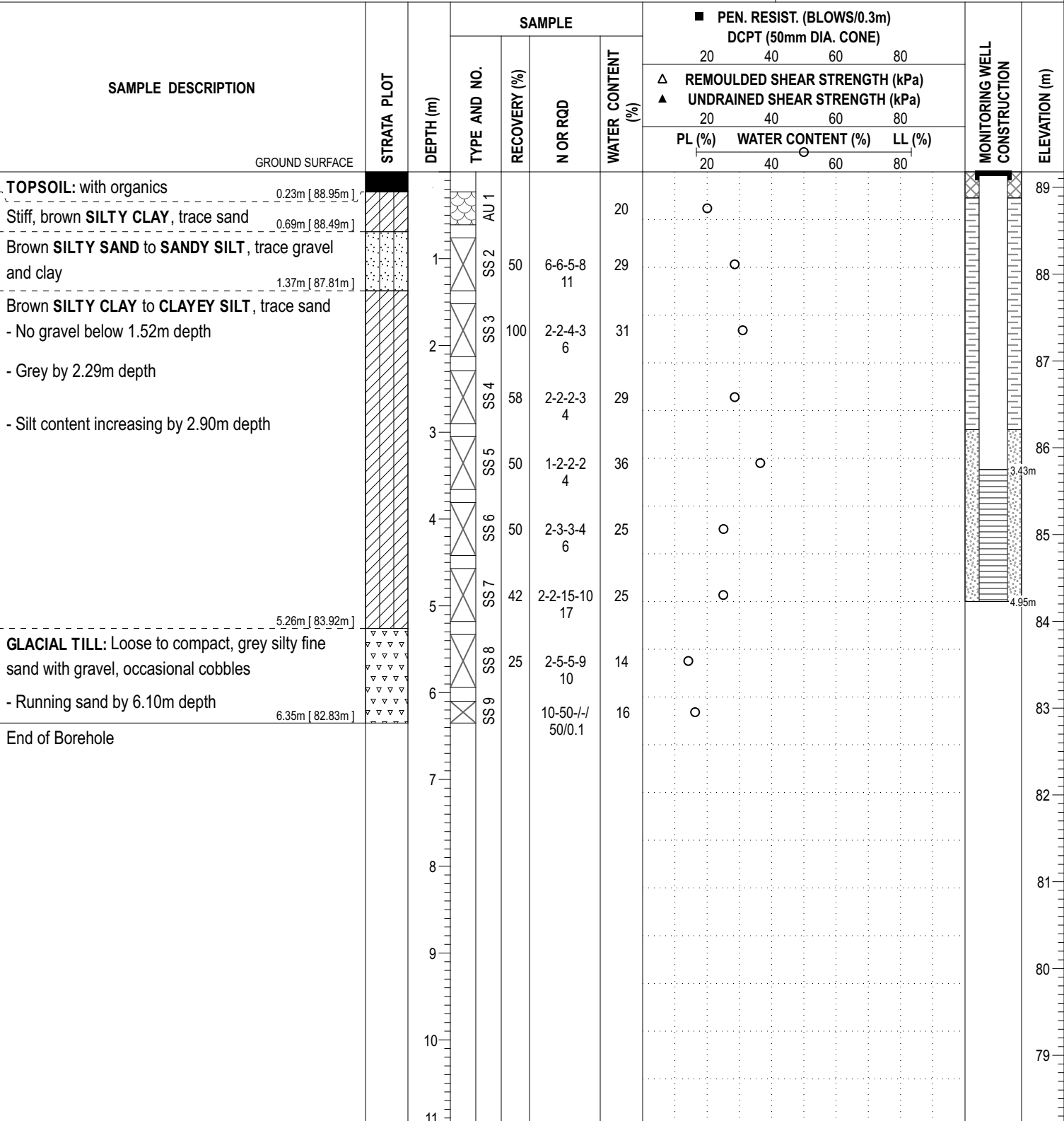
FILE NO.: PG7301

ADVANCED BY: Track Mounted Drill Rig

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010

DATE: March 3, 2026

HOLE NO.: BH 4-26



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COORD. SYS.: MTM ZONE 9 **EASTING:** 376492.29 **NORTHING:** 5020369.66 **ELEVATION:** 89.25

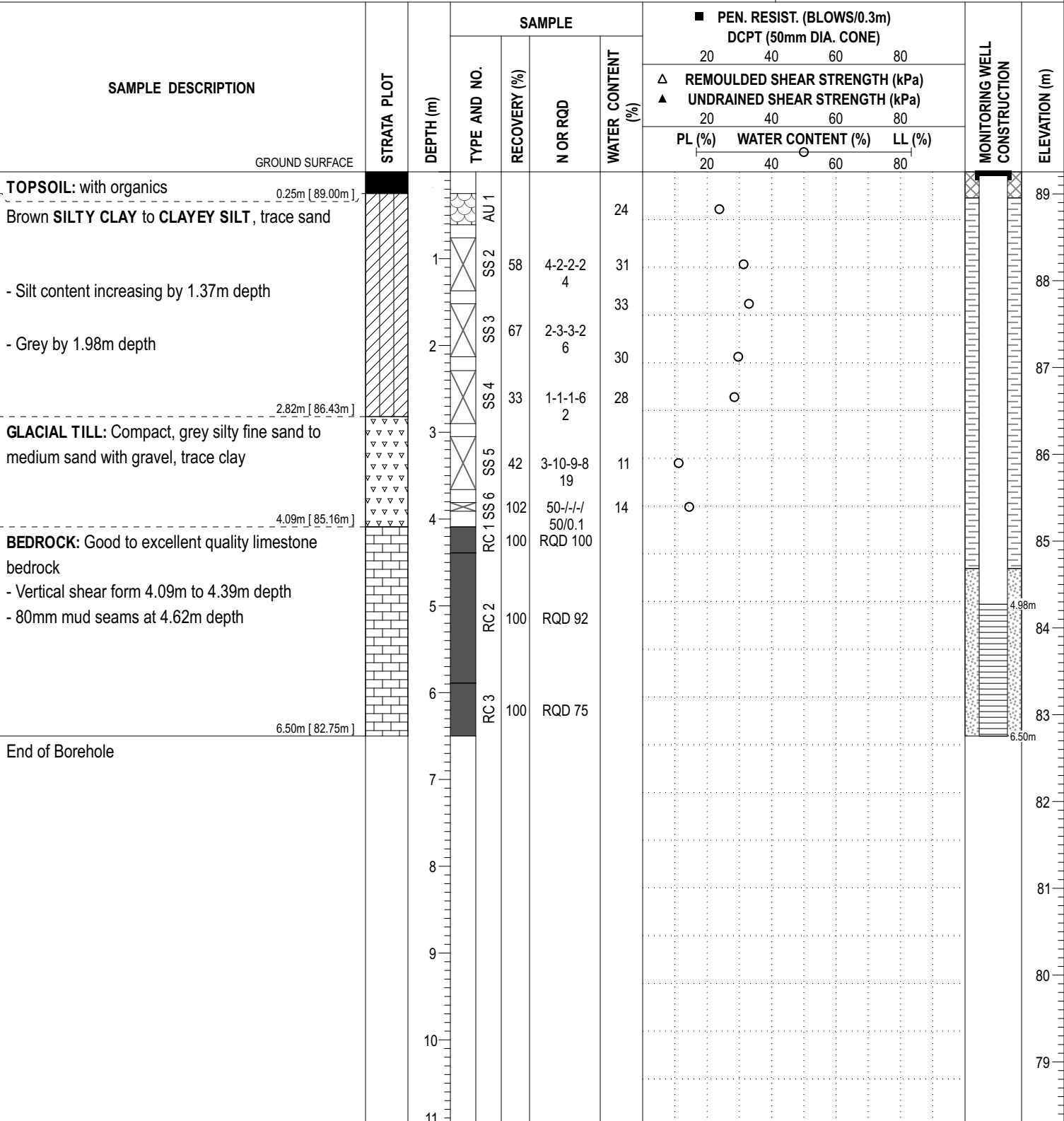
PROJECT: Geotechnical Investigation

FILE NO. : PG7301

ADVANCED BY: Track Mounted Drill Rig

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010

DATE: March 3, 2026

HOLE NO. : BH 5-26


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COORD. SYS.: MTM ZONE 9	EASTING: 376511.84	NORTHING: 5020397.47	ELEVATION: 89.81
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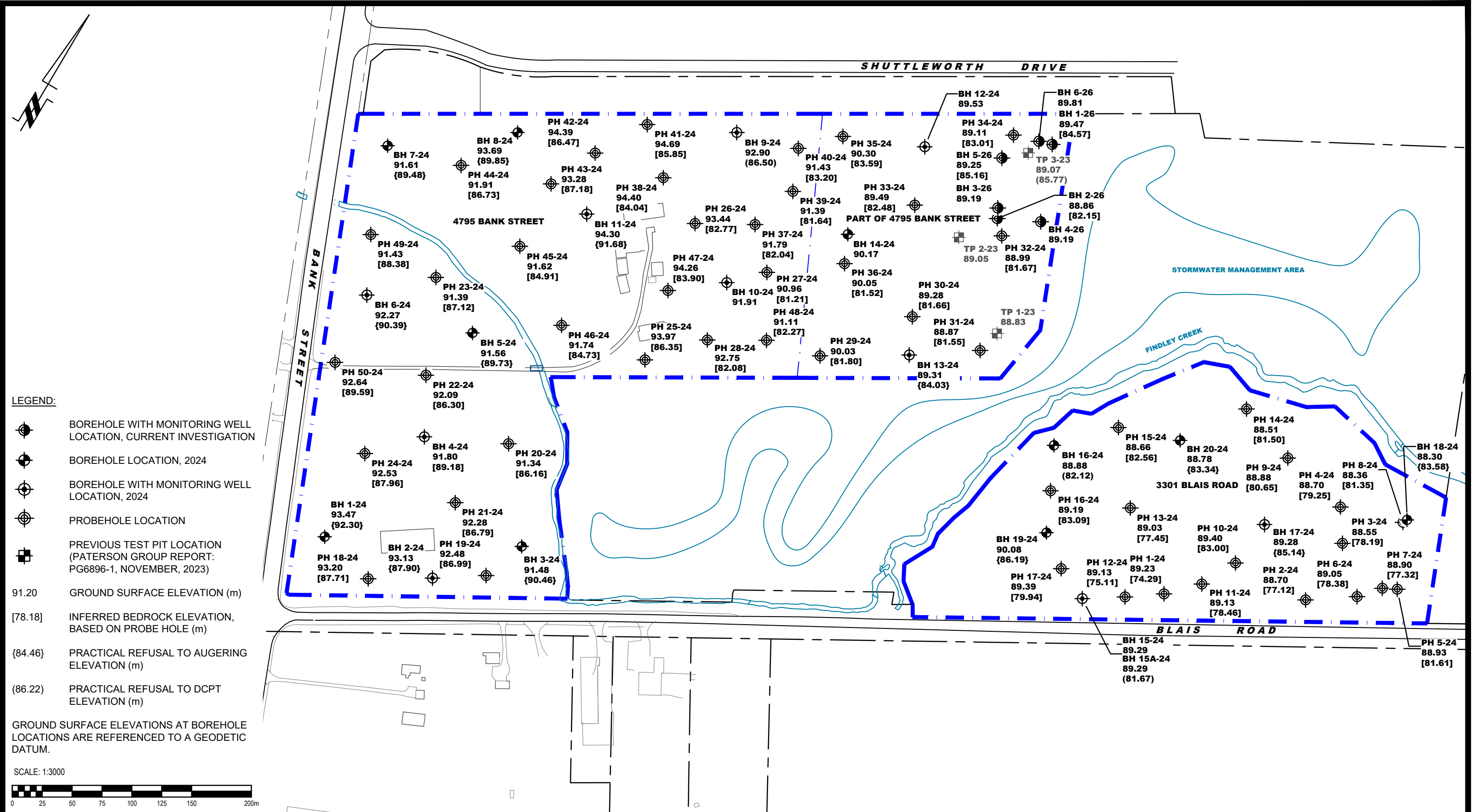
PROJECT: Geotechnical Investigation	FILE NO. : PG7301
--	--------------------------

ADVANCED BY: Track Mounted Drill Rig	HOLE NO. : BH 6-26
---	---------------------------

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010	DATE: March 3, 2026	
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SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE				■ PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)				MONITORING WELL CONSTRUCTION	ELEVATION (m)
			TYPE AND NO.	RECOVERY (%)	N OR RQD	WATER CONTENT (%)	20	40	60	80		
							△ REMOULDED SHEAR STRENGTH (kPa)					
							▲ UNDRAINED SHEAR STRENGTH (kPa)					
							PL (%)	WATER CONTENT (%)		LL (%)		
20	40	60	80									
GROUND SURFACE												
OVERBURDEN												
		1									89	
		2									88	
		3									87	
		4									86	
		5									85	
5.59m [84.22m]											5.21m	
End of Borehole		6									84	
		7									83	
		8									82	
		9									81	
		10									80	
		11									79	

DISCLAIMER: THE DATA PRESENTED IN THIS SHEET IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHOM IT WAS PRODUCED. THIS SHEET SHOULD BE READ IN CONJUNCTION WITH ITS CORRESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.





9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

1	ADDED 2026 BOREHOLE LOCATION BH 1-26 TO BH 6-26	27/05/2026	KP
NO.	REVISIONS	DD/MM/YYYY	INITIAL

OTTAWA,
Title:

CAIVAN COMMUNITIES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
4795 BANK STREET & 3301 BLAIS ROAD
ONTARIO

TEST HOLE LOCATION PLAN

Scale: 1:3000

Drawn by: ZS

Checked by: MA

Approved by: KP

Date: 10/2024

Report No.: PG7301-1

Dwg. No.: **PG7301-1**

Revision No.: 1

APPENDIX 2

TABLE 5 - MONTHLY WATER BALANCE FOR SOIL WITH 75 mm WATER HOLDING CAPACITY AT THE OTTAWA INTERNATIONAL AIRPORT

TABLE 6 - MONTHLY WATER BALANCE FOR SOIL WITH 150 mm WATER HOLDING CAPACITY AT THE OTTAWA INTERNATIONAL AIRPORT

TABLE 7 - MONTHLY WATER BALANCE FOR SOIL WITH 250 mm WATER HOLDING CAPACITY AT THE OTTAWA INTERNATIONAL AIRPORT

TABLE 8 - MONTHLY WATER BALANCE FOR SOIL WITH 300 mm WATER HOLDING CAPACITY AT THE OTTAWA INTERNATIONAL AIRPORT

TABLE 9 - PRE-DEVELOPMENT ANNUAL WATER BUDGET CALCULATIONS

TABLE 10 - POST-DEVELOPMENT ANNUAL WATER BUDGET CALCULATIONS

Table 5 - Monthly Water Balance for Soil With 75 mm Water Holding Capacity at the Ottawa International Airport

Month	Temperature (°C)	Total Precipitation (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)
January	-10.6	62	0	25
February	-9.0	56	1	26
March	-2.8	65	6	103
April	5.7	73	31	110
May	13.1	76	80	14
June	18.3	85	107	4
July	20.9	88	104	3
August	19.7	85	84	1
September	14.8	82	65	3
October	8.3	76	36	14
November	1.3	77	10	38
December	-6.8	79	1	37
Annual	6	904	525	378

Table 6 - Monthly Water Balance for Soil With 150 mm Water Holding Capacity at the Ottawa International Airport

Month	Temperature (°C)	Total Precipitation (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)
January	-10.6	62	0	21
February	-9.0	56	1	24
March	-2.8	65	6	99
April	5.7	73	31	109
May	13.1	76	80	14
June	18.3	85	116	4
July	20.9	89	127	3
August	19.7	84	98	1
September	14.8	82	68	2
October	8.3	76	36	7
November	1.3	77	10	20
December	-6.8	80	0.1	25
Annual	6	904	574	329

Table 7 - Monthly Water Balance for Soil With 250 mm Water Holding Capacity at the Ottawa International Airport

Month	Temperature (°C)	Total Precipitation (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)
January	-10.6	62	0	18
February	-9.0	56	1	22
March	-2.8	65	6	92
April	5.7	73	31	107
May	13.1	76	80	14
June	18.3	85	116	4
July	20.9	89	135	3
August	19.7	84	111	1
September	14.8	82	72	2
October	8.3	76	37	6
November	1.3	77	10	16
December	-6.8	80	1	19
Annual	6	904	600	304

Table 8 - Monthly Water Balance for Soil With 300 mm Water Holding Capacity at the Ottawa International Airport

Month	Temperature (°C)	Total Precipitation (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)
January	-10.6	62	0	17
February	-9.0	56	1	21
March	-2.8	65	6	91
April	5.7	73	31	105
May	13.1	76	80	14
June	18.3	85	116	4
July	20.9	89	135	3
August	19.7	84	114	1
September	14.8	82	73	2
October	8.3	76	37	6
November	1.3	77	10	16
December	-6.8	80	1	18
Annual	6	904	605	298

Table 9 - Pre-Development Annual Water Budget Calculations

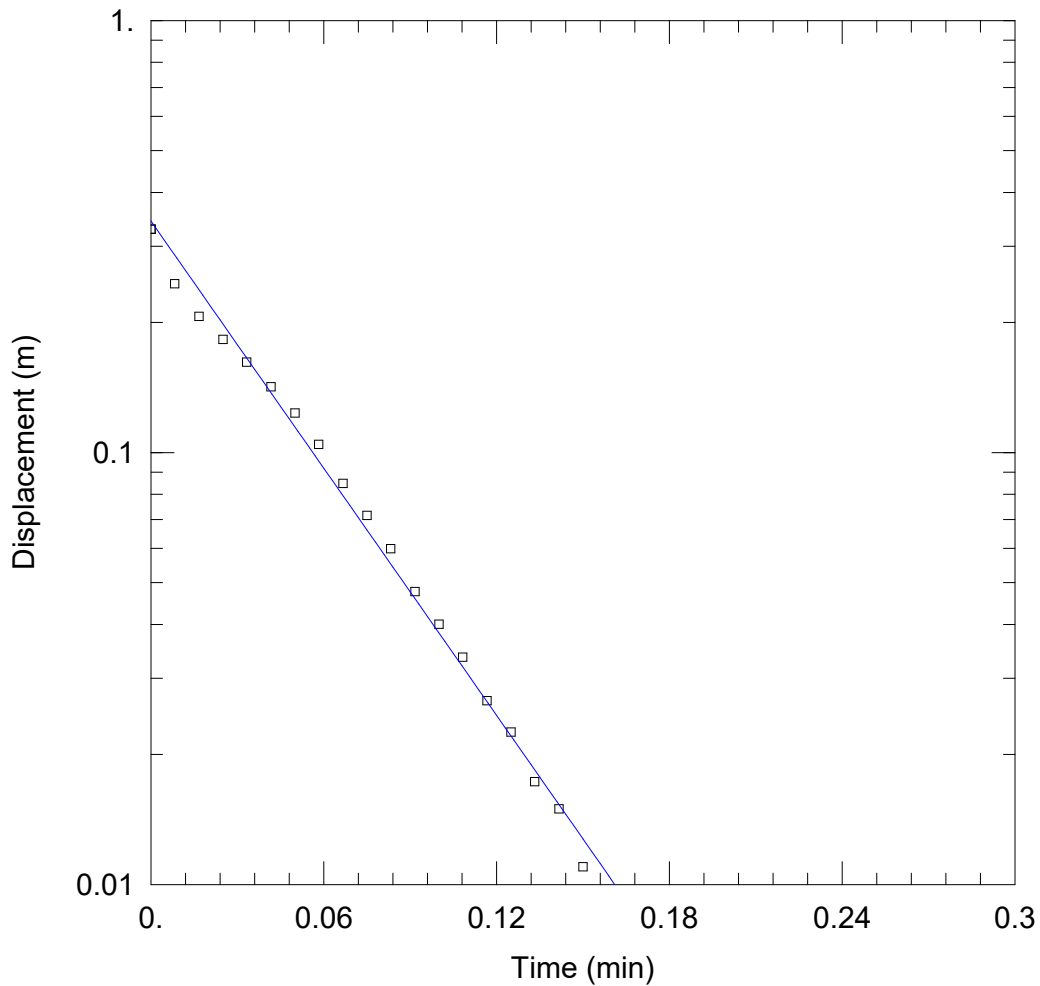
Land Use Unit	Area (m ²)	Water Surplus (mm)	Topography Factor	Soil Factor	Vegetation Factor	Infiltration Factor	Runoff Factor	Total Infiltration (mm/year)	Total Infiltration (L/year)	Total Runoff (mm/year)	Total Runoff (L/year)
Impervious surfaces	15,310	759	0	0	0	0	1	0	0.00	759	11,620,290
Urban Lawn/ Shallow Rooted Crops (Fine Sandy Loam)	70,075	378	0.1	0.3	0.1	0.5	0.5	189	13,244,175	189	13,244,175
Pasture and Shrubs (Fine Sandy Loam)	29,799	329	0.1	0.3	0.1	0.5	0.5	164.5	4,901,936	164.5	4,901,936
Pasture and Shrubs (Clay Loam)	40,128	304	0.1	0.2	0.1	0.4	0.6	121.6	4,879,565	182.4	7,319,347
Mature Forest (Fine Sandy Loam)	16,447	298	0.1	0.3	0.2	0.6	0.4	178.8	2,940,724	119.2	1,960,482
Total	171,759								25,966,399		39,046,230

Table 10 - Post-Development Annual Water Budget Calculations

Land Use Unit	Area (m ²)	Water Surplus (mm)	Topography Factor	Soil Factor	Vegetation Factor	Infiltration Factor	Runoff Factor	Total Infiltration (mm/year)	Total Infiltration (L/year)	Total Runoff (mm/year)	Total Runoff (L/year)
Impervious Surfaces	111,377	759	0	0	0	0	1	0	0	759.0	84,535,143
Urban Lawn/Shallow Rooted Crops (Fine Sandy Loam)	53,342	378	0.15	0.3	0.1	0.55	0.45	207.9	11,089,802	170.1	9,073,474
Stormwater Management Pond	7,040	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals	171,759								11,089,802		93,608,617
Difference (L/year)									-14,876,597		54,562,387
Percentage Variation									-57%		140%

APPENDIX 3

HYDRAULIC CONDUCTIVITY RESULTS - FALLING AND RISING HEAD TESTS
SAMPLE CALCULATIONS - DUPUIT FORCHHEIMER



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH1-26
 Test Date: May 26, 2026

WELL DATA (BH1-26)

Initial Displacement: 0.329 m
 Total Well Penetration Depth: 6.98 m
 Casing Radius: 0.01588 m

Static Water Column Height: 6.98 m
 Screen Length: 1.524 m
 Well Radius: 0.0381 m

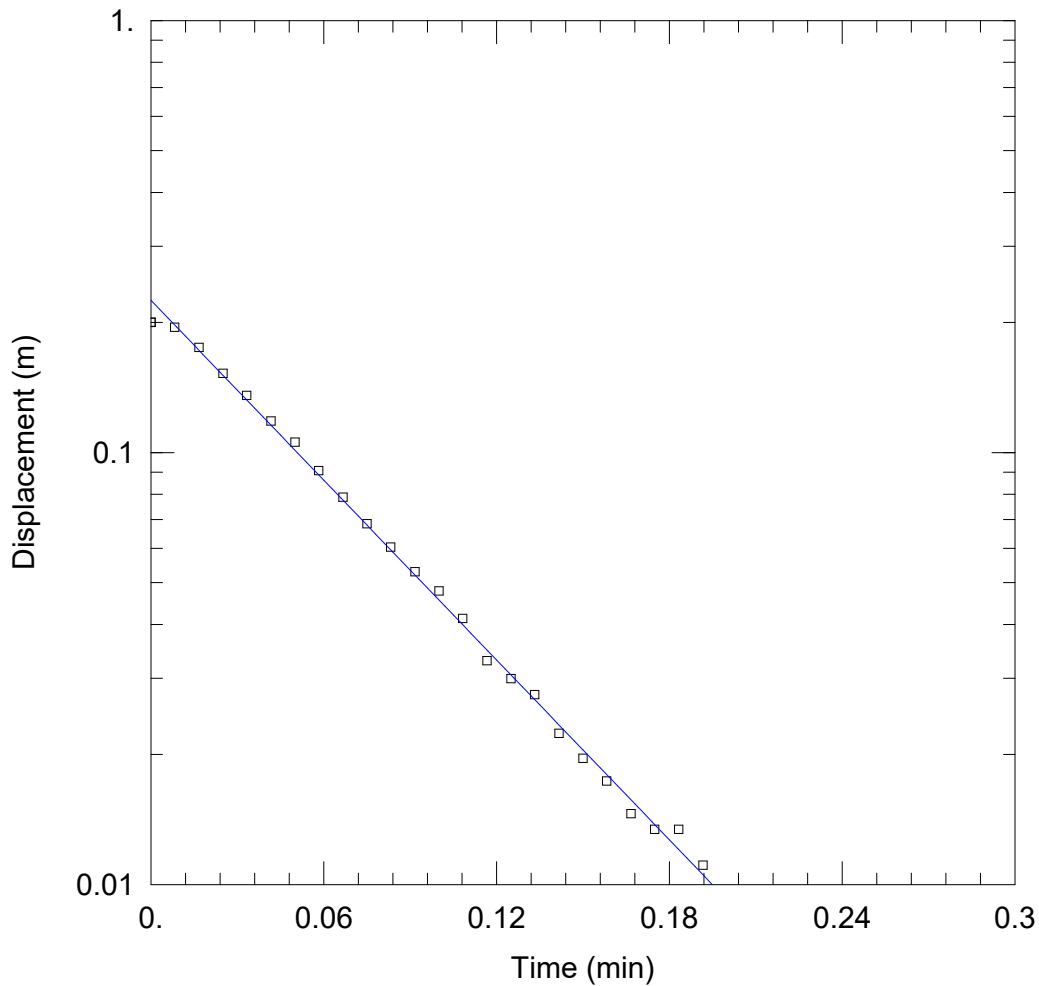
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 0.0001674 \text{ m/sec}$

$y_0 = 0.3433 \text{ m}$



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH1-26
 Test Date: May 26, 2026

WELL DATA (BH1-26)

Initial Displacement: 0.2 m
 Total Well Penetration Depth: 6.98 m
 Casing Radius: 0.01588 m

Static Water Column Height: 6.98 m
 Screen Length: 1.524 m
 Well Radius: 0.0381 m

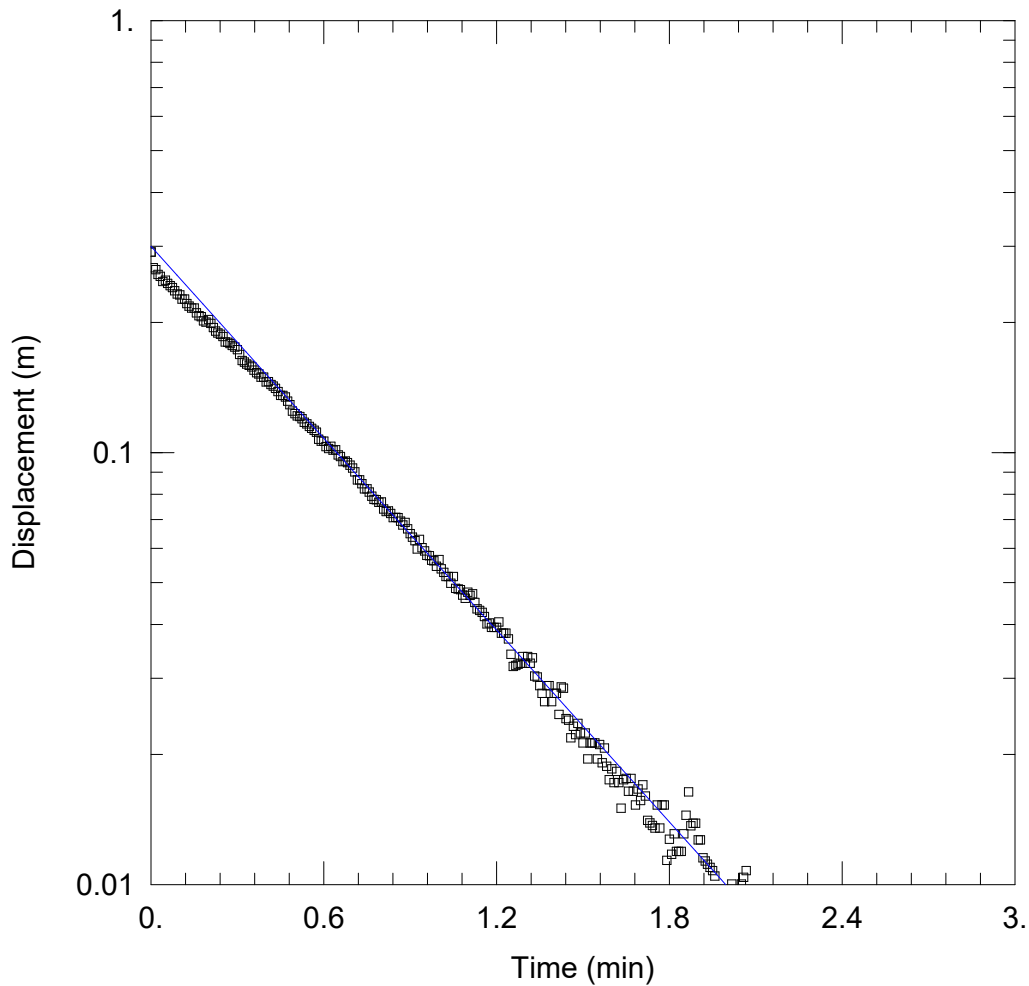
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 0.0001218 m/sec

y0 = 0.225 m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH2-26
 Test Date: May 26, 2026

WELL DATA (BH2-26)

Initial Displacement: 0.291 m
 Total Well Penetration Depth: 8.73 m
 Casing Radius: 0.01588 m

Static Water Column Height: 8.73 m
 Screen Length: 1.524 m
 Well Radius: 0.0381 m

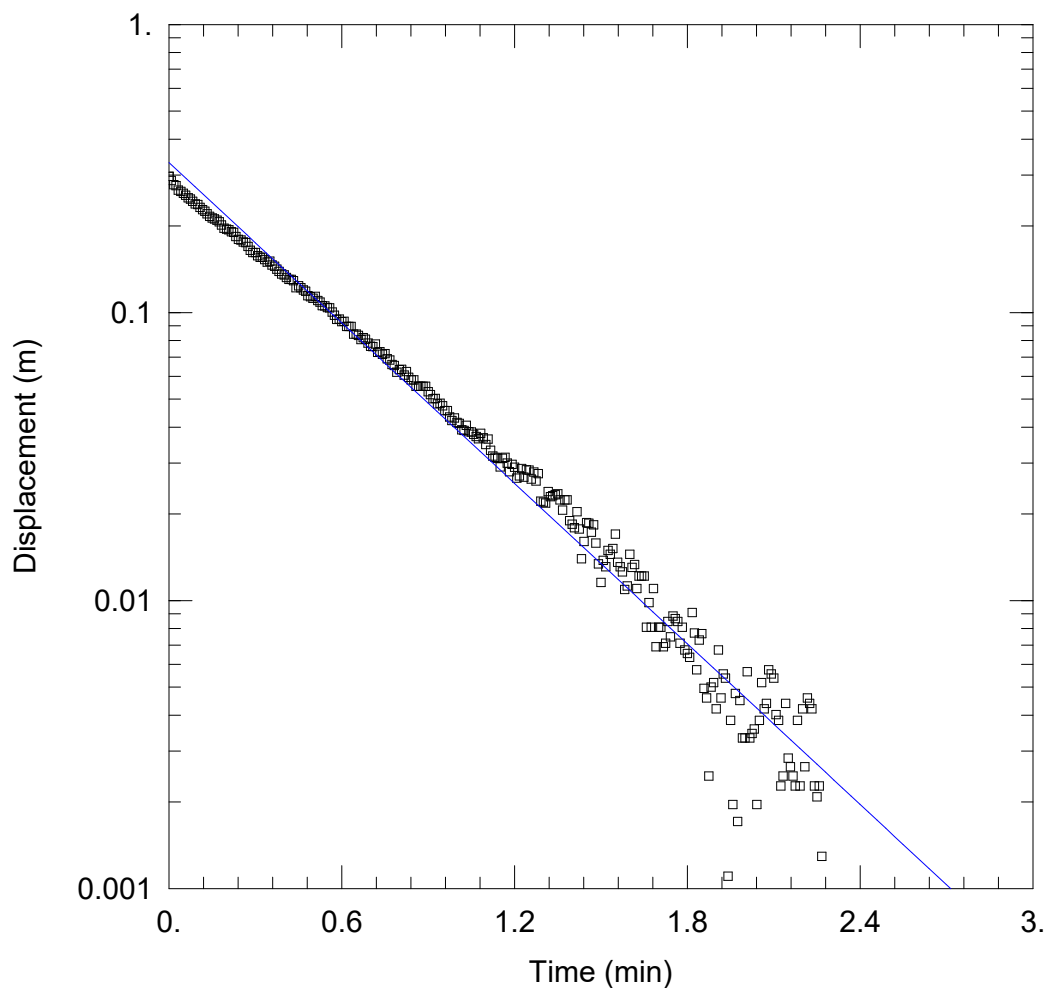
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 1.299E-5$ m/sec

$y_0 = 0.2999$ m



WELL TEST ANALYSIS

Data Set: P:\...\PG7301- BH2-26 Rising Head 2 of 2.aqt

Date: 05/27/26

Time: 15:23:39

PROJECT INFORMATION

Company: Paterson Group

Client: Caivan Communities

Project: PG7301

Location: 4795 Bank Street

Test Well: BH2-26

Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 8.74 m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH2-26)

Initial Displacement: 0.2973 m

Static Water Column Height: 8.74 m

Total Well Penetration Depth: 8.74 m

Screen Length: 1.524 m

Casing Radius: 0.01588 m

Well Radius: 0.0381 m

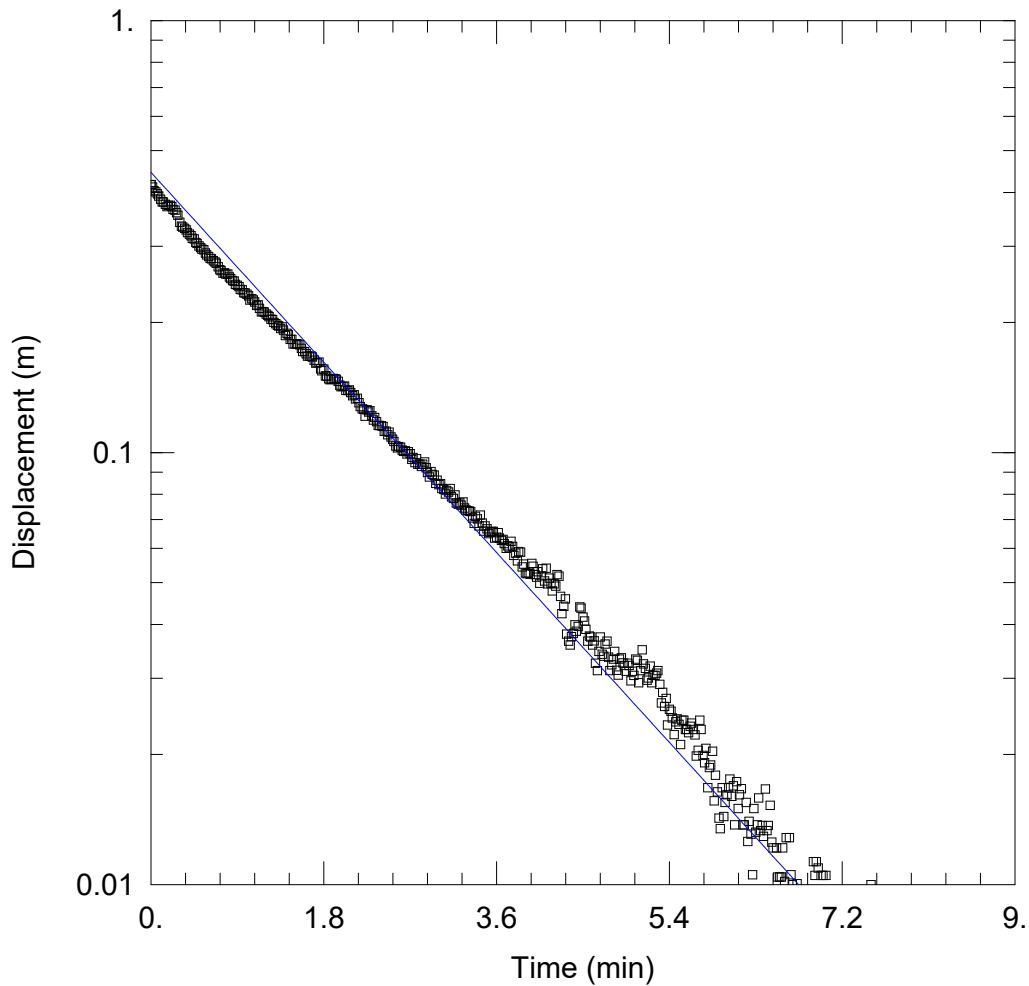
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 1.63E-5$ m/sec

$y_0 = 0.3317$ m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH3-26
 Test Date: May 26, 2026

WELL DATA (BH3-26)

Initial Displacement: 0.417 m
 Total Well Penetration Depth: 4.9 m
 Casing Radius: 0.0254 m

Static Water Column Height: 4.9 m
 Screen Length: 1.524 m
 Well Radius: 0.1048 m

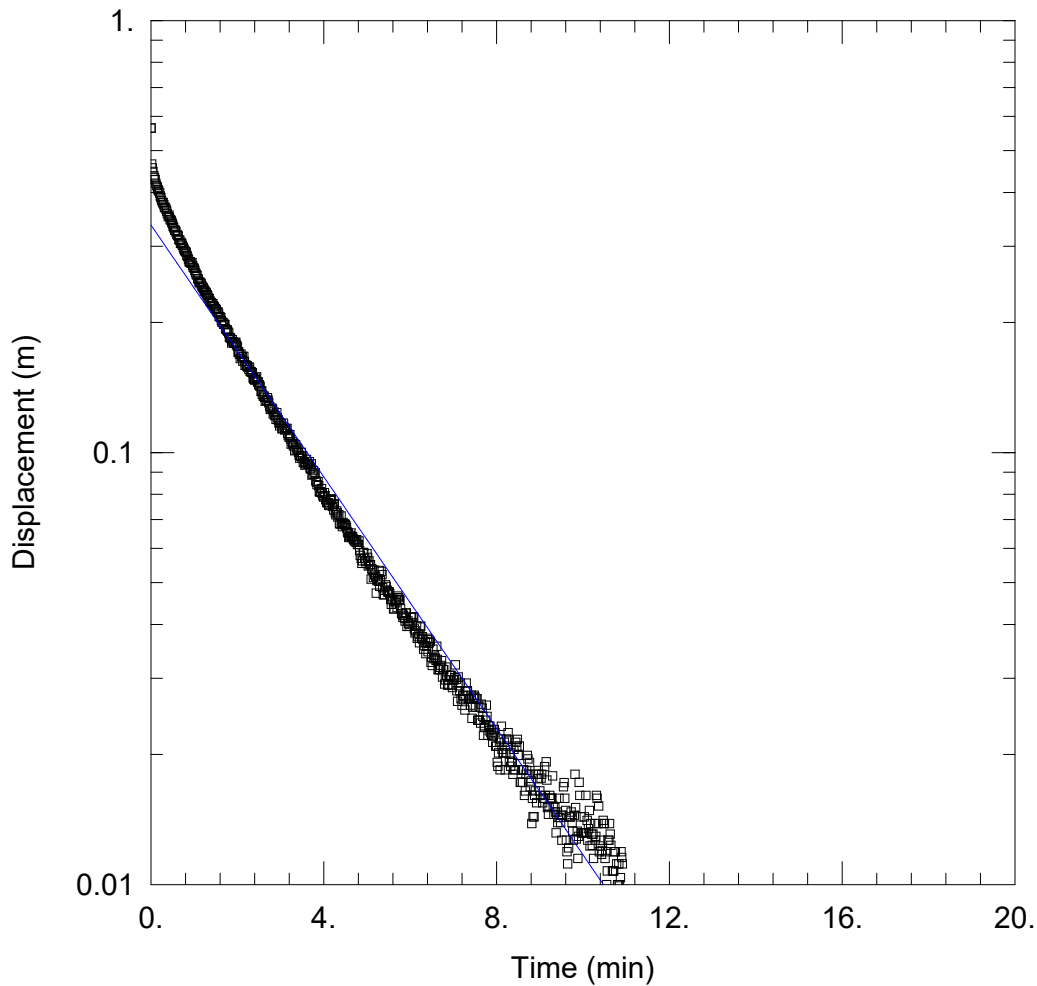
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 8.971E-6 m/sec

y0 = 0.4452 m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH3-26
 Test Date: May 26, 2026

WELL DATA (BH3-26)

Initial Displacement: 0.564 m
 Total Well Penetration Depth: 4.92 m
 Casing Radius: 0.0254 m

Static Water Column Height: 4.92 m
 Screen Length: 1.524 m
 Well Radius: 0.1048 m

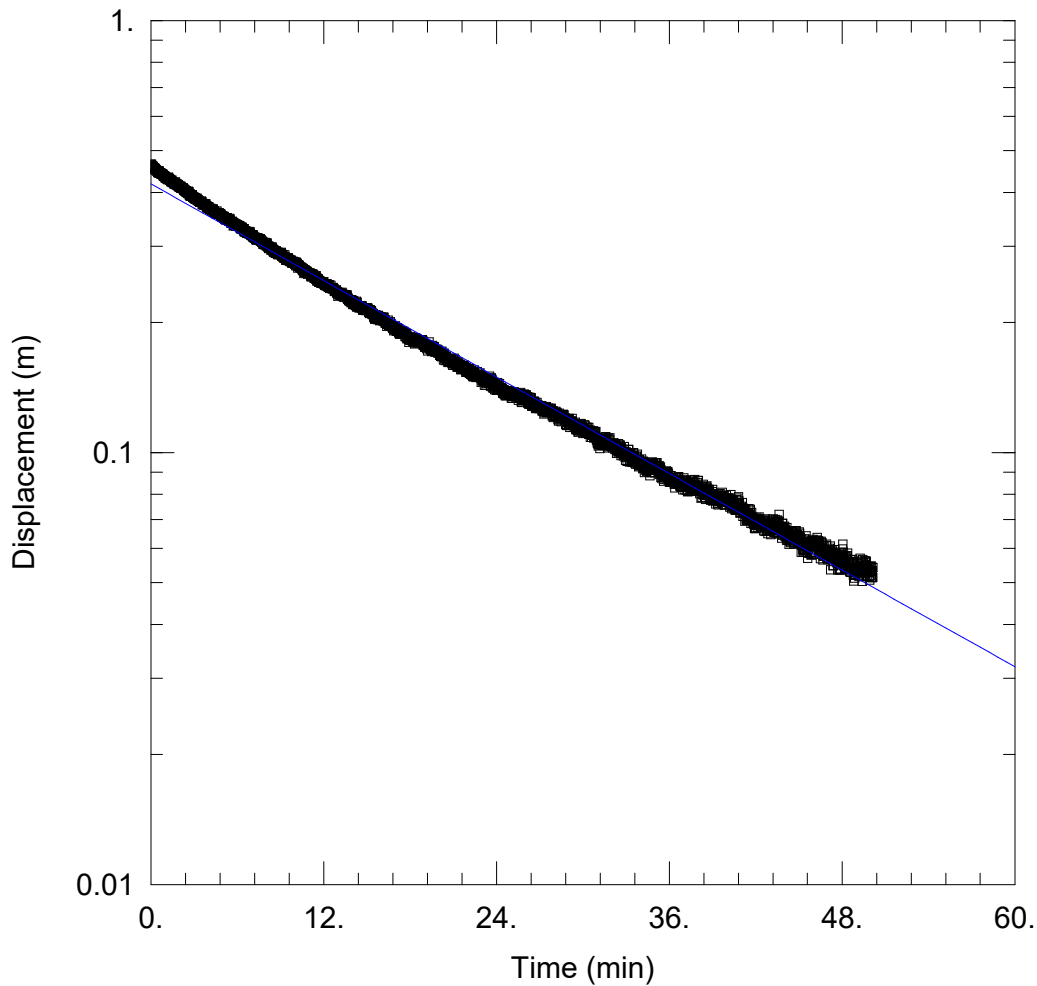
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 5.35E-6$ m/sec

$y_0 = 0.3359$ m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH4-26
 Test Date: May 26, 2026

WELL DATA (BH4-26)

Initial Displacement: 0.465 m
 Total Well Penetration Depth: 3.49 m
 Casing Radius: 0.0254 m

Static Water Column Height: 3.49 m
 Screen Length: 1.524 m
 Well Radius: 0.1048 m

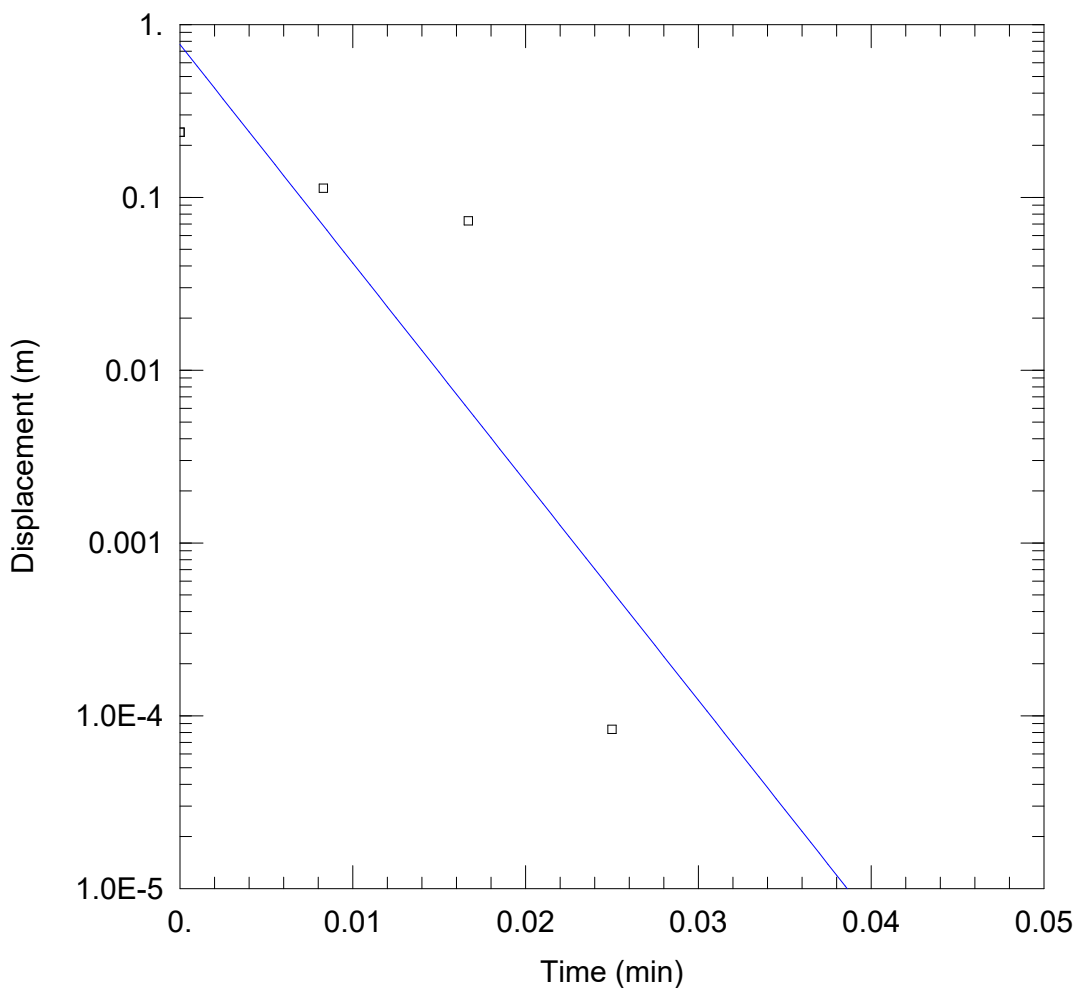
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = \underline{6.84E-7}$ m/sec

$y_0 = \underline{0.4184}$ m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH5-26
 Test Date: May 26, 2026

WELL DATA (BH5-26)

Initial Displacement: 0.2381 m
 Total Well Penetration Depth: 5. m
 Casing Radius: 0.0254 m

Static Water Column Height: 5. m
 Screen Length: 1.524 m
 Well Radius: 0.0381 m

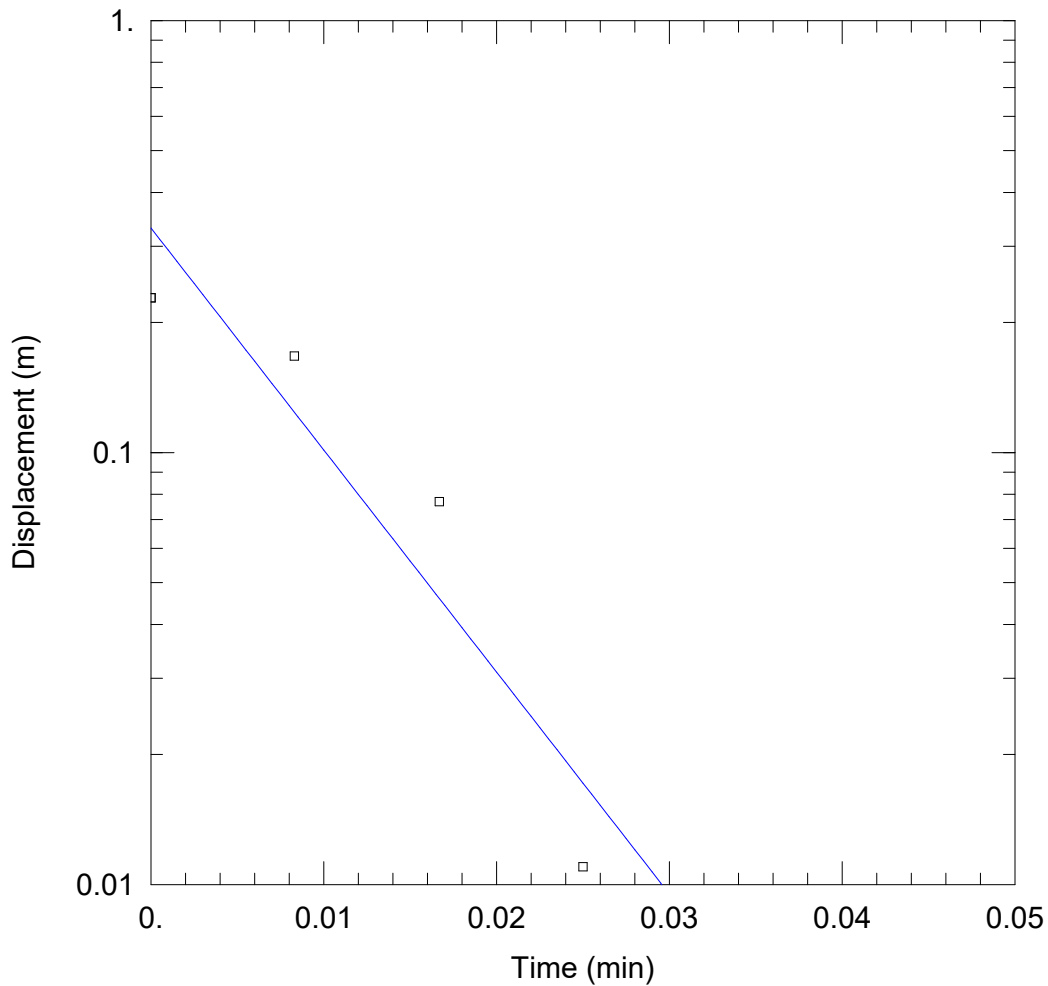
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 0.005686 m/sec

y0 = 0.7668 m



WELL TEST ANALYSIS

Data Set: P:\...\PG7301- BH5-26 Rising Head 2 of 2.aqt

Date: 05/27/26

Time: 16:18:16

PROJECT INFORMATION

Company: Paterson Group

Client: Caivan Communities

Project: PG7301

Location: 4795 Bank Street

Test Well: BH5-26

Test Date: May 26, 2026

AQUIFER DATA

Saturated Thickness: 5. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH5-26)

Initial Displacement: 0.228 m

Static Water Column Height: 5. m

Total Well Penetration Depth: 5. m

Screen Length: 1.524 m

Casing Radius: 0.0254 m

Well Radius: 0.0381 m

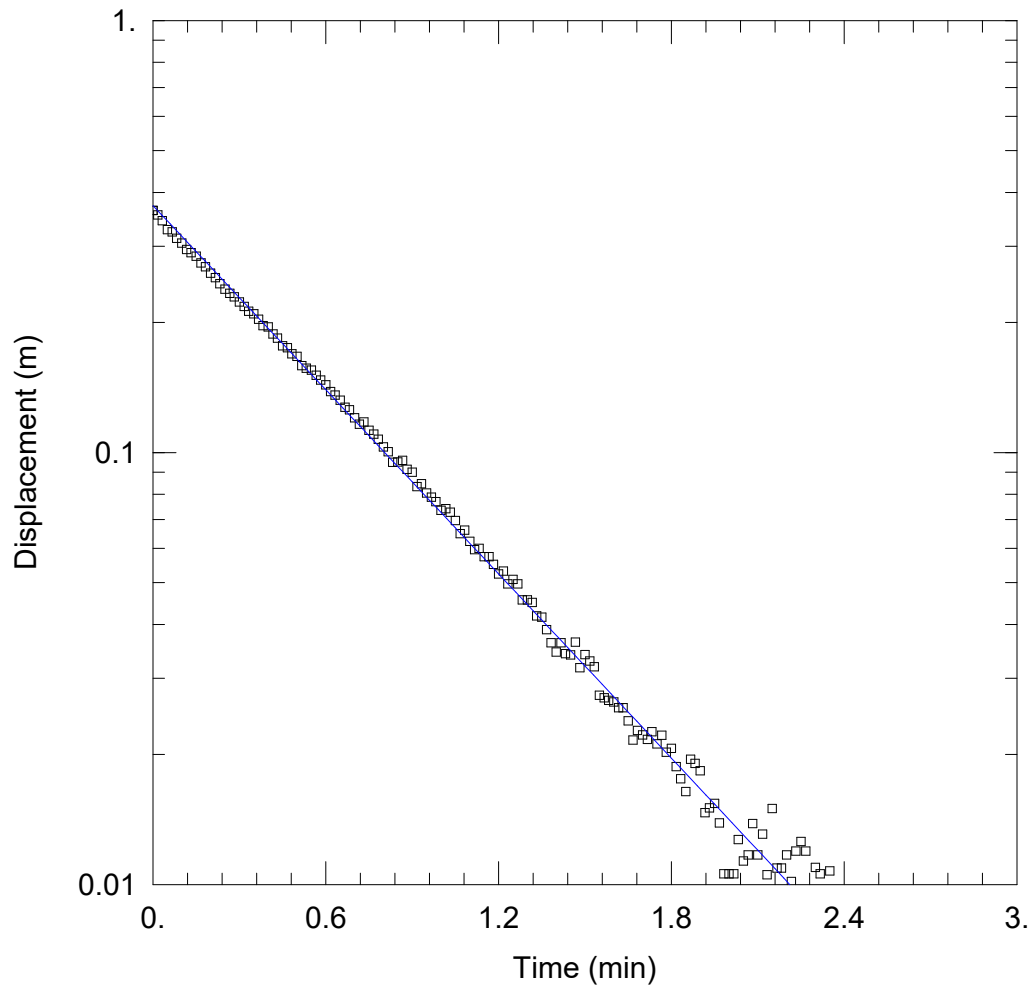
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 0.00231$ m/sec

$y_0 = 0.3309$ m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH6-26
 Test Date: May 26, 2026

WELL DATA (BH6-26)

Initial Displacement: 0.3633 m
 Total Well Penetration Depth: 3.23 m
 Casing Radius: 0.0254 m

Static Water Column Height: 3.23 m
 Screen Length: 1.524 m
 Well Radius: 0.1048 m

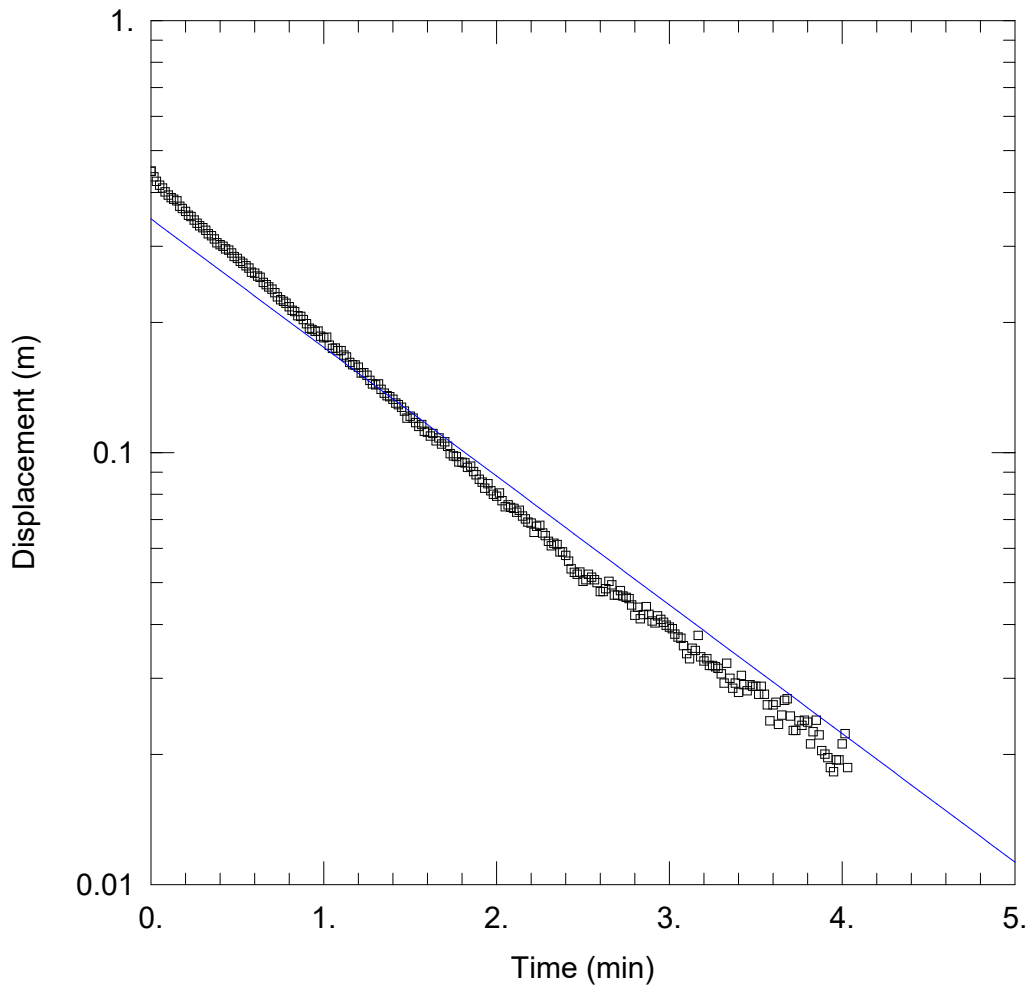
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 2.61E-5$ m/sec

$y_0 = 0.3729$ m



WELL TEST ANALYSIS

PROJECT INFORMATION

Company: Paterson Group
 Client: Caivan Communities
 Project: PG7301
 Location: 4795 Bank Street
 Test Well: BH6-26
 Test Date: May 26, 2026

WELL DATA (BH6-26)

Initial Displacement: 0.448 m
 Total Well Penetration Depth: 3.22 m
 Casing Radius: 0.0254 m

Static Water Column Height: 3.22 m
 Screen Length: 1.524 m
 Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 9.259E-6 m/sec

y0 = 0.3474 m

Estimated Groundwater Inflow**Caivan Communities - 4795 Bank Street - Building Excavation****Dupuit-Forchheimer Equation**

$$Q = \pi K ((h_0^2 - h_p^2) / \ln(R/r))$$

K (m/sec) = 6.02E-06

h₀ (m) = 10h_p (m) = 8

r (m) = 17.35

Equivalent Radius of Excavation =

A+B=Pi*r

Excavation Width (A) =

26.5 m

Excavation Length (B) =

28 m

Perimeter Length =

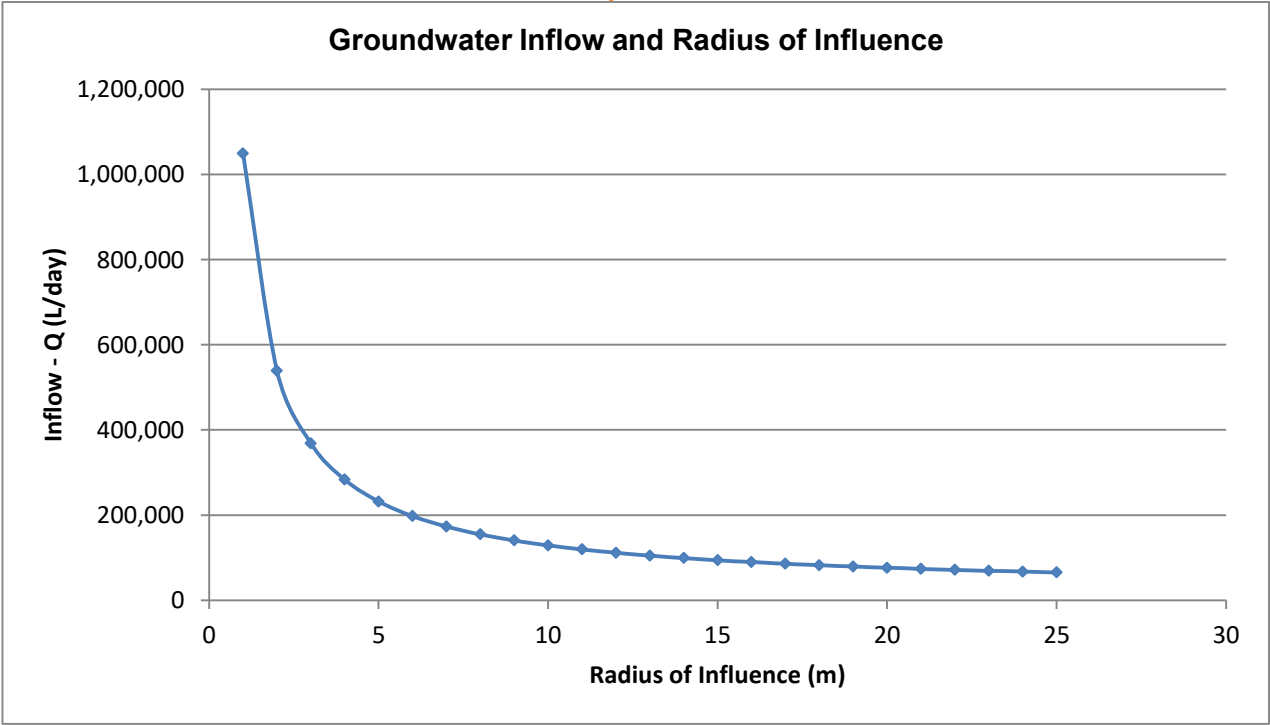
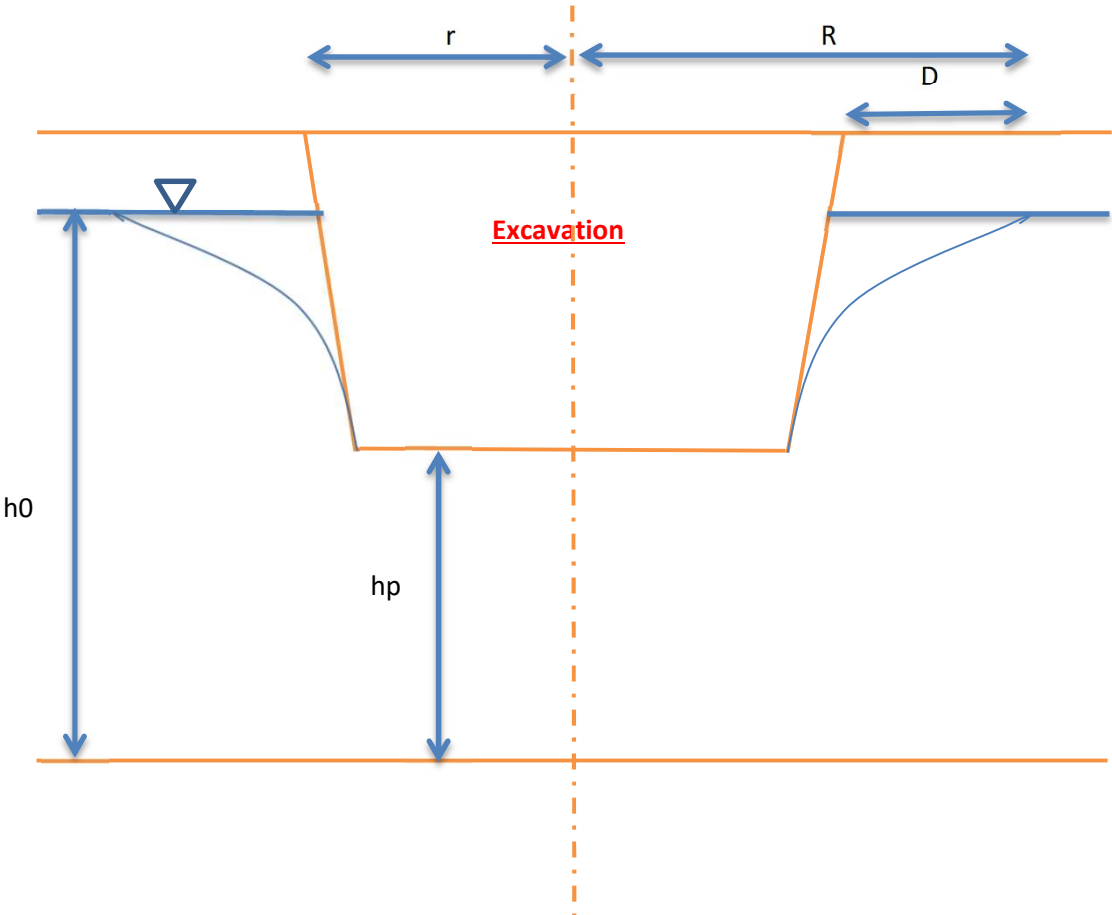
109 m

Equivalent Radius (r) =

17.35 m

R	Distance to edge of excavation (D)
18.35	1.00
19.35	2.00
20.35	3.00
21.35	4.00
22.35	5.00
23.35	6.00
24.35	7.00
25.35	8.00
26.35	9.00
27.35	10.00
28.35	11.00
29.35	12.00
30.35	13.00
31.35	14.00
32.35	15.00
33.35	16.00
34.35	17.00
35.35	18.00
36.35	19.00
37.35	20.00
38.35	21.00
39.35	22.00
40.35	23.00
41.35	24.00
42.35	25.00
43.35	26.00
44.35	27.00
45.35	28.00
46.35	29.00
47.35	30.00

Q (m ³ /s)	Q (m ³ /day)	Q (L/day)
0.0121	1049.6	1,049,629
0.0062	539.1	539,123
0.0043	368.8	368,795
0.0033	283.5	283,519
0.0027	232.3	232,271
0.0023	198.0	198,040
0.0020	173.5	173,538
0.0018	155.1	155,119
0.0016	140.8	140,758
0.0015	129.2	129,238
0.0014	119.8	119,787
0.0013	111.9	111,888
0.0012	105.2	105,185
0.0012	99.4	99,421
0.0011	94.4	94,410
0.0010	90.0	90,012
0.0010	86.1	86,119
0.0010	82.6	82,646
0.0009	79.5	79,529
0.0009	76.7	76,714
0.0009	74.2	74,159
0.0008	71.8	71,828
0.0008	69.7	69,692
0.0008	67.7	67,728
0.0008	65.9	65,914
0.0007	64.2	64,234
0.0007	62.7	62,674
0.0007	61.2	61,219
0.0007	59.9	59,860
0.0007	58.6	58,588



Estimated Groundwater InflowCaivan Communities - 4795 Bank Street - Condominium ExcavationDupuit-Forchheimer Equation

$$Q = \pi K ((h_0^2 - h_p^2) / \ln(R/r))$$

K (m/sec) = 6.02E-06

h₀ (m) = 6h_p (m) = 4

r (m) = 91.04

Equivalent Radius of Excavation =

A+B=Pi*r

Excavation Width (X) =

141 m

Excavation Length (Y) =

145 m

Perimeter Length =

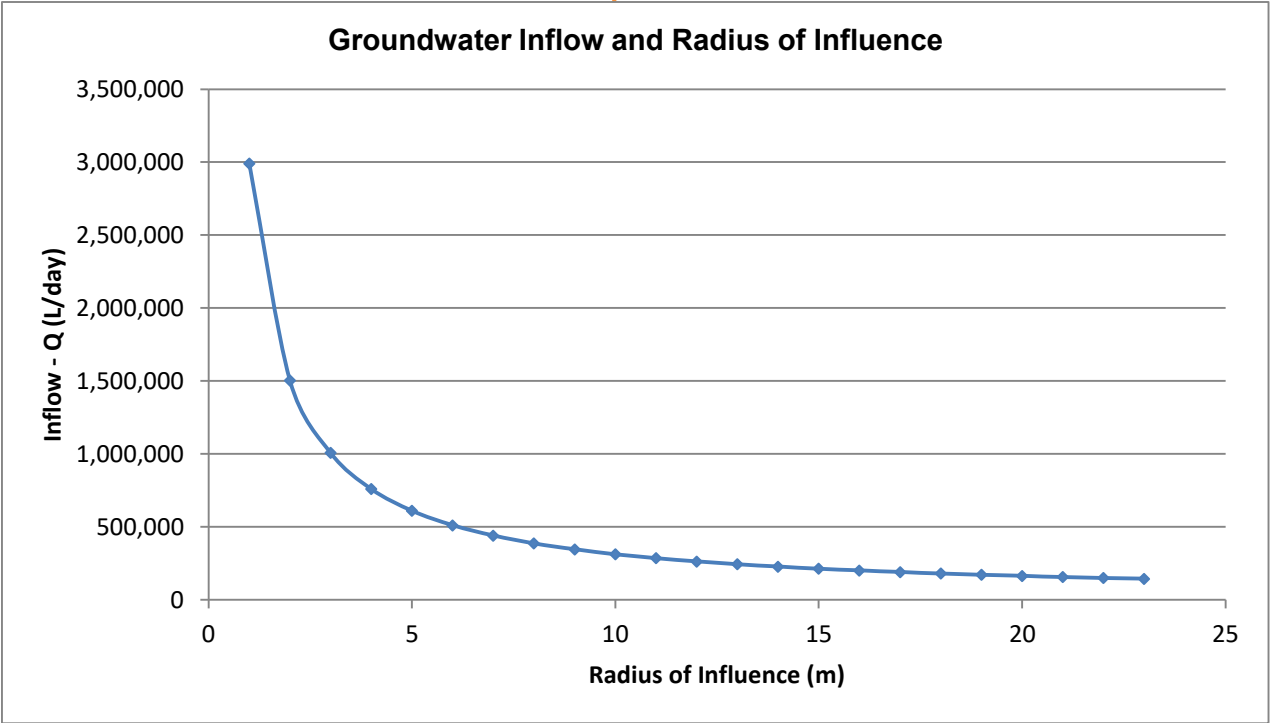
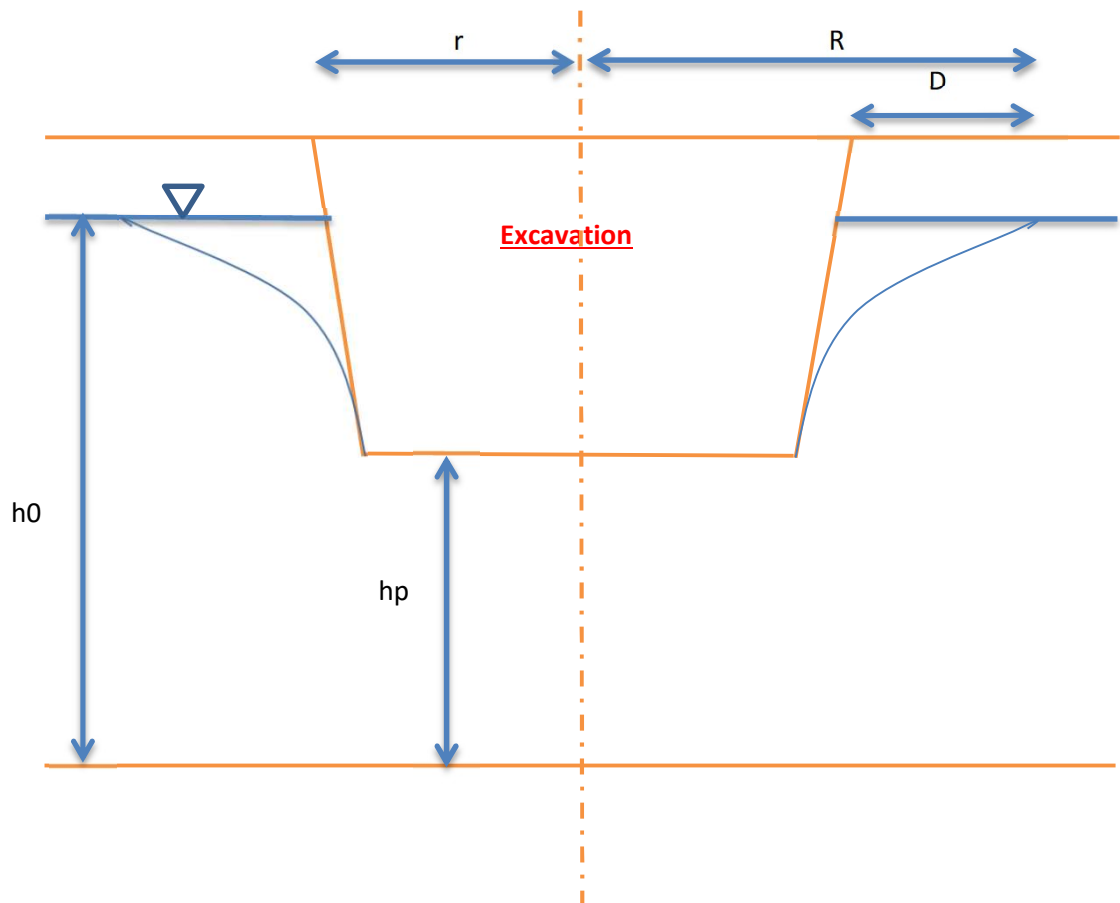
572 m

Equivalent Radius (r) =

91.04 m

R	Distance to edge of excavation (D)
92.04	1.00
93.04	2.00
94.04	3.00
95.04	4.00
96.04	5.00
97.04	6.00
98.04	7.00
99.04	8.00
100.04	9.00
101.04	10.00
102.04	11.00
103.04	12.00
104.04	13.00
105.04	14.00
106.04	15.00
107.04	16.00
108.04	17.00
109.04	18.00
110.04	19.00
111.04	20.00
112.04	21.00
113.04	22.00
114.04	23.00
115.04	24.00
116.04	25.00
117.04	26.00
118.04	27.00
119.04	28.00
120.04	29.00
121.04	30.00

Q (m ³ /s)	Q (m ³ /day)	Q (L/day)
0.0346	2991.4	2,991,443
0.0174	1503.8	1,503,847
0.0117	1008.0	1,007,963
0.0088	760.0	760,006
0.0071	611.2	611,221
0.0059	512.0	512,022
0.0051	441.2	441,157
0.0045	388.0	388,002
0.0040	346.7	346,654
0.0036	313.6	313,570
0.0033	286.5	286,496
0.0031	263.9	263,931
0.0028	244.8	244,833
0.0026	228.5	228,460
0.0025	214.3	214,267
0.0023	201.8	201,845
0.0022	190.9	190,882
0.0021	181.1	181,134
0.0020	172.4	172,410
0.0019	164.6	164,556
0.0018	157.4	157,448
0.0017	151.0	150,985
0.0017	145.1	145,081
0.0016	139.7	139,667
0.0016	134.7	134,685
0.0015	130.1	130,085
0.0015	125.8	125,824
0.0014	121.9	121,866
0.0014	118.2	118,179
0.0013	114.7	114,737



Estimated Groundwater Inflow**Caivan Communities - 4795 Bank Street - Servicing Excavation****Dupuit-Forchheimer Equation**

$$Q = \pi K ((h_0^2 - h_p^2) / \ln(R/r))$$

K (m/sec) = 6.02E-06

h₀ (m) = 10h_p (m) = 6

r (m) = 9.55

Equivalent Radius of Excavation =

A+B=Pi + r

Excavation Width (X) =

5 m

Excavation Length (Y) =

25 m

Perimeter Length =

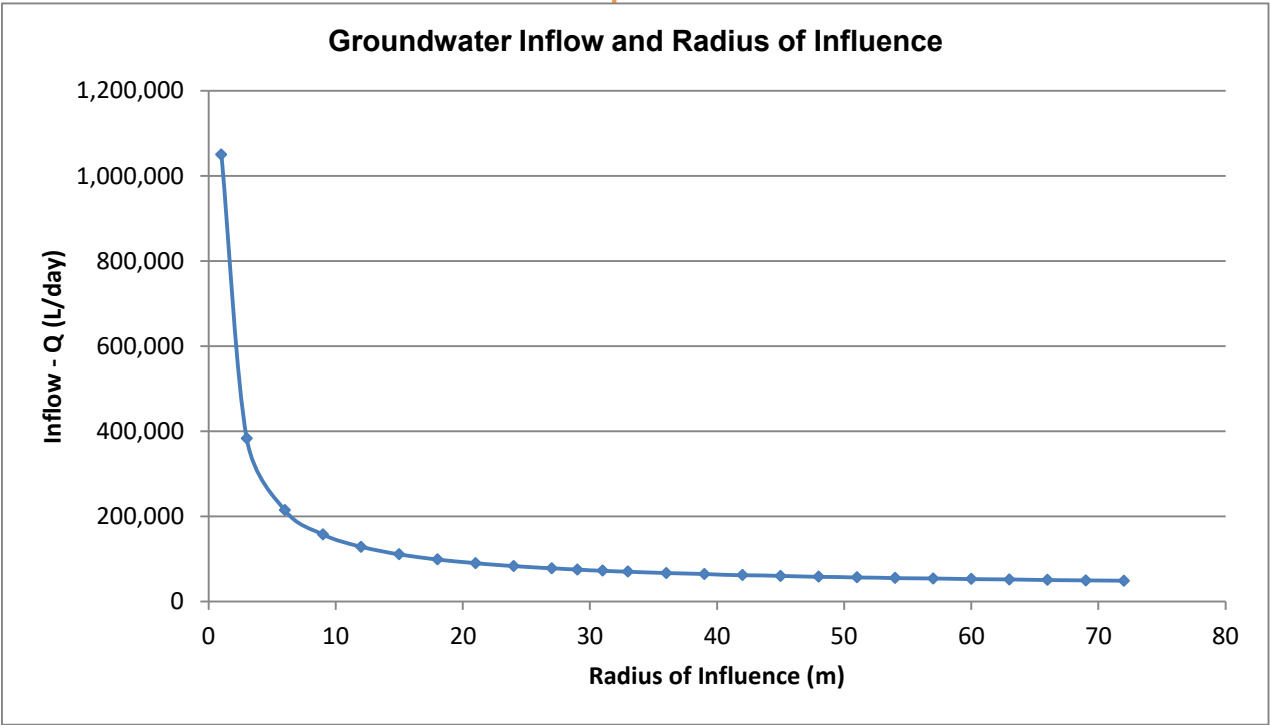
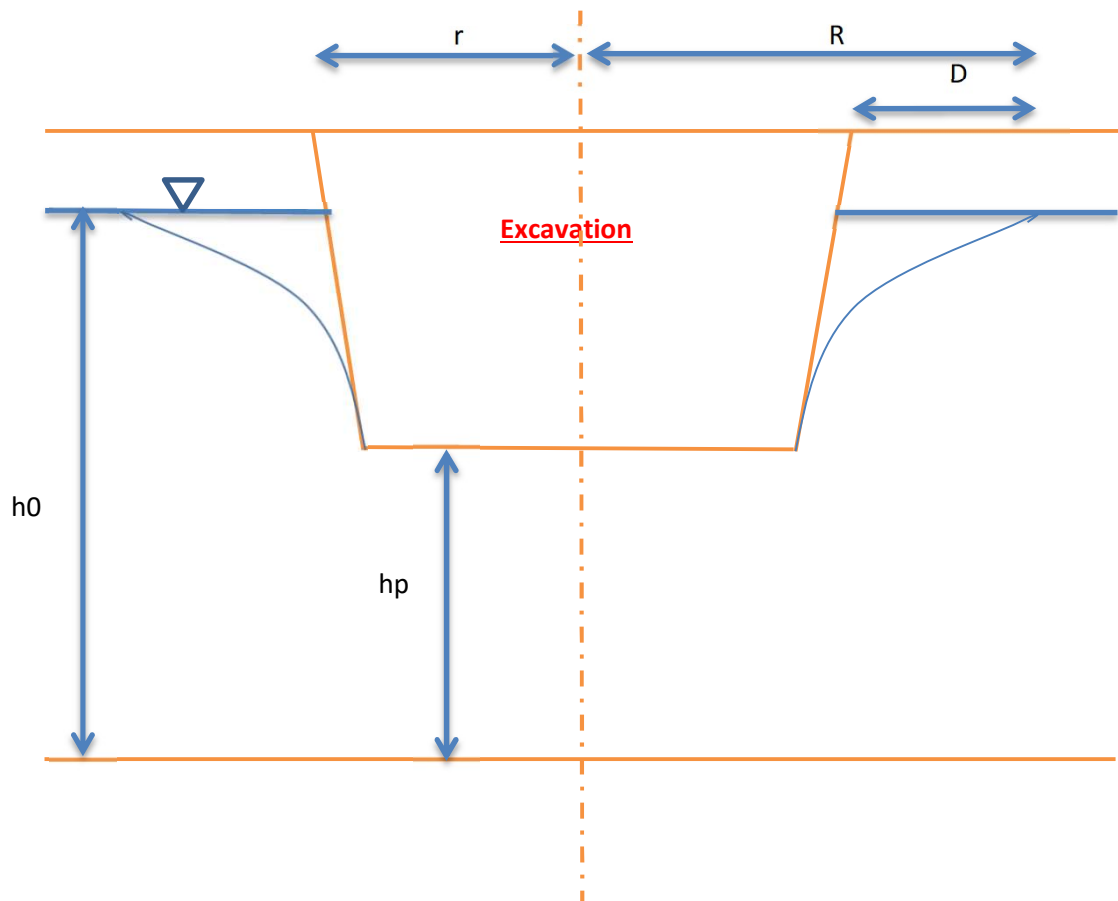
60 m

Equivalent Radius (r) =

9.55 m

R	Distance to edge of excavation (D)
10.55	1.00
12.55	3.00
15.55	6.00
18.55	9.00
21.55	12.00
24.55	15.00
27.55	18.00
30.55	21.00
33.55	24.00
36.55	27.00
38.55	29.00
40.55	31.00
42.55	33.00
45.55	36.00
48.55	39.00
51.55	42.00
54.55	45.00
57.55	48.00
60.55	51.00
63.55	54.00
66.55	57.00
69.55	60.00
72.55	63.00
75.55	66.00
78.55	69.00
81.55	72.00
84.55	75.00
87.55	78.00
90.55	81.00
93.55	84.00

Q (m ³ /s)	Q (m ³ /day)	Q (L/day)
0.0122	1050.1	1,050,067
0.0044	382.8	382,793
0.0025	214.5	214,498
0.0018	157.5	157,505
0.0015	128.5	128,494
0.0013	110.8	110,756
0.0011	98.7	98,704
0.0010	89.9	89,931
0.0010	83.2	83,226
0.0009	77.9	77,916
0.0009	74.9	74,941
0.0008	72.3	72,320
0.0008	70.0	69,989
0.0008	66.9	66,937
0.0007	64.3	64,312
0.0007	62.0	62,025
0.0007	60.0	60,011
0.0007	58.2	58,223
0.0007	56.6	56,621
0.0006	55.2	55,176
0.0006	53.9	53,865
0.0006	52.7	52,669
0.0006	51.6	51,572
0.0006	50.6	50,562
0.0006	49.6	49,627
0.0006	48.8	48,760
0.0006	48.0	47,952
0.0005	47.2	47,198
0.0005	46.5	46,491
0.0005	45.8	45,827



Estimated Groundwater InflowCaivan Communities - 4795 Bank Street - SWMP ExcavationDupuit-Forchheimer Equation

$$Q = \pi K ((h_0^2 - h_p^2) / \ln(R/r))$$

K (m/sec) = 6.02E-06

h₀ (m) = 10h_p (m) = 8

r (m) = 53.79

Equivalent Radius of Excavation =

A+B=Pi + r

Excavation Width (X) =

74 m

Excavation Length (Y) =

95 m

Perimeter Length =

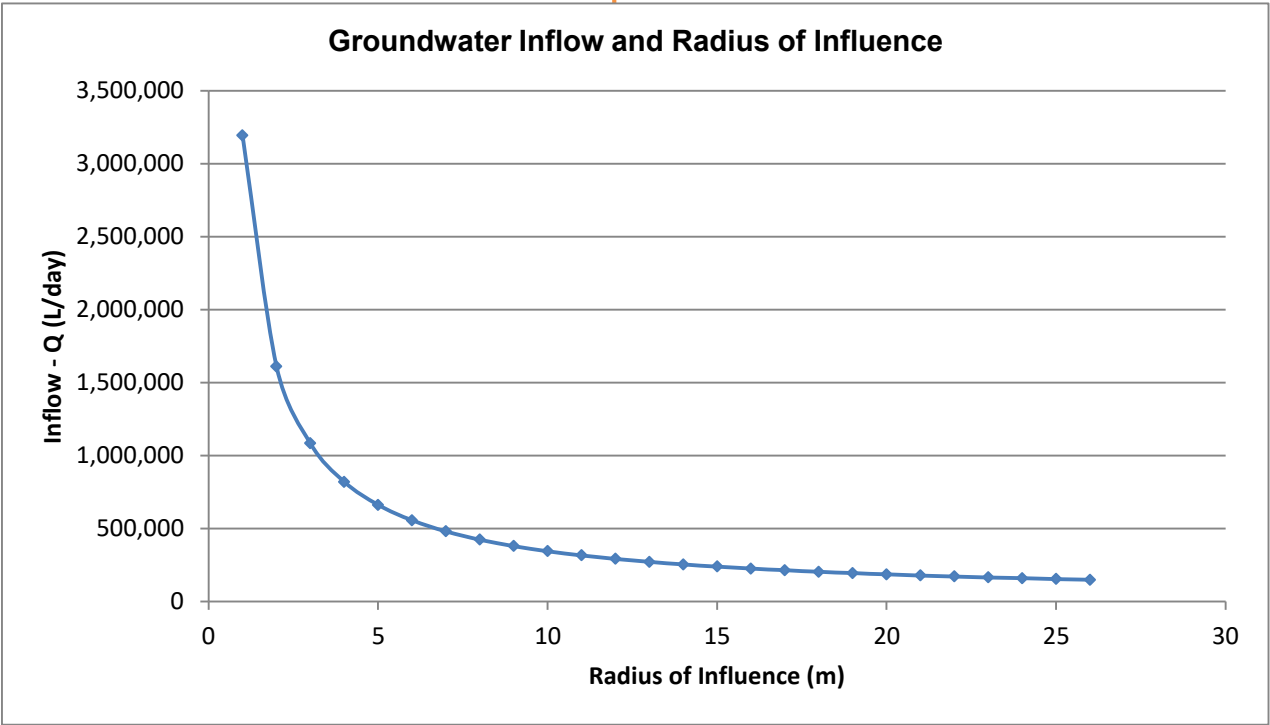
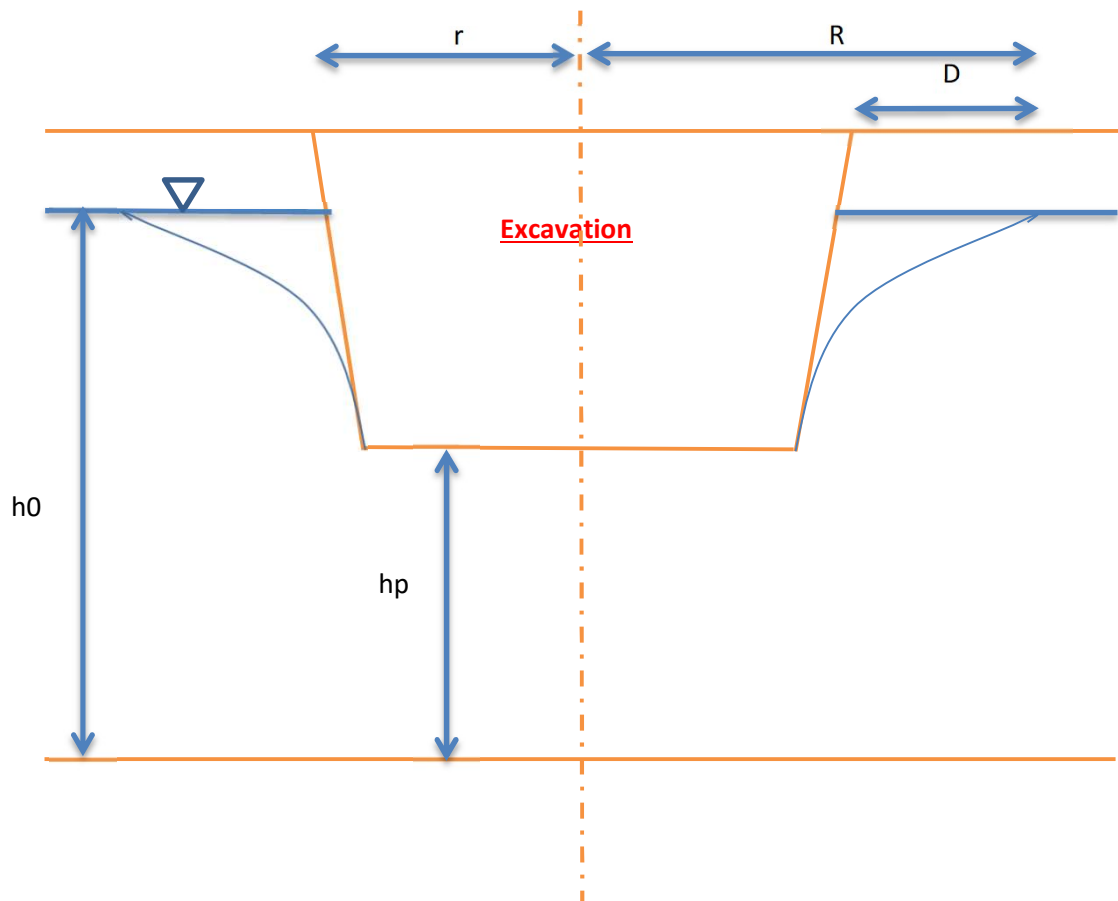
338 m

Equivalent Radius (r) =

53.79 m

R	Distance to edge of excavation (D)
54.79	1.00
55.79	2.00
56.79	3.00
57.79	4.00
58.79	5.00
59.79	6.00
60.79	7.00
61.79	8.00
62.79	9.00
63.79	10.00
64.79	11.00
65.79	12.00
66.79	13.00
67.79	14.00
68.79	15.00
69.79	16.00
70.79	17.00
71.79	18.00
72.79	19.00
73.79	20.00
74.79	21.00
75.79	22.00
76.79	23.00
77.79	24.00
78.79	25.00
79.79	26.00
80.79	27.00
81.79	28.00
82.79	29.00
83.79	30.00

Q (m ³ /s)	Q (m ³ /day)	Q (L/day)
0.0370	3193.8	3,193,781
0.0187	1611.5	1,611,463
0.0125	1084.0	1,083,966
0.0095	820.2	820,176
0.0077	661.9	661,869
0.0064	556.3	556,304
0.0056	480.9	480,879
0.0049	424.3	424,290
0.0044	380.3	380,261
0.0040	345.0	345,023
0.0037	316.2	316,179
0.0034	292.1	292,131
0.0031	271.8	271,772
0.0029	254.3	254,312
0.0028	239.2	239,172
0.0026	225.9	225,916
0.0025	214.2	214,213
0.0024	203.8	203,803
0.0023	194.5	194,483
0.0022	186.1	186,088
0.0021	178.5	178,488
0.0020	171.6	171,574
0.0019	165.3	165,256
0.0018	159.5	159,461
0.0018	154.1	154,124
0.0017	149.2	149,195
0.0017	144.6	144,626
0.0016	140.4	140,381
0.0016	136.4	136,425
0.0015	132.7	132,729



Estimated Groundwater Inflow**Caivan Communities - 4795 Bank Street - Servicing Excavation-Bedrock****Dupuit-Forchheimer Equation**

$$Q = \pi K((h_0^2 - h_p^2) / \ln(R/r))$$

K (m/sec) = 1.94E-04

h₀ (m) = 20h_p (m) = 18

r (m) = 9.55

Equivalent Radius of Excavation =

A+B=Pi + r

Excavation Width (X) =

5 m

Excavation Length (Y) =

25 m

Perimeter Length =

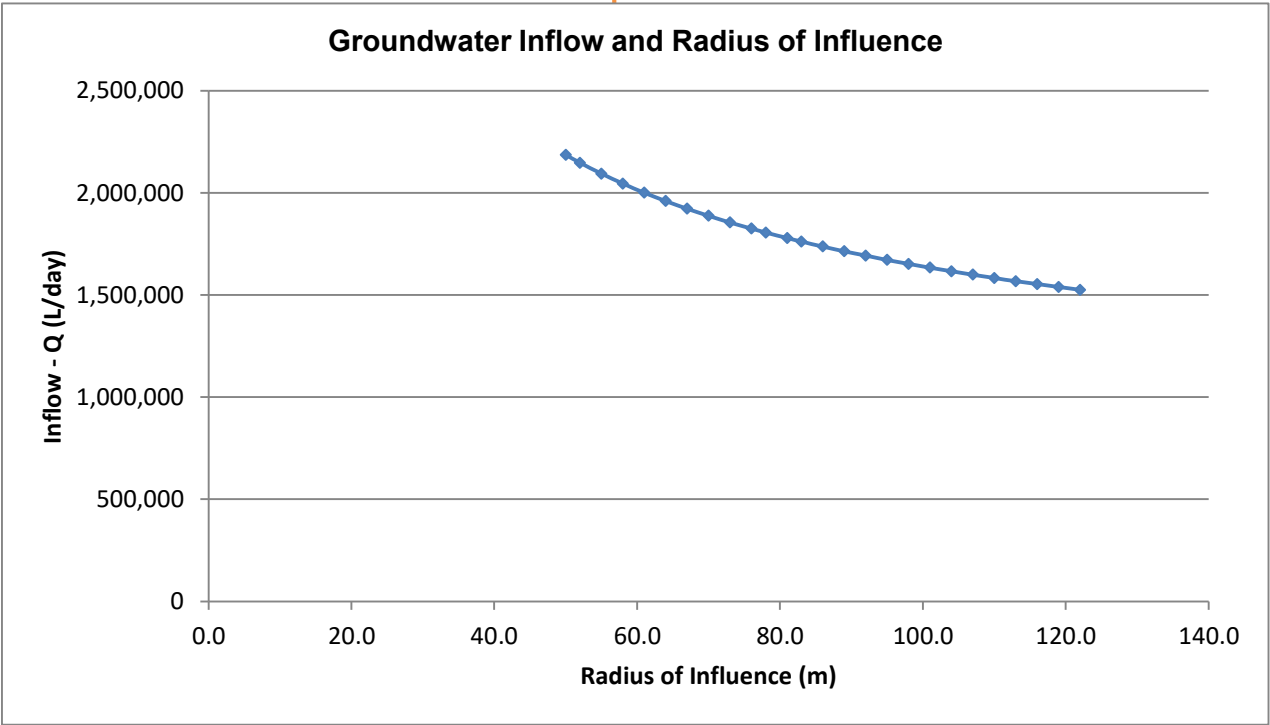
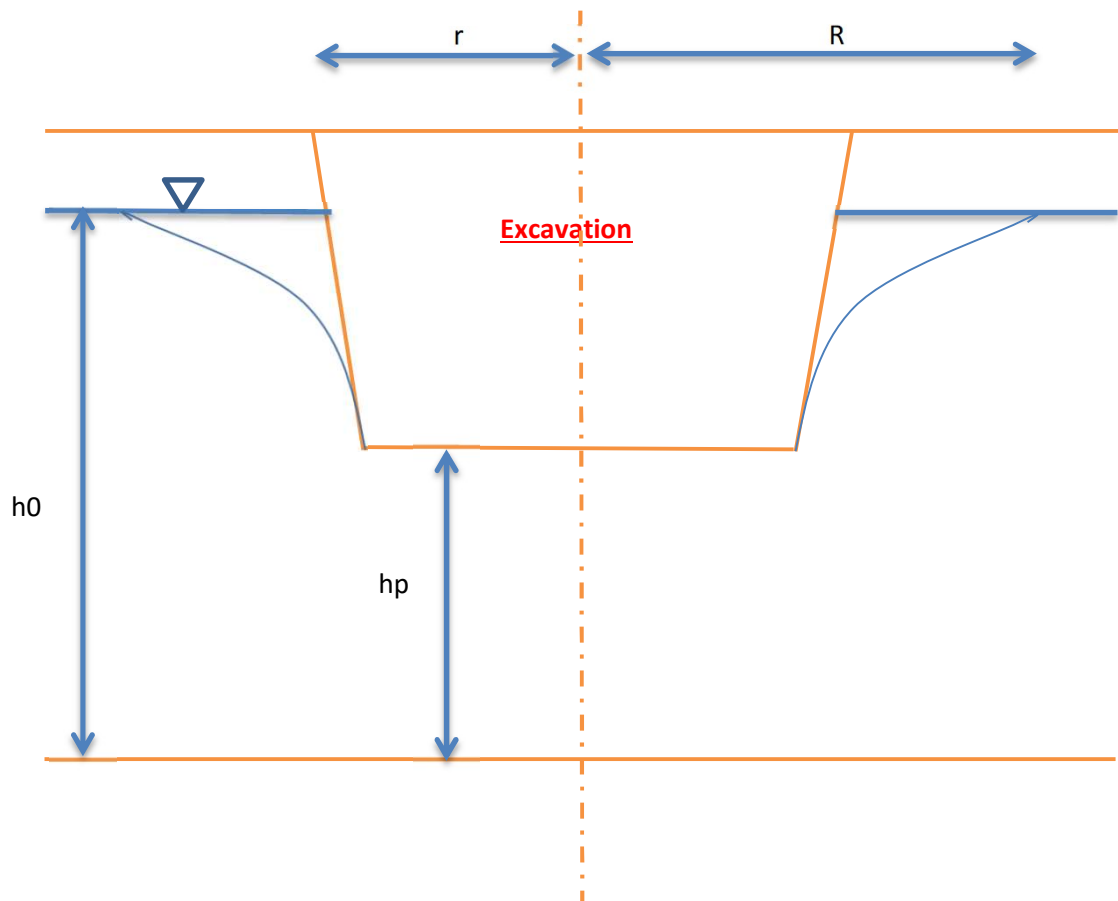
60 m

Equivalent Radius (r) =

9.55 m

R	Distance to edge of excavation (D)
59.55	50.00
61.55	52.00
64.55	55.00
67.55	58.00
70.55	61.00
73.55	64.00
76.55	67.00
79.55	70.00
82.55	73.00
85.55	76.00
87.55	78.00
90.55	81.00
92.55	83.00
95.55	86.00
98.55	89.00
101.55	92.00
104.55	95.00
107.55	98.00
110.55	101.00
113.55	104.00
116.55	107.00
119.55	110.00
122.55	113.00
125.55	116.00
128.55	119.00
131.55	122.00
134.55	125.00
137.55	128.00
140.55	131.00
143.55	134.00

Q (m ³ /s)	Q (m ³ /day)	Q (L/day)
0.0253	2186.5	2,186,492
0.0249	2147.7	2,147,730
0.0242	2094.2	2,094,242
0.0237	2045.6	2,045,613
0.0232	2001.2	2,001,164
0.0227	1960.3	1,960,343
0.0223	1922.7	1,922,690
0.0218	1887.8	1,887,825
0.0215	1855.4	1,855,424
0.0211	1825.2	1,825,217
0.0209	1806.2	1,806,181
0.0206	1779.1	1,779,127
0.0204	1762.0	1,762,014
0.0201	1737.6	1,737,609
0.0198	1714.6	1,714,595
0.0196	1692.8	1,692,846
0.0194	1672.3	1,672,251
0.0191	1652.7	1,652,714
0.0189	1634.1	1,634,147
0.0187	1616.5	1,616,474
0.0185	1599.6	1,599,625
0.0183	1583.5	1,583,539
0.0182	1568.2	1,568,160
0.0180	1553.4	1,553,439
0.0178	1539.3	1,539,329
0.0177	1525.8	1,525,790
0.0175	1512.8	1,512,785
0.0174	1500.3	1,500,279
0.0172	1488.2	1,488,242
0.0171	1476.6	1,476,644



APPENDIX 4

SURROUNDING WATER WELL RECORDS

000000

316/52



GROUND WATER BRANCH

SEP 15 1962

2176

ONTARIO WATER
RESOURCES COMMISSION

UTM 1182 4537610E

N 15R 561175610N

The Ontario Water Resources Commission Act

Elev: 4R 03115

WATER WELL RECORD

Basin 251 CARLETON

Township, Village, Town or City

FLORESTER

Con. 4 RF Lot 21

Date completed 20 JULY 62
(day month year)

Address BILLINGS BRIDGE

Casing and Screen Record

Inside diameter of casing 184
 Total length of casing 184
 Type of screen -
 Length of screen -
 Depth to top of screen -
 Diameter of finished hole 4

Pumping Test

Static level 6
 Test-pumping rate 6 G.P.M.
 Pumping level 8
 Duration of test pumping 1 HR
 Water clear or cloudy at end of test CL
 Recommended pumping rate 6 G.P.M.
 with pump setting of 30 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

From
ft.To
ft.Depth(s) at
which water(s)
foundKind of water
(fresh, salty,
sulphur)

CLAY

0

18

Limestone

18

45

45

F

For what purpose(s) is the water to be used?

Home

Is well on upland, in valley, or on hillside?

U

Drilling or Boring Firm

M MEDSTER

Address

6 FORD

Licence Number

612

Name of Driller or Borer

S HARRIS

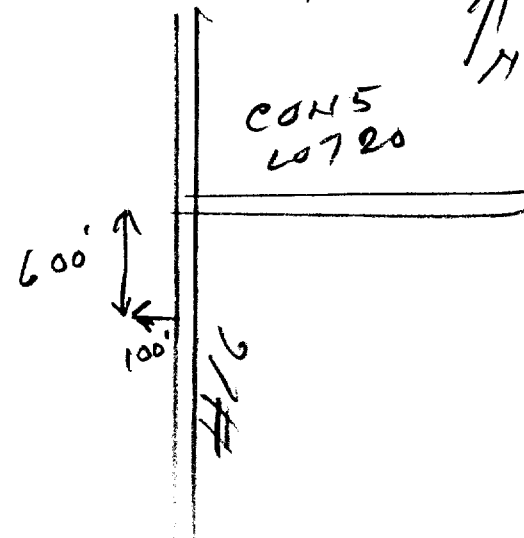
Address

Date

AUG 28

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from
road and lot line. Indicate north by arrow.

316/5a.

UTM 18 453660 E
5 5018070 N



15 No 2245
RECEIVED
MAR 31 1952
GEOLOGICAL BRANCH
DEPARTMENT of MINES

Flex. AR 02 95
 Basin 25

The Well Drillers' ^{Union} Act
Department of Mines, Province of Ontario

Water Well Record

Cullerton
 Township, Village, Town or City Gloucester
 [Redacted]
 [Redacted]
 [Redacted]
 Date Completed 20 Sept 97 Cost of well (excluding pump) \$1,000.00
 (day) (month) (year)

Pipe and Casing Record

Pumping Test

Casing diameter(s).....	3"	Date.....	Sept. 25 1951
Length(s) of casing(s).....	10'	Static level.....	10'
Type of screen.....		Pumping level.....	15'
Length of screen.....		Pumping rate.....	300 G. P.H.
Distance from top of screen to ground level.....		Duration of test.....	30 MIN
Is well a gravel-wall type?.....	No	Distance from cylinder or bowls to ground level.....	

Water Record

Kind (fresh or mineral).....	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
Quality (hard, soft, contains iron, sulphur, etc.).....	37'	Good	27'
Appearance (clear, cloudy, coloured).....			
For what purpose(s) is the water to be used?.....			
.....			
How far is well from possible source of contamination?.....			
What is the source of contamination?.....			
Enclose a copy of any mineral analysis that has been made of water.....			

Well Log

[illegible]

Location of Well

See Over

The diagram shows a hand-drawn map. At the top, a north arrow points upwards, with 'N' at the top, 'S' at the bottom, 'E' to the left, and 'W' to the right. A vertical line represents a road. Along this road, from top to bottom, are a 'PRIVY' (represented by a rectangle with an arrow pointing up) and a 'WELL' (represented by a circle with a cross). A horizontal line at the bottom is labeled 'METCALF HIGHWAY' and '10 MILES TO OTHER'. A small square is drawn to the left of the road, between the privy and the highway.

Situation: Is well on upland, in valley, or on hillside? Upland
Drilling Firm... B. J. Wellman
Address... 578 Westminster
Name of Driller B. J. Wellman Address B 578 Westminster
Date Sept 25 1957 Licence Number 343
Signature of Licensee B. J. Wellman

UTM 1182 453840 E

5R 50117850 N

Elev. 4R 0305

Basin 25



ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

15 No 2246

RECEIVED

DEC - 6 1951

GEOLOGICAL BRANCH
DEPARTMENT OF MINES

Water Well Record

County of Gloucester Township, Village, Town or City Gloucester

Town or City

ss Welltrim

Date Completed 11/24/51 Cost of well (excluding pump) \$3,27.00
(day) (month) (year)

Pipe and Casing Record

Pumping Test

Casing diameter(s) <u>5"</u>	Date <u>Nov 24</u>
Length(s) of casing(s) <u>0</u>	Static level <u>5'</u>
Type of screen <u>—</u>	Pumping level <u>20'</u>
Length of screen <u>—</u>	Pumping rate <u>2 GPM</u>
Distance from top of screen to ground level <u>—</u>	Duration of test <u>30 Min</u>
Is well a gravel-wall type? <u>No</u>	Distance from cylinder or bowls to ground level <u>—</u>

Water Record

Kind (fresh or mineral) <u>Fresh</u>	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
Quality (hard, soft, contains iron, sulphur, etc.) <u>hard</u>	<u>30'</u>	<u>good</u>	<u>20'</u>
Appearance (clear, cloudy, coloured) <u>clear</u>	<u>60'</u>	<u>"</u>	<u>55'</u>
For what purpose(s) is the water to be used? <u>Farm</u>	<u>79'</u>	<u>"</u>	<u>74'</u>
How far is well from possible source of contamination? <u>100' Burn</u>			
What is the source of contamination? <u>BHRN</u>			
Enclose a copy of any mineral analysis that has been made of water			

Well Log

Overburden and Bedrock Record

From

To

BOULDER Till
SANDSTONE

0 ft.

5 ft.

5"

20'

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.

Hwy 31 Ottawa →

→ N.

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

50yd

Situation: Is well on upland, in valley, or on hillside? upland

Drilling Firm F.A. McWEN & SON

Address 195 JAMES ST

Name of Driller M. Renaud Address

Date Nov Dec 1, 50 Licence Number

UTM 18 5 4 0 6 0 E

316/52



15 No 2248

15 2 1 5 0 1 1 7 8 7 9 N

The Ontario Water Resources Commission Act

Elev. 4 R 0 3 1 0

WATER WELL RECORD

Basin 25 L C A R L E T O N

Township, Village, Town or City G L O U C E S T E R

Con. 5 R F Lot 21

Date completed 25 4 1966
(day month year)

Address P.O. Box 212 R.R.#6 OTTAWA, ONT.

Casing and Screen Record

Inside diameter of casing 6 1/4"
Total length of casing 21' 3"
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 6"

Pumping Test

Static level 14'
Test-pumping rate 3 G.P.M.
Pumping level 80
Duration of test pumping 1 1/2 HRS
Water clear or cloudy at end of test CLEAR
Recommended pumping rate 3 G.P.M.
with pump setting of 90 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

From
ft.

To
ft.

Depth(s) at
which water(s)
found

Kind of water
(fresh, salty,
sulphur)

TOP SOIL
CLAY
SANDSTONE

0

1

1

6

6

98

80 - 97

Fresh

For what purpose(s) is the water to be used? INDUSTRY

Is well on upland, in valley, or on hillside? Upland

Drilling or Boring Firm MCLEAN WATER
SUPPLY LTD.

Address 1532 RAVEN AVE
OTTAWA, ONT.

Licence Number 2154

Name of Driller or Borer LOUIS BURROWS

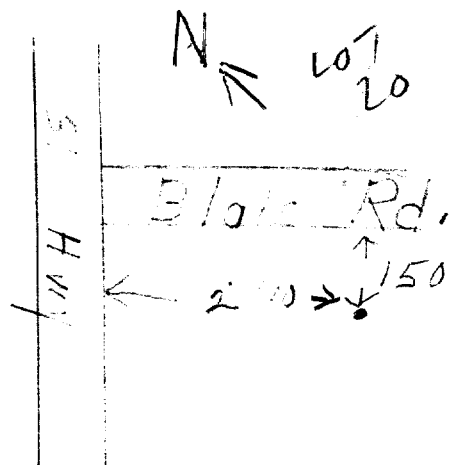
Address 7157

Date APR 26 - 1966

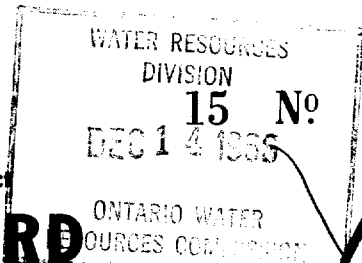
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



UTM 1182 4539610 E



5R 50117880N

The Ontario Water Resources Commission Act

Elev. 4R 0300

WATER WELL RECORD

Basin 25 11 Carl

County or District

Township, Village, Town or City

Gloucester

Con. 5 1P

Lot 21

Date completed 19 Nov. 1966

(day month year)

Address RR #3 Metcalfe Ont

Casing and Screen Record

Inside diameter of casing 5"
Total length of casing 20'
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 5"

Pumping Test

Static level 15
Test-pumping rate 5 G.P.M.
Pumping level 45
Duration of test pumping 1 hr
Water clear or cloudy at end of test cloudy
Recommended pumping rate 5 G.P.M.
with pump setting of 75' feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

sand fill
sandstone

From ft.

To ft.

Depth(s) at which water(s) found

Kind of water (fresh, salty, sulphur)

0

4

83

fresh

4

85

For what purpose(s) is the water to be used?

old house

Is well on upland, in valley, or on hillside?

upland

Drilling or Boring Firm

Capital Water Supply

Address 14 Ashford Dr Ottawa 6

Licence Number 2158

Name of Driller or Borer H Scott

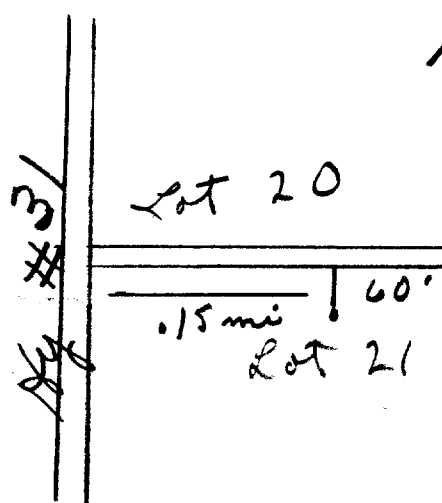
Address

Date Nov 19, 1966

Thalter Lavanagh
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



UTM 18 453 890
584 501 7040
Elev. 4 0308
S. 25



CODED
The Ontario Water Resources Commission Act
WATER WELL RECORD

County or District **Carleton** Township, Village, Town or City **Gloucester**
Con. **RF 5** Lot **2021** Date completed **6 December 1968**
(day month year)
Address **Long Sault, Ontario**

Casing and Screen Record

Inside diameter of casing **6"**
Total length of casing **15'**
Type of screen **nil**
Length of screen **n/a**
Depth to top of screen **n/a**
Diameter of finished hole **6"**

Pumping Test

Static level **2'**
Test-pumping rate **10** G.P.M.
Pumping level **5'**
Duration of test pumping **1 Hour**
Water clear or cloudy at end of test **cloudy**
Recommended pumping rate **10** G.P.M.
with pump setting of **25'** feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Closely packed Boulders	0'	13'		
Very Abrasive Sandstone	13'	63'	60'	fresh

For what purpose(s) is the water to be used?
Trailer Sales Depot

Is well on upland, in valley, or on hillside? **Valley**

Drilling or Boring Firm
Blair Phillips Drilling Co. Ltd.,

Address **1119 Palaise Road, Ottawa 5, Ontario.**

Licence Number **2779**

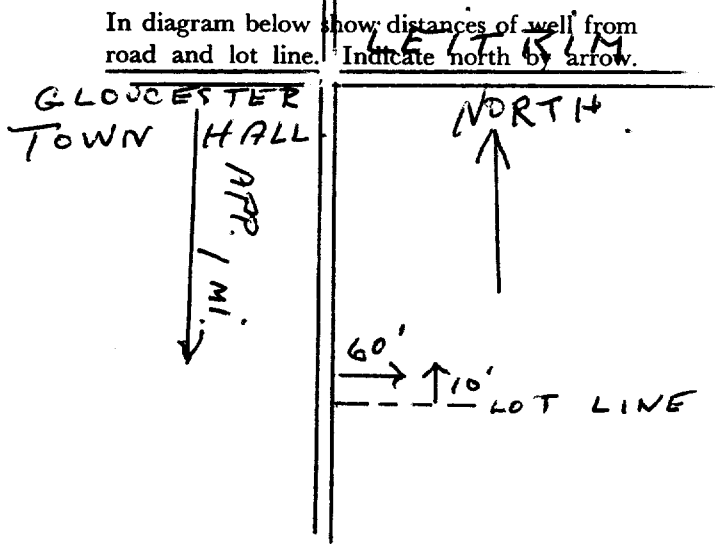
Name of Driller or Borer **J. Moore**

Address **Kars, Ontario**

Date **6 December 1968**

(Signature of Licensed Drilling or Boring Contractor)
Blair Phillips

Location of Well





WATER WELL RECORD

1517349

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

COUNTY OR DISTRICT <i>Ottawa Carleton</i>	TOWNSHIP BOROUGH CITY, TOWN VILLAGE <i>Gloucester</i>	CON. BLOCK, TRACT, SURVEY ETC. <i>5</i>	DATE COMPLETED 48-53 DAY <i>9</i> NO <i>jun</i> YR <i>80</i>
ADDRESS <i>R.R. #6 Ottawa Ont.</i>			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

[illegible]

31

32

WATER RECORD

WATER FOUND AT - FEET		KIND OF WATER			
10-13 27	1 ☒ FRESH	3 ☐ SULPHUR	14		
	2 ☒ SALTY	4 ☐ MINERAL			
15-18	1 ☐ FRESH	3 ☐ SULPHUR	19		
	2 ☐ SALTY	4 ☐ MINERAL			
20-23	1 ☐ FRESH	3 ☐ SULPHUR	24		
	2 ☐ SALTY	4 ☐ MINERAL			
25-28	1 ☐ FRESH	3 ☐ SULPHUR	29		
	2 ☐ SALTY	4 ☐ MINERAL			
30-33	1 ☐ FRESH	3 ☐ SULPHUR	34		
	2 ☐ SALTY	4 ☐ MINERAL			

CASING & OPEN HOLE RECORD

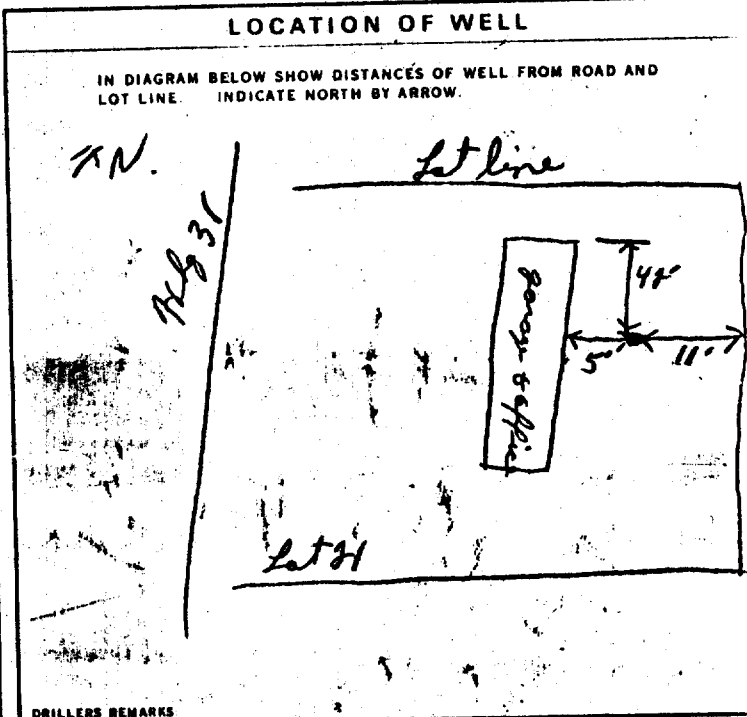
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 1/4	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE	18 5	0	20
17-18	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	19		20-21
24-25	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	26		27-30

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE CEMENT GROUT, LEAD PACKER, ETC.
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



FINAL STATUS OF WELL

- 1 ☒ WATER SUPPLY
2 ☒ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED POOR QUALITY
7 ☐ UNFINISHED

WATER USE

- 1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
5 ☒ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

**METHOD
OF**

- | | | | |
|---|--|---|----------------------------------|
| 1 | ☒ CABLE TOOL | 6 | ☐ BORING |
| 2 | ☐ ROTARY (CONVENTIONAL) | 7 | ☐ DIAMOND |
| 3 | ☐ ROTARY (REVERSE) | 8 | ☐ JETTING |
| 4 | ☐ ROTARY (AIR) | 9 | ☐ DRIVING |
| 5 | ☐ AIR PERCUSSION | | |

DRILLERS REMARKS

CONTRACTOR	NAME OF WELL CONTRACTOR		LICENCE NUMBER	
	Maurice Gyer P.O.		1517	
	ADDRESS			
	Casselman Ont.			
	NAME OF DRILLER OR BORE		LICENCE NUMBER	
	SIGNATURE OF CONTRACTOR		SUBMISSION DATE	
	Maurice Gyer		DAY _____ MO _____ YR _____	

OFFICE USE ONLY	DATA SOURCE	58	CONTRACTOR	59-62	UAS NUMBER	020980	63-6
	DATE OF INSPECTION		INSPECTOR				
	REMARKS						



The Ontario Water Resources Act

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MUNICIP

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2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

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COUNTY OR DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

CON BLOCK TRACT SURVEY ETC

LOT	25-27
-----	-------

Gloucester

5

20

Pineglen Cres. Nepean, Ontario K2G 0G9

DATE COMPLETED

48-53

DAY 14 MO 10 YR 94

The diagram shows a horizontal flow from left to right. Stage I is a single rectangular block. An arrow points from Stage I to Stage II, which consists of two rectangular blocks stacked vertically. Another arrow points from Stage II to Stage III, which also consists of two rectangular blocks stacked vertically. The labels 'I', 'II', and 'III' are placed below their respective stages.

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

31	10	14 15	21	32	41	54	65	75	80
32									
1 2									

WATER RECORD

CASING & OPEN HOLE RECORD

SCREEN	SIZE/SA OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
			INCHES		FEET	
	MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN		41-44	10
					FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT FEET		MATERIAL AND TYPE	
FROM	TO	(CEMENT GROUT LEAD PACKER, ETC.)	
10-13	14-17	Grouted Cement (3)	
20	0		
18-21	22-25		
26-29	30-33	80	

PUMP TEST	PUMPING TEST METHOD		PUMPING RATE		DURATION OF PUMPING	
	1 ☒ PUMP 2 ☐ BAILER		4 GPM		15-16 HOURS 17-18 MINS	
	STATIC LEVEL		WATER LEVEL END OF PUMPING		25 WATER LEVELS DURING	
	19-21		22-24		1 ☒ PUMPING 2 ☐ RECOVERY	
	18 FEET		120 FEET		15 MINUTES 26-28 30 MINUTES 29-31 45 MINUTES 32-34 60 MINUTES 35-37	
IF FLOWING, GIVE RATE		PUMP INTAKE SET AT		WATER AT END OF TEST		
GPM		FEET		1 ☐ CLEAR 2 ☒ CLOUDY		
RECOMMENDED PUMP TYPE		RECOMMENDED PUMP SETTING		RECOMMENDED PUMPING RATE		
☐ SHALLOW ☒ DEEP		115 FEET		46-49 GPM		

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.

Hawthorne Road

Blais Road

Hwy #3

147755

34 FINAL STATUS OF WELL	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING
55-56 WATER USE	1 ☒ DOMESTIC 2 ☒ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER _____	5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
57 METHOD OF CONSTRUCTION	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER _____

CONTRACTOR	NAME OF WELL CONTRACTOR		WELL CONTRACTOR'S LICENCE NUMBER	
	Capal Water Supply Ltd.		1558	
	ADDRESS			
	P.O. Box 490 Stittsville, Ontario K2S 1A6			
	NAME OF WELL TECHNICIAN		WELL TECHNICIAN'S LICENCE NUMBER	
	S. Miller		T0097	
	SIGNATURE OF TECHNICIAN/CONTRACTOR		SUBMISSION DATE	
			DAY 17 MO 10 YR 94	

OFFICE USE ONLY	DATA SOURCE	58	CONTRACTOR	59-62	DATE RECEIVED	63-68	80
	1558		DEC 07 1994				
	DATE OF INSPECTION		INSPECTOR				
REMARKS							



Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

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Municipality

15002

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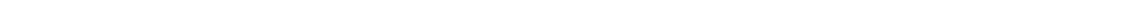
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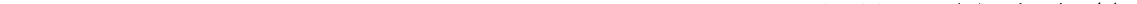
05

County or District <i>Ottawa</i>	Township/Borough/City/Town/Village <i>Gloucester</i>	Con block tract survey, etc. <i>5</i>	Lot <i>6</i>
Address <i>Greely St</i>		Date completed <i>25</i> day <i>10</i> month <i>00</i> year	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

[illegible]

31 

32 

41 WATER RECORD									
Water found at - feet		Kind of water							
10-13		1	☒ Fresh	3	☐ Sulphur	14			
206		2	☐ Salty	4	☐ Minerals	15			
15-18		1	☒ Fresh	3	☐ Sulphur	19			
214		2	☐ Salty	4	☐ Minerals	20			
20-23		1	☐ Fresh	3	☐ Sulphur	24			
		2	☐ Salty	4	☐ Minerals	25			
25-28		1	☐ Fresh	3	☐ Sulphur	29			
		2	☐ Salty	4	☐ Minerals	30			
30-33		1	☐ Fresh	3	☐ Sulphur	34			
		2	☐ Salty	4	☐ Minerals	35			
				6	☐ Gas	36			

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11 6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	12 188	0	13-16 22
17-18 8 3/4	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	19	0	20-23 20
24-25 6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	26	20	27-30 220

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-38	Length	39-40
			inches		feet	
	Material and type			Depth at top of screen		
				41-44		
				feet		

61	PLUGGING & SEALING RECORD			
☒ Annular space		☐ Abandonment		
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)		
From	To			
10-13	14-17			
22	22			
18-21	22-25			
26-29	30-33	80		

PUMPING TEST	Pumping test method ¹⁰ 1 ☒ Pump 2 ☐ Bailer		Pumping rate ¹¹⁻¹⁴ 10 GPM		Duration of pumping ¹⁵⁻¹⁶ 1 Hours ¹⁷⁻¹⁸ 15 Mins	
	Static level	Water level end of pumping	Water levels during		1 ☐ Pumping	2 ☒ Recovery
	¹⁹⁻²¹	²²⁻²⁴	²⁵	²⁶⁻²⁸	²⁹⁻³¹	³²⁻³⁴
	15 minutes	30 minutes	45 minutes	60 minutes		
	30 feet	120 feet	30 feet	30 feet	30 feet	30 feet
	If flowing give rate ³⁶⁻⁴¹ GPM		Pump intake set at feet		Water at end of test ⁴² ☐ Clear ☒ Cloudy	
	Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting ⁴³⁻⁴⁵ 120 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 10 GPM	
50-53						

FINAL STATUS OF WELL		54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well
3 ☐ Test hole	7 ☐ Abandoned (Other)	
4 ☐ Recharge well	8 ☐ Dewatering	

WATER USE		55-56
1 ☒ Domestic	5 ☐ Commercial	9 ☐ Not use
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other
3 ☐ Irrigation	7 ☐ Public supply	
4 ☐ Industrial	8 ☐ Cooling & air conditioning	

METHOD OF CONSTRUCTION		57
1 ☐ Cable tool	5 ☒ Air percussion	9 ☐ Driving
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other
4 ☐ Rotary (air)	8 ☐ Jetting	

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.

The diagram shows a vertical line representing a lot line and a horizontal line representing Blais Rd. A well is located 90 feet south of the road. The distance from the lot line to the well is 2 km. A north arrow points towards the top right.

222862

Name of Well Contractor	Well Contractor's Licence No.
Air-Rock Drilling Co Ltd	1119
Address	
RR # 2 Jasper Dt	
Name of Well Technician	Well Technician's Licence No.
Shannon Purcell	T2122
Signature of Technician/Contractor	Submission date
	02 mo 00

MINISTRY USE ONLY	Data source	58 Contractor	59-62	Date received	63-68	8
		11 19		JAN 03 2001		
	Date of inspection	Inspector				
	Remarks					
	CSS.ES					



The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

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Municipality **15002** Con. **RF**

Con.
RF

05

County or District Ottawa Carleton	Township/Borough/City/Town/Village Gloucester	Con block tract survey, etc. 5	Lot 21
	Address Gloucester, Ont	Date completed 07 day 02 month 03 year	

21		U T		Northing		RC		Elevation		RC		Basin Code		ii		iii		iv	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)[illegible]

31

32 10 14 15 21 32 43 54 65 75 80

44 WATER RECORDS 54 CAVING & OPEN HOLE RECORDS 65 Size of opening 31.23 Diameter 24.38 Length 20.40

41		14		15		21	
WATER RECORD							
Water found at - feet		Kind of water					
216	19-13	1	☐ Fresh	3	☐ Sulphur	14	
	2	☐ Salty	4	☐ Minerals	6	☐ Gas	
	15-18	1	☐ Fresh	3	☐ Sulphur	19	
	2	☐ Salty	4	☐ Minerals	6	☐ Gas	
	20-23	1	☐ Fresh	3	☐ Sulphur	24	
	2	☐ Salty	4	☐ Minerals	6	☐ Gas	
	25-28	1	☐ Fresh	3	☐ Sulphur	29	
	2	☐ Salty	4	☐ Minerals	6	☐ Gas	
	30-33	1	☐ Fresh	3	☐ Sulphur	34	
	2	☐ Salty	4	☐ Minerals	6	☐ Gas	

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11 6 1/4	☒ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic	12 188	0	22 13-16
17-18 8 3/4	☐ Steel ☐ Galvanized ☒ Concrete ☐ Open hole ☐ Plastic	19	0	20 20-23
24-25 6	☐ Steel ☐ Galvanized ☒ Concrete ☐ Open hole ☐ Plastic	26	20	220 27-30

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-38	Length	39-40
			inches		feet	
	Material and type			Depth at top of screen		30
				feet		

61		PLUGGING & SEALING RECORD	
☒ Annular space		☐ Abandonment	
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
0-13	22 ¹⁷	Cement grout	
18-21	22-25		
26-29	30-33	80	

PUMPING TEST	71 Pumping test method ¹⁰ ☒ Pump ² ☐ Bailer		Pumping rate ⁹ 11-14 GPM		Duration of pumping ¹ 15-16 Hours ¹⁷⁻¹⁸ Mins	
	Static level		25 Water levels during		☐ Pumping ☒ Recovery	
	Water level end of pumping					
	¹⁹⁻²¹ 16 ²²⁻²⁴ 120 feet feet		^{15 minutes} 16 ²⁶⁻²⁸ 16 ²⁹⁻³¹ feet feet		^{45 minutes} 16 ³²⁻³⁴ 16 ³⁵⁻³⁷ feet feet	
	If flowing give rate ³⁸⁻⁴¹		Pump intake set at		Water at end of test ⁴²	
	GPM		feet		☐ Clear ☒ Cloudy	
Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting ⁴³⁻⁴⁵ 120 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 9 GPM		

FINAL STATUS OF WELL		54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well
3 ☐ Test hole	7 ☐ Abandoned (Other)	
4 ☐ Recharge well	8 ☐ Dewatering	

WATER USE		55-56
1 ☐ Domestic	5 ☐ Commercial	9 ☐ Not use
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other
3 ☐ Irrigation	7 ☐ Public supply	
4 ☐ Industrial	8 ☐ Cooling & air conditioning	

METHOD OF CONSTRUCTION		57
1 ☐ Cable tool	5 ☒ Air percussion	9 ☐ Driving
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other
4 ☐ Rotary (air)	8 ☐ Jetting	

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.

311

Blair Rd.

2 Km

80'

↑ N

248869

Name of Well Contractor Aikach Drilling Ltd	Well Contractor's Licence No. 1119
Address RR#1 Richmond, Ont	
Name of Well Technician Shannon Powell	Well Technician's Licence No. T2122
Signature of Technician/Contractor her [Signature]	Submission date 28 02 03 day mo yr

MINISTRY USE ONLY	Data source	58	Contractor	59-62	Date received	63-68
			1119		MAR 31 2003	
	Date of inspection		Inspector			
	Remarks					
	CSS.ES3					

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

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County or District Ottawa Carleton	Township/Borough/City/Town/Village Gloucester	Con block tract survey, etc. 5	Lot 21
Address Gloucester, Ont		Date completed 07 02 03 day month year	

21	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
WELL ABANDONMENT					

31	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

41 WATER RECORD		51 CASING & OPEN HOLE RECORD		61 PLUGGING & SEALING RECORD	
Water found at - feet	Kind of water	Inside diam inches	Material	Wall thickness inches	Depth - feet
10-13	1 ☐ Fresh 2 ☐ Salty	10-11	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		From To
15-18	1 ☐ Fresh 2 ☐ Salty	17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		20-23
20-23	1 ☐ Fresh 2 ☐ Salty	24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		27-30
23-28	1 ☐ Fresh 2 ☐ Salty				
30-33	1 ☐ Fresh 2 ☐ Salty				

71 Pumping test method	10 Pumping rate	11-14 Duration of pumping
1 ☐ Pump 2 ☐ Bailer	GPM	Hours Mins
Static level	Water level end of pumping	Water levels during
19-21	22-24	15 minutes 25-28
feet	feet	feet
If flowing give rate	Pump intake set at	Water at end of test
GPM	feet	☐ Clear ☐ Cloudy
Recommended pump type	Recommended pump setting	Recommended pump rate
☐ Shallow ☐ Deep	feet	GPM

LOCATION OF WELL	
In diagram below show distances of well from road and lot line. Indicate north by arrow.	
248870	

FINAL STATUS OF WELL	
1 ☐ Water supply	2 ☐ Abandoned, insufficient supply
2 ☐ Observation well	3 ☐ Abandoned, poor quality
3 ☐ Test hole	4 ☐ Abandoned (Other)
4 ☐ Recharge well	5 ☐ Dewatering
WATER USE	
1 ☐ Domestic	2 ☐ Commercial
2 ☐ Stock	3 ☐ Municipal
3 ☐ Irrigation	4 ☐ Public supply
4 ☐ Industrial	5 ☐ Cooling & air conditioning
METHOD OF CONSTRUCTION	
1 ☐ Cable tool	2 ☐ Air percussion
2 ☐ Rotary (conventional)	3 ☐ Boring
3 ☐ Rotary (reverse)	4 ☐ Diamond
4 ☐ Rotary (air)	5 ☐ Jetting

Name of Well Contractor Air Rock Drilling Ltd	Well Contractor's Licence No. 1119
Address Rt #1 Richmond, Ont	
Name of Well Technician Ken Desaulniers	Well Technician's Licence No. 74
Signature of Technician/Contractor Ken Desaulniers	
Submission date 07 02 03 day mo yr	

MINISTRY USE ONLY	Data source 1119	Contractor 1119	Date received MAR 31 2003
Date of inspection		Inspector	
Remarks			
CSS.ES3			

Well Owner's Information

First Name		Last Name		E-mail Address				☐ Well Constructed by Well Owner		
Airport Golfland										
Mailing Address (Street Number/Name, RR)			Municipality		Province		Postal Code		Telephone No. (inc. area code)	
6357 Emerald Links			Greely		Ontario		K 4 P 1 M 4		613 850 5468	

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)				Township		Lot		Concession	
Hwy 31				Gloucester		20		5	
County/District/Municipality				City/Town/Village				Province	
Ottawa Carleton				Gloucester				Ontario	
UTM Coordinates		Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation:		
NAD 83		18	453794	5018088		Garmin	☐ Undifferentiated ☒ Averaged		
☐ Differentiated, specify _____									

Overburden and Bedrock Materials (see instructions on the back of this form)

Overburden and Bedrock Materials (from Section 1)				Depth (Metres)	
General Colour	Most Common Material	Other Materials	General Description	From	To
Brown	Clay	Stones	Packed	0	3.35
Grey	Limestone		Broken	3.35	4.57
Grey	Limestone		Medium Hard	4.57	42.66
Grey	Limestone	Sandstone Layers	Hard	42.66	52.72

Annular Space/Abandonment Sealing Record

Depth Set at (Metres)		Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
From	To		
6.40	0	Grouted Bentonite Slurry	.132m ³

Method of Construction

☐ Cable Tool
☐ Rotary (Conventional)
☐ Rotary (Reverse)
☒ Rotary (Air)
☐ Air percussion
☐ Other, specify _____

Water Use

☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial	☐ Not used
☐ Rotary (Conventional)	☐ Jetting	☒ Domestic	☐ Municipal	☐ Dewatering
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole	☐ Monitoring
☒ Rotary (Air)	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning	
☐ Air percussion	☐ Boring	☐ Industrial		
☐ Other, specify _____		☐ Other, specify _____		

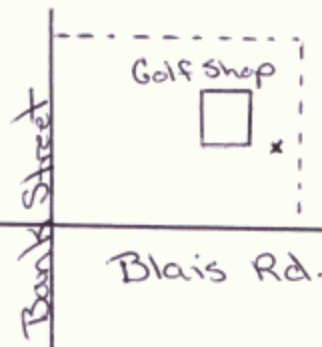
Status of Well

☒ Water Supply	☐ Dewatering Well	☐ Observation and/or Monitoring Hole
☐ Replacement Well	☐ Abandoned, Insufficient Supply	☐ Alteration (Construction)
☐ Test Hole	☐ Abandoned, Poor Water Quality	☐ Other, <i>specify</i> _____
☐ Recharge Well	☐ Abandoned, other, <i>specify</i> _____	

Location of Well

Please provide a map below showing:

- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- digital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered? ☒ Yes ☐ No	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2008/07/14		2008/07/15

Well Contractor and Well Technician Information

Business Name of Well Contractor		Well Contractor's Licence No.			
Capital Water Supply Ltd.		1	5	5	8
Business Address (Street No./Name, number, RR)		Municipality			
Box 490		Stittsville			

Province	Postal Code	Business E-mail Address
Ontario	M2S 1A6	office@capitalwater.ca
Bus. Telephone No. (inc. area code)		
Name of Well Technician (Last Name, First Name)		

Bus. telephone no. (inc. area code)			Name of your technician (Last name, first name)		
613	836	1766	Miller, Stephen		

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
0 0 9 7		2008/07/16

Results of Well Yield Testing

Check box if after test of well yield, water was:	Draw Down		Recovery	
	Time (Min)	Water Level (Metres)	Time (Min)	Water Level (Metres)
☒ Clear and sand free	Static Level	4.75	Static Level	
☐ Cannot develop to sand-free state	1	6.42	1	18.19
If pumping discontinued, give reason:	2	8.55	2	17.26
Pumping test method	3	9.96	3	15.67
Submersible	4	11.18	4	14.50
Pump intake set at (Metres)	5	12.29	5	13.32
45.71	10	16.10	10	9.44
Pumping rate (Litres/min)	15	18.20	15	7.38
54.6	20	19.51	20	6.24
Duration of pumping	25	20.36	25	5.61
3 hrs + min	30	20.94	30	5.18
Final water level end of pumping (Metres)	40	21.64	40	4.75
21.37	50	22.01	50	
Recommended pump type	60	22.14	60	
☐ Shallow ☒ Deep				
Recommended pump depth				
30.47 Metres				
Recommended pump rate (Litres/min)				
45.5				
If flowing give rate (Litres/min)				

Water Details

Water found at Depth 51.50 Metres ☐ Gas	Kind of Water ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth Metres ☐ Gas	Kind of Water ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth Metres ☐ Gas	Kind of Water ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used

☐ Galvanized	☐ Galvanized
☒ Steel	☐ Steel
☐ Fibreglass	☐ Fibreglass
☐ Plastic	☐ Plastic
☐ Concrete	☐ Concrete

Screen Used

☐ Galvanized
☐ Steel
☐ Fibreglass
☐ Plastic
☐ Concrete

Casing and Well Details

Diameter of the Hole (Centimetres)	15.39
Depth of the Hole (Metres)	52.72
Wall Thickness (Metres)	.48
Inside Diameter of the Casing (Metres)	15.86
Depth of the Casing (Metres)	+ .45 to 6.40

No Casing and Screen Used

Disinfected? ☒ Yes ☐ No

Ministry Use Only

Audit No. z 77392	Well Contractor No.
Date Received (yyyy/mm/dd) OCT 14 2008	Date of Inspection (yyyy/mm/dd)
Remarks	



A149011

Tag#: A149011

Measurements recorded in: ☒ Metric ☐ Imperial

Page _____ of _____

Well Owner's Information

First Name Airport Golf Land Last Name / Organization _____ E-mail Address _____ ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name) 6357 Emerald Links Drive Municipality Greely Province Ontario Postal Code R4P1M4 Telephone No. (inc. area code) 6138505468

Well Location

Address of Well Location (Street Number/Name) 4795 Bank Street Township Gloucester Lot _____ Concession _____
County/District/Municipality _____ City/Town/Village _____ Province Ontario Postal Code _____

UTM Coordinates Zone 18 Easting 453909 Northing 5018388 Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Soil	Stones	Packed	0	3.65
Gray	Till		Hard Packed	3.65	9.75
Gray	Limestone	Brown Layers	Medium	9.75	68.57

Annular Space			
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
11.58	0	Grouted Cement & Bentonite	.42m3

Method of Construction		Well Use		
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial	☐ Not used
☒ Rotary (Conventional)	☐ Jetting	☒ Domestic	☐ Municipal	☐ Dewatering
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole	☐ Monitoring
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning	
☒ Air percussion		☐ Industrial		
☐ Other, specify _____		☐ Other, specify _____		

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To	
27.13	Open		0	11.58	☒ Water Supply
15.86	Steel	.48	11.58	60.95	☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, Insufficient Supply
					☐ Abandoned, Poor Water Quality
					☐ Abandoned, other, specify _____
					☐ Other, specify _____

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

☐ Abandoned, Poor Water Quality

☐ Abandoned, other, specify

☐ Other, specify

Water Details		Hole Diameter	
Water found at Depth <u>20.11 (m/ft)</u> Kind of Water: ☐ Fresh ☒ Untested		Depth (m/ft) From	To
☐ Gas ☐ Other, specify _____		0	11.58
Water found at Depth <u>65.83 (m/ft)</u> Kind of Water: ☐ Fresh ☒ Untested		11.58	68.57
☐ Gas ☐ Other, specify _____			
Water found at Depth _____ Kind of Water: ☐ Fresh ☐ Untested			
☐ Gas ☐ Other, specify _____			

Well Contractor and Well Technician Information			
Business Name of Well Contractor <u>Capital Water Supply Ltd.</u>	Well Contractor's Licence No. <u>1558</u>	Municipality <u>Stittsville</u>	
Business Address (Street Number/Name) <u>P.O. Box 490</u>	Province <u>Ontario</u>	Postal Code <u>K2S1A6</u>	Business E-mail Address <u>office@capitalwater.ca</u>

Well Technician's Licence No. <u>6138361766</u>	Name of Well Technician (Last Name, First Name) <u>S Miller, Stephen</u>	Date Submitted <u>20161209</u>
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Results of Well Yield Testing			
After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify _____		Draw Down	
If pumping discontinued, give reason: _____		Time (min)	Water Level (m/ft)
Pump intake set at (m/ft) <u>60.95</u>		Static Level	6.21
Pumping rate (l/min / GPM) <u>36.4</u>		1	7.71
Duration of pumping <u>1</u> hrs + _____ min		2	8.88
Final water level end of pumping (m/ft) <u>45</u>		3	10.42
If flowing give rate (l/min / GPM) _____		4	11.69
Recommended pump depth (m/ft) <u>60.95</u>		5	12.90
Recommended pump rate (l/min / GPM) <u>36.4</u>		10	17.07
Well production (l/min / GPM) _____		15	18.65
Disinfected? ☒ Yes ☐ No		20	20.33
		25	24.90
		30	28.60
		40	34.99
		50	40.10
		60	45.
			13.06

Map of Well Location

Please provide a map below following instructions on the back.

Blais Road

Bank Street

#4795

Farm House

Comments: _____	Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered <u>20161208</u>	Date Work Completed <u>20161207</u>
	Ministry Use Only		
	Audit No. <u>2226858</u>		
	MAY 25 2017		
	Received _____		