Scoped Hydrogeological Assessment

13668 Emil Kolb Parkway
Colerain Drive and Harvest Moon Drive
Town of Bolton (Caledon), Ontario

Project 10224

1. INTRODUCTION

Hydrogeology Consulting Services Inc. (HCS) was retained by Camcos (Bolton Village) Inc. to conduct a scoped hydrogeological assessment for the proposed development at 13668 Emily Kolb Parkway in the Town of Bolton (Caledon), Ontario. The location of the subject property is shown on Drawing 1 in Appendix A. Proposed development of the 0.40-hectare property includes stacked townhouses with one level of underground parking. The property is currently occupied by a residential property and is serviced by municipal water supply and sewage effluent disposal.

This assessment has been prepared to respond to requirements from the Town of Caledon and the Region of Peel.

1.1 Previous and Concurrent Studies

Concurrently with the hydrogeological assessment a geotechnical investigation is being completed by CMT Engineering Inc. The Geotechnical Engineering report (CMT Engineering Inc., Project No. 23-089, May, 2023) provides a description of the subsurface soil stratigraphy and geotechnical conditions beneath the property, along with evaluations of geotechnical parameters and requirements for the proposed redevelopment. The geotechnical investigation report should be read in conjunction with this report.

Additionally, a Phase I Environmental Site Assessment (ESA) is being completed concurrently by Peritus Environmental Consultants Inc. The Phase I ESA report (Peritus Environmental Consultants Inc., Project No. 22-21-231878, May, 2023) provides a description of the historical usage of the property and adjacent properties along with an evaluation of the potential for contaminating activities and areas of potential environmental concerns. The Phase I ESA report should be read in conjunction with this report.

1.2 Scope of Work

Field investigation for this scoped hydrogeological assessment comprised a site visit to assess the property and the proposed site plan layout. Five boreholes were drilled on the property by CMT Engineering Inc., with three boreholes completed as 38 mm diameter monitoring wells to investigate the presence of shallow groundwater. Soil samples were obtained from the boreholes for the purposes of particle size distribution (grain size) analysis, and monitoring wells were assessed via slug tests to estimate saturated soil hydraulic conductivity. Water chemistry samples were also obtained from selected wells for analysis of general chemistry parameters per the Region of Peel's Storm Sewer Use By-Law regulations.

1.2.1 Borehole Drilling and Monitoring Well Installation

On March 24, 2023 CMT Engineering Inc. observed and performed drilling of five boreholes (BH1 to BH5) to depths between 5.18 and 6.10 metres below ground surface (mBGS) via direct push using a Geoprobe 7822DT drill rig.

Split spoon samples were obtained at 0.76 and 1.52 m intervals within the first 3 m of drilling, with continuous soil core samples obtained below 3 m. Selected soil samples were submitted to CMT Engineering Inc. for particle size distribution (grain size) analysis.

Well locations and ground surface elevations were surveyed by CMT Engineering Inc., and the locations are shown on the appended Drawing 2 (CMT, 2023). The boreholes were located to a local datum.

Boreholes BH1 – BH3 were completed as 38-mm diameter monitoring wells using 3.05 m slotted Schedule 40 PVC well screens and PVC riser pipes, with well sand installed around the well screens and the borehole annular spaces sealed with bentonite. All wells were constructed with flush mounted protective steel casings, and lockable vented protective caps. Monitoring well construction followed Ontario Regulation 903 (as amended). Borehole logs are included in Appendix C for reference.

The wells were developed (purged) using a Waterra inertial valve and tubing to remove fine-grained material from the well screen sand pack and mitigate smearing on the borehole walls during drilling.

Stabilized groundwater elevations were measured using a manual electronic water level tape on March 28th 2023. Well construction information and 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 located within a predominantly residential area within the Town of Bolton (Caledon). The property is bounded by existing residential properties to the north and west, Coleraine Drive to the east, and Harvest Moon Drive to the south.

As shown on the appended Drawing 2, the subject property is currently occupied by a residential property. There are a few coniferous trees near the corner of the intersection and along the north property line. The surface topography of the subject property is relatively level with a slight slope to the east, varying from approximately 259-258 metres above sea level (mASL).

2.2 Physiography

The subject property is located within the South Slope physiographic region, and is within the Drumlinized Till Plains physiographic landform which is mainly comprised of drumlinized glacial till overlain by thin aeolian sand deposits (Chapman and Putnam, 2007). Within the Town of Bolton urban limits the Drumlinized Till Plains surface topography has generally been graded.

2.3 Geology

Quaternary Geology mapping (Ontario Geological Survey, 2000) indicates the subject property is underlain by clay to silt-textured till with interbedded deposits of silt and sand (Halton Till) derived from glaciolacustrine deposits or shale.

Overburden soil stratigraphy observed in the five boreholes drilled on the subject property generally consists of topsoil underlain by clayey silt with some sand and trace gravel (till) to the borehole completion depths of up to 6.1 mBGS. The borehole logs are included in Appendix C for reference.

Paleozoic Geology mapping of Ontario (Anderson and Dodge, 2007) indicates underlying the overburden deposits is Georgian Bay Formation shale and limestone bedrock. Water well records from adjacent properties show that shale bedrock was encountered at depths between 45.4 and 77.7 mBGS.

2.4 Hydrogeology and Groundwater

Perched groundwater was encountered in the fine-grained overburden till deposits at depths of 4.65 to 5.48 mBGS corresponding to elevations of 254.63 to 252.74 mASL on March 28, 2023. It is noted that seasonal fluctuations in groundwater elevations would be expected, with the March measurements expected to be somewhat lower than typical spring high water levels.

Groundwater encountered in the silt and clay till soils is considered perched water trapped within seams of more permeable material within the low permeability deposits, or within the deposits themselves, rather than a local or regional groundwater aquifer.

While one of the on-site monitoring wells was dry at the time measurements were collected, HCS measured the shallow groundwater perched within the low permeability soils beneath the property flowing on the neighbouring property to the south generally south-eastwards following the flow direction of nearby creeks. It is therefore anticipated shallow perched groundwater beneath the subject property also flows generally south-eastwards.

Locally, shallow overburden groundwater is expected to flow generally eastwards following the tributary creeks and surface water features that flow towards the Humber River. As the site is located within the Black Creek Humber River Outlet subwatershed of the Main Humber River watershed; regionally, groundwater is expected to flow generally eastwards/south-eastwards

following the general watershed topography and flow routes of the creeks within the Humber River subwatershed. It is noted that the boundary of the Bolton Dam - Humber River subwatershed is located approximately 210 m north of the subject property.

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. Small volumes of precipitation infiltrating into the near-surface native low-permeability deposits would be expected to become perched on top of and within low permeability deposits of clayey silt till. Over time small volumes of perched water could gradually percolate vertically downwards or flow laterally following ground surface topography. The lack of hummocky terrain within the South Slope region means that ponding of precipitation and depression-focused infiltration are unlikely.

Based on subsurface stratigraphy consisting of deposits of low permeability till, no shallow overburden aquifer is present beneath the property at depths of 6.1 mBGS or less. As discussed previously, small amounts of perched water exist in overburden soils, which generally acts as an aquitard beneath the subject property. As no monitoring wells were screened/completed in deeper overburden aquifer units an evaluation of deep overburden groundwater was not performed.

More regional hydrostratigraphy would be expected to consist of the Halton Till Aquitard overlying the Oak Ridges Aquifer, which in turn overlies sequences of aquifers and aquitards such as the Newmarket Aquitard, the Thorncliffe Aquifer, and older overburden deposits. The silt till encountered in the boreholes could represent the Halton Till; however, without deeper boreholes on site it is difficult to conclusively determine whether the soils encountered represent a vertically extensive aquitard, or whether they are simply minor variations of more regional near surface stratigraphy.

2.5 Surface Water Features

Based on the site visit completed March 28, 2023, there are no visible surface water features on the subject property. A stormwater management pond is located south of Harvest Moon Drive to the south of the subject property. There is a tributary of Jaffary's Creek located east of the property leading to Jaffary's pond. TRCA mapping indicates that the creek and surrounding area are regulated by the TRCA; however, the subject property is not within a regulated area.

2.6 Soil Hydraulic Conductivity

Hydraulic conductivity estimates for the site soils were determined using single response hydraulic (slug) tests of the soil deposits screened by the 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.

2.6.1 Slug Test Results

Prior to conducting slug testing of the monitoring wells, each well was developed (purged) to mitigate smearing during drilling and 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 E, and the hydraulic conductivity estimates are listed in the appended Table 2. As neither of the two slug tests achieved $T_{0.37}$, an estimated hydraulic conductivity value of $<1 \times 10^{-7}$ m/sec suggests very low permeability for the clayey silt till soils.

2.6.2 Grain Size Analysis Results

Samples of soil collected from Boreholes BH1 – BH3 during drilling were submitted to the CMT Engineering Inc. laboratory facility in St. Clements, Ontario for analysis of particle size distribution (grain size). As shown on the grain size analysis graphs included in Appendix F, the near-surface soils predominantly consist of clay and silt with trace amounts of sand and gravel (i.e. till). The grain size analysis results were used to estimate soil hydraulic conductivity (K) values by applying the Kaubisch, Breyer, Hazen, and Kozeny-Carman formulae where appropriate based on the

limitations of each formula. The hydraulic conductivity estimates are summarized in the appended Table 2.

It is noted for all soil samples a high percentage of fine-grained material was present in each sample, requiring the D_{10} values of the samples to be approximated; therefore, calculated values are considered estimates.

Hydraulic conductivity values of 6.83×10^{-10} to 1.36×10^{-9} m/sec correlate well with the slug test calculated values and indicate a very low permeability for the soils underlying the property.

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

2.7 Groundwater Chemistry

On March 28, 2023 one water chemistry sample was obtained from on-site monitoring well BH1. The sample was collected in the appropriate laboratory-supplied containers, stored in a cooler, and delivered to ALS Environmental Laboratories in Waterloo, Ontario for analysis of the Region of Peel's Storm Sewer and Sanitary Sewer Use By-Law chemistry parameters. The laboratory Certificate of Analysis (COA) is included in Appendix G for reference, and the appended Table 3 summarizes parameters of interest.

It is important to consider the water chemistry sample was obtained using an inertial valve (Waterra Valve) and tubing. The method of water collection inherently results in the inclusion of sediments into the water sample which can increase concentrations of parameters such as colour, turbidity, total suspended solids, total dissolved solids, and total metals where metals are adsorbed onto soil particles.

The sample from BH1 exhibited exceedances of the Region of Peel's Storm Sewer By-Law limits for the following parameters:

- Total Suspended Solids (TSS)
- Total Manganese
- Total Zinc

The sample from BH1 exhibited no exceedances of the Region of Peel's Sanitary Sewer By-Law limits.

It is understood proposed development on the site includes construction of one underground parking level which will likely not require excavation below the level of perched groundwater. 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

permission to discharge to municipal sewers from the municipality or Region of Peel. Treatment of discharge to resolve potential exceedances of total manganese would likely be necessary.

3. WATER USERS

Well Records from the Ministry of the Environment, Conservation, and Parks (MECP) Water Well Record (WWR) Database (2020) were reviewed to determine the number of supply wells present. According to the MECP WWR Database nineteen wells are located within an approximate radius of 500 m from the subject property.

Of these wells, eight are identified as test holes or monitoring wells. Five well records pertain to abandoned wells, two well records have partial or no data, and one additional well is identified as not in use. These records have been excluded from further consideration.

The three remaining domestic use wells are completed in overburden soils at depths of 15.24 and 77.72 mBGS, respectively. A copy of the MECP well records is included in Appendix D, and the two wells are plotted on the appended Drawing 3.

It is noted that some wells plotted on the appended Drawing 3 are located in areas where the actual existence of a well is unlikely (they may be associated with nearby properties), and that some properties shown on the aerial imagery do not have a well associated with them; however, the MECP WWR coordinate data has been used in the absence of more reliable information.

The Region of Peel Department of Public Works was consulted to determine where municipal watermains existed within a 500 m radius of the property. Watermains were identified along Colerain Drive, Harvest Moon Drive, King Street (Emil Kolb Parkway), and 6th Line. It is anticipated that MECP WWRs which may plot along these roadways could represent wells which have been previously decommissioned, or wells which are not used for drinking water supply.

3.1 Door-to-Door Well Survey

On March 28, 2023 a survey of properties where a private water supply well might exist within a 500 m radius of the subject property was conducted to determine the locations and construction details of private water supply wells in the area.

Seven homes and one commercial property were canvassed. Zero surveys were received prior to the preparation of this report.

3.2 Municipal Wellhead Protection Areas

Ontario Source Protection Information Atlas (OSPIA) mapping shows that the property is not located within a Wellhead Protection Area (WHPA). There are no WHPAs is more than 6 km southeast of the subject property.

3.3 Sensitive Features

OSPIA mapping indicates that the subject property does not fall within a highly vulnerable aquifer (HVA) zone, or a significant groundwater recharge area (SGRA).

Based on the presence of low permeability clayey silt till overburden soils from ground surface to a depth of more than 6 mBGS there is no shallow overburden aquifer beneath the subject property, and any deeper overburden aquifer would be sufficiently isolated by the overburden aquitard to be protected from any potential ground surface contaminants. Since all pavement stormwater runoff will be directed to municipal storm sewers, it is reasonable to conclude that no potential surface contaminants that might be accidentally released at the site would be able to migrate vertically downwards to a deep overburden or bedrock aquifer, or laterally to surface water features.

Natural Heritage Area maps from the Ministry of Natural Resources and Forestry (MNRF; 2023) reveal no Areas of Natural and Scientific Interest (ANSIs) within the subject property or surrounding area. As discussed in Section 2.5, TRCA mapping (2023) indicates that Jaffary's Creek and surrounding area southeast of the site are regulated by the TRCA.

Minimum buffer requirements must be satisfied for all sensitive features.

4. PRELIMINARY CONSTRUCTION DEWATERING ASSESSMENT

Table I below summarizes the preliminary construction excavation parameters based on information provided on preliminary engineering drawings for the project (Q4 Architects Inc., May 2023). It is important to note these calculations are preliminary, and based on limited site data. Construction dewatering calculations will need to be updated once additional site investigation and detailed design of the project have been completed.

Table I: Preliminary Construction Excavation Parameters

Task	Excavation Dimensions (approximate) (m)	Excavation Depth (mBGS)	Estimated Seasonally High Groundwater Elevation (mBGS)*
1-Level Underground Parking	85 x 78 m	3.5-4.5 mBGS	4.15 mBGS

*- Estimated seasonally high groundwater elevation is the highest measured groundwater elevation from March 2023, increased by 0.5 m.

Based on preliminary excavation locations, dimensions, and depths provided for this report, construction of the proposed one-level of underground parking may require excavation below

the elevation of perched groundwater. As a result, construction dewatering may be required for construction of the building.

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 an 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 Preliminary 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 dry excavations. Dewatering calculations include a number of variables such as the static groundwater level, soil hydraulic conductivity, aquifer thickness, confined aquifer conditions, etc. that can be adjusted to provide conservative buffers to account for conditions beyond those encountered in the available monitoring wells.

It is noted all excavations will be completed in overburden deposits.

Table II below summarizes the preliminary excavation requirements. Additionally, Table II includes the following buffers as factors of safety:

- A buffer of 2 m 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;
- A “squared off” excavation shape to account for excavation dimension adjustments during the construction process;

- A buffer of 0.5 m for the groundwater elevation (the highest measured elevation from on-site monitoring wells) to account for seasonal fluctuations.

Table II: Preliminary Excavation Requirements

Excavation	Excavation Length (m) (+2 m)	Excavation Width (m) (+2 m)	Excavation Elevation (mBGS) (-1m)	GW Elevation (mBGS) (+0.5 m)
1-Level Underground Parking	87	80	5.5	4.15

It is very important to consider that all construction dewatering calculations provided in this report are based on the preliminary excavation requirements and dimensions listed above. If design changes or other site plan modifications result in changes to the information listed above, the dewatering calculations below will need to be revised accordingly.

4.1.1 Concurrent Excavations

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

- Concurrent excavation of the entire multi-building footprint for construction of one-level of underground parking.

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 anticipated concurrent tasks noted above based on the following assumptions to account for variability in soil, surface water, and groundwater conditions:

- Aquifer hydraulic conductivity of 5.0×10^{-7} m/sec (the highest hydraulic conductivity measured in the on-site well slug tests and grain size samples, increased as a conservative factor of safety).
- An unconfined aquifer thickness of 8 m.
- An initial groundwater elevation corresponding to the highest measured groundwater elevation from the on-site monitoring wells (4.65 mBGS), increased by 0.5 m (to 4.15 mBGS) to account for seasonal variation.

4.2 Preliminary 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 an unconfined aquifer) from Powers (2007)[1] was used:

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

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)

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 can be replaced with ($R_o + r_e$) in the formula above, which gives a reasonable estimate of the dewatering requirements. Using the assumptions described in Section 4.1 and its subsections the steady-state inflow rate and radius of influence listed in Table III below are estimated.

Table III: Preliminary Steady-State Dewatering Requirements

Excavation	Daily Dewatering Rate (L/day)	Radius of Influence (m)
1-Level Underground Parking	45,400	2.9

4.2.1 Preliminary 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 matrix

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

must be extracted. This overburden storage must be accounted for to allow for rapid achievement of drawdown targets.

Initial drawdown of the shallow overburden 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 50% of the estimated steady state dewatering rate.

Additionally, 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.

While 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; recent changes to Ontario Regulation 63/16 mandate that stormwater does not need to be counted as part of the daily dewatering limit..

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

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

	Steady State Dewatering (L/day)	**Initial Drawdown Surcharge (L/day)**	**Total Dewatering Requirement (L/day)**
1-Level Underground Parking	45,400	22,700	68,100

The preliminary totals shown in Table IV indicate a potential maximum dewatering requirement of 68,100 L/day for the multi-building underground parking structure. An Environmental Activity and Sector Registry (EASR) would be required to authorize pumping at this rate. Additionally, a Sewer Discharge Permit from the Region of Peel would be required to discharge to municipal sewers.

While the conservative assumptions and factors of safety discussed in the preceding sections combine to create conservative dewatering calculations, it is important to consider the potentially variable nature of the overburden stratigraphy on groundwater flow.

The potential maximum dewatering requirements outlined above are reasonable based on the information available; however, performing one or several pumping tests of the shallow overburden aquifer in advance of designing and installing dewatering systems would provide empirical data that could be used to refine maximum daily pumping requirements. The client, the construction contractor, and the dewatering contractor shall review the dewatering

calculations provided above and make their own determinations regarding the potential benefits of performing pumping tests as part of the construction dewatering design strategy.

As noted previously these calculations are preliminary, and based on limited site data. Construction dewatering calculations will need to be updated once additional project design has been completed.

5. PRELIMINARY 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 4.1 and its subsections, construction dewatering will likely require daily dewatering rates below 400,000 L/day; therefore, an EASR submission for the project should be considered a requirement to permit pumping from the excavation.

Discharge to a municipal sewer would require a Sewer Discharge Permit from the Region of Peel.

5.1 Dewatering Discharge

It is expected that dewatering discharge will be directed to municipal sewers.

As discussed in Section 2.7, groundwater chemistry samples exhibited exceedances of Region of Peel Storm Sewer Use By-Law criteria limits for TSS and several metals. Discharge treatment and mitigation measures will need to be developed and implemented to permit discharging to municipal storm sewers.

Groundwater chemistry samples exhibited no exceedances of Region of Peel Sanitary Sewer Use By-Law criteria limits; therefore, discharge treatment and mitigation measures are not anticipated to be required to permit discharging to municipal sanitary sewers.

As a suggestion for consideration, a cost-benefit analysis should be undertaken to evaluate the potential to discharge to municipal sewers vs. collection of water using a hydrovac truck or similar equipment for off-site disposal.

6. CLOSURE

Subsurface stratigraphy beneath the subject property consists of fill underlain by more than 6 m of clay/silt till deposits. Perched water was encountered at a depth of 4.65 to 5.48 mBGS, anticipated to be flowing generally south-eastwards in the general flow direction of nearby creeks. The perched groundwater conditions encountered in the low permeability till overburden do not represent a local or regional shallow aquifer.

Soil hydraulic conductivity estimates from grain size analyses and slug tests indicate the clayey silt till deposits have a low hydraulic conductivity ranging from $<1 \times 10^{-9}$ to $<1 \times 10^{-7}$ m/sec.

There are no visible surface water features on the property. A stormwater management pond is located south of the subject site.

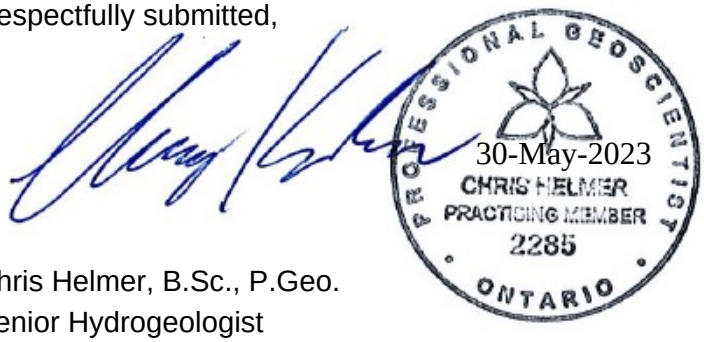
TRCA mapping indicates that Jaffary's Creek and the surrounding area are regulated by the TRCA; however, the subject property does not lie within a regulated area. Mapping indicates the subject property is not within a highly vulnerable aquifer zone, significant groundwater recharge area, or a municipal wellhead protection area.

The preliminary construction dewatering assessment performed for the site demonstrates the proposed one-level underground parking structure may require dewatering at rates below the 400,000 L/day Permit to Take Water (PTTW) threshold; therefore, an EASR submission for the project should be considered a requirement to permit pumping from the excavation.

Any construction dewatering discharge that will be generated would need to be tested and treated to ensure it meets Region of Peel Sewer Use By-Law criteria prior to discharge to a municipal sewer. Additionally, any discharge to a municipal sewer would require a Sewer Discharge Permit from the Region of Peel.

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,



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7. LIMITATIONS AND USE

This report has been prepared for the exclusive use of the Client indicated in Section 1. Hydrogeology Consulting Services Inc. (HCS) and Chris F Helmer 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.

In preparing this report HCS and Chris F Helmer 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 HCS and Chris F Helmer, or others where noted, 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 testing and 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.

8. REFERENCES

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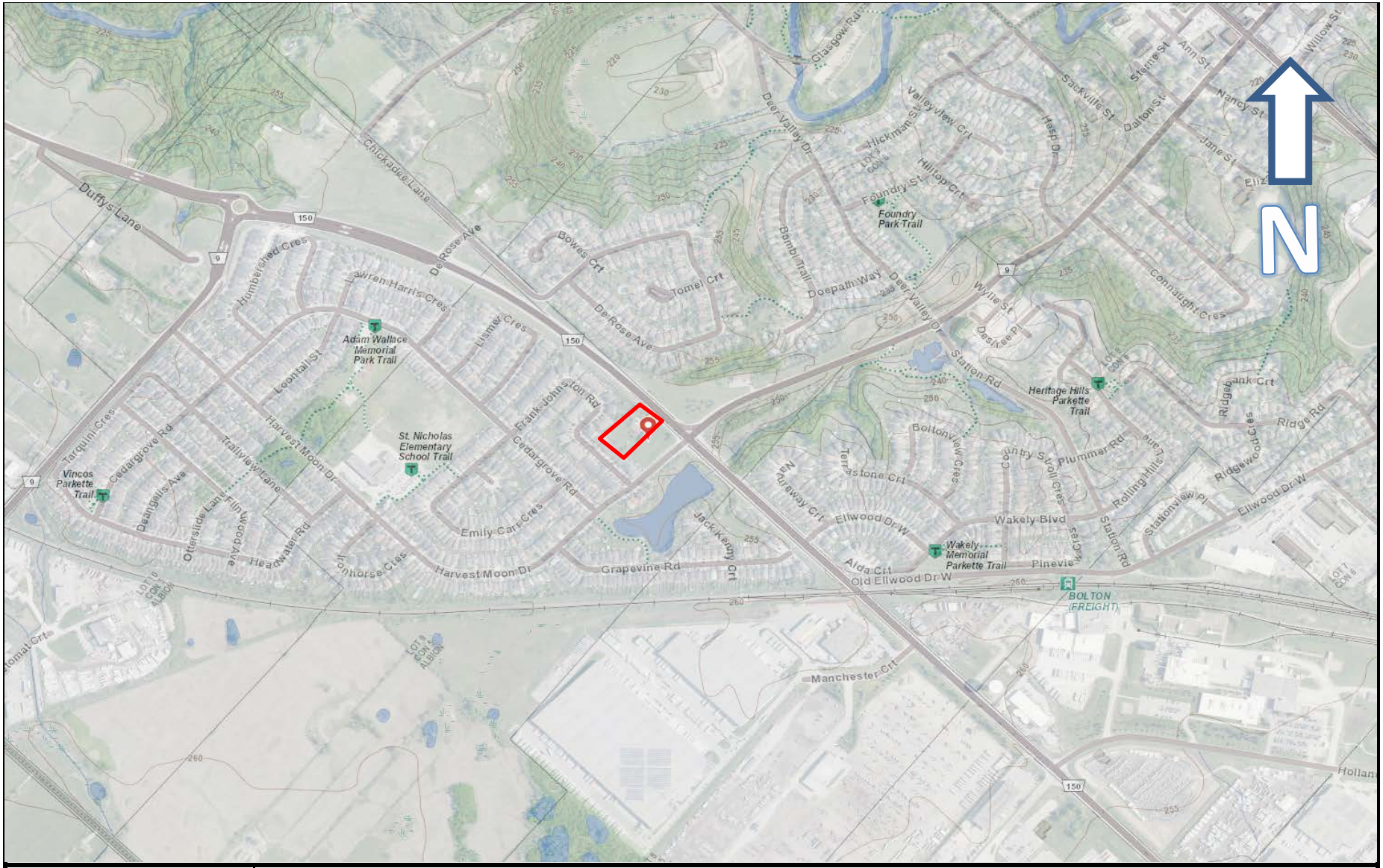
APPENDIX A: DRAWINGS

Drawing 1 – Location Plan
Drawing 2 – Site Plan (CMT Engineering, 2023)
Drawing 3 - MECP Water Well Records



LEGEND

Subject Property

imagery from OSPIA © 2023

Drawing 1 - Location Plan

13668 Emil Kolb Parkway, Bolton

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	SK
Date:	26-Apr-23

NOTES:

Base map provided by Caledon Maps.

Legend

CMT Engineering Borehole

CMT Engineering Borehole with Monitoring Well

N

NO.	DESCRIPTION	DATE

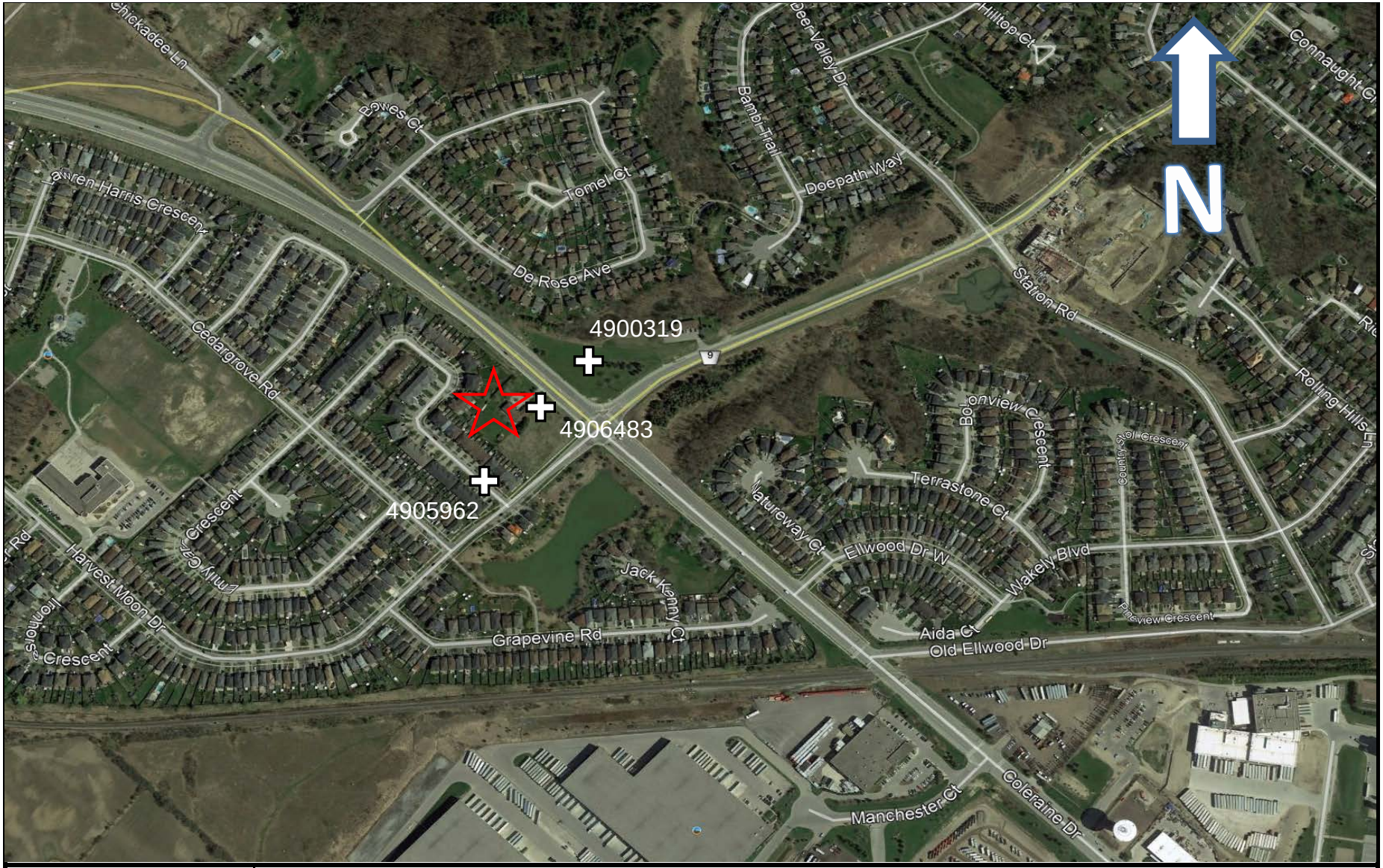
REVISIONS

CMT ENGINEERING INC.
1011 Industrial Crescent, Unit 1
St. Clements, Ontario N0B 2M0
Tel.: 519-699-5775
Fax: 519-699-4664
www.cmtinc.net

PROJECT:
Geotechnical Investigation
Proposed Development
13668 Emil Kolb Parkway
Bolton, Ontario

DRAWING TITLE:
AERIAL VIEW SHOWING BOREHOLE LOCATIONS

PROJECT NO.:	DATE:
23-089	April 11, 2023
SCALE:	DRAWING NO.
N.T.S.	2



LEGEND

- Subject Property
- Supply Well

imagery from Google Earth © 2023

Drawing 3 - MECP WWRs

13668 Emil Kolb Parkway, Bolton

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	SK
Date:	26-Apr-23

APPENDIX B: TABLES

Table 1 – Groundwater Level Measurements

Table 2 – Hydraulic Conductivity Estimates

Table 3 – Water Chemistry Analysis Results

13668 Emil Kolb Parkway, Bolton
Table 1 - Groundwater Level Measurements

Name	Ground Surface Elevation (m)*	Stickup (m)	28-Mar-23		
			WL (mBTOP)	WL (mBGS)	WL (mASL)
BH1	258.16	-	dry	dry	dry
BH2	258.22	1.06	6.54	5.48	252.74
BH3	259.28	1.01	5.66	4.65	254.63

mASL - metres Above Sea Level
mBGS - metres Below Ground Surface

13668 Emil Kolb Parkway, Bolton
Table 2 - Hydraulic Conductivity Estimates

Name	Soil Sample Depth or Screened Interval (mBGS)	Soil Type	Analysis Method	Hydraulic Conductivity (m/sec)
BH1	1.52 - 2.13	clayey silt, some sand, trace gravel	Kaubisch*	6.83×10^{-10}
BH1	4.57 - 5.18	clayey silt, some sand, trace gravel	Kaubisch*	1.36×10^{-9}
BH2	5.18 - 6.10	clayey silt, some sand, trace gravel	Kaubisch*	1.02×10^{-9}
BH2	3.1 - 6.1	clayey silt, some sand, trace gravel	Hvorslev**	$<1 \times 10^{-7}$
BH3	5.18 - 6.10	clayey silt, some sand, trace gravel	Kaubisch*	7.80×10^{-10}
BH3	3.1 - 6.1	clayey silt, some sand, trace gravel	Hvorslev**	$<1 \times 10^{-7}$

mBGS - metres Below Ground Surface
m/sec - metres per second
* - D_{10} values were approximated; therefore, the hydraulic conductivity value is considered an estimate
** - $T_{0.37}$ was not achieved; therefore, the hydraulic conductivity value is considered approximate
Bold - K values obtained from Slug Tests

13668 Emil Kolb Parkway, Bolton
Table 3 - Water Chemistry Analysis Results
28-Mar-21

Parameter	Units[(i)]	Region of Peel Storm Sewer Use By-Law Limits	Region of Peel Sanitary Sewer Use By-Law Limits	BH 02
Physical Tests				
pH	pH units	6-9	5.5 - 10	8.01
Total Suspended Solids	mg/L	15	350	**132**
Anions and Nutrients				
Fluoride	mg/L	-	10	0.108
Sulfate (as SO4)	mg/L	-	1500	26.500
Cyanides				
Cyanide, Total	mg/L	0.02	2	<0.002
Bateriological Tests				
E. Coli	CFU[(iii)]/mL	200	-	-
Total Metals				
Arsenic (As)-Total	mg/L	0.02	1	<0.001
Cadmium (Cd)-Total	mg/L	0.008	0.7	<0.000130
Chromium (Cr)-Total	mg/L	0.08	5	0.0106
Copper (Cu)-Total	mg/L	0.05	3	0.0078
Lead (Pb)-Total	mg/L	0.120	3.000	0.00704
Manganese (Mn)-Total	mg/L	0.05	5	**0.115**
Mercury (Hg)-Total	mg/L	0.0004	0.01	<0.0000050
Nickel (Ni)-Total	mg/L	0.08	3	0.01610
Zinc (Zn)-Total	mg/L	0.04	3	**0.6000**
Aggregate Organics				
BOD Carbonaceous	ug/L	15	300	3.0
Phenols (4AAP)	ug/L	0.008	1	-
Volatile Organic Compounds				
Benzene	ug/L	2	10	<0.50
Chloroform	ug/L	2	40	<0.5
Ethylbenzene	ug/L	2	160	<0.50
Tetrachloroethylene	ug/L	4	1,000	<0.50
Toluene	ug/L	2	270	<0.50
Trichloroethylene	ug/L	8	400	<0.50
Total PAHs	ug/L	-	-	-

i - All measured concentrations are in units indicated.

ii - Concentrations in *italicized* text exceed the Region of Peel's Sanitary Sewer Use By-Law Limits.

iii - Concentrations in **bold** text exceed the Region of Peel's Storm Sewer Use By-Law Limits.

iv- CFU: Coliform Units.

HCS HYDROGEOLOGY CONSULTING SERVICES INC

APPENDIX C: BOREHOLE LOGS

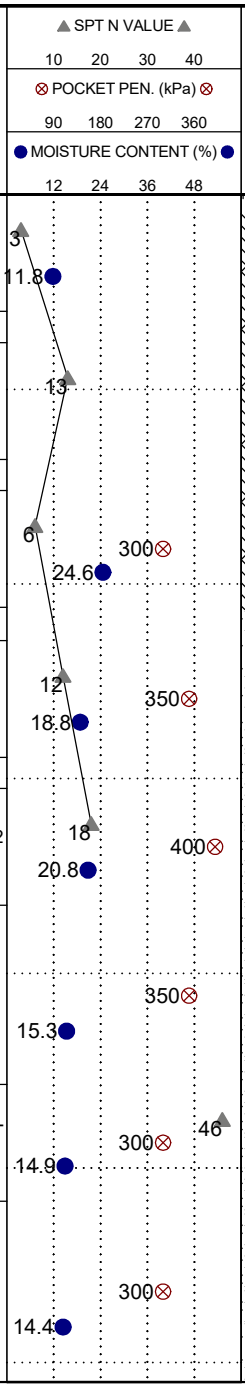
CMT Engineering Inc. Boreholes BH 1 through BH 5

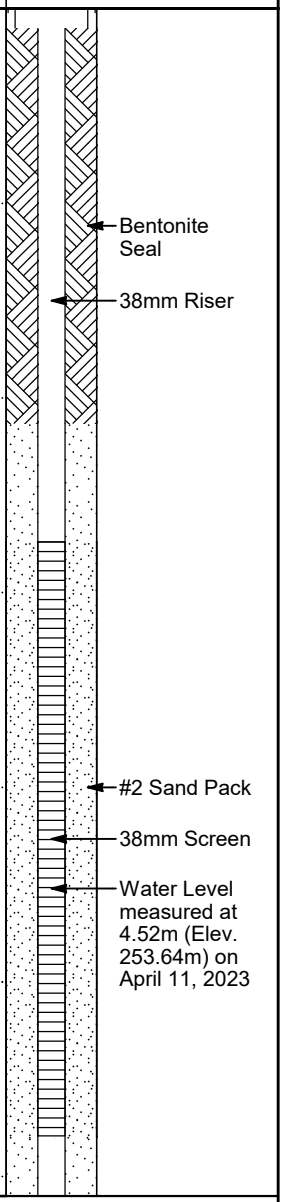
CMT Engineering Inc.
1011 Industrial Crescent
St. Clements, Ontario, N0B 2M0
Telephone: 519-699-5775
Fax: 519-699-4664

BOREHOLE NUMBER 1

PROJECT: Proposed Development
PROJECT ADDRESS: 13668 Emil Kolb Parkway
PROJECT NUMBER: 23-089
PROJECT LOCATION: Bolton, Ontario
DRILLING DATE: 23-3-24
GROUND ELEVATION: 258.16 m
DRILLING CONTRACTOR: CMT DRILLING INC.
LOGGED BY: BL
DRILLING EQUIPMENT: Geoprobe 7822DT
SAMPLING METHOD: SPT/MC5

DEPTH (m)	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)
0	**TOPSOIL:** Loose, dark brown silty topsoil, wet (330 mm)	0.00, 258.16	SPT 1	50	1-1-2-3 (3)
	FILL: Firm, grey-brown clayey silt fill, some sand, trace organics, deleterious materials (bricks), moist	0.33, 257.83			
1			SPT 2	100	5-7-6-7 (13)
	frequent organics encountered	1.07, 257.09			
	CLAYEY SILT: Firm, grey-brown clayey silt, some sand, trace gravel, moist (drier than the plastic limit)	1.52, 256.64	SPT 3	100	3-3-3-4 (6)
2					
	becoming stiff	2.44, 255.72	SPT 4	100	3-5-7-9 (12)
3			SPT 5	100	6-7-11-12 (18)
4			MC5 6	100	
	becoming very stiff, grey, trace sand	4.83, 253.33	SPT 7	100	13-21-25-18 (46)
5			MC5 8	100	
6					





Bottom of borehole at 6.10 m, Elevation 252.06 m.

Monitoring well installed at an elevation of approximately 252.37m on March 24, 2023.

Groundwater measured at approximately 5.42m below the ground surface (Elev. 253.64m) on April 11, 2023.

CMT Engineering Inc.
1011 Industrial Crescent
St. Clements, Ontario, N0B 2M0
Telephone: 519-699-5775
Fax: 519-699-4664

BOREHOLE NUMBER 2

PROJECT: Proposed Development
PROJECT ADDRESS: 13668 Emil Kolb Parkway
PROJECT NUMBER: 23-089
PROJECT LOCATION: Bolton, Ontario
DRILLING DATE: 23-3-24
GROUND ELEVATION: 258.22 m
DRILLING CONTRACTOR: CMT DRILLING INC.
LOGGED BY: BL
DRILLING EQUIPMENT: Geoprobe 7822DT
SAMPLING METHOD: SPT/MC5

DEPTH (m)	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	SPT N VALUE / POCKET PEN. (kPa) / MOISTURE CONTENT (%)	WELL DIAGRAM
0	**TOPSOIL:** Loose, dark brown silty topsoil, wet (200 mm)	0.00, 258.22	SPT 1	75	1-0-1-0 (1)	MC 15.9	
	CLAYEY SILT: Firm, grey-brown clayey silt, some sand, trace gravel, intermixed organics and rootlets, moist (drier than the plastic limit)	0.20, 258.02					
	no intermixed organics or rootlets	0.60, 257.62					
1			SPT 2	100	3-4-9-8 (13)	SPT 13; PP 300; MC 13.8	Bentonite Seal; 38mm Riser
	becoming stiff to very stiff	1.22, 257.00					
2			SPT 3	100	10-7-11-11 (18)	SPT 18; PP 400; MC 14.5	
			SPT 4	100	8-11-13-10 (24)	SPT 24; PP 450; MC 15.4	
3			SPT 5	100	9-11-15-16 (26)	SPT 26; PP 450; MC 14.5	
	becoming grey, trace sand	3.96, 254.26	MC5 6	100		PP 450; MC 15	#2 Sand Pack; 38mm Screen
4			SPT 7	100	8-14-18-16 (32)	SPT 32; PP 450; MC 14.6	
5			MC5 8	100		PP 350; MC 14.8	Water Level measured at 5.48m (Elev. 252.74m) on April 11, 2023
6							

Bottom of borehole at 6.10 m, Elevation 252.12 m.

Monitoring well installed at an elevation of approximately 252.12m on March 24, 2023.

Groundwater measured at approximately 5.48m below the ground surface (Elev. 252.74m) on April 11, 2023.

BOREHOLE LOG WITH WELL2 23-089 - BHS 1 TO 3 WITH MW.GPJ CMT_TEMPLATE_2020-05-15.GDT 23-4-18

CMT Engineering Inc.
1011 Industrial Crescent
St. Clements, Ontario, N0B 2M0
Telephone: 519-699-5775
Fax: 519-699-4664

BOREHOLE NUMBER 3

PROJECT: Proposed Development
PROJECT ADDRESS: 13668 Emil Kolb Parkway
PROJECT NUMBER: 23-089
PROJECT LOCATION: Bolton, Ontario
DRILLING DATE: 23-3-24
GROUND ELEVATION: 259.28 m
DRILLING CONTRACTOR: CMT DRILLING INC.
LOGGED BY: BL
DRILLING EQUIPMENT: Geoprobe 7822DT
SAMPLING METHOD: SPT/MC5

DEPTH (m)	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	SPT N VALUE / POCKET PEN. (kPa) / MOISTURE CONTENT (%)	WELL DIAGRAM
0	**TOPSOIL:** Loose, dark brown silty topsoil, wet (410 mm)	0.00, 259.28	SPT 1	75	1-1-1-1 (2)	2	
	CLAYEY SILT: Firm, grey-brown clayey silt, some sand, trace gravel, intermixed organics and rootlets, moist (drier than the plastic limit)	0.41, 258.87				21.6	
1	becoming stiff to very stiff, no intermixed organics or rootlets	1.07, 258.21	SPT 2	100	2-4-8-11 (12)	12 15.1	Bentonite Seal 38mm Riser
			SPT 3	100	8-10-18-11 (28)	28 350 15.8	
2			SPT 4	100	8-11-16-16 (27)	27 450 15.3	
3			SPT 5	100	8-8-15-19 (23)	23 450 15.2	
4	becoming grey, trace sand	4.11, 255.17	MC5 6	100		13.6	#2 Sand Pack
5			SPT 7	100	9-12-10-16 (22)	22 300 14	38mm Screen Water Level measured at 4.65m (Elev. 254.63m) on April 11, 2023
6			MC5 8	100		350 15.2	

Bottom of borehole at 6.10 m, Elevation 253.18 m.

Monitoring well installed at an elevation of approximately 253.18m on March 24, 2023.

Groundwater measured at approximately 4.65m below the ground surface (Elev. 254.63m) on April 11, 2023.

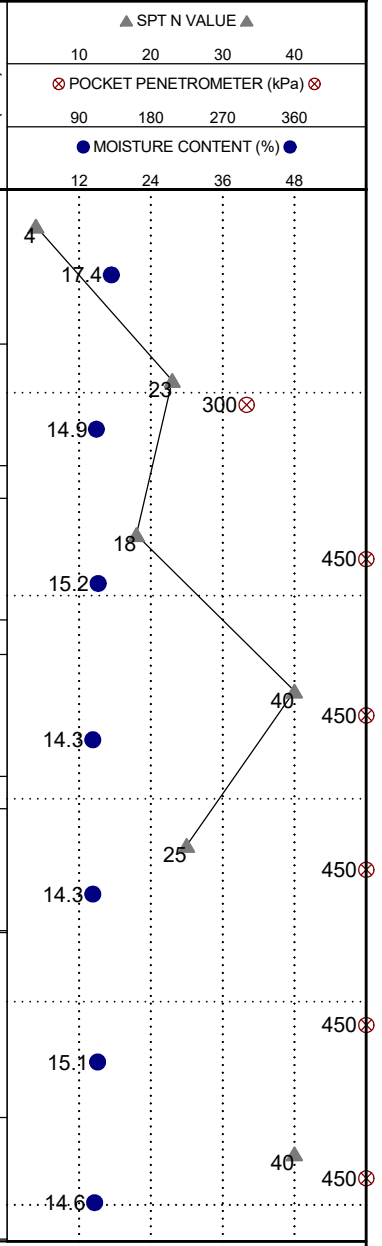
BOREHOLE LOG WITH WELL2 23-089 - BHS 1 TO 3 WITH MW.GPJ CMT_TEMPLATE_2020-05-15.GDT 23-4-18

CMT Engineering Inc.
1011 Industrial Crescent
St. Clements, Ontario, N0B 2M0
Telephone: 519-699-5775
Fax: 519-699-4664

BOREHOLE NUMBER 4

PROJECT: Proposed Development
PROJECT ADDRESS: 13668 Emil Kolb Parkway
PROJECT NUMBER: 23-089
PROJECT LOCATION: Bolton, Ontario
DRILLING DATE: 23-3-24
GROUND ELEVATION: 259.21 m
DRILLING CONTRACTOR: CMT DRILLING INC.
LOGGED BY: BL
DRILLING EQUIPMENT: Geoprobe 7822DT
SAMPLING METHOD: SPT/MC5

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	MOISTURE CONTENT (%)	POCKET PEN. (kPa)
		TOPSOIL: Loose, dark brown silty topsoil, wet (200 mm)	0.00, 259.21					
			0.18, 259.03	SPT 1	50	1-2-2-2 (4)	17.4	
		CLAYEY SILT: Firm, grey-brown clayey silt, some sand, trace gravel, intermixed organics and rootlets, moist (drier than the plastic limit) becoming stiff to very stiff, no intermixed organics or rootlets	0.36, 258.85					
1				SPT 2	100	10-12-11-12 (23)	14.9	300
2				SPT 3	100	8-8-10-12 (18)	15.2	450
3				SPT 4	100	16-17-23-25 (40)	14.3	450
				SPT 5	100	12-8-17-21 (25)	14.3	450
4				MC5 6	100		15.1	450
5				SPT 7	100	30-19-21-22 (40)	14.6	450



Bottom of borehole at 5.18 m, Elevation 254.03 m.

Borehole open to termination.

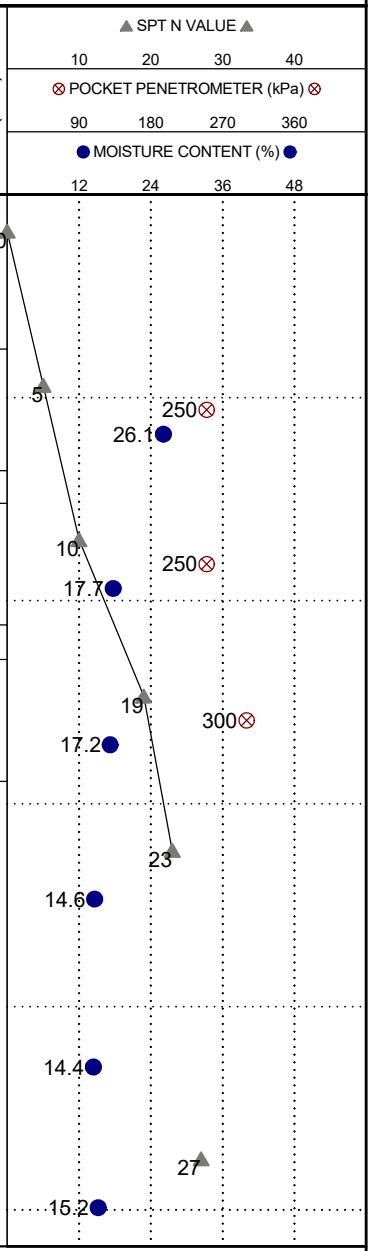
No accumulated groundwater encountered upon completion.

CMT Engineering Inc.
1011 Industrial Crescent
St. Clements, Ontario, N0B 2M0
Telephone: 519-699-5775
Fax: 519-699-4664

BOREHOLE NUMBER 5

PROJECT: Proposed Development
PROJECT ADDRESS: 13668 Emil Kolb Parkway
PROJECT NUMBER: 23-089
PROJECT LOCATION: Bolton, Ontario
DRILLING DATE: 23-3-24
GROUND ELEVATION: 259.14 m
DRILLING CONTRACTOR: CMT DRILLING INC.
LOGGED BY: BL
DRILLING EQUIPMENT: Geoprobe 7822DT
SAMPLING METHOD: SPT/MC5

DEPTH (m)	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	MOISTURE CONTENT (%)	POCKET PEN. (kPa)
	TOPSOIL: Loose, dark brown silty topsoil, wet (410 mm)	0.00, 259.14	SPT 1	50	0-0-0-1 (0)		
	CLAYEY SILT: Firm, grey-brown clayey silt, some sand, trace gravel, intermixed organics and rootlets, moist (drier than the plastic limit)	0.41, 258.73					
1	no intermixed organics or rootlets	0.76, 258.38	SPT 2	100	2-2-3-4 (5)	26.1	250
	becoming stiff to very stiff	1.52, 257.62	SPT 3	100	6-5-5-5 (10)	17.7	250
2			SPT 4	100	8-10-9-10 (19)	17.2	300
3	becoming grey, trace sand	3.35, 255.79	SPT 5	100	9-11-12-14 (23)	14.6	
4			MC5 6	100		14.4	
5			SPT 7	100	11-13-14-15 (27)	15.2	



Bottom of borehole at 5.18 m, Elevation 253.96 m.

Borehole open to termination.

No accumulated groundwater encountered upon completion.

APPENDIX D: MECP WATER WELL RECORDS AND WELL SURVEY FORMS

Water Well Records

Wednesday, April 26, 2023

12:36:10 PM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
CALEDON TOWN (ALBION	17 600108 4858347 W	2014/02 7360	0.75			MO	0015 5	7217676 (Z174452) A161292	SILT 0015 CLAY 0020
CALEDON TOWN (ALBION	17 600485 4858450 W	2017/08 7147	1.25	UT 0008		MO	0010 5	7294294 (Z255072) A223378	BLCK LOAM 0001 BRWN SILT CLAY 0012 BRWN CLAY SILT TILL 0015
CALEDON TOWN (ALBION	17 600526 4858466 W	2017/08 7147	1.25	UT 0008		MO	0010 5	7294293 (Z255071) A223377	BLCK LOAM 0001 BRWN SILT CLAY 0012 BRWN CLAY SILT TILL 0015
CALEDON TOWN (ALBION	17 600458 4858270 W	2017/03 7464						7286282 (C37185) A208366 P	
CALEDON TOWN (ALBION	17 600585 4858004 W	2006/03 7230	1.97			NU	0010 10	4910244 (Z44332) A039816	BLCK SAND LOOS 0001 BRWN CLAY DNSE 0010 GREY CLAY DNSE 0020
CALEDON TOWN (ALBION CON 05 009	17 600243 4858381 W	2021/06 7366	1.59		///:	MO	0009 10	7394856 (963OGZUY) A333573	BRWN TILL SILT DNSE 0019
CALEDON TOWN (ALBION CON 05 009	17 600223 4858401 W	2021/06 7366	1.59		///:	MO	0010 10	7394855 (PCNGT2FQ) A333572	BRWN TILL SILT DNSE 0020
CALEDON TOWN (ALBION CON 05 009	17 600215 4858323 W	1982/11 3108	6	FR 0238	147/240/10/3:0	DO	0244 3	4905962 ()	LOAM 0002 BRWN CLAY GVLY 0017 GREY CLAY 0043 GREY CLAY SNDY 0072 GREY CLAY 0201 GREY CLAY SNDY 0235 GREY SAND 0247
CALEDON TOWN (ALBION CON 05 009	17 600277 4858412 W	2021/06 7366	1.59		///:	MO	0008 10	7394857 (62V3TLZY) A333574	BRWN TILL SILT DNSE 0018
CALEDON TOWN (ALBION CON 05 010	17 599905 4858789 W	1129						4907845 (149039)	
CALEDON TOWN (ALBION CON 05 010	17 600252 4858370 W	2004/05 1663				NU		4909422 (Z13072) A	
CALEDON TOWN (ALBION CON 05 010	17 599797 4858856 W	2016/05 7147	3.20 5				0037 2 0032 6	7263986 (Z228026) A	
CALEDON TOWN (ALBION CON 06 009	17 600329 4858432 W	2009/03 7147	35.4	FR 0023				7121185 (Z85214) A	
CALEDON TOWN (ALBION CON 06 009	17 600320 4858462 W	1957/07 1307	36	FR 0050	30///:	DO		4900319 ()	BRWN LOAM CLAY 0015 BLUE CLAY 0049 GRVL 0050

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
CALEDON TOWN (ALBION CON 06 009	17 600451 4858422 W	2017/08 7147	0.75	UT 0008		MO	0008 5	7294295 (Z255074) A223376	BLCK LOAM 0001 BRWN SILT CLAY 0012 BRWN CLAY SILT 0012
CALEDON TOWN (ALBION CON 06 009	17 600426 4858389 W	2017/08 7147	0.75	UT 0008		MO	0008 5	7294296 (Z255073) A223375	BLCK LOAM 0001 BRWN SILT CLAY 0012 GREN CLAY SILT TILL 0012
CALEDON TOWN (ALBION CON 06 010	17 600031 4858855 W	2003/04 1663				NU		4909128 (253125) A	
CALEDON TOWN (ALBION CON 06 010	17 600264 4858447 W	1985/09 4778	6 4	FR 0249	156/240/4/3:0	DO	0249 6	4906483 (NA)	BRWN CLAY STNS 0018 BLUE CLAY STNS 0074 BLUE CLAY 0180 BLUE CLAY SILT 0249 FSND 0255
CALEDON TOWN (ALBION CON 06 010	17 599937 4858893 W	2013/07 7147	35.4	FR 0007				7205856 (Z171558) 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

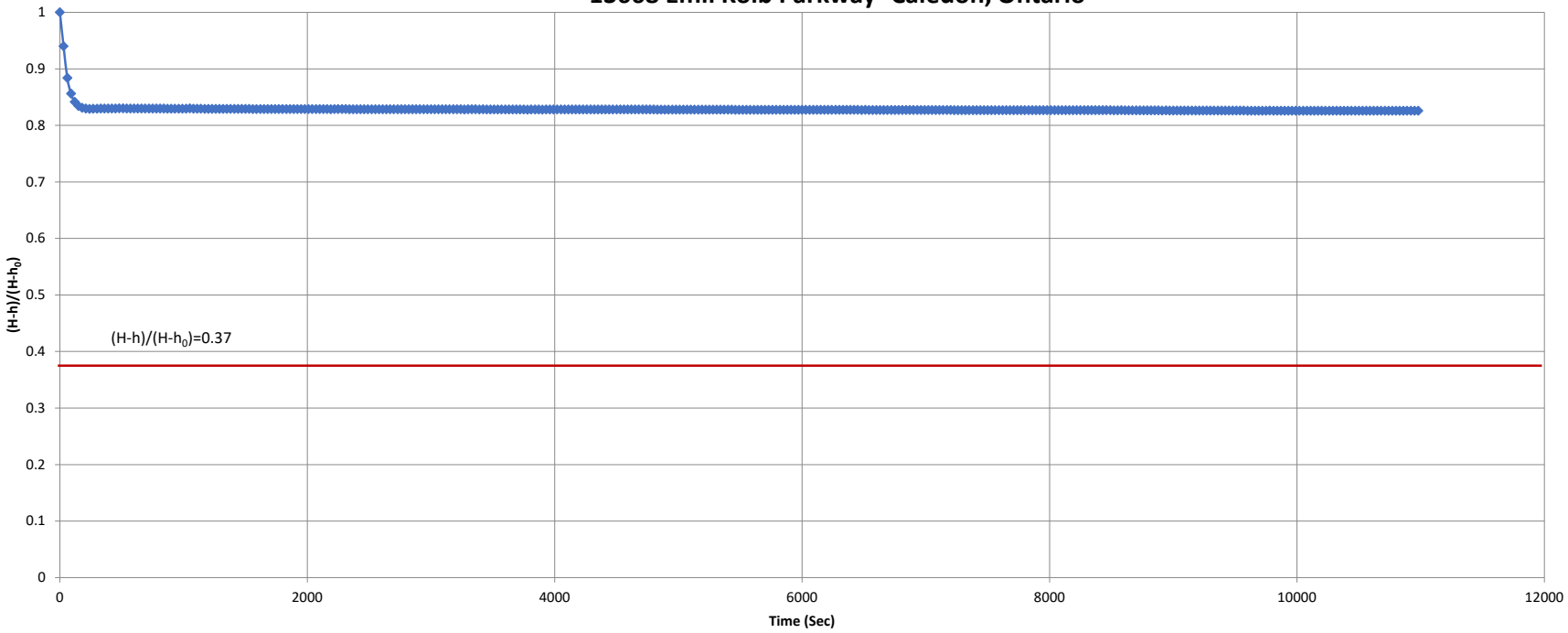
Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

APPENDIX E: SLUG TEST ANALYSIS GRAPHS

Figure 1: BH 2

Figure 2: BH 3

Figure 1
BH2 Slug Test Analysis
13668 Emil Kolb Parkway- Caledon, Ontario



Hvorslev Method for Slug Test Analysis

stickup=	1.06	m	casing stickup from ground surface
SWL=	6.54	m	Static Water Level (mBTOP)
r =	0.019	m	casing radius
L =	3.05	m	screen length
R =	0.05	m	borehole radius (estimated)
$H-h_o$ =	6.40	m	Water level change at T=0
$T_{0.37}$ =	n/a	sec	T at $(H-h)/(H-h_0)=0.37$

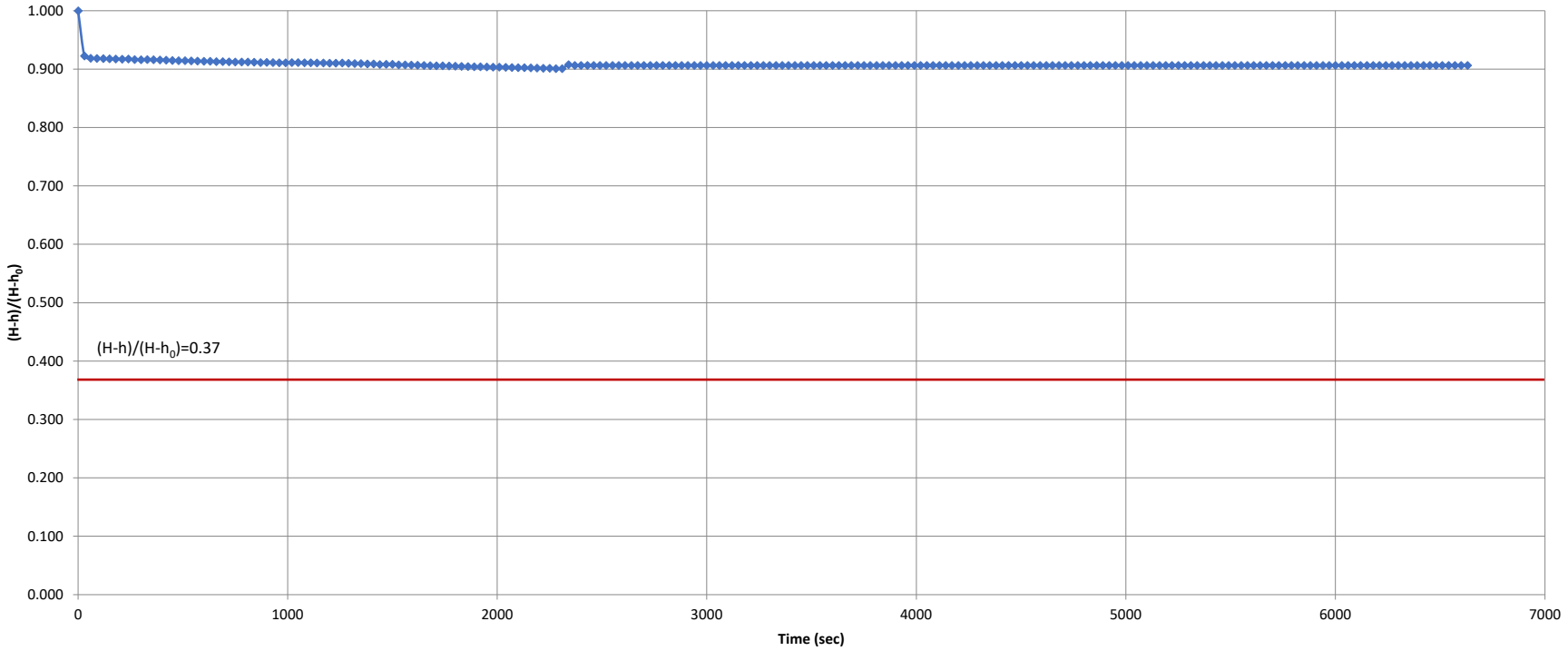
$$k = \frac{r^2 \ln(L/R)}{2LT_{0.37}}$$

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

HCS HYDROGEOLOGY CONSULTING SERVICES INC

28-03-2023

Figure 2
BH3 Slug Test Analysis
13668 Emil Kolb Parkway- Caledon, Ontario



Hvorslev Method for Slug Test Analysis

stickup=	1.01	m	casing stickup from ground surface
SWL=	5.66	m	Static Water Level (mBTOP)
r =	0.019	m	casing radius
L =	3.05	m	screen length
R =	0.05	m	borehole radius
$H-h_o$ =	0.87	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

28-03-2023

APPENDIX F: GRAIN SIZE ANALYSIS GRAPHS

Figures 1-4 (CMT Engineering Inc.)

Particle Size Distribution Report

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	1.6	2.6	9.0	58.7	27.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH1	4	1.52-2.13m	clayey silt, some sand, trace gravel	ML
				Sampled by BL of CMT Engineering Inc. March 24, 2023	
				Tested by JM of CMT Engineering Inc. April 3, 2023	

CMT Engineering Inc.

St. Clements, ON

Client: Hydrogeology Consulting Services

Project: Proposed Development
13668 Emil Kolb Parkway, Bolton, Ontario

Project No.: 23-089 **Figure** 1

Particle Size Distribution Report

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.8	2.4	3.8	11.3	50.7	29.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH1	7	4.57-5.18m	clayey silt, some sand, trace gravel	ML
				Sampled by BL of CMT Engineering Inc. March 24, 2023	
				Tested by JM of CMT Engineering Inc. April 3, 2023	

CMT Engineering Inc.

St. Clements, ON

Client: Hydrogeology Consulting Services

Project: Proposed Development
13668 Emil Kolb Parkway, Bolton, Ontario

Project No.: 23-089 **Figure** 2

Particle Size Distribution Report

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.7	1.9	5.3	11.7	47.0	32.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH2	8	5.18-6.10m	clayey silt, some sand, trace gravel	ML
				Sampled by BL of CMT Engineering Inc. March 24, 2023	
				Tested by JM of CMT Engineering Inc. April 3, 2023	

CMT Engineering Inc.

St. Clements, ON

Client: Hydrogeology Consulting Services

Project: Proposed Development
13668 Emil Kolb Parkway, Bolton, Ontario

Project No.: 23-089 **Figure** 3

Particle Size Distribution Report

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.3	1.9	3.8	9.8	53.6	29.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH3	8	5.18-6.10m	clayey silt, some sand, trace gravel	ML
				Sampled by BL of CMT Engineering Inc. March 24, 2023	
				Tested by JM of CMT Engineering Inc. April 3, 2023	

CMT Engineering Inc.

St. Clements, ON

Client: Hydrogeology Consulting Services

Project: Proposed Development
13668 Emil Kolb Parkway, Bolton, Ontario

Project No.: 23-089 **Figure** 4

APPENDIX G: LABORATORY CERTIFICATE OF ANALYSIS

WT2306752

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CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2307652**	Page	: 1 of 5
Client	: **Hydrogeology Consulting Services**	Laboratory	: Waterloo - Environmental
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	: Emil Kolb Parkway	Date Samples Received	: 28-Mar-2023 19:00
PO	: ----	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 04-Apr-2023 17:20
Sampler	: Client		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Katrina Zwambag	Business Manager - Environmental	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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*
µg/L	micrograms per litre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.
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 .

Qualifiers

Qualifier	*Description*
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).*
DLUI	*Detection Limit Raised: Unknown interference generated an apparent false positive test result.*
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.*

Analytical Results

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

Analyte	Method	LOR	Unit	Client sample ID: A360497 Sampling date/time: 28-Mar-2023 11:00 WT2307652-001	RMPSUB SAN	RMPSUB STM				
Physical Tests										
pH	E108	0.10	pH units	8.01	5.5 - 10 pH units	6 - 9 pH units	--	--	--	--
Solids, total suspended [TSS]	E160	3.0	mg/L	132	350 mg/L	15 mg/L	--	--	--	--
Anions and Nutrients										
Fluoride	E235.F	0.020	mg/L	0.108	10 mg/L	--	--	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	26.5	1500 mg/L	--	--	--	--	--
Cyanides										
Cyanide, strong acid dissociable (Total)	E333	0.0020	mg/L	<0.0020	2 mg/L	0.02 mg/L	--	--	--	--
Total Metals										
Aluminum, total	E420	0.0030	mg/L	1.08 DLHC	50 mg/L	--	--	--	--	--
Antimony, total	E420	0.00010	mg/L	0.00101 DLHC	5 mg/L	--	--	--	--	--
Arsenic, total	E420	0.00010	mg/L	<0.00100 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Cadmium, total	E420	0.0000050	mg/L	<0.000130 DLHC DLM	0.7 mg/L	0.008 mg/L	--	--	--	--
Chromium, total	E420	0.00050	mg/L	0.0106 DLHC	5 mg/L	0.08 mg/L	--	--	--	--
Cobalt, total	E420	0.00010	mg/L	0.00145 DLHC	5 mg/L	--	--	--	--	--
Copper, total	E420	0.00050	mg/L	0.00778 DLHC	3 mg/L	0.05 mg/L	--	--	--	--
Lead, total	E420	0.000050	mg/L	0.00704 DLHC	3 mg/L	0.12 mg/L	--	--	--	--
Manganese, total	E420	0.00010	mg/L	0.115 DLHC	5 mg/L	0.05 mg/L	--	--	--	--
Mercury, total	E508	0.0000050	mg/L	<0.0000050	0.01 mg/L	0.0004 mg/L	--	--	--	--
Molybdenum, total	E420	0.000050	mg/L	0.0722 DLHC	5 mg/L	--	--	--	--	--
Nickel, total	E420	0.00050	mg/L	0.0161 DLHC	3 mg/L	0.08 mg/L	--	--	--	--
Selenium, total	E420	0.000050	mg/L	0.00252 DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silver, total	E420	0.000010	mg/L	<0.000100 DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Tin, total	E420	0.00010	mg/L	0.00566 DLHC	5 mg/L	--	--	--	--	--
Titanium, total	E420	0.00030	mg/L	<0.0400 DLHC DLUI	5 mg/L	--	--	--	--	--
Zinc, total	E420	0.0030	mg/L	0.600 DLHC	3 mg/L	0.04 mg/L	--	--	--	--
Aggregate Organics										
Carbonaceous biochemical oxygen demand [CBOD]	E555	2.0	mg/L	3.0	300 mg/L	15 mg/L	--	--	--	--
Volatile Organic Compounds										
Benzene	E611D	0.50	µg/L	<0.50 OWP	10 µg/L	2 µg/L	--	--	--	--

Analyte	Method	LOR	Unit	WT2307652-001 (Continued)		RMPSUB SAN	RMPSUB STM				
Volatile Organic Compounds - Continued											
Chloroform	E611D	0.50	µg/L	<0.50	OWP	40 µg/L	2 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	OWP	50 µg/L	5.6 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	OWP	80 µg/L	6.8 µg/L	--	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	OWP	4000 µg/L	5.6 µg/L	--	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	OWP	2000 µg/L	5.2 µg/L	--	--	--	--
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	OWP	140 µg/L	5.6 µg/L	--	--	--	--
Ethylbenzene	E611D	0.50	µg/L	<0.50	OWP	160 µg/L	2 µg/L	--	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	OWP	8000 µg/L	--	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	OWP	200 µg/L	--	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	OWP	1400 µg/L	17 µg/L	--	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	OWP	1000 µg/L	4.4 µg/L	--	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	OWP	270 µg/L	2 µg/L	--	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	OWP	400 µg/L	8 µg/L	--	--	--	--
Xylene, m+p-	E611D	0.40	µg/L	<0.40	OWP	--	--	--	--	--	--
Xylene, o-	E611D	0.30	µg/L	<0.30	OWP	--	--	--	--	--	--
Xylenes, total	E611D	0.50	µg/L	<0.50	OWP	1400 µg/L	4.4 µg/L	--	--	--	--
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	E611D	1.0	%	94.1		--	--	--	--	--	--
Difluorobenzene, 1,4-	E611D	1.0	%	101		--	--	--	--	--	--
Nonylphenols											
Nonylphenol diethoxylates [NP2EO]	E749B	0.10	µg/L	<0.10		--	--	--	--	--	--
Nonylphenol ethoxylates, total	E749B	2.0	µg/L	<2.0		200 µg/L	--	--	--	--	--
Nonylphenol monoethoxylates [NP1EO]	E749B	2.0	µg/L	<2.0		--	--	--	--	--	--
Nonylphenols [NP]	E749A	1.0	µg/L	<1.0		20 µg/L	--	--	--	--	--
Polychlorinated Biphenyls											
Aroclor 1016	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020		--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020		--	--	--	--	--	--

Analyte	Method	LOR	Unit	WT2307652-001 (Continued)	RMPSUB SAN	RMPSUB STM				
Polychlorinated Biphenyls - Continued										
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	1 µg/L	0.4 µg/L	--	--	--	--
Decachlorobiphenyl	E687	0.1	%	81.1	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	90.2	--	--	--	--	--	--

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

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
A360497	Water	Solids, total suspended [TSS]		RMPSUB	STM	132 mg/L	15 mg/L
	Water	Manganese, total		RMPSUB	STM	0.115 mg/L	0.05 mg/L
	Water	Zinc, total		RMPSUB	STM	0.600 mg/L	0.04 mg/L

Key:

RMPSUB Ontario Reg.Mun. of Peel Sewer Bylaw #53-2010 (APR, 2019)

SAN Peel Sanitary Sewer (53-2010)

STM Peel Storm Sewer (53-2010)

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2307652**	Page	: 1 of 9
Client	: **Hydrogeology Consulting Services**	Laboratory	: Waterloo - Environmental
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	: Emil Kolb Parkway	Date Samples Received	: 28-Mar-2023 19:00
PO	: ----	Issue Date	: 04-Apr-2023 17:20
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 1		
No. of samples analysed	: 1		

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 Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

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
Matrix Spike (MS) Recoveries								
Nonylphenols	Anonymous	Anonymous	Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	154 % K	60.0-140%	Recovery greater than upper data quality objective

Result Qualifiers

Qualifier	Description
K	*Matrix Spike recovery outside ALS DQO due to sample matrix effects.*

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 (Carbonaceous) - 5 day										
HDPE [BOD HT-4d] A360497	E555	28-Mar-2023	----	----	----		30-Mar-2023	4 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] A360497	E235.F	28-Mar-2023	30-Mar-2023	----	----		30-Mar-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] A360497	E235.SO4	28-Mar-2023	30-Mar-2023	----	----		30-Mar-2023	28 days	2 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) A360497	E333	28-Mar-2023	31-Mar-2023	----	----		31-Mar-2023	14 days	3 days	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS A360497	E749B	28-Mar-2023	31-Mar-2023	7 days	3 days	✓	31-Mar-2023	7 days	0 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS A360497	E749A	28-Mar-2023	31-Mar-2023	7 days	3 days	✓	31-Mar-2023	7 days	0 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] A360497	E108	28-Mar-2023	30-Mar-2023	----	----		02-Apr-2023	14 days	5 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]										
A360497	E160	28-Mar-2023	----	----	----		31-Mar-2023	7 days	3 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
A360497	E687	28-Mar-2023	31-Mar-2023	14 days	3 days	✓	04-Apr-2023	40 days	4 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
A360497	E508	28-Mar-2023	30-Mar-2023	----	----		30-Mar-2023	28 days	2 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
A360497	E420	28-Mar-2023	30-Mar-2023	----	----		30-Mar-2023	180 days	2 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
A360497	E611D	28-Mar-2023	30-Mar-2023	----	----		30-Mar-2023	14 days	2 days	✓

Legend & Qualifier Definitions

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

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 (Carbonaceous) - 5 day	E555	881353	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	881401	1	10	10.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	882641	1	19	5.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	882640	1	19	5.2	5.0	✓
pH by Meter	E108	881407	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	881405	1	10	10.0	5.0	✓
Total Cyanide	E333	883279	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	880982	1	10	10.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	880783	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	883185	1	19	5.2	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	882243	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	881353	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	881401	1	10	10.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	882641	1	19	5.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	882640	1	19	5.2	5.0	✓
PCB Aroclors by GC-MS	E687	882593	1	17	5.8	4.7	✓
pH by Meter	E108	881407	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	881405	1	10	10.0	5.0	✓
Total Cyanide	E333	883279	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	880982	1	10	10.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	880783	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	883185	1	19	5.2	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	882243	1	17	5.8	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	881353	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	881401	1	10	10.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	882641	1	19	5.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	882640	1	19	5.2	5.0	✓
PCB Aroclors by GC-MS	E687	882593	1	17	5.8	4.7	✓
Sulfate in Water by IC	E235.SO4	881405	1	10	10.0	5.0	✓
Total Cyanide	E333	883279	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	880982	1	10	10.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	880783	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	883185	1	19	5.2	4.7	✓

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*
Method Blanks (MB) - Continued							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	882243	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Fluoride in Water by IC	E235.F	881401	1	10	10.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	882641	1	19	5.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	882640	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	881405	1	10	10.0	5.0	✓
Total Cyanide	E333	883279	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	880982	1	10	10.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	880783	1	7	14.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	882243	1	17	5.8	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
pH by Meter	E108 Waterloo - Environmental	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 Waterloo - Environmental	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.
Fluoride in Water by IC	E235.F Waterloo - Environmental	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 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Cyanide	E333 Waterloo - Environmental	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 metals in Water by CRC ICPMS	E420 Waterloo - Environmental	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.
Total Mercury in Water by CVAAS	E508 Waterloo - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Waterloo - Environmental	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. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	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.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A Waterloo - Environmental	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 Waterloo - Environmental	Water	J. Chrom A849 (1999) p.467-482	Water samples are filtered and analyzed on LCMS/MS by direct injection.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 Waterloo - Environmental	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.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 Waterloo - Environmental	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.
Preparation of Nonylphenol and Nonylphenol Ethoxylates	EP749 Waterloo - Environmental	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	: **WT2307652**	Page	: 1 of 11
Client	: Hydrogeology Consulting Services	Laboratory	: Waterloo - Environmental
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	: Emil Kolb Parkway	Date Samples Received	: 28-Mar-2023 19:00
PO	: ----	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 04-Apr-2023 17:29
Sampler	: Client 905 550 0969		
Site	: ----		
Quote number	: Standing Offer 2022		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Katrina Zwambag	Business Manager - Environmental	Waterloo LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, 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: 881407)											
HA2300112-001	Anonymous	pH	----	E108	0.10	pH units	9.28	9.23	0.540%	4%	----
Physical Tests (QC Lot: 883185)											
WT2307669-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	14.6	13.2	1.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 881401)											
WT2307730-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.092	0.090	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 881405)											
WT2307730-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	130	130	0.100%	20%	----
Cyanides (QC Lot: 883279)											
HA2300112-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Total Metals (QC Lot: 880783)											
WT2307652-001	A360497	Aluminum, total	7429-90-5	E420	0.0300	mg/L	1.08	1.05	3.04%	20%	----
		Antimony, total	7440-36-0	E420	0.00100	mg/L	0.00101	<0.00100	0.00001	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.000130	mg/L	<0.000130	<0.000130	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00500	mg/L	0.0106	0.0111	0.00045	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00100	mg/L	0.00145	0.00144	0.000006	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00500	mg/L	0.00778	0.00780	0.00002	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000500	mg/L	0.00704	0.00710	0.857%	20%	----
		Manganese, total	7439-96-5	E420	0.00100	mg/L	0.115	0.115	0.177%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0722	0.0716	0.916%	20%	----
		Nickel, total	7440-02-0	E420	0.00500	mg/L	0.0161	0.0157	0.00040	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000500	mg/L	0.00252	0.00260	0.000076	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	0.00566	0.00515	0.00051	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00300	mg/L	<0.0400	0.0411	0.0411	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0300	mg/L	0.600	0.613	2.08%	20%	----
Total Metals (QC Lot: 880982)											
WT2307652-001	A360497	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	0.0000060	0.0000010	Diff <2x LOR	----
Aggregate Organics (QC Lot: 881353)											

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*
Aggregate Organics (QC Lot: 881353) - continued											
WT2307802-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	31.0	31.2	0.4%	30%	----
Volatile Organic Compounds (QC Lot: 882243)											
WT2307767-001	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	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Styrene	100-42-5	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	<0.50	<0.50	0	Diff <2x LOR	----
		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: 882640)											
RG2300320-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	100	µg/L	<100	<100	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 882641)											
RG2300320-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.10	µg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2.0	µg/L	<2.0	<2.0	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: 883185)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 881401)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 881405)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Cyanides (QCLot: 883279)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Total Metals (QCLot: 880783)						
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	----
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: 880982)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 881353)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Volatile Organic Compounds (QCLot: 882243)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 882243) - continued						
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	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Styrene	100-42-5	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	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Nonylphenols (QCLot: 882640)						
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	<1.0	----
Nonylphenols (QCLot: 882641)						
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: 882593)						
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: 881407)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 883185)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.0	85.0	115	----
Anions and Nutrients (QCLot: 881401)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 881405)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Cyanides (QCLot: 883279)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	94.4	80.0	120	----
Total Metals (QCLot: 880783)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	96.4	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	104	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	107	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	97.8	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	102	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	100	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	97.9	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	99.4	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	100	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	93.6	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	99.0	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	100	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	101	80.0	120	----
Total Metals (QCLot: 880982)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	91.7	80.0	120	----
Aggregate Organics (QCLot: 881353)									

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
Aggregate Organics (QCLot: 881353) - continued									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	107	85.0	115	----
Volatile Organic Compounds (QCLot: 882243)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	98.5	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	93.0	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	91.6	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	90.1	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	97.5	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	99.6	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	88.2	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	91.4	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	112	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	91.2	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	96.4	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	86.9	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	90.7	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	90.7	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	91.3	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	90.7	70.0	130	----
Nonylphenols (QCLot: 882640)									
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	10 µg/L	93.2	75.0	125	----
Nonylphenols (QCLot: 882641)									
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	1 µg/L	97.8	75.0	125	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	20 µg/L	105	75.0	125	----
Polychlorinated Biphenyls (QCLot: 882593)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	109	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	92.8	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	102	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	120	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	120	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	120	60.0	140	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier

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: 881401)										
WT2307730-001	Anonymous	Fluoride	16984-48-8	E235.F	0.955 mg/L	1 mg/L	95.5	75.0	125	----
Anions and Nutrients (QCLot: 881405)										
WT2307730-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Cyanides (QCLot: 883279)										
HA2300112-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.242 mg/L	0.25 mg/L	96.6	75.0	125	----
Total Metals (QCLot: 880783)										
WT2307654-001	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0525 mg/L	0.05 mg/L	105	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0560 mg/L	0.05 mg/L	112	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00533 mg/L	0.005 mg/L	107	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0131 mg/L	0.0125 mg/L	105	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0128 mg/L	0.0125 mg/L	102	70.0	130	----
		Copper, total	7440-50-8	E420	0.0126 mg/L	0.0125 mg/L	100	70.0	130	----
		Lead, total	7439-92-1	E420	0.0245 mg/L	0.025 mg/L	98.2	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	0.0129 mg/L	0.0125 mg/L	103	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0250 mg/L	0.025 mg/L	100	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0541 mg/L	0.05 mg/L	108	70.0	130	----
		Silver, total	7440-22-4	E420	0.00470 mg/L	0.005 mg/L	93.9	70.0	130	----
		Tin, total	7440-31-5	E420	0.0258 mg/L	0.025 mg/L	103	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0257 mg/L	0.025 mg/L	103	70.0	130	----
Total Metals (QCLot: 880982)										
WT2307688-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000949 mg/L	0.0001 mg/L	94.9	70.0	130	----
Volatile Organic Compounds (QCLot: 882243)										
WT2307767-001	Anonymous	Benzene	71-43-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Chloroform	67-66-3	E611D	97.3 µg/L	100 µg/L	97.3	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	95.7 µg/L	100 µg/L	95.7	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	94.3 µg/L	100 µg/L	94.3	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Dichloromethane	75-09-2	E611D	106 µg/L	100 µg/L	106	60.0	140	----

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
Volatile Organic Compounds (QCLot: 882243) - continued										
WT2307767-001	Anonymous	Dichloropropylene, trans-1,3-	10061-02-6	E611D	89.4 µg/L	100 µg/L	89.4	60.0	140	----
		Ethylbenzene	100-41-4	E611D	93.3 µg/L	100 µg/L	93.3	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	121 µg/L	100 µg/L	121	60.0	140	----
		Styrene	100-42-5	E611D	94.2 µg/L	100 µg/L	94.2	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	88.7 µg/L	100 µg/L	88.7	60.0	140	----
		Toluene	108-88-3	E611D	93.0 µg/L	100 µg/L	93.0	60.0	140	----
		Trichloroethylene	79-01-6	E611D	93.7 µg/L	100 µg/L	93.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	186 µg/L	200 µg/L	93.0	60.0	140	----
		Xylene, o-	95-47-6	E611D	92.8 µg/L	100 µg/L	92.8	60.0	140	----
Nonylphenols (QCLot: 882640)										
RG2300320-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	10.0 µg/L	10 µg/L	100	60.0	140	----
Nonylphenols (QCLot: 882641)										
RG2300320-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.91 µg/L	1 µg/L	91.3	60.0	140	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	30.9 µg/L	20 µg/L	154	60.0	140	K

Qualifiers

Qualifier	Description
K	*Matrix Spike recovery outside ALS DQO due to sample matrix effects.*

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:

Pa

Environmental Division
Waterloo
Work Order Reference
WT2307652

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

Select Service Level Below - Contact your AM to

Regular [R] ☒ Standard TAT if received by 3 p

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

EMERGENCY
1 Business
Same Day, (Laboratory

Date and Time Required for all E&P TATs:

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

Analysis R

Project Information

ALS Account # / Quote #: 2023 Price List
Job #: Emil Kolb Parkway
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): WT2307652 TS

ALS Contact: Emily Smith Sampler:

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	Peel Sanitary & Storm Pkg	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	A360497	28/03/23	11:00	Water	9				
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☑ NO

Are samples for human consumption/ use?
☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Peel Storm and Sanitary Sewer Use By-Law

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			
				-0.3			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Silvia Valentini	28/03/23	6:30 PM

INITIAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:
CS	Mar 28/23	7pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 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**.

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