

Hydrogeological Investigation
Clockwork- Phase 2 Development
1429 Dundas Street East
Oakville, Ontario

Prepared For:
Mattamy Development Corp.

Project No.: 19-294-101
Date: August 3, 2023



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19-294-101

August 3, 2023

Mattamy Development Corp.

Attention: Helen Xie, Development Manager

Via email: Helen.Xie@mattamycorp.com

RE: Hydrogeological Investigation–Clockwork Phase 2- 1429 Dundas Street East, Oakville

DS Consultants Limited (DS) was retained by Mattamy Corporation to complete a hydrogeological investigation for the proposed development at 1429 Dundas Street East in Oakville, Ontario (herein referred to as “the site “). The hydrogeological investigation presented here is for Phase 2 of the proposed development. The Phase 2 development will be comprised of a seven (7) storey building with two (P2) levels of underground parking. As per the design drawings available to DS, the proposed ground floor elevation is 161.8 masl and the floor elevation of P2 levels is 154.8 meters above sea level (masl).

This hydrogeological investigation includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, an assessment of the hydrogeological constraints, impacts of the proposed development on the local groundwater, and provides an estimation of construction dewatering during the proposed development phase. If needed, the results of this investigation can be used in support of an application for a Category 3 Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) for construction dewatering from the Ministry of the Environment Conservation and Parks (MECP). This report was prepared in support of the design for the proposed re-development of the Site for residential uses. Based on the results of this investigation, the following conclusions and recommendations are presented:

1. As part of the hydrogeological investigation, DS completed a search of the MECP Water Well Records (WWRs) database. Based on the MECP WWR search, there are fifty-four (54) water wells within 500 meters of the site. Two (2) wells were noted for domestic (DO) use and two (2) wells were noted for irrigation (IR) use. All other wells were noted as either monitoring (MO), test hole (TH) or not in use (NU). A water well survey is recommended within the study area to confirm the presence and use of any domestic wells.
2. In November 2019, DS drilled six (6) boreholes (BH19-200 to BH19-206) and equipped two (2) drilled boreholes (BH19-200 and BH19-206) with monitoring wells at the development site as part of preliminary geotechnical and hydrogeological investigations for Phase 1 to Phase 4 development. The boreholes were advanced to depths ranging from 10.9 to 12.7 meters below the ground surface (mbgs). Monitoring wells were screened at the bottom of boreholes with a 3.05 m well screen. BH19-206 was destroyed during the earthworks activities and hence is not included in this hydrogeological investigation.

3. In June 2022, DS drilled an additional fourteen (14) boreholes (BH22-1 to BH22-14) and equipped five boreholes (BH22-2, BH22-5, BH22-7, BH22-8 and BH22-13) with monitoring wells at the site as for further geotechnical and hydrogeological investigations. Monitoring wells were screened at depths ranging from 6.10 to 13.8 mbgs in different geological units. BH22-8 was also destroyed due to ongoing construction and hence is not included in this hydrogeological investigation.
4. According to the Ontario Geological Survey mapping across the region, the site lies within the South Slope physiographic region of southern Ontario characterized by drumlinized till plains landforms. Surficial geology at the site is mapped as clay-silt textured till derived from glaciolacustrine deposits or shale. Shale bedrock of the Queenston formation was encountered during drilling varying in depth from 7.6 mbgs to 15.4 mbgs indicative of an incised valley infilled with till sediments.
5. Groundwater levels were measured in all five (5) monitoring wells (BH22-2, BH22-5, BH22-7, BH22-13 and BH19-200) on June 16, 2022, by DS. Groundwater levels varied between 3.2 to 8.3 mbgs or 159.4 to 153.4 meters above sea level (masl) at the site. Based on groundwater elevations, the flow direction is expected to be towards Joshua Creek.
6. Five (5) Single Well Response Tests (slug tests) were completed by DS on June 16, 2022, to estimate the hydraulic conductivity (k) for the representative geological units in which the wells were screened. The k-values ranged between 1.42×10^{-7} to 2.81×10^{-9} m/s with a geomean k-value of 9.01×10^{-9} m/s.
7. Short-Term Dewatering or Construction Dewatering: The requirement for dewatering or groundwater control during the construction period is as follows.

Phase 2- Building with Two(2) Levels (P2)	Short-term Dewatering
Estimated Flow Rate- L/day (without safety factor)	4,000
Estimated Flow Rate- L/day (with safety factor x 1.5)	8,000
Additional Dewatering- Stormwater (assumed 10 mm /24 hrs)- L/day	39,000
Total Dewatering Rate/Design Rate- L/day)	47,000

8. Permanent Drainage or Foundation Drain: Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. The estimated permanent flow rate is as below.

Phase 2- Building with Two(2) Levels (P2)	Permanent Drainage or Long-term Discharge
Estimated Flow Rate- L/day (without safety factor)	1,000
Estimated Flow Rate- L/day (with safety factor x 1.5)	2,000

9. Permit Requirements:

- The expected design dewatering rate during construction for Phase 2 is expected to be less than 50,000 L/day. Therefore, an EASR or a PTTW application is not required to be submitted to the MECP for short-term dewatering.
- Based on current groundwater conditions, permanent groundwater flow or permanent drainage is expected to be less than the water-taking limit of 50,000 L/day, therefore, a PTTW is not required permanently.

10. One (1) unfiltered groundwater sample was collected from monitoring well BH 22-13 on June 24, 2022, to assess the suitability for discharge of groundwater to the Halton Region sanitary and combined sewers, the Town of Oakville storm sewers and the PWQO criteria. The reported analytical results indicate that Sulphates exceeded the Halton Region's sewer criteria, but several parameters exceeded the Town of Oakville's storm sewer criteria and PWQO. Therefore, groundwater encountered during construction at the site is not suitable for discharge into the Halton Region's sanitary and combined sewers, the Town of Oakville's storm sewers or near by water bodies without pre-treatment.

11. Following the completion of construction activities, all dewatering wells, well points, eductors and monitoring wells installed at various stages of this project must be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system must be conducted by a licensed water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

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- Appendix B Hydraulic Conductivity Analysis
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1.0 INTRODUCTION

DS Consultants Limited (DS) was retained by Mattamy Corporation to complete a hydrogeological investigation for the proposed development at 1429 Dundas Street East in Oakville, Ontario (herein referred to as “the site “). The location of the site is shown in Figure 1. The proposed development is divided into four (4) phases. The hydrogeological investigation presented here is for Phase 2 of the proposed development. The Phase 2 development will be comprised of a seven (7) storey building with two (P2) levels of underground parking. As per the design drawings available to DS, the proposed ground floor elevation is 161.8 masl and the floor elevation of P2 levels is 154.8 meters above sea level (masl).

This hydrogeological investigation includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, an assessment of the hydrogeological constraints, impacts of the proposed development on the local groundwater, and provides an estimation of construction dewatering during the proposed development phase. If needed, the results of this investigation can be used in support of an application for a Category 3 Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) for construction dewatering from the Ministry of the Environment Conservation and Parks (MECP).

1.1 Purpose

The purpose of this investigation was to review and determine the need for dewatering, estimate dewatering rates, assess groundwater quality and determine the need for a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the Ministry of Environment, Conservation and Parks (MECP) in addition to requirements to obtain discharge permits from the Halton Region if needed. Potential impacts related to construction dewatering and associated monitoring/mitigation measures were also to be investigated.

1.2 Scope of Work

The scope of work for this investigation included:

- Site visits.
- Desktop review of pertinent geological and hydrogeological resources.
- Review the MECP Water Well Records and water use in the surrounding area.
- Fieldwork includes drilling six (6) boreholes in November 2019, and thirteen (13) boreholes in June 2022.

- Conducting single well response tests (slug tests) to determine hydraulic conductivity values across the site.
- Characterize the stratigraphy and measure the groundwater levels across the site.
- Collection and analysis of groundwater samples to quantify and characterize any contaminants that may impact future discharge applications.
- Estimation of construction dewatering volumes, which is to be used to predict the short-term groundwater control requirements for the construction of the proposed building(s) on the site.

2.0 FIELDWORK

- In November 2019, DS drilled six (6) boreholes (BH19-200 to BH19-206) and equipped two (2) drilled boreholes (BH19-200 and BH19-206) with monitoring wells at the development site as part of preliminary geotechnical and hydrogeological investigations for Phase 1 to Phase 4 development. The boreholes were advanced to depths ranging from 10.9 to 12.7 meters below the ground surface (mbgs). Monitoring wells were screened at the bottom of boreholes with a 3.05 m well screen. BH19-206 was destroyed during the earthworks activities and hence is not included in this hydrogeological investigation.
- In June 2022, DS drilled an additional fourteen (14) boreholes (BH22-1 to BH22-14) and equipped five boreholes (BH22-2, BH22-5, BH22-7, BH22-8 and BH22-13) with monitoring wells at the site as for further geotechnical and hydrogeological investigations. Monitoring wells were screened at depths ranging from 6.10 to 13.8 mbgs in different geological units. BH22-8 was also destroyed due to ongoing construction and hence is not included in this hydrogeological investigation.
- All monitoring wells were developed before any use to allow for groundwater level monitoring, hydraulic conductivity testing, and to assess groundwater quality.
- Five (5) single well response tests (SWRTs) were completed by performing a rising head test (slug test) to estimate the hydraulic conductivity values of the soils at the site.
- One (1) unfiltered groundwater sample was also collected and analyzed for the parameters listed under the Halton Region sewer discharge by-law, the Town of Oakville storm sewer discharge by-law, and PWQO for surface water discharge.

3.0 PHYSICAL SETTING

Available topographic maps and environmental, geotechnical, and hydrogeological reports were used to develop an understanding of the physical setting of the study area. Borehole logs and the MECR WWRs were used to interpret the geological and hydrogeological conditions at the development site.

3.1 Physiography and Drainage

The topography at the development site slopes towards Joshua Creek located about 65 m to the north side of the Site. Surface elevation across the site ranges from 160.5 to 164.5 masl. Drainage in the study area is controlled by streams, artificial channels, and the local topography, and may also be influenced by fill and underground utilities.

3.2 Geology

The following presents a brief description of regional and development site geology based on the review of available information and development site-specific soil investigations.

3.2.1 Quaternary Geology

According to the Ontario Geological Survey mapping across the region, the site lies within the South Slope physiographic region of southern Ontario and is characterized by drumlinized till plains landforms. Surficial geology at the site is mapped as clay-silt textured till derived from glaciolacustrine deposits or shale. The surficial geology map is shown in **Figure 2**.

3.2.2 Bedrock Geology

According to the Ontario Geological Survey mapping across the region, the bedrock at the site is comprised of shale, limestone, dolostone, and siltstone of the Queenston Formation. Shale Bedrock of Queenston formation was encountered during drilling varied in depth from 7.6-15.4 mbgs indicating the presence of an incised valley.

3.2.3 Site Geology/ Soil Conditions

On-site subsurface soil conditions were summarized from the boreholes advanced by DS for the current investigation. Detailed subsurface conditions are presented in **Figure 5**, and the borehole logs are presented in **Appendix A**. The subsurface conditions in the boreholes are summarized in the following paragraphs.

Topsoil and Fill Materials

Topsoil was encountered in the majority of the boreholes varying in thickness from 100 to mm. Fill material was encountered in all boreholes except BH22-7, BH22-8, BH22-12 and BH22-13(Silty clay till was encountered instead), extending to depths ranging from 0.8 m to 2.3 m.

Silty Clay Till:

Below the fill material, upper native soil consisting of silty clay till was encountered in all boreholes extending to a depth ranging from 0-12.2 mbgs. BH22-7, BH22-8, BH22-12, and BH22-13 encountered

silty clay till on the surface. Silty clay till was overlain on shale complex or shale bedrock, except for BH22-11, BH22-12, and BH22-14 where the silty clay till was underlain by sandy silt to silty sand till.

Sandy Silt to Silty Sand Till:

BH22-11, BH22-12, and BH22-14 encountered sandy silt to silty sand till deposits overlain on shale/shale complex, extending to depths ranging from 9.1-12.2 mbgs.

Shale Bedrock:

Shale bedrock of Queenston formation was encountered in BH22-1 to BH22-14, BH19-200 and BH19-203 at depths ranging from 7.6-15.4 mbgs, dipping south to north towards Joshua Creek.

3.3 Hydrogeology

The hydrogeology at the site was evaluated using the on-site monitoring wells installed by DS, and the MECP WWRs in the study area.

3.3.1 Local Groundwater Use

As part of the hydrogeological investigation, DS completed a search of the MECP Water Well Records (WWRs) database (**Appendix D**). Based on the MECP WWR search, there are fifty-four (54) water wells within 500 meters of the site. Two (2) wells were noted for domestic (DO) use and two (2) wells were noted for irrigation (IR) use. All other wells were noted as either monitoring (MO), test hole (TH) or not in use (NU). A water well survey is recommended within the study area to confirm the presence and use of any domestic wells. **Figure 1** shows the MECP water well location plan. A water well survey is recommended within the study area to confirm the presence and use of any domestic wells.

3.3.2 Groundwater Conditions

Groundwater levels were measured in all available monitoring wells on June 16, 2022, by DS. **Table 3-1** presents the groundwater levels in all monitoring wells. Groundwater levels varied between 3.2 to 8.4 mbgs or 153.4-159.4 masl. Based on groundwater elevations, the flow direction is expected to be southeast towards Joshua Creek. The groundwater levels are subject to seasonal fluctuations and may vary in response to changing climate conditions and may also affect the shallow groundwater flow direction at the Site. Infilled material and underground utilities may also affect shallow groundwater flow direction at the Site.

Table 3-1: Groundwater Levels in Monitoring Wells on June 16, 2022

Well ID/ Location	Ground Elevation (masl)	Well Depth (mbgs)	Screened Interval (masl)	Depth to Water (mbgs)	Groundwater Elevation (masl)
BH22-2	161.306	9.7	6.7-9.7	3.68	157.63

Well ID/ Location	Ground Elevation (masl)	Well Depth (mbgs)	Screened Interval (masl)	Depth to Water (mbgs)	Groundwater Elevation (masl)
BH22-5	162.534	10.7	7.7-10.7	3.24	159.29
BH22-7	161.855	9.10	6.10-9.10	8.30	153.56
BH22-13	161.525	13.7	10.7-13.7	6.05	155.48
BH19-200	163.126	10.7	7.7-10.7	5.54	157.59

3.3.3 Hydraulic Conductivity

Five (5) Single Well Response Tests (slug tests) were completed by DS on June 16, 2022, to estimate hydraulic conductivity (k) for the representative geological units in which the wells were screened. The testing was completed using data loggers placed at the bottom of the monitoring wells to accurately measure the change in the hydraulic head versus time. Hydraulic conductivity (k) values were calculated using the Hvorslev method using the AquiferTest® Software. The semi-log plots for normalized drawdown versus time are provided in **Appendix B**. The k-values ranged between 1.42×10^{-7} to 2.81×10^{-9} m/s with a geomean k-value of 9.01×10^{-9} m/s. **Table 3-2** presents the Hydraulic Conductivity (k) values for the representative geological units.

Table 3-2: Summary of Hydraulic Conductivity (k) Test Results

Well ID	Screened Interval (mbgs)	Screened Formation	K-value (m/s)
BH22-2	6.7-9.7	Shale complex/shale bedrock	3.58×10^{-8}
BH22-5	7.7-10.7	Clay silt till-sandy silt till	2.81×10^{-9}
BH22-7	6.10-9.10	Silty clay till	1.52×10^{-9}
BH22-13	10.7-13.7	Silty clay till-sandy silt till	2.74×10^{-9}
BH19-200	7.7-10.7	Clay silt till-sandy silt till	1.42×10^{-7}

3.3.4 Groundwater Quality

One (1) unfiltered groundwater sample was collected from monitoring well BH 22-13 on June 24, 2022, to assess the suitability for discharge of groundwater to the Halton Region sanitary and combined sewers and the Town of Oakville storm sewers. The analytical results were also compared to Provincial Water Quality Objectives (PWQOs) to assess the baseline water quality conditions and suitability for discharge overland. The groundwater samples were submitted to SGS Laboratories in Lakefield, Ontario. SGS is certified by the Canadian Association of Laboratory Accreditation Inc. (CALA) and the Canadian Standard Association (CSA). The reported analytical results indicate that only Sulphates exceeded the Halton Region’s sewer criteria, but several parameters exceeded the Town of Oakville’s storm sewer criteria and the PWQOs. **Table 3-3** and **Table 3-4** present a summary of the exceeded parameters, and the certificates of analyses are provided in **Appendix C**.

Table 3-3: Parameters in Groundwater Exceeding Halton Region Sewer Use By-Law and Town of Oakville Storm Sewer Use By-law

Parameter	Unit	Halton Region Sanitary Sewer By-Law Criteria	Halton Region/Town of Oakville Storm Sewer By-Law Criteria	BH20-10
Total Suspended Solids (TSS)	mg/L	350	15	<u>84</u>
Sulphates	mg/L	1500	--	2,900
Hexachlorobenzene	mg/L	--	0.00004	<u>1.86</u>
Manganese	mg/L	5	0.05	<u>0.455</u>
<u>0.00</u> - Exceeds Storm Sewer Criteria; 0.00(bold) - Exceeds Sanitary and Combined Sewer Criteria; 0.00				

Table 3-4: Parameters in Groundwater Exceeding PWQO

Parameter	Unit	PWQO Criteria	BH20-10
Aldrin + Dieldrin	mg/L	1x10 ⁻⁶	< 0.00002 *
Chlordane	mg/L	6x10 ⁻⁵	< 0.001 *
DDT+Metabolites	mg/L	3x10 ⁻⁶	< 0.00004 *
Hexachlorobenzene	mg/L	6.5x10 ⁻⁶	< 0.0001 *
Cobalt	mg/L	0.0009	0.00126
Copper	mg/L	0.001	0.127
Iron	mg/L	0.3	0.526
Phosphorus	mg/L	0.01	0.041
4AAP-Phenolics	mg/L	0.001	0.004
0.00 - Exceeds PWQO Criteria; 0.00* - Detection Limit Exceeds PWQO			

4.0 CONSTRUCTION DEWATERING

4.1 Estimation of Flow Rates- Proposed Building

The Phase 2 development will be comprised of a seven (7) storey building with two (P2) levels of underground parking. As per the design drawings available to DS, the proposed ground floor elevation is 161.8 masl and the floor elevation of P2 levels is 154.8 meters above sea level (masl). The highest groundwater elevation is 159.3 masl and hence dewatering will be required during excavation. The dewatering volume was estimated using the steady-state equation as below in **Table 4-1**. The groundwater flux is expected to be limited because of the low hydraulic conductivity of the till.

$$Q = \frac{\pi(H^2 - h^2)}{2.3 \log\left(\frac{R_0}{re}\right)} \quad \text{Eq.1}$$

$$R_0 = C(H - h)\sqrt{k} \quad \text{Eq.2}$$

$$r_e = \sqrt{\frac{ab}{\pi}}$$

Eq.3

Table 4-1: Dewatering Flow Rates (Short-term)- Optional Underground two(2) Levels (P2)

Parameters	Phase 2
K -Hydraulic conductivity(geomean) (m/s)	5x 10 ⁻⁸
H-Distance from water level to the bottom of an aquifer (m)	5.5
h -Depth of water in the well while pumping (m)	0
Area -(m ²)	3900
r _e –equivalent radius, where a and b excavation dimensions (m)	36
Radius of the cone of depression Ro+re	39
Estimated Flow Rate- L/day (without safety factor)	4,000
Estimated Flow Rate- L/day (with safety factor x 5)	8,000
Additional Dewatering- Stormwater (assumed 10 mm /24 hrs)- L/day	47,000
Total Dewatering Rate/Design Rate- L/day)	47,000

4.2 Total Estimation of Flow Rate (Short-Term/ Temporary Discharge)

Considering the unsealed excavation method, the estimated steady-state flow rate for Phase 2 with P2 levels would be 8,000 L/day with a safety factor of x 2. Also, the additional flow rate may be needed because of a major precipitation event within 24 hrs. The design flow rate with stormwater consideration would be 47,000 L/day.

4.3 Zones of Influence During Construction

The radius of influence (Ro) for the construction dewatering was calculated based on the Sichardt equation (Equation 2). Ro is the distance at which the drawdown resulting from pumping is negligible. The equation is empirical and was developed to provide representative flow rates using the steady-state flow dewatering equations as indicated above. Under steady-state conditions, the Ro of pumping will extend until boundary flow conditions are reached, and sufficient water inputs are equal to the discharge rate due to pumping. Therefore, the Sichardt equation is used to provide a representative flow rate but is not precise in determining the actual radius of influence by pumping. Based on the Sichardt equation the ZOI is approximately 39 m from the centre of the excavation for the underground parking structure.

4.4 Permanent Drainage (Long-term Discharge)

Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. The estimated permanent flow rate is as below in **Table 4-3**.

Table 4-3: Permanent Flow Rate or Foundation Drain- P2 Levels

Parameters	Phase 2
K -Hydraulic conductivity(geomean) (m/s)	1×10^{-8}
H-Distance from water level to subfloor drainage	3.5
h -Depth of water in the well while pumping (m)	0
Area (m ²)	3900
Estimated Flow Rate- L/day (without safety factor)	1,000
Estimated Flow Rate- L/day (with safety factor x 2)	2,000

4.5 Permit Requirements

4.5.1 Environmental Activity and Sector Registry (EASR) /Permit to Take Water (PTTW) Application

- An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and stormwater for a temporary construction project is between 50,000 L/day and 400,000 L/ day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering. A PTTW is required to be submitted to the MECP if the taking of groundwater and stormwater for a temporary construction project is more than 400,000 L/ day.
- The expected design dewatering rate for Phase 2 is expected to be less than 50,000 L/day, an EASR application or a PTTW is not required to be submitted to the MECP for short-term dewatering. Based on current groundwater conditions, permanent groundwater flow or permanent drainage is expected to be less than the water-taking limit of 50,000 L/day, therefore, a PTTW is not required permanently.

4.5.2 Discharge Permits

A discharge permit will be required from the Halton Region/Town of Oakville if private water is to be sent to the sewer system for construction dewatering and permanent drainage.

5.0 POTENTIAL IMPACTS

The following are the predicted potential impacts due to construction dewatering:

5.1 Local Groundwater Use

Based on the MECP WWRs, there are no private water wells expected in the maximum predicted radius of Influence of about 4 m. Also, the expected dewatering volumes are minimal and therefore, it is not expected short-term or long-term impacts to private water wells occurring from the proposed short-

term dewatering. However, a baseline private well survey and groundwater monitoring may require before construction to confirm groundwater users within the predicted radius of influence.

5.2 Source Protection Area

The site is located within the Halton Region Source Protection Area (SPA). Source Protection Plans contain policies aimed at protecting drinking water sources by reducing or eliminating significant threats to the source of municipal drinking water. No source of municipal water drinking water within the expected radius of influence of about 40 m from the center of the construction. Therefore, no impacts are anticipated on the drinking water supply within the zone of influence.

5.3 Highly Vulnerable Aquifer

The site is not located in a Highly Vulnerable Aquifer (HVA). HVAs are aquifers that are more susceptible to contamination consisting of granular material (i.e., sand & gravel, and fractured rock near the surface of the ground) as

5.4 Wellhead Protection Area

The site and the study area are not located within a municipal Wellhead Protection Area (WHPA). WHPAs are used to identify locations of potential water quantity threats. There are two types of threats: those associated with water demand and those associated with a reduction in groundwater recharge.

5.5 Intake Protection Zone

The site and the study area are not located within an Intake Protection Zone (IPZ). IPZs depend on surface water for municipal water supply and include areas of land adjacent to streams and storm sewers where runoff water can quickly reach an intake.

5.6 Surface Water

The nearest surface body is Joshua Creek located about 50 m away from the northern boundary of the site, not falling within the thermal radius of influence of about 4 m from the edge of the excavation or the property boundary or 39 m from the center of the excavation. The development is likely to be completed in low permeable silty clay to sandy silt till. The horizontal and vertical groundwater movement within the till is expected to be limited and local. As such, any adverse impact is not anticipated on the nearby Joshua Creek because of dewatering activities.

5.7 Point of Discharge and Groundwater Quality

Groundwater quality analysis indicated that Sulphates exceeded the Halton Region sanitary and combined sewer criteria and that several parameters exceeded the Town of Oakville storm sewer and the PWQO criteria. Therefore, groundwater at the development site is not suitable for discharge into

the Halton Region's sanitary and combined sewers and the Town of Oakville's storm sewers and nearby water bodies without pre-treatment. A discharge permit may be required from the Halton Region/Town of Oakville for short-term discharge if water is sent to the Town's sewer system.

6.0 MONITORING AND MITIGATION

Based on the findings of the hydrogeological investigation and associated potential impacts due to development, the following monitoring and mitigation program is provided:

- Baseline groundwater quality has been assessed and established before construction. However, groundwater quality can change based on several factors (land-use change, spills, etc.) and should be monitored during construction dewatering and after construction to ensure that water quality meets the guideline or regulations associated with any permits from the MECP, Halton Region and Town of Oakville.
- If a groundwater dewatering system is set up at the Site, daily and weekly monitoring should be implemented to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality and any adverse impacts because of dewatering.
- In conformance with Regulation 903 of the Ontario Water Resources Act, the decommissioning of any dewatering system and monitoring wells should be carried out by a licensed contractor under the supervision of a licensed water well technician.

7.0 LIMITATIONS

This report was prepared for the sole use of the addressee to provide an assessment of the hydrogeological conditions on the property. The information presented in this report is based on information collected during the completion of the hydrogeological investigation. DS Consultants Limited was required to use and rely upon various information sources produced by other parties. The information provided in this report reflects DS' judgment considering the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of these documents or findings, conclusions, and recommendations represented herein is at the sole risk of said users. The conclusions drawn from the Hydrogeological report were based on information at selected observation and sampling locations. Different conditions between and beyond these locations may become apparent during future investigations or on-site work, which could not be detected or anticipated at the time of this investigation. DS Consultants Ltd. cannot be held responsible for hydrogeological conditions at the site that was not apparent from the available information.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

Prepared By:



**Pradeep Patel, M.Sc., P.Geo.
Hydrogeologist**

Reviewed By:



**Martin Gedeon, M.Sc., P.Geo.
Senior Hydrogeologist**



8.0 CONSULTANT QUALIFICATIONS

Martin Gedeon, M.Sc., P.Geo., is a Professional Geoscientist (P.Geo.) with over 26 years of experience as an environmental/hydrogeological consultant in the areas of groundwater and soil monitoring, environmental site assessments, environmental due diligence, and remediation. Martin has significant experience in physical and contaminant hydrogeology across Canada and overseas and has provided hydrogeological/environmental technical support on various projects. Martin has prepared hundreds of hydrogeological reports in support of permit applications for a private sector development application, municipal dewatering operations, and provincial infrastructure projects across the province.

Pradeep Patel, M.Sc., P.Geo. is a hydrogeologist at DS Consultants Ltd. and has more than 15 years of experience working in the environmental industry. He participates in numerous Hydrogeological and Geotechnical investigation projects. His experience includes the preparation of construction dewatering activities and hydrogeological investigations in support of Environmental Activity and Sector Registry (EASR) and Permit to Take Water (PTTW) applications.

Abdul Qadir, G.I.T is a Geoscientist in Training and has experience with conducting hydrogeological investigations in the Greater Toronto Area (GTA) for development and has been involved with project coordination, field assessments, data interpretation, and reporting. Abdul has assisted with PTTW, EASRs and Discharge Permit applications in support of construction dewatering from the MECP and discharge permits.

9.0 REFERENCES

Approved Source Protection Plan: CTC Source Protection Region. Prepared by: CTC Source Protection Committee. Amendment (Version 2.0). Effective March 25, 2019

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

Ontario Regulation 245/11- Environmental Activity and Sector Registry.

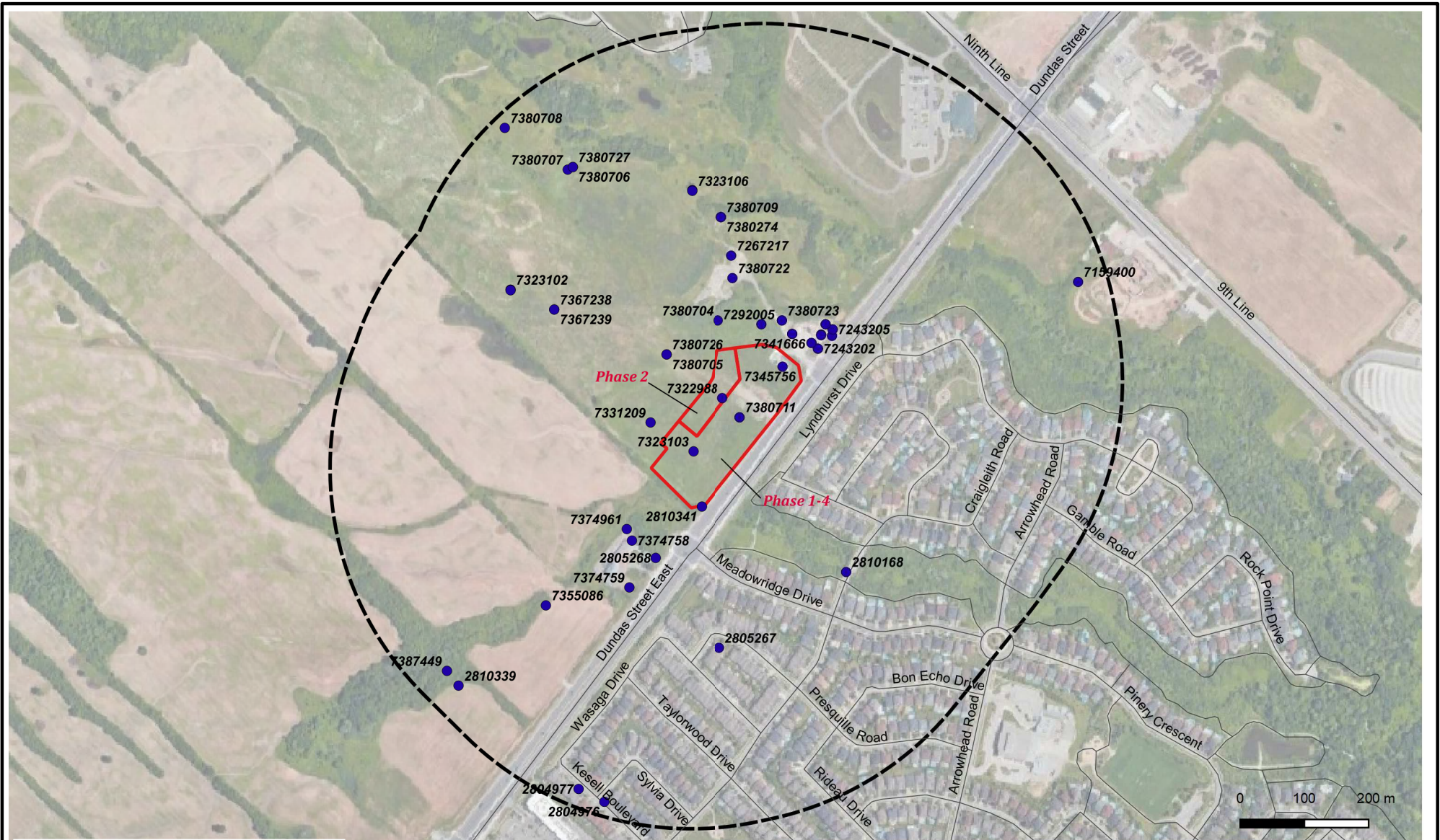
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Powers, J. Patrick, P.E. (1992); Construction Dewatering: New Methods and Applications - Second Edition, New York: John Wiley & Sons.



Pat M. Cashman and Martin Preene; Groundwater Lowering in Construction- Second Edition, CRC Press.

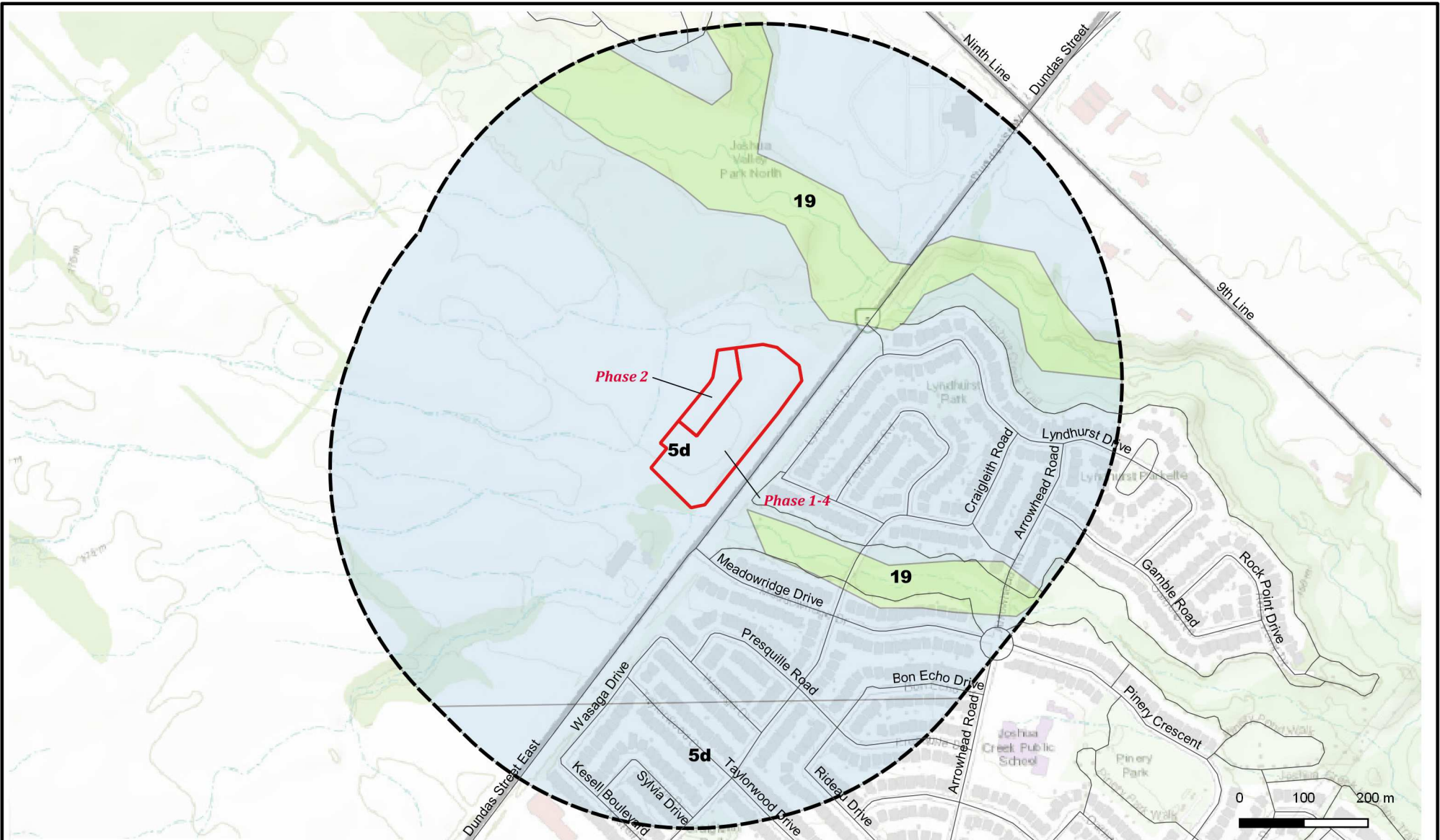
FIGURES



Legend



- Approx Property boundary
- 500m Buffer
- Registered Water Well (MECP WWR)

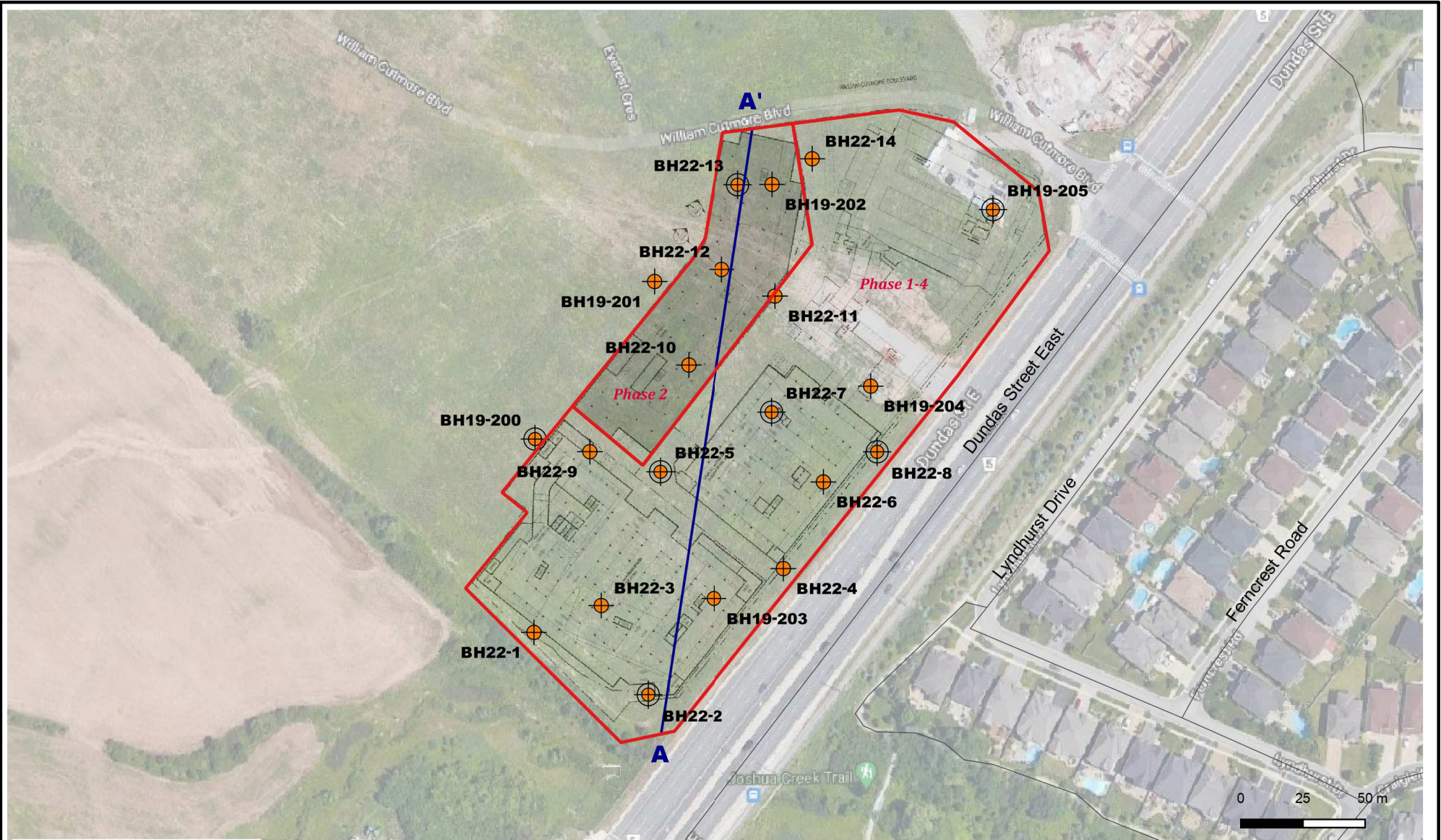
 <p>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project: HYDROGEOLOGICAL INVESTIGATION Clockwork - Phase 2 - 1429 Dundas Street E., Oakville, ON			
	Title: SITE LOCATION AND MECP WELL RECORDS			
Client: MATTAMY DEVELOPMENT CORP.	Size: 8.5 x 11	Approved By: A.Q	Drawn By: S.Y	Date: August 2023
Rev: 0	Scale: As Shown		Project No.: 19-294-101	Figure No.: 1
Image/Map Source: Google Satellite Image				



Legend



- Approx Property boundary
- 500m Buffer
- 19 - Modern Alluvium
- 5d - Till

 <p>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project: HYDROGEOLOGICAL INVESTIGATION Clockwork - Phase 2 - 1429 Dundas Street E., Oakville, ON			
	Title: SURFICIAL GEOLOGY MAP			
Client: MATTAMY DEVELOPMENT CORP.	Size: 8.5 x 11	Approved By: A.Q	Drawn By: S.Y	Date: August 2023
	Rev: 0	Scale: As Shown	Project No.: 19-294-101	Figure No.: 2
Image/Map Source: Google Satellite Image				

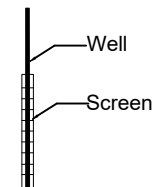
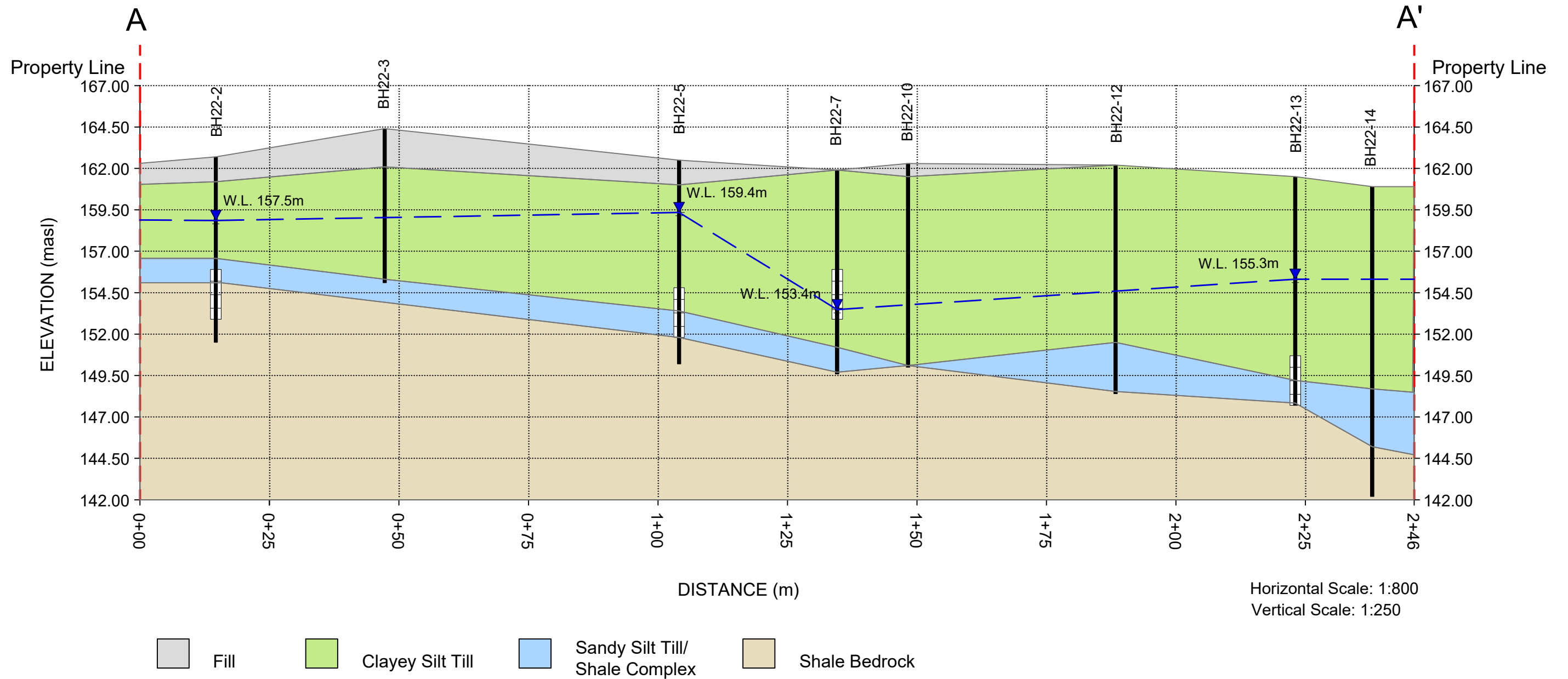


Legend

- Approx Property boundary
- Borehole
- Monitoring Well
- Cross Section

 <p>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project: HYDROGEOLOGICAL INVESTIGATION Clockwork - Phase 2 - 1429 Dundas Street E., Oakville, ON			
	Title: BOREHOLE AND MONITORING WELL LOCATIONS			
Client: MATTAMY DEVELOPMENT CORP.	Size: 8.5 x 11	Approved By: A.Q	Drawn By: S.Y	Date: August 2023
	Rev: 0	Scale: As Shown	Project No.: 19-294-101	Figure No.: 3
Image/Map Source: Google Satellite Image & PDF Image				

Path:j:\gis\2019 projects\19-294-100 bressa duc block\7-misc\cad\geological cross section.dwg



DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: HYDROGEOLOGICAL INVESTIGATION
Clockwork - Phase 2 - 1429 Dundas Street E., Oakville, ON

Title: **GEOLOGICAL CROSS SECTION A-A'**

Client: **MATTAMY DEVELOPMENT CORP.**

Size: 11 X 17	Approved By: A.Q	Drawn By: S.Y	Date: August 2023
Rev.	Scale: As Shown	Project No: 19-294-101	Figure No. 4

APPENDICES

Appendix A: Borehole Logs

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817505.29 E 604735.45

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-08-2022
 REF. NO.: 19-294-101
 ENCL NO.: 2

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
163.7	TOPSOIL: 200mm		1	SS	7									
163.9	FILL: silty clay, trace topsoil/rootlets, brown, moist, firm to stiff		2	SS	11									
162.2	SILTY CLAY TILL: some sand to sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, very stiff to hard grey at 4.6m		3	SS	21								4 15 54 27	
			4	SS	29									
			5	SS	31									
			6	SS	32									
			7	SS	50/150mm									
157.6	SILTY CLAY TILL/SHALE COMPLEX: reddish brown, moist, hard		8	SS	50/50mm									
156.1		SHALE BEDROCK: Queenston Formation, reddish brown, weathered TCR=100%, SCR=86%, RQD=86% Hard layer=5%, Maximum hard layer thickness=50mm TCR=100%, SCR=96%, RQD=96% Hard layer=22%, Maximum hard layer thickness=130mm TCR=100%, SCR=100%, RQD=100% Hard layer=22%, Maximum hard layer thickness=120mm	R1	RC										
155.8			R2	RC										
154.0	R3		RC											
152.5	END OF BOREHOLE: Notes: 1) Rock core starts at 7.8m.													

DS SOIL LOG-2021-FINAL 19-294-101 GEO COPY.GPJ DS.GDT 22-7-7

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817480.23 E 604781.44

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-09-2022
 REF. NO.: 19-294-101
 ENCL NO.: 3

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
161.3	TOPSOIL: 100mm	1	SS	7										
160.9	FILL: silty clay, trace topsoil/rootlets, brown, moist, firm to stiff	2	SS	12										
159.8	SILTY CLAY TILL: some sand, trace gravel, occasional cobble/boulder, reddish brown, moist, very stiff to hard	3	SS	22										
159.2		4	SS	31										
158.6		5	SS	36										
158.0		6	SS	21										
157.4		7	SS	50/30mm										
155.2	CLAYEY SILT TILL/SHALE COMPLEX: reddish brown, moist, hard	8	SS	50/30mm										5 27 53 15
153.7	SHALE BEDROCK: Queenston Formation, reddish brown, weathered TCR=85%, SCR=57%, RQD=43% Hard layer=19%, Maximum hard layer thickness=50mm TCR=100%, SCR=95%, RQD=83% Hard layer=23%, Maximum hard layer thickness=100mm TCR=100%, SCR=100%, RQD=99% Hard layer=11%, Maximum hard layer thickness=50mm	R1	RC	50mm										
153.7		R2	RC											
151.6		R3	RC											
150.1														
11.2	END OF BOREHOLE: Notes: 1) 50mm dia, monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): June 14, 2022 3.8													

DS SOIL LOG-2021-FINAL 19-294-101 GEO COPY.GPJ DS.GDT 22-7-7

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817516.1 E 604762.52

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-08-2022
 REF. NO.: 19-294-101
 ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
164.4	TOPSOIL: 100mm		1	SS	12										
163.9	FILL: silty clay, mixed with shale fragments, trace organics, trace topsoil/rootlets, grey to dark brown, moist, firm to stiff some organics at 1.5m		2	SS	9										
162.1			3	SS	7										
162.3	SILTY CLAY TILL: some sand, trace gravel, occasional cobble/boulder, reddish brown, moist, very stiff to hard		4	SS	50/ 30mm										
161.4			5	SS	31										
160.6			6	SS	55										
159.6	grey at 6.1m		7	SS	21										
158.7			8	SS	67										
157.8	reddish brown at 7.6m														
155.9															
155.2	SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense		9	SS	50/ 75mm										
154.9	SHALE BEDROCK: Queenston Formation, reddish brown, weathered														
154.9	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.														

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817530.99 E 604836.16

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-01-2022
 REF. NO.: 19-294-101
 ENCL NO.: 5

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
162.7	TOPSOIL: 100mm		1	SS	7									
160.0	FILL: silty clay, trace shale pieces, trace topsoil/rootlets, grey to brown, moist, firm trace organics at 0.8m		2	SS	5									
160.4			3	SS	7									
160.4	SILTY CLAY TILL: trace to some sand, trace gravel, reddish brown, moist, very stiff to hard		4	SS	68									
159.6			5	SS	42									
158.8	grey, wet silt layer at 4.6m		6	SS	24									
157.6			7	SS	24									
156.8			8	SS	44									
153.6	SANDY SILT TILL/SHALE COMPLEX: trace clay, trace gravel, reddish brown, moist, very dense		9	SS	50/ 30mm									
152.8														
151.9	SHALE BEDROCK: weathered, reddish brown													
10.8	END OF BOREHOLE: Notes: 1) Water was at depth of 4.6m during drilling.		10	SS	50/ 25mm									

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817569.95 E 604786.36

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-01-2022
 REF. NO.: 19-294-101
 ENCL NO.: 6

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
162.5	TOPSOIL: 150mm													
160.9	FILL: silty clay, trace shale pieces, trace topsoil/rootlets, reddish brown, moist, stiff	1	SS	13										
161.0		2	SS	9										
161.5	SILTY CLAY TILL: some sand to sandy, trace gravel, occasional cobble, reddish brown, moist, stiff to hard	3	SS	33										
162.0		4	SS	32										
163.0		5	SS	20										
164.0														
165.0	grey at 4.6m	6	SS	13									7 21 49 23	
166.0		7	SS	34										
167.0		8	SS	50/ 150mm									5 26 48 21	
168.0														
169.1	SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense	9	SS	53										
170.0	SHALE BEDROCK: weathered, reddish brown	10	SS	50/ 25mm										
171.0														
172.3	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): June 15, 2022 3.2	11	SS	50/ 25mm										

W. L. 159.4 m
Jun 14, 2022

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817565.85 E 604852.28

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-07-2022
 REF. NO.: 19-294-101
 ENCL NO.: 7

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
162.1	TOPSOIL: 150mm		1	SS	11									
160.9	FILL: silty clay, reddish brown, moist, stiff		2	SS	20									
161.3	SILTY CLAY TILL: some sand, trace gravel, occasional cobble, reddish brown, moist, very stiff to hard grey at 4.6m		3	SS	29									
162.0			4	SS	25									
162.8			5	SS	25									
163.6			6	SS	24									
164.4			7	SS	27									
165.2			8	SS	39									
166.0	SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense		9	SS	51									
166.8			10	SS	50/ 25mm									
167.6	SHALE BEDROCK: Queenston Formation, reddish brown, weathered TCR=95%, SCR=86%, RQD=83% Hard layer=17%, Maximum hard layer thickness=100mm TCR=97%, SCR=97%, RQD=92% Hard layer=20%, Maximum hard layer thickness=100mm TCR=100%, SCR=100%, RQD=93% Hard layer=10%, Maximum hard layer thickness=50mm		11	SS	50/ 25mm									
168.4			R1	RC										
169.2			R2	RC										
170.0			R3	RC										
170.8	END OF BOREHOLE: Notes: 1) Borehole was wet at the bottom upon completion.													

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GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817593.97 E 604831.45

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-06-2022
 REF. NO.: 19-294-101
 ENCL NO.: 8

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)								
161.9 0.0	SILTY CLAY TILL: some sand to sandy, trace gravel, occasional cobble, reddish brown, moist, very stiff to hard grey at 4.6m		1	SS	15		20 40 60 80 100 UNCONFINED + FIELD VANE & Sensitivity QUICK TRIAXIAL X LAB VANE	20 40 60 80 100	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30	
161			2	SS	33											161
160			3	SS	22											160
159			4	SS	17											159
158			5	SS	25											158
157			6	SS	50/ 50mm											157
156			7	SS	24											156
155			8	SS	18											155
154			9	SS	32											154
153.4			10	SS	47											153.4
151.2 10.7	SILTY CLAY TILL/SHALE COMPLEX: reddish brown, moist, hard		11	SS	50/ 50mm	W. L. 153.4 m Jun 14, 2022	20 40 60 80 100	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30	10 20 30		
149.9 148.6	SHALE BEDROCK: weathered, reddish brown		12	SS	50/ 50mm										149.9	
12.3	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): June 14, 2022 8.4															

DS SOIL LOG-2021-FINAL 19-294-101 GEO COPY.GPJ DS.GDT 22-7-7

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , X 3 : Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817577.99 E 604873.88

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-02-2022
 REF. NO.: 19-294-101
 ENCL NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60	80	100
160.6 0.0	SILTY CLAY TILL: sandy, trace gravel, occasional cobble, reddish brown, moist, stiff to hard grey at 3.1m		1	SS	13													
160			2	SS	30													
159			3	SS	56													
158			4	SS	50/ 30mm													
157			5	SS	31													
156			6	SS	22													
155			7	SS	32													
154			8	SS	53													
153			9	SS	73													
152			10	SS	50/ 100mm													
149.9 10.7	SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense		10	SS	50/ 100mm													
148.6 11.8	SHALE BEDROCK: weathered, reddish brown		11	SS	50/ 25mm													
12.3	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): June 14, 2022 destroyed																	

DS SOIL LOG-2021-FINAL 19-294-101 GEO COPY.GPJ DS.GDT 22-7-7

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817578.04 E 604757.94

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-02-2022
 REF. NO.: 19-294-101
 ENCL NO.: 10

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
163.0	TOPSOIL: 100mm		1	SS	12									
160.9	FILL: silty clay, trace gravel, brown, moist, stiff to very stiff		2	SS	22									
161.5	SILTY CLAY TILL: sandy, trace gravel, occasional cobble, reddish brown, moist, stiff to hard grey at 4.6m		3	SS	27									
161.0			4	SS	24									
160.5			5	SS	13									
159.5			6	SS	11									6 25 47 22
158.5			7	SS	29									
157.5		8	SS	36										
153.9	SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense		9	SS	50/ 30mm									
152.5	SHALE BEDROCK: weathered, reddish brown		10	SS	50/ 25mm									
150.3	END OF BOREHOLE: Notes: 1) Borehole was wet at the bottom upon completion.													

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817612.93 E 604797.78

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-09-2022
 REF. NO.: 19-294-101
 ENCL NO.: 11

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
162.3														
0.0	FILL: silty clay, some gravel, brown, moist, very stiff		1	SS	17									
161.5														
0.8	SILTY CLAY TILL: some sand to sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, stiff to hard		2	SS	36									
			3	SS	42									
			4	SS	36									
			5	SS	34									
			6	SS	10									
			7	SS	28									
			8	SS	53									
			9	SS	42									
			10	SS	59									
150.3														
150.0	SHALE BEDROCK: weathered, reddish brown		11	SS	50/25mm									
12.3	END OF BOREHOLE: Notes: 1) Borehole was wet at the bottom upon completion.													

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817640.69 E 604832.79

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-03-2022
 REF. NO.: 19-294-101
 ENCL NO.: 12

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
161.7	0.0 FILL: silty clay, some gravel, brown, moist, firm to stiff	[Cross-hatched pattern]	1	SS	7										
160.2			2	SS	9										
1.5	SILTY CLAY TILL: sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, stiff to hard	[Diagonal lines]	3	SS	24										
			4	SS	32										
			5	SS	21										
			6	SS	19										
			7	SS	13										
	grey below 6.1m		8	SS	33										
52.6	SANDY SILT TILL: trace clay, trace gravel, grey, moist, very dense wet at 10.7m	[Dotted pattern]	9	SS	50										
9.1			10	SS	79										
149.3			11	SS	50/										
149.4	SHALE BEDROCK: Queenston Formation, reddish brown, weathered														
12.6	END OF BOREHOLE: Notes: 1) Water at the depth of 10.7m during drilling.														

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817685.5 E 604817.76

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-06-2022
 REF. NO.: 19-294-101
 ENCL NO.: 14

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60	80
161.5	SILTY CLAY TILL: sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, stiff to hard grey below 3.1m		1	SS	19												
161			2	SS	33												
160			3	SS	38												
159			4	SS	32												
158			5	SS	18												
157			6	SS	18												
156			7	SS	12												
154			8	SS	45												
153			9	SS	20												
151			10	SS	50/ 100mm												
149.3			SANDY SILT TILL/SHALE COMPLEX: reddish brown, moist, very dense		11	SS	53										
148.0	SHALE BEDROCK: weathered, reddish brown	12	SS		50/ 100mm												
147.7	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): June 14, 2022 6.2																

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W. L. 155.3 m
Jun 14, 2022

5 27 49 19

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation - DUC Phases 2 & 3
 CLIENT: Mattamy Homes
 PROJECT LOCATION: 1429 Dundas St. E, Oakville, ON
 DATUM: Geodetic
 BH LOCATION: See Drawing 1 N 4817695.96 E 604847.76

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Jun-03-2022
 REF. NO.: 19-294-101
 ENCL NO.: 15

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
160.9														
0.0	FILL: silty clay, trace sand, brown, moist, firm		1	SS	7									
160.1														
0.8	SILTY CLAY TILL: some sand to sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, stiff to hard		2	SS	19									
			3	SS	25									
			4	SS	14									
	grey below 3.1m		5	SS	11									
			6	SS	10									
			7	SS	17									
			8	SS	38									
			9	SS	20									
			10	SS	50/ 75mm									
148.7														
12.2	SILTY SAND TILL: trace clay, trace gravel, reddish brown, very moist, very dense		11	SS	50/ 130mm									9 44 42 5
			12	SS	50/ 75mm									
145.6														
15.3	SHALE BEDROCK: Queenston Formation, reddish brown, weathered TCR=100%, SCR=100%, RQD=82% Hard layer=22%, Maximum hard layer thickness=130mm		13 R1	SS RC	50/ 50mm									
			R2	RC										
143.7														
17.2	TCR=95%, SCR=80%, RQD=70% Hard layer=17%, Maximum hard layer thickness=100mm		R3	RC										
142.2														
18.7	END OF BOREHOLE: Notes: 1) Rock core starts at 15.7m.													

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GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

Appendix B: Hydraulic Conductivity Analysis

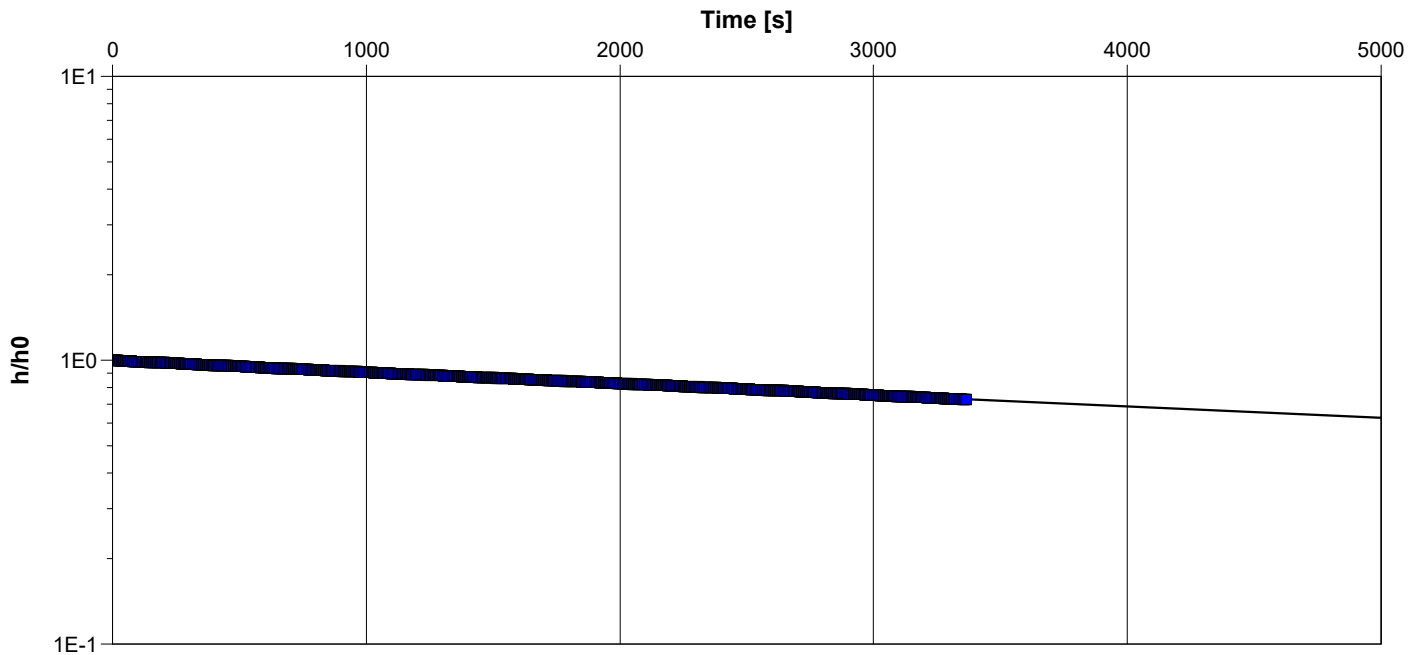
Slug Test Analysis Report

Project: 1429 Dundas St W, Oakville

Number: 19-294-101

Client: Mattamy

Location:	Slug Test: BH22-2	Test Well: BH22-2
Test Conducted by: A.Q		Test Date: 6/16/2022
Analysis Performed by: A.Q	Slug test BH22-2	Analysis Date: 7/4/2022
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH22-2	3.59×10^{-8}	

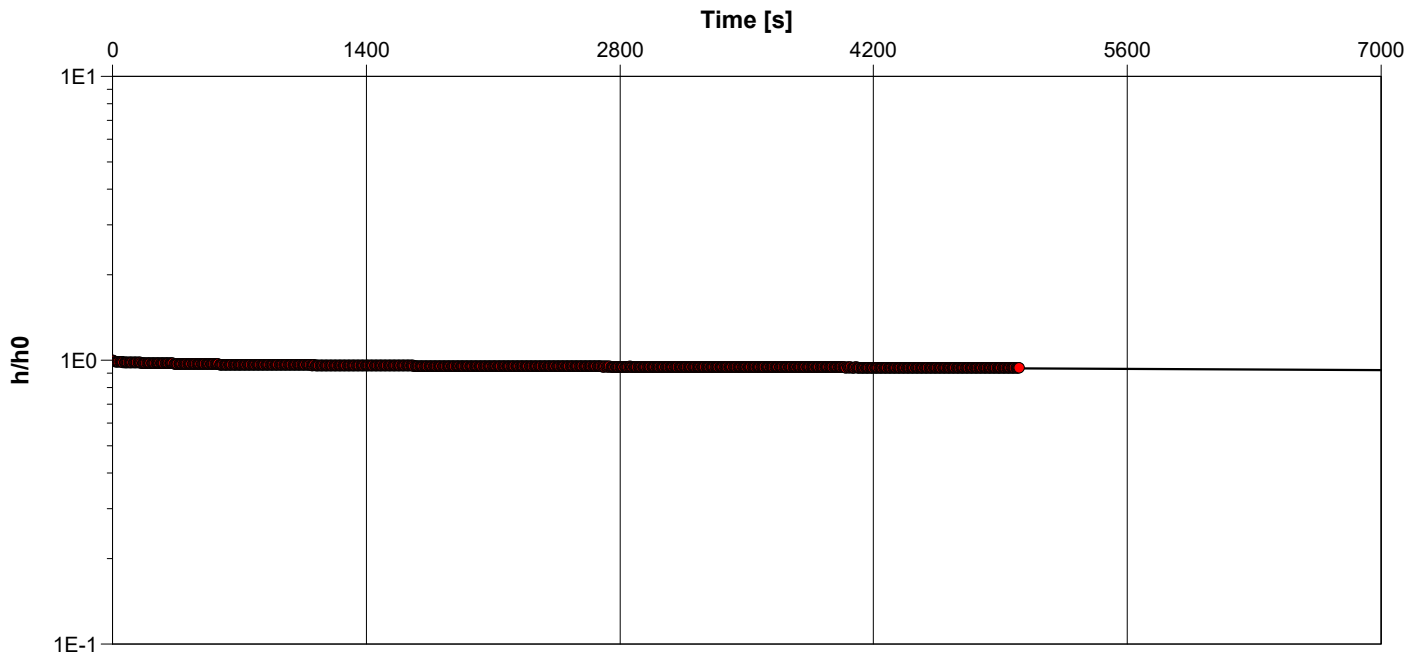
Slug Test Analysis Report

Project: 1429 Dundas St W, Oakville

Number: 19-294-101

Client: Mattamy

Location:	Slug Test: BH22-5	Test Well: BH22-5
Test Conducted by:		Test Date: 6/16/2022
Analysis Performed by: A.Q	Slug test BH22-5	Analysis Date: 7/4/2022
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH22-5	2.81×10^{-9}	

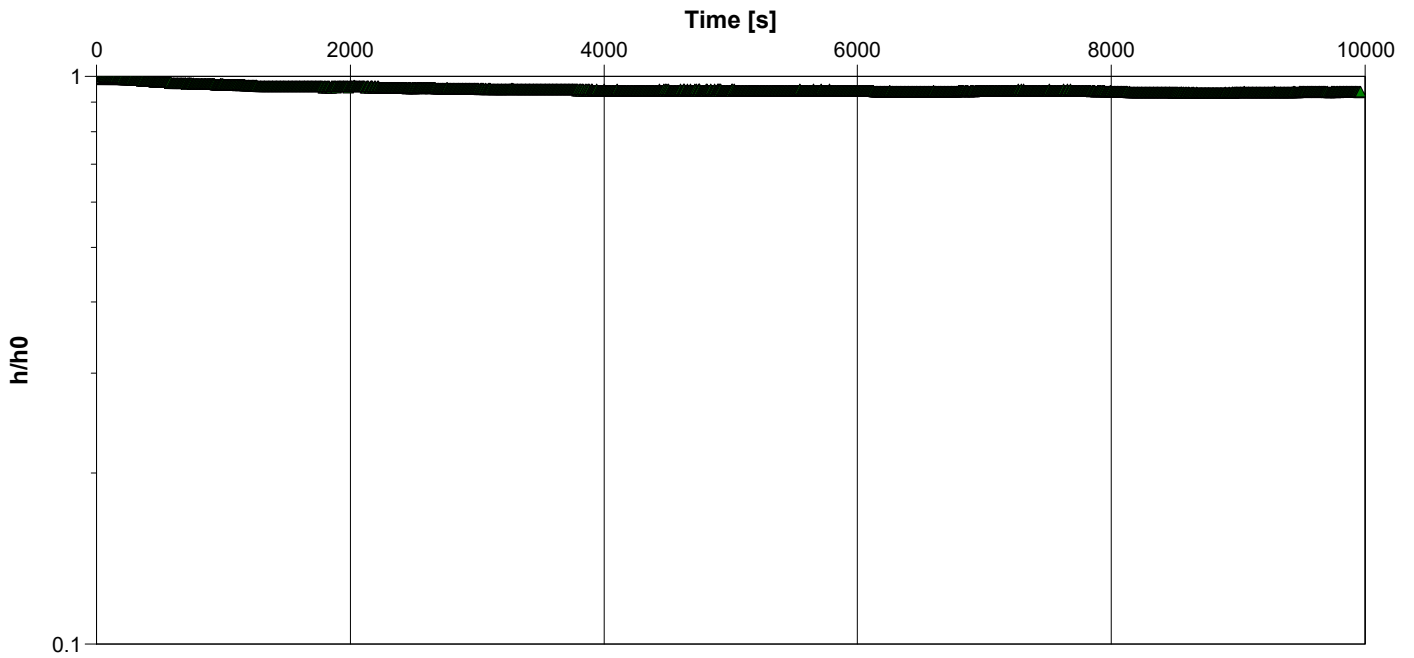
Slug Test Analysis Report

Project: 1429 Dundas St W, Oakville

Number: 19-294-101

Client: Mattamy

Location:	Slug Test: BH22-7	Test Well: BH22-7
Test Conducted by: A.Q		Test Date: 6/16/2022
Analysis Performed by: A.Q	Slug test BH22-7	Analysis Date: 7/4/2022
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]
BH22-7	1.52×10^{-9}

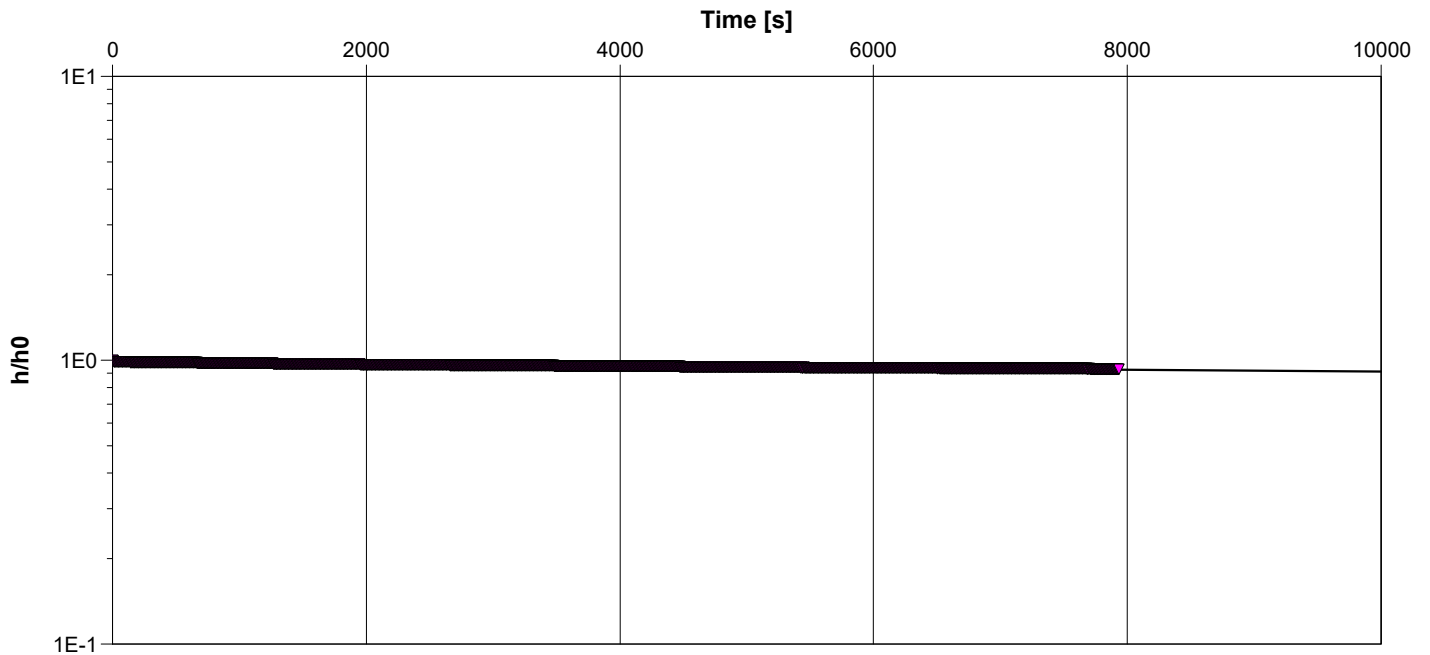
Slug Test Analysis Report

Project: 1429 Dundas St W, Oakville

Number: 19-294-101

Client: Mattamy

Location:	Slug Test: BH22-13	Test Well: BH22-13
Test Conducted by: A.Q		Test Date: 6/16/2022
Analysis Performed by: A.Q	Slug test BH22-13	Analysis Date: 7/4/2022
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH22-13	2.74×10^{-9}	

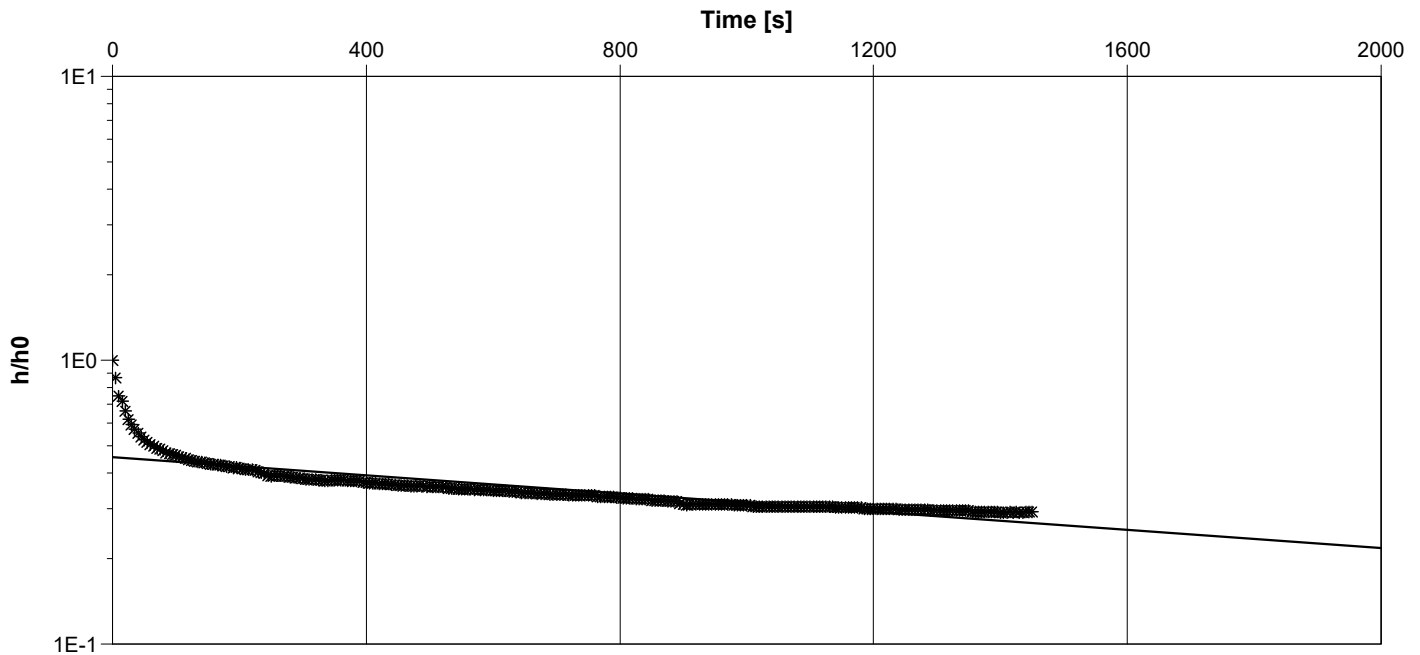
Slug Test Analysis Report

Project: 1429 Dundas St W, Oakville

Number: 19-294-101

Client: Mattamy

Location:	Slug Test: BH202	Test Well: BH202
Test Conducted by: A.Q		Test Date: 6/16/2022
Analysis Performed by: A.Q	slug test BH202	Analysis Date: 7/4/2022
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH202	1.42×10^{-7}	

**Appendix C: Groundwater Quality
Certificate of Analysis**



FINAL REPORT

CA40595-JUN22 R1

19-294-100, 1429 Dundas St. E, Oakville ON

Prepared for

DS Consultants

First Page

CLIENT DETAILS

LABORATORY DETAILS

Client	DS Consultants	Project Specialist	Maarit Wolfe, Hon.B.Sc
Address	6221 Highway 7 Unit 6 Vaughan, Ontario L4H 0K8, Canada	Laboratory	SGS Canada Inc.
Contact	Abdul Qadir	Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	204-951-8164	Telephone	705-652-2000
Facsimile	905-264-2685	Facsimile	705-652-6365
Email	abdul.qadir@dsconsultants.ca	Email	Maarit.Wolfe@sgs.com
Project	19-294-100, 1429 Dundas St. E, Oakville ON	SGS Reference	CA40595-JUN22
Order Number		Received	06/24/2022
Samples	Ground Water (1)	Approved	07/11/2022
		Report Number	CA40595-JUN22 R1
		Date Reported	07/21/2022

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 9 degrees C

Cooling Agent Present: Yes

Custody Seal Present: Yes

Chain of Custody Number: 032638

RL raised for TKN due to sample matrix

RL Raised for cr6 due to sample matrix

CBOD spike high, all other QC acceptable

SIGNATORIES

Maarit Wolfe, Hon.B.Sc



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Legend.....	21
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FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

Sample Date 24/06/2022

L1 = PWQQ_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Oakville - Storm Sewer Discharge - BL_2009_031

Parameter	Units	RL	L1	L2	Result
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General Chemistry

Carbonaceous Biochemical Oxygen Demand	mg/L	2			< 4 †
Biochemical Oxygen Demand (BOD5)	mg/L	2		15	< 4 †
Total Suspended Solids	mg/L	2		15	84
Total Kjeldahl Nitrogen	as N mg/L	5.0			< 5.0

Metals and Inorganics

Cyanide (total)	mg/L	0.01		0.02	< 0.01
Fluoride	mg/L	0.06			0.41
Sulphate	mg/L	0.2			2900
Aluminum (total)	mg/L	0.001			0.358
Antimony (total)	mg/L	0.0009	0.02		< 0.0009
Arsenic (total)	mg/L	0.0002	0.005	0.02	0.0037
Beryllium (total)	mg/L	0.000007	0.011		0.000020
Cadmium (total)	mg/L	0.000003	0.0001	0.008	0.000039
Chromium (total)	mg/L	0.00008	0.1	0.08	0.00126
Cobalt (total)	mg/L	0.000004	0.0009		0.00126
Copper (total)	mg/L	0.0002	0.001	0.04	0.0014
Iron (total)	mg/L	0.007	0.3		0.526
Lead (total)	mg/L	0.00009	0.005	0.12	0.00027
Manganese (total)	mg/L	0.00001		0.05	0.464
Molybdenum (total)	mg/L	0.00004	0.04		0.0242
Nickel (total)	mg/L	0.0001	0.025	0.08	0.0019



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

Sample Date 24/06/2022

L1 = PWQQ_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Oakville - Storm Sewer Discharge - BL_2009_031

Parameter	Units	RL	L1	L2	Result
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Metals and Inorganics (continued)

Phosphorus (total)	mg/L	0.003	0.01	0.4	0.041
Selenium (total)	mg/L	0.00004	0.1	0.02	0.00030
Silver (total)	mg/L	0.00005	0.0001	0.12	< 0.00005
Tin (total)	mg/L	0.00006			0.00344
Titanium (total)	mg/L	0.00005			0.00781
Zinc (total)	mg/L	0.002	0.02	0.04	0.015

Microbiology

E. Coli	cfu/100mL	0	100	200	< 2†
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Nonylphenol and Ethoxylates

Nonylphenol	mg/L	0.001		0.001	< 0.001
Nonylphenol Ethoxylates	mg/L	0.01		0.01	< 0.01

Oil and Grease

Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4			< 4
Oil & Grease (mineral/synthetic)	mg/L	4			< 4



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

Sample Date 24/06/2022

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Oakville - Storm Sewer Discharge - BL_2009_031

Parameter	Units	RL	L1	L2	Result
-----------	-------	----	----	----	--------

Other (ORP)

pH	No unit	0.05	8.6	8.5	7.77
Chromium VI	µg/L	0.2	1	40	< 1.0†
Mercury (total)	mg/L	0.00001	0.0002	0.0004	< 0.00001

PCBs

Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001		0.0004	< 0.0001
--	------	--------	--	--------	----------

Pesticides

Aldrin + Dieldrin	mg/L	0.00002	0.00000 1	0.00008	< 0.00002
Chlordane (total)	mg/L	0.001	0.00006	0.04	< 0.001
DDT+Metabolites	mg/L	0.00004	0.00000 3		< 0.00004
op-DDT	mg/L	0.00002			< 0.00002
pp-DDD	mg/L	0.00002			< 0.00002
pp-DDE	mg/L	0.00001			< 0.00001
pp-DDT	mg/L	0.00002			< 0.00002
o,p-DDD	mg/L	0.00002			< 0.00002
o,p-DDE	mg/L	0.00001			< 0.00001
Mirex	mg/L	0.001		0.04	< 0.001
Hexachlorocyclohexane	mg/L	0.001		0.04	< 0.001



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

Sample Date 24/06/2022

L1 = PWQQ_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Oakville - Storm Sewer Discharge - BL_2009_031

Parameter	Units	RL	L1	L2	Result
Phenols					
4AAP-Phenolics	mg/L	0.002	0.001	0.008	0.004

SVOCs

PAHs (Total)	mg/L			0.002	< 0.001
di-n-Butyl Phthalate	mg/L	0.002		0.015	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002		0.0088	< 0.002
Hexachlorobenzene	mg/L	0.00001	0.00000 65	0.00004	< 0.0001 ↑
3,3-Dichlorobenzidine	mg/L	0.0005		0.0008	< 0.0005
Pentachlorophenol	mg/L	0.0005		0.002	< 0.0005

SVOCs - PAHs

Naphthalene	mg/L	0.0005	0.007		< 0.0005
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VOCs

Chloroform	mg/L	0.0005		0.002	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005		0.0068	< 0.0005
Methylene Chloride	mg/L	0.0005	0.1	0.0052	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.05	0.0044	< 0.0005
Trichloroethylene	mg/L	0.0005	0.02	0.0076	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005		0.0056	< 0.0005
cis-1,2-Dichloroethylene	mg/L	0.0005		0.0056	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005		0.0056	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.07	0.017	< 0.0005



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

Sample Date 24/06/2022

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

L2 = SANSEW / WATER / - - Oakville - Storm Sewer Discharge - BL_2009_031

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.1	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.008	0.002	< 0.0005
Toluene	mg/L	0.0005	0.0008	0.002	< 0.0005
m-p-xylene	mg/L	0.0005	0.002		< 0.0005
o-xylene	mg/L	0.0005	0.04		< 0.0005
Xylene (total)	mg/L	0.0005			< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	PWQO_L / WATER	SANSEW / WATER
				L1	L2
				/ - - Table 2 - General - July 1999 PIBS 3303E	/ - - Oakville - Storm Sewer Discharge - BL_2009_031

BH22-13

Parameter	Method	Units	Result	L1	L2
Aldrin + Dieldrin	EPA 3510C/8270D	mg/L	< 0.00002	0.000001	
Chlordane	EPA 3510C/8270D	mg/L	< 0.001	0.00006	
DDT+Metabolites	EPA 3510C/8270D	mg/L	< 0.00004	0.000003	
Hexachlorobenzene	EPA 3510C/8270D	mg/L	< 0.0001	0.0000065	0.00004
Total Suspended Solids	SM 2540D	mg/L	84		15
Cobalt	SM 3030/EPA 200.8	mg/L	0.00126	0.0009	
Copper	SM 3030/EPA 200.8	mg/L	0.0014	0.001	
Iron	SM 3030/EPA 200.8	mg/L	0.526	0.3	
Manganese	SM 3030/EPA 200.8	mg/L	0.464		0.05
Phosphorus	SM 3030/EPA 200.8	mg/L	0.041	0.01	
4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001	

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO0081-JUL22	mg/L	0.2	<0.2	0	20	103	90	110	104	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Carbonaceous Biochemical Oxygen Demand	BOD0052-JUN22	(CBOD5) mg/L	2	< 2	2	30	87	70	130	136	70	130
Biochemical Oxygen Demand (BOD5)	BOD0061-JUN22	mg/L	2	< 2	2	30	103	70	130	114	70	130



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QC SUMMARY

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0267-JUN22	mg/L	0.01	<0.01	ND	10	93	90	110	98	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0597-JUN22	mg/L	0.06	<0.06	ND	10	101	90	110	97	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0012-JUL22	ug/L	0.2	<0.2	1	20	97	80	120	NV	75	125



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QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0053-JUN22	mg/L	0.00001	< 0.00001	ND	20	120	80	120	102	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0271-JUN22	mg/L	0.00005	<0.00005	ND	20	99	90	110	89	70	130
Aluminum (total)	EMS0271-JUN22	mg/L	0.001	<0.001	4	20	100	90	110	104	70	130
Arsenic (total)	EMS0271-JUN22	mg/L	0.0002	<0.0002	8	20	103	90	110	103	70	130
Beryllium (total)	EMS0271-JUN22	mg/L	0.000007	<0.000007	9	20	100	90	110	100	70	130
Cadmium (total)	EMS0271-JUN22	mg/L	0.000003	<0.000003	17	20	97	90	110	89	70	130
Cobalt (total)	EMS0271-JUN22	mg/L	0.000004	<0.000004	1	20	102	90	110	95	70	130
Chromium (total)	EMS0271-JUN22	mg/L	0.00008	<0.00008	6	20	99	90	110	100	70	130
Copper (total)	EMS0271-JUN22	mg/L	0.0002	<0.0002	1	20	98	90	110	103	70	130
Iron (total)	EMS0271-JUN22	mg/L	0.007	<0.007	3	20	96	90	110	100	70	130
Manganese (total)	EMS0271-JUN22	mg/L	0.00001	<0.00001	1	20	103	90	110	104	70	130
Molybdenum (total)	EMS0271-JUN22	mg/L	0.00004	<0.00004	1	20	101	90	110	103	70	130
Nickel (total)	EMS0271-JUN22	mg/L	0.0001	<0.0001	1	20	99	90	110	101	70	130
Lead (total)	EMS0271-JUN22	mg/L	0.00009	<0.00001	7	20	102	90	110	97	70	130
Phosphorus (total)	EMS0271-JUN22	mg/L	0.003	<0.003	1	20	98	90	110	NV	70	130
Antimony (total)	EMS0271-JUN22	mg/L	0.0009	<0.0009	ND	20	102	90	110	98	70	130
Selenium (total)	EMS0271-JUN22	mg/L	0.00004	<0.00004	16	20	101	90	110	78	70	130
Tin (total)	EMS0271-JUN22	mg/L	0.00006	<0.00006	0	20	103	90	110	NV	70	130
Titanium (total)	EMS0271-JUN22	mg/L	0.00005	<0.00005	17	20	101	90	110	NV	70	130
Zinc (total)	EMS0271-JUN22	mg/L	0.002	<0.002	2	20	100	90	110	102	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9445-JUN22	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol Ethoxylates	GCM0031-JUL22	mg/L	0.01	< 0.01								
Nonylphenol	GCM0031-JUL22	mg/L	0.001	<0.001			76	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0499-JUN22	mg/L	2	<2	NSS	20	108	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0499-JUN22	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0499-JUN22	mg/L	4	< 4	NSS	20	NA	70	130			

QC SUMMARY

Pesticides

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-018

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Hexachlorocyclohexane	GCM0024-JUL22	mg/L	0.001	< 0.001	ND	30	93	50	140	96	50	140
Mirex	GCM0024-JUL22	mg/L	0.001	< 0.001	ND	30	99	50	140	108	50	140
o,p-DDD	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	95	50	140	101	50	140
o,p-DDE	GCM0024-JUL22	mg/L	0.00001	< 0.00001	ND	30	102	50	140	111	50	140
op-DDT	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	103	50	140	117	50	140
pp-DDD	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	105	50	140	117	50	140
pp-DDE	GCM0024-JUL22	mg/L	0.00001	< 0.00001	ND	30	98	50	140	104	50	140
pp-DDT	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	102	50	140	118	50	140

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0595-JUN22	No unit	0.05	NA	1		100			NA		



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QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0269-JUN22	mg/L	0.002	<0.002	ND	10	106	80	120	NV	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-IENVIGC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0072-JUL22	mg/L	0.0001	<0.0001	NSS	30	91	60	140	NSS	60	140



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QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
3,3-Dichlorobenzidine	GCM0099-JUL22	mg/L	0.0005	< 0.0005	NSS	30	94	30	130	NSS	30	130
Bis(2-ethylhexyl)phthalate	GCM0465-JUN22	mg/L	0.002	< 0.002	NSS	30	112	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0465-JUN22	mg/L	0.002	< 0.002	NSS	30	96	50	140	NSS	50	140
Hexachlorobenzene	GCM0465-JUN22	mg/L	0.00001	< 0.0001	NSS	30	70	50	140	NSS	50	140
Naphthalene	GCM0465-JUN22	mg/L	0.0005	< 0.0005	NSS	30	76	50	140	NSS	50	140
Pentachlorophenol	GCM0465-JUN22	mg/L	0.0005	< 0.0005	NSS	30	63	50	140	NSS	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0664-JUN22	mg/L	2	< 2	8	10	99	90	110	NA		

QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0007-JUL22	as N mg/L	5.0	<0.5	6	10	101	90	110	98	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	92	60	130	97	50	140
1,2-Dichlorobenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	99	50	140
1,4-Dichlorobenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	98	50	140
Benzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	102	50	140
Chloroform	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	102	50	140
cis-1,2-Dichloroethylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	100	50	140
Ethylbenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	95	60	130	101	50	140
m-p-xylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	95	60	130	102	50	140
Methylene Chloride	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	90	60	130	108	50	140
o-xylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	91	60	130	99	50	140
Toluene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	101	50	140
trans-1,3-Dichloropropene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	92	60	130	101	50	140
Trichloroethylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	100	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

- NSS** Insufficient sample for analysis.
- RL** Reporting Limit.
 - ↑ Reporting limit raised.
 - ↓ Reporting limit lowered.
- NA** The sample was not analysed for this analyte
- ND** Non Detect

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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This report supersedes all previous versions.

-- End of Analytical Report --



FINAL REPORT

CA40595-JUN22 R1

19-294-100, 1429 Dundas St. E, Oakville ON

Prepared for

DS Consultants

First Page

CLIENT DETAILS

LABORATORY DETAILS

Client	DS Consultants	Project Specialist	Maarit Wolfe, Hon.B.Sc
Address	6221 Highway 7 Unit 6 Vaughan, Ontario L4H 0K8, Canada	Laboratory	SGS Canada Inc.
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Project	19-294-100, 1429 Dundas St. E, Oakville ON	SGS Reference	CA40595-JUN22
Order Number		Received	06/24/2022
Samples	Ground Water (1)	Approved	07/11/2022
		Report Number	CA40595-JUN22 R1
		Date Reported	07/11/2022

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 9 degrees C

Cooling Agent Present: Yes

Custody Seal Present: Yes

Chain of Custody Number: 032638

RL raised for TKN due to sample matrix

RL Raised for cr6 due to sample matrix

CBOD spike high, all other QC acceptable

SIGNATORIES

Maarit Wolfe, Hon.B.Sc



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FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8
Sample Name BH22-13
Sample Matrix Ground Water
Sample Date 24/06/2022

L1 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Storm Sewer Discharge - BL_2_03

Parameter	Units	RL	L1	L2	Result
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General Chemistry

Carbonaceous Biochemical Oxygen Demand	mg/L	2			< 4 †
Biochemical Oxygen Demand (BOD5)	mg/L	2	300		< 4 †
Total Suspended Solids	mg/L	2	350		84
Total Kjeldahl Nitrogen	as N mg/L	5.0	100		< 5.0

Metals and Inorganics

Cyanide (total)	mg/L	0.01	2		< 0.01
Fluoride	mg/L	0.06	10		0.41
Sulphate	mg/L	0.2	1500		2900
Aluminum (total)	mg/L	0.001	50		0.358
Antimony (total)	mg/L	0.0009	5		< 0.0009
Arsenic (total)	mg/L	0.0002	1		0.0037
Beryllium (total)	mg/L	0.000007	5		0.000020
Cadmium (total)	mg/L	0.000003	1		0.000039
Chromium (total)	mg/L	0.00008	3		0.00126
Cobalt (total)	mg/L	0.000004	5		0.00126
Copper (total)	mg/L	0.0002	3		0.0014
Iron (total)	mg/L	0.007	50		0.526
Lead (total)	mg/L	0.00009	3		0.00027
Manganese (total)	mg/L	0.00001	5		0.464
Molybdenum (total)	mg/L	0.00004	5		0.0242



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

L1 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Storm Sewer Discharge - BL_2_03

Sample Date 24/06/2022

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Nickel (total)	mg/L	0.0001	3		0.0019
Phosphorus (total)	mg/L	0.003	10		0.041
Selenium (total)	mg/L	0.00004	5		0.00030
Silver (total)	mg/L	0.00005	5		< 0.00005
Tin (total)	mg/L	0.00006	5		0.00344
Titanium (total)	mg/L	0.00005	5		0.00781
Zinc (total)	mg/L	0.002	3		0.015

Parameter	Units	RL	L1	L2	Result
Microbiology					
E. Coli	cfu/100mL	0		200	< 2†

Parameter	Units	RL	L1	L2	Result
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001			< 0.001
Nonylphenol Ethoxylates	mg/L	0.01			< 0.01

Parameter	Units	RL	L1	L2	Result
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

L1 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Storm Sewer Discharge - BL_2_03

Sample Date 24/06/2022

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	10	8.5	7.77
Chromium VI	µg/L	0.2			< 1.0†
Mercury (total)	mg/L	0.00001	0.05		< 0.00001

PCBs

Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001			< 0.0001
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Pesticides

Aldrin + Dieldrin	mg/L	0.00002			< 0.00002
Chlordane (total)	mg/L	0.001			< 0.001
DDT+Metabolites	mg/L	0.00004			< 0.00004
op-DDT	mg/L	0.00002			< 0.00002
pp-DDD	mg/L	0.00002			< 0.00002
pp-DDE	mg/L	0.00001			< 0.00001
pp-DDT	mg/L	0.00002			< 0.00002
o,p-DDD	mg/L	0.00002			< 0.00002
o,p-DDE	mg/L	0.00001			< 0.00001
Mirex	mg/L	0.001			< 0.001
Hexachlorocyclohexane	mg/L	0.001			< 0.001



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

L1 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03

L2 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Storm Sewer Discharge - BL_2_03

Sample Date 24/06/2022

Parameter	Units	RL	L1	L2	Result
Phenols					
4AAP-Phenolics	mg/L	0.002	1		0.004

SVOCs

PAHs (Total)	mg/L				< 0.001
di-n-Butyl Phthalate	mg/L	0.002			< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002			< 0.002
Hexachlorobenzene	mg/L	0.00001			< 0.0001†
3,3-Dichlorobenzidine	mg/L	0.0005			< 0.0005
Pentachlorophenol	mg/L	0.0005			< 0.0005

SVOCs - PAHs

Naphthalene	mg/L	0.0005	0.14		< 0.0005
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VOCs

Chloroform	mg/L	0.0005	0.04		< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.08		< 0.0005
Methylene Chloride	mg/L	0.0005	2		< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1		< 0.0005
Trichloroethylene	mg/L	0.0005	0.4		< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005			< 0.0005
cis-1,2-Dichloroethylene	mg/L	0.0005			< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005			< 0.0005
1,1,1,2-Tetrachloroethane	mg/L	0.0005			< 0.0005



FINAL REPORT

CA40595-JUN22 R1

Client: DS Consultants

Project: 19-294-100, 1429 Dundas St. E, Oakville ON

Project Manager: Abdul Qadir

Samplers: Abdul Qadir

MATRIX: WATER

Sample Number 8

Sample Name BH22-13

Sample Matrix Ground Water

L1 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03

Sample Date 24/06/2022

L2 = SANSEW / WATER / - - Halton Sewer Discharge By Law - Storm Sewer Discharge - BL_2_03

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.01		< 0.0005
Ethylbenzene	mg/L	0.0005	0.16		< 0.0005
Toluene	mg/L	0.0005	0.016		< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005			< 0.0005
Xylene (total)	mg/L	0.0005			< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER	SANSEW / WATER
				Discharge By Law - Sanitary and Combined Sewer Discharge - BL_2_03	Discharge By Law - Storm Sewer Discharge - BL_2_03
				L1	L2

BH22-13

Sulphate	EPA300/MA300-Ions1.3	mg/L	2900	1500
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QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO0081-JUL22	mg/L	0.2	<0.2	0	20	103	90	110	104	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Carbonaceous Biochemical Oxygen Demand	BOD0052-JUN22	(CBOD5) mg/L	2	< 2	2	30	87	70	130	136	70	130
Biochemical Oxygen Demand (BOD5)	BOD0061-JUN22	mg/L	2	< 2	2	30	103	70	130	114	70	130

QC SUMMARY

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0267-JUN22	mg/L	0.01	<0.01	ND	10	93	90	110	98	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0597-JUN22	mg/L	0.06	<0.06	ND	10	101	90	110	97	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0012-JUL22	ug/L	0.2	<0.2	1	20	97	80	120	NV	75	125



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QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0053-JUN22	mg/L	0.00001	< 0.00001	ND	20	120	80	120	102	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0271-JUN22	mg/L	0.00005	<0.00005	ND	20	99	90	110	89	70	130
Aluminum (total)	EMS0271-JUN22	mg/L	0.001	<0.001	4	20	100	90	110	104	70	130
Arsenic (total)	EMS0271-JUN22	mg/L	0.0002	<0.0002	8	20	103	90	110	103	70	130
Beryllium (total)	EMS0271-JUN22	mg/L	0.000007	<0.000007	9	20	100	90	110	100	70	130
Cadmium (total)	EMS0271-JUN22	mg/L	0.000003	<0.000003	17	20	97	90	110	89	70	130
Cobalt (total)	EMS0271-JUN22	mg/L	0.000004	<0.000004	1	20	102	90	110	95	70	130
Chromium (total)	EMS0271-JUN22	mg/L	0.00008	<0.00008	6	20	99	90	110	100	70	130
Copper (total)	EMS0271-JUN22	mg/L	0.0002	<0.0002	1	20	98	90	110	103	70	130
Iron (total)	EMS0271-JUN22	mg/L	0.007	<0.007	3	20	96	90	110	100	70	130
Manganese (total)	EMS0271-JUN22	mg/L	0.00001	<0.00001	1	20	103	90	110	104	70	130
Molybdenum (total)	EMS0271-JUN22	mg/L	0.00004	<0.00004	1	20	101	90	110	103	70	130
Nickel (total)	EMS0271-JUN22	mg/L	0.0001	<0.0001	1	20	99	90	110	101	70	130
Lead (total)	EMS0271-JUN22	mg/L	0.00009	<0.00001	7	20	102	90	110	97	70	130
Phosphorus (total)	EMS0271-JUN22	mg/L	0.003	<0.003	1	20	98	90	110	NV	70	130
Antimony (total)	EMS0271-JUN22	mg/L	0.0009	<0.0009	ND	20	102	90	110	98	70	130
Selenium (total)	EMS0271-JUN22	mg/L	0.00004	<0.00004	16	20	101	90	110	78	70	130
Tin (total)	EMS0271-JUN22	mg/L	0.00006	<0.00006	0	20	103	90	110	NV	70	130
Titanium (total)	EMS0271-JUN22	mg/L	0.00005	<0.00005	17	20	101	90	110	NV	70	130
Zinc (total)	EMS0271-JUN22	mg/L	0.002	<0.002	2	20	100	90	110	102	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9445-JUN22	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol Ethoxylates	GCM0031-JUL22	mg/L	0.01	< 0.01								
Nonylphenol	GCM0031-JUL22	mg/L	0.001	<0.001			76	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0499-JUN22	mg/L	2	<2	NSS	20	108	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0499-JUN22	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0499-JUN22	mg/L	4	< 4	NSS	20	NA	70	130			

QC SUMMARY

Pesticides

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-018

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Hexachlorocyclohexane	GCM0024-JUL22	mg/L	0.001	< 0.001	ND	30	93	50	140	96	50	140
Mirex	GCM0024-JUL22	mg/L	0.001	< 0.001	ND	30	99	50	140	108	50	140
o,p-DDD	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	95	50	140	101	50	140
o,p-DDE	GCM0024-JUL22	mg/L	0.00001	< 0.00001	ND	30	102	50	140	111	50	140
op-DDT	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	103	50	140	117	50	140
pp-DDD	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	105	50	140	117	50	140
pp-DDE	GCM0024-JUL22	mg/L	0.00001	< 0.00001	ND	30	98	50	140	104	50	140
pp-DDT	GCM0024-JUL22	mg/L	0.00002	< 0.00002	ND	30	102	50	140	118	50	140

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0595-JUN22	No unit	0.05	NA	1		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0269-JUN22	mg/L	0.002	<0.002	ND	10	106	80	120	NV	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-IENVIGC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0072-JUL22	mg/L	0.0001	<0.0001	NSS	30	91	60	140	NSS	60	140



FINAL REPORT

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QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
3,3-Dichlorobenzidine	GCM0099-JUL22	mg/L	0.0005	< 0.0005	NSS	30	94	30	130	NSS	30	130
Bis(2-ethylhexyl)phthalate	GCM0465-JUN22	mg/L	0.002	< 0.002	NSS	30	112	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0465-JUN22	mg/L	0.002	< 0.002	NSS	30	96	50	140	NSS	50	140
Hexachlorobenzene	GCM0465-JUN22	mg/L	0.00001	< 0.0001	NSS	30	70	50	140	NSS	50	140
Naphthalene	GCM0465-JUN22	mg/L	0.0005	< 0.0005	NSS	30	76	50	140	NSS	50	140
Pentachlorophenol	GCM0465-JUN22	mg/L	0.0005	< 0.0005	NSS	30	63	50	140	NSS	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0664-JUN22	mg/L	2	< 2	8	10	99	90	110	NA		

QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0007-JUL22	as N mg/L	5.0	<0.5	6	10	101	90	110	98	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	92	60	130	97	50	140
1,2-Dichlorobenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	99	50	140
1,4-Dichlorobenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	98	50	140
Benzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	102	50	140
Chloroform	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	102	50	140
cis-1,2-Dichloroethylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	94	60	130	100	50	140
Ethylbenzene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	95	60	130	101	50	140
m-p-xylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	95	60	130	102	50	140
Methylene Chloride	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	90	60	130	108	50	140
o-xylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	91	60	130	99	50	140
Toluene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	101	50	140
trans-1,3-Dichloropropene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	92	60	130	101	50	140
Trichloroethylene	GCM0504-JUN22	mg/L	0.0005	<0.0005	ND	30	93	60	130	100	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
 ↑ Reporting limit raised.
 ↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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This report supersedes all previous versions.

-- End of Analytical Report --

Appendix D: MECP Water Wells Records

Table: MECP Water Well Records(500 m Radius)**Location: 1429 Dundas Street East, Oakville**

TOWNSHIP C	UTM	E	N	DATE CNTR	CASING	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
OAKVILLE TOWN	17 W	604929	4817732	2017-08 6875	1.97	UT 0034			0041 10	7296916	BRWN SILT CLAY GRVL 0002 BRWN CLAY SILT STNS 0034 BRWN CLAY SILT GRVL 0046 RED SHLE CLAY SILT 0051
OAKVILLE TOWN	17 W	604929	4817732	2019-09 6875		12	///:	MO		7341666	
OAKVILLE TOWN	17 W	604974	4817731	2018-06 7472	2			MO	0027 10	7323107	RED TILL CLAY SILT 0030 RED SAND GRVL SILT 0037
OAKVILLE TOWN	17 W	604772	4817956	2018-06 7472	2			MO	0025 10	7323105	RED TILL CLAY SILT 0030 RED SAND SILT GRVL 0035
OAKVILLE TOWN	17 W	604774	4817549	2018-06 7472	2			MO	0040 10	7323103	RED TILL CLAY SILT 0025 RED SHLE HARD 0050
OAKVILLE TOWN	17 W	604489	4817801	2018-06 7472	2			MO	0015 10	7323102	RED TILL CLAY SILT 0025
OAKVILLE TOWN	17 W	604489	4817800	2018-06 7472	2			MO	0046 5	7323101	RED TILL CLAY SILT 0030 RED SAND SILT GRVL 0037 RED SHLE HARD 0051
OAKVILLE TOWN	17 W	604914	4817681	2019-10 7523	36		///:			7345756	
OAKVILLE TOWN	17 W	604991	4817729	2017-08 6875	1.97	UT 0050		MO	0043 10	7296917	BRWN LOAM GRVL SOFT 0001 BRWN CLAY STNS DNSE 0034 BRWN CLAY SILT STNS 0047 BRWN SHLE CLAY SILT 0052
OAKVILLE TOWN	17 W	604974	4817730	2018-06 7472	2			MO	0045 5	7323108	RED TILL CLAY SILT 0030 RED SAND SILT GRVL 0037 RED SHLE HARD 0050
OAKVILLE TOWN	17 W	604881	4817747	2017-06 6875	2.04			MO	0025 10	7292005	
OAKVILLE TOWN	17 W	604992	4817739	2017-06 6875	5.19			MO	0013 2	7292004	
OAKVILLE TOWN	17 W	604959	4817718	2017-06 6875	2.04			MO	0045 5	7292003	
OAKVILLE TOWN	17 W	604969	4817709	2017-06 6875	2.04			MO		7292002	
OAKVILLE TOWN	17 W	604834	4817854	2015-01 6607						7267217	
OAKVILLE TOWN	17 W	604992	4817739	2015-05 7472	2.04			MO	0042 5	7243205	BRWN SILT CLAY PCKD 0020 GREY SILT CLAY PCKD 0045 RED SILT CLAY PCKD 0047
OAKVILLE TOWN	17 W	604981	4817747	2015-05 7472	2.04			MO	0040 10	7243204	BRWN SILT CLAY PCKD 0020 GREY SILT CLAY PCKD 0040 RED SILT CLAY GRVL 0050
OAKVILLE TOWN	17 W	604981	4817747	2015-05 7472	2.04			MO	0025 10	7243203	BRWN SILT CLAY PCKD 0020 GREY SILT CLAY PCKD 0035
OAKVILLE TOWN	17 W	604969	4817709	2015-05 7472	2.04			MO	0040 10	7243202	BRWN SILT CLAY PCKD 0020 GREY SILT CLAY PCKD 0040 RED SILT CLAY GRVL 0050
OAKVILLE TOWN	17 W	604959	4817718	2015-05 7472	2.04			MO	0045 5	7243201	BRWN SILT CLAY PCKD 0020 GREY SILT CLAY PCKD 0040 RED SILT CLAY PCKD 0050
OAKVILLE TOWN	17 W	604787	4817463	2005-08 6809	2				0013 5	2810341	BLCK LOAM 0001 BRWN TILL 0007 RED SHLE 0018
OAKVILLE TOWN	17 W	604408	4817184	2005-08 6809	2				0020 5	2810339	BLCK LOAM 0001 BRWN TILL 0010 RED SHLE 0025
OAKVILLE TOWN	17 W	604820	4817632	2018-11 7523	39.3					7322988	
OAKVILLE TOWN	17 W	604678	4817410	2020-11 7644						7374758	
OAKVILLE TOWN	17 W	604772	4817955	2018-06 7472	2			MO	0046 5	7323106	RED TILL CLAY SILT 0030 RED SAND SILT GRVL 0040 RED SHLE HARD 0051
OAKVILLE TOWN	17 W	604670	4817428	2020-11 7644						7374961	
OAKVILLE TOWN	17 W	604544	4817309	6946						7355086	
OAKVILLE TOWN	17 W	604674	4817337	2020-11 7644						7374759	
OAKVILLE TOWN 01 007	17 W	605013	4817361	2005-02 1660						2810168	
OAKVILLE TOWN DS N 01 007	17 W	604847	4817602	2020-07 7523	2		///:			7380725	
OAKVILLE TOWN DS N 01 007	17 W	604818	4817914	2020-07 7523	2		///:			7380709	
OAKVILLE TOWN DS N 01 007	17 W	604732	4817700	2020-07 7523	2		///:			7380726	
OAKVILLE TOWN DS N 01 007	17 W	604586	4817992	2020-07 7523	2		///:			7380727	
OAKVILLE TOWN DS N 01 007	17 W	604818	4817914	2020-07 7523	2		///:			7384173	
OAKVILLE TOWN DS N 01 007	17 W	604913	4817753	2020-07 7523	2		///:			7380723	
OAKVILLE TOWN DS N 01 007	17 W	604836	4817819	2020-07 7523	2		///:			7380722	
OAKVILLE TOWN DS N 01 007	17 W	604818	4817914	2020-07 7523	2		///:			7380710	

OAKVILLE TOWN DS N 01 007	17 W	604913	4817753	2020-07 7523	2		///:			7380724	
OAKVILLE TOWN DS N 01 007	17 W	604707	4817594	2019-03 7523	36		///:			7331209	20
OAKVILLE TOWN DS N 01 007	17 W	604578	4817988	2020-07 7523	2		///:			7380707	
OAKVILLE TOWN DS N 01 007	17 W	604586	4817992	2020-07 7523	5.07		///:			7380706	
OAKVILLE TOWN DS N 01 007	17 W	604732	4817700	2020-07 7523	2		///:			7380705	
OAKVILLE TOWN DS N 01 007	17 W	604813	4817753	2020-07 7523	2		///:			7380704	
OAKVILLE TOWN DS N 01 007	17 W	604818	4817914	2020-07 7523	2		///:			7380274	
OAKVILLE TOWN DS N 01 007	17 W	604557	4817770	2020-08 7523	2		///:			7367239	
OAKVILLE TOWN DS N 01 007	17 W	604480	4818053	2020-07 7523	2		///:			7380708	
OAKVILLE TOWN DS N 01 007	17 W	604847	4817602	2020-07 7523	2		///:			7380711	
OAKVILLE TOWN DS N 01 007	17 W	604557	4817770	2020-08 7523	2		11///:			7367238	
OAKVILLE TOWN DS N 01 008	17 W	604715	4817383	1978-04 3637	30 24	0010 FR 0	5///:	ST DO		2805268	BRWN LOAM 0001 BRWN CLAY PCKD 0009 RED SHLE VERY HARD 0020
OAKVILLE TOWN DS N 01 009	17 W	604390	4817207	2021-05 7523	2		///:	MO		7387449	
OAKVILLE TOWN DS S 01 006	17 W	605374	4817813	2010-11 1660	6.25 6	0035 FR 0	4/65/7/1:30	OT		7159400	BLCK LOAM 0001 GREY CLAY 0029 RED SHLE 0070
OAKVILLE TOWN DS S 01 008	17 W	604815	4817243	1978-04 3637	30 24	0 FR 0017	8/22/14/4:0	DO		2805267	BRWN LOAM 0001 BRWN CLAY 0007 RED SHLE HARD VERY 0025
OAKVILLE TOWN DS S 01 009	17 W	604595	4817023	1975-04 3413	30	FR 0022	2/20/8/4:0	IR		2804977	CLAY 0010 SHLE 0027
OAKVILLE TOWN DS S 01 009	17 W	604635	4817003	1975-04 3413	30	FR 0045	5/15/18/4:0	IR		2804976	BRWN CLAY 0005 SHLE 0070