Hydrogeological Investigation and Construction Dewatering Assessment

1543, 1545, 1547, 1549, 1551 The Queensway & 66 And 76 Fordhouse Boulevard Etobicoke, Ontario

Project 10266-REV 1

1. INTRODUCTION

Hydrogeology Consulting Services Inc. (HCS) was retained by 1370443 Ontario Limited to conduct a hydrogeological investigation for a proposed redevelopment at 1543, 1545, 1547, 1549, 1551 The Queensway & 66 and 76 Fordhouse Boulevard, Etobicoke, Ontario. The location of the subject property is shown on Drawing 1 in Appendix A.

The subject property is currently owned by 1370443 Ontario Limited. The property is municipally serviced for water and sewers. The property zoning is listed at CR 2.5, SS2 on the City of Toronto's Interactive Zoning Map for commercial-residential use.

The site is currently developed with five one-and-two-storey commercial buildings. The proposed development includes four residential mixed-use buildings (30-45 storeys), all with two levels of underground parking.

This assessment has been prepared to respond to requirements from the City of Toronto Terms of Reference for Hydrological reports, and in accordance with legislation including the Ontario Water Resources Act, Ontario Regulation 387/04 (as amended), and Toronto Municipal Code Chapter 681.

Revision 1 of this report contemplates changes to the project design (including a reduction in the number of underground parking levels from three to two). This report supersedes and replaces previous versions.

1.1 Concurrent Studies

It is understood that Sola Engineering Inc. (SOLA) will be conducting a geotechnical investigation concurrently with the hydrogeological investigation conducted by HCS Inc.

The Geotechnical investigation (2023) includes the advancement of twelve boreholes on the property completed as 50 mm diameter monitoring wells. The geotechnical report should be referred to for details including drilling and well construction, soil stratigraphy, and soil sample analysis results.

The locations of the boreholes/monitoring wells on the property are shown on the appended Drawing 2

1.2 Scope of Work

Field investigation for this hydrogeological investigation comprised a site visit to assess the property and the proposed site plan layout. Twelve boreholes were advanced on the property by SOLA Engineering Inc. with six boreholes completed as 50 mm diameter monitoring wells to investigate the presence of shallow groundwater. A soil sample was obtained from BH1 for the purpose of particle size distribution (grain size) analysis, and monitoring wells were assessed via slug tests to estimate saturated soil hydraulic conductivity.

1.2.1 Field Tasks

Five monitoring wells (BH1, BH3, BH4A, BH5 and BH6) were developed (purged) using Waterra inertial valves and tubing on September 15, 2023 to remove fine-grained material from the well screen sand pack and mitigate smearing on the borehole walls during drilling in preparation of well testing. Water chemistry samples were obtained from two wells for analysis of City of Toronto Storm and Sanitary Sewer Use By-Law parameters, and five wells (BH1, BH3, BH4A, BH5 and BH6) were assessed via slug tests to estimate saturated soil hydraulic conductivity. Due to a malfunction in the datalogger, slug test data from BH6 will not be included in the report.

Stabilized groundwater elevations were measured using an electronic water level tape on September 20, 2023, and five monitoring wells were instrumented with electronic pressure transducers (dataloggers) to allow continuous measurement of groundwater levels for a period of three months. Water level measurements are summarized in Table 1 in Appendix B.

2. STUDY AREA PHYSIOGRAPHY AND HYDROGEOLOGY

2.1 Site Description

The subject property is a 2.1-hectare commercial/residential property located within the City of Toronto (Etobicoke). As shown on the appended Drawing 1, the property is located adjacent to the Gardiner Expressway, bounded by The Queensway in the north and Fordhouse Boulevard in the south. The site is bordered by commercial properties to the east and west, with commercial/residential properties further along in all directions.

The site is currently developed for commercial/residential/industrial purposes and is occupied by one and two storey buildings dispersed throughout the area. The remainder of the Site is covered by an asphalt parking lot as well as small lawn areas.

The ground surface topography of the subject property indicates a gentle southward slope with a change of elevation from approximately 101.8 meters in the north to 100 meters near the southern property boundary. Elevations (in meters) are in reference to a local datum.

2.2 Physiography and Soil Stratigraphy

The property lies within the Iroquois Plain physiographic region (Chapman and Putnam, 2007) which is mainly comprised of silt and clay till that is partly floored with sand deposits that formed when Pleistocene Lake Iroquois emptied, and includes its old shorelines and lake bottom. The subject property is located within the Sand Plains physiographic unit (Chapman and Putnam, 2007) which consists of both bedload and suspended load sediment deposits from glaciolacustrine environments.

Surficial Geology mapping of Southern Ontario (Ontario Geological Survey, 2003) indicates the property is underlain by coarse-textured glaciolacustrine deposits of sand, gravel, and minor silt and clay from foreshore and basinal deposits.

Overburden soil stratigraphy observed in the boreholes advanced on the subject property mainly consists of fill of varying composition underlain by deposits of clayey silt/silt till (in BH1 and BH3) of varying thickness, with a thicker layer of silt till encountered in most boreholes at depths of approximately 1.3-2.2 mBGS. Weathered shale was encountered below the overburden layers in boreholes BH1-8. The boreholes from the current investigation extend to depths between 2 to 13.4 m below existing ground surface. The borehole logs are included in Appendix C for reference, and the appended Drawing 2 shows the locations of the boreholes on the subject property.

Paleozoic Geology mapping (Ontario Geological Survey, 1991) indicates underlying the overburden deposits is the Georgian Bay Formation shale, limestone, dolostone, and siltstone bedrock. While no deep water well records are found in proximity to the subject property, the on-site boreholes show overburden deposits are approximately 3-5 m thick.

Table I below provides a summary of the typical subsurface stratigraphy beneath the property based on borehole data provided by SOLA Engineering.

Table I: Typical Subsurface Stratigraphy

Soil Type	Depth From (mBGS)	Depth To (mBGS)
Asphaltic Concrete	0	0.1
Granular Base	0.1	0.5 to 0.8
Fill	0.5 to 0.8	1.5 to 2.3
Silt Till	1.5 to 2.3	2.0 to 4.6
Weathered Shale	2.3 to 4.6	unknown

2.3 Hydrogeology and Groundwater

Groundwater was encountered in the shale bedrock deposits, at depths ranging from 2.65 to 7.28 mBGS on September 20, 2023. The measured groundwater levels correspond to elevations of 94.55 – 97.88 meters (in relation to a local datum provided by Keystone Environmental 2023).

Long-term monitoring of groundwater levels was initiated on September 20, 2023 using electronic pressure transducers (dataloggers) installed in five on-site monitoring wells and set to record data at one-hour intervals. A supplementary groundwater level measurements table and groundwater hydrographs will be issued once the three-month monitoring period has been completed.

Groundwater encountered in the shale bedrock interface is considered to represent confined aquifer conditions. Shallow groundwater encountered while advancing the boreholes through overburden may represent perched water trapped within the generally fine-grained material overlying the weathered shale.

Locally, bedrock groundwater would be expected to flow generally southwards towards Lake Ontario; however, the extensive subsurface infrastructure and services beneath and adjacent to the subject property would be expected to cause localized influences in the movement of shallow groundwater. Regional groundwater flow beyond the subject property would be expected to flow generally towards southwards towards Lake Ontario.

Percolation of precipitation into the shallow subsurface is governed by near-surface soil types, in addition to factors such as topography, evapotranspiration, and the degree of soil saturation. Where asphalt and structures exist precipitation would be expected to run off into storm sewers. On grassed areas, small volumes of precipitation infiltrating into the near-surface fill and native low-permeability deposits would be expected to become perched on top of and within low permeability deposits of silty and clayey tills. Over time small volumes of perched water could gradually percolate vertically downwards and/or flow laterally following ground surface topography.

2.4 Surface Water Features

There are no surface water features on or adjacent to the property. The closest natural surface water feature is Little Etobicoke Creek located approximately 2.1 km west of the property.

TRCA mapping (2022) shows the property is not located within a regulated area. The closest regulated areas are approximately 2 km west of the property, associated with Etobicoke Creek. The property lies within the West Lake Ontario Shoreline watershed.

2.5 Soil Hydraulic Conductivity

Hydraulic conductivity estimates for the site soils were determined using single response hydraulic (slug) tests of the soil deposits screened by selected monitoring wells. Estimates of hydraulic conductivity were also made using soil sample grain size analyses and the Kaubisch, Breyer, Kozeny-Carman, and Hazen formulae where appropriate.

2.5.1 Slug Test Results

Prior to conducting slug testing of the monitoring wells, each well was developed (purged) to remove fine-grained material from the sand pack around the well screen and the screened interval.

The slug test methodology followed the procedures developed by Hvorslev (1951), as described in Freeze and Cherry (1979). The slug tests were conducted as falling head tests by introducing a volume (slug) of potable water into the well to cause a temporary rise in the water table; or, as rising head tests by purging a well dry and allowing water to flow naturally back into the well. The displacement and gradual re-equilibration of the water level in the wells was recorded using electronic pressure transducers (dataloggers). Hvorslev's method is expressed by the following equation:

$$K = \frac{r^2 \ln (L/R)}{2LT_{0.37}}$$

where:

- K = hydraulic conductivity of the tested material (m/sec)
- r = inner radius of the well riser pipe (m)
- R = outer radius of the well riser pipe (m)
- L = length of screen and sand pack (m)
- $T_{0.37}$ = time lag (sec), where $(H-h)/(H-H_0) = 0.37$
- h = water level at each time of measurement (m)
- H_0 = initial water level (m, start of test)
- H = stabilized water level prior to slug testing (m)

The time lag, $T_{0.37}$, represents the time required for the water level to recover to the stabilized level if the initial flow rate from the surrounding aquifer into the well is maintained. This time lag is determined graphically as the time where (H-h) divided by $(H-H_0)$ is equal to 0.37.

Graphical analyses of the slug tests are included in Appendix D, and the hydraulic conductivity estimates are listed in the appended Table 2. The hydraulic conductivity ranges of 5.9×10^{-6} to 2.3×10^{-6} m/sec for the silt till (containing shale fragments) and shale deposits in BH1, BH3, and BH4A indicates a relatively moderately low permeability. BH5 did not reach $T_{0.37}$ and had an estimated soil hydraulic conductivity of $<1.0 \times 10^{-7}$ m/sec indicating a low permeability for the shale deposit screened by the monitoring well. Due to a malfunction in the datalogger, slug test data from BH6 will not be included in the report.

2.5.2 Grain Size Analysis Results

A sample of subsurface soil collected from BH1 was submitted to the SOLA Engineering Inc. laboratory in Concord, Ontario for analysis of particle size distribution (grain size). The grain size analysis result (included in Appendix E) was used to estimate soil hydraulic conductivity (K) value by applying the Kaubisch, Breyer, Hazen, and Kozeny-Carman formulae where appropriate based on the limitations of each formula. The hydraulic conductivity estimate is summarized in the appended Table 2.

The hydraulic conductivity value for the clayey silt till encountered in the borehole was 6×10^{-10} m/sec, indicating a very low permeability soil. It is noted the hydraulic conductivity value from the slug test result for BH1 is several orders of magnitude higher than the grain size analysis. The higher hydraulic conductivity values found via slug tests is most likely associated with the thick layer of weathered shale found in BH1.

The hydraulic conductivity estimates from both slug test and grain size analyses generally correlate reasonably well with published ranges for major soil types (Freeze and Cherry, 1979).

2.6 Groundwater Chemistry

On September 20, 2023 water chemistry samples were obtained from monitoring wells BH5 and BH6. Samples were collected in the appropriate laboratory supplied containers, stored in a cooler, and delivered to ALS Environmental Laboratories in Waterloo, Ontario for analysis of City of Toronto Storm and Sanitary Sewer Use By-Law parameters. The laboratory Certificates of Analysis are included in Appendix F for reference, and the appended Table 3 summarizes parameters of interest.

It is important to consider the water chemistry samples were obtained using inertial valve pumps (Waterra tubing and foot valve). The method of water collection inherently results in the inclusion of sediments into the water sample, thereby increasing concentrations of parameters such as colour, turbidity, total suspended solids, total dissolved solids, and total metals where metals are adsorbed onto soil particles. Water chemistry samples were not filtered during or after collection.

Additionally, it is important to consider that the 4AAP laboratory analysis for Phenols detects a wide variety of naturally occurring organic substances, along with the chemical Phenol (C_6H_5OH). Measured exceedances of “Phenols” may not be indicative of a contamination issue, but rather groundwater that is influenced by natural environmental factors.

2.6.1 Storm Sewer Criteria

One or both groundwater samples exhibited exceedances of the Storm Sewer Use By-Law criteria limits for Total Suspended Solids (TSS), Phosphorus; Total Metals including Manganese, Arsenic, Chromium, Copper, Manganese, Nickel and Zinc; Dissolved metals including Phosphorus; Volatile Organic Compounds (VOCs) including Benzene; Total Polycyclic Aromatic Hydrocarbons (PAHs); and Total Polychlorinated Biphenyls (PCBs).

As noted above it is important to consider the sampling methodology results in high Total Suspended Sediments concentrations, and the requirement to analyze for Total Metals results in metals adsorbed on to sediment particles causing high total metals concentrations. It is reasonable to expect that mechanical filtration of dewatering discharge would result in much lower TSS and total metals concentrations.

It is important to note that if any dewatering is required and discharge is not collected using a hydrovac truck for off-site treatment and disposal, discharge to municipal storm sewers would require discharge chemistry testing to ensure all Storm Sewer Use By-Law criteria are met, and a Sewer Discharge Permit from the City of Toronto. Treatment of discharge to resolve exceedances of TSS, various metals, PAHs, and PCBs would likely be necessary.

2.6.2 Sanitary Sewer Criteria

One or both groundwater samples exhibited exceedances of the Sanitary Sewer Use By-Law criteria limits for Total Suspended Solids (TSS); Total Phosphorus; Total metals including Aluminum and Manganese.

As discussed previously in Section 2.6.1 it is reasonable to expect that mechanical filtration of dewatering discharge would result in much lower TSS and total metals concentrations.

It is important to note that if any dewatering is required and discharge is not collected using a hydrovac truck for off-site treatment and disposal, discharge to municipal sanitary sewers would require discharge chemistry testing to ensure all Sanitary Sewer Use By-Law criteria are met, and a Sewer Discharge Permit from the City of Toronto. Treatment of discharge to resolve exceedances of Total Suspended Solids and Total Metals would likely be necessary.

An evaluation of costs to treat and discharge to the Storm Sewer vs. Sanitary Sewer, and to municipal sewers vs. collecting and hauling for offsite disposal, should be considered by the client prior to selecting their preferred discharge option.

3. WATER USERS

Well Records from the Ministry of the Environment, Conservation, and Parks (MECP) Water Well Record (WWR) Database were reviewed to determine the number of supply wells present. As shown on the well records in Appendix G, twenty-five (25) wells are located within an approximate radius of 250 m from the subject property according to the MECP WWR Database.

Of these wells, eleven are identified as test holes or monitoring wells, five have a diameter of 50 mm or less and are assumed to be monitoring wells, five are identified as partial data entry only and four are identified as abandoned. These records have been excluded from further consideration.

Based on the information in the MECP WWR database there are no private water supply wells within 250 m of the subject property.

3.1 Municipal Wellhead Protection Areas

Ontario Source Protection Information Atlas mapping shows the property is not located within a Wellhead Protection Area (WHPA) or surface water Intake Protection Zone (IPZ). The closest WHPA is more than 28 km away from the subject property however there is an IPZ-2 located adjacent to the southern property boundary.

3.2 Sensitive Features, and Sensitivity to Contamination

Ontario Source Protection Information Atlas (OSPIA) mapping indicates the southern portion of the property is located within a Highly Vulnerable Aquifer (HVA) area. The property is not located within a Significant Groundwater Recharge Area (SGRA), not located within a vulnerable groundwater area, not located within a Groundwater Under Direct Influence (GUDI) of surface water area, and not located within a vulnerable surface water area.

Since all pavement stormwater runoff is directed to municipal storm sewers, it is reasonable to conclude potential surface contaminants that might be accidentally released at the site would have a lower likelihood of migrating vertically downwards to the bedrock aquifer, or laterally to off-site surface water features.

Natural Heritage Area maps from the Ministry of Natural Resources and Forestry (MNRF, 2020) shows the property is not located within a greenbelt area, not located within the Oak Ridges Moraine, and no Area of Natural and Scientific Interest (ANSI) is located within the subject property or surrounding area. TRCA mapping also shows the property is not located within a regulated area.

The location of the subject property in an urbanized residential/commercial/industrial area increases the potential risk of subsurface soil and groundwater contamination by potential contaminant release from nearby properties. Groundwater chemistry testing measured exceedances of several parameters; however, the origin of these contaminants (i.e. on site current or historical events, or off site events) cannot be determined. As the majority of the site will be covered with buildings and a small area of asphalt pavement, and subsurface soils have a moderately low permeability, infiltration of precipitation carrying any potential surficial contaminants would generally be minimal and not considered a significant impact to any perched groundwater found on site.

4. CONSTRUCTION DEWATERING ASSESSMENT

Based on excavation locations, dimensions, and depths provided for this report, construction of the 2-level underground parking structure for the study area shown on the attached Master Plan (Hariri Pontarini Architects, September 2024) will require construction dewatering to lower the groundwater table within the excavation to maintain a dry excavation base and sidewalls. It is anticipated dewatering will occur primarily in the weathered shale bedrock beneath the planned construction excavation to dewater both overburden soils and bedrock and prevent excavation bottom heave.

Temporary dewatering requirements are dependent on factors such as excavation parameters (excavation dimensions, infrastructure invert elevations, the number of concurrent excavations, etc.), hydrogeological conditions at the site (groundwater levels, soil/bedrock hydrogeological parameters, etc.), construction and dewatering methodologies (open cuts, dewatering pits, sumps, wellpoints, etc.), and the amount of groundwater drawdown required to achieve and maintain dry working conditions and stable excavations.

Additionally, factors such as the use of shoring would be expected to influence the rate of groundwater inflow into the excavation. The calculations provided below assume an open excavation as a conservative factor of safety.

It is important to note that the dewatering contractor retained to perform construction dewatering is solely responsible for achieving and maintaining dry working conditions at the site at all times. The calculations and dewatering rates/volumes provided below are not directives for a dewatering contractor, and the dewatering contractor must review the information, calculations, and recommendations provided as part of their own assessment of dewatering requirements to determine appropriate methodologies and designs for their construction dewatering project.

4.1 Excavation Requirements and Temporary Construction Dewatering Assumptions

During the construction project dewatering operations are expected to take place twenty-four hours per day to maintain a dry excavation. Dewatering calculations include a number of variables such as the static groundwater level, soil hydraulic conductivity, aquifer thickness, confined/unconfined aquifer conditions, etc. that can be adjusted to provide conservative buffers to account for conditions beyond those encountered in the available monitoring wells.

Table II below summarizes the preliminary excavation requirements for the proposed underground parking structure.

Additionally, Table II includes the following buffers as factors of safety:

- A buffer of 2 m (assumed, although the exact buffer shall be determined during the construction design phases with the shoring engineer, and accounting for property limits) for all excavation widths and lengths to account for an excavation large enough to accommodate working around the perimeter;
- A buffer of 1 m for the excavation invert elevation to ensure groundwater is drawn down 1 m below the base of the excavation to maintain a dry work surface. The excavation invert is taken as approximately 91 mASL or 8 mBGS, which is understood to be the lowest Underside of Footing (USF) elevation across the building footprint.
- A “squared off” excavation shape to account for excavation dimension adjustments during the construction process;
- A buffer of approximately 1.65 m for the groundwater elevation (2.65 mBGS measured at BH4A, increased to 1.0 mBGS) in the area of the underground parking excavation to account for seasonal fluctuations.

Table II: Excavation Requirements

Excavation	Excavation Length (m) (+2 m)	Excavation Width (m) (+2 m)	Excavation Depth (mBGS) (-1 m)	GW Elevation (mBGS) (+1.65 m)
2-Level Underground Parking	242	77	9 mBGS	1.0 mBGS

It is very important to consider that all construction dewatering calculations provided in this report are based on the excavation requirements and dimensions provided by Keystone Environmental (November, 2024). In the event the excavation requirements and/or dimensions change during the process of planning and design, revision of the construction dewatering calculations provided will be required.

4.1.1 Concurrent Excavations

It is understood the following concurrent tasks should be contemplated for construction dewatering:

- Concurrent excavation of the full footprint for the underground parking structure.

It is very important to consider that if modifications to the concurrent construction tasks are desired, the calculated dewatering requirements would need to be reassessed.

4.1.2 Dewatering Assumptions

Dewatering calculations have been prepared for the concurrent tasks noted above based on the following assumptions to account for variability in soil, bedrock, and groundwater conditions:

- Aquifer hydraulic conductivity of 5.6 x 10^{-6} m/sec (the highest hydraulic conductivity value based on the slug tests of the weathered bedrock aquifer deposits and the grain size analysis graphs);
- An estimated confined aquifer thickness (B) of 15 m.
- An initial groundwater elevation in the area of the underground parking excavation corresponding to the highest measured groundwater level from the on-site monitoring wells (2.65 mBGS) increased to 1.0 mBGS to account for seasonal variation.

4.2 Dewatering Calculations

To estimate the steady-state dewatering flow rate needed to maintain dry conditions in the excavation for the underground parking structure, the following equation (for radial flow to a confined aquifer) from Powers (2007)[1] was used:

$$Q = \frac{2\pi KB(H - h_w)}{\ln\left(\frac{R_o}{r_e}\right)}$$

[1] Powers, P.J. et al. 2007. Construction Dewatering and Groundwater Control: New Methods and Applications. Wiley.

Where:

Q = Flow Rate (m^3/sec)

H = Initial Saturated Thickness (Piezometric Head) of Aquifer (m)

h_w = Dewatered Saturated Thickness (Piezometric Head) of Aquifer (m)

K = Soil Hydraulic Conductivity (m/sec)

B = Thickness of Confined Aquifer (m)

r_e = Effective radius, $r_e = \sqrt{(excavation\ area/\pi)}$ (m)

$R_o = 3000*(H-h_w)*\sqrt{K}$ (m)

Where R_o is very close to r_e or less than r_e, to avoid $\ln\left(\frac{R_o}{r_e}\right)$ resulting in a very small or negative number R_o is replaced with ($R_o + r_e$) in the formula above, which gives a reasonable estimate of the dewatering requirements.

Using the assumptions listed in Section 4.1 and its subsections, the steady-state inflow rate and radius of influence listed in Table III below were estimated.

Table III: Steady-State Dewatering Requirements

Excavation	Steady State Dewatering Rate (L/day)	Radius of Influence (m)
2-Level Underground Parking	660,400	56.8

4.2.1 Calculated Dewatering Rates, With Factors of Safety

It is important to consider that dewatering requirements will be highest at the start of the dewatering process when the volume of water stored within the pore spaces of the soil and within the bedrock fracture matrix must be extracted. This storage must be accounted for to allow for rapid achievement of drawdown targets.

Initial drawdown of the overburden soils and shallow bedrock aquifer within a short period of time would be expected to require additional pumping capacity. An initial drawdown requirement has been calculated assuming a surcharge of 100% of the estimated steady state dewatering rate.

It is important to consider that during and after precipitation events significantly higher dewatering flow rates may be required to account for direct precipitation and surficial runoff falling into an excavation. Table IV below includes pump-out of a 50 mm storm event within 24-hours as a conservative factor of safety.

Table IV below provides a summary of the calculated dewatering rates and factors of safety for the underground parking excavation.

Table IV –Calculated Potential Maximum Total Dewatering Rate including Factors of Safety

	Steady State Dewatering (L/day)	**Initial Drawdown Surcharge (L/day)**	**Precipitation Event (L/day)**	**Potential Maximum Total Dewatering Requirement (L/day)**
2-Level Underground Parking	660,400	660,400	931,700	2,252,500

The totals shown in Table IV indicate a potential maximum dewatering requirement of up to 1,320,800 L/day for the underground parking structure, plus up to 931,700 L/day to manage a significant precipitation event, for a potential total maximum pumping requirement of up to 2,252,500 L/day.

A Category 3, Permit to Take Water (PTTW) would be required to authorize pumping at this rate. Additionally, a Sewer Discharge Permit from the City of Toronto would be required to discharge to municipal sewers.

While the conservative assumptions and factors of safety discussed in the preceding sections combine to create very conservative dewatering calculations, it is important to consider the variable nature of the overburden aquifer as well as the significant areal and vertical extents of the proposed excavation.

The potential maximum dewatering requirements outlined above are reasonable based on the information available; however, a less-conservative assumption of total dewatering requirements (e.g. a allowing a longer initial drawdown time for the excavation, using a slightly less conservative hydraulic conductivity value, etc.) could reduce the estimated total dewatering requirement. The client, the construction contractor, and the dewatering contractor shall review the dewatering calculations provided above and make their own determinations regarding the potential maximum daily dewatering requirements for the project.

5. PERMIT REQUIREMENTS AND DEWATERING DISCHARGE

Ontario Regulation 387/04 requires authorization from the Ministry of the Environment, Conservation, and Parks (MECP) for all water takings over 50,000 L/day. Ontario Regulation 63/16 specifies that for temporary construction dewatering at rates between 50,000 and 400,000 L/day an Environmental Activity and Sector Registry (EASR) may be obtained in lieu of a Permit to Take Water (PTTW). Dewatering at rates of more than 400,000 L/day require a PTTW to authorize groundwater withdrawal.

As shown in Section 4.2.1, construction dewatering will require maximum daily dewatering rates above 400,000 L/day; therefore, a Category 3 PTTW would be required for the proposed temporary construction dewatering.

Temporary discharge to a municipal sewer would require a Sewer Discharge Permit/Agreement from the City of Toronto.

5.1 Dewatering Discharge

It is expected that dewatering discharge will be routed to the municipal storm or sanitary sewer.

As discussed in Section 2.6 and its subsections groundwater chemistry samples exhibited measured exceedances of the City of Toronto Storm Sewer Use By-Law criteria limits for TSS, Phosphorus; multiple total metals; a dissolved metal including Phosphorus; VOCs including Benzene; PAHs and PCBs.

Groundwater chemistry samples also measured exceedances of the City of Toronto Sanitary Sewer By-Law criteria for TSS; total Phosphorus and multiple total metals.

5.1.1 City of Toronto Storm Sewer Use By-Law

Groundwater chemistry samples exhibited exceedances of the following City of Toronto Storm Sewer Use By-Law criteria limits:

- Total Suspended Solids
- Anions and Nutrients: Phosphorus
- Dissolved metals: Phosphorus
- Benzene
- Total PAHs
- Total PCBs
- multiple Total Metals

Section 7.2.2 discusses mitigation measures that will need to be implemented to permit discharging to municipal sewers if desired.

5.1.2 Discharge to Municipal Storm Sewers

Based on the analysis results, discharge to municipal storm sewers would require treatment such as settling tanks with flocculation and/or mechanical filtration (using filter bags) to reduce TSS and total metals concentrations to acceptable levels, plus additional treatment systems to address measured exceedances of VOC, PAHs, and PCBs. During construction dewatering operations, regular sampling and analysis of discharge would be required to confirm continued compliance with the Storm Sewer Use By-Law. In the event parameter exceedances were measured, treatment of discharge would need to be adjusted/modified/supplemented to achieve Storm Sewer Use By-Law criteria limits.

5.1.3 City of Toronto Sanitary Sewer Use By-Law

Groundwater chemistry samples exhibited exceedances of the following City of Toronto Sanitary Sewer Use By-Law criteria limits:

- Total Suspended Solids
- Anions and Nutrients: Phosphorus
- Total Aluminum

Section 7.2.2 discusses mitigation measures that will need to be implemented to permit discharging to municipal sewers if desired.

5.1.4 Discharge to Municipal Sanitary Sewers

Based on the analysis results, discharge to municipal sanitary sewers would require treatment such as settling tanks with flocculation and/or mechanical filtration (using filter bags) to reduce TSS concentrations to acceptable levels. During construction dewatering operations, regular sampling and analysis of discharge would be required to confirm continued compliance with the Sanitary Sewer Use By-Law. In the event parameter exceedances were measured, treatment of discharge would need to be adjusted/modified/supplemented to achieve Sanitary Sewer Use By-Law criteria limits.

6. POTENTIAL IMPACTS OF CONSTRUCTION DEWATERING

6.1 Municipal Supply Wells and Surface Water Intakes

Ontario Source Protection Information Atlas mapping shows the subject property does not lie within a municipal wellhead protection area (WHPA). The property also does not lie within a municipal surface water Intake Protection Zone (IPZ). As the municipal intake draws water from Lake Ontario, and construction dewatering discharge that might be routed to the municipal sewers must meet all Sewer Use By-Law criteria limits, no impacts to municipal water supplies would be anticipated due to construction dewatering at the subject property.

6.2 Private Supply Wells

Review of the MECP Water Well Record online database identified zero private water supply wells within 250 m of the subject property. As the conservatively calculated radius of influence of construction dewatering is 78.1 m, no negative impacts would be anticipated for any private water supply wells which may exist.

6.3 Surface Water Features

There are no surface water features on or adjacent to the property. The closest natural surface water feature is Little Etobicoke Creek located approximately 2.1 km west of the property.

TRCA mapping (2022) shows the property is not located within a regulated area. The closest regulated areas are approximately 2 km west of the property, associated with Etobicoke Creek. The property lies within the West Lake Ontario Shoreline watershed. As the calculated radius of influence of construction dewatering is 78.1 m, no negative impacts to surface water features are anticipated.

6.4 Groundwater Resources

As construction dewatering will temporarily withdraw water from the shallow overburden and shallow bedrock which is not being utilized by private water supply wells within the estimated radius of influence of construction dewatering, no material impacts to shallow groundwater resources are anticipated. Ontario Source Protection Information Atlas mapping shows the southern portion of the subject property is located within a highly vulnerable aquifer area; however, this relates to vulnerability to impacts from contaminants rather than extraction of groundwater. As a result, no impacts to an aquifer beneath the subject property are anticipated.

6.4.1 Confined Groundwater Conditions and Excavation Bottom Heave

While significant confined aquifer conditions were not observed during drilling or in the monitoring wells installed on the subject property, seasonal groundwater fluctuations may result in more significant confined conditions. Bottom heave occurring in excavations due to unweighting of the soil/bedrock as a result of excavations removing soil/bedrock weight overlying pressurized aquifer conditions should be considered a possibility as a conservative factor of safety. As discussed in Section 7.4 below, diligent observation of conditions in the excavations is recommended to monitor for potential bottom heaving. In the event bottom heaving or other issues due to pressurized aquifer conditions occur, the construction and dewatering strategies for the project would need to be revised.

6.5 Geotechnical Issues and Settlement

The conservatively calculated radius of influence of construction dewatering is up to 78.1 m. As buildings and structures lie within the radius of influence, and roadways and services are located within the radius of influence, a geotechnical engineer should be consulted to determine whether geotechnical issues or impacts due to settlement resulting from construction dewatering could be anticipated. A geotechnical engineer should provide any applicable monitoring and/or mitigation recommendations to address any potential geotechnical issues or impacts.

7. MONITORING AND MITIGATION

The following monitoring and mitigation recommendations are provided to ensure construction dewatering does not impact the proposed discharge location, and to ensure any impacts from construction dewatering are promptly and effectively resolved. These monitoring and mitigation recommendations should be incorporated into the PTTW that will be required for construction dewatering, along with any monitoring and mitigation recommendations that may be provided by a geotechnical engineer.

7.1 Discharge Volumes

During all construction dewatering operations, total pumping rates and discharge volumes from all excavations shall be measured using calibrated flow measurement devices (such as flow meters), with daily summation of total pumping rates and volumes and comparison o the permitted rates and volumes to ensure no exceedances occur.

In the event daily water taking rates or volumes exceed permitted values, the construction methodology or dewatering methodology will need to be modified immediately to bring the daily water taking back into compliance with the permitted values.

The dewatering contractor shall maintain records of all daily water taking rates and volumes, including dates and locations of all water takings.

7.2 Discharge Water Chemistry

As discussed in Section 2.6 and its subsections groundwater chemistry samples exhibited measured exceedances of the City of Toronto Storm Sewer Use By-Law criteria limits for TSS, Phosphorus; multiple total metals; dissolved metals including Phosphorus; VOCs including Benzene; PAHs and PCBs. Groundwater chemistry samples also measured exceedances of the City of Toronto Sanitary Sewer By-Law criteria for TSS; total Phosphorus and multiple total metals.

The dewatering contractor must implement appropriate treatment methodologies for the selected discharge location, and all required treatment equipment shall be set up on site prior to any construction dewatering.

7.2.1 Discharge to Municipal Storm or Sanitary Sewers

Field testing will be required to ensure the appropriate Sewer Use By-Law criteria are being met along with any requirements mandated in the Sewer Discharge Permit that will need to be obtained from the City of Toronto.

A suggested initial treatment system could consist of the following:

- A settling tank equipped with Flocculation Blocks (Floc Blocks);
- Two filter vessels (appropriately sized for the dewatering flow rate) equipped with disposable 50-micron filter bags.
- An appropriately designed treatment system to mitigate exceedances of VOCs, PAHs, and PCBs (if required).

Please see Section 7.2.1.1 below regarding collection of trial dewatering chemistry samples and potential modification of treatment system requirements.

7.2.1.1 Assessment and Monitoring

Once the treatment system is set up, short-term trial dewatering should take place to allow representative water samples to be collected upstream (pre-treatment) and downstream (post-treatment) of the system, with sampling for appropriate City of Toronto Sewer Use By-Law parameters for discharge to municipal sewers. In the event post-treatment samples exhibit exceedances of any parameters, the treatment system would need to be modified and chemistry re-testing completed until the post-treatment samples show no exceedances.

During all construction dewatering operations, samples from each dewatering system should be collected on a weekly basis and analyzed for the appropriate suite of parameters. If water chemistry testing shows an exceedance of applicable criteria limits, the dewatering contractor or a water treatment specialist shall be consulted immediately to determine the most effective method of mitigating the exceedance. Treatment should be implemented with follow-up water chemistry sampling to confirm that no further exceedances are measured.

Weekly water chemistry sampling can also include upstream (pre-treatment) sampling to assess whether continued use of treatment systems is required. If upstream sampling results demonstrate that the pumped water meets the appropriate criteria, the treatment system(s) can be taken offline. In the event exceedances are measured in future weekly samples, the treatment system(s) would need to be brought back online immediately.

7.3 Discharge Locations

It is expected construction dewatering discharge will be routed to the municipal storm or sanitary sewer. As noted above, water chemistry samples will need to be collected weekly from the discharge hose(s) and analyzed for the appropriate Sewer Use By-Law criteria limits for discharge to municipal sewers. If any exceedances are measured, water treatment and mitigation measures will need to be implemented immediately and the water will need to be re-tested with a maximum 24-hour turnaround time to confirm compliance with the appropriate criteria limits prior to continued discharge

All conditions specified in the Sewer Discharge Permit (to be obtained for the project from the City of Toronto) must be adhered to during construction dewatering operations.

7.4 Excavation Bottom Heave

The excavation shall be monitored daily for signs of bottom heave. In the event heaving is observed, all excavation work in the immediate area shall cease and soils shall be replaced in the excavation to restore overburden weight. If bottom heave occurs, alternate construction and/or dewatering methodologies will be required to address the issue, and coordination between the construction contractor, the dewatering contractor, and engineering consultants will be required to ensure the situation is effectively mitigated.

This scope of this report does not include detailed analysis of the potential for excavation bottom heave, and it will be the responsibility of the construction contractor and dewatering contractor to identify and mitigate bottom heave in the event it occurs.

7.5 Geotechnical Issues for Adjacent Infrastructure

A geotechnical consulting engineer shall be retained to evaluate all infrastructure, (utility poles, light poles, above ground and underground services, building foundations, roadways, etc.) within the calculated radius of influence of dewatering. Infrastructure such as utility poles, light poles, underground services, etc. shall be braced and supported as required based on the geotechnical engineer's recommendations within the radius of influence of the excavation. Where a geotechnical engineer identified potential concerns, supported infrastructure shall be monitored regularly during construction dewatering activities (or as otherwise recommended by the geotechnical engineer) to ensure no settlement or impacts are occurring. Any settlement or impacts that are noted by the geotechnical consulting engineer shall be assessed and mitigated promptly and effectively using appropriate methodology.

For building foundations and other structures within the calculated radius of influence, the geotechnical consulting engineer shall determine whether to perform a foundation assessment, install crack monitors as required, and monitor the foundations on an appropriate frequency for signs of settlement or other impact. In the event settlement or other impact to foundations occurs, construction dewatering and/or excavation methodologies may need to be revised, dewatering may need to cease temporarily, and the geotechnical consulting engineer shall take all required steps to halt resolve the impact.

7.6 Water Supply Wells

As discussed in Sections 6.1 and 6.2, no impacts to private or municipal water supply wells or surface water intakes from construction dewatering are anticipated due to the distance of potential receptors from the proposed construction dewatering area and the conservatively calculated radius of influence of construction dewatering.

8. CLOSURE

As illustrated in the appended borehole logs subsurface stratigraphy beneath the site consists of fill of varying composition underlain by deposits of clayey silt/silt till of varying thickness, with a thicker layer of silt till encountered in most boreholes at depths of approximately 1.3-2.2 mBGS, overlying weathered shale bedrock. Groundwater was encountered in the in the shale deposits (representing a confined aquifer) at depths of approximately 2.65-7.28 mBGS.

Soil hydraulic conductivity estimates from slug tests of monitoring wells range from 5.9×10^{-6} to 2.3×10^{-6} m/sec for the silt till and shale deposits in BH1, BH3, and BH4A, indicating a relatively moderately low permeability. BH5 did not reach $T_{0.37}$ and had an estimated soil hydraulic conductivity of $<1.0 \times 10^{-7}$ m/sec indicating a low permeability for the shale deposit screened by the monitoring well. Due to a malfunction in the datalogger, slug test data from BH6 has not been included in the report.

The grain size analysis for the clayey silt till encountered in the borehole indicated a hydraulic conductivity of approximately 6 x 10^{-10} m/sec, indicating a very low permeability soil.

The southern portion of the property is located within a Highly Vulnerable Aquifer (HVA) area, not located within a Significant Groundwater Recharge Area (SGRA), not located within a vulnerable groundwater area, not located within a Groundwater Under Direct Influence (GUDI) of surface water area, and not located within a vulnerable surface water area. Mapping and the MECP WWR database indicates there are no private or municipal water supply wells located within the conservatively calculated radius of influence of construction dewatering.

Construction dewatering calculations conservatively estimate that up to 1,320,800 L/day of pumping required for the 2-level underground parking structure, plus up to 931,700 L/day to manage a significant precipitation event, for a potential total maximum pumping requirement of up to 2,252,500 L/day. The potential for excavation bottom heave due to confined aquifer conditions in the overburden deposits is unlikely; however, monitoring of excavations for bottom heave will be an important part of the construction dewatering monitoring program.

A Category 3 Permit to Take Water (PTTW) will be required to permit pumping during construction dewatering as the anticipated maximum dewatering rates are above the 400,000 L/day EASR threshold.

Water chemistry analyses indicate exceedances Storm and Sanitary Sewer Use By-Law parameters; therefore, treatment of construction dewatering discharge will be required prior to directing the discharge to municipal sewers. A Sewer Discharge Permit from the City of Toronto will be required to discharge to municipal sewers.

Monitoring and mitigation recommendations have been provided to address potential impacts of construction dewatering on site and discharge of water to municipal sewers.

We trust that this report satisfies your present requirements, and we thank you for this opportunity to be of service. If you have any questions, or require further hydrogeological consulting services, please feel free to contact the undersigned directly.

Respectfully submitted,

Sara Khawja, M.Sc., GIT
Groundwater Analyst

Chris Helmer, B.Sc., P.Geo.
Senior Hydrogeologist
MECP Licensed Well Contractor and
Class 5 Well Technician
www.hydrog.ca

PROFESSIONAL GEOSCIENTIST
27-Nov-2024
CHRIS HELMER
PRACTICING MEMBER
2285
ONTARIO

9. LIMITATIONS AND USE

This report has been prepared for the exclusive use of the Client indicated in Section 1. Chris F Helmer and Hydrogeology Consulting Services Inc. (HCS) hereby disclaim any liability or responsibility to any person or party for any loss, damage, expense, fines, or penalties which may arise from the use of any information or recommendations contained in this report by anyone other than the Client.

The conclusions and recommendations provided in this report are not intended as specifications or instructions to contractors. Any use contractors may make of this report, or decisions made based on it, are the responsibility of the contractors. Contractors must accept responsibility for means and methods of construction they select, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect them.

In preparing this report Chris F Helmer and HCS have relied in good faith on information provided by individuals and companies noted in this report, and assumes that the information provided is factual and accurate. No responsibility is accepted for any deficiencies, misstatements, or inaccuracies contained in this report as a result of errors, omissions, misinterpretations, or fraudulent acts in the resources referenced, or of persons interviewed or consulted during the preparation of this report.

The report and its complete contents are based on data and information collected during investigations conducted by Chris F Helmer and HCS, and pertains solely to the conditions of the site at the time of the investigation, supplemented by historical information and data as described in this report. It is important to note that the investigation involves sampling of the site at specific locations, and the conclusions in this report are based on the information gathered. Limitations of the data and information include the fact that conditions between and beyond the sampling locations may vary; that the assessment is dependent upon the accuracy of the analytical data generated through sample analysis; and that conditions or contaminants may exist for which no analyses have been conducted. Furthermore, no assurance is made regarding potential changes in site conditions and/or the regulatory regime (standards, guidelines, etc.), subsequent to the time of investigation.

The professional services provided for this project include only the hydrogeological aspects of the subsurface conditions at the site, unless otherwise stated specifically in the report. No other warranty or representation is either expressed or implied, as to the accuracy of the information or recommendations included or intended in this report.

10. REFERENCES

Armstrong, D.K. and Dodge, J.E.P. 2007. *Paleozoic Geology Map of Southern Ontario; Ontario Geological Survey.*

Chapman, L.J. and Putnam, D.F. 2007. *Physiography of Southern Ontario*. Ontario Geological Survey.

Freeze, R.A. and Cherry, J.A. 1979. *Groundwater*. Englewood Cliffs, New Jersey: Prentice-Hall.

Ministry of Natural Resources and Forestry (MNRF). 2020. Make a Map: Natural Heritage Areas. Online GIS.

Karrow, P.F. & Rogers, D.P. & 1961. Metropolitan Toronto Bedrock Contours. Ontario Department of Mines. Preliminary Map 102

Ontario Geological Survey. 1991. *Bedrock Geology of Ontario, Southern Sheet*. Ontario Geological Survey Map 2544.

Ontario Ministry of Environment, Conservation and Parks (MECP). 2020. Source Protection Information Atlas. Online GIS.

Ontario Ministry of Environment, Conservation and Parks (MECP). 2020. Water Well Information System. Online GIS.

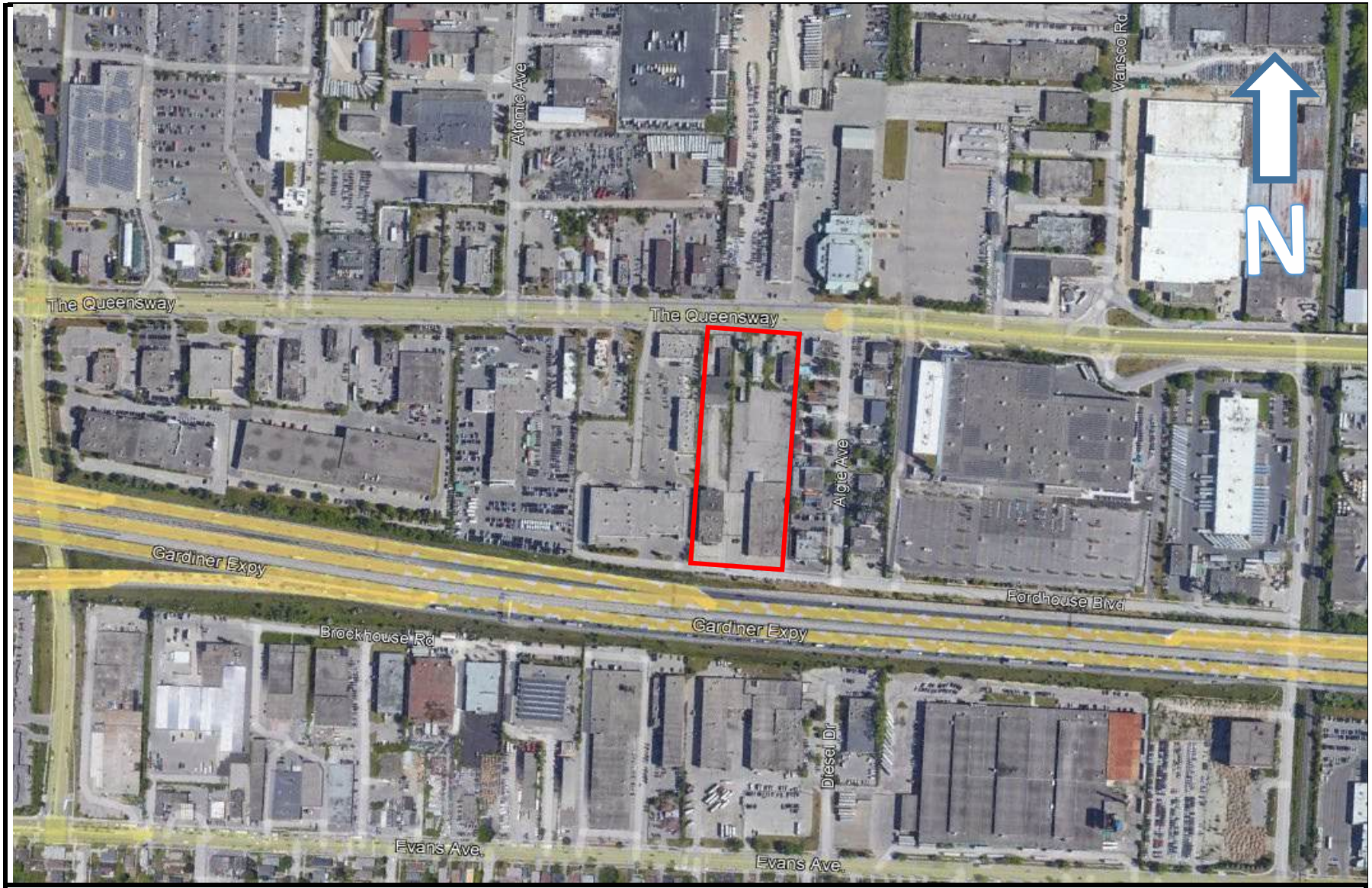
Ontario Ministry of the Environment. 2003. *Stormwater Management Planning and Design Manual.*

Powers, J.P. et al. 2007. *Construction Dewatering and Groundwater Control, New Methods and Applications*. Third Edition.

Sharpe, D.R. 1980. *Quaternary Geology of Toronto and Surrounding Area.* Ontario Geological Survey Preliminary Map P.2204.

APPENDIX A: DRAWINGS

Drawing 1 – Location Plan
Drawing 2 – BH Location Plan (SOLA Engineering, September 2023)
Master Plan (Hariri Pontarini Architects, September 2024)



imagery from Google Earth © 2023

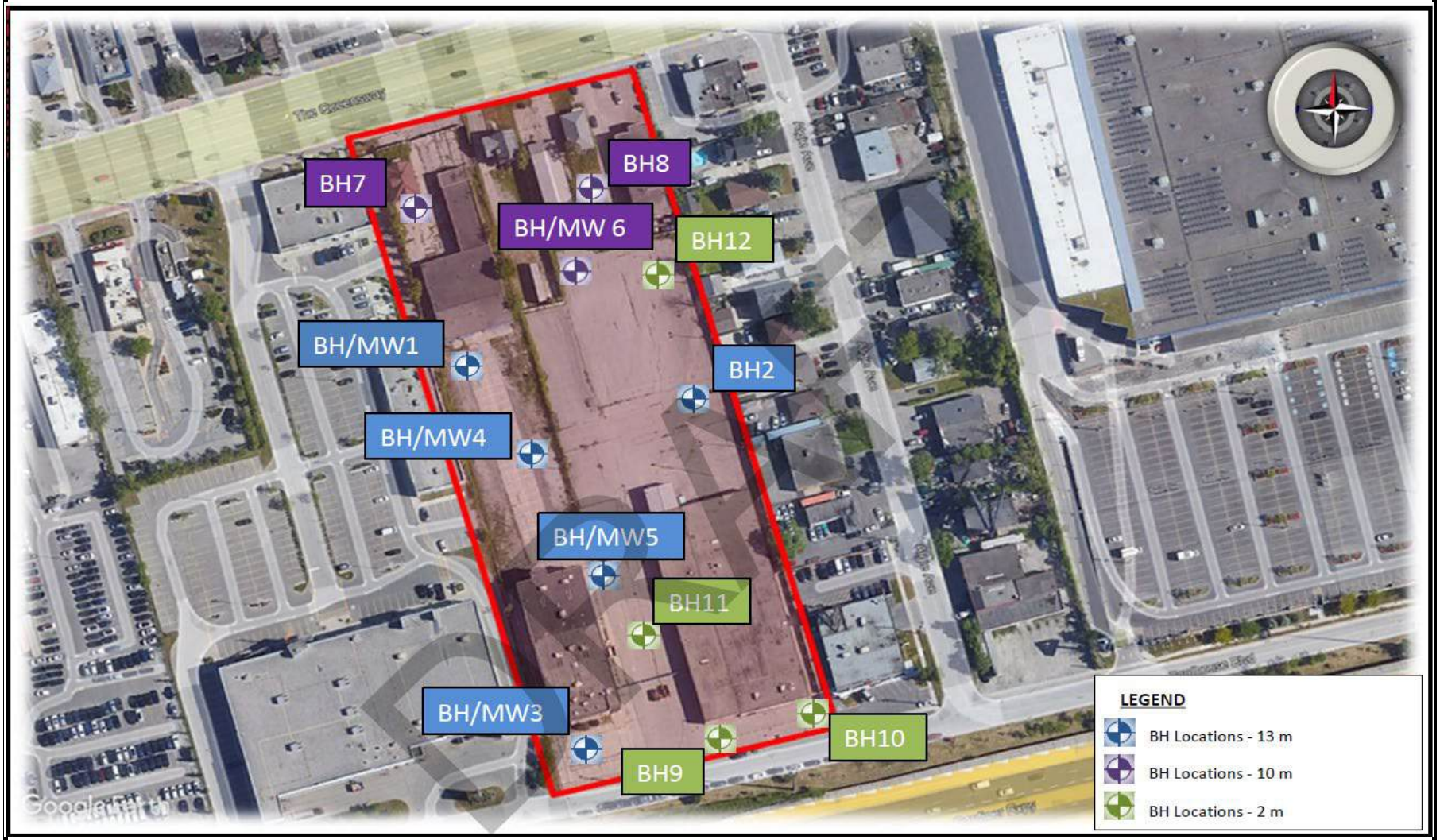
Drawing 1 - Location Plan

The Queensway and Fordhosue, Etobicoke

LEGEND
Site Area

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	SK
Date:	11/3/2023



SOLA Engineering (2023)

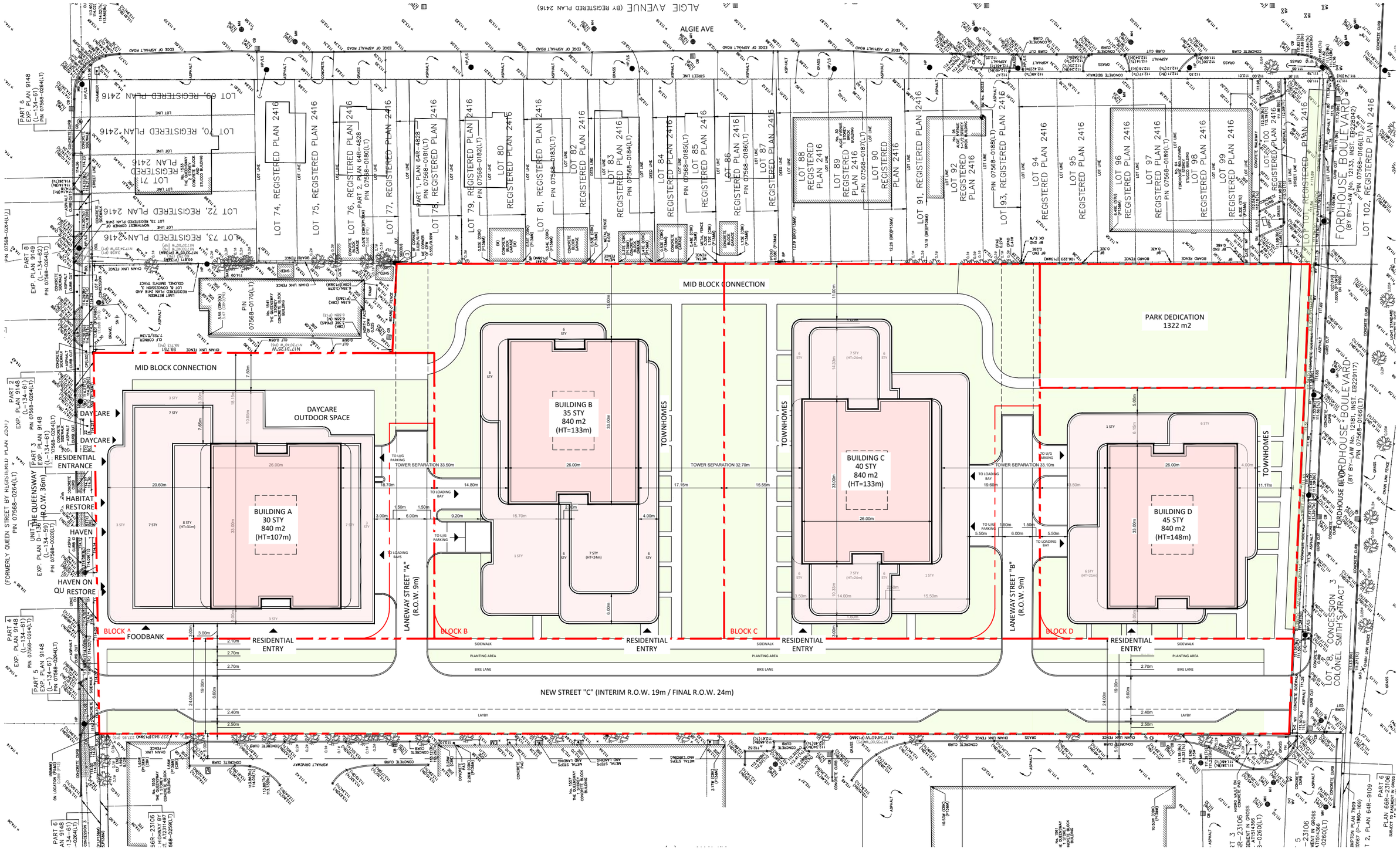
Drawing 2 - Site Plan

The Queensway and Fordhosue, Etobicoke

LEGEND	
⊕	Monitoring Well Location

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	SOLA
Date:	11/3/2023



MASTER PLAN

SCALE 1 : 700

THE QUEENSWAY & ALGIE STREET DEVELOPMENT

Date: 17th Sept 2024

HARIRI PONTARINI ARCHITECTS

APPENDIX B: TABLES

Table 1 – Groundwater Level Measurements
Table 2 – Hydraulic Conductivity Estimates
Table 3 – Water Chemistry Analysis Results

The Queensway and Fordhouse Boulevard, Etobicoke
Table 1 - Groundwater Level Measurements

Name	Ground Surface Elevation (m)	Stickup (m)	20-Sep-23		
			WL (mBTOP)	WL (mBGS)	WL (m)
BH1	101.60	-0.12	3.54	3.66	97.95
BH3	100.00	-0.13	3.20	3.33	96.68
BH4A	100.52	-0.12	2.53	2.65	97.88
BH5	100.27	-0.10	3.40	3.50	96.77
BH6	101.83	-0.05	7.23	7.28	94.55

m - metres (respective to local datum)
mBGS - metres Below Ground Surface
mBTOP - meters Below Top

The Queensway and Fordhouse Boulevard, Etobicoke
Table 2 - Hydraulic Conductivity Estimates

Name	Soil Sample Depth or Screened Interval (mBGS)	Soil Type	Analysis Method	Hydraulic Conductivity (m/sec)
BH1	11.3 - 12.8	Shale (weathered)	Hvorslev	5.4×10^{-6}
BH1	1.52 - 2.01	Fill - Clayey Silt	Kaubisch	6×10^{-10}
BH3	2.3 - 3.8	Silt Till and Shale	Hvorslev	2.3×10^{-6}
BH4A	11.28 - 12.8	Shale (weathered)	Hvorslev	5.9×10^{-6}
BH5	3.05 - 4.57	Shale (weathered)	Hvorslev**	$<1 \times 10^{-7}$

mBGS - metres Below Ground Surface
m/sec - metres per second
* - D_{10} value was not provided; therefore, the hydraulic conductivity value is considered approximate
** - $T_{0.37}$ was not achieved; therefore, the hydraulic conductivity value is considered approximate

The Queensway and Fordhouse Boulevard, Etobicoke
Table 3 - Water Chemistry Analysis Results
20-Sep-23

Parameter	BH/MW 6	BH/MW 5	Toronto Storm Sewer Criteria Limit(s)	Toronto Sanitary Sewer Criteria Limit(s)
pH	8.06	8.62	6.0-9.5	6.0-11.5
Total Suspended Solids (mg/L)	***37***	***2,690***	15	350
Phosphorus, Total (mg/L)	***1950***	***28.1***	0.4	10
E.coli (CFU/100 mL)	0	0	200	--
TOTAL METALS				
Aluminum (mg/L)	7.84	298	-	50
Arsenic (mg/L)	0.0131	***0.0605***	0.02	-
Chromium (mg/L)	0.0124	***0.434***	0.08	-
Copper (mg/L)	0.0184	***0.327***	0.04	2
Lead (mg/L)	0.007	0.0489	0.12	1
Manganese (mg/L)	***0.357***	***7.34***	0.05	5
Nickel (mg/L)	0.0158	***0.508***	0.08	-
Zinc (mg/L)	***0.0462***	***1.0200***	0.04	2
DISSOLVED METALS				
Phosphorus (mg/L)	***<0.50***	***<0.50***	0.4	10
AGGREGATE ORGANICS				
BOD (mg/L)	<3.0	4.6	15	300
Oil and Grease, Total	<5.0	<5.0	-	-
Phenols (4AAP) (mg/L)	<0.0010	<0.0050	0.008	1
VOLATILE ORGANIC COMPOUNDS				
Benzene (µg/L)	<0.50	***5.3***	2	10
Ethylbenzene (µg/L)	<0.50	<0.50	2	160
Toluene (µg/L)	<0.50	<0.50	2	16
Trichloroethylene (µg/L)	<0.50	<0.50		
Xylenes (Total) (µg/L)	<0.50	<0.50	4.4	1400
POLYCYCLIC AROMATIC HYDROCARBONS				
Total PAHs (µg/L)	<1.75	***2.6***	2	5
Polychlorinated Biphenyls				
Total PCBs (µg/L)	<0.060	***<0.600***	0.4	1

i- All measured concentrations are in units indicated.
ii- All metals concentrations are total metals, including metals adsorbed on to suspended sediments
iii- Concentrations in ***bold italicized text*** exceed Storm Sewer criteria.
iv- Concentrations in red text exceed Sanitary Sewer criteria

HCS HYDROGEOLOGY CONSULTING SERVICES INC

APPENDIX C: BOREHOLE LOGS

Boreholes BH1 – BH12

SOLA ENGINEERING

ENCLOSURE No. 2

RECORD OF BOREHOLE No. BH1 1 OF 2 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.11 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Asphalt										
0.0 / 0.1	ASPHALTIC CONCRETE - 75 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 685 mm thick		1	SS	15				○		
0.8	FILL - clayey silt, trace gravel, brown, moist		2	SS	12				○		
			3	SS	17				○		
2.3	CLAYEY SILT TILL- brown, compact , moist		4	SS	32				○		
3.0	SHALE - completely weathered, gray		5	SS	99/ 23 cm				○		
			6	AS					○		
			7	AS					○		
			8	AS					○		
	- some clay		9	SS	50/ 8 cm				○		

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 2

RECORD OF BOREHOLE No. BH1 2 OF 2 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.11 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SHALE - completely weathered, gray *(continued)*										
			10	SS	50/ 5 cm						
13.0	End of Borehole at the Targeted Depth; Borehole was Open and Water at 2.5 m Below Existing Ground Surface Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 3

RECORD OF BOREHOLE No. BH2 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.13 - 2023.09.13 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick GRANULAR BASE/SUBBASE (sand and gravel) - 530 mm thick		1A	SS	34				○		
0.6			1B								
0.8	FILL - clayey silt, trace gravel, brown, moist FILL - sandy silt, trace gravel, trace sand, oxidation, brown, moist		2	SS	27				○		
1.5	SILT - containing shale fragments, brown, dense to very dense, moist		3	SS	41				○		
			4	SS	50/ 13 cm				○		
3.0	SHALE - completely weathered, gray		5	SS	89/ 23 cm				○		
			6	SS	50/ 10 cm				○		
			7	SS	50/ 5 cm				○		
6.1	Start of rock coring;										

$+^{3}$, $\times^{3}$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH2**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 13/09/2023 AT: _____ DATE FINISH: 13/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: HH

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
7.2	SHALE	moderate to slightly weathered, grey, moderately weak in strength, intense to moderately fractured, TCR: 97% RQD: 85%	1.524/ 1.575 =97%					
8.4	SHALE	TCR: 100% RQD: 76%	1.473/ 1.473 =100%					
9.2	SHALE	moderate to slightly weathered, grey, moderately weak in strength, moderate to slightly fractured,						
10.8	SHALE	moderate to slightly weathered, grey, moderately weak in strength, moderately fractured, - 75 mm limestone layer at 10.8 m - 50 mm limestone layer at 11.2 m TCR: 100% RQD: 80%	1.524/ 1.524 =100%					
11.6		moderately weathered, grey, moderately weak in strength, intensely fractured, - 75 mm limestone layer at	1.524/ 1.524 =100%					

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH2**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 13/09/2023 AT: _____ DATE FINISH: 13/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: HH

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
12	SHALE	11.4 m - 100 mm limestone layer at 12.1 m - 75 mm limestone layer at 12.4 m TCR: 100% RQD: 18%						
12.4								
12.8								
		End of Rock Core at the Targeted Depth of 12.9 m Below Ground Surface						
13.2								
13.6								
14								
14.4								
14.8								
15.2								
15.6								
16								
16.4								
16.8								

SOLA ENGINEERING

ENCLOSURE No. 4

RECORD OF BOREHOLE No. BH3 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.12 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick GRANULAR BASE/SUBBASE (sand and gravel) - 650 mm thick		1	SS	14				○		
0.8	FILL - silty sand, trace gravel, trace organic, brown, moist		2	SS	6						
1.5	CLAYEY SLIT TILL- trace gravel, grey to brown, oxidation, compact , moist		3	SS	24				○		
2.2	SILT TILL - containing shale fragments, grey, dense, moist		4	SS	49				○		
3.0	SHALE - completely weathered, gray		5	SS	50/ 5 cm				○		
			6	SS	50/ 8 cm				○		
6.0	Start of rock coring;										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH3**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 12/09/2023 AT: _____ DATE FINISH: 12/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: _____

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
6.4	SHALE	GEORGIAN BAY FORMATION - intensely weathered, grey, weak in strength, very intensely fractured TCR:60% RQD:0%	0.635/ 1.067 =60%					
6.8	SHALE	TCR:95% RQD:20%	1.473/ 1.549 =95%					
7.2	SHALE	-intense to moderately weathered, grey, moderately weak in strength, intnesly fractured						
7.6	SHALE							
8	SHALE							
8.4	SHALE	-moderately to slightly weathered, grey, moderately weak in strength, intensely fractured TCR=97% RQD=47%	1.473/ 1.524 =97%					
8.8	SHALE							
9.2	SHALE							
9.6	SHALE							
10	SHALE	TCR:98% RQD:27%	1.475/ 1.524 =97%					
10.4	SHALE							
10.8	SHALE							

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH3**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 12/09/2023 AT: _____ DATE FINISH: 12/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: _____

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
11.2								
11.6		- 70 mm limestone layer at 11.8 m TCR:95% RQD:30%	1.45/ 1.524 =95%					
12	SHALE							
12.4								
12.8								
		End of Rock Core at the Targeted Depth of 12.9 m Below Ground Surface						
13.2								
13.6								
14								
14.4								
14.8								
15.2								
15.6								

SOLA ENGINEERING

ENCLOSURE No. 5

RECORD OF BOREHOLE No. BH4A 1 OF 2 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.11 - 2023.09.11 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 530 mm thick		1A	SS	11				○		
0.6			1B								
0.8	FILL - clayey silt, trace gravel, trace sand, trace organic, brown, moist		2	SS	14				○		
	FILL - sandy silt, trace gravel, brown, moist										
1.5	SILT TILL - brown, dense, moist		3	SS	40				○		
2.3	SHALE - completely weathered, gray		4	SS	86/ 25 cm				○		
			5	SS	50/ 5 cm				○		
			6	AS					○		
			7	SS	50/ 8 cm				○		
			8	AS					○		
			9	SS	50/ 13 cm				○		

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 5

RECORD OF BOREHOLE No. BH4A 2 OF 2 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.11 - 2023.09.11 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SHALE - completely weathered, gray *(continued)*		10	AS					○		
			11	SS	50/ 5 cm				○		
13.4	End of Borehole at the Targeted Depth; Borehole was Open and Water was at 11 m Below Existing Ground Surface Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 5

RECORD OF BOREHOLE No. BH4B 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.11 - 2023.09.11 NORTHING _____ EASTING _____ CHECKED BY HH

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION ⊗ RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
0.0	Asphalt Direct Augur to 3.8 m for monitoring well installation										
3.8											

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 6

RECORD OF BOREHOLE No. BH5 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.13 - 2023.09.13 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 430 mm thick		1A / 1B	SS	23						
0.5											
0.8	FILL - silty sand, some clay, trace gravel, trace organic, dark brown, moist		2	SS	12						
	FILL - clayey silt, trace gravel, trace sand, brown, moist										
	- occasionally inferred cobbles and boulders		3	SS	34						
2.3	SILT - containing shale fragments, grey, dense, moist		4	SS	43						
3.0	SHALE - completely weathered, gray		5	SS	50/ 8 cm						
			6	SS	50/ 5 cm						
6.1	Start of rock coring		7	SS	50/ 5 cm						

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH5**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 14/09/2023 AT: _____ DATE FINISH: 14/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: _____

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
7.2	SHALE	GEORGIAN BAY FORMATION moderate to slightly weathered, grey, moderately weak in strength, moderately fractured, TCR: 94% RQD: 88%	1.425/ 1.524 =94%					
7.6								
8								
8.4								
8.8	SHALE	moderate to slightly weathered, grey, moderately weak in strength, intensely fractured, - 90 mm limestone layer at 9.2 m TCR: 98% RQD: 68%	1.475/ 1.499 =98%					
9.2								
9.6								
10								
10.4	SHALE	moderately weathered, grey moderately weak in strength, moderately fractured, - 70 mm limestone layer at 9.9 m TCR: 98% RQD: 85%	1.525/ 1.549 =98%					
10.8								
11.2								
11.6	SHALE	TCR: 100% RQD: 78%	1.524/ 1.524 =100%					

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH5**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 14/09/2023 AT: _____ DATE FINISH: 14/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: _____

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
12								
	SHALE	moderately weathered, grey moderately hard in strength, moderately to slightly fractured,					○	
12.4		- 50 mm limestone layer at 12.1 m						
		- 50 mm limestone layer at 12.3 m						
12.8		- 50 mm limestone layer at 12.5 m						
		End of Rock Core at the Targeted Depth of 13 m Below Ground Surface						
13.2								
13.6								
14								
14.4								
14.8								
15.2								
15.6								
16								
16.4								
16.8								

SOLA ENGINEERING

ENCLOSURE No. 7

RECORD OF BOREHOLE No. BH6 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.15 - 2023.09.15 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick		1A	SS	13				○		
0.5	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1B								
0.8	FILL - silty sand, trace gravel, dark brown, moist		2	SS	11				○		
	FILL - clayey silt, brown, moist										
1.5	SILT - occasionally inferred cobbles and boulders, brown, compact to very dense, moist		3	SS	24				○		
			4	SS	50/ 8 cm				○		
			5	SS	50/ 8 cm				○		
4.6	SHALE - completely weathered, gray		6	SS	50/ 5 cm				○		
			7	SS	50/ 5 cm				○		
			8	SS	50/ 5 cm				○		
			9	SS	50/ 5 cm				○		
9.2	End of Borehole at the Targeted Depth; Borehole Caved at 8.2 m and Water was at 8.2 m Below Existing Ground Surface Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 8

RECORD OF BOREHOLE No. BH7 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.14 - 2023.09.14 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 85 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1A	SS	13				○		
0.5			1B						○		
	FILL - silty sand, trace organic, dark brown, moist		2A	SS	12					127.5	
0.9	FILL - sandy silt, grey, moist		2B							208.9	
1.5	SILT - grey, compact to dense, moist		3	SS	18				○		
	- occasionally inferred cobbles and boulders		4	SS	47				○		
3.0	SHALE - completely weathered, gray		5	SS	50/ 14 cm				○		
			6	SS	50/ 10 cm				○		
			7	AS					○		
6.6	Start of rock coring;										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ROCK CORE LOG

PROJECT NO.: 11240

PROJECT: QEW + 427 Development
LOCATION: The Queensway and Fordhpuse
ELEVATION: _____ DATUM: _____

CORING NO.: **BH7**

CONTRACTOR: _____ DRILL TYPE: _____
DATE STARTED: 14/09/2023 AT: _____ DATE FINISH: 14/09/2023 AT: _____
ORIENTATION: VERTICAL: ☐ INCLINED: ☐ BEARING: _____
COORDS. N: _____ E: _____ LOGGER: _____

DEPTH	ROCK TYPE	DESCRIPTION	CORE RUN AND RECOVERY	DISCONTINUITIES: RQD (PERCENT) 0 25 50 75 100	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DEFECT DESCRIPTION	WEATHERING: FR SW MW HW XW	REMARKS
7.2	SHALE	intense to moderately weathered, grey, moderately weak in strength, intensely fractured, TCR: 100% RQD: 85%	1.524/ 1.524 =100%					
7.6								
8								
8.4								
8.8	SHALE	TCR: 95% RQD: 77%	1.448/ 1.524 =95%					
9.2								
9.6								
10		End of Rock Core at the Targeted Depth of 9.9 m Below Ground Surface						
10.4								
10.8								
11.2								
11.6								

SOLA ENGINEERING

ENCLOSURE No. 9

RECORD OF BOREHOLE No. BH8 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.15 - 2023.09.15 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Gravel											
0.0	GRAVEL - 85 mm thick										
0.1	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1A	SS	21				○		
0.5	FILL - sandy silt, trace clay, brown, moist		1B						○		
			2	SS	11				○		
1.5	SILT TILL - contaning shale fragments, brown, dense to very dense, moist		3	SS	36				○		
			4	SS	50/ 14 cm				○		
3.0	SHALE - completely weathered, gray, very dense, moist		5	SS	50/ 10 cm				○		
			6	SS	50/ 8 cm				○		
			7	SS	50/ 8 cm				○		
			8	SS	50/ 5 cm				○		
			9	SS	50/ 5 cm				○		
9.2	End of Borehole at the Targeted Depth; Borehole was Open and Dry Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 10

RECORD OF BOREHOLE No. BH9 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.12 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Asphalt											
0.0 / 0.1	ASPHALTIC CONCRETE - 75 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 530 mm thick		1A	SS	18				○		
0.6			1B								
0.8	FILL - clay, trace gravel, trace sand, brown, moist		2	SS	15				○		
	FILL - sandy silt, trace gravel, trace clay, occasionally inferred cobbles and boulders, brown, moist										
			3A	SS	24				○		
1.8	SILT TILL, grey, compact, moist		3B						○		
2.0	End of Borehole at the Targeted Depth; Borehole was Open and Water was at 1.9 m Below Existing Ground Surface Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 11

RECORD OF BOREHOLE No. BH10 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.12 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0 Asphalt											
0.1	ASPHALTIC CONCRETE - 75 mm thick										
	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1A / 1B	SS	7				○		
0.5											
0.8	FILL - silt, some clay, trace gravel, trace sand, brown, moist		2	SS	32				○		
	FILL - sandy silt, some gravel, occasionally inferred cobbles and boulders, brown, moist to very moist										
			3	SS	41				○		
2.0	End of Borehole at the Targeted Depth; Borehole was Open and Water was at 1.9 m Below Existing Ground Surface Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 12

RECORD OF BOREHOLE No. BH11 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.12 - 2023.09.12 NORTHING _____ EASTING _____ CHECKED BY HH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 75 mm thick		1A	SS	18				○		
0.5	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1B						○		
0.8	FILL - silty sand, trace gravel, occasionally inferred cobbles and boulders, brown, moist		2	SS	18				○		
	FILL - sandy silt, some clay, brown, moist										
1.5	SILT - occasionally inferred cobbles and boulders, grey to brown, compact, moist		3	SS	26				○		
2.0	End of Borehole at the Targeted Depth; Borehole was Open and Dry Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 13

RECORD OF BOREHOLE No. BH12 1 OF 1 METRIC

PROJECT NUMBER 11240 LOCATION The Queensway and Fordhouse Boulevard, Etobicoke, Onatrio ORIGINATED BY RT

NAME QEW + 427 Development CLIENT 1370443 Ontario Limited c/o RSM Canada METHOD Soild Stem Augers COMPILED BY RT

DATUM _____ DATE 2023.09.15 - 2023.09.15 NORTHING _____ EASTING _____ CHECKED BY HH

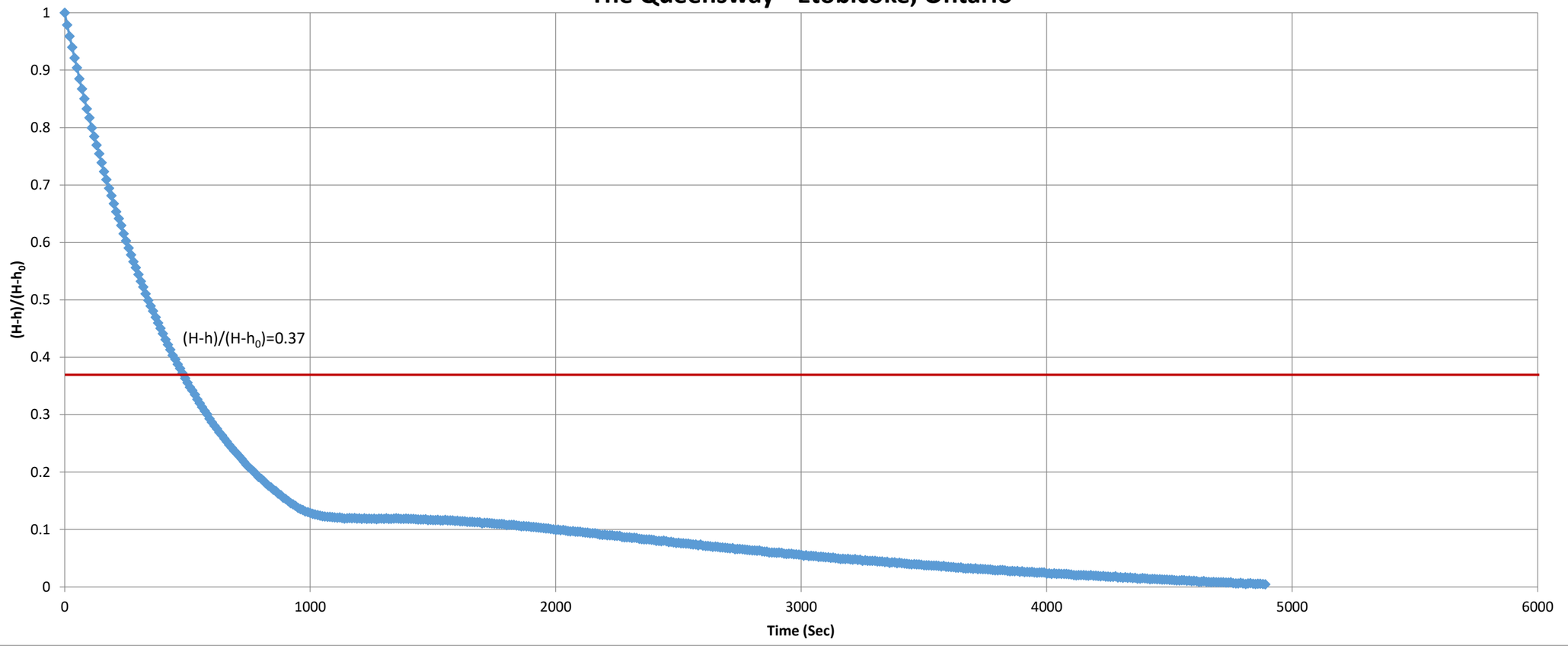
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	Asphalt										
0.1	ASPHALTIC CONCRETE - 75 mm thick		1A	SS	19				○		
0.5	GRANULAR BASE/SUBBASE (sand and gravel) - 380 mm thick		1B						○		
0.8	FILL - silty sand, trace gravel, containing brick fragments, black, moist		2	SS	7				○		
	FILL - clayey silt, brown, moist										
1.5	SILT - occasionally inferred cobbles and boulders, brown, compact, moist		3	SS	31				○		
2.0	End of Borehole at the Targeted Depth; Borehole was Open and Dry Upon Completion of Drilling Period.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

APPENDIX D: SLUG TEST ANALYSIS GRAPHS

Figure 1: BH1
Figure 2: BH3
Figure 3: BH4A
Figure 4: BH5

Figure 1
BH-MW1 Slug Test Analysis
The Queensway - Etobicoke, Ontario



Hvorslev Method for Slug Test Analysis

stickup=	-0.12	m	casing stickup from ground surface
SWL=	3.54	m	Static Water Level (mBTOP)
r =	0.051	m	casing radius
L =	1.5	m	screen length
R =	0.08	m	borehole radius (estimated)
$H-h_o$ =	2.87	m	Water level change at T=0
$T_{0.37}$ =	480	sec	T at $(H-h)/(H-h_0)=0.37$

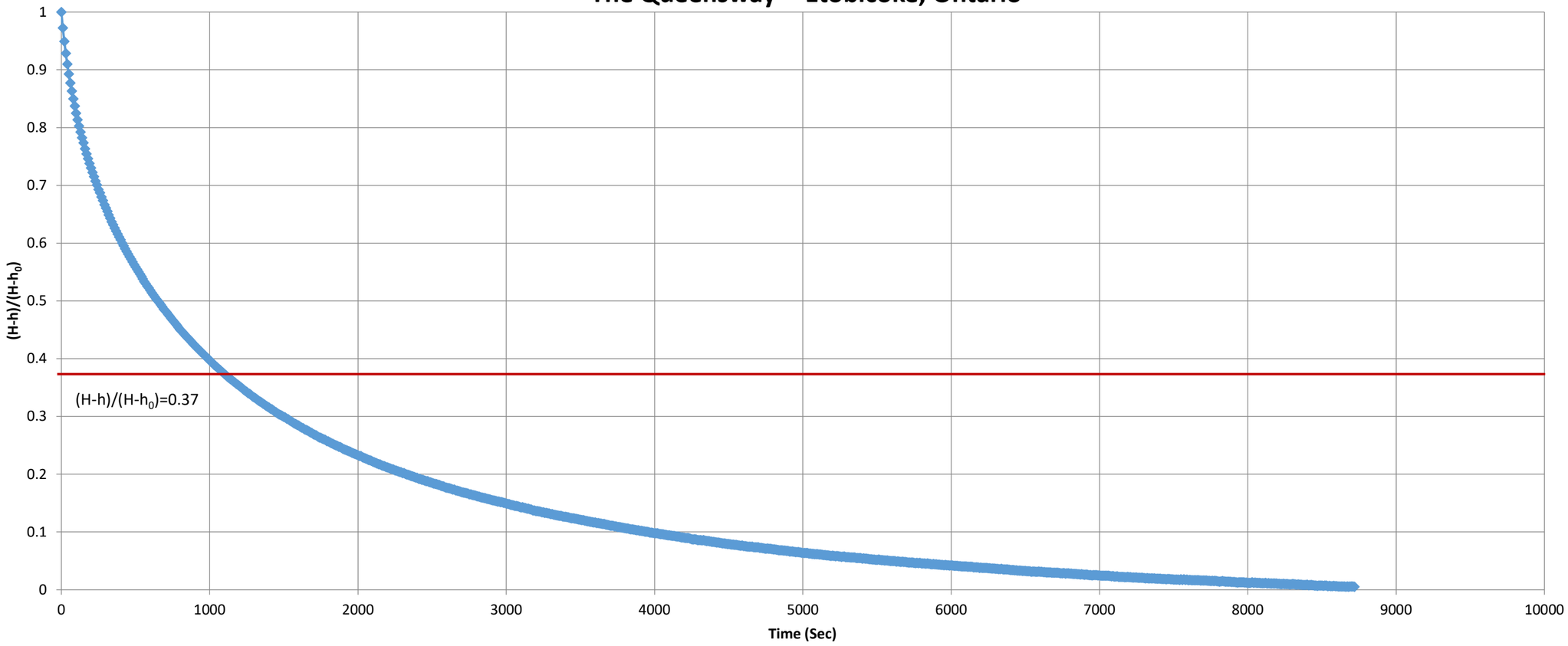
$$k = \frac{r^2 \ln(L/R)}{2LT_{0.37}}$$

k= 5.4E-06 m/sec

HCS HYDROGEOLOGY CONSULTING SERVICES INC

9/20/2023

Figure 2
BH-MW3 Slug Test Analysis
The Queensway - Etobicoke, Ontario



Hvorslev Method for Slug Test Analysis

stickup=	-0.13	m	casing stickup from ground surface
SWL=	3.2	m	Static Water Level (mBTOP)
r =	0.051	m	casing radius
L =	1.5	m	screen length
R =	0.08	m	borehole radius (estimated)
$H-h_o$ =	1.10	m	Water level change at T=0
$T_{0.37}$ =	1110	sec	T at $(H-h)/(H-h_0)=0.37$

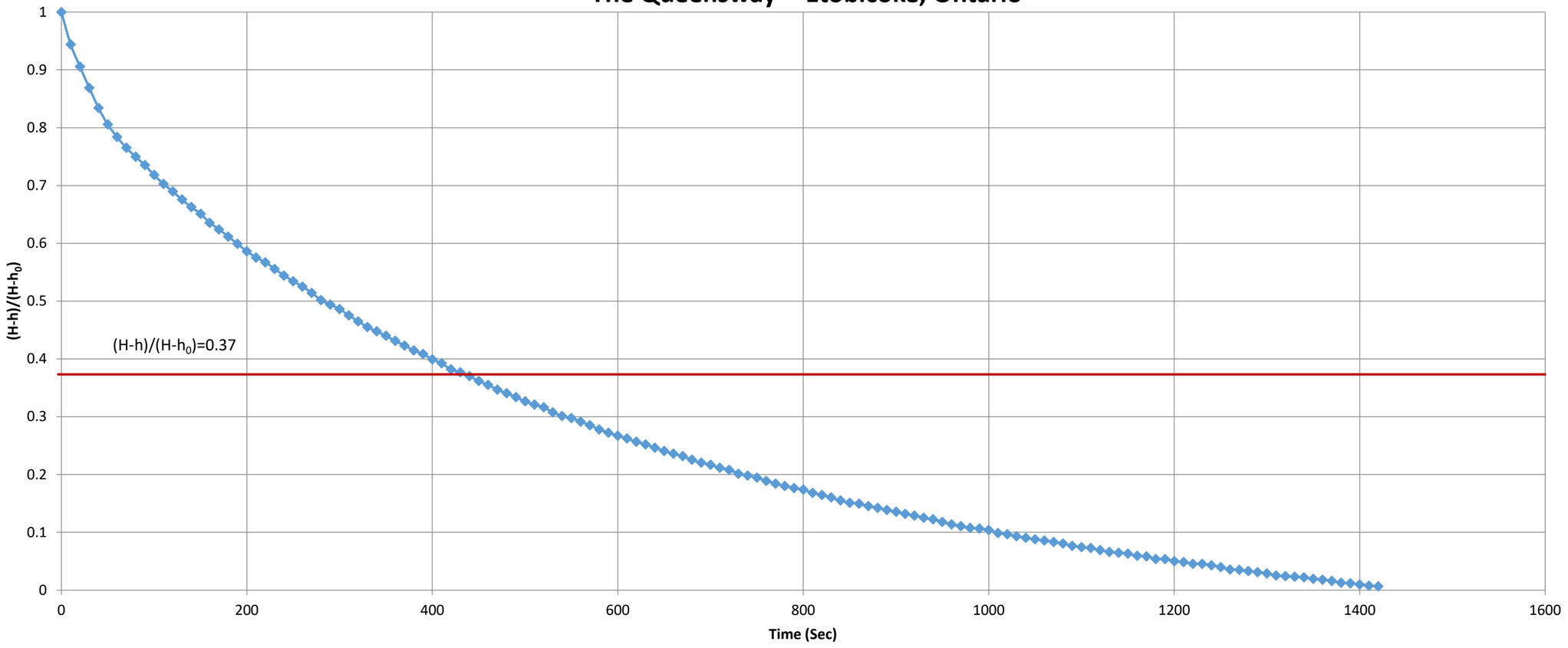
$$k = \frac{r^2 \ln(L/R)}{2LT_{0.37}}$$

k= 2.3E-06 m/sec

HCS HYDROGEOLOGY CONSULTING SERVICES INC

9/20/2023

Figure 3
BH-MW4 Slug Test Analysis
The Queensway - Etobicoke, Ontario



Hvorslev Method for Slug Test Analysis

stickup=	-0.12	m	casing stickup from ground surface
SWL=	2.53	m	Static Water Level (mBTOP)
r =	0.051	m	casing radius
L =	1.5	m	screen length
R =	0.08	m	borehole radius (estimated)
$H-h_o$ =	1.60	m	Water level change at T=0
$T_{0.37}$ =	440	sec	T at $(H-h)/(H-h_0)=0.37$

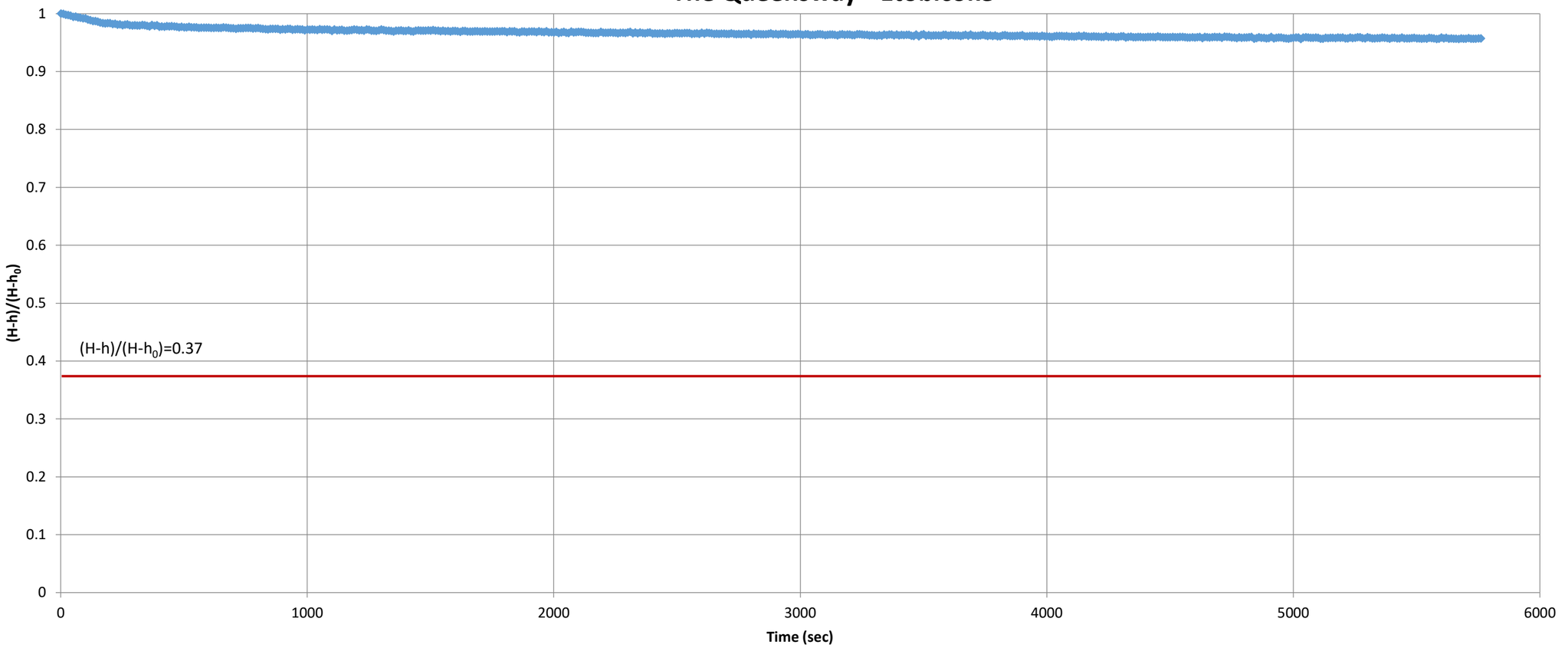
$$k = \frac{r^2 \ln(L/R)}{2LT_{0.37}}$$

k= 5.9E-06 m/sec

HCS HYDROGEOLOGY CONSULTING SERVICES INC

9/20/2023

Figure 4
BH-MW5 Slug Test Analysis
The Queensway - Etobicoke



Hvorslev Method for Slug Test Analysis

stickup=	-0.1	m	casing stickup from ground surface
SWL=	3.4	m	Static Water Level (mBTOP)
r =	0.025	m	casing radius
L =	1.50	m	screen length
R =	0.05	m	borehole radius
$H-h_o$ =	2.17	m	Water level change at T=0
$T_{0.37}$ =	n/a	sec	T at $(H-h)/(H-h_0)=0.37$

$$k=(r^2 \ln[\![(L/R)]\!])/2LT_{0.37}$$

k= <1 x 10^{-7} m/sec

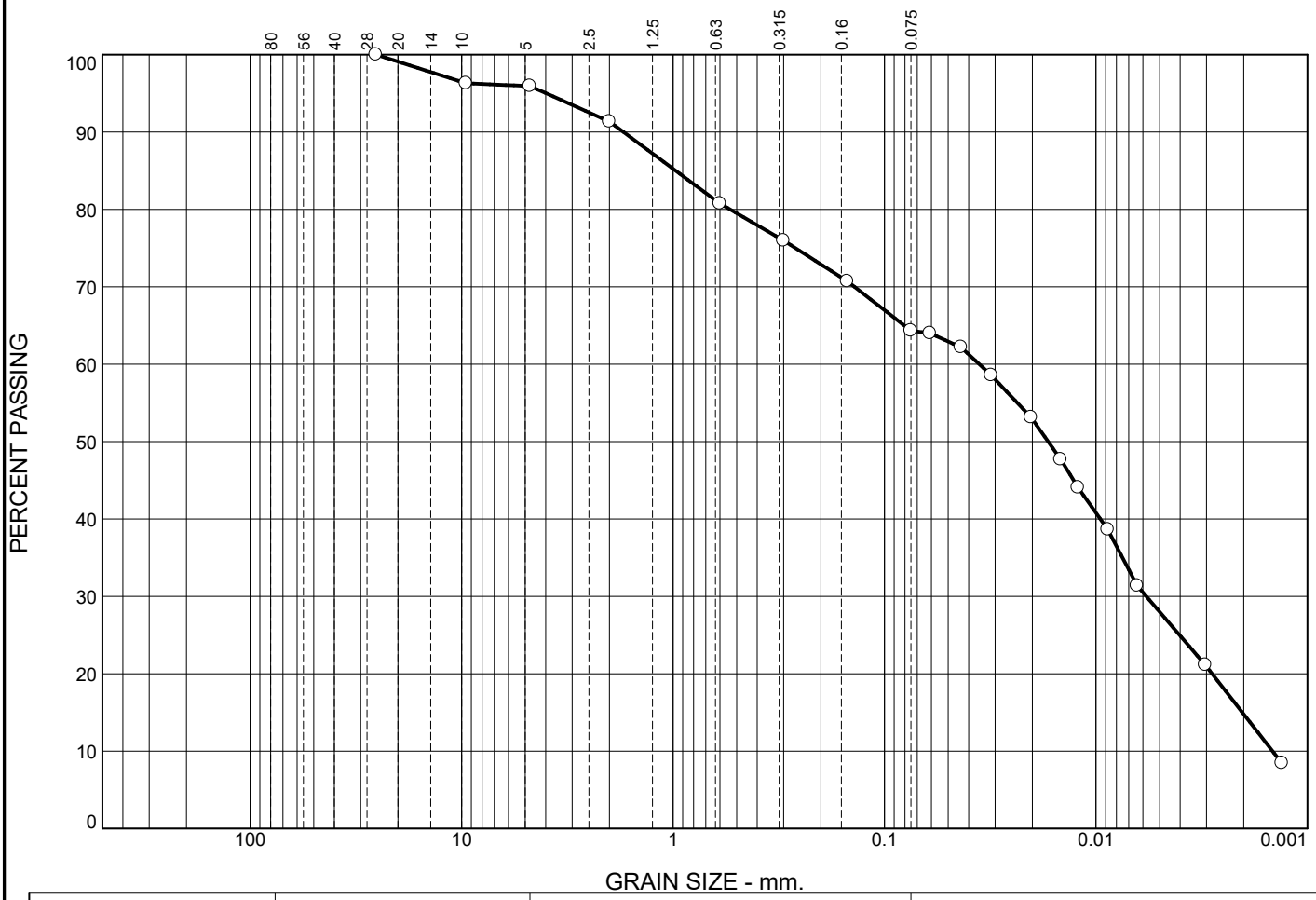
HCS HYDROGEOLOGY CONSULTING SERVICES INC

9/20/2023

APPENDIX E: SOIL GRAIN SIZE ANALYSIS GRAPHS

Figure 1 (SOLA Engineering Inc., October 2023)

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0	1	3	5	13	14	64

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.9714	0.0356	0.0168	0.0058	0.0020	0.0015	0.64	24.38

Material Description	USCS	AASHTO
○ Borehole Sample		

Project No. 11240 **Client:** 1370443 Ontario Limited c/o RSM Canada

Project: QEW + 427 Development

○ **Location:** BH1 SS3 (5' - 6'6") **Sample Number:** 23-255

Remarks:

○Sampled By:Rohan Tankaria
Date:October 12,2023
Report No: 2023-18799
Note:Additional informatio is available upon request

SOLA ENGINEERING INC.

Figure 16

APPENDIX F: LABORATORY CERTIFICATES OF ANALYSIS

WT2330257

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2330257**	Page	: 1 of 15
Client	: **Hydrogeology Consulting Services**	Laboratory	: ALS Environmental - Waterloo
Contact	: Chris Helmer	Account Manager	: Emily Smith
Address	: 25 Water Street West Elora ON Canada N0B 1S0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 550 0969	Telephone	: +1 519 886 6910
Project	: Queensway-Etobicoke	Date Samples Received	: 20-Sep-2023 19:30
PO	: ----	Date Analysis Commenced	: 21-Sep-2023
C-O-C number	: ----	Issue Date	: 28-Sep-2023 17:36
Sampler	: Client		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario
Zeba Patel		Microbiology, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
µg/L	micrograms per litre
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Workorder Comments

RRR: DCM LOR increased due to the potential of laboratory contamination.

Qualifiers

Qualifier	Description
BODL	Limit of Reporting for BOD was increased to account for the largest volume of sample tested.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
HSED	High sediment content in submitted water sample. Analysis could only proceed using aqueous fraction after decanting. Results may be biased low and may be inappropriate for regulatory or compliance purposes.
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.
RRR	Refer to report comments for issues regarding this analysis.
SP	Sample was preserved at the laboratory.
VOCHS	VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	Method/Lab	LOR	Unit	Client sample ID: MW6 Sampling date/time: 20-Sep-2023 11:00 WT2330257-001	TORSUB SAN	TORSUB STM	--	--	--	--
Physical Tests										
pH	E108/WT	0.10	pH units	8.06	6 - 11.5 pH units	6 - 9.5 pH units	--	--	--	--
Solids, total suspended [TSS]	E160/WT	3.0	mg/L	36.6	350 mg/L	15 mg/L	--	--	--	--
Anions and Nutrients										
Chloride	E235.Cl/WT	0.50	mg/L	731 DLDS	--	--	--	--	--	--
Fluoride	E235.F/WT	0.020	mg/L	2.13 DLDS	10 mg/L	--	--	--	--	--
Kjeldahl nitrogen, total [TKN]	E318/WT	0.050	mg/L	3.15	100 mg/L	--	--	--	--	--
Phosphorus, total	E372-U/WT	0.0020	mg/L	1950 DLHC	10 mg/L	0.4 mg/L	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	51.3 DLDS	1500 mg/L	--	--	--	--	--
Cyanides										
Cyanide, strong acid dissociable (Total)	E333/WT	0.0020	mg/L	<0.0020	2 mg/L	0.02 mg/L	--	--	--	--
Microbiological Tests										
Coliforms, Escherichia coli [E. coli]	E012A.EC/WT	1	CFU/100mL	Not Detected	--	200 CFU/100mL	--	--	--	--
Total Metals										
Aluminum, total	E420/WT	0.0030	mg/L	7.84 DLHC	50 mg/L	--	--	--	--	--
Antimony, total	E420/WT	0.00010	mg/L	0.00422 DLHC	5 mg/L	--	--	--	--	--
Arsenic, total	E420/WT	0.00010	mg/L	0.0131 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Cadmium, total	E420/WT	0.0000050	mg/L	<0.0000500 DLHC	0.7 mg/L	0.008 mg/L	--	--	--	--
Chromium, total	E420/WT	0.00050	mg/L	0.0124 DLHC	4 mg/L	0.08 mg/L	--	--	--	--
Cobalt, total	E420/WT	0.00010	mg/L	0.00689 DLHC	5 mg/L	--	--	--	--	--
Copper, total	E420/WT	0.00050	mg/L	0.0184 DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Lead, total	E420/WT	0.000050	mg/L	0.00731 DLHC	1 mg/L	0.12 mg/L	--	--	--	--
Manganese, total	E420/WT	0.00010	mg/L	0.357 DLHC	5 mg/L	0.05 mg/L	--	--	--	--
Mercury, total	E508/WT	0.0000050	mg/L	0.0000143	0.01 mg/L	0.0004 mg/L	--	--	--	--
Molybdenum, total	E420/WT	0.000050	mg/L	0.0318 DLHC	5 mg/L	--	--	--	--	--
Nickel, total	E420/WT	0.00050	mg/L	0.0158 DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Selenium, total	E420/WT	0.000050	mg/L	0.000694 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silver, total	E420/WT	0.000010	mg/L	<0.000100 DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Tin, total	E420/WT	0.00010	mg/L	0.00655 DLHC	5 mg/L	--	--	--	--	--
Titanium, total	E420/WT	0.00030	mg/L	0.0729 DLHC	5 mg/L	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-001 (Continued)		TORSUB SAN	TORSUB STM	--	--	--	--
Total Metals - Continued											
Zinc, total	E420/WT	0.0030	mg/L	0.0462	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Dissolved Metals											
Aluminum, dissolved	E421/WT	0.0010	mg/L	0.0244	DLHC	50 mg/L	--	--	--	--	--
Antimony, dissolved	E421/WT	0.00010	mg/L	0.00440	DLHC	5 mg/L	--	--	--	--	--
Arsenic, dissolved	E421/WT	0.00010	mg/L	0.00986	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Barium, dissolved	E421/WT	0.00010	mg/L	0.116	DLHC	--	--	--	--	--	--
Beryllium, dissolved	E421/WT	0.000020	mg/L	<0.000200	DLHC	--	--	--	--	--	--
Bismuth, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	--	--	--	--	--	--
Boron, dissolved	E421/WT	0.010	mg/L	2.26	DLHC	--	--	--	--	--	--
Cadmium, dissolved	E421/WT	0.0000050	mg/L	<0.0000500	DLHC	0.7 mg/L	0.008 mg/L	--	--	--	--
Calcium, dissolved	E421/WT	0.050	mg/L	32.9	DLHC	--	--	--	--	--	--
Cesium, dissolved	E421/WT	0.000010	mg/L	0.000264	DLHC	--	--	--	--	--	--
Chromium, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	4 mg/L	0.08 mg/L	--	--	--	--
Cobalt, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	5 mg/L	--	--	--	--	--
Copper, dissolved	E421/WT	0.00020	mg/L	<0.00200	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Iron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	--	--	--	--	--	--
Lead, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	1 mg/L	0.12 mg/L	--	--	--	--
Lithium, dissolved	E421/WT	0.0010	mg/L	0.133	DLHC	--	--	--	--	--	--
Magnesium, dissolved	E421/WT	0.0050	mg/L	8.16	DLHC	--	--	--	--	--	--
Manganese, dissolved	E421/WT	0.00010	mg/L	0.0267	DLHC	5 mg/L	0.05 mg/L	--	--	--	--
Molybdenum, dissolved	E421/WT	0.000050	mg/L	0.0336	DLHC	5 mg/L	--	--	--	--	--
Nickel, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Phosphorus, dissolved	E421/WT	0.050	mg/L	<0.500	DLHC	10 mg/L	0.4 mg/L	--	--	--	--
Potassium, dissolved	E421/WT	0.050	mg/L	45.2	DLHC	--	--	--	--	--	--
Rubidium, dissolved	E421/WT	0.00020	mg/L	0.0242	DLHC	--	--	--	--	--	--
Selenium, dissolved	E421/WT	0.000050	mg/L	0.000716	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silicon, dissolved	E421/WT	0.050	mg/L	2.54	DLHC	--	--	--	--	--	--
Silver, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Sodium, dissolved	E421/WT	0.050	mg/L	477	DLHC	--	--	--	--	--	--
Strontium, dissolved	E421/WT	0.00020	mg/L	0.999	DLHC	--	--	--	--	--	--
Sulfur, dissolved	E421/WT	0.50	mg/L	18.5	DLHC	--	--	--	--	--	--
Tellurium, dissolved	E421/WT	0.00020	mg/L	<0.00200	DLHC	--	--	--	--	--	--
Thallium, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	--	--	--	--	--	--
Thorium, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	--	--	--	--	--	--
Tin, dissolved	E421/WT	0.00010	mg/L	0.00236	DLHC	5 mg/L	--	--	--	--	--
Titanium, dissolved	E421/WT	0.00030	mg/L	<0.00300	DLHC	5 mg/L	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-001 (Continued)		TORSUB SAN	TORSUB STM	--	--	--	--
Dissolved Metals - Continued											
Tungsten, dissolved	E421/WT	0.00010	mg/L	0.00128	DLHC	--	--	--	--	--	--
Uranium, dissolved	E421/WT	0.000010	mg/L	0.00143	DLHC	--	--	--	--	--	--
Vanadium, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	--	--	--	--	--	--
Zinc, dissolved	E421/WT	0.0010	mg/L	<0.0100	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Zirconium, dissolved	E421/WT	0.00030	mg/L	<0.00300	DLHC	--	--	--	--	--	--
Dissolved metals filtration location	EP421/WT		-	Laboratory		--	--	--	--	--	--
Speciated Metals											
Chromium, hexavalent [Cr VI], total	E532/WT	0.00050	mg/L	<0.00050		2 mg/L	0.04 mg/L	--	--	--	--
Aggregate Organics											
Biochemical oxygen demand [BOD]	E550/WT	2.0	mg/L	<3.0	BODL	300 mg/L	15 mg/L	--	--	--	--
Oil & grease (gravimetric)	E567/WT	5.0	mg/L	<5.0		--	--	--	--	--	--
Oil & grease, animal/vegetable (gravimetric)	EC567A.SG/WT	5.0	mg/L	<5.0		150 mg/L	--	--	--	--	--
Oil & grease, mineral (gravimetric)	E567SG/WT	5.0	mg/L	<5.0		15 mg/L	--	--	--	--	--
Phenols, total (4AAP)	E562/WT	0.0010	mg/L	<0.0010		1 mg/L	0.008 mg/L	--	--	--	--
Volatile Organic Compounds											
Benzene	E611D/WT	0.50	µg/L	<0.50		10 µg/L	2 µg/L	--	--	--	--
Chloroform	E611D/WT	0.50	µg/L	<0.50		40 µg/L	2 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D/WT	0.50	µg/L	<0.50		50 µg/L	5.6 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D/WT	0.50	µg/L	<0.50		80 µg/L	6.8 µg/L	--	--	--	--
Dichloroethylene, cis-1,2-	E611D/WT	0.50	µg/L	<0.50		4000 µg/L	5.6 µg/L	--	--	--	--
Dichloromethane	E611D/WT	1.0	µg/L	<3.0	RRR	2000 µg/L	5.2 µg/L	--	--	--	--
Dichloropropylene, trans-1,3-	E611D/WT	0.30	µg/L	<0.30		140 µg/L	5.6 µg/L	--	--	--	--
Ethylbenzene	E611D/WT	0.50	µg/L	<0.50		160 µg/L	2 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D/WT	0.50	µg/L	<0.50		1400 µg/L	17 µg/L	--	--	--	--
Tetrachloroethylene	E611D/WT	0.50	µg/L	<0.50		1000 µg/L	4.4 µg/L	--	--	--	--
Toluene	E611D/WT	0.50	µg/L	<0.50		16 µg/L	2 µg/L	--	--	--	--
Trichloroethylene	E611D/WT	0.50	µg/L	<0.50		400 µg/L	7.6 µg/L	--	--	--	--
Xylene, m+p-	E611D/WT	0.40	µg/L	<0.40		--	--	--	--	--	--
Xylene, o-	E611D/WT	0.30	µg/L	<0.30		--	--	--	--	--	--
Xylenes, total	E611D/WT	0.50	µg/L	<0.50		1400 µg/L	4.4 µg/L	--	--	--	--
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	E611D/WT	1.0	%	97.4		--	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-001 (Continued)	TORSUB SAN	TORSUB STM	--	--	--	--
Volatile Organic Compounds Surrogates - Continued										
Difluorobenzene, 1,4-	E611D/WT	1.0	%	98.5	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons										
Anthracene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benz(a)anthracene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(a)pyrene	E641A-L/WT	0.0000050	mg/L	<0.0000050	--	--	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(e)pyrene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(k)fluoranthene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Chrysene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Dibenz(a,h)acridine	E642D/WT	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Dibenz(a,h)anthracene	E641A-L/WT	0.0000050	mg/L	<0.0000050	--	--	--	--	--	--
Dibenz(a,j)acridine	E642D/WT	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Dibenzo(a,i)pyrene	E642D/WT	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Dibenzo(c,g)carbazole, 7H-	E642D/WT	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Dinitropyrene, 1,3-	E642D/WT	0.0010	mg/L	<0.0010	--	--	--	--	--	--
Dinitropyrene, 1,6-	E642D/WT	0.0010	mg/L	<0.0010	--	--	--	--	--	--
Dinitropyrene, 1,8-	E642D/WT	0.0010	mg/L	<0.0010	--	--	--	--	--	--
Fluoranthene	E641A-L/WT	0.000010	mg/L	0.000027	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Methylcholanthrene, 3-	E642D/WT	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Perylene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Phenanthrene	E641A-L/WT	0.000010	mg/L	0.000073	--	--	--	--	--	--
Pyrene	E641A-L/WT	0.000010	mg/L	0.000063	--	--	--	--	--	--
PAHs, total (ON Sewer Use)	EC640A/WT	0.00175	mg/L	<0.00175	0.005 mg/L	0.002 mg/L	--	--	--	--
Chrysene-d12	E641A-L/WT	0.1	%	126	--	--	--	--	--	--
Naphthalene-d8	E641A-L/WT	0.1	%	99.7	--	--	--	--	--	--
Phenanthrene-d10	E641A-L/WT	0.1	%	113	--	--	--	--	--	--
Terphenyl-d14, p-	E642D/WT	0.1	%	82.5	--	--	--	--	--	--
Phthalate Esters										
bis(2-Ethylhexyl) phthalate [DEHP]	E655F/WT	2.0	µg/L	<2.0	12 µg/L	8.8 µg/L	--	--	--	--
Di-n-butyl phthalate	E655F/WT	1.0	µg/L	1.6	80 µg/L	15 µg/L	--	--	--	--
Semi-Volatile Organics										
Dichlorobenzidine, 3,3'-	E655F/WT	0.40	µg/L	<0.40	2 µg/L	0.8 µg/L	--	--	--	--
Semi-Volatile Organics Surrogates										

Analyte	Method/Lab	LOR	Unit	WT2330257-001 (Continued)	TORSUB SAN	TORSUB STM	--	--	--	--
Semi-Volatile Organics Surrogates - Continued										
Fluorobiphenyl, 2-	E655F/WT	1.0	%	91.6	--	--	--	--	--	--
Terphenyl-d14, p-	E655F/WT	1.0	%	80.2	--	--	--	--	--	--
Chlorinated Phenolics										
Pentachlorophenol [PCP]	E655F/WT	0.50	µg/L	<0.50	5 µg/L	2 µg/L	--	--	--	--
Tribromophenol, 2,4,6-	E655F/WT	0.20	%	162 RRR	--	--	--	--	--	--
Nonylphenols										
Nonylphenol diethoxylates [NP2EO]	E749B/WT	0.10	µg/L	<0.10	--	--	--	--	--	--
Nonylphenol ethoxylates, total	E749B/WT	2.0	µg/L	<2.0	200 µg/L	10 µg/L	--	--	--	--
Nonylphenol monoethoxylates [NP1EO]	E749B/WT	2.0	µg/L	<2.0	--	--	--	--	--	--
Nonylphenols [NP]	E749A/WT	1.0	µg/L	<1.0	20 µg/L	1 µg/L	--	--	--	--
Polychlorinated Biphenyls										
Aroclor 1016	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687/WT	0.060	µg/L	<0.060	1 µg/L	0.4 µg/L	--	--	--	--
Decachlorobiphenyl	E687/WT	0.1	%	122	--	--	--	--	--	--
Tetrachloro-m-xylene	E687/WT	0.1	%	89.4	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
MW6	Water	Phosphorus, total		TORSUB	SAN	1950 mg/L	10 mg/L
	Water	Solids, total suspended [TSS]		TORSUB	STM	36.6 mg/L	15 mg/L
	Water	Phosphorus, total		TORSUB	STM	1950 mg/L	0.4 mg/L
	Water	Manganese, total		TORSUB	STM	0.357 mg/L	0.05 mg/L
	Water	Zinc, total		TORSUB	STM	0.0462 mg/L	0.04 mg/L
	Water	Phosphorus, dissolved		TORSUB	STM	<0.500	0.4 mg/L

Sample Comments

Sample	*Client Id*	*Comment*
WT2330257-001	MW6	RRR; Surrogate result is outside of ALS control limits; Associated non-detect results are considered reliable.

Key:

TORSUB	Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016)
SAN	Toronto Sanitary Discharge Sewer By-Law
STM	Toronto Storm Discharge Sewer By-Law

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	Method/Lab	LOR	Unit	Client sample ID: MW5 Sampling date/time: 20-Sep-2023 14:00 WT2330257-002	TORSUB SAN	TORSUB STM	--	--	--	--
Physical Tests										
pH	E108/WT	0.10	pH units	8.62	6 - 11.5 pH units	6 - 9.5 pH units	--	--	--	--
Solids, total suspended [TSS]	E160/WT	3.0	mg/L	2690 DLHC	350 mg/L	15 mg/L	--	--	--	--
Anions and Nutrients										
Chloride	E235.Cl/WT	0.50	mg/L	190 DLM	--	--	--	--	--	--
Fluoride	E235.F/WT	0.020	mg/L	2.97 DLM	10 mg/L	--	--	--	--	--
Kjeldahl nitrogen, total [TKN]	E318/WT	0.050	mg/L	70.3 DLHC DLM	100 mg/L	--	--	--	--	--
Phosphorus, total	E372-U/WT	0.0020	mg/L	28.1 DLM	10 mg/L	0.4 mg/L	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	134 DLM	1500 mg/L	--	--	--	--	--
Cyanides										
Cyanide, strong acid dissociable (Total)	E333/WT	0.0020	mg/L	<0.0020	2 mg/L	0.02 mg/L	--	--	--	--
Microbiological Tests										
Coliforms, Escherichia coli [E. coli]	E012A.EC/WT	1	CFU/100mL	Not Detected DLM	--	200 CFU/100mL	--	--	--	--
Total Metals										
Aluminum, total	E420/WT	0.0030	mg/L	298 DLHC	50 mg/L	--	--	--	--	--
Antimony, total	E420/WT	0.00010	mg/L	<0.0100 DLHC	5 mg/L	--	--	--	--	--
Arsenic, total	E420/WT	0.00010	mg/L	0.0605 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Cadmium, total	E420/WT	0.0000050	mg/L	<0.000500 DLHC	0.7 mg/L	0.008 mg/L	--	--	--	--
Chromium, total	E420/WT	0.00050	mg/L	0.434 DLHC	4 mg/L	0.08 mg/L	--	--	--	--
Cobalt, total	E420/WT	0.00010	mg/L	0.229 DLHC	5 mg/L	--	--	--	--	--
Copper, total	E420/WT	0.00050	mg/L	0.327 DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Lead, total	E420/WT	0.000050	mg/L	0.0489 DLHC	1 mg/L	0.12 mg/L	--	--	--	--
Manganese, total	E420/WT	0.00010	mg/L	7.34 DLHC	5 mg/L	0.05 mg/L	--	--	--	--
Mercury, total	E508/WT	0.0000050	mg/L	<0.0000500 DLM HSED	0.01 mg/L	0.0004 mg/L	--	--	--	--
Molybdenum, total	E420/WT	0.000050	mg/L	0.0931 DLHC	5 mg/L	--	--	--	--	--
Nickel, total	E420/WT	0.00050	mg/L	0.508 DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Selenium, total	E420/WT	0.000050	mg/L	<0.00500 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silver, total	E420/WT	0.000010	mg/L	0.0188 DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Tin, total	E420/WT	0.00010	mg/L	<0.0100 DLHC	5 mg/L	--	--	--	--	--
Titanium, total	E420/WT	0.00030	mg/L	0.246 DLHC	5 mg/L	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-002 (Continued)		TORSUB SAN	TORSUB STM	--	--	--	--
Total Metals - Continued											
Zinc, total	E420/WT	0.0030	mg/L	1.02	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Dissolved Metals											
Aluminum, dissolved	E421/WT	0.0010	mg/L	0.0836	DLHC	50 mg/L	--	--	--	--	--
Antimony, dissolved	E421/WT	0.00010	mg/L	0.00594	DLHC	5 mg/L	--	--	--	--	--
Arsenic, dissolved	E421/WT	0.00010	mg/L	0.0138	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Barium, dissolved	E421/WT	0.00010	mg/L	0.0185	DLHC	--	--	--	--	--	--
Beryllium, dissolved	E421/WT	0.000020	mg/L	<0.000200	DLHC	--	--	--	--	--	--
Bismuth, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	--	--	--	--	--	--
Boron, dissolved	E421/WT	0.010	mg/L	1.31	DLHC	--	--	--	--	--	--
Cadmium, dissolved	E421/WT	0.0000050	mg/L	<0.0000500	DLHC	0.7 mg/L	0.008 mg/L	--	--	--	--
Calcium, dissolved	E421/WT	0.050	mg/L	10.3	DLHC	--	--	--	--	--	--
Cesium, dissolved	E421/WT	0.000010	mg/L	0.000183	DLHC	--	--	--	--	--	--
Chromium, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	4 mg/L	0.08 mg/L	--	--	--	--
Cobalt, dissolved	E421/WT	0.00010	mg/L	0.00243	DLHC	5 mg/L	--	--	--	--	--
Copper, dissolved	E421/WT	0.00020	mg/L	0.00504	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Iron, dissolved	E421/WT	0.010	mg/L	<0.100	DLHC	--	--	--	--	--	--
Lead, dissolved	E421/WT	0.000050	mg/L	<0.000500	DLHC	1 mg/L	0.12 mg/L	--	--	--	--
Lithium, dissolved	E421/WT	0.0010	mg/L	0.0509	DLHC	--	--	--	--	--	--
Magnesium, dissolved	E421/WT	0.0050	mg/L	3.22	DLHC	--	--	--	--	--	--
Manganese, dissolved	E421/WT	0.00010	mg/L	0.0168	DLHC	5 mg/L	0.05 mg/L	--	--	--	--
Molybdenum, dissolved	E421/WT	0.000050	mg/L	0.206	DLHC DTC	5 mg/L	--	--	--	--	--
Nickel, dissolved	E421/WT	0.00050	mg/L	<0.00500	DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Phosphorus, dissolved	E421/WT	0.050	mg/L	<0.500	DLHC	10 mg/L	0.4 mg/L	--	--	--	--
Potassium, dissolved	E421/WT	0.050	mg/L	26.9	DLHC	--	--	--	--	--	--
Rubidium, dissolved	E421/WT	0.00020	mg/L	0.0184	DLHC	--	--	--	--	--	--
Selenium, dissolved	E421/WT	0.000050	mg/L	0.00451	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silicon, dissolved	E421/WT	0.050	mg/L	5.10	DLHC	--	--	--	--	--	--
Silver, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Sodium, dissolved	E421/WT	0.050	mg/L	248	DLHC	--	--	--	--	--	--
Strontium, dissolved	E421/WT	0.00020	mg/L	0.264	DLHC	--	--	--	--	--	--
Sulfur, dissolved	E421/WT	0.50	mg/L	50.7	DLHC	--	--	--	--	--	--
Tellurium, dissolved	E421/WT	0.00020	mg/L	<0.00200	DLHC	--	--	--	--	--	--
Thallium, dissolved	E421/WT	0.000010	mg/L	<0.000100	DLHC	--	--	--	--	--	--
Thorium, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	--	--	--	--	--	--
Tin, dissolved	E421/WT	0.00010	mg/L	<0.00100	DLHC	5 mg/L	--	--	--	--	--
Titanium, dissolved	E421/WT	0.00030	mg/L	<0.00300	DLHC	5 mg/L	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-002 (Continued)		TORSUB SAN	TORSUB STM	--	--	--	--
Dissolved Metals - Continued											
Tungsten, dissolved	E421/WT	0.00010	mg/L	0.411	DLHC	--	--	--	--	--	--
Uranium, dissolved	E421/WT	0.000010	mg/L	0.00356	DLHC	--	--	--	--	--	--
Vanadium, dissolved	E421/WT	0.00050	mg/L	0.00520	DLHC	--	--	--	--	--	--
Zinc, dissolved	E421/WT	0.0010	mg/L	<0.0100	DLHC	2 mg/L	0.04 mg/L	--	--	--	--
Zirconium, dissolved	E421/WT	0.00030	mg/L	<0.00300	DLHC	--	--	--	--	--	--
Dissolved metals filtration location	EP421/WT		-	Laboratory		--	--	--	--	--	--
Speciated Metals											
Chromium, hexavalent [Cr VI], total	E532/WT	0.00050	mg/L	<0.00050		2 mg/L	0.04 mg/L	--	--	--	--
Aggregate Organics											
Biochemical oxygen demand [BOD]	E550/WT	2.0	mg/L	4.6		300 mg/L	15 mg/L	--	--	--	--
Oil & grease (gravimetric)	E567/WT	5.0	mg/L	<5.0		--	--	--	--	--	--
Oil & grease, animal/vegetable (gravimetric)	EC567A.SG/WT	5.0	mg/L	<5.0		150 mg/L	--	--	--	--	--
Oil & grease, mineral (gravimetric)	E567SG/WT	5.0	mg/L	<5.0		15 mg/L	--	--	--	--	--
Phenols, total (4AAP)	E562/WT	0.0010	mg/L	<0.0050	DLM SP	1 mg/L	0.008 mg/L	--	--	--	--
Volatile Organic Compounds											
Benzene	E611D/WT	0.50	µg/L	5.30	OWP VOCHS	10 µg/L	2 µg/L	--	--	--	--
Chloroform	E611D/WT	0.50	µg/L	0.86	OWP VOCHS	40 µg/L	2 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	50 µg/L	5.6 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	80 µg/L	6.8 µg/L	--	--	--	--
Dichloroethylene, cis-1,2-	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	4000 µg/L	5.6 µg/L	--	--	--	--
Dichloromethane	E611D/WT	1.0	µg/L	<3.5	OWP RRR VOCHS	2000 µg/L	5.2 µg/L	--	--	--	--
Dichloropropylene, trans-1,3-	E611D/WT	0.30	µg/L	<0.30	OWP VOCHS	140 µg/L	5.6 µg/L	--	--	--	--
Ethylbenzene	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	160 µg/L	2 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	1400 µg/L	17 µg/L	--	--	--	--
Tetrachloroethylene	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	1000 µg/L	4.4 µg/L	--	--	--	--
Toluene	E611D/WT	0.50	µg/L	0.89	OWP VOCHS	16 µg/L	2 µg/L	--	--	--	--
Trichloroethylene	E611D/WT	0.50	µg/L	<0.50	OWP VOCHS	400 µg/L	7.6 µg/L	--	--	--	--
Xylene, m+p-	E611D/WT	0.40	µg/L	<0.40	OWP VOCHS	--	--	--	--	--	--
Xylene, o-	E611D/WT	0.30	µg/L	<0.30	OWP VOCHS	--	--	--	--	--	--
Xylenes, total	E611D/WT	0.50	µg/L	<0.50		1400 µg/L	4.4 µg/L	--	--	--	--
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	E611D/WT	1.0	%	93.2		--	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2330257-002 (Continued)	TORSUB SAN	TORSUB STM	--	--	--	--
Volatile Organic Compounds Surrogates - Continued										
Difluorobenzene, 1,4-	E611D/WT	1.0	%	97.8	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons										
Anthracene	E641A-L/WT	0.000010	mg/L	<0.000036 DLM	--	--	--	--	--	--
Benz(a)anthracene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(a)pyrene	E641A-L/WT	0.0000050	mg/L	<0.0000050	--	--	--	--	--	--
Benzo(b+j)fluoranthene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(e)pyrene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Benzo(k)fluoranthene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Chrysene	E641A-L/WT	0.000010	mg/L	0.000026	--	--	--	--	--	--
Dibenz(a,h)acridine	E642D/WT	0.000050	mg/L	<0.000075 RRR	--	--	--	--	--	--
Dibenz(a,h)anthracene	E641A-L/WT	0.0000050	mg/L	<0.0000050	--	--	--	--	--	--
Dibenz(a,j)acridine	E642D/WT	0.000050	mg/L	<0.000075 RRR	--	--	--	--	--	--
Dibenzo(a,i)pyrene	E642D/WT	0.000050	mg/L	<0.000075 RRR	--	--	--	--	--	--
Dibenzo(c,g)carbazole, 7H-	E642D/WT	0.000050	mg/L	<0.000075 RRR	--	--	--	--	--	--
Dinitropyrene, 1,3-	E642D/WT	0.0010	mg/L	<0.0015 RRR	--	--	--	--	--	--
Dinitropyrene, 1,6-	E642D/WT	0.0010	mg/L	<0.0015 RRR	--	--	--	--	--	--
Dinitropyrene, 1,8-	E642D/WT	0.0010	mg/L	<0.0015 RRR	--	--	--	--	--	--
Fluoranthene	E641A-L/WT	0.000010	mg/L	0.000044	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Methylcholanthrene, 3-	E642D/WT	0.000050	mg/L	<0.000075 RRR	--	--	--	--	--	--
Perylene	E641A-L/WT	0.000010	mg/L	<0.000010	--	--	--	--	--	--
Phenanthrene	E641A-L/WT	0.000010	mg/L	0.000702	--	--	--	--	--	--
Pyrene	E641A-L/WT	0.000010	mg/L	0.000093	--	--	--	--	--	--
PAHs, total (ON Sewer Use)	EC640A/WT	0.00175	mg/L	<0.00260	0.005 mg/L	0.002 mg/L	--	--	--	--
Chrysene-d12	E641A-L/WT	0.1	%	115	--	--	--	--	--	--
Naphthalene-d8	E641A-L/WT	0.1	%	101	--	--	--	--	--	--
Phenanthrene-d10	E641A-L/WT	0.1	%	90.1	--	--	--	--	--	--
Terphenyl-d14, p-	E642D/WT	0.1	%	29.6 RRR	--	--	--	--	--	--
Phthalate Esters										
bis(2-Ethylhexyl) phthalate [DEHP]	E655F/WT	2.0	µg/L	<4.0 RRR	12 µg/L	8.8 µg/L	--	--	--	--
Di-n-butyl phthalate	E655F/WT	1.0	µg/L	<6.0 RRR	80 µg/L	15 µg/L	--	--	--	--
Semi-Volatile Organics										
Dichlorobenzidine, 3,3'-	E655F/WT	0.40	µg/L	<0.40	2 µg/L	0.8 µg/L	--	--	--	--
Semi-Volatile Organics Surrogates										

Analyte	Method/Lab	LOR	Unit	WT2330257-002 (Continued)	TORSUB SAN	TORSUB STM	--	--	--	--
Semi-Volatile Organics Surrogates - Continued										
Fluorobiphenyl, 2-	E655F/WT	1.0	%	64.6	--	--	--	--	--	--
Terphenyl-d14, p-	E655F/WT	1.0	%	25.4 RRR	--	--	--	--	--	--
Chlorinated Phenolics										
Pentachlorophenol [PCP]	E655F/WT	0.50	µg/L	<0.50	5 µg/L	2 µg/L	--	--	--	--
Tribromophenol, 2,4,6-	E655F/WT	0.20	%	99.5	--	--	--	--	--	--
Nonylphenols										
Nonylphenol diethoxylates [NP2EO]	E749B/WT	0.10	µg/L	<0.10	--	--	--	--	--	--
Nonylphenol ethoxylates, total	E749B/WT	2.0	µg/L	<2.0	200 µg/L	10 µg/L	--	--	--	--
Nonylphenol monoethoxylates [NP1EO]	E749B/WT	2.0	µg/L	<2.0	--	--	--	--	--	--
Nonylphenols [NP]	E749A/WT	1.0	µg/L	<1.0	20 µg/L	1 µg/L	--	--	--	--
Polychlorinated Biphenyls										
Aroclor 1016	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1221	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1232	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1242	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1248	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1254	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1260	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1262	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Aroclor 1268	E687/WT	0.020	µg/L	<0.200 DLM	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687/WT	0.060	µg/L	<0.600 DLM	1 µg/L	0.4 µg/L	--	--	--	--
Decachlorobiphenyl	E687/WT	0.1	%	79.4	--	--	--	--	--	--
Tetrachloro-m-xylene	E687/WT	0.1	%	65.2	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
MW5	Water	Solids, total suspended [TSS]		TORSUB	SAN	2690 mg/L	350 mg/L
	Water	Phosphorus, total		TORSUB	SAN	28.1 mg/L	10 mg/L
	Water	Aluminum, total		TORSUB	SAN	298 mg/L	50 mg/L
	Water	Manganese, total		TORSUB	SAN	7.34 mg/L	5 mg/L
	Water	Solids, total suspended [TSS]		TORSUB	STM	2690 mg/L	15 mg/L
	Water	Phosphorus, total		TORSUB	STM	28.1 mg/L	0.4 mg/L
	Water	Arsenic, total		TORSUB	STM	0.0605 mg/L	0.02 mg/L
	Water	Chromium, total		TORSUB	STM	0.434 mg/L	0.08 mg/L
	Water	Copper, total		TORSUB	STM	0.327 mg/L	0.04 mg/L
	Water	Manganese, total		TORSUB	STM	7.34 mg/L	0.05 mg/L
	Water	Nickel, total		TORSUB	STM	0.508 mg/L	0.08 mg/L
	Water	Zinc, total		TORSUB	STM	1.02 mg/L	0.04 mg/L
	Water	Phosphorus, dissolved		TORSUB	STM	<0.500	0.4 mg/L
	Water	Benzene		TORSUB	STM	5.30 µg/L	2 µg/L
	Water	PAHs, total (ON Sewer Use)		TORSUB	STM	<0.00260	0.002 mg/L
	Water	Polychlorinated biphenyls [PCBs], total		TORSUB	STM	<0.600	0.4 µg/L

Sample Comments

Sample	*Client Id*	*Comment*
WT2330257-002	MW5	RRR: Surrogate recovery is outside ALS DQO. Detection limits for affected compounds have been raised accordingly.
		RRR; Surrogate result is outside of ALS control limits, Reporting limits have been raised accordingly.

Key:

TORSUB	Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016)
SAN	Toronto Sanitary Discharge Sewer By-Law
STM	Toronto Storm Discharge Sewer By-Law

ALS Canada Ltd.

right solutions. right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2330257**	Page	: 1 of 17
Client	: **Hydrogeology Consulting Services**	Laboratory	: ALS Environmental - Waterloo
Contact	: Chris Helmer	Account Manager	: Emily Smith
Address	: 25 Water Street West Elora ON Canada N0B 1S0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 550 0969	Telephone	: +1 519 886 6910
Project	: Queensway-Etobicoke	Date Samples Received	: 20-Sep-2023 19:30
PO	: ----	Issue Date	: 28-Sep-2023 17:35
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Polycyclic Aromatic Hydrocarbons	QC-1147321-002	----	Dinitropyrene, 1,8-	42397-65-9	E642D	139 % LCS-H	60.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.

Regular Sample Surrogates

Sub-Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
Samples Submitted							
Polycyclic Aromatic Hydrocarbons Surrogates	WT2330257-002	MW5	Terphenyl-d14, p-	1718-51-0	29.6 %	40.0-130 %	Recovery less than lower data quality objective
Semi-Volatile Organics Surrogates	WT2330257-002	MW5	Terphenyl-d14, p-	1718-51-0	25.4 %	60.0-140 %	Recovery less than lower data quality objective
Phenolics Surrogates	WT2330257-001	MW6	Tribromophenol, 2,4,6-	118-79-6	162 %	60.0-140 %	Recovery greater than upper data quality objective

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] MW5	E550	20-Sep-2023	----	----	----		21-Sep-2023	4 days	0 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] MW6	E550	20-Sep-2023	----	----	----		21-Sep-2023	4 days	1 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW5	E567SG	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	22-Sep-2023	40 days	0 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW6	E567SG	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	22-Sep-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW5	E567	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	22-Sep-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW6	E567	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	22-Sep-2023	40 days	0 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP] MW5	E562	20-Sep-2023	26-Sep-2023	28 days	6 days	✓	27-Sep-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
MW6	E562	20-Sep-2023	26-Sep-2023	28 days	6 days	✓	27-Sep-2023	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
MW5	E235.Cl	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
MW6	E235.Cl	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
MW5	E235.F	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
MW6	E235.F	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
MW5	E235.SO4	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
MW6	E235.SO4	20-Sep-2023	25-Sep-2023	28 days	5 days	✓	25-Sep-2023	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
MW5	E318	20-Sep-2023	27-Sep-2023	28 days	7 days	✓	27-Sep-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
MW6	E318	20-Sep-2023	27-Sep-2023	28 days	7 days	✓	27-Sep-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
MW5	E372-U	20-Sep-2023	26-Sep-2023	28 days	6 days	✓	27-Sep-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
MW6	E372-U	20-Sep-2023	26-Sep-2023	28 days	6 days	✓	27-Sep-2023	28 days	7 days	✓
Chlorinated Phenolics : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW5	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓
Chlorinated Phenolics : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW6	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide)										
MW5	E333	20-Sep-2023	26-Sep-2023	14 days	6 days	✓	26-Sep-2023	14 days	6 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide)										
MW6	E333	20-Sep-2023	26-Sep-2023	14 days	6 days	✓	26-Sep-2023	14 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab filtered)										
MW5	E421	20-Sep-2023	22-Sep-2023	0 hrs	38 hrs	× UCP	22-Sep-2023	0 hrs	46 hrs	× UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab filtered)										
MW6	E421	20-Sep-2023	22-Sep-2023	0 hrs	41 hrs	× UCP	22-Sep-2023	0 hrs	49 hrs	× UCP
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP]										
MW5	E012A.EC	20-Sep-2023	----	----	----		21-Sep-2023	48 hrs	23 hrs	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP]										
MW6	E012A.EC	20-Sep-2023	----	----	----		21-Sep-2023	48 hrs	26 hrs	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS										
MW5	E749B	20-Sep-2023	23-Sep-2023	7 days	3 days	✓	26-Sep-2023	7 days	3 days	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS										
MW6	E749B	20-Sep-2023	23-Sep-2023	7 days	3 days	✓	26-Sep-2023	7 days	3 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS										
MW5	E749A	20-Sep-2023	23-Sep-2023	7 days	3 days	✓	26-Sep-2023	7 days	3 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS										
MW6	E749A	20-Sep-2023	23-Sep-2023	7 days	3 days	✓	26-Sep-2023	7 days	3 days	✓
Phthalate Esters : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW5	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓
Phthalate Esters : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW6	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
MW5	E108	20-Sep-2023	25-Sep-2023	14 days	5 days	✓	26-Sep-2023	14 days	6 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
MW6	E108	20-Sep-2023	25-Sep-2023	14 days	5 days	✓	26-Sep-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
MW5	E160	20-Sep-2023	----	----	----		27-Sep-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
MW6	E160	20-Sep-2023	----	----	----		27-Sep-2023	7 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW6	E687	20-Sep-2023	24-Sep-2023	14 days	5 days	✓	26-Sep-2023	40 days	1 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW5	E687	20-Sep-2023	26-Sep-2023	14 days	6 days	✓	27-Sep-2023	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs (ON Special List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW5	E642D	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	25-Sep-2023	40 days	4 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs (ON Special List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW6	E642D	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	25-Sep-2023	40 days	4 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW5	E641A-L	20-Sep-2023	25-Sep-2023	14 days	5 days	✓	28-Sep-2023	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW6	E641A-L	20-Sep-2023	25-Sep-2023	14 days	5 days	✓	28-Sep-2023	40 days	3 days	✓
Semi-Volatile Organics : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW5	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Semi-Volatile Organics : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
MW6	E655F	20-Sep-2023	21-Sep-2023	14 days	1 days	✓	22-Sep-2023	40 days	1 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
HDPE - total (NaOH+Buf) [ON MECP]										
MW5	E532	20-Sep-2023	----	----	----		22-Sep-2023	28 days	2 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
HDPE - total (NaOH+Buf) [ON MECP]										
MW6	E532	20-Sep-2023	----	----	----		22-Sep-2023	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
MW5	E508	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	26-Sep-2023	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
MW6	E508	20-Sep-2023	22-Sep-2023	28 days	2 days	✓	26-Sep-2023	28 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
MW5	E420	20-Sep-2023	21-Sep-2023	180 days	1 days	✓	22-Sep-2023	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
MW6	E420	20-Sep-2023	21-Sep-2023	180 days	2 days	✓	22-Sep-2023	180 days	2 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW5	E611D	20-Sep-2023	22-Sep-2023	14 days	2 days	✓	22-Sep-2023	14 days	2 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW6	E611D	20-Sep-2023	22-Sep-2023	14 days	2 days	✓	22-Sep-2023	14 days	2 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	1146825	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1152068	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1147431	1	10	10.0	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1146624	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1152066	1	15	6.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1150217	1	11	9.0	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1150216	1	11	9.0	5.0	✓
pH by Meter	E108	1152063	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1153632	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1152069	1	18	5.5	5.0	✓
Total Cyanide	E333	1151603	1	6	16.6	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1148398	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1153630	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1148810	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1147394	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1153631	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1155860	2	26	7.6	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1148562	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	1146825	1	20	5.0	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	1147303	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1152068	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1147431	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	1152066	1	15	6.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1147334	1	8	12.5	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1150217	1	11	9.0	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1150216	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	1147333	1	13	7.6	5.0	✓
PAHs (ON Special List) by GC-MS	E642D	1147321	1	8	12.5	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	1151423	1	3	33.3	5.0	✓
PCB Aroclors by GC-MS	E687	1151168	2	19	10.5	4.7	✓
pH by Meter	E108	1152063	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1153632	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1152069	1	18	5.5	5.0	✓
Total Cyanide	E333	1151603	1	6	16.6	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1148398	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1153630	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1148810	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1147394	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1153631	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1155860	2	26	7.6	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1148562	1	19	5.2	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	1146825	1	20	5.0	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	1147303	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1152068	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1147431	1	10	10.0	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1146624	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1152066	1	15	6.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1147334	1	8	12.5	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1150217	1	11	9.0	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1150216	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	1147333	1	13	7.6	5.0	✓
PAHs (ON Special List) by GC-MS	E642D	1147321	1	8	12.5	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	1151423	1	3	33.3	5.0	✓
PCB Aroclors by GC-MS	E687	1151168	2	19	10.5	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	1153632	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1152069	1	18	5.5	5.0	✓
Total Cyanide	E333	1151603	1	6	16.6	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1148398	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1153630	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1148810	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1147394	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1153631	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1155860	2	26	7.6	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1148562	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1152068	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1147431	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	1152066	1	15	6.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1150217	1	11	9.0	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1150216	1	11	9.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1153632	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1152069	1	18	5.5	5.0	✓
Total Cyanide	E333	1151603	1	6	16.6	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Hexavalent Chromium (Cr VI) by IC	E532	1148398	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1153630	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1148810	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1147394	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1153631	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1148562	1	19	5.2	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
E. coli (MF-mFC-BCIG)	E012A.EC ALS Environmental - Waterloo	Water	ON E3433 (mod)	Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Waterloo	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Cyanide	E333 ALS Environmental - Waterloo	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Total Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. Results are based on an un-filtered, field-preserved sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Waterloo	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Gravimetry	E567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Mineral Oil & Grease by Gravimetry	E567SG ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PAHs (ON Special List) by GC-MS	E642D ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by GC-MS.
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F ALS Environmental - Waterloo	Water	EPA 8270E (mod)	BNA are analyzed by GC-MS.
PCB Aroclors by GC-MS	E687 ALS Environmental - Waterloo	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	Water samples are filtered and analyzed on LCMS/MS by direct injection.
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG ALS Environmental - Waterloo	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)
Total PAH (Ontario Sewer Use Extended List)	EC640A ALS Environmental - Waterloo	Water	Calculation (Sum of the Squares)	Total PAH (Ontario Sewer Use) is the sum of the following PAHs: anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b+j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, phenanthrene, pyrene, benzo(e)pyrene, perylene, 3-methylcholanthrene, 1,3-dinitropyrene, 1,6-dinitropyrene, 1,8-dinitropyrene, 7H-dibenzo(c,g)carbazole, dibenzo(a,i)pyrene, dibenz(a,j)acridine, and dibenz(a,h)acridine. When the PAH is less than LOR, zero is used for calculation.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 ALS Environmental - Waterloo	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	ALS Environmental - Waterloo			
Oil & Grease Extraction for Gravimetry	EP567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
PAHs DCM Extraction	EP642 ALS Environmental - Waterloo	Water	EPA 3510C (mod)	PAH are extracted from aqueous sample using DCM liquid-liquid extraction.
BNA Extraction	EP655 ALS Environmental - Waterloo	Water	EPA 3510C (mod)	SVOCs are extracted from aqueous sample using DCM liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.
Preparation of Nonylphenol and Nonylphenol Ethoxylates	EP749 ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.

QUALITY CONTROL REPORT

Work Order	: **WT2330257**	Page	: 1 of 20
Client	: Hydrogeology Consulting Services	Laboratory	: ALS Environmental - Waterloo
Contact	: Chris Helmer	Account Manager	: Emily Smith
Address	: 25 Water Street West Elora ON Canada N0B 1S0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: +1 519 886 6910
Project	: Queensway-Etobicoke	Date Samples Received	: 20-Sep-2023 19:30
PO	: ----	Date Analysis Commenced	: 21-Sep-2023
C-O-C number	: ----	Issue Date	: 28-Sep-2023 17:24
Sampler	: Client 905 550 0969		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	Waterloo LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Zeba Patel		Waterloo Microbiology, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1152063)											
WT2328550-001	Anonymous	pH	----	E108	0.10	pH units	7.96	7.88	1.01%	4%	----
Physical Tests (QC Lot: 1155860)											
WT2330099-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	7.4	8.6	1.2	Diff <2x LOR	----
Physical Tests (QC Lot: 1157562)											
WT2330400-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	4.9	5.8	0.9	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1152066)											
WT2328550-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.330	0.328	0.395%	20%	----
Anions and Nutrients (QC Lot: 1152068)											
WT2328550-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	141	141	0.00285%	20%	----
Anions and Nutrients (QC Lot: 1152069)											
WT2328550-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	155	155	0.0341%	20%	----
Anions and Nutrients (QC Lot: 1153630)											
WT2330236-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	69.3	58.3	17.1%	20%	----
Anions and Nutrients (QC Lot: 1153631)											
WT2330224-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.466	0.465	0.284%	20%	----
Cyanides (QC Lot: 1151603)											
CG2313223-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 1146624)											
WT2330274-021	Anonymous	Coliforms, Escherichia coli [E. coli]	----	E012A.EC	10	CFU/100mL	<10	<10	0	Diff <2x LOR	----
Total Metals (QC Lot: 1147394)											
WT2330257-001	MW6	Aluminum, total	7429-90-5	E420	0.0300	mg/L	7.84	7.48	4.67%	20%	----
		Antimony, total	7440-36-0	E420	0.00100	mg/L	0.00422	0.00409	0.00013	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00100	mg/L	0.0131	0.0135	3.54%	20%	----
		Cadmium, total	7440-43-9	E420	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00500	mg/L	0.0124	0.0126	0.00019	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00100	mg/L	0.00689	0.00669	0.00019	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00500	mg/L	0.0184	0.0184	0.00006	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000500	mg/L	0.00731	0.00705	3.63%	20%	----
		Manganese, total	7439-96-5	E420	0.00100	mg/L	0.357	0.352	1.61%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1147394) - continued											
WT2330257-001	MW6	Molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0318	0.0314	1.26%	20%	----
		Nickel, total	7440-02-0	E420	0.00500	mg/L	0.0158	0.0151	0.00072	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000500	mg/L	0.000694	0.000847	0.000153	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00100	mg/L	0.00655	0.00655	0.0000005	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00300	mg/L	0.0729	0.0750	2.86%	20%	----
		Zinc, total	7440-66-6	E420	0.0300	mg/L	0.0462	0.0446	0.0017	Diff <2x LOR	----
Total Metals (QC Lot: 1148810)											
BF2300281-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1147431)											
WT2330445-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00206	0.00212	3.22%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.076	0.075	0.001	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	190	190	0.362%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000019	0.000020	0.0000002	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00054	0.00055	0.000004	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0128	0.0123	3.64%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	10.8	10.9	0.410%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00511	0.00509	0.331%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00050	0.00052	0.000010	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	9.31	9.37	0.647%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00620	0.00613	1.24%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 1147431) - continued											
WT2330445-001	Anonymous	Silicon, dissolved	7440-21-3	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	47.2	47.6	0.762%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00200	mg/L	7.66	7.58	1.01%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	203	208	2.62%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1148398)											
WP2323565-002	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1148410)											
WP2323880-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1146825)											
WT2330219-007	Anonymous	Biochemical oxygen demand [BOD]	----	E550	3.0	mg/L	<3.0	<3.0	0.0%	30%	----
Aggregate Organics (QC Lot: 1153632)											
TY2309537-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1148562)											
BF2300306-001	Anonymous	Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	1.22	1.20	0.02	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 1148562) - continued											
BF2300306-001	Anonymous	Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1150216)											
CG2313200-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1150217)											
CG2313200-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.10	µg/L	0.40	0.44	0.04	Diff <2x LOR	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	10.0	µg/L	<10.0	<10.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1155860)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 1157562)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1152066)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1152068)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1152069)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1153630)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1153631)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 1151603)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 1146624)						
Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	----
Total Metals (QCLot: 1147394)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1147394) - continued						
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 1148810)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1147431)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1147431) - continued						
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 1148398)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 1148410)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 1146825)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1147333)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1147334)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1153632)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1148562)						
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1148562) - continued						
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1147321)						
Dibenz(a,h)acridine	226-36-8	E642D	0.05	µg/L	<0.050	----
Dibenz(a,j)acridine	224-42-0	E642D	0.05	µg/L	<0.050	----
Dibenzo(a,i)pyrene	189-55-9	E642D	0.05	µg/L	<0.050	----
Dibenzo(c,g)carbazole, 7H-	194-59-2	E642D	0.05	µg/L	<0.050	----
Dinitropyrene, 1,3-	75321-20-9	E642D	1	µg/L	<1.0	----
Dinitropyrene, 1,6-	42397-64-8	E642D	1	µg/L	<1.0	----
Dinitropyrene, 1,8-	42397-65-9	E642D	1	µg/L	<1.0	----
Methylcholanthrene, 3-	56-49-5	E642D	0.05	µg/L	<0.050	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1151423)						
Anthracene	120-12-7	E641A-L	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	<0.010	----
Benzo(e)pyrene	192-97-2	E641A-L	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	<0.010	----
Perylene	198-55-0	E641A-L	0.01	µg/L	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	<0.010	----
Phthalate Esters (QCLot: 1147303)						
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E655F	2	µg/L	<2.0	----
Di-n-butyl phthalate	84-74-2	E655F	1	µg/L	<1.0	----
Semi-Volatile Organics (QCLot: 1147303)						
Dichlorobenzidine, 3,3'-	91-94-1	E655F	0.4	µg/L	<0.40	----
Chlorinated Phenolics (QCLot: 1147303)						
Pentachlorophenol [PCP]	87-86-5	E655F	0.5	µg/L	<0.50	----
Nonylphenols (QCLot: 1150216)						
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	<1.0	----
Nonylphenols (QCLot: 1150217)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Nonylphenols (QCLot: 1150217) - continued						
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	<0.10	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	<2.0	----
Polychlorinated Biphenyls (QCLot: 1151168)						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----
Polychlorinated Biphenyls (QCLot: 1155266)						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1152063)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1155860)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	104	85.0	115	----
Physical Tests (QCLot: 1157562)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 1152066)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1152068)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 1152069)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1153630)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 1153631)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.393 mg/L	112	80.0	120	----
Cyanides (QCLot: 1151603)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	89.4	80.0	120	----
Total Metals (QCLot: 1147394)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	101	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	109	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	105	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	105	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	103	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	103	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	105	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	104	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	105	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1147394) - continued									
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	96.5	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	103	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	101	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	105	80.0	120	----
Total Metals (QCLot: 1148810)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 1147431)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	96.8	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	102	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	98.8	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	100	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	103	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	104	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	100	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	99.8	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	99.3	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	101	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	100	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	100	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	111	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	102	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	103	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	98.7	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	108	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	102	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	104	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	106	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	96.5	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	106	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 1147431) - continued									
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	104	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	103	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	105	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	96.4	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	102	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	97.1	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	97.7	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	99.4	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	99.5	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	97.4	80.0	120	----
Speciated Metals (QCLot: 1148398)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	98.5	80.0	120	----
Speciated Metals (QCLot: 1148410)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	93.8	80.0	120	----
Aggregate Organics (QCLot: 1146825)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	109	85.0	115	----
Aggregate Organics (QCLot: 1147333)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	97.7	70.0	130	----
Aggregate Organics (QCLot: 1147334)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	95.2	70.0	130	----
Aggregate Organics (QCLot: 1153632)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	100	85.0	115	----
Volatile Organic Compounds (QCLot: 1148562)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	97.4	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	96.9	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	97.5	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	98.4	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	98.1	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	86.6	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	94.1	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	97.6	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 1148562) - continued									
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	97.1	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	97.0	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	97.0	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	94.6	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	98.5	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1147321)									
Dibenz(a,h)acridine	226-36-8	E642D	0.05	µg/L	1.6 µg/L	90.3	60.0	130	----
Dibenz(a,j)acridine	224-42-0	E642D	0.05	µg/L	1.6 µg/L	92.8	60.0	130	----
Dibenzo(a,i)pyrene	189-55-9	E642D	0.05	µg/L	1.6 µg/L	90.7	60.0	130	----
Dibenzo(c,g)carbazole, 7H-	194-59-2	E642D	0.05	µg/L	1.6 µg/L	98.8	60.0	130	----
Dinitropyrene, 1,3-	75321-20-9	E642D	1	µg/L	1.6 µg/L	113	60.0	130	----
Dinitropyrene, 1,6-	42397-64-8	E642D	1	µg/L	1.6 µg/L	82.5	60.0	130	----
Dinitropyrene, 1,8-	42397-65-9	E642D	1	µg/L	1.6 µg/L	# 139	60.0	130	LCS-H
Methylcholanthrene, 3-	56-49-5	E642D	0.05	µg/L	1.6 µg/L	110	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1151423)									
Anthracene	120-12-7	E641A-L	0.01	µg/L	0.5263 µg/L	89.1	50.0	140	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	0.5263 µg/L	126	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	0.5263 µg/L	108	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	0.5263 µg/L	95.4	50.0	140	----
Benzo(e)pyrene	192-97-2	E641A-L	0.01	µg/L	0.5263 µg/L	90.8	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	0.5263 µg/L	98.8	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	0.5263 µg/L	98.5	50.0	140	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	0.5263 µg/L	116	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	0.5263 µg/L	107	50.0	140	----
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	0.5263 µg/L	114	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	0.5263 µg/L	135	50.0	140	----
Perylene	198-55-0	E641A-L	0.01	µg/L	0.5263 µg/L	105	50.0	140	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	0.5263 µg/L	112	50.0	140	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	0.5263 µg/L	118	50.0	140	----
Phthalate Esters (QCLot: 1147303)									
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E655F	2	µg/L	6.4 µg/L	125	50.0	140	----
Di-n-butyl phthalate	84-74-2	E655F	1	µg/L	6.4 µg/L	106	50.0	140	----
Semi-Volatile Organics (QCLot: 1147303)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Semi-Volatile Organics (QCLot: 1147303) - continued									
Dichlorobenzidine, 3,3'-	91-94-1	E655F	0.4	µg/L	1.6 µg/L	65.6	50.0	140	----
Chlorinated Phenolics (QCLot: 1147303)									
Pentachlorophenol [PCP]	87-86-5	E655F	0.5	µg/L	4.8 µg/L	132	50.0	140	----
Nonylphenols (QCLot: 1150216)									
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	10 µg/L	113	75.0	125	----
Nonylphenols (QCLot: 1150217)									
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	1 µg/L	99.7	75.0	125	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	20 µg/L	96.8	75.0	125	----
Polychlorinated Biphenyls (QCLot: 1151168)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	95.8	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	95.0	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	96.5	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	96.5	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	96.5	60.0	140	----
Polychlorinated Biphenyls (QCLot: 1155266)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	105	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	96.6	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	97.1	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	116	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	116	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	116	60.0	140	----

Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1152066)										
WT2328550-001	Anonymous	Fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1152068)										
WT2328550-001	Anonymous	Chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1152069)										
WT2328550-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1153630)										
WT2330236-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1153631)										
WT2330224-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.1 mg/L	ND	70.0	130	----
Cyanides (QCLot: 1151603)										
CG2313223-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.243 mg/L	0.25 mg/L	97.1	75.0	125	----
Total Metals (QCLot: 1147394)										
WT2330308-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0949 mg/L	0.1 mg/L	94.9	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0544 mg/L	0.05 mg/L	109	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0541 mg/L	0.05 mg/L	108	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00499 mg/L	0.005 mg/L	99.9	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0130 mg/L	0.0125 mg/L	104	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0126 mg/L	0.0125 mg/L	101	70.0	130	----
		Copper, total	7440-50-8	E420	0.0124 mg/L	0.0125 mg/L	99.5	70.0	130	----
		Lead, total	7439-92-1	E420	0.0247 mg/L	0.025 mg/L	98.8	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0132 mg/L	0.0125 mg/L	106	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0247 mg/L	0.025 mg/L	98.9	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0519 mg/L	0.05 mg/L	104	70.0	130	----
		Silver, total	7440-22-4	E420	0.00467 mg/L	0.005 mg/L	93.3	70.0	130	----
		Tin, total	7440-31-5	E420	0.0256 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0236 mg/L	0.025 mg/L	94.3	70.0	130	----
Total Metals (QCLot: 1148810)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1148810) - continued										
BF2300281-002	Anonymous	Mercury, total	7439-97-6	E508	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 1147431)										
WT2330445-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.886 mg/L	1 mg/L	88.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.471 mg/L	0.5 mg/L	94.2	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.504 mg/L	0.5 mg/L	101	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.117 mg/L	0.125 mg/L	93.9	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0465 mg/L	0.05 mg/L	92.9	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.471 mg/L	0.5 mg/L	94.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.368 mg/L	0.5 mg/L	73.7	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0476 mg/L	0.05 mg/L	95.2	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	25 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0244 mg/L	0.025 mg/L	97.8	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.119 mg/L	0.125 mg/L	95.6	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.118 mg/L	0.125 mg/L	94.1	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.118 mg/L	0.125 mg/L	94.4	70.0	130	----
		Iron, dissolved	7439-89-6	E421	0.476 mg/L	0.5 mg/L	95.3	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.233 mg/L	0.25 mg/L	93.1	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.114 mg/L	0.125 mg/L	91.4	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	25 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.118 mg/L	0.125 mg/L	94.4	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.122 mg/L	0.125 mg/L	97.8	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.236 mg/L	0.25 mg/L	94.3	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	4.81 mg/L	5 mg/L	96.2	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	23.6 mg/L	25 mg/L	94.4	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0466 mg/L	0.05 mg/L	93.3	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.498 mg/L	0.5 mg/L	99.6	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	5.07 mg/L	5 mg/L	101	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0446 mg/L	0.05 mg/L	89.2	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	25 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.125 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	25 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0473 mg/L	0.05 mg/L	94.5	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.466 mg/L	0.5 mg/L	93.3	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0440 mg/L	0.05 mg/L	87.9	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.240 mg/L	0.25 mg/L	96.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1147431) - continued										
WT2330445-002	Anonymous	Titanium, dissolved	7440-32-6	E421	0.121 mg/L	0.125 mg/L	96.8	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0458 mg/L	0.05 mg/L	91.6	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00228 mg/L	0.0025 mg/L	91.4	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.243 mg/L	0.25 mg/L	97.1	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.233 mg/L	0.25 mg/L	93.1	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0456 mg/L	0.05 mg/L	91.3	70.0	130	----
Speciated Metals (QCLot: 1148398)										
WP2323565-002	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0363 mg/L	0.04 mg/L	90.7	70.0	130	----
Speciated Metals (QCLot: 1148410)										
WP2323880-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
Aggregate Organics (QCLot: 1153632)										
TY2309537-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0204 mg/L	0.02 mg/L	102	75.0	125	----
Volatile Organic Compounds (QCLot: 1148562)										
BF2300306-001	Anonymous	Benzene	71-43-2	E611D	98.0 µg/L	100 µg/L	98.0	60.0	140	----
		Chloroform	67-66-3	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	97.4 µg/L	100 µg/L	97.4	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	96.5 µg/L	100 µg/L	96.5	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	99.6 µg/L	100 µg/L	99.6	60.0	140	----
		Dichloromethane	75-09-2	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	88.9 µg/L	100 µg/L	88.9	60.0	140	----
		Ethylbenzene	100-41-4	E611D	92.2 µg/L	100 µg/L	92.2	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	93.7 µg/L	100 µg/L	93.7	60.0	140	----
		Toluene	108-88-3	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	----
		Trichloroethylene	79-01-6	E611D	96.2 µg/L	100 µg/L	96.2	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	185 µg/L	200 µg/L	92.6	60.0	140	----
		Xylene, o-	95-47-6	E611D	97.2 µg/L	100 µg/L	97.2	60.0	140	----
Nonylphenols (QCLot: 1150216)										
CG2313200-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	11.2 µg/L	10 µg/L	112	60.0	140	----
Nonylphenols (QCLot: 1150217)										
CG2313200-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.98 µg/L	1 µg/L	97.8	60.0	140	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	12.0 µg/L	20 µg/L	60.1	60.0	140	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17

Page

Environmental Division Waterloo

Work Order Reference WT2330257

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Hydrogeology Consulting
Contact:	Chris Helmer
Phone:	905-550-0969
	Company address below will appear on the final report
Street:	25 Water Street West
City/Province:	Elora, ON
Postal Code:	N0B 1S0
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	chrishelmer@hydrog.ca
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	chrishelmer@hydrog.ca
Email 2	

Project Information	
ALS Account # / Quote #:	2022 Price List
Job #:	Queensway - Etobicoke
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Emily Smith

Sampler:

Select Service Level Below - Contact your AM to co

Regular [R] ☒ Standard TAT if received by 3 pm -

PRIORITY (Business Days): 4 day [P4-20%] ☐ 3 day [P3-25%] ☐ 2 day [P2-50%] ☐

EMERGENCY: 1 Business d… Same Day, We… (Laboratory o…

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selecte…

Analysis Re…

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Toronto Storm and Sanitary Sewer Use Pkg	DISSOLVED METALS	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	[redacted]	20/09/29	[redacted]	Water	[redacted]	X			
	[redacted]	"	[redacted]	Water	1	X			
	MW6		11:00	Water	19	X	X		
	MW5	"	14:00	Water	19	X	X		
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Toronto Storm and Sanitary Sewer Use By-Law
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☑ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				6.2	4.6		

SHIPMENT RELEASE (client use)		
Released by: Silvia Valentini	Date: 20/09/23	Time: 19:00

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 21 Sept 2023	Time: 19:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2016 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

L-845 B-057 OR-178EC OS-858
MM-530 GC-769 VW-288 CN-240
OGG-922 SC-475

APPENDIX G: MECP WATER WELL RECORDS

Water Well Records

Friday, November 3, 2023

1:44:34 PM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ETOBICOKE BOROUGH	17 618088 4830488 W	2013/10 7147						7209961 (C22698) A149616 P	
ETOBICOKE BOROUGH	17 617876 4830485 W	2005/07 7215	1				0003 10	6929335 (Z33936) A015573	
ETOBICOKE BOROUGH	17 618101 4830563 W	2006/08 6902	2	FR 0011			0010 10	6930529 (159988) A050961	0000 BRWN 0001 GREY SILT TILL DNSE 0007 GREY SHLE WTHD HARD 0010 GREY SHLE HARD 0020
ETOBICOKE BOROUGH	17 618181 4830261 W	2011/04 7241						7162685 (M10132) A114406 P	
ETOBICOKE BOROUGH	17 617762 4830615 W	2011/06 7241	2			MT	0007 10	7164261 (Z134284) A116681	BLCK LOAM LOOS 0000 BRWN SAND SILT LOOS 0007 GREY SILT CLAY LOOS 0010 GREY SHLE DNSE 0017
ETOBICOKE BOROUGH	17 617771 4830653 W	2011/06 7241	2			MT	0006 10	7164262 (Z134285) A118677	GREY SAND GRVL LOOS 0000 BRWN SILT SAND LOOS 0007 GREY SILT CLAY LOOS 0010 GREY SHLE DNSE 0016
ETOBICOKE BOROUGH	17 617921 4830610 W	2012/04 7241	2			MT	0007 5	7181266 (Z148189) A129348	GREY CMTD 0001 BRWN SAND GRVL LOOS 0007 GREY SILT SAND LOOS 0009 GREY SHLE DNSE 0012
ETOBICOKE BOROUGH	17 617925 4830585 W	2012/04 7241	2			MT	0006 7	7181267 (Z148190) A129349	BLCK CMTD 0001 BRWN SAND GRVL LOOS 0011 GREY SHLE DNSE 0012
ETOBICOKE BOROUGH	17 617928 4830655 W	2012/04 7241	2			MT	0007 5	7181268 (Z148188) A129347	BLCK CMTD 0000 BRWN SAND GRVL LOOS 0001 BRWN SAND SILT LOOS 0009 GREY SHLE DNSE 0012
ETOBICOKE BOROUGH	17 617998 4830541 W	2012/09 7241				MT		7190026 (Z158529) A	
ETOBICOKE BOROUGH	17 617981 4830542 W	2012/09 7241				MT		7190027 (Z158556) A	
ETOBICOKE BOROUGH	17 617932 4830424 W	2004/05 6607	1.97	UK 0010			0015 5	6928026 (Z14471) A011869	GREY TILL 0005 GREY ROCK SHLE 0020
ETOBICOKE BOROUGH	17 617985 4830550 W	2012/09 7241				MT		7190029 (Z158531) A	
ETOBICOKE BOROUGH	17 617790 4830558 W	2020/11 6946						7376097 (Z349999) A304087 P	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ETOBICOKE BOROUGH	17 617764 4830291 W	2014/11 7320	2.00			MT	0003 10	7232715 (Z198874) A168050	BLCK FILL GRVL ---- 0001 BRWN GRVL FILL 0003 BRWN SILT SAND 0010 BRWN SILT SHLE FCRD 0013
ETOBICOKE BOROUGH	17 617804 4830314 W	2014/11 7320	2.00			MT	0003 10	7232718 (Z198872) A168031	BLCK FILL GRVL ---- 0001 BRWN GRVL FILL 0003 BRWN SILT SAND 0010 BRWN SILT SHLE FCRD 0013
ETOBICOKE BOROUGH	17 617806 4830291 W	2014/11 7320	2.00				0004 10	7232719 (Z198869) A168032	BLCK FILL GRVL ---- 0001 BRWN GRVL FILL 0003 BRWN SILT SAND 0011 BRWN SILT SHLE FCRD 0014
ETOBICOKE BOROUGH	17 617775 4830325 W	2014/11 7320	2.00			MT	0003 10	7232720 (Z198871) A168033	GREY ---- 0001 GREY GRVL FILL 0003 BRWN SILT SAND 0010 BRWN SILT SHLE FCRD 0013
ETOBICOKE BOROUGH	17 617768 4830325 W	2014/11 7320	2.00			MT	0004 10	7232721 (Z198870) A147417	GREY ---- 0001 GREY GRVL FILL 0003 BRWN SILT SAND 0011 BRWN SILT SHLE FCRD 0014
ETOBICOKE BOROUGH	17 618082 4830313 W	2014/12 7215	2	UT 0004			0010 5	7236004 (Z183571) A176992	BRWN SAND WBRG 0000 GREY CLAY SHLE DRY 0007
ETOBICOKE BOROUGH	17 617802 4830280 W	2015/09 7147						7248032 (C30871) A177878 P	
ETOBICOKE BOROUGH	17 617772 4830287 W	7147						7310493 (C40516) A168632 P	
ETOBICOKE BOROUGH	17 618140 4830221 W	2018/09 7241	2			MT	0010 10	7326567 (Z298343) A254520	BLCK ---- 0000 BRWN CLAY SILT 0008 GREY SHLE 0020
ETOBICOKE BOROUGH	17 618166 4830665 W	2018/09 7241	2			MT	0010 10	7326568 (Z298345) A254518	BLCK ---- 0000 BRWN CLAY SILT 0008 GREY SHLE 0020
ETOBICOKE BOROUGH	17 617910 4830548 W	2012/09 7241						7190028 (Z158444) A	

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL (AUDIT #) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MRBL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDN	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDYOAPSTONE		

2. Core Color

Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Well Use

Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial	MT	Monitoring TestHole
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		