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File: 65080.01

Attention: Mason Laycock, Manager of Property and Development

**Re: Hydrogeological Investigation and Terrain Analysis
Rural Site Plan Control Application, 300 Somme Street, Ottawa, Ontario**

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Copart to carry out a hydrogeological investigation and terrain analysis for a proposed commercial/light industrial development to be located in the Hawthorne Industrial Park at 300 Somme Street in Ottawa, Ontario.

1.0 INTRODUCTION

Plans are being prepared for the construction of a vehicle storage yard at 300 Somme Street in Ottawa, Ontario (Detailed Site Plan, Figure 1 in Appendix A). The outdoor vehicle storage will take up most of the property. However, an office/warehouse building is proposed in the west corner of the property in support of the storage yard. The building will be serviced with private services, including a septic system and well. The approximate development area is 17.8 hectares.

The objectives of the investigation are the following:

- Confirm that the construction of any new well is in accordance with the Ministry of the Environment, Conservation and Parks (MECP) requirements;
- Confirm that the quality of the well water meets the Ontario Drinking Water Standards and maximum treatable limits prescribed in MECP Procedure D-5-5;
- Confirm that the quantity of water meets the MECP requirements; and,
- Confirm that the septic impact assessment meets the MECP Procedure D-5-4 requirements;

2.0 SITE BACKGROUND

2.1 Background Studies

The available studies completed for the subject site include:

- “Hydrogeological Investigation and Terrain Analysis, Proposed Rural Industrial Subdivision, Lots 26 & 27, Concession 6, City of Gloucester, Ontario” prepared by Golder Associates Ltd. and dated March 1994 (Golder, 1994).
- “Geotechnical Study Subdivision Plan, Hawthorne Industrial Park, Lots 26 & 27, Concession 6, Southeast of Hawthorne and Rideau Roads, Ottawa, Ontario: prepared by Inspec Sol Engineering Solutions and dated May 4, 2009 (InspecSol, 2009).
- “Phase II Environmental Site Assessment and Hydrogeological Assessment, Part of Lot 26 & 27 Concession 6, Ottawa, Ontario” prepared by Conestoga-Rovers & Associates and dated September 2008 (CRA, 2008).
- “Hydrogeological Investigation, Terrain Analysis and Impact Assessment, Proposed Industrial Subdivision, Lots 26 & 27, Concession VI, Geographic City of Gloucester, City of Ottawa, Ontario” prepared by Golder Associates Ltd. and dated December 2008 (Golder, 2008).
- “Potential Impacts From Organics Composting Facility On Hawthorne Industrial Park Groundwater Quality, Lots 26 and 27, Concession VI, Geographic City of Gloucester, Ottawa, Ontario” prepared by Golder Associates Ltd. and dated June 18, 2019 (Golder, 2019).
- “Abbreviated Hydrogeological Assessment, Rural Site Plan Control Application, 300 Somme Street, Ottawa, Ontario: prepared by GEMTEC and dated March 9, 2020 (GEMTEC, 2020a).
- “Geotechnical Investigation, Proposed Office/Receiving Building, 300 Somme Street, Ottawa, Ontario” prepared by GEMTEC and dated September 9, 2020 (GEMTEC, 2020b).

The relevant information from the available reports are discussed throughout the report.

3.0 TERRAIN ANALYSIS

3.1 Site Geology

Background reports indicate that the site is covered with inert fill, primarily excavated from road construction projects. A thin layer of topsoil is present below the fill at some locations. The soils are described as silty sand, sandy silt and silty sand and gravel. Clayey silt, silty clay and glacial till were also encountered at depth at some locations. Overburden thicknesses across the site

range from about 0.7 metres to greater than 3 metres, averaging about 2 metres in thickness. Thin soils may also be encountered at the eastern edge of the site.

3.2 Subsurface Conditions

The subsurface conditions within the building and septic footprint at the subject site are described in the geotechnical investigation report (GEMTEC, 2020b; refer to Figure 1 in Appendix A). The fieldwork for the geotechnical investigation was carried out on May 19, 2020. At that time, George Downing Estate Drilling Ltd. advanced three (3) boreholes, numbered 20-1 to 20-3, inclusively, at the site using a track mounted drill rig. The boreholes were advanced to depths ranging from about 4.1 to 12.7 metres below surface grade. A standpipe piezometer was installed at the location of borehole 20-2. The record of borehole sheets is provided in Appendix B.

Fill Material

Fill and topsoil fill material was encountered from ground surface at all of the borehole locations. The fill material generally consists of brown, grey brown, and black silty sand with varying amounts of cobbles, gravel, and clay. Trace to some organic material, brick and debris were also noted in the fill material.

The fill material extends to depths of about 3.5 to 6.1 metres below ground surface (elevations 84.8 to 88.0 metres, geodetic).

Peat/Topsoil

An organic deposit of peat/topsoil was encountered below the fill material at borehole 20-1 at a depth of about 6.1 metres below ground surface.

The peat/topsoil deposit consists of dark brown silty sand and contains rootlets. The thickness of the peat/topsoil is about 0.9 metres at the borehole location, and extends to a depth of about 7 metres below ground surface (elevation 83.9 metres, geodetic).

Clayey Silt

A native deposit of grey brown to grey clayey silt with trace sand and gravel was encountered below the peat/topsoil layer in borehole 20-1 at a depth of about 7 metres below ground surface (elevation 83.9 metres, geodetic datum). The thickness of this deposit is about 3.0 metres and extends to a depth of about 9.9 metres (elevation 81 metres, geodetic).

Layered Sandy Silt and Clayey Silt

A native deposit of layered grey sandy silt and clayey silt with trace gravel was encountered below the grey clayey silt at borehole 20-1 at a depth of about 9.9 metres (elevation 81.0). The thickness of the layered deposit is about 1.7 metres.

Glacial Till

A native deposit of glacial till composed of grey brown silty sand, some gravel and cobbles, and trace clay was encountered at all of the borehole locations. The glacial till was found below the grey sandy silt/clayey silt in borehole 20-1 at a depth of about 11.6 metres (elevation 79.3 metres), and below the fill material in boreholes 20-2 and 20-3 at depths of 3.5 and 3.9 metres below ground surface, respectively (elevations 88.0 and 87.7 metres, geodetic). Based on inferred bedrock depths due to auger refusal, the thickness of the glacial till ranges from about 0.2 to 1.1 metres.

All of the boreholes were terminated due to auger refusal on the inferred bedrock surface at depths of 4.1 to 12.7 metres below ground surface (elevations 78.2 to 87.5 metres, geodetic).

Inferred Bedrock

All of the boreholes encountered refusal on the inferred bedrock surface at depths ranging from about 4.1 to 12.7 metres below ground surface (elevations 78.2 to 87.5 metres, geodetic).

It should be noted that auger refusal can occur on boulders within the glacial till and may not necessarily represent the surface of the bedrock.

Groundwater Levels

The groundwater level in the well screen installed in borehole 20-2 was measured on May 25, 2020. At that time, the groundwater level was at about 2.3 metres below surface grade (elevation 89.2 metres, geodetic).

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

4.0 GROUNDWATER SUPPLY INVESTIGATION

4.1 Test Well Construction

A water supply well (TW20-1) was constructed at 300 Somme Street on September 3, 2020, by a licensed MECP well contractor (Air Rock Drilling; License No. 7681). The approximate location of the water well is provided on the Detailed Site Plan, Figure 1. A copy of the MECP Water Well Record and Certificate of Well Compliance is provided in Appendix C.

As part of the abbreviated hydrogeological assessment (GEMTEC, 2020a), a former test well “TW2”, situated approximately 110 metres north of the proposed location of the future supply well (Tw20-1) was assessed. Test well TW2 was installed in 1993 and is approximately 30.5 metres deep. The well record for TW2 is provided in Appendix C.

The construction details from the water wells tested are summarized in Table 1:

Table 1: On-Site Water Well Construction Details

Well Construction Details	TW20-1	TW2
	(Well Tag No. A305146)	(Well ID 135946)
Depth to Bedrock	3.96	8.53
Length of Well Casing Below Ground Surface	18.29	10.67
Length of Well Casing Set Into Bedrock	14.32	2.13
Depth Water Found	31.39, 40.84	17.68, 26.82
Total Well Depth	42.67	30.48
Overburden Description	Sandy clay and gravel	Sand, Hardpan
Bedrock Description	Sandstone with limestone mix	Sandstone

The water well construction recommendations for TW20-1 were provided to Air Rock Drilling by GEMTEC. The geotechnical investigation (GEMTEC, 2020b) encountered overburden up to 12.7 metres thick in the vicinity of the water supply well. To provide additional separation distance between the overburden and bedrock water supply, the well casing was extended from the minimum hydrogeological investigation requirements (Golder, 2008) of 12 metres to 18.0 metres below ground surface. The extended well casing recommendation was provided to reduce potential impacts from the non-potable overburden aquifer.

4.2 Overburden and Bedrock Aquifers

Two hydrogeological units have been identified on the property. The first is a shallow unconfined unit located within the native soils and imported fill in the upper bedrock zone. This zone is not considered suitable as a potable water supply source due to the proximity to the ground surface, low well yield and poor water quality (CRA, 2008; Golder, 2019). Based on findings from the phase II environmental site assessment and hydrogeological assessment (CRA, 2008) and hydrogeological investigation (Golder, 1994), the shallow overburden aquifer may be impacted by the presence of imported fill material, as evident by the reported potable water quality exceedances of PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene and ideno(1,2,3)pyrene), petroleum hydrocarbons (fraction F3+F4), volatile organic compounds (toluene) and metals (sodium).

A deeper confined aquifer is found in the sandstone bedrock, generally at depths of 25 to 35 metres below ground surface. The deep bedrock aquifer is not hydraulically connected to the overburden aquifer and is considered suitable as a potable water supply (CRA, 2008; Golder, 2019). The CRA (2008) study evaluated the interconnectivity of the overburden aquifer and the underlying deep bedrock aquifer through analysis of pumping tests and water quality results. The

study indicates the deep bedrock is confined and a competent bedrock layer is present between the overburden aquifer and the deep aquifer.

4.3 Groundwater Quantity

Groundwater quantity of the bedrock water supply aquifer was previously assessed as part of the hydrogeological investigations completed for the proposed rural industrial subdivision (Golder, 1994; Golder, 2008) as well as the Abbreviated Hydrogeological Study (GEMTEC, 2020a).

As part of the Site Plan Control Application for the proposed development, an 8-hour pumping test was completed on the proposed water supply well (TW20-1). During the pumping test of TW20-1, water level measurements were collected on a continuous basis using an electronic data logger and supplemented with manual water level measurements using an electric water level tape. Manual water level measurements were also collected from TW2 completed in the bedrock and overburden monitoring well MW07-08 (refer to Figure 1 in Appendix A for well locations). After the pump was shut off, water level data was collected to monitor the recovery. The water level measurements for the drawdown and recovery data for the pump tests are provided in Appendix D.

The well was pumped using an electric submersible pump and portable generator supplied by Air Rock Drilling Ltd. The flow rate of the pump discharge hose was monitored using a flow nozzle to ensure that the discharge rate maintained a constant flow rate (i.e., within 5 percent).

As per MECP Procedure D-5-5, the test well was pumped at a flow rate sufficient for the proposed use. The test well was pumped at a rate of approximately 45.4 litres per minute and the maximum drawdown observed at the end of pumping was 1.01 metres, which is equivalent to approximately 3 percent of the available drawdown in the test well. The water demand for the development is anticipated to be 3,800 litres per day, equivalent to the proposed septic volume (8 litres per minute over an 8-hour workday). The volume of water pumped from TW20-1 was 21,800 litres, or more than five times the actual daily requirement.

The transmissivity of the water supply aquifer was estimated from the pump test drawdown data using Aqtesolv version 4.5, a commercially available software program from HydroSOLVE Inc. An analysis of the pump test data was carried out using the Cooper-Jacob method of analysis. Transmissivity values were also calculated using the recovery data, Theis (1935) method. The results of the Aqtesolv 4.5 analysis are provided in Appendix D.

The specific capacity of the well at the time of maximum drawdown was 44.9 litres per minute per metre. An aquifer transmissivity ranging from 26 to 68 metres squared per day was estimated using the drawdown and recovery data, respectively. The results of the pumping test for TW20-1 and three prior pump tests carried out on test well TW2 are presented in Table 2 below.

Table 2: Summary Pump Tests

	TW2			TW20-1
	29-Aug-93	20-Aug-08	24-Feb-20	21-Sep-20
Static Level (mBTOC) ^a	3.15	3.15 ^b	7.62	7.73
Pump Rate (L/minute)	66.7	55	37.8	45.4
Drawdown (m)	1.18	1.2	0.91	1.01
Volume Pumped (Litres)	24,012	19,800	15,120	21,800
Available Drawdown (m)	27	27	22.6	35.5
Percent Available Drawdown (%)	4	5	4	3
Specific Capacity (L/minute/m)	56.5	45.8	41.5	44.9
Transmissivity (m ² /day)	22/41	16/39	16/40	26 / 68

Notes: ^a mBTOC- metres below top of casing.

^b Water level identified as being similar to previous result.

The aquifer response and properties were assessed at the on-site water supply well TW20-1 and TW2. The pumping test results for TW20-1 is consistent with TW2 and with past pump tests, although the static water level has decreased by approximately 4.5 metres since the measurement taken in 2008. Seasonal variation may account for some of the difference in water levels, but the decrease is larger than what typically occurs at other locations in the Ottawa area. A portion of the decrease may also be related to local quarry dewatering or other groundwater users in the area. Despite the water level decrease, the available drawdown is more than sufficient to support the proposed development.

Based on these results, it is our opinion that the deep supply aquifer at the site is capable of meeting the demand of the proposed development. In addition, no concerns with long-term sustainability of the proposed water supply aquifer were identified.

4.4 Groundwater Quality

Water samples were collected on September 21, 2020 during the pumping test at 4 hours and 8 hours by sampling the pump discharge water and preserving the water samples in the field. The samples were submitted to an accredited laboratory (AGAT Laboratories) for bacteriological, chemical and physical analyses (subdivision package, heavy metals, volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), and petroleum hydrocarbon (PHC) fractions (F1-F4)). It is noted that the samples analyzed for VOCs were collected using a bailer, following cessation of the pumping test. Copies of the laboratory certificates of analysis for the water samples are provided in Appendix E. Field measurements were taken at regular intervals throughout the pumping test and are summarized in Appendix E.

Due to elevated bacteriological indicators such as heterotrophic plate count and phenols, increasing concentrations of total dissolved solids throughout the 8-hour pumping test and detectable concentrations of toluene and chloroform, additional water quality samples were collected. The test well TW20-1 was pumped on October 13, 2020 at a rate of approximately 37.8 litres per minute for 6 hours and samples were collected from the pump discharge water. The additional water quality samples were submitted for analysis of toluene, chloroform, total dissolved solids, phenols, total coliform, E. coli, fecal coliform and heterotrophic plate count.

The results of the laboratory analysis on the water samples are also summarized in Appendix E, along with the applicable standards, guidelines and objectives provided in the Ontario Drinking Water Quality Standards (ODWQS).

The following comments are provided regarding the drinking water quality and exceedances of the ODWQS:

Maximum Acceptable Concentration

Based on water samples collected from the onsite test well (TW20-1), the 4-hour sample reported a total coliform concentration of 2 CFU/100mL, which exceeds the Ontario Drinking Water Quality Standards (ODWQS). The total coliform decreased to 0 CFU/100mL in the 8-hour sample. Although the total coliform concentrations exceed the ODWQS maximum acceptable concentration of 0 CFU/100mL in the 4-hour sample, the total coliform concentrations detected meet the MECP Procedure D-5-5 limit of less than 6 counts per 100 mL for Total Coliform bacteria, with non-detectable e.coli and fecal coliform concentrations. It is noted that the field measure chlorine concentrations were slightly detected, which may be residual chlorine from the well chlorination following well drilling.

Additional well development was completed on October 13, 2020 at which time the field measured chlorine concentration was non-detectable and the total coliform, E. coli and fecal coliform concentrations were reported to be non-detectable.

The concentrations of heterotrophic plate count (HPC) were reported to increase from 440 to 900 CFU/1mL in the 4-hour and 8-hour samples, respectively. HPC is an indicator of overall water quality with respect to general bacteria population and is a tool for monitoring changes in overall water quality. However, HPC are not an indicator of water safety and is not an indicator of potential adverse human health effects. The initial elevated HPC concentrations may be associated with the installation of temporary pump required to complete the 8-hour pumping test. Upon re-sampling on October 13, 2020, the concentrations of HPC decreased to 40 CFU/1mL.

Based on the bacteriological testing, the water is suitable for consumption.

Operational Objective

Organic Nitrogen

The organic nitrogen concentration (total kjeldahl nitrogen – ammonia) was calculated to be 0.18 and 0.19 mg/L in the 4-hour and 8-hour samples, respectively, which exceeds the ODWQS operational guideline of 0.15 mg/L.

The ODWQS indicates that high levels of organic nitrogen may be caused by septic tank or sewage effluent contamination and organic nitrogen concentrations greater than 0.15 mg/L are typically associated with Dissolved Organic Carbon (DOC) contribution of 0.6 mg/L. DOC concentrations in the onsite well were 1.6 and 1.9 mg/L. At the concentrations calculated in TW20-1, the organic nitrogen is unlikely associated with septic tank or sewage effluent contamination, given the non-detectable nitrate concentrations, low levels total coliform and non-detectable fecal coliform and e. Coli concentrations.

The source of the organic nitrogen is presently not known but given the absence of other elevated septic indicators, septic effluent does not appear to be an issue. Elevated DOC can be related to naturally occurring sources.

Hardness

The hardness levels in the 4-hour and 8-hour samples were reported to be 639 and 625 mg/L respectively, which exceeds the ODWQS operational guideline of 100 milligrams per litre. Water having a hardness level above 80 to 100 mg/L as CaCO₃ is often softened for domestic use. The MECP Procedure D-5-5 document states that water having a hardness value more than 300 mg/L is considered "very hard". The Ontario Ministry of the Environment publication entitled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", states that water with hardness in excess of 500 mg/L is considered to be unacceptable for most domestic purposes; however, there is no upper treatable limit for hardness specified in MECP Procedure D-5-5.

Most of the water supply wells within rural areas of Eastern Ontario are equipped with water softeners. Water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water, which may be of interest to persons on a sodium-restricted diet. As such, a separate tap, which bypasses the softener, may be considered for drinking water purposes.

Aesthetic Objective

Iron

The iron concentration in the 4-hour and 8-hour samples were reported to be 0.635 and 0.735 mg/L respectively, which exceeds the aesthetic objective of 0.3 milligrams per litre listed by the ODWQS. Elevated levels of iron may cause staining to plumbing fixtures and laundry. However,

the iron concentration is well within the treatable limits of up to 5 mg/L using water softeners or manganese greensand filters provided in Table 3 of the Appendix in the MECP Guideline D-5-5.

Manganese

The manganese concentration in the 4-hour and 8-hour samples were reported to be 0.106 and 0.107 mg/L respectively, which exceeds the aesthetic objective of 0.05 milligrams per litre listed by the ODWQS. Elevated levels of manganese may cause staining to plumbing fixtures and laundry, and effect the taste of the water. The manganese level is well within the treatable limits of up to 1.0 mg/L using water softeners or manganese greensand filters provided in Table 3 of the Appendix in the MECP Guideline D-5-5.

Total Dissolved Solids (TDS)

The TDS concentration in the 4-hour and 8-hour samples were reported to be 756 and 1,020 mg/L respectively, which exceeds the ODWQS aesthetic objective of 500 milligrams per litre. Following additional well development on October 13, 2020, the TDS concentration was reported to be 1,080 mg/L. Elevated levels of TDS can lead to problems associated with encrustation and corrosion.

To determine the corrosive nature of the groundwater, the Langelier Saturation Index (LSI) was calculated for the samples obtained from the well. These values are based on the TDS (1,020 mg/L), temperature, pH, alkalinity, and calcium observed in the sample. A copy of the calculation to determine the LSI value is provided in Attachment D. The LSI was calculated to be 0.83 using an estimated groundwater temperature of 10°C. This indicates that the water is scale forming and corrosive.

As per the “Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines”, TDS levels in excess of 500 mg/L may result in excessive hardness, taste, mineral deposition or corrosion. The TDS analytical results from the on-site water well was 1,080 mg/L which exceeds the aesthetic objective of 500 mg/L. According to the “Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Total Dissolved Solids (TDS)”, published by Health Canada (1991), TDS levels between 900 and 1,200 mg/L are considered to be ‘poor’. At levels above 1,200 mg/L, the palatability of drinking water is ‘unacceptable’.

The palatability of the drinking water is expected to be acceptable, although taste problems may occur as the palatability is classified as ‘poor’. Furthermore, encrustation is expected and excessive scaling in water distribution systems may shorten the service life of water pipes, water heaters, boilers and household appliances (Health Canada, 1991).

Notable Detectable Parameters

During the pumping test completed on September 21, 2020, the 8-hour samples reported detectable concentrations of toluene and chloroform. Volatile organic compounds (VOCs) were

sampled using a bailer, from the top of the well column. Upon re-sampling on October 13, 2020 from groundwater being discharged to surface, the concentrations of toluene and chloroform were non-detectable.

Toluene was identified within the overburden aquifer (CRA, 2008), which is considered to be hydraulically isolated from the bedrock water supply aquifer. The source of the initial toluene and chloroform detections are unknown; however, they are likely attributed to the sampling methodology. The VOCs were sampled from the top of the well column using a bailer. Given the high well yield, the toluene may have been introduced at the time of well drilling and additional well development may be required to remove trace levels. No other VOCs or petroleum hydrocarbons (PHCs) were detected (refer to Laboratory Certificate of Analysis, Appendix E).

5.0 IMPACT ASSESSMENT

The impact on groundwater and surface water resources due to wastewater treatment and disposal by the onsite sewage disposal system on the subject site is assessed in the following sections.

It should be noted that the following information is provided for general guidance purposes only and that the septic system installed on the subject site should be designed using specific subsurface conditions at the location of the proposed septic system. In all cases, the septic system design must conform to the Ontario Building Code (OBC) requirements.

5.1 Hydrogeological Sensitivity

Areas of thin soils cover, highly permeable soils, fractured bedrock exposed at ground surface and karst environments contribute to hydrogeological sensitivity of the site, which may not allow for sufficient attenuative processes for on-site septic systems and negatively impact the receiving aquifer. Areas of thin soil cover, generally taken to be less than two metres, were encountered on the southern and eastern portions of the subject site. Karst mapping (Brunton and Dodge, 2008) does not indicate the presence of any inferred or potential karstic features and no karstic features were observed on-site.

As discussed in section 3.0, the overburden material in the vicinity of the proposed septic system generally consisted of topsoil and fill material with a thickness ranging between 3.53 and 6.96 metres underlain by native deposits of clayey silt, layered sandy silt and clayey silt, and glacial till (boreholes 20-1, 20-2 and 20-3; refer to Figure 1 in Appendix A). The overburden thickness in the vicinity of the proposed septic system is greater than 2.0 metres. Based on the conceptual site layout (Appendix A), the septic system is not located within a hydrogeologically sensitive area. The determination of hydrogeological sensitivity is consistent with the findings from the original hydrogeological report prepared for the proposed rural industrial subdivision, which did not identify any areas of hydrogeologically sensitive terrain (Golder, 2008).

5.2 Groundwater Impacts

5.2.1 On-Site Septic

The potential risk to groundwater resources on and off the subject site was assessed in accordance with Ministry of Environment Procedure D-5-4: Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment. To evaluate the groundwater impacts, lot size considerations as well as nitrate dilution calculations for commercial properties outlined in MECP D-5-4 were followed.

The risks of individual on-site septic systems will be assessed using nitrate-nitrogen contaminant loading. The maximum allowable concentration of nitrate in the groundwater at the boundaries of the subject property is 10 milligrams per litre as per the Ministry of the Environment, Conservation and Parks' guideline D-5-4, dated August 1996.

The nitrate concentration at the site boundaries was calculated using the following information:

- Subject site area of 17.8 hectares (refer to Detailed Site Plan Figure 1, Appendix A);
- Water holding capacity of soils (WHC) based on information obtained from Table 3.1 of the Ministry of Environment Stormwater Management Planning and Design Manual, dated March 2003;
- Post-Development water holding capacity;
 - 75 mm: Urban lawns, fine sandy-loam.
- An annual water surplus of 0.378 metres/year (post-development) for soils with a water holding capacity of 75 mm;
 - Ottawa International Airport (1939-2013), 75 mm WHC; attached in Appendix F.
- Topography Factor of 0.20;
 - Rolling land with average slope 2.8 to 3.8 m/km.
- Vegetation Factor: 0.10;
 - Conservatively estimated to be cultivated land.
- Soil Factor of 0.30; and,
 - Between medium combination of clay and loam (0.2) and open sandy loam (0.4).
- Post-Development hard surface area of approximately 84% and includes hard surface areas and gravel parking lot (refer to Surface Types Overall Figure provided in Appendix F).
 - Available infiltration area of 28,894 m² (16% of total site area).

The septic flow for the commercial lot is based on information provided in Section 5.6.3 of Guideline D-5-4. Based on the nitrate impact assessment for commercial properties, the maximum allowable daily design sanitary sewage flow (DDSSF) for the proposed commercial lot is 5,985 liters per day. The calculations and assumptions of this are provided in Appendix F.

Based on information provided to us, the DDSSF for the proposed development is 3,800 litres per day and is within the calculated maximum DDSSF of 5,985 litres per day.

5.3 Background Nitrate Conditions

To further evaluate the potential risk of septic effluent on the water supply aquifer, the background water quality in the receiving overburden aquifer and confined bedrock aquifer was reviewed. Based on water quality samples collected in 2008 as part of the Phase II ESA and Hydrogeological Investigation (CRA, 2008), nitrate and nitrite concentrations were reported to range from <0.1 to 0.3 mg/L and <0.1 and <0.3 mg/L in monitoring wells MW1-08 to MW10-08 (inclusive), respectively. The bedrock water quality in TW-02 and TW-03 were reported to be non-detectable (<0.1 mg/L; CRA, 2008).

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Based on the results of this investigation, the following conclusions are provided:

- The surficial soils encountered at the subject site generally consist of silty sand and sand and gravel fill material, ranging in thickness from 0.3 to 3.3 metres below ground surface (Golder, 1994). The geotechnical investigation (GEMTEC, 2020b) completed in the vicinity of the proposed well and septic system encountered topsoil and fill material with a thickness ranging between 3.53 and 6.96 metres underlain by native deposits of clayey silt, layered sandy silt and clayey silt, and glacial till.
- The subject site is not considered to be hydrogeologically sensitive; no thin soils, highly permeable soils or karstic geology were encountered on-site. This is consistent with the findings from the hydrogeological report prepared for the proposed rural industrial development (Golder, 1994; Golder, 2008).
- The test well is capable of providing at least 21,800 litres per day, which is greater than the anticipated maximum water demand of 3,800 litres (equivalent to the maximum daily design septic flows). The maximum drawdown in the water level of the well was approximately 1.01 metres following 8 hours of pumping at a flow rate of 45.4 litres per minute. Based on a static water level of 7.73 metres below top of casing, the total well depth of 42.7 metres and the water level after 8 hours of pumping, the remaining available drawdown in the well is approximately 35.5 metres.
- Based on the pumping test completed on TW20-1, the bedrock water supply aquifer is considered to be hydraulically isolated from the overburden aquifer. Previous studies completed for the rural industrial subdivision also reported that the deep bedrock is confined and a competent bedrock layer is present between the overburden aquifer and the deep aquifer (CRA, 2008).

- Toluene and chloroform, which are present in the overburden aquifer, were initially detected in the bedrock aquifer; however, upon re-sampling the concentrations were reported to be non-detectable. The initial detectable concentrations may be attributed to the sampling location; the VOCs were sampled using a bailer and were collected from the top of the well water column.
- The groundwater quality exceeds the ODWQS for the operational guideline for hardness and organic nitrogen, the aesthetic objectives for total dissolved solids, iron and manganese, and the warning levels for sodium.
 - The water supply well TW20-1 exhibits elevated operational guideline and aesthetic parameters (hardness, iron, manganese, total dissolved solids, organic nitrogen and sodium) and some incrustation and taste problems can be expected.
 - The groundwater quality is classified as aesthetically 'poor' due to the elevated total dissolved solids concentrations. Furthermore, the Langelier Saturation Index indicates that groundwater is scale forming and encrustation can be expected.
- The maximum allowable daily design sanitary sewage flow are calculated to be 5,985 litres per day. The maximum DDSSF is greater than the anticipated average DDSSF of 3,800 litres per day, based on information provided.

6.2 Recommendations

Based on the results of this investigation, the following water supply, septic system and groundwater impact mitigation measures recommendations are provided:

Water Supply Recommendations

- It is recommended that the property owners construct, maintain and test their drinking water well in accordance with the Ministry of the Environment and Climate Change document "Water Supply Wells - Requirements and Best Management Practices, Revised April 2015".
- As stated in the hydrogeological report prepared for rural industrial subdivision, the use of earth energy systems shall not be permitted (Golder, 2008).
- Groundwater quality treatment may be utilized to treat the following ODWQS exceedances:
 - Hardness – Can be treated using a water softening by conventional sodium ion exchange water softeners that use sodium chloride may introduce relatively high concentrations of sodium into the drinking water, which may be of concern to persons on a sodium restricted diet. The use of potassium chloride in the water softener (which adds potassium to the water instead of sodium) could be considered as a means of keeping sodium concentrations in softened water at the

background level. Alternatively, consideration could be given to providing a cold-water bypass water line for drinking water purposes that is not treated by a water softener

- Sodium - Sodium concentrations in the raw water supply exceed the ODWQS warning level for persons on sodium restricted diets and the local Medical Officer of Health should be notified.
 - Iron and manganese – Groundwater treatment options include water softeners and/or greensand manganese filters.
 - Organic Nitrogen – Organic nitrogen can react with chlorine and severely reduce its disinfectant power; in addition, taste and odour problems are common. Ongoing chlorination is not recommended.
 - Total Dissolved Solids – Lime-soda ash softening, sodium exchange zeolite softening, demineralization processes, reverse osmosis and electrodialysis.
- It is recommended that a qualified water quality treatment specialist correctly size the water treatment systems and ensure their operational requirements are met.

Septic System Recommendations

- The maximum daily design sewage flows are calculated to be 5,985 litres per day;
- It is recommended that the property owners construct, maintain and check their onsite septic system in accordance with the Ontario Building Code.

7.0 LIMITATIONS OF LETTER

This letter was prepared for and is intended for the exclusive use of Copart. This letter may not be relied upon by any other person or entity without written consent of GEMTEC and Copart. The contents of this letter are not intended to provide legal opinion.

The investigation undertaken by GEMTEC, as well as the recommendations and conclusion made herein reflect the best judgements of GEMTEC based on the site conditions observed at the time the report was prepared. GEMTEC received information from outside sources that was not independently verified and was relied upon in good faith. GEMTEC does not accept responsibility for any deficiencies, misstatements or inaccuracies contained herein due to omissions, misinterpretation or fraudulent acts.

Should new information become available during future work, including excavations, borings or other studies, GEMTEC should be requested to review the information and, if necessary, re-assess the conclusions presented herein.

8.0 CLOSURE

We trust that this letter meets your current requirements. If you have questions or concerns please do not hesitate to contact the undersigned.



Andrius Paznekas, M.Sc., P.Geo.
Hydrogeologist



Jean-Philippe Gobeil, M.Sc., P.Geo.
Hydrogeologist



9.0 REFERENCES

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- Ontario Geological Survey. 2010. Surficial geology of Southern Ontario. Ontario Geological Survey, Miscellaneous Release-Data 128-Revision 1.
- Ontario Geological Survey. 2011. 1:250 000 scale bedrock geology of Ontario. Ontario Geological Survey, Miscellaneous Release-Data 126-Revision 1.
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- Ontario Ministry of the Environment and Climate Change. 1996. Procedure D-5-4, Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment. August 1996.
- Ontario Ministry of the Environment and Climate Change. 2008. Ontario Drinking Water Quality Standards, Safe Drinking Water Act, 2002, Ontario Regulation 169/03 as amended by Ontario Regulation 327/08.
- Ontario Ministry of the Environment and Climate Change. 2006. Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. June 2006.
- Ontario Ministry of the Environment and Climate Change. 1995. MOEE Hydrogeological Technical Requirements for Land Development Applications. April 1995.



APPENDIX A

Figures



APPENDIX B

Record of Borehole Sheets

RECORD OF BOREHOLE 20-1

CLIENT: Novatech
 PROJECT: Geotechnical Investigation
 JOB#: 65080.01
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 2
 DATUM: CGVD28
 BORING DATE: May 19 2020

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED WATER CONTENT, % W _p — W — W _L		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m					
0		Ground Surface		90.88									
		Grey brown silty sand, some gravel, trace cobbles, trace asphalt, trace wood with depth (FILL MATERIAL)			1	SS	500	30	○ ●				
1					2	SS	500	13	○ ●				
2					3	SS	500	30	○ ●				
					4	SS	500	31	○ ●				
3					5	SS	450	12	○ ●				
4					6	SS	200	2	● ○				
5					7	SS	250	4	● ○				
					8	SS	100	3	● ○				
6													
		Dark brown PEAT/TOPSOIL, some silty sand		84.78 6.10	9	SS	230	1	● ○				
7				83.92									

Backfilled with Auger Cuttings

GEO - BOREHOLE LOG GINT LOGS 65080.01 MAY 21, 2020.GPJ GEMTEC 2018.GDT 6-1-20

RECORD OF BOREHOLE 20-1

CLIENT: Novatech
 PROJECT: Geotechnical Investigation
 JOB#: 65080.01
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 2 OF 2
 DATUM: CGVD28
 BORING DATE: May 19 2020

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	SHEAR STRENGTH (Cu), kPa + NATURAL ⊕ REMOULDED WATER CONTENT, % W _p — W — W _L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m				
7		Very stiff to stiff, grey brown CLAYEY SILT, trace sand		6.96	10	SS	500	10	●			
8					11	SS	500	10	●	⊕	MH	
9					12	SS	600	3	●	⊕		
		Firm, grey CLAYEY SILT, some sand, trace gravel		81.73 9.15	13	SS	600	1	●	⊕	MH	
10				80.97 9.91	14	SS	450	15	●	⊕		
11		Compact, grey layered SANDY SILT and CLAYEY SILT, trace gravel			15	SS	600	10	●	⊕	MH	
12				79.29 11.59	16	SS	230	10	●	⊕		
		Compact, grey brown silty sand, some gravel and cobbles, trace clay (GLACIAL TILL)										
13		Auger Refusal on inferred bedrock End of Borehole		78.22 12.66								
14												

Backfilled with Auger Cuttings

GEO - BOREHOLE LOG GINT LOGS 65080.01 MAY 21, 2020.GPJ GEMTEC 2018.GDT 6-1-20

RECORD OF BOREHOLE 20-2

CLIENT: Novatech
 PROJECT: Geotechnical Investigation
 JOB#: 65080.01
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: May 19 2020

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED		WATER CONTENT, % W _p — W — W _L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m						
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		91.49										
		TOPSOIL FILL		91.36 0.13										
		Brown silty sand, some gravel and organic material, trace cobbles, brick, debris and asphalt (FILL MATERIAL)			1	SS	500	39						
1					2	SS	380	12						
2					3	SS	380	14						
3					4	SS	450	27						
					5	SS	500	15						
4		Grey, clayey sand, some silt and gravel (GLACIAL TILL)		87.96 3.53										
					6	SS	350	5						
					7	SS	50	50						
5		Auger Refusal on Inferred Bedrock End of Borehole		86.86 4.63										
6														
7														



Filter sand

51 mm
Diameter, 1.5
metres long
well screen




GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
20-05-25	2.3	89.2

RECORD OF BOREHOLE 20-3

CLIENT: Novatech
 PROJECT: Geotechnical Investigation
 JOB#: 65080.01
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: May 19 2020

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED WATER CONTENT, % W _p — W — W _L		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m					
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		91.60									
		TOPSOIL FILL		91.47 0.13									
		Brown and black, silty sand, some gravel, concrete, and asphalt (FILL MATERIAL)			1	SS	430	10	●				
1													
					2	SS	430	32	●				
2					3	SS	480	8	●				
					4	SS	350	72			●		
3													
					5	SS	380	24	●				
4													
		Grey, silty sand and gravel, trace organic material (GLACIAL TILL)		87.71 3.89	6	SS	230	57			●		
		Auger Refusal on Inferred Bedrock End of Borehole		87.48 4.12									
5													
6													
7													

Backfilled with Auger Cuttings

GEO - BOREHOLE LOG GINT LOGS 65080.01 MAY 21, 2020.GPJ GEMTEC 2018.GDT 6-1-20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Orgaworld

PROJECT NUMBER: 45804

CLIENT: Orgaworld Canada Real Estate Ltd.

LOCATION: Hawthorn and Rideau Road, Ottawa, Ontario

HOLE DESIGNATION: MW7-08

DATE COMPLETED: July 14, 2008

DRILLING METHOD: HSA

FIELD PERSONNEL: T. Saunders

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	TOP OF RISER GROUND SURFACE	94.82 93.81						
1	FILL - silty sand with some gravel, trace asphalt, trace concrete, trace clay, compact to dense, grey to brown, moist			SS1		50	38	0.0
2				SS2		35		4.6
3				SS3		50	13	0.0
4	- becoming wet at 3.65m BGS			SS4		25	15	4.3
5				SS5		100		
6	SM - TILL - silty sand with some gravel, brown, moist to wet	88.32		SS6		42	54	0.0
7	END OF BOREHOLE @ 6.98m BGS	86.83		SS7		50	15	0.0
8				SS8		100		1.5
9				SS9		100		0.0
10								
11								

WELL DETAILS

Screened interval:

90.76 to 87.72m

3.05 to 6.10m BGS

Length: 3.05m

Diameter: 51mm

Slot Size: 10

Material: PVC

Seal:

93.20 to 91.37m

0.61 to 2.44m BGS

Material: Bentonite

Sand Pack:

91.37 to 87.72m

2.44 to 6.10m BGS

Material: Silica Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ July 17, 2008

CHEMICAL ANALYSIS



OVERBURDEN LOG 45804-00(JULY-2008)MW-OT003.GPJ CRA_CORP.GDT 8/8/08



APPENDIX C

MECP Water Well Record and Certificate of Well Compliance

Measurements recorded in: ☐ Metric ☒ Imperial

A305146

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
COPART			
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code
14185 Dallas Parkway Suite 300	Dallas, Texas	USA	75254

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
300 Somme Street	Gloucester		P11 26 27 6 R.F.
County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Gloucester	Ontario	
UTM Coordinates Zone	Eastings	Northings	Municipal Plan and Sublot Number
NAD 83	18 456627	5017085	4M-1388

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 From (m/ft)	Depth To (m/ft)
	Sand	Clay	+ Gravel	0'	13'
Grey & White	Sandstone	w/ Gray limestone mix		13'	103'
Grey & White	Sandstone	w/ Gray limestone mix		103'	134'
Grey & White	Sandstone	w/ Gray limestone mix		134'	140'

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)	After test of well yield, water was:	Draw Down	Recovery	
From To			<input type="checkbox"/> Clear and sand free	Time (min)	Water Level (m/ft)	Time (min)
80' 50'	Neat cement	0.38	<input type="checkbox"/> Other, specify Not tested			
50' 0'	Bentonite slurry	16.8	If pumping discontinued, give reason:	Static Level	25.5'	30.8'
				1	27.6	1 25.5
			Pump intake set at (m/ft)	2	28	2 25.5
			100	3	28.2	3 25.5
			Pumping rate (l/min/GPM)	4	28.3	4 25.5
			20	5	28.4	5 25.5
			Duration of pumping	10	28.6	10 25.5
			hrs + min	15	28.7	15 25.5
			Final water level end of pumping (m/ft)	20	28.8	20 25.5
			30.8"	25	28.9	25 25.5
			If flowing give rate (l/min/GPM)	30	30	30 25.5
			X	40	30.2	40 25.5
			Recommended pump depth (m/ft)	50	30.5	50 25.5
			100	60	30.8	60 25.5
			Recommended pump rate (l/min/GPM)			
			20			
			Well production (l/min/GPM)			
			20			
			Disinfected?			
			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			

Method of Construction	Well Use
<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input checked="" type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify	<input type="checkbox"/> Diamond <input type="checkbox"/> Jetting <input checked="" type="checkbox"/> Driving <input type="checkbox"/> Digging <input type="checkbox"/> Public <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify

Construction Record - Casing	Status of Well												
<table border="1"> <tr> <th>Inside Diameter (cm/in)</th> <th>Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)</th> <th>Wall Thickness (cm/in)</th> <th>Depth (m/ft)</th> </tr> <tr> <td>6 1/4"</td> <td>Steel</td> <td>.188"</td> <td>+2' 80'</td> </tr> <tr> <td>6 1/8"</td> <td>Open Hole</td> <td></td> <td>80' 140'</td> </tr> </table>	Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	6 1/4"	Steel	.188"	+2' 80'	6 1/8"	Open Hole		80' 140'	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)										
6 1/4"	Steel	.188"	+2' 80'										
6 1/8"	Open Hole		80' 140'										

Construction Record - Screen								
<table border="1"> <tr> <th>Outside Diameter (cm/in)</th> <th>Material (Plastic, Galvanized, Steel)</th> <th>Slot No.</th> <th>Depth (m/ft)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)					

Water Details	Hole Diameter						
Water found at Depth 103 (m/ft) <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested Water found at Depth 134 (m/ft) <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested Water found at Depth (m/ft) <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	<table border="1"> <tr> <th>Depth (m/ft)</th> <th>Diameter (cm/in)</th> </tr> <tr> <td>0' 60'</td> <td>9 3/4"</td> </tr> <tr> <td>60' 140'</td> <td>6 1/8"</td> </tr> </table>	Depth (m/ft)	Diameter (cm/in)	0' 60'	9 3/4"	60' 140'	6 1/8"
Depth (m/ft)	Diameter (cm/in)						
0' 60'	9 3/4"						
60' 140'	6 1/8"						

Well Contractor and Well Technician Information
Business Name of Well Contractor: Air Rock Drilling Co. Ltd. Business Address (Street Number/Name): 6659 Franktown Road Province: ON Postal Code: K0A 2F0 Business E-mail Address: air-rock@sympatico.ca Bus. Telephone No. (inc. area code): 613-882-1700 Name of Well Technician (Last Name, First Name): Hogan, Dan Well Technician's Licence No.: T3058 Signature of Technician and/or Contractor: [Signature] Date Submitted: 2020 09 30

Map of Well Location
Please provide a map below following instructions on the back. <div style="text-align: center;"> </div>

Comments:
3/4 HP 15 GPM Set @ 100'
Well owner's information package delivered: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Date Package Delivered: 2020 09 03 Date Work Completed: 2020 09 03 Ministry Use Only: Audit No. 344053 Received:

CERTIFICATE OF WELL COMPLIANCE



I (Jeremy Hanna) AIR ROCK DRILLING CO. LTD. - DO HEREBY CERTIFY

that I am licensed to drill water wells in the Province of Ontario, and that I have

supervised the drilling of the water well on the property of :

OWNER:

COPART

Location:

#300 SOMME STREET, GLOUCESTER

Part 26

LOT:

927 CON: 6 R.F. PLAN # 4M-1388 S/L # X

Ottawa-Carleton / Geographical Township of

Gloucester

I CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Signed this 2ND Day of SEPTEMBER, 2020.

Jeremy Hanna (T3632)

Air Rock Drilling Co. Ltd. (C-7681)

The Engineer on behalf of the Landowner set out above, Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

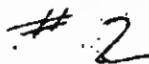
Signed this 23rd day of October, 2020

Andrius Paznekas, P.Geo.
(Engineer) GEMTEC



220603
TAGA 305146





WATER WELL RECORD

TEST WELL TW-2

COUNTY OR DISTRICT	TOWNSHIP OR URBAN C.D.P. (OWN VILLAGE)	LOCAL BUREAU (NAME, NUMBER ETC)	NO.
Ottawa Carleton	Gloucester	6	26
NAME OF FARMER FIRST	ADDRESS	DATE COMPLETED	NO.
Beaver Road Builders	P.O. Box 4208 strn. "E" Ottawa, Ontario K1S 5B2	16	8
			93

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

[illegible]

WATER RECORD

WATER TUBING FAB		KIND OF WATER	
58	<input type="checkbox"/> FRESH	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR
	<input type="checkbox"/> SALT	<input type="checkbox"/> MINERALS	<input type="checkbox"/> MINERALS
88	<input type="checkbox"/> FRESH	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR
	<input type="checkbox"/> SALT	<input type="checkbox"/> MINERALS	<input type="checkbox"/> MINERALS
NOT TESTED			
	<input type="checkbox"/> SALT	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR
	<input type="checkbox"/> FRESH	<input type="checkbox"/> MINERALS	<input type="checkbox"/> MINERALS
	<input type="checkbox"/> SALT	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR
	<input type="checkbox"/> FRESH	<input type="checkbox"/> MINERALS	<input type="checkbox"/> MINERALS
	<input type="checkbox"/> SALT	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR
	<input type="checkbox"/> FRESH	<input type="checkbox"/> MINERALS	<input type="checkbox"/> MINERALS
	<input type="checkbox"/> SALT	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> SULPHUR

CASING & OPEN HOLE RECORD

INCHES FROM INCHES	MATERIAL	WALL THICKNESS, INCHES	DEPTH INCH	FEET EQ
6 1/4	STEEL GALVANIZED CONCRETE OPEN HOLE PLASTIC	.188	0	34
5 15/16	STEEL GALVANIZED CONCRETE OPEN HOLE PLASTIC		39	100

PLUGGING & SEALING RECORD

DEPTH (FEET)	DATE	MATERIAL AND TYPE	REMARKS
37.5	0	Cement - Grouted	

UW-146 EAST MICHIGAN

<input checked="" type="checkbox"/> PUMP		<input type="checkbox"/> BAILER	20		60	1		HOURS	MIN
STATIC LEVEL		WATER LEVEL END OF PUMPING		WATER LEVEL RISING		<input checked="" type="checkbox"/> PUMPING		<input type="checkbox"/> ALLEVY	
				15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES		
7'6" ±	14'6" ±	13'11" ±	14' ±	14'4" ±	14'6" ±				
IS FLOWING. GIVE DATA		PUMP INTERF SET AT		WATER AT END OF TEST					
		GPM		FEET		<input type="checkbox"/> CLEAR		<input checked="" type="checkbox"/> CLOUDY	
UNDERGROUND PUMP TYPE		APPROXIMATE PUMP SETTING		50		ALLOWED PUMPING RATE		5	
FL AND/OR		<input checked="" type="checkbox"/> FILL							

LOCATION OF WELL

Diagram below show distances of well from road and
 dot line indicate north by arrow.

380 meters

150 meters

Well #2

135946

FINAL STATUS OF WELL

WATER USE	<input checked="" type="checkbox"/> DOMESTIC	<input checked="" type="checkbox"/> COMMERCIAL
	<input checked="" type="checkbox"/> SIGMA	<input checked="" type="checkbox"/> MUNICIPAL
	<input checked="" type="checkbox"/> FERTILIZER	<input checked="" type="checkbox"/> PUBLIC SUPPLY
	<input checked="" type="checkbox"/> INDUSTRIAL	<input checked="" type="checkbox"/> COOLING OR AIR CONDITIONING
	<input type="checkbox"/> OTHER	<input type="checkbox"/> NOT USED

**METHOD
OF
INSTRUCTION**

METHOD OF INSTRUCTION

<input type="checkbox"/> CABLE TOOL	<input type="checkbox"/> BORING
<input type="checkbox"/> ROTARY (CONVENTIONAL)	<input type="checkbox"/> MAMMOGRAPHY
<input type="checkbox"/> ROTARY (REVERSE)	<input type="checkbox"/> MILLING
<input type="checkbox"/> ROTARY (AIR)	<input type="checkbox"/> DRIVING
<input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> TAPPING
	<input type="checkbox"/> OTHER

NAME OF WILL DONOR(S)

~~Capital Water Supply Ltd.~~

WALL CONTRACTOR'S
...CHANGED NUMBER
1558

or 490 Stittville, Ontario K2S 1A6

S. Miller/T. Harrison

5-146
WILLIAM CHAMBERLAIN
LICENSE NUMBER
T0097/T2251

DATE 12 MO 4 - YR 28

OFFICE USE ONLY

NER'S COPY



APPENDIX D

TW20-1 Pumping Test Analysis



GEMTEC

CONSULTING ENGINEERS
AND SCIENTISTS

Pumping Test Analysis Report

Project: Hydrogeological Investigation

Project Number: 65080.01

Client: Copart

Location: 300 Somme Street, Ottawa, Ontario

Test Conducted by: CS

Pumping Well: TW20-1

P-Test Date: Sep 21, 2020

Analysis Performed by: AP

Method: Manual Measurements

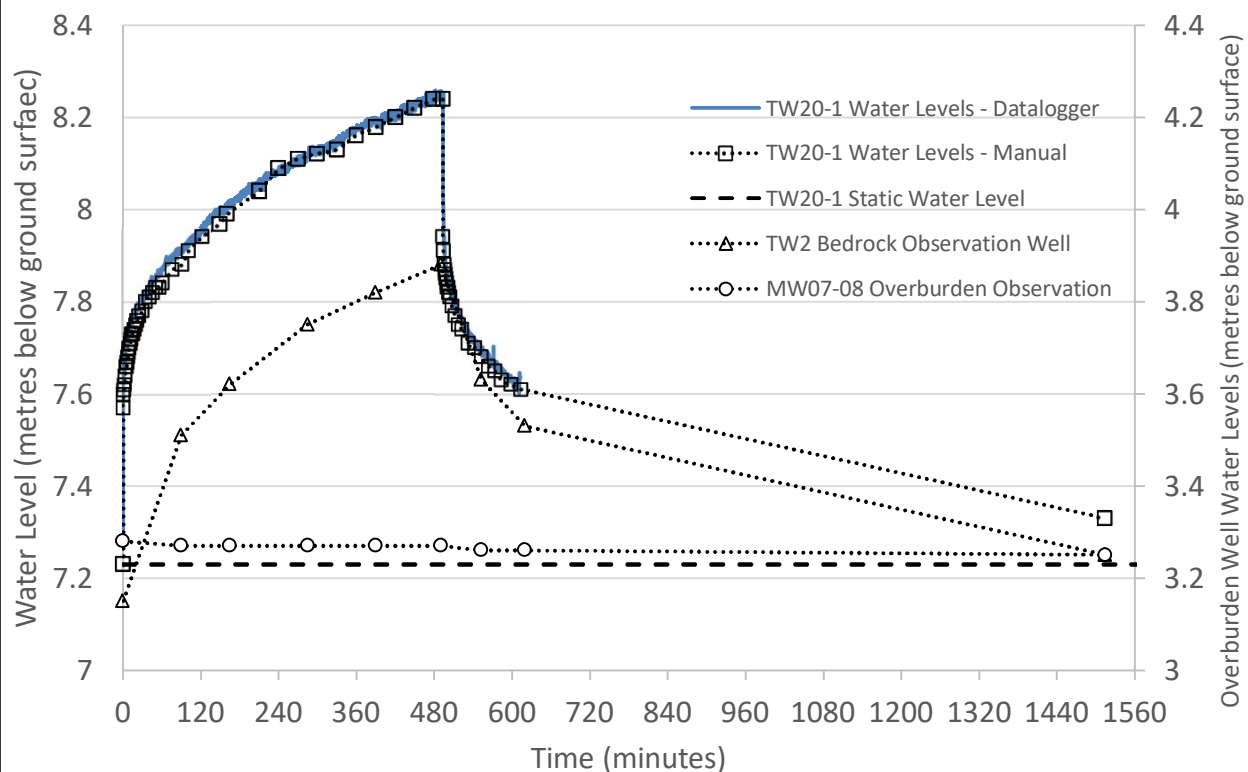
Analysis Date: Oct 22, 2020

Aquifer Thickness: 35 m

Discharge: Constant 45.4 L/min

Duration: 480 minutes

Pumping Test Data (TW20-1): Drawdown and Recovery



Water Levels TW20-1

Static : 7.23 m bgs

End of pump test (400 minutes): 8.24 m

- Datalogger water levels compensated for barometric pressure

Following recovery (60 minutes): 7.68 m (55%)

Following recovery (120 minutes): 7.61 m (62%)

Following recovery (25 hours): 7.33 m (90%)



Pumping Test Analysis Report

Project: Hydrogeological Investigation

Project Number: 65080.01

Client: Copart

Location: 300 Somme Street, Ottawa, Ontario

Test Conducted by: CS

Pumping Well: TW20-1

P-Test Date: Sep 21, 2020

Analysis Performed by: AP

Method: Aqtesolv Analysis

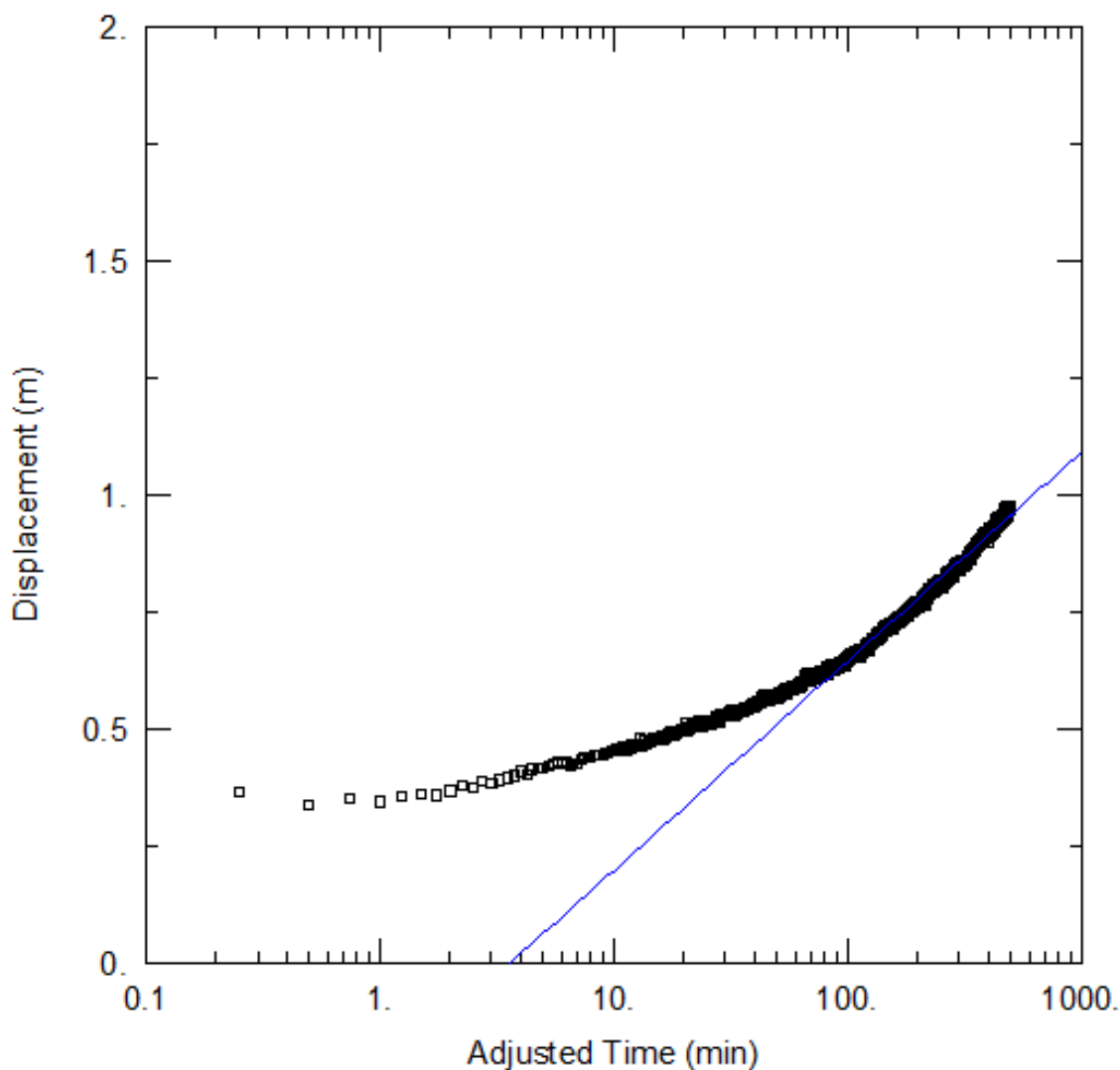
Analysis Date: Oct 22, 2020

Aquifer Thickness: 35 m

Discharge: Constant 45.3 L/min

Duration: 480 minutes

Pumping Test Analysis (TW20-1): Cooper-Jacob (Confined Aquifer)



Estimated Transmissivity: 26 m²/day or 3 x 10⁻⁴ m²/s



GEMTEC

CONSULTING ENGINEERS
AND SCIENTISTS

Pumping Test Analysis Report

Project: Hydrogeological Investigation

Project Number: 65080.01

Client: Copart

Location: 300 Somme Street, Ottawa, Ontario

Test Conducted by: CS

Pumping Well: TW20-1

P-Test Date: Sep 21, 2020

Analysis Performed by: AP

Method: Aqtesolv Analysis

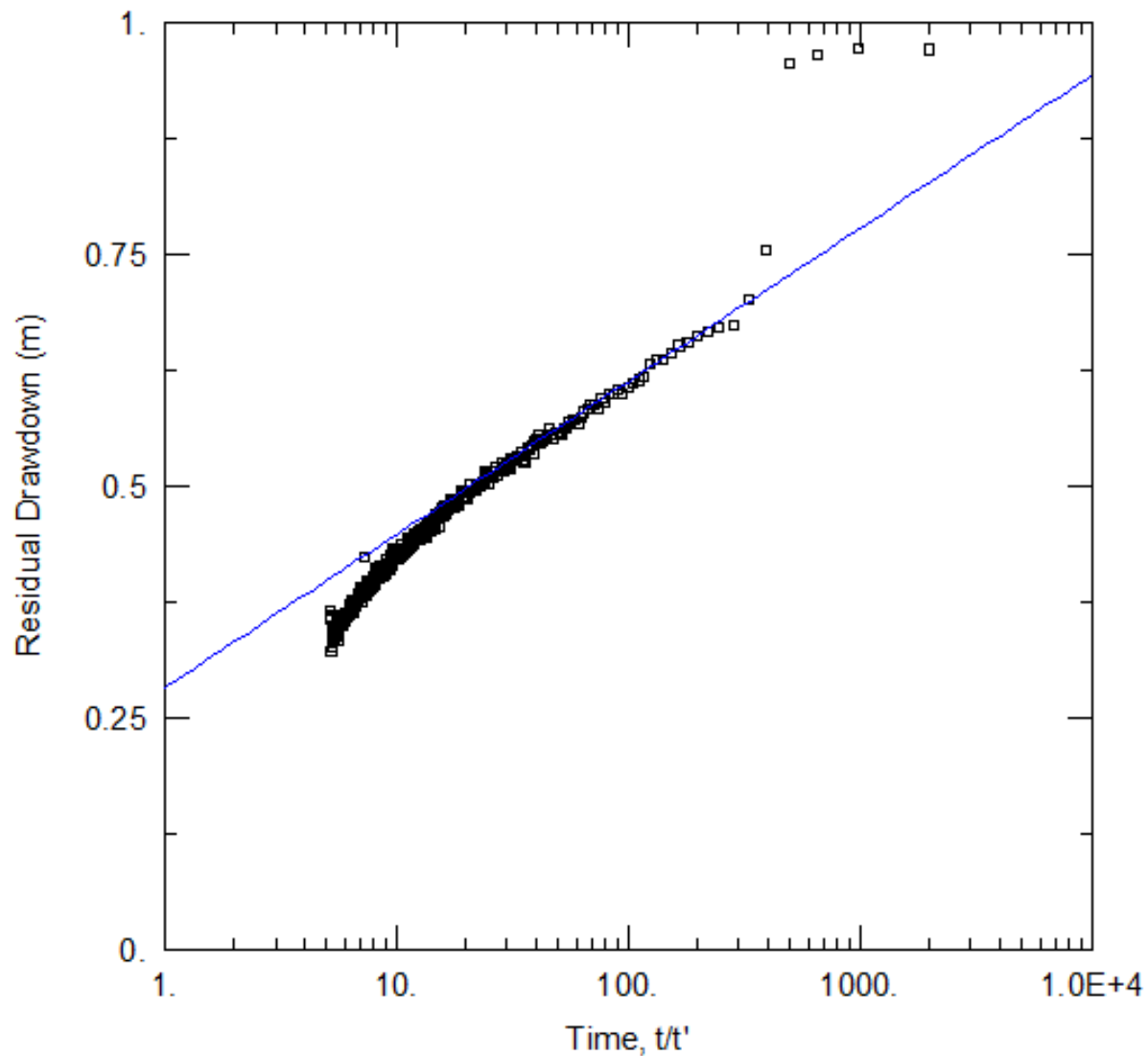
Analysis Date: Oct 22, 2020

Aquifer Thickness: 35 m

Discharge: Constant 45.4 L/min

Duration: 480 minutes

Pumping Test Analysis (TW20-1): Theis Recovery (Confined Aquifer)



Estimated Transmissivity: 68 m²/day or 8 x 10⁻⁴ m²/s



APPENDIX E

Summary of Field and Laboratory Measurements Laboratory Certificates of Analyses

Table E1 Field Measured Groundwater Quality

Date/Time	pH	Temp (°C)	TDS ³ (ppm)	EC ⁴ (us/cm)	Turbidity (NTU)	Chlorine (mg/L)	Colour (ACU ⁵)	Colour (TCU ⁵)
TW2 P-Test ¹								
Feb 24, 2020 2:30 PM (6.6 hours)	7.45	10.0	778	1,210	<1.0	0.0	52	0
TW20-1 P-Test ²								
Sep 21, 2020 1 hour	8.02	9.1	722	1444	10.9	-	-	-
2 hour	8.05	9.1	721	1443	5.7	-	-	-
3 hour	8.04	9.1	721	1442	3.6	-	4	0
4 hour	7.89	9.1	724	1448	4.6	> 0	0	0
5 hour	7.93	9.1	721	1442	4.1	-	-	-
6 hour	7.86	9.1	726	1475	5.1	-	-	-
7 hour	7.97	9.1	743	1493	4.1	-	-	-
8 hour	7.75	9.1	741	1490	3.4	> 0	5	0
TW20-1 Additional Pumping								
Oct 13, 2020 6 hours	-	-	-	-	-	0	-	-

Notes: 1. Measured using Horiba Multiparameter Meter. Calibrated by Maxim Environmental. Colour measured using Hach DR900.

2. Measured using Hannah pH/EC pen, field calibrated. Colour measured using Hach DR900. Temperature measured from Diver datalogger, attached at pump.

3. TDS – Total Dissolved Solids; 4. EC – Electrical Conductivity; 5. ACU – Actual Colour Units; 6. TCU – True Colour Units. Field filtered using 0.45 micron filter.

Table E2 Groundwater Quality Analyses TW2 and TW20-1

		TW2					TW20-1		
		Aug 29, 1993		Aug 20, 2008		Feb 24, 2020	Sep 21, 2020		Oct 13, 2020
Parameter	Criteria	1.5 hours	6.0 hours	0.5 hours	5.5 hours	6.6 hours	4 hours	8 hours	6 hours
'Subdivision Package"									
Alkalinity (CaCO3)	30-500	308	306	316	314	278	259	258	-
Ammonia	-	0.23	0.22	0.18	0.18	0.17	0.22	0.21	-
Calcium	-	117	107	86	88	101	141.18	137.93	-
Chloride	250	72	73	66	66	77.8	98.9	99.2	-
Colour (TCU)	5	6	2	<2	<2	<5	<5	<5	-
Conductivity (uS/cm)	-	925	900	1060	1060	1260	1300	1290	-
DOC (TOC in 1993)	5	3.2	3.4	2.4	2.3	1.8	1.6	1.9	-
Fluoride	1.5	0.25	0.56	0.35	0.35	<0.05	<0.05	<0.05	-
Hardness (CaCO3)	-	515	490	400	405	454	639	625	-
Hydrogen Sulphide	0.05	0.01	0.01	0.01	<0.01	<0.05	NR	NR	-
Iron	0.3	0.50	0.60	0.84	0.42	0.532	0.635	0.735	-
Magnesium	-	54	54	45	45	48.9	69.65	68.13	-
Manganese	0.05	0.14	0.14	0.12	0.11	0.149	0.106	0.107	-
Nitrate (as N)	10	<0.1	<0.1	<0.10	<0.10	<0.25	<0.25	<0.25	-
Nitrite (as N)	1	<0.1	<0.1	<0.10	<0.10	<0.25	<0.25	<0.25	-
pH (pH units)	6.5-8.5	7.2	7.1	7.94	7.95	7.73	7.94	7.91	-
Phenols	-	<0.002	<0.002	<0.001	<0.001	<0.001	0.009	0.006	0.002

		TW2					TW20-1		
		Aug 29, 1993		Aug 20, 2008		Feb 24, 2020	Sep 21, 2020		Oct 13, 2020
Parameter	Criteria	1.5 hours	6.0 hours	0.5 hours	5.5 hours	6.6 hours	4 hours	8 hours	6 hours
Potassium	-	7	8	8	8	7.76	8.47	8.14	-
Sodium	200	60	60	55	56	55.1	96.36	94.21	-
Sulphate	500	223	234	167	168	212	448	449	-
Tannin & Lignin	-	<0.1	<0.1	0.2	0.3	0.1	-	-	-
TDS	500	700	710	689	689	664	756	1020	1080
TKN	-	0.29	0.24	0.24	0.19	<0.1	0.40	0.40	-
Turbidity (NTU)	5	4.8	5.4	10.5	3.9	6.9	2.2	3.8	-
Total Coliforms (cts/100 mL)	5	0	0	1	0	0	2	0	0
E. coli (cts/100 mL)	0	0	0	0	0	0	0	0	0
Faecal Coliforms (cts/100 mL)	-	-	-	0	0	0	0	0	0
Faecal Streptococcus (cts 100/mL)	-	-	-	0	0	-	-	-	-
Heterotrophic Plate Count (cts/1 mL)	-	-	-	2	2	0	440	900	40
Heavy metals, volatile organic compounds (VOCs), Petroleum Hydrocarbons (PHCs) – refer to Laboratory Certificate of Analysis									
Notable Volatile Organic Compounds									
Toluene	24	-	-	-	-	<0.20	-	0.64	<0.20
Chloroform	-	-	-	-	-	89 / 0.014	-	2.2	<0.20

Notes: All values in mg/L unless otherwise noted

Bolded Number – Concentration exceeds aesthetic or health related criteria

Criteria – Ontario Drinking Water Quality Standards (Health related) or Guideline (Aesthetic)

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
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(613) 836-1422

ATTENTION TO: Andrius Paznekas

PROJECT: 65080.01

AGAT WORK ORDER: 20Z653592

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Sep 29, 2020

PAGES (INCLUDING COVER): 25

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

5835 COOPERS AVENUE
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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Fecal Coliforms in Water					
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 4hr	TW20-1 8hr
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2020-09-21 12:00	2020-09-21 16:00
Parameter	Unit	G / S	RDL	1469923	1470022
Fecal Coliform	CFU/100mL	1	ND	ND	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1469923-1470022 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:





Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Heterotrophic Plate Count in Water					
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 4hr	TW20-1 8hr
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2020-09-21 12:00	2020-09-21 16:00
Parameter	Unit	G / S	RDL	1469923	1470022
Heterotrophic Plate Count	CFU/1ml		10	440	900

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Total Coliforms & E. Coli (Using MI Agar)					
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 4hr	TW20-1 8hr
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2020-09-21 12:00	2020-09-21 16:00
Parameter	Unit	G / S	RDL	1469923	1470022
Escherichia coli	CFU/100mL	1	ND	ND	ND
Total Coliforms	CFU/100mL	1	2	ND	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1469923-1470022 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2020-09-22

DATE REPORTED: 2020-09-29

SAMPLE DESCRIPTION: TW20-1 8hr				
SAMPLE TYPE: Water				
DATE SAMPLED: 2020-09-21 16:00				
Parameter	Unit	G / S	RDL	1470022
Naphthalene	µg/L		0.20	<0.20
Acenaphthylene	µg/L		0.20	<0.20
Acenaphthene	µg/L		0.20	<0.20
Fluorene	µg/L		0.20	<0.20
Phenanthrene	µg/L		0.10	<0.10
Anthracene	µg/L		0.10	<0.10
Fluoranthene	µg/L		0.20	<0.20
Pyrene	µg/L		0.20	<0.20
Benzo(a)anthracene	µg/L		0.20	<0.20
Chrysene	µg/L		0.10	<0.10
Benzo(b)fluoranthene	µg/L		0.10	<0.10
Benzo(k)fluoranthene	µg/L		0.10	<0.10
Benzo(a)pyrene	µg/L	0.01	0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L		0.20	<0.20
Dibenz(a,h)anthracene	µg/L		0.20	<0.20
Benzo(g,h,i)perylene	µg/L		0.20	<0.20
2-and 1-methyl Naphthalene	µg/L		0.20	<0.20
Sediment				No
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140	102	
Acenaphthene-d10	%	50-140	96	
Chrysene-d12	%	50-140	99	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards. Na value derived from O. Reg 248

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1470022

Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

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PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)

DATE RECEIVED: 2020-09-22

DATE REPORTED: 2020-09-29

SAMPLE DESCRIPTION: TW20-1 8hr				
SAMPLE TYPE: Water				
DATE SAMPLED: 2020-09-21 16:00				
Parameter	Unit	G / S	RDL	1470022
F1 (C6-C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25
F2 (C10 to C16)	µg/L		100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100
F3 (C16 to C34)	µg/L		100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100
F4 (C34 to C50)	µg/L		100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA
Sediment				No
Surrogate	Unit	Acceptable Limits		
Terphenyl	%	60-140	75	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1470022

The C6-C10 fraction is calculated using toluene response factor.
C6-C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 - C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

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AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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SAMPLING SITE:

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O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2020-09-22

DATE REPORTED: 2020-09-29

SAMPLE DESCRIPTION: TW20-1 8hr					
SAMPLE TYPE: Water					
DATE SAMPLED: 2020-09-21 16:00					
Parameter	Unit	G / S: A	G / S: B	RDL	1470022
Dichlorodifluoromethane	µg/L			0.20	<0.20
Vinyl Chloride	µg/L	1		0.17	<0.17[<A]
Bromomethane	µg/L			0.20	<0.20
Trichlorofluoromethane	µg/L			0.40	<0.40
Acetone	µg/L			1.0	<1.0
1,1-Dichloroethylene	µg/L			0.30	<0.30
Methylene Chloride	µg/L	50		0.30	<0.30[<A]
trans- 1,2-Dichloroethylene	µg/L			0.20	<0.20
Methyl tert-butyl ether	µg/L			0.20	<0.20
1,1-Dichloroethane	µg/L			0.30	<0.30
Methyl Ethyl Ketone	µg/L			1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L			0.20	<0.20
Chloroform	µg/L			0.20	2.2
1,2-Dichloroethane	µg/L	5		0.20	<0.20[<A]
1,1,1-Trichloroethane	µg/L			0.30	<0.30
Carbon Tetrachloride	µg/L	2		0.20	<0.20[<A]
Benzene	µg/L	1.0		0.20	<0.20[<A]
1,2-Dichloropropane	µg/L			0.20	<0.20
Trichloroethylene	µg/L	5		0.20	<0.20[<A]
Bromodichloromethane	µg/L			0.20	<0.20
Methyl Isobutyl Ketone	µg/L			1.0	<1.0
1,1,1-Trichloroethane	µg/L			0.20	<0.20
Toluene	µg/L		24	0.20	0.64[<B]
Dibromochloromethane	µg/L			0.10	<0.10
Ethylene Dibromide	µg/L			0.10	<0.10
Tetrachloroethylene	µg/L	10		0.20	<0.20[<A]
1,1,1,2-Tetrachloroethane	µg/L			0.10	<0.10
Chlorobenzene	µg/L	80		0.10	<0.10[<A]
Ethylbenzene	µg/L	140	2.4	0.10	<0.10[<B]

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Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)					
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 8hr	
		SAMPLE TYPE:		Water	
		DATE SAMPLED:		2020-09-21 16:00	
Parameter	Unit	G / S: A	G / S: B	RDL	1470022
m & p-Xylene	µg/L			0.20	<0.20
Bromoform	µg/L			0.10	<0.10
Styrene	µg/L			0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L			0.10	<0.10
o-Xylene	µg/L			0.10	<0.10
1,3-Dichlorobenzene	µg/L			0.10	<0.10
1,4-Dichlorobenzene	µg/L	5	1	0.10	<0.10[<B]
1,2-Dichlorobenzene	µg/L	200	3	0.10	<0.10[<B]
1,3-Dichloropropene	µg/L			0.30	<0.30
Xylenes (Total)	µg/L	90	300	0.20	<0.20[<A]
n-Hexane	µg/L			0.20	<0.20
Surrogate	Unit	Acceptable Limits			
Toluene-d8	% Recovery	50-140		108	
4-Bromofluorobenzene	% Recovery	50-140		79	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard; A Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards. Na value derived from O. Reg 248, B Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

1470022 Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Metals Scan				
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29	
		SAMPLE DESCRIPTION:	TW20-1 4hr	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2020-09-21 12:00	
Parameter	Unit	G / S	RDL	1469923
Total Iron	mg/L	0.3	0.010	0.635
Total Manganese	mg/L	0.05	0.002	0.106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Iris Vera'stegui



Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Metals Scan incl. Chromium VI					
DATE RECEIVED: 2020-09-22			DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 8hr	
		SAMPLE TYPE:		Water	
		DATE SAMPLED:		2020-09-21 16:00	
Parameter	Unit	G / S: A	G / S: B	RDL	1470022
Total Aluminum	mg/L		0.1	0.010	0.020[<B]
Total Antimony	mg/L	0.006		0.003	<0.003[<A]
Total Arsenic	mg/L	0.01		0.003	<0.003[<A]
Total Barium	mg/L	1.0		0.002	0.120[<A]
Total Beryllium	mg/L			0.0005	<0.0005
Total Boron	mg/L	5.0		0.010	0.233[<A]
Total Cadmium	mg/L	0.005		0.0001	<0.0001[<A]
Total Chromium	mg/L	0.05		0.003	<0.003[<A]
Chromium VI	mg/L			0.005	<0.005
Total Cobalt	mg/L			0.0005	<0.0005
Total Copper	mg/L		1	0.001	<0.001[<B]
Total Iron	mg/L		0.3	0.010	0.765[>B]
Total Lead	mg/L	0.010		0.001	<0.001[<A]
Total Manganese	mg/L		0.05	0.002	0.107[>B]
Total Mercury	mg/L	0.001		0.0001	<0.0001[<A]
Total Molybdenum	mg/L			0.002	0.049
Total Nickel	mg/L			0.003	<0.003
Total Selenium	mg/L	0.05		0.001	<0.001[<A]
Total Silver	mg/L			0.0001	<0.0001
Total Strontium	mg/L			0.005	7.23
Total Thallium	mg/L			0.0003	<0.0003
Total Titanium	mg/L			0.002	0.005
Total Tungsten	mg/L			0.010	<0.010
Total Uranium	mg/L	0.02		0.0005	<0.0005[<A]
Total Vanadium	mg/L			0.002	<0.002
Total Zinc	mg/L		5	0.005	<0.005[<B]
Total Zirconium	mg/L			0.004	<0.004

Certified By:

Iris Vera'stegui



Certificate of Analysis

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Metals Scan incl. Chromium VI

DATE RECEIVED: 2020-09-22

DATE REPORTED: 2020-09-29

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards. Na value derived from O. Reg 248, B Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Iris Verástegui



Certificate of Analysis

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Subdiv. Well Water Supply						
DATE RECEIVED: 2020-09-22				DATE REPORTED: 2020-09-29		
		SAMPLE DESCRIPTION:		TW20-1 4hr	TW20-1 8hr	
		SAMPLE TYPE:		Water	Water	
		DATE SAMPLED:		2020-09-21 12:00	2020-09-21 16:00	
Parameter	Unit	G / S: A	G / S: B	RDL	1469923	1470022
Electrical Conductivity	µS/cm			2	1300	1290
pH	pH Units		6.5-8.5	NA	7.94	7.91
Hardness (as CaCO ₃) (Calculated)	mg/L		80-100	0.5	639	625
Total Dissolved Solids	mg/L		500	20	756[>B]	1020[>B]
Alkalinity (as CaCO ₃)	mg/L		30-500	5	259	258
Fluoride	mg/L	1.5		0.05	<0.05[<A]	<0.05[<A]
Chloride	mg/L		250	0.50	98.9[<B]	99.2[<B]
Nitrate as N	mg/L	10.0		0.25	<0.25[<A]	<0.25[<A]
Nitrite as N	mg/L	1.0		0.25	<0.25[<A]	<0.25[<A]
Sulphate	mg/L		500	0.50	448[<B]	449[<B]
Ammonia as N	mg/L			0.02	0.22	0.21
Total Kjeldahl Nitrogen	mg/L			0.10	0.40	0.40
Dissolved Organic Carbon	mg/L		5	0.5	1.6[<B]	1.9[<B]
Phenols	mg/L			0.001	0.009	0.006
Hydrogen Sulphide	mg/L			0.05	NR	NR
Turbidity	NTU		5	0.5	2.2[<B]	3.8[<B]
True Colour	TCU		5	5	<5[<B]	<5[<B]
Total Calcium	mg/L			0.25	141.18	137.93
Total Magnesium	mg/L			0.25	69.65	68.13
Total Potassium	mg/L			0.25	8.47	8.14
Total Sodium	mg/L	20	200	0.25	96.36[A-B]	94.21[A-B]
% Difference/ Ion Balance (Calculated)	%			NA	0.300	1.47

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards. Na value derived from O. Reg 248, B Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
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1469923-1470022 Dilution required, RDL has been increased accordingly.

Hydrogen Sulphide is calculated from Sulphide and since the Sulphide concentration is less than the MDL, Hydrogen Sulphide is reported as NR (Not Reportable).

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Yris Vera'stegui



Guideline Violation

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1469923	TW20-1 4hr	ON 169/03 AO&OG	Metals Scan	Total Iron	mg/L	0.3	0.635
1469923	TW20-1 4hr	ON 169/03 AO&OG	Metals Scan	Total Manganese	mg/L	0.05	0.106
1469923	TW20-1 4hr	ON 169/03 AO&OG	Subdiv. Well Water Supply	Hardness (as CaCO ₃) (Calculated)	mg/L	80-100	639
1469923	TW20-1 4hr	ON 169/03 AO&OG	Subdiv. Well Water Supply	Total Dissolved Solids	mg/L	500	756
1469923	TW20-1 4hr	ON 169/03 MAC/IMAC	Subdiv. Well Water Supply	Total Sodium	mg/L	20	96.36
1470022	TW20-1 8hr	ON 169/03 AO&OG	Metals Scan incl. Chromium VI	Total Iron	mg/L	0.3	0.765
1470022	TW20-1 8hr	ON 169/03 AO&OG	Metals Scan incl. Chromium VI	Total Manganese	mg/L	0.05	0.107
1470022	TW20-1 8hr	ON 169/03 AO&OG	Subdiv. Well Water Supply	Hardness (as CaCO ₃) (Calculated)	mg/L	80-100	625
1470022	TW20-1 8hr	ON 169/03 AO&OG	Subdiv. Well Water Supply	Total Dissolved Solids	mg/L	500	1020
1470022	TW20-1 8hr	ON 169/03 MAC/IMAC	Subdiv. Well Water Supply	Total Sodium	mg/L	20	94.21

Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Microbiology Analysis

RPT Date: Sep 29, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Fecal Coliforms in Water

Fecal Coliform	1469923	1469923	ND	ND	NA	< 1
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Heterotrophic Plate Count in Water

Heterotrophic Plate Count	1469923	1469923	440	430	2.3%	< 10
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Total Coliforms & E. Coli (Using MI Agar)

Escherichia coli	1470022	1470022	ND	ND	NA	< 1
Total Coliforms	1470022	1470022	ND	ND	NA	< 1

Comments: ND - Not Detected, NA - % RPD Not Applicable

Certified By:



Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 29, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PAHs (Water)															
Napthalene	1466741		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	115%	50%	140%	115%	50%	140%
Acenaphthylene	1466741		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	112%	50%	140%	112%	50%	140%
Acenaphthene	1466741		< 0.20	< 0.20	NA	< 0.20	115%	50%	140%	100%	50%	140%	110%	50%	140%
Fluorene	1466741		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	101%	50%	140%	101%	50%	140%
Phenanthrene	1466741		< 0.10	< 0.10	NA	< 0.10	100%	50%	140%	102%	50%	140%	104%	50%	140%
Anthracene	1466741		< 0.10	< 0.10	NA	< 0.10	101%	50%	140%	106%	50%	140%	107%	50%	140%
Fluoranthene	1466741		< 0.20	< 0.20	NA	< 0.20	85%	50%	140%	96%	50%	140%	106%	50%	140%
Pyrene	1466741		< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	99%	50%	140%	85%	50%	140%
Benzo(a)anthracene	1466741		< 0.20	< 0.20	NA	< 0.20	84%	50%	140%	95%	50%	140%	88%	50%	140%
Chrysene	1466741		< 0.10	< 0.10	NA	< 0.10	74%	50%	140%	85%	50%	140%	84%	50%	140%
Benzo(b)fluoranthene	1466741		< 0.10	< 0.10	NA	< 0.10	71%	50%	140%	88%	50%	140%	74%	50%	140%
Benzo(k)fluoranthene	1466741		< 0.10	< 0.10	NA	< 0.10	75%	50%	140%	81%	50%	140%	71%	50%	140%
Benzo(a)pyrene	1466741		< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	80%	50%	140%	79%	50%	140%
Indeno(1,2,3-cd)pyrene	1466741		< 0.20	< 0.20	NA	< 0.20	85%	50%	140%	74%	50%	140%	84%	50%	140%
Dibenz(a,h)anthracene	1466741		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	75%	50%	140%	74%	50%	140%
Benzo(g,h,i)perylene	1466741		< 0.20	< 0.20	NA	< 0.20	82%	50%	140%	80%	50%	140%	75%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)															
F1 (C6-C10)	1473595		< 25	< 25	NA	< 25	93%	60%	140%	95%	60%	140%	77%	60%	140%
F2 (C10 to C16)	1466925		< 100	< 100	NA	< 100	105%	60%	140%	76%	60%	140%	74%	60%	140%
F3 (C16 to C34)	1466925		< 100	< 100	NA	< 100	97%	60%	140%	77%	60%	140%	78%	60%	140%
F4 (C34 to C50)	1466925		< 100	< 100	NA	< 100	103%	60%	140%	98%	60%	140%	96%	60%	140%
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	1466741		< 0.20	< 0.20	NA	< 0.20	84%	50%	140%	87%	50%	140%	89%	50%	140%
Vinyl Chloride	1466741		< 0.17	< 0.17	NA	< 0.17	93%	50%	140%	107%	50%	140%	89%	50%	140%
Bromomethane	1466741		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	98%	50%	140%	94%	50%	140%
Trichlorofluoromethane	1466741		< 0.40	< 0.40	NA	< 0.40	108%	50%	140%	85%	50%	140%	97%	50%	140%
Acetone	1466741		< 1.0	< 1.0	NA	< 1.0	102%	50%	140%	105%	50%	140%	93%	50%	140%
1,1-Dichloroethylene	1466741		< 0.30	< 0.30	NA	< 0.30	93%	50%	140%	101%	60%	130%	88%	50%	140%
Methylene Chloride	1466741		< 0.30	< 0.30	NA	< 0.30	105%	50%	140%	106%	60%	130%	91%	50%	140%
trans- 1,2-Dichloroethylene	1466741		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	106%	60%	130%	94%	50%	140%
Methyl tert-butyl ether	1466741		< 0.20	< 0.20	NA	< 0.20	89%	50%	140%	84%	60%	130%	103%	50%	140%
1,1-Dichloroethane	1466741		< 0.30	< 0.30	NA	< 0.30	97%	50%	140%	102%	60%	130%	90%	50%	140%
Methyl Ethyl Ketone	1466741		< 1.0	< 1.0	NA	< 1.0	77%	50%	140%	98%	50%	140%	83%	50%	140%
cis- 1,2-Dichloroethylene	1466741		< 0.20	< 0.20	NA	< 0.20	111%	50%	140%	111%	60%	130%	98%	50%	140%
Chloroform	1466741		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	110%	60%	130%	89%	50%	140%
1,2-Dichloroethane	1466741		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	100%	60%	130%	93%	50%	140%
1,1,1-Trichloroethane	1466741		< 0.30	< 0.30	NA	< 0.30	91%	50%	140%	84%	60%	130%	82%	50%	140%
Carbon Tetrachloride	1466741		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	77%	60%	130%	72%	50%	140%

Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 29, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzene	1466741		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	98%	60%	130%	94%	50%	140%
1,2-Dichloropropane	1466741		< 0.20	< 0.20	NA	< 0.20	92%	50%	140%	90%	60%	130%	85%	50%	140%
Trichloroethylene	1466741		< 0.20	< 0.20	NA	< 0.20	109%	50%	140%	101%	60%	130%	96%	50%	140%
Bromodichloromethane	1466741		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	78%	60%	130%	76%	50%	140%
Methyl Isobutyl Ketone	1466741		< 1.0	< 1.0	NA	< 1.0	91%	50%	140%	93%	50%	140%	102%	50%	140%
1,1,2-Trichloroethane	1466741		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	108%	60%	130%	95%	50%	140%
Toluene	1466741		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	106%	60%	130%	98%	50%	140%
Dibromochloromethane	1466741		< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	90%	60%	130%	88%	50%	140%
Ethylene Dibromide	1466741		< 0.10	< 0.10	NA	< 0.10	95%	50%	140%	103%	60%	130%	107%	50%	140%
Tetrachloroethylene	1466741		< 0.20	< 0.20	NA	< 0.20	101%	50%	140%	101%	60%	130%	100%	50%	140%
1,1,1,2-Tetrachloroethane	1466741		< 0.10	< 0.10	NA	< 0.10	108%	50%	140%	96%	60%	130%	94%	50%	140%
Chlorobenzene	1466741		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	115%	60%	130%	114%	50%	140%
Ethylbenzene	1466741		< 0.10	< 0.10	NA	< 0.10	97%	50%	140%	101%	60%	130%	94%	50%	140%
m & p-Xylene	1466741		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	109%	60%	130%	103%	50%	140%
Bromoform	1466741		< 0.10	< 0.10	NA	< 0.10	116%	50%	140%	97%	60%	130%	101%	50%	140%
Styrene	1466741		< 0.10	< 0.10	NA	< 0.10	104%	50%	140%	102%	60%	130%	97%	50%	140%
1,1,2,2-Tetrachloroethane	1466741		< 0.10	< 0.10	NA	< 0.10	101%	50%	140%	113%	60%	130%	102%	50%	140%
o-Xylene	1466741		< 0.10	< 0.10	NA	< 0.10	95%	50%	140%	111%	60%	130%	104%	50%	140%
1,3-Dichlorobenzene	1466741		< 0.10	< 0.10	NA	< 0.10	102%	50%	140%	104%	60%	130%	92%	50%	140%
1,4-Dichlorobenzene	1466741		< 0.10	< 0.10	NA	< 0.10	101%	50%	140%	108%	60%	130%	95%	50%	140%
1,2-Dichlorobenzene	1466741		< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	112%	60%	130%	94%	50%	140%
n-Hexane	1466741		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	73%	60%	130%	74%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:



Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Sep 29, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals Scan															
Total Iron	1468130		0.556	0.576	3.5%	< 0.010	92%	70%	130%	97%	80%	120%	100%	70%	130%
Total Manganese	1468130		0.079	0.082	3.7%	< 0.002	91%	70%	130%	91%	80%	120%	95%	70%	130%
Subdiv. Well Water Supply															
Electrical Conductivity	1472945		985	987	0.2%	< 2	89%	80%	120%						
pH	1472945		7.07	7.00	1.0%	NA	100%	90%	110%						
Total Dissolved Solids	1481278		380	392	3.1%	< 20	100%	80%	120%						
Alkalinity (as CaCO3)	1472945		80	80	0.0%	< 5	99%	80%	120%						
Fluoride	1473239		<0.05	<0.05	NA	< 0.05	108%	90%	110%	100%	90%	110%	112%	85%	115%
Chloride	1473239		65.0	64.7	0.5%	< 0.10	93%	70%	130%	105%	80%	120%	103%	70%	130%
Nitrate as N	1473239		17.7	17.6	0.6%	< 0.05	92%	70%	130%	106%	80%	120%	101%	70%	130%
Nitrite as N	1473239		<0.25	<0.25	NA	< 0.05	96%	70%	130%	99%	80%	120%	112%	70%	130%
Sulphate	1473239		7.33	7.09	3.3%	< 0.10	102%	70%	130%	102%	80%	120%	100%	70%	130%
Ammonia as N	1468839		1.23	1.20	2.5%	< 0.02	112%	70%	130%	99%	80%	120%	NA	70%	130%
Total Kjeldahl Nitrogen	1472320		2.52	2.66	5.4%	< 0.10	102%	70%	130%	103%	80%	120%	100%	70%	130%
Dissolved Organic Carbon	1469923	1469923	1.6	1.7	NA	< 0.5	102%	90%	110%	98%	90%	110%	96%	80%	120%
Phenols	1456306		0.009	0.009	0.0%	< 0.001	96%	90%	110%	100%	90%	110%	83%	80%	120%
Sulphide	1469923	1469923	<0.05	<0.05	NA	< 0.05	100%	80%	120%	99%	85%	115%	99%	70%	130%
Hydrogen Sulphide	1469923	1469923	<0.05	<0.05	NA	< 0.05	100%	90%	110%	99%	90%	110%	99%	80%	120%
Turbidity	1470022	1470022	3.8	3.8	0.0%	< 0.5	102%	80%	120%						
True Colour	1464153		<5	<5	NA	< 5	102%	90%	110%						
Total Calcium	1467058		107.40	101.46	5.7%	< 0.05	91%	70%	130%	88%	80%	120%	101%	70%	130%
Total Magnesium	1467058		25.85	24.62	4.9%	< 0.05	92%	70%	130%	88%	80%	120%	101%	70%	130%
Total Potassium	1467058		1.25	1.09	13.7%	< 0.05	91%	70%	130%	88%	80%	120%	99%	70%	130%
Total Sodium	1467058		65.33	61.76	5.6%	< 0.05	92%	70%	130%	89%	80%	120%	99%	70%	130%
Metals Scan incl. Chromium VI															
Total Aluminum	1468130		0.028	0.026	NA	< 0.010	97%	70%	130%	100%	80%	120%	104%	70%	130%
Total Antimony	1468130		<0.003	<0.003	NA	< 0.003	96%	70%	130%	98%	80%	120%	111%	70%	130%
Total Arsenic	1468130		<0.003	<0.003	NA	< 0.003	103%	70%	130%	103%	80%	120%	114%	70%	130%
Total Barium	1468130		0.18	0.19	5.4%	< 0.002	89%	70%	130%	91%	80%	120%	93%	70%	130%
Total Beryllium	1468130		<0.005	<0.005	NA	< 0.0005	100%	70%	130%	102%	80%	120%	109%	70%	130%
Total Boron	1468130		0.10	<0.10	NA	< 0.010	103%	70%	130%	100%	80%	120%	104%	70%	130%
Total Cadmium	1468130		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	101%	80%	120%	112%	70%	130%
Total Chromium	1468130		<0.003	0.003	NA	< 0.003	102%	70%	130%	101%	80%	120%	105%	70%	130%
Chromium VI	1462982		<0.005	<0.005	NA	< 0.005	100%	70%	130%	101%	80%	120%	100%	70%	130%
Total Cobalt	1468130		<0.0005	<0.0005	NA	< 0.0005	94%	70%	130%	95%	80%	120%	100%	70%	130%
Total Copper	1468130		<0.001	0.001	NA	< 0.001	92%	70%	130%	95%	80%	120%	94%	70%	130%
Total Iron	1468130		0.556	0.576	3.5%	< 0.010	92%	70%	130%	97%	80%	120%	100%	70%	130%
Total Lead	1468130		<0.001	<0.001	NA	< 0.001	90%	70%	130%	91%	80%	120%	93%	70%	130%

Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 29, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Manganese	1468130		0.079	0.082	3.7%	< 0.002	91%	70%	130%	91%	80%	120%	95%	70%	130%
Total Mercury	1472485		<0.0001	<0.0001	NA	< 0.0001	103%	70%	130%	96%	80%	120%	97%	70%	130%
Total Molybdenum	1468130		<0.002	<0.002	NA	< 0.002	94%	70%	130%	97%	80%	120%	106%	70%	130%
Total Nickel	1468130		<0.003	<0.003	NA	< 0.003	103%	70%	130%	103%	80%	120%	107%	70%	130%
Total Selenium	1468130		0.001	<0.001	NA	< 0.001	109%	70%	130%	112%	80%	120%	120%	70%	130%
Total Silver	1468130		<0.0001	<0.0001	NA	< 0.0001	97%	70%	130%	100%	80%	120%	97%	70%	130%
Total Strontium	1468130		0.38	0.40	5.1%	< 0.005	90%	70%	130%	87%	80%	120%	98%	70%	130%
Total Thallium	1468130		<0.003	<0.003	NA	< 0.0003	99%	70%	130%	100%	80%	120%	104%	70%	130%
Total Titanium	1468130		<0.002	<0.002	NA	< 0.002	99%	70%	130%	102%	80%	120%	109%	70%	130%
Total Tungsten	1468130		<0.10	<0.10	NA	< 0.010	102%	70%	130%	95%	80%	120%	100%	70%	130%
Total Uranium	1468130		<0.005	<0.005	NA	< 0.0005	90%	70%	130%	92%	80%	120%	97%	70%	130%
Total Vanadium	1468130		<0.02	<0.02	NA	< 0.002	92%	70%	130%	92%	80%	120%	99%	70%	130%
Total Zinc	1468130		0.006	0.006	NA	< 0.005	102%	70%	130%	102%	80%	120%	102%	70%	130%
Total Zirconium	1468130		<0.04	<0.04	NA	< 0.004	90%	70%	130%	94%	80%	120%	96%	70%	130%

Comments: NA signifies Not Applicable.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Matrix spike: Spike level < native concentration. Matrix spike acceptance limits do not apply.

Certified By:



Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z653592

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Fecal Coliform	MIC-93-7000	SM 9222 D	MF/INCUBATOR
Heterotrophic Plate Count	MIC-93- 7020	SM 9215 C	INCUBATOR
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluorene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Acenaphthene-d10	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Chrysene-d12	ORG-91-5105	modified from EPA SW-846 3510C & 8270E	GC/MS
Sediment			
F1 (C6-C10)	VOL-91- 5010	modified from MOE PHC-E3421	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	modified from MOE PHC-E3421	P&T GC/FID
F2 (C10 to C16)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34) minus PAHs	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	modified from MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Dichlorodifluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Bromomethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Bromoform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Aluminum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Chromium VI	INOR-93-6034	modified from SM 3500-CR B	SPECTROPHOTOMETER
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tungsten	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 20Z653592
PROJECT: 65080.01
ATTENTION TO: Andrius Paznekas
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Hardness (as CaCO ₃) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C,D	BALANCE
Alkalinity (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Hydrogen Sulphide	INOR-93-6054	SM 4500 S ₂ - D	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	modified from SM 2130 B	NEPHELOMETER
True Colour	INOR-93-6046	SM 2120 C	SPECTROPHOTOMETER
Total Calcium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Magnesium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Potassium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Sodium	MET-93-6105	modified from EPA 6010D	ICP/OES
% Difference/ Ion Balance (Calculated)		SM 1030 E	CALCULATION

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
32 STEACIE DRIVE
OTTAWA, ON K2K 2A9
(613) 836-1422

ATTENTION TO: Andrius Paznekas

PROJECT: 65080.01

AGAT WORK ORDER: 20Z663133

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

DATE REPORTED: Oct 21, 2020

PAGES (INCLUDING COVER): 12

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Fecal Coliforms in Water

DATE RECEIVED: 2020-10-13

DATE REPORTED: 2020-10-21

SAMPLE DESCRIPTION: TW20-1
SAMPLE TYPE: Water
DATE SAMPLED: 2020-10-13
14:30
1556620

Parameter	Unit	G / S	RDL
Fecal Coliform	CFU/100mL	1	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1556620 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Nivine Basly



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

5835 COOPERS AVENUE
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<http://www.agatlabs.com>

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Heterotrophic Plate Count in Water

DATE RECEIVED: 2020-10-13

DATE REPORTED: 2020-10-21

SAMPLE DESCRIPTION: TW20-1
SAMPLE TYPE: Water
DATE SAMPLED: 2020-10-13
14:30
1556620

Parameter	Unit	G / S	RDL
Heterotrophic Plate Count	CFU/1ml	5	40

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Nivine Basly



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
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TEL (905)712-5100
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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Total Coliforms & E. Coli (Using MI Agar)

DATE RECEIVED: 2020-10-13

DATE REPORTED: 2020-10-21

SAMPLE DESCRIPTION: TW20-1
SAMPLE TYPE: Water
DATE SAMPLED: 2020-10-13
14:30
1556620

Parameter	Unit	G / S	RDL	1556620
Escherichia coli	CFU/100mL		1	ND
Total Coliforms	CFU/100mL		1	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1556620 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Nivine Basly



AGAT Laboratories

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AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water (ug/L)

DATE RECEIVED: 2020-10-13

DATE REPORTED: 2020-10-21

SAMPLE DESCRIPTION: TW20-1
SAMPLE TYPE: Water
DATE SAMPLED: 2020-10-13
14:30
1556620

Parameter	Unit	G / S	RDL	
Chloroform	µg/L		0.20	<0.20
Toluene	µg/L	24	0.20	<0.20
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140		112
4-Bromofluorobenzene	% Recovery	50-140		74

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

(Water) Inorganic Chemistry

DATE RECEIVED: 2020-10-13

DATE REPORTED: 2020-10-21

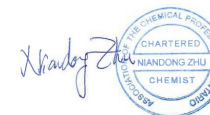
SAMPLE DESCRIPTION: TW20-1
SAMPLE TYPE: Water
DATE SAMPLED: 2020-10-13
14:30
1556620

Parameter	Unit	G / S	RDL	
Total Dissolved Solids	mg/L	500	20	1080
Phenols	mg/L		0.001	0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg 169/03 - Ontario Drinking Water Quality Standards - Aesthetic Objectives and Operational Guidelines
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:





AGAT Laboratories

Exceedance Summary

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Andrius Paznekas

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1556620	TW20-1	ON 169/03 AO&OG	(Water) Inorganic Chemistry	Total Dissolved Solids	mg/L	500	1080

Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Microbiology Analysis

RPT Date: Oct 21, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Total Coliforms & E. Coli (Using MI Agar)

Escherichia coli	1556620	1556620	ND	ND	NA	< 1
Total Coliforms	1556620	1556620	ND	ND	NA	< 1

Fecal Coliforms in Water

Fecal Coliform	1556620	1556620	ND	ND	NA	< 1
----------------	---------	---------	----	----	----	-----

Heterotrophic Plate Count in Water

Heterotrophic Plate Count	1556620	1556620	40	40	0.0%	< 5
---------------------------	---------	---------	----	----	------	-----

Comments: ND - Not Detected, NA - % RPD Not Applicable

Certified By:


Nivine Basily

Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 21, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper

Volatile Organic Compounds in Water (ug/L)

Chloroform	1563212		<0.20	<0.20	NA	< 0.20	100%	50%	140%	103%	60%	130%	98%	50%	140%
Toluene	1563212		<0.20	<0.20	NA	< 0.20	101%	50%	140%	82%	60%	130%	103%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:


Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Oct 21, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper

(Water) Inorganic Chemistry

Total Dissolved Solids	1562914		34	36	NA	< 20	104%	80%	120%						
Phenols	1556930		<0.001	0.001	NA	< 0.001	93%	90%	110%	91%	90%	110%	84%	80%	120%

Comments: NA Signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:



Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 20Z663133

PROJECT: 65080.01

ATTENTION TO: Andrius Paznekas

SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Fecal Coliform	MIC-93-7000	SM 9222 D	MF/INCUBATOR
Heterotrophic Plate Count	MIC-93- 7020	SM 9215 C	INCUBATOR
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration
Trace Organics Analysis			
Chloroform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Water Analysis			
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C,D	BALANCE
Phenols	INOR-93-6072	modified from SM 5530 D	LACHAT FIA

Langelier Saturation Index Calculation

Project: 65080.01

Location: 300 Somme Street, Ottawa

Sample ID: TW20-1

Well Tag: A305146

Inputs

TW20-1 8-hr

pH =	7.91	
Total Dissolved Solids =	1020	
Calcium (as CaCO ₃) =	625	Note: Ca (as CaCO ₃) = 2.5 x Ca
Alkalinity (as CaCO ₃) =	258	
Temperature (°C) =	9.1	Measured groundwater temperature

Where Langelier Saturation Index (LSI) is defined as: $LSI = pH - pH_s$

Where: $pH_s = (9.3 + A + B) - (C + D)$

And: $A = \frac{(\log_{10}[TDS] - 1)}{10}$

$$B = -13.12 \cdot \log_{10}[Temp + 273] + 34.55$$

$$C = \log_{10}[Calcium] - 0.4$$

$$D = \log_{10}[Alkalinity]$$

Output:

A =	0.20
B =	2.40
C =	2.40
D =	2.41
pH _s =	7.09

LSI = 0.82

LSI Value

-2.0 to -0.5
-0.5 to 0.0
LSI = 0
0.0 to 0.5
0.5 to 2

Indication

Serious corrosion
Slight corrosion but non-scale forming
Balanced but corrosion possible
Slightly scale forming and corrosive
Scale forming but non corrosive



APPENDIX F

Nitrate Dilution Calculations

TABLE 1: Allowable Flows - Commercial Septic Systems (300 Somme Street)

								Scenario 1: Conventional Septic	
Site	Available Infiltration Area m ²	Topography Factor	Soil Factor	Vegetation Factor	Infiltration Factor	Annual Water Surplus (m ³ /year)	Infiltration Volume (m ³ /year)	Available Infiltration (litres per day)	Maximum Septic Flow (litres per day)
300 Somme Street	28,894	0.20	0.30	0.10	0.60	0.378	10,922	17,954	5,985

Notes:

1. Scenario No. 1 values are calculated under the following:

a) Carried out in accordance with Section 5.6.3 of the MECP Procedure D-5-4

b) Annual water surplus based on urban lawns, shallow rooted crops - Fine sandy loam with a water holding capacity of 75 mm (SWM Planning & Design Manual, 2003)

Ottawa Intl A

WATER BUDGET MEANS FOR THE PERIOD 1939-2013

DC20492

LAT.... 45.32

WATER HOLDING CAPACITY... 75 MM

HEAT INDEX... 36.57

LONG... 75.67

LOWER ZONE..... 45 MM

A..... 1.078

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.7	62	11	14	0	0	0	24	85	74	296
28- 2	-9.0	55	10	16	1	1	0	25	115	74	352
31- 3	-2.7	66	31	79	6	6	0	104	71	75	418
30- 4	5.7	71	67	76	32	32	0	111	0	75	489
31- 5	13.0	76	76	0	80	80	0	14	0	57	566
30- 6	18.3	84	84	0	116	107	-9	5	0	29	649
31- 7	20.9	86	86	0	136	103	-33	2	0	10	735
31- 8	19.6	83	83	0	117	82	-35	1	0	10	818
30- 9	14.7	84	84	0	75	65	-10	4	0	25	902
31-10	8.2	75	75	0	37	36	-1	14	0	51	76
30-11	1.3	78	60	8	10	10	0	38	10	70	154
31-12	-7.1	81	27	15	1	1	0	36	49	74	234
AVE	6.0 TTL	901	694	208	611	523	-88	378			

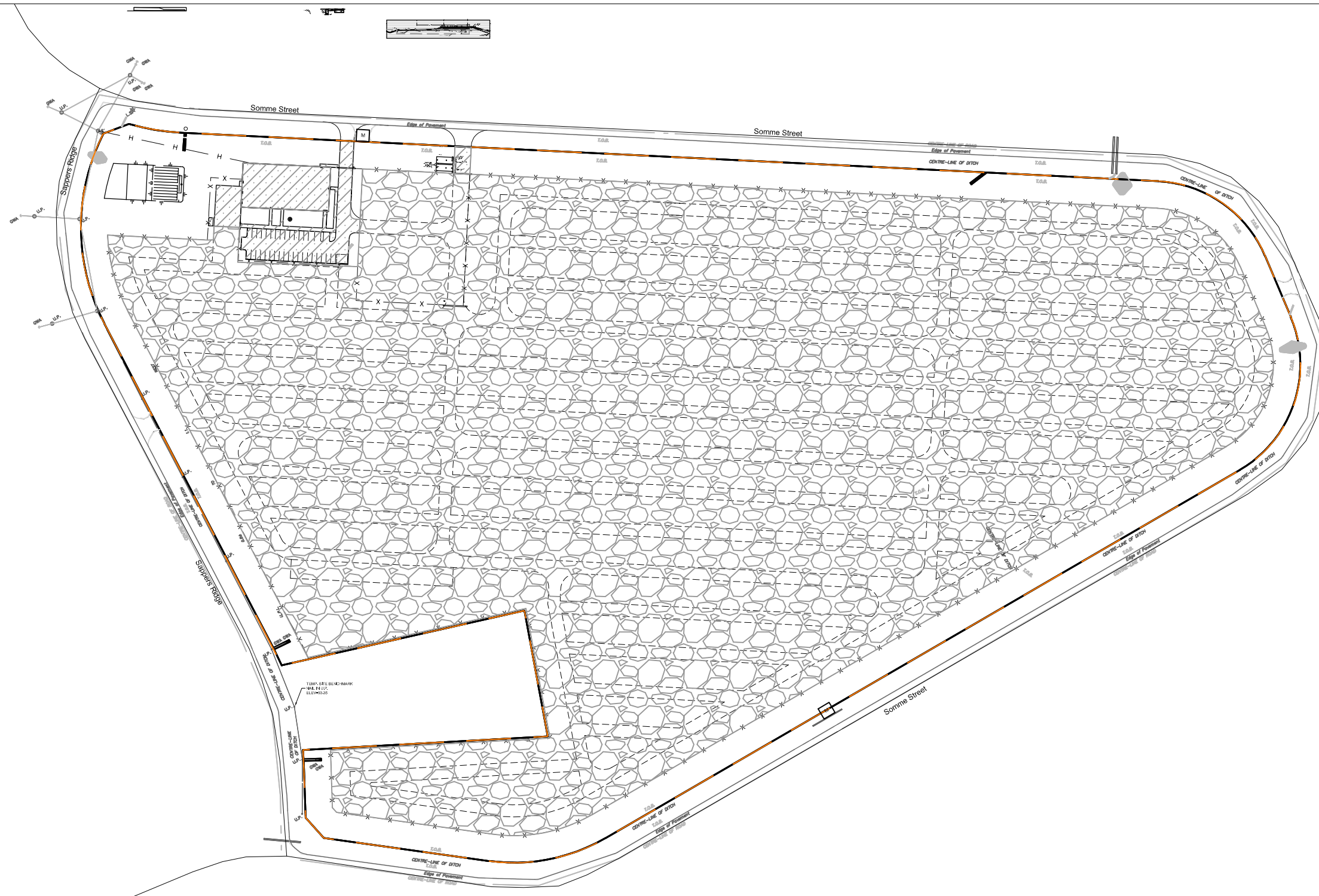
Ottawa Intl A


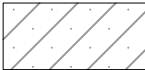
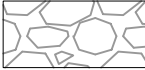

STANDARD DEVIATIONS FOR THE PERIOD 1939-2013

DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	2.9	26	15	18	1	1	0	29	45	3	59
28- 2	2.5	27	14	25	1	1	0	35	60	3	63
31- 3	2.6	28	22	50	5	5	0	56	90	0	70
30- 4	1.8	31	32	91	9	9	0	91	3	2	78
31- 5	1.9	32	32	3	12	12	0	23	0	22	90
30- 6	1.2	39	39	0	8	18	18	17	0	29	101
31- 7	1.1	40	40	0	8	31	32	10	0	21	104
31- 8	1.3	38	38	0	8	29	31	4	0	21	117
30- 9	1.4	40	40	0	8	16	16	15	0	29	124
31-10	1.5	36	36	1	7	7	2	22	0	28	36
30-11	1.7	27	27	8	4	4	0	33	13	12	45
31-12	2.9	30	23	14	1	1	0	31	35	4	56

M:\2019\119181\CAD\Design\119181-GS.dwg, ST2, Oct 05, 2020 - 4:03pm, amcauley



	AREA BOUNDARY AREA = 178,362 m ²
	HARD SURFACE AREA = 3,306 m ²
	GRAVEL AREA = 146,162 m ²
	LANDSCAPE AREA = 28,894 m ²


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**300 SOMME STREET
COPART FACILITY**

**SURFACE TYPES
OVERALL**

SCALE 1 : 500 

DATE	OCT 16/20	JOB	119181	FIGURE	119181-ST2
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CUT11V17 DWG 270mm V132mm