ENVISION
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PRELIMINARY HYDROGEOLOGICAL INVESTIGATION

7072 Sixth Line, Milton, Ontario

Project #: 24-0774
Prepared for: 1000377643 ONTARIO INC.
Date: September 8, 2025

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Attention: Andy Sidhu, andy@targettrucksales.ca

SUBJECT: PRELIMINARY HYDROGEOLOGICAL INVESTIGATION, 7072 SIXTH LINE, MILTON, ONTARIO

EnVision Consultants Ltd. is pleased to present the enclosed Preliminary Hydrogeological Investigation report for the above-noted property.

We thank you for utilizing EnVision for this assignment. If there are any questions regarding the enclosed report, please do not hesitate to contact us.

Yours sincerely,

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QUALITY MANAGEMENT

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1. INTRODUCTION

EnVision Consultants Ltd. (EnVision) was retained 1000377643 ONTARIO INC. (the 'Client') to conduct preliminary hydrogeological assessment at the property located at 7072 Sixth Line, Milton, Ontario (the 'Site'). It is our understanding that this assessment has been requested to support ongoing design and site planning activities associated with redevelopment of the existing Site. The following report has been prepared to characterize the local hydrogeological regime and delineate any hydrogeological constraints for future development of the Site. The study provides preliminary findings from an active investigation and has been prepared in accordance with the Conservation Halton Requirements for Completion of Hydrogeological Studies. This work was completed concurrently with a limited geotechnical investigation and which are provided under separate cover. The location and orientation of the Site, including a 500-meter buffer extending out from the property line to represent the Study Area, is included in Figure 1.

The Site is located northwest of Derry Road and Sixth Line, in the Town of Milton. The property is currently occupied with a commercial/industrial use, operating as a truck and trailer storage facility. The redevelopment plans include construction of a one-storey industrial building with associated parking surfaces and associated internal servicing.

1.1. OBJECTIVES AND SCOPE OF WORK

The key objectives for the preliminary hydrogeological investigation are to:

- Characterize the regional and site-specific geology and hydrogeology;
- Identify the local groundwater conditions, including the phreatic surface, flow patterns, and any interactions with nearby natural heritage features;
- Identify nearby water users that may be impacted by future development;
- Conduct a preliminary assessment of the soil conditions at site, including the unsaturated infiltration potential at several borehole locations by way of grain size analysis and interpretation to aid in future LID and Stormwater Management design;
- Identify any groundwater constraints to the proposed development concept, including any potential concerns related to short-term and long-term groundwater drainage from the Site;
- Assess potential impacts and provide mitigation measures to aid in design purposes;
- Site reconnaissance to inventory any onsite water features under the influence of groundwater, including evidence of groundwater seepage, ponding, and drainage channels;

1.2. SITE DESCRIPTION

The Site is located approximately 265m to the northwest of the intersection of Derry Road and Sixth line in a mixed commercial, residential, institutional, and agricultural area in Milton, Ontario. The Site is rectangular in shape, occupying an area of approximately 1 ha (2.54 acres) and is currently occupied by Advantage Equipment Sales. The Site is bounded by Sixth Line to the northeast, and agriculture fields to the remaining

sides. The location and orientation of the Site is depicted on Figure 1, attached. A 500-m buffer has been applied to the property boundary to represent the Study Area.

1.3. PROPOSED DEVELOPMENT

The Site is proposed for industrial development, consisting of the existing structure being replaced by a one-storey industrial building and accessory trailer parking. The existing site conditions are to be altered in conformance with Conservation Halton requirements, particularly with respect to trailer parking areas to avoid encroachment into regulatory areas.

Currently the Site is reliant on groundwater from an onsite water supply well, and wastewater is managed via private septic. The proposed redevelopment will not alter the current water servicing for the Site. The hydrogeological investigation scope does not include any private water feasibility work.

2. REGIONAL SETTING

2.1. PHYSIOGRAPHY OF THE STUDY AREA

The Site and Study Area is situated with the physiographic region identified as the Peel Plain, which is an area of land that bisects the South Slope region of the Oak Ridges Moraine landform. In the area of the Site, the Peel Plain is comprised of successive layers of glacial material deposited during ice advance and retreat cycles. A plot of the Physiography is included as Figure 2.

2.2. OVERBURDEN GEOLOGY

Based on a review of published surficial geological mapping in the Study Area, the surficial material across the Site is expected to be comprised of red to brown gritty silt to clayey silt overlain by a layer of sand. The silt clay matches the characteristics of the Halton till. Modern alluvial has been mapped north of the Site that runs along the Sixteen Mile creek system. This alluvium has been described as undifferentiated gravel, sand, silt, clay and muck. (Ministry of Northern Development, Mines and Forestry, 2013). Figure 3 highlights the mapped surficial geology of the Study Area.

2.3. BEDROCK GEOLOGY

Bedrock mapping of the Study Area identifies the bedrock as the Queenston Formation; a mix of shale, limestone, dolostone and siltstone (Sharpe, 1980). Based on a review of the lithology reported within the Ministry of the Environment, Conservation and Parks (MECP) well records database, bedrock is reported ranging from 15 m to 52 m below ground level. Bedrock was not encountered during the subsequent field investigation, however a local well record associated with the Site (Well Tag 2808394) reported red shale strike at 26.5 m.

2.4. STUDY AREA REVIEW OF MECP WATER WELL RECORDS

EnVision reviewed the online Ministry of the Environment, Conservation and Parks (MECP) Water Well Record information system to determine the number and reported use of water wells present within the Study Area.

The MECP WWR database indicated that there are thirty-one (31) water wells in the Study Area. Of the well records returned in the search, eight (8) of them were classified as water supply wells, eleven (11) were determined to be observation/monitoring wells and the remaining twelve (12) are classified as abandoned or unknown. The results of this search have been plotted on Figure 4 and tabulated in Appendix B.

The well records identified as supply wells for residential or commercial use have been accessed and compiled in Appendix B.

Based on the well records, the major source of water for groundwater use is in the shale bedrock, located approximately 26 m below ground surface across the Study Area. Water quality and quantity issues are reported within the surrounding study area, particularly with regards to iron and lack of consistent water. The surrounding area commonly reports supplemental water through cistern use, or purchase of bottled water for consumption.

2.5. SOURCE WATER PROTECTION POLICY AREAS

EnVision reviewed the Source Water Protection Information Atlas (Ministry of the Environment, Conservation and Parks, 2021) and confirms that the Site and Study Area is not located within any sensitive wellhead protection areas, intake protection zones, or issue contributing areas. The Site does include areas delineated as a significant groundwater recharge area (SGRA), however the score is reported as not applicable. An area delineated as a SGRA represents an area where surface water infiltration and recharge opportunities exist. Changes to land cover (pervious to impervious surfaces, for example) represent a potential risk to ongoing groundwater recharge.

3. SITE SETTING

3.1. TOPOGRAPHY AND DRAINAGE

Based on the Ontario Digital Elevation Model, the Site is estimated between elevation 190 to 192 meters above sea level (masl). The Site is relatively flat, with some minor relief along the northern boundary associated with the small drainage course and natural heritage feature.

Precipitation that falls within the Site is inferred to be directed to the natural heritage feature along the northern property boundary, or towards the eastern roadside ditch.

3.2. SURFACE WATER FEATURES

Within the Site boundaries, there are no surface water features, however, Sixteen Mile Creek is located approximately 124m northeast of the property boundary. The Site is located on the Sixteen Mile Creek Watershed which covers 357 square kilometers of land and drains into Lake Ontario from the Town of Oakville.

A section of a tributary of Middle Sixteen Mile Creek (65 m in length) is present within the northeastern portion of the Site.

General observations of this tributary were made throughout field investigations by the ecology team:

During the October 8, 2024, visit, a single shallow pooled area of water was noted within the flow path of the tributary upstream of the culvert inlet under Sixth Line. The pooled area was 0.5 m wide by 2.5 m long and approximately 0.02 to 0.05 m deep. Only damp soil was observed beyond the pooled area. No flow was observed downstream of the Site. However, during the May 22, 2025, visit, minimal flow was present within the tributary, likely as a result of the consecutive rain events two days prior to the visit. During the June 11, 2025, visit, the tributary appeared dry, and no flow was observed. Thus, it appears only seasonal flows within the system likely only exist after rain and melting events.

3.3. ENVIRONMENTAL CONDITIONS

Historically, the Site operated as a farm before its current use as a trucking facility. Potential activities that could impair the shallow groundwater quality include the use and storage of fuels, fertilizers, lubricating fluids, and agricultural wastes. Evidence for buried refuse (i.e. berms, knobs, etc,) where not encountered during site investigation activities. The presence of a septic system of undetermined size, design, and condition could also result in impacts to the shallow groundwater system related to the release of effluent, or from leeching bed operations.

3.4. ON SITE WATER WELLS

Currently, the operations at the Site draw water from an onsite supply well identified with the MECP tag #2808399. This well is described as a 0.9m diameter concrete cased bored well, extending to a total depth of 12.8 mbgs. The primary water bearing soils are described as grey fine sand, encountered between 7.6 m and 9.4 m. Blue clay is reported above and below this sand layer. The well was drilled on November 1, 1995, and

reports a static water level around that date at 3.65 mbgs. A pumping test was not conducted, however the well record indicates a recommended pumping rate, provided by the licenced well driller, of 3 gallons per minute (intermittent).

Based on the other well records associated with the property, additional test drilling was carried out on the Site. Well Tag 2808394 reports a drilled 152mm steel well drilled to a total depth of 51.8 mbgs, terminating within the shale bedrock. Testing for this well indicated poor water quality and the well was then abandoned.

Well Tag 2808393 reports a test well drilled to a total depth of 39.6 mbgs, terminating within the shale bedrock. Testing for this well indicated poor water quantity and the well was then abandoned.

Well Record 7199245 (Tag not found) reports an abandoned dug well, located close to the southern property boundary. The decommissioning record indicates a large diameter (1060 cm) stone lined well was sealed with bentonite and cement chips to a total depth of 7m. The well was reported abandoned by the owner as "not needed".

The onsite water well bearing tag #2808399 has been incorporated into a monitoring and testing program, described below. For purposes of identification, this well shall be described as WS-1 (Water Supply #1).

4. FIELD INVESTIGATION

4.1. BOREHOLE DRILLING

The preliminary field investigation consisted of drilling four (4) boreholes (BH24-1 to BH24-4) to depths varying from 6 m to 12 m. All boreholes were completed as monitoring wells. BH24-03 was completed as a nested well with a shallow (6m) and deep (12m) screening interval. The locations of the boreholes/monitoring wells are presented on the Borehole Location Plan included as Figure 4.

The boreholes were advanced using a CME75 truck mounted power auger drilling machine fitted with hollow stem augers. Split spoon samples were retrieved at regular intervals of depth with a hammer weighing 624 N and dropping 760 mm as per ASTM D1586. This sampling method recovers samples from the soil strata, and the number of blows required to drive the sampler 0.3m depth into the undisturbed soil (SPT 'N'-values) gives an indication of the compactness condition or consistency of the sampled soil material.

The samples were logged in the field and returned to the Envision laboratory for detailed examination by the geotechnical engineer and for laboratory testing.

Prior to drilling operations, underground utilities were cleared at the borehole locations by the representatives of the public and private utilities locate companies.

The monitoring wells have not been decommissioned. The monitoring wells must be decommissioned in accordance with O. Reg. 903 (as amended) prior to construction.

4.2. Soil Descriptions

Initial descriptions of the overburden are listed below; a full soil description will be provided in a separate geotechnical cover.

4.2.1.1 Sand/fill Materials

Fill material consisting of sand and gravel, with some silt was encountered in boreholes and was found to extend to depths varying from 1.2m to 3.5m below the existing ground surface.

4.2.1.2 Silt Clay Till

The Halton till complex was encountered below the sandy material and has been described as compact silt and clay with trace sand and gravel.

4.3. MONITORING WELL INSTALLATION

Monitoring wells were installed in four (4) boreholes upon completion of drilling for long term groundwater monitoring. In addition, WS-1 has been incorporated into the groundwater investigation. The borehole logs and MECP Water Well Record (WS-1) is included in Appendix A. The location of the boreholes/monitoring wells and the onsite supply well are included in Figure 5.

Each monitoring well was installed by inserting the screen and casing assembly into the borehole to the designed depth and then packing a silica sand pack filter around the screen interval. Above the sand pack, a

bentonite hole plug was installed to eliminate contamination from surface along the annulus space. All the installed monitoring wells were finished with a flush-mount protective casing. Ground levels at each of the monitoring well locations were surveyed to an elevation datum and reported on the borehole logs. Well installation details are also included on the individual borehole logs in Appendix A.

4.4. GROUNDWATER LEVEL MONITORING

Annual groundwater level monitoring has been initiated for the Site to develop an understanding of the seasonal fluctuation and intermittent responses to precipitation events within the shallow groundwater system. The annual program involves regular attendance on the Site to record manual depth to groundwater levels. As of July 2025, a total of three visits have been concluded. The annual monitoring is scheduled to continue through to Spring of 2026.

In April 2025, during the initial water level readings, BH25-04 was not located. Evidence of regrading in this area was noted, and the flush-mount casing was assumed buried, or otherwise disturbed, resulting in the well being excluded from active monitoring. In June of 2025, additional regrading in the area around BH25-03s/d resulted in the covering of the two wells.

A summary of the water level observations is included in Table 4-1.

Table 4-1: Groundwater Levels

WELL ID	SCREENED DEPTH (m)	DATE OF READING	DEPTH TO GROUNDWATER (m)	NOTES
BH25-01	2.4 to 5.5	4-Apr-25 23-Apr-25 25-Jun-25	1.86 3.09 2.25	
BH25-02	5.3 to 6.5	4-Apr-25 25-Jun-25	0.15 1.01	
BH25-03D	9.1 to 12.1	14-Apr-25 23-Apr-25	0.72 0.88	Flushmount buried during regrading activities in May or June of 2025
BH25-03S	3.0 to 6.1	14-Apr-25 23-Apr-25	2.58 4.70	Flushmount buried during regrading activities in May or June of 2025
BH25-04	9.1 to 10.7	-	-	No readings after drilling due to the flushmount becoming buried sometime in March or April
WS-1 (#2808399)	7.6 to 9.4 (sand layer)	25-Jun-25	4.28	Supply well incorporated into monitoring due to loss of BH24-04

These measurements are taken from ground surface, and a GPS survey is planned to establish elevation data.

Based on the groundwater data to date, the depth to water table ranges from 0.15m to 4.70m below ground surface. On June 25, a Solinst Levellogger was installed in the Concrete supply well, to allow for long term groundwater monitoring. Groundwater direction is inferred to be moving to the northwest as laid out in figure 6.

4.5. CONCEPTUAL SITE HYDROSTRATIGRAPHY

Surficial soils show similarities with Halton Till, which has been mapped across the Study Area. Halton Till is typically considered a low permeable capping layer which restricts groundwater movement both vertically and horizontally. Fractures within the till are commonly infilled with silts and sands producing secondary hydraulic properties. These discontinuous seams can be a pathway for groundwater movement, both in the vertical and horizontal direction. Evidence of sand and silt seams was reported across the Site in the geotechnical borehole logs.

The presence of a bedrock aquifer is noted, underlying the overburden at depths approximately 12 m below existing grades. This bedrock aquifer provides groundwater to nearby residents.

4.6. HYDRAULIC CONDUCTIVITY ASSESSMENT

4.6.1.1 Grain Size Distribution

EnVision has reviewed grain size distribution plots from the geotechnical field investigation and has tabulated estimated hydraulic conductivity (K) using a variety of empirical relationships. Details are included on the calculation sheets in Appendix C. Table 4-2 presents a summary of the estimated K value for each of the assessed soil samples.

Table 4-2: Grain Size Analysis Hydraulic Conductivty Results

BH ID	Sample ID	Depth		Soil Unit	Hydraulic Conductivity
		From (m)	To (m)		(m/sec)
BH25-1	SS4	2.3	2.9	Silty clay till	3.2×10^{-8}
BH25-2	SS4	2.3	2.9	Silty clay till	4.0×10^{-7}
BH25-3	SS4	2.3	2.9	Silty clay till	7.5×10^{-10}
BH25-4	SS5	3.1	3.7	Sandy silt till	1.2×10^{-7}
BH25-4	SS10	9.1	9.7	Sandy silt till	1.6×10^{-7}

The K values have been summarized to provide a range based on the soil unit description

4.6.2. IN-SITU SINGLE WELL RESPONSE TESTING

EnVision conducted confirmatory SWRT at BH25-01, BH25-03d and BH25-03s. In advance of performing SWRT, the monitoring wells were developed to remove the potential presence of fine sediments. The development process involved purging of the monitoring wells to induce the flow of fresh formation water through the screen. The monitoring well water levels were permitted to fully recover prior to performing SWRTs.

During the SWRT, a known volume of water was near-instantaneously removed from the well and the response in water level was recorded. The K values for each of the tested wells were calculated from the SWRT data using Aqtesolv Software and the Bower-Rice solutions for confined conditions. The semi-log plots for normalized drawdown versus time are included in Appendix D. *Table 4-3* provides a summary of the estimated hydraulic conductivity for the soil adjacent to the screen depths shown.

Table 4-3: In-Situ Single Well Response Results

WELL ID	TOP SCREEN (m)	BOTTOM SCREEN (m)	HYDRAULIC CONDUCTIVITY (m/sec)	HYDRAULIC CONDUCTIVITY (m/day)
BH25-01	2.4	5.5	$3.74X10^{-9}$	$3.23X10^{-4}$
BH25-03D	9.1	12.1	$1.19X10^{-7}$	$1.02X10^{-2}$
BH25-03S	3.0	6.1	$7.14X10^{-8}$	$6.17X10^{-2}$

The range of hydraulic conductivity for tests within the overburden ranged from 1.2 X 10-7 to 3.7X10-9 m/second, which is considered typical for soils of similar composition (Cherry & Freeze, 1979).

4.6.3. INFILTRATION POTENTIAL

EnVision has prepared a preliminary assessment of the infiltration potential at the Site based on select grain size data and the hydraulic conductivity assessment. In-situ testing is generally recommended to support future LID design, however the following information is provided to highlight the on-site soil conditions and infiltration potential, challenges, and constraints.

EnVision has reviewed grain size approximations from the borehole sampling to develop hydraulic conductivity in the horizontal direction for select samples (selected as the split spoon samples collected above 3.1 m BGS. The data has been converted to a vertical hydraulic conductivity by applying a decrease of one order of magnitude (Todd 1980, Freeze Cherry 1979) to each approximated horizontal conductivity. These values have been reviewed using the established relationship between vertical hydraulic conductivity and infiltration rates presented in the Credit Valley Conservation and Toronto Regional Conservation Low Impact Stormwater Management Planning and Design Guide (LID SMPDG). The approximate infiltration rate for each of the soil distribution profiles are included in Table D-1, Appendix D. The range of infiltration based on this method is between 4 and 20 mm/hr.

EnVision also reviewed the saturated hydraulic conductivity values from the well testing, which was completed at the Site to provide additional estimates for infiltration rates at the screen depth. Based on similar approximation of the vertical hydraulic conductivity ranges determined from the single well response tests, the range of infiltration is estimated between 6 and 16 mm/hr. as shown in Table D-1.

Across all sources, the ranges for infiltration are highlighted in the summary shown in Table D-1, with an average of 12 mm/hr.

During detailed design stage, LID functionality should be confirmed by in-situ infiltration testing at the planned facility location and base elevation. In addition, the LID features should be designed to maintain separation from the seasonally high groundwater elevations by 0.5 m. Additional groundwater monitoring to determine the high levels is underway at the Site.

4.7. GROUNDWATER QUALITY ASSESSMENT

To establish baseline groundwater quality, two (2) suits of RCAp groundwater samples where collected on April 23rd and BH24-01, and BH24-02. Prior to collection of the samples, approximately three (3) well volumes of standing groundwater were purged from the well. The suites were collected unfiltered and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The groundwater samples were submitted to an independent laboratory, ALS Environmental in Waterloo, Ontario, for analysis of parameters against the Provincial Water Quality Objectives. ALS is a certified laboratory by the Canadian Association for Laboratory Accreditation Inc.

A summary of the analytical results and the laboratory Certificate of Analysis (CofA) from EnVision testing are enclosed in Appendix E.

Envision noted one exceedance in any of the samples compared to the PWQO. BH24-01 shows an exceedance of iron.

4.8. IMPACTS FROM DEVELOPMENT AND DEWATERING

A relatively high groundwater table was noted during the April 2025 Site investigation (~1.5 mbgs). Excavations below the water table are expected to produce a continuous groundwater seep that will require temporary handling. Although a detailed dewatering analysis is not possible due to lack of design detail, any future dewatering activity is expected to be of short-duration and unlikely to require a Water Taking Permit. It is expected that shallow works can be dewatered using simple gravity trenching methods with water taking rates remaining below 400,000 L/day. A registration using the Environmental Activity and Sector Registry will likely be sufficient to handle any of the proposed works.

Long-term (permanent drainage) dewatering activities are not expected based on the conceptual plans for the development.

Although considered unlikely due to shallow works and low permeability, impacts from dewatering would need to be reviewed based on the detailed design information, including a soil settlement, impact to environment, and impacts to groundwater users assessment for the Study Area.

It is expected that the water budget analysis will require updating with mitigation efforts to reduce the potential infiltration deficit using Low Impact Development (LID) measures, such as rooftop disconnections, swales, stormwater storage tanks, or other features. Challenges related to low permeability and a high seasonal groundwater table could impede infiltration efforts, and additional water level monitoring is ongoing. These challenges could be overcome by engineering efforts such as raising grades, installation of stormwater management facilities, rainwater harvesting, and other LID measures.

As per O.Reg. 903, the monitoring wells are to be abandoned upon completion of use. This work is to be completed by a licensed water well contractor, with appropriate records filed with the MECP.

5. WATER BALANCE

A Water Balance Assessment is a tool intended to provide an accounting of the water inputs and outputs within a defined area. This accounting approach utilizes a spreadsheet model that is based on the Thornthwaite and Mather (Thornthwaite & Mather, 1955) method, as outlined in "Hydrogeological Technical Information Requirements for Land Development Applications" (MECP, 1995).

The basics involved in a water balance analysis is that the water entering the system is conserved, therefore the inputs should be equal to the outputs, unless a change in storage occurs. The typical form of the water balance appears as:

$$Water\ In\ = Water\ Out$$

$$P + EI = ET + IR\ +\ RO + ST$$

Where:

P = Precipitation

EI = External Inputs (including run-on, irrigation, and vertical/lateral transfers)

ET = Evapotranspiration

IR = Infiltration Recharge

RO = Runoff

ST = Groundwater Storage

In more complex situations, the lateral inputs through groundwater and surface water movement between subsurface aquifers can be considered, resulting in a removal or addition to the storage of the system.

The overall objectives of the water balance assessment are to provide the following:

- Quantify the water budget for the existing pre-developed site conditions;
- Quantify the water budget for the proposed future site conditions (post-development);
- Quantify the amount of change between the existing and future conditions, and assess the significance of this change so that mitigation measures can be employed to minimize potential impacts.

5.1. PROPOSED DEVELOPMENT

Preliminary conceptual plans have been reviewed that show plans to construct an industrial building approximately 720 square meters. Additional parking will be designed for storing up to 16 transport trailers. The proposed development plan is shown in Figure 9 and will consist of the following areas.

- About 142 m^2 of concrete sidewalk area (around 1.3% of the area)
- About 643 m^2 of landscaped area (around 6.0% of the area)
- About 720m^2 of rooftop area (around 6.7% of the area)
- About 3841m^2 of uncultivated area (around 35.8% of the area)

- About 5382m^2 of paved area (around 50.2% of the area)

Each of the land uses listed above will have an effect and will result in change to the existing water balance.

5.2. CLIMATE DATA

Climate data from the Georgetown WWTP Climate Station 1981-2010 was chosen to represent the site based on proximity to the Site. The data has been provided in Appendix F, Table F-1. Mean monthly temperatures were determined by averaging monthly temperatures between 1981-2010.

The Thornthwaite-Mather method was used to estimate potential and actual monthly evapotranspiration. The Thornthwaite-Mather method is based on an empirical relationship between mean air temperature and potential evapotranspiration. This method uses the water holding capacity for the soil to determine actual evapotranspiration and the surplus of moisture that becomes available for runoff and infiltration.

To calculate the water holding capacity of the soil, the soil type, structure, and vegetation type must be known. Soil will hold variable amounts of moisture and have different storage capacities. Different species of vegetation will extend their roots to different depths in the soil, affecting the amount of moisture they retain. The water holding capacity for the soil/vegetation type belonging to the site was obtained from the Environmental Design Criteria of the Stormwater Management Planning and Design Manual published by the MECP in 2003.

5.3. PRE-DEVELOPMENT WATER BALANCE

To evaluate the pre-development water budget, naturally occurring inputs and outputs need to be considered. The detailed pre-development calculations are presented in Appendix F, Table F-2.

5.3.1. PRECIPITATION (P)

Monthly climate data from the Georgetown WWTP Climate Station was obtained and based on an average from 1981-2010, the average annual precipitation is about 877.3 mm/year.

5.3.2. STORAGE (ΔST)

Across the site, the surficial soil has been classified as uncultivated silty/clay loam. According to the Environmental Design Criteria of the Stormwater Management Planning and Design Manual (MOE, 2013), the water holding capacity of an uncultivated silt/clay loam soil is 250mm/year. The water holding capacities of different soil types and land use can be found in Appendix F, Table F-2.

5.3.3. EVAPOTRANSPIRATION (ET)

Evapotranspiration is the transfer of water from the ground into the atmosphere by means of evaporation as well as transpiration from plants. Adjusted Potential Evapotranspiration (APE) uses mean monthly temperatures as well as day lengths to measure evapotranspiration (Reed, 2007). Actual Evapotranspiration (AET) is based on the change in storage (ΔST) and the APE.

5.3.4. ADJUSTED POTENTIAL EVAPOTRANSPIRATION (APE)

The monthly Adjusted Potential Evapotranspiration has been calculated to a total of 570.1 mm/year or about 65% of the total annual precipitation. By comparing the APE and precipitation, a soil moisture deficit of up to 116 mm/year is obtained to represent the Site.

5.3.5. ACTUAL EVAPOTRANSPIRATION (AET)

Actual Evapotranspiration is calculated based on the APE and the change in storage. During warmer months, when there is not enough precipitation to account for APE, storage decreases. Because of this, AET is less than APE. By calculating the distribution of storage throughout the year, an annual AET of 543.2mm/year was determined to represent the Site. Appendix F, Table F-2, shows the monthly breakdown of storage and AET using the storage capacity of a silt/clay loam uncultivated soil.

5.3.6. SURPLUS (S)

A surplus in precipitation is calculated by subtracting yearly AET and Potential Evaporation (PE) from annual P (S= P - AET - PE). The PE is assumed to be 15% of the precipitation for impervious surfaces. Since limited impervious surfaces have been identified for the Site, PE is assumed to be negligible.

5.4. PRE-DEVELOPMENT ANALYSIS

The Pre-Development Water Budget was estimated using the approach recommended in Table 2 of the "Hydrogeological Technical Information Requirements for Land Development Applications" (MECP, 1995). The steps taken to estimate the Pre-Development Water Budget included:

- Identifying existing topography, soil types, and other controls on infiltration and runoff.
- Delineating drainage catchments and catchments based on observed drainage outlets and physical characteristics as described below.
- Estimating the quantities of infiltration and runoff for each of the sub-catchment areas and preparing summary estimates for catchments related to identified drainage outlets and for the proposed development area.

The drainage catchments and sub-catchments were defined by considering the following factors:

- Existing elevations;
- Existing property boundaries;
- Post-development features and property boundaries;
- Natural topographical features;
- Slope ratio;
- Land cover; and
- Land use.

The catchments defined for the Pre-Development Water Budget also considered the proposed development areas and future drainage considerations for the proposed development. This was incorporated into the analysis to be able to demonstrate changes in drainage to the identified outlets and infiltration beneath the

development area. The defined catchments for the Pre-Development Water Budget are shown on Figure 8 and in Appendix F, Table F-3.

The Infiltration Factor for each Pre-Development sub-catchment was estimated by adding the sub-factors for topography, soil type, and land cover as recommended in the MECP methodology. A geographic information system (GIS) was used to evaluate the topography, soil type and land use for each of the Pre-Development, Current Condition, and Post-Development scenarios and to generate a set of catchments that can be used in analysis of each scenario. The calculated infiltration factor for each catchment was reviewed and updated manually, as a confirmation that they reflect actual conditions. Assumptions applied to the Pre-Development water budget scenario are described in the sections below.

The volume of Pre-Development Infiltration was estimated as the product of [catchment area] x [moisture surplus] x [infiltration factor]. The Pre-Development Runoff was estimated by subtracting the volume of infiltration from the total volume of moisture surplus for each sub-catchment. A detailed table to document the calculations of the Pre-development Water Budget is provided in Appendix F.

Properties associated with area, slope, soil type, and land cover were analyzed and assigned to each Pre-Development sub-catchment. The values assigned to the Pre-Development catchment are provided in Appendix F, Table F-3.

These values were used to estimate an Infiltration Factor. The Infiltration Factors were reviewed to confirm that they are appropriate and adjusted if necessary.

Appendix F, Table F-3 includes the overall analysis of the infiltration and runoff for the Site. A summary of the Pre-Development water budget calculations is provided in Table F-5. These values will be used to assess the changes that proposed development will create relative to the pre-development conditions.

5.4.1. PRE-DEVELOPMENT INFILTRATION

The estimated total infiltration for the Site in pre-development conditions is 2,066 m3/yr or an equivalent of 192.56 mm/year (mm/m2/yr). The calculated infiltration represents approximately 26% of the annual precipitation (877.3 mm/yr) and 52% of the estimated annual water surplus (367.0 mm/yr). See Table F-3.

5.4.2. PRE-DEVELOPMENT RUNOFF

The total runoff for the Site in pre-development conditions is 1878 m^3/yr or an equivalent of 175 mm/year. The calculated runoff represents approximately 20% of the annual precipitation (877.3 mm/yr) and 47% of the estimated annual water surplus (367 mm/yr). Refer to Table F-3.

5.5. POST-DEVELOPMENT WATER BUDGET

The Post-Development Water Budget was estimated using a similar approach as outlined for the Pre-Development case.

For the pervious areas, the quantity of infiltration was calculated using the [pervious area] x [precipitation surplus] x [Infiltration Factor]. The Infiltration Factors were reviewed to correspond to the Post-Development conditions. The runoff for the pervious areas was estimated by subtracting the volume of infiltration from the total volume of precipitation surplus for the pervious area in each sub-catchment.

The volume of runoff from the impervious surfaces was estimated using the area of impervious surfaces and the volume of precipitation. A factor of 10% was considered to represent some evaporation in the course of runoff.

5.5.1. POST-DEVELOPMENT CATCHMENTS

Figure 9 illustrates the delineation of drainage catchments for the Site based on the proposed site plan. The Post-Development scenario introduces a larger building area, larger parking area, and introduction of landscaping and concrete walkways.

5.5.2. POST-DEVELOPMENT ANALYSIS

Appendix F, Table F-4 includes the overall analysis of the infiltration and runoff for the total Site and also documents the calculation of volumes associated with input and output parameters for the Post-Development condition. These volumes are also expressed in terms of the number of mm of water within the catchment area. The volumes are summed by catchment and for the total property area.

Assumptions incorporated into the water budget for the Post-Development scenario included:

Impervious surfaces (roads, driveways and buildings) are assumed to have a 10% evaporative loss.

- The assumed pervious areas are based on input from drawings provided by the client as outlined below:
- Landscaped areas are assumed to be 0% impervious.
- The building area is 100% impervious.
- The assumed pervious areas of the proposed development are assumed to have an infiltration factor equivalent to that of lawns.

A summary of the Post-Development water budget calculations is provided in Table F-5.

5.5.3. POST-DEVELOPMENT INFILTRATION

In the post-development condition with, the total infiltration through pervious areas is 802 m^3/year or 74 mm/yr. This is approximately 8% of the precipitation (877.3 mm/yr) and 12% of the estimated annual water surplus (585 mm/yr).

5.5.4. POST-DEVELOPMENT RUNOFF

The total runoff for the Site in post-development conditions is 5,474 m^3/yr or an equivalent of 510 mm/year. The calculated runoff represents approximately 58% of the annual precipitation (877.3 mm/yr) and 87% of the estimated annual water surplus (585 mm/yr).

5.6. COMPARISON WITH PRE-DEVELOPMENT CONDITIONS

Table F-5 provides a comparison of the preliminary water budget estimates for the Pre-Development and Post-Development cases. The Post-Development scenario does not incorporate any mitigation measures currently. The total on-site infiltration is reduced by approximately 61% or 1,264 m3/yr when compared to the Pre-Development Scenario. It is further noted that the introduction of building areas increases runoff from

260 m3/yr to 537 m3/yr, an increase of 277 m^3/yr, which could be utilized as a source of clean water that could be conveyed to support infiltration to reduce the deficit.

The increase in total impervious areas increases the total runoff to 4,939 m3/yr, which represents a 163% increase over the pre-development condition. The increased runoff will be managed by the stormwater management system or can be selectively directed to natural environment.

6. CLOSING

6.1. CONCLUSIONS

Based on the information obtained through this Preliminary Hydrogeological Assessment, Envision presents the following conclusions and recommendations:

- The Site and Study Area are underlain by glacial deposits identified as Halton Till of limited permeability;
- Based on the nearby water well record database, bedrock is expected to range from 26 to 28 mbgs;
- A single private well is located on Site
- The April 2025 onsite groundwater levels across the Site range from depths of 1.0 to 3.1 mbgs
- The overburden bulk hydraulic conductivity ranges from 5.0×10^{-7} to 9.6×10^{-9} m/s
- The pre- to post-development water budget without mitigation results in an infiltration deficit of 1,264 m3/yr and an increase in runoff of 3,061 m3/yr.

6.2. QUALIFICATIONS OF THE ASSESSORS

Robin Byers is a licensed professional geoscientist with PGO, and therefore meets the qualifications of O.Reg 63/16 as a qualified person permitted to prepare water taking plans. He has over 8 years' experience in preparing hydrogeological reports, water taking plans, permit to take water applications, and other studies within the province. He has successfully completed many dewatering assessments, pumping tests, dewatering system designs, environmental monitoring programs, and other related activities.

6.3. CERTIFICATION AND SIGNATURES

Prepared by

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Reviewed by

Rob Byers, B.Sc.,P.Geo.,
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6.4. QUALIFIER

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The content and opinions contained in the report are based on the observations and/or information available to EnVision at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by EnVision and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

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This limitations statement is considered an integral part of this report.

7. REFERENCES

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FIGURES

Prepared By: KaitlynNg

LEGEND

- SITE BOUNDARY
- 500 m STUDY AREA
- WATERCOURSE
- WATERBODY
- UNEVALUATED WETLAND

Scale: 1:5,000

0 50 100 150 200 Metres

TITLE

SITE LOCATION PLAN

PROJECT

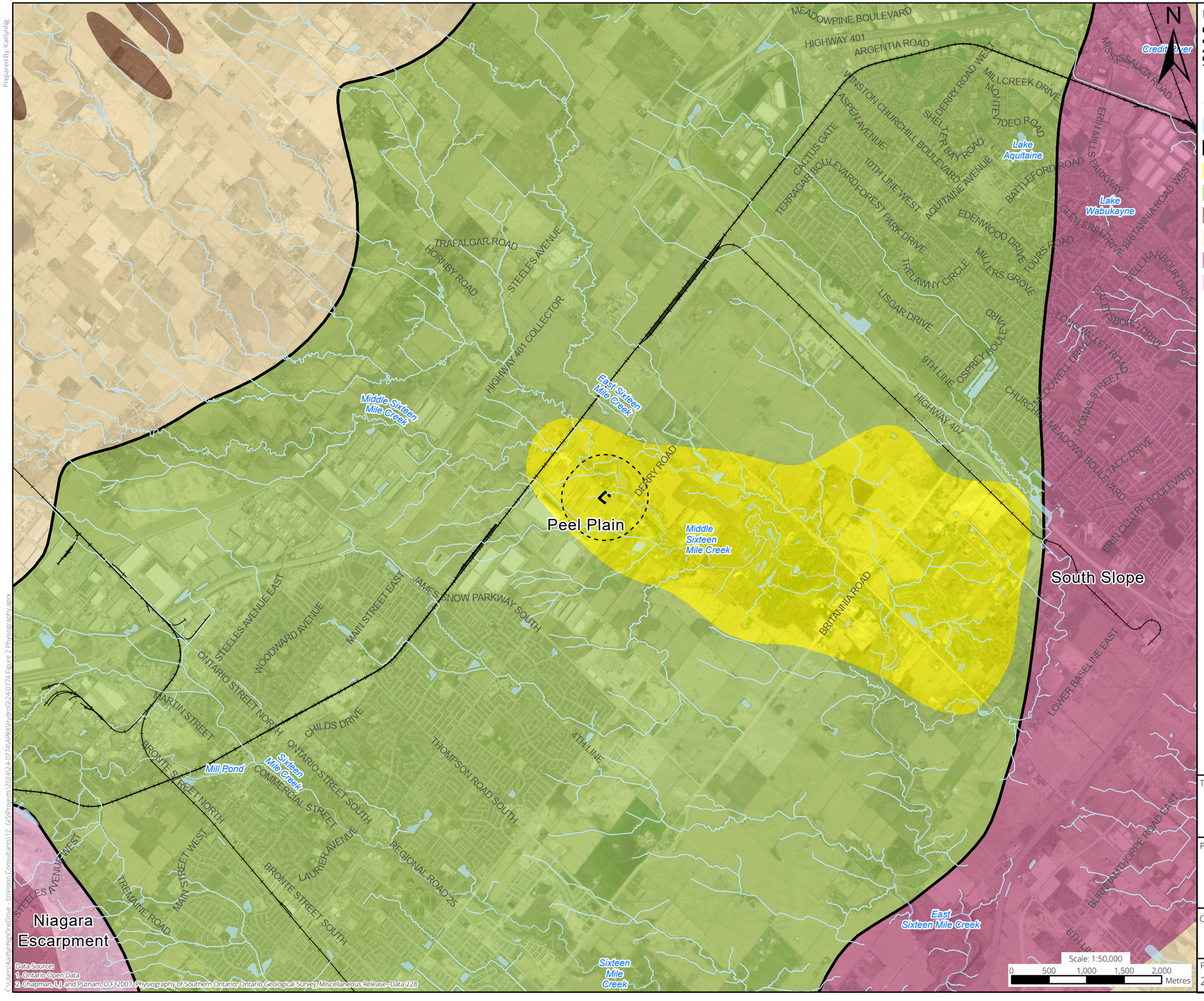
HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	1

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\ARR\Hydro\G24-0774 Figure 1 Site Location.aprx



LEGEND

- SITE BOUNDARY
- 500 m STUDY AREA
- RAILWAY
- WATERCOURSE
- WATERBODY
- PHYSIOGRAPHIC REGION
- SAND PLAINS
- BEVELLED TILL PLAINS
- DRUMLINS
- TILL PLAINS (DRUMLINIZED)
- TILL MORAINES
- ESCARPMENTS

TITLE

PHYSIOGRAPHY

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	2

Prepared By: KaitlynNg

C:\Users\KaitlynNg\OneDrive - EnVision Consultants12_GIS\Projects\2024\24-0774\APRX\Hydro\G24-0774 Figure 2 Physiography.aprx

Prepared By: KaitlynNg

Middle Sixteen Mile Creek

East Sixteen Mile Creek

DERRY ROAD

Middle Sixteen Mile Creek

6TH LINE

LABRADOR AVENUE

LEGEND

- SITE BOUNDARY
- 500 m STUDY AREA
- RAILWAY
- WATERCOURSE
- WATERBODY
- 5D: GLACIOLACUSTRINE-DERIVED SILTY TO CLAYEY TILL
- 8B: INTERBEDDED FLOW TILL, RAINOUT DEPOSITS AND SILT AND CLAY
- 9C: FORESHORE-BASINAL DEPOSITS
- 19: MODERN ALLUVIAL DEPOSITS

Scale: 1:5,000

0 50 100 150 200 Metres

Data Source:
1. Ontario Open Data
2. Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 128-REV

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\APRX\Hydro\24-0774 Figure 3 Surficial Geology.aprx

TITLE

SURFICIAL GEOLOGY OF THE STUDY AREA

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	3

Prepared By: KaitlynNg

LEGEND

- SITE BOUNDARY
- 500 m BUFFER
- WATERBODY
- WATERCOURSE
- RAILWAY

MECP WATER WELL LOCATION

- ABANDONED
- MONITORING & TEST HOLE
- OBSERVATION WELLS
- UNKNOWN
- WATER SUPPLY

TITLE

MECP WATER WELL LOCATIONS

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	4

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\ARRX\HydroG\24-0774 Figure 4 MECP Well Locations.aprx

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- PROPOSED DEVELOPMENT
- MONITORING WELL LOCATION
- SUPPLY WELL LOCATION

TITLE

BOREHOLE LOCATION PLAN

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	5

Prepared By: KaitlynNg

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\APRX\Hydro\24-0774 Figure 5 BH Location Plan.aprx

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- PROPOSED DEVELOPMENT
- 186.26 GROUNDWATER ELEVATION (APRIL, 2025)
- MONITORING WELL LOCATION
- SUPPLY WELL LOCATION
- GROUNDWATER CONTOURS (MASL)
- INFERRED GROUNDWATER FLOW DIRECTION

TITLE

APRIL 2025 SHALLOW GROUNDWATER CONTOURS

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

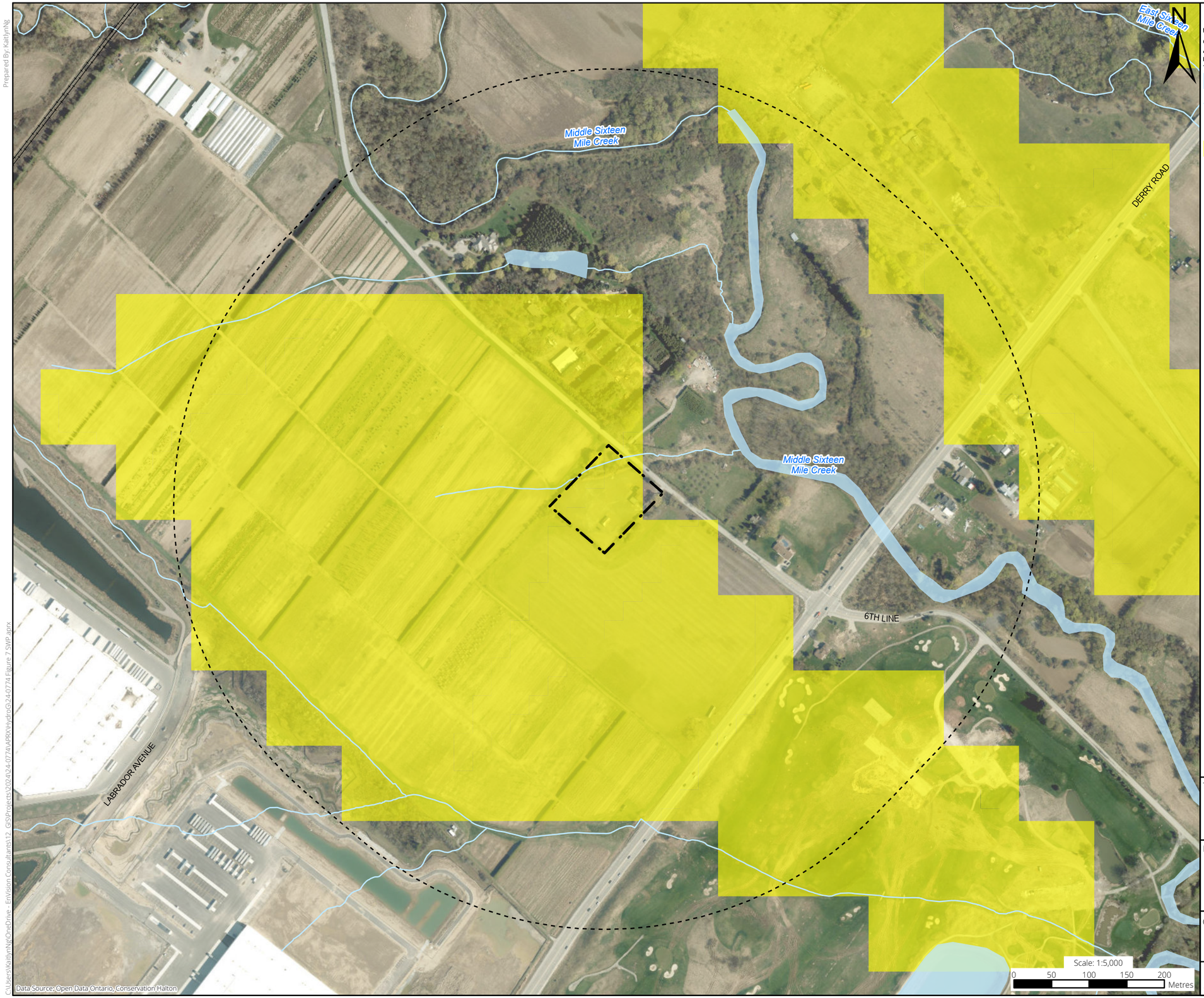
CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	6

Prepared By: KaitlynNg

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\ARR\Hydro\Q24-0774 Figure 6 GW Contours.aprx



LEGEND

- SITE BOUNDARY
- 500 m BUFFER
- WATERBODY
- WATERCOURSE
- RAILWAY
- SIGNIFICANT GROUNDWATER RECHARGE AREA

TITLE

SOURCE WATER PROTECTION -
SIGNIFICANT GROUNDWATER RECHARGE AREA

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	7

Prepared By: KaitlynNg

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LEGEND

SITE BOUNDARY

WATERCOURSE

PRE DEVELOPMENT LANDUSE AREAS

BUILDING

GRAVEL

UNCULTIVATED

TITLE

PRE DEVELOPMENT

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	8

Prepared By: KaitlynNg

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12. GIS\Projects\2024\24-0774\ARR\Hydro\G\24-0774 Figure 8 Pre Development.aprx

LEGEND

- SITE BOUNDARY
- PROPOSED DEVELOPMENT
- WATERCOURSE

POST DEVELOPMENT LANDUSE AREAS

- BUILDING
- UNCULTIVATED
- PARKING LOT
- CONCRETE
- LAWN

TITLE

POST DEVELOPMENT

PROJECT

HYDROGEOLOGICAL INVESTIGATION
7072 SIXTH LINE
MILTON, ONTARIO

CLIENT

1000377643 ONTARIO INC.

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE
24-0774	JULY 2025	TP	RB	9

Prepared By: KaitlynNg

C:\Users\KaitlynNg\OneDrive - EnVision Consultants\12_GIS\Projects\2024\24-0774\APRX\Hydro\Q24-0774 Figure 9 Post Development.aprx

APPENDIX A: *Borehole Logs*

ENVISION CONSULTANTS LTD

LOG OF BOREHOLE BH25-01

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line,
Milton DATUM: Geodetic
BH LOCATION: N 4822110.9 E 595082.5

Method: Solid Stem Auger
Diameter: 150mm
Date: Feb-18-2025 to Feb-18-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
190.4	Ground Surface												
0.0	**FILL:**sand and gravel, brown, moist, dense		1	SS	initial 50/ 0mm		Flushmount 190						
189.6													
0.8	**FILL:**sand, trace to some silt, brown, moist to wet, loose		2A	SS	8		Bentonite						
189.2													
1.2	**CLAYEY SILT TILL:**sandy, trace gravel, brown, moist, very stiff to hard		2B	SS			189						
			3	SS	18		Sand						
			4	SS	21		188						4 24 51 21
	some oxidation, brown to grey, moist to wet		5	SS	18		W. L. 187.3 m Apr 23, 2025 187						
	trace to some sand, trace cobbles, reddish brown, moist		6	SS	19		Screen 186						
			7	SS	30		185						
			8A	SS	20		Bentonite 184						
183.7			8B	SS									
6.7	**END OF BOREHOLE:**												

Notes:
1) A 50mm dia. monitoring well was installed screened from 2.4m to 5.5m upon drilling completion.

Water Level Readings:
Date W.L. Depth (mbgs)
April 23, 2025 3.09

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\circ^6$=3% Strain at Failure

ENVISION CONSULTANTS LTD

LOG OF BOREHOLE BH25-02

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton
DATUM: Geodetic
BH LOCATION: N 4822073.1 E 595049.8

Method: Solid Stem Auger
Diameter: 150mm
Date: Mar-14-2025 to Mar-14-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
190.3	Ground Surface												
0.0 / 189.8	**FILL:**sand and gravel, brown, moist, compact		1	SS			Flushmount 190						
0.5 / 189.5	**FILL:**silty clay, trace sand, trace gravel, brown, moist, stiff												
0.8	**FILL:**clayey silt to silty clay, trace sand, trace organics, trace gravel, reddish brown to grey, moist, very stiff to hard		2	SS	13		189						
1	some sand to sandy, brown, moist to wet		3A	SS	24	▽	W. L. 188.4 m Apr 04, 2025						
188.3 / 2			3B	SS									
2.0	**CLAYEY SILT TILL:**sandy, trace gravel, brown, moist, hard		4	SS	31		188 Bentonite						8 35 45 12
3			5	SS	31		187						
4			6	SS	34		186						
5			7	SS	42		Sand 185						
6							Screen						
183.8			8	SS	100/ 255mm		184						
6.5	**END OF BOREHOLE:**												

Notes:
1) A 50mm dia. monitoring well was installed screened from 5.3m to 6.5m upon drilling completion.

Water Level Readings:
Date W.L. Depth (mbgs)
April 4, 2025 1.86

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; ○ 8=3% Strain at Failure

ENVISION
CONSULTANTS LTD

LOG OF BOREHOLE BH25-03D

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton DATUM: Geodetic
BH LOCATION: N 4822116.1 E 595012.8

Method: Solid Stem Auger
Diameter: 150mm
Date: Feb-18-2025 to Feb-18-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
190.1	Ground Surface												
0.0	**FILL:**sand and gravel, brown, moist, dense		1	SS	initial 50/150mm								
	moist to wet		2A	SS	13		189						
188.9													
1.2	**SILTY CLAY TILL:**some sand, trace gravel, brown, moist, stiff to hard		2B	SS									
			3	SS	18		188						
			4	SS	13								1 11 47 41
			5	SS	11		187						
			6	SS	19		186						
			7	SS	17	▽	185						
			8	SS	16		184						
			9	SS	7		182						
			10A	SS	29		181						
			10B	SS									

Flushmount
Bentonite
W. L. 185.4 m Apr 23, 2025
Sand

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

LOG OF BOREHOLE BH25-03D

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton
DATUM: Geodetic
BH LOCATION: N 4822116.1 E 595012.8

Method: Solid Stem Auger
Diameter: 150mm
Date: Feb-18-2025 to Feb-18-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued												
	SILTY CLAY TILL:some sand, trace gravel, brown, moist, stiff to hard(Continued)						180						
							Screen						
11			11	SS	38		179						
12							178						
177.5			12A	SS	73/ 280mm		Bentonite						
			12B	SS									
12.6	**END OF BOREHOLE:**												
	Notes: 1) A 50mm dia. monitoring well was installed screened from 9.1m to 12.1m upon drilling completion. Water Level Readings: Date W.L. Depth (mbgs) April 23, 2025 4.70												

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; $\circ^{\varepsilon=3\%}$ Strain at Failure

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LOG OF BOREHOLE BH25-03S

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton
DATUM: Geodetic
BH LOCATION: N 4822115 E 595012.8

Method: Solid Stem Auger
Diameter: 150mm
Date: Feb-18-2025 to Feb-18-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors		PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m			PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40				
190.1	Ground Surface												
0.0	Straight Auger					Flushmount; W. L. 189.2 m Apr 23, 2025; Bentonite; Sand; Screen	190, 189, 188, 187, 186, 185, 184						
184.0 / 6.1	**END OF BOREHOLE:**												

Notes:
1) A 50mm dia. monitoring well was installed screened from 3.0m to 6.1m upon drilling completion.
2) BH24-03S was drilled 1m south of BH24-03D.

Water Level Readings:

Date	W.L. Depth (mbgs)
April 23, 2025	0.88

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

ENVISION CONSULTANTS LTD

LOG OF BOREHOLE BH25-04

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton DATUM: Geodetic
BH LOCATION: N 4822139 E 595051.6

Method: Solid Stem Auger
Diameter: 150mm
Date: Mar-14-2025 to Mar-14-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
190.1	Ground Surface												
0.0	**FILL:**sand and gravel, trace cobbles, dense		1	SS	initial 50/ 25mm		Flushmount						
189.3													
0.8	**FILL:**clayey silt, sandy, trace gravel, brown to grey, moist, stiff to very stiff		2	SS	8		189						
	trace cobbles		3	SS	23		188						
	trace organics, trace rock pieces, mottled		4	SS	19								
187.1													
3.1	**CLAYEY SILT TILL:**sandy, trace gravel, brown, moist, very stiff to hard		5	SS	15		187						5 30 48 17
			6	SS	19		186						
			7	SS	24		Bentonite 185						
			8	SS	15		184						
			9	SS	13		183						
			10	SS	13		182 Sand 181 Screen						4 31 48 17

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

LOG OF BOREHOLE BH25-04

PROJECT: 7072 Sixth Line, Milton
CLIENT: 1000377643 ONTARIO INC.
PROJECT LOCATION: 7072 Sixth Line, Milton
DATUM: Geodetic
BH LOCATION: N 4822139 E 595051.6

Method: Solid Stem Auger
Diameter: 150mm
Date: Mar-14-2025 to Mar-14-2025
Equipment: TEC Geological Drilling Inc CME 75

REF. NO.: 24-0774
ENCL NO.:
ORIGINATED BY ML
COMPILED BY PD
CHECKED BY MM

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	(Truck) Soil Head Space Vapors PID (ppm) 10 20 30 40	CGD (ppm) 10 20 30 40	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued												
	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard(Continued)						180						
11			11	SS	55		179						Wet spoon
						Bentonite							
12							178						
177.6			12	SS	100/ 230mm								Spoon bouncing Wet spoon
12.5	**END OF BOREHOLE:**												

Notes:
1) A 50mm dia. monitoring well was installed screened from 9.1m to 10.7m upon drilling completion.
2) Monitoring well covered with gravel and unable to access.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 — 2808399 — Municipality 28004 — Con. N S — Lot 11

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	MILTON (Trafalgar)	6	11

Address: 7072 6TH LINE, MILTON
Date completed: 15 (day) 9 (month) 95 (year)

21 — Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	TOP-SOIL			0	1
BROWN	SANDY	CLAY		1	12
BLUE	CLAY	STONES		12	25
GREY	SAND		FINE	25	31
BLUE	CLAY	STONES		31	42 1/2

31
32

41 WATER RECORD

Water found at – feet	Kind of water
12	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
25-31	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
40	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
36	1 ☐ Steel 2 ☐ Galvanized 3 ☑ Concrete 4 ☐ Open hole 5 ☐ Plastic	3	0	42 1/2
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type: GRAVEL
Depth at top of screen: feet

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	8	BENSEAL
		SAKRITE JOINTS

71 PUMPING TEST

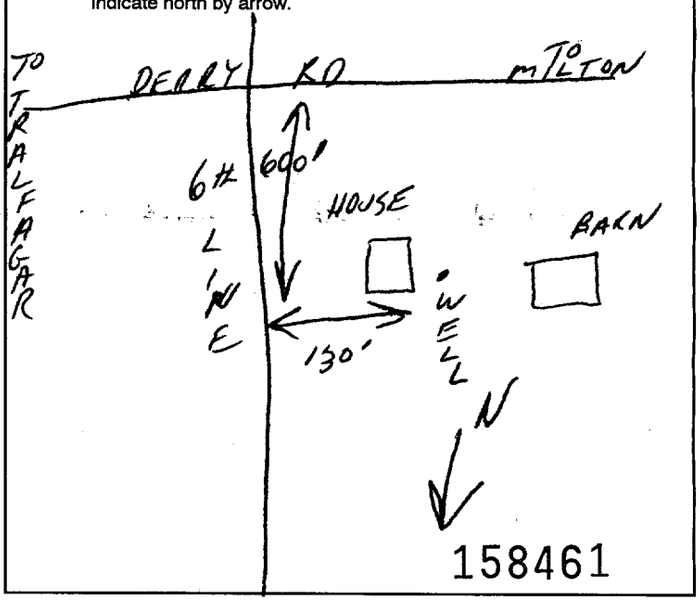
Pumping test method: 1 ☐ Pump 2 ☐ Bailer
Pumping rate: GPM
Duration of pumping: Hours Mins

Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☐ Recovery 15 minutes	30 minutes	45 minutes	60 minutes
12 feet	feet	feet	feet	feet	feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☐ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☑ Deep
Recommended pump setting: 38 feet
Recommended pump rate: 3 INT GPM

LOCATION OF WELL

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



FINAL STATUS OF WELL

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

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

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

Name of Well Contractor	Well Contractor's Licence No.
JOHNSON & BAETZ	3030
Address: RR#1 MT. PLEASANT	
Name of Well Technician: JOHN BAETZ	Well Technician's Licence No.: T-0333
Signature of Technician/Contractor	Submission date: day mo yr

MINISTRY USE ONLY

Data source — Contractor: 3030 — Date received: NOV 0 1 1995
Date of inspection — Inspector
Remarks

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

APPENDIX B: *MECP Well Records*

Table B-1: Summary of MECP Water Well Records

Well Id	Final Status	Water Use	Easting	Northing	Depth to Water
7199245	Abandoned-Other	Not Used	595096	4822104	2.00
7389001	Abandoned-Other		595448	4822113	
7389002	Abandoned-Other		595381	4822027	
7389003	Abandoned-Other		595336	4821967	
7393792	Abandoned-Other		595382	4822029	
7440526	Abandoned-Other		595377	4821933	8.00
7440527	Abandoned-Other		595377	4821933	
2808394	Abandoned-Quality	Domestic	595095.9	4822112	26.52
2808393	Abandoned-Supply	Not Used	595079.9	4822112	10.67
7404949	Observation Wells	Monitoring	595554	4822344	
7404950	Observation Wells	Monitoring	595257	4821932	
7421166	Observation Wells	Monitoring	594961	4822031	
7421167	Observation Wells	Monitoring	595138	4822057	
7421168	Observation Wells	Monitoring	595267	4821992	
7421169	Observation Wells	Monitoring	595129	4821839	
7446385	Observation Wells	Monitoring	594961	4822031	
7446386	Observation Wells	Monitoring	595138	4822057	
7446387	Observation Wells	Monitoring	595267	4821992	
7446388	Observation Wells	Monitoring	595129	4821839	
2806503	Test Hole	Irrigation	595118.9	4821774	19.20
2802599	Water Supply	Domestic	595375.5	4822023	14.63
2802600	Water Supply	Domestic	595312.5	4821952	18.29
2803752	Water Supply	Irrigation	595604.5	4822061	1.52
2804053	Water Supply	Domestic	595350.5	4822140	7.92
2807318	Water Supply	Domestic	594843.9	4822470	13.72
2807993	Water Supply	Irrigation	595413.9	4821934	8.84
2808399	Water Supply	Domestic	595083.9	4822113	3.66
2808919	Water Supply	Domestic	594773.5	4821739	15.24
7274001			595073	4821631	
7274002			595148	4821731	
7429775			595367	4821949	

APPENDIX C: *Grain Size Analysis*

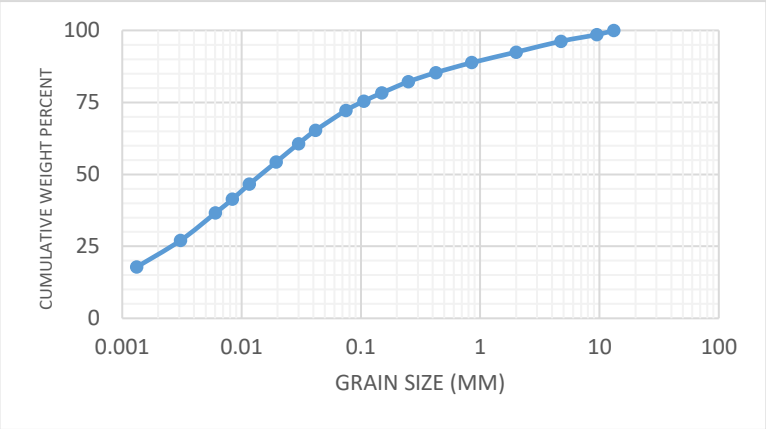
ENVISION CONSULTANTS LTD

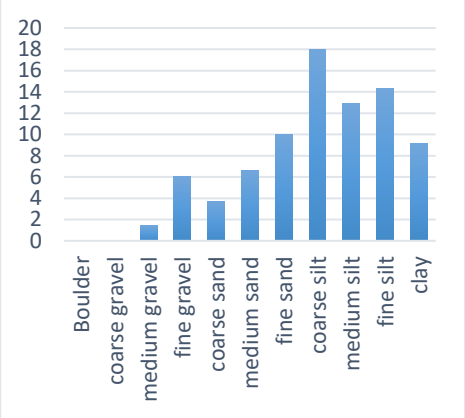
Grain Size Analysis Report Date: 2025-June-23

Sample Name: BH25-1 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted clay with fines





Sieve opening (ps) di (mm)	Mass of retained (mr) (g)	mass fraction (mf)	Percent Passing (pp)
13.2	0	0	100
9.5	1.487222	0.014872	98.51278
4.75	2.279011	0.02279	96.23377
2	3.774612	0.037746	92.45915
0.85	3.661382	0.036614	88.79777
0.425	3.457972	0.03458	85.3398
0.25	3.162103	0.031621	82.1777
0.15	3.883284	0.038833	78.29441
0.106	2.847742	0.028477	75.44667
0.075	3.23607	0.032361	72.2106
0.04159	6.968381	0.069684	65.24222
0.030007	4.571344	0.045713	60.67087
0.019496	6.399881	0.063999	54.27099
0.011604	7.679857	0.076799	46.59114
0.008386	5.218646	0.052186	41.37249
0.006049	4.754197	0.047542	36.61829
0.003069	9.607136	0.096071	27.01116
0.001319	9.192058	0.091921	17.8191

Effective Grain Diameters (mm)	
d10	0.001
d17	0.001
d20	0.002
d50	0.015
d60	0.029
de (Kruger)	0.012
de (Kozeny)	0.005
de (Zunker)	0.005
de (Zamarin)	0.005
Io (Alyameni)	-0.003

Other Useful Parameters	
Uniformity Coef.	39.05
n computed	0.26
g (cm/s^2)	980.00
ρ (g/cm^3)	0.9981
μ (g/cm s)	0.0098
ρg/μ (1/cm s)	9.9327E+04
tau (Sauerbrei)	1.053
$d_{geometric\ mean}$	0.074
σ_ϕ	4.075

mm	0	% in sample
>64	Boulder	
16 - 64	coarse gravel	
8 - 16	medium gravel	1.487222455
2 - 8	fine gravel	6.053623796
0.5 - 2	coarse sand	3.661382488
0.25 - 0.5	medium sand	6.620075408
0.063 - 0.25	fine sand	9.967096774
0.016 - 0.063	coarse silt	17.93960638
0.008 - 0.016	medium silt	12.89850345
0.002 - 0.008	fine silt	14.36133345
<0.002	clay	9.192057961

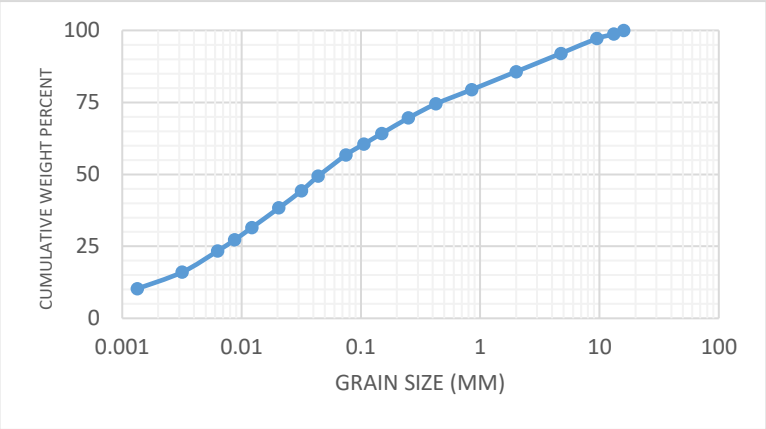
ENVISION CONSULTANTS LTD

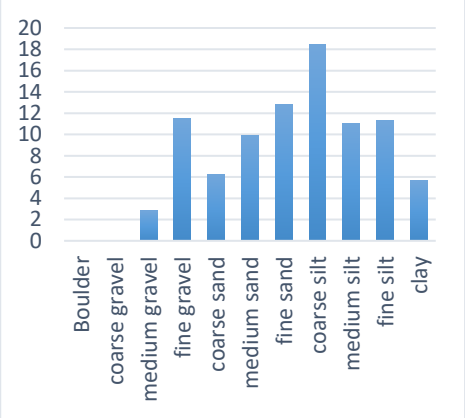
Grain Size Analysis Report Date: 2025-June-23

Sample Name: BH25-2 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy gravelly silt with fines





Sieve opening (ps) di (mm)	Mass of retained (mr) (g)	mass fraction (mf)	Percent Passing (pp)
16	0	0	100
13.2	1.296608	0.012966	98.70339
9.5	1.553757	0.015538	97.14964
4.75	5.133916	0.051339	92.01572
2	6.34179	0.063418	85.67393
0.85	6.237062	0.062371	79.43687
0.425	4.969088	0.049691	74.46778
0.25	4.900549	0.049005	69.56723
0.15	5.346053	0.053461	64.22118
0.106	3.683979	0.03684	60.5372
0.075	3.786788	0.037868	56.75041
0.04386	7.400828	0.074008	49.34958
0.031698	5.083044	0.05083	44.26654
0.02054	5.930218	0.059302	38.33632
0.012191	6.82314	0.068231	31.51318
0.008758	4.23587	0.042359	27.27731
0.006296	3.897001	0.03897	23.38031
0.003171	7.377192	0.073772	16.00312
0.001339	5.701481	0.057015	10.30164

Effective Grain Diameters (mm)	
d10	0.001
d17	0.004
d20	0.005
d50	0.047
d60	0.102
de (Kruger)	0.017
de (Kozeny)	0.008
de (Zunker)	0.008
de (Zamarin)	0.008
Io (Alyameni)	-0.010

Other Useful Parameters	
Uniformity Coef.	78.15
n computed	0.26
g (cm/s^2)	980.00
ρ (g/cm^3)	0.9981
μ (g/cm s)	0.0098
ρg/μ (1/cm s)	9.9327E+04
tau (Sauerbrei)	1.053
$d_{geometric\ mean}$	0.123
σ_ϕ	4.310

mm	0	% in sample
>64	Boulder	
16 - 64	coarse gravel	0
8 - 16	medium gravel	2.850364897
2 - 8	fine gravel	11.47570671
0.5 - 2	coarse sand	6.237061987
0.25 - 0.5	medium sand	9.869636551
0.063 - 0.25	fine sand	12.81681969
0.016 - 0.063	coarse silt	18.41409043
0.008 - 0.016	medium silt	11.05900994
0.002 - 0.008	fine silt	11.27419215
<0.002	clay	5.701481302

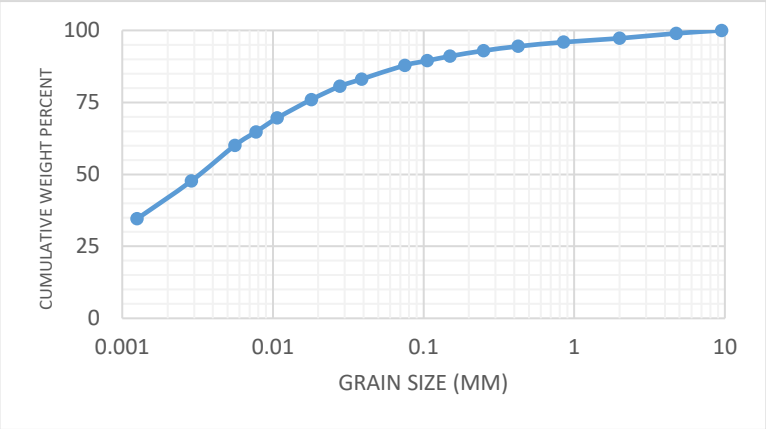
ENVISION CONSULTANTS LTD

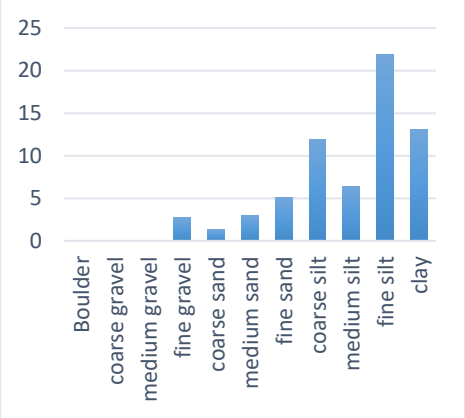
Grain Size Analysis Report Date: 2025-June-23

Sample Name: BH25-3 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted clay with fines





Sieve opening (ps) di (mm)	Mass of retained (mr) (g)	mass fraction (mf)	Percent Passing (pp)
9.5	0	0	100
4.75	1.023651	0.010237	98.97635
2	1.731794	0.017318	97.24455
0.85	1.322526	0.013225	95.92203
0.425	1.458668	0.014587	94.46336
0.25	1.517015	0.01517	92.94635
0.15	1.905993	0.01906	91.04035
0.106	1.575362	0.015754	89.46499
0.075	1.594811	0.015948	87.87018
0.038894	4.775473	0.047755	83.09471
0.027835	2.50013	0.025001	80.59458
0.017987	4.615625	0.046156	75.97895
0.010694	6.39841	0.063984	69.58054
0.007717	4.807942	0.048079	64.7726
0.00559	4.719476	0.047195	60.05312
0.002873	12.36026	0.123603	47.69287
0.001254	13.12953	0.131295	34.56334

Effective Grain Diameters (mm)	
d10	0.000
d17	0.001
d20	0.001
d50	0.003
d60	0.006
de (Kruger)	0.009
de (Kozeny)	0.003
de (Zunker)	0.003
de (Zamarin)	0.003
Io (Alyameni)	0.000

Other Useful Parameters	
Uniformity Coef.	15.38
n computed	0.27
g (cm/s^2)	980.00
ρ (g/cm^3)	0.9981
μ (g/cm s)	0.0098
ρg/μ (1/cm s)	9.9327E+04
tau (Sauerbrei)	1.053
$d_{geometric\ mean}$	0.065
σ_ϕ	3.340

mm	0	% in sample
>64	Boulder	
16 - 64	coarse gravel	
8 - 16	medium gravel	0
2 - 8	fine gravel	2.755445452
0.5 - 2	coarse sand	1.322525942
0.25 - 0.5	medium sand	2.975683369
0.063 - 0.25	fine sand	5.076165747
0.016 - 0.063	coarse silt	11.89122757
0.008 - 0.016	medium silt	6.398409726
0.002 - 0.008	fine silt	21.88767691
<0.002	clay	13.12952906

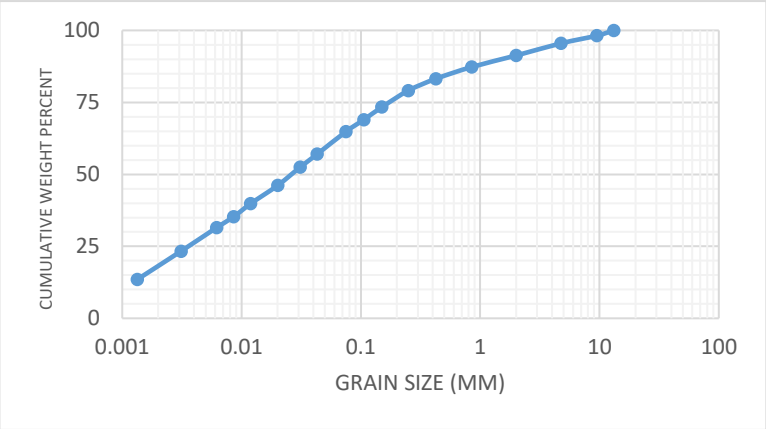
ENVISION CONSULTANTS LTD

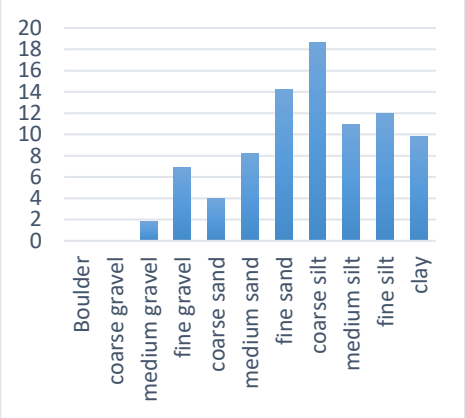
Grain Size Analysis Report Date: 2025-June-23

Sample Name: BH25-4 SS5 From 3.1 to 3.7

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy silt with fines





Sieve opening (ps) di (mm)	Mass of retained (mr) (g)	mass fraction (mf)	Percent Passing (pp)
13.2	0	0	100
9.5	1.826083	0.018261	98.17392
4.75	2.677204	0.026772	95.49671
2	4.21958	0.042196	91.27713
0.85	3.979683	0.039797	87.29745
0.425	4.107471	0.041075	83.18998
0.25	4.089216	0.040892	79.10076
0.15	5.732204	0.057322	73.36856
0.106	4.363047	0.04363	69.00551
0.075	4.143982	0.04144	64.86153
0.043089	7.820248	0.078202	57.04128
0.031051	4.512902	0.045129	52.52838
0.020143	6.318063	0.063181	46.21032
0.011927	6.366803	0.063668	39.84351
0.008585	4.561642	0.045616	35.28187
0.006169	3.790838	0.037908	31.49103
0.00311	8.171964	0.08172	23.31907
0.001335	9.830907	0.098309	13.48816

Effective Grain Diameters (mm)	
d10	0.001
d17	0.002
d20	0.003
d50	0.027
d60	0.055
de (Kruger)	0.012
de (Kozeny)	0.006
de (Zunker)	0.006
de (Zamarin)	0.006
Io (Alyameni)	-0.005

Other Useful Parameters	
Uniformity Coef.	55.75
n computed	0.26
g (cm/s^2)	980.00
ρ (g/cm^3)	0.9981
μ (g/cm s)	0.0098
ρg/μ (1/cm s)	9.9327E+04
tau (Sauerbrei)	1.053
$d_{geometric\ mean}$	0.081
σ_ϕ	4.027

mm	0	% in sample
>64	Boulder	
16 - 64	coarse gravel	
8 - 16	medium gravel	1.826083041
2 - 8	fine gravel	6.896784653
0.5 - 2	coarse sand	3.979682969
0.25 - 0.5	medium sand	8.196686481
0.063 - 0.25	fine sand	14.23923264
0.016 - 0.063	coarse silt	18.65121379
0.008 - 0.016	medium silt	10.92844469
0.002 - 0.008	fine silt	11.96280194
<0.002	clay	9.830906803

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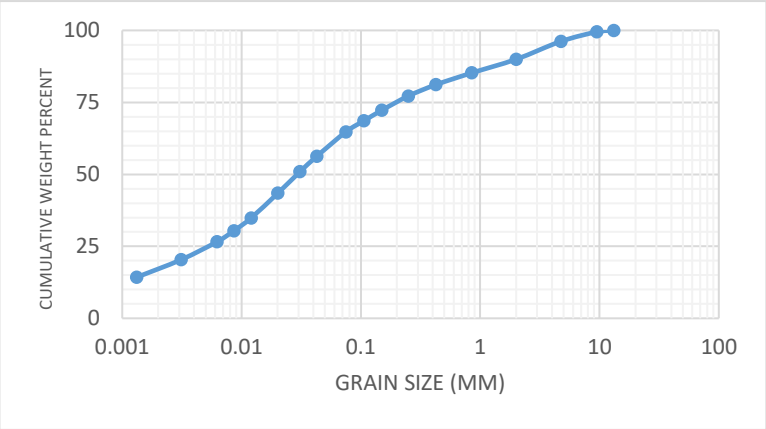
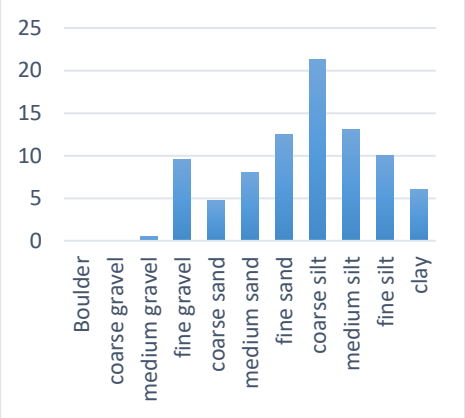
Grain Size Analysis Report Date: 2025-June-23

Sample Name: BH2454 SS10 From 9.1 to 9.7

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy gravelly silt with fines





Sieve opening (ps) di (mm)	Mass of retained (mr) (g)	mass fraction (mf)	Percent Passing (pp)
13.2	0	0	100
9.5	0.511279	0.005113	99.48872
4.75	3.295144	0.032951	96.19358
2	6.220914	0.062209	89.97266
0.85	4.732562	0.047326	85.2401
0.425	4.102753	0.041028	81.13735
0.25	3.922808	0.039228	77.21454
0.15	4.930502	0.049305	72.28404
0.106	3.688879	0.036889	68.59516
0.075	3.814841	0.038148	64.78032
0.042687	8.506186	0.085062	56.27413
0.030886	5.338089	0.053381	50.93604
0.020139	7.473324	0.074733	43.46272
0.012029	8.588985	0.08589	34.87373
0.008645	4.448407	0.044484	30.42533
0.006225	3.832748	0.038327	26.59258
0.003115	6.22777	0.062278	20.36481
0.00132	6.083642	0.060836	14.28117

Effective Grain Diameters (mm)	
d10	0.001
d17	0.002
d20	0.003
d50	0.030
d60	0.057
de (Kruger)	0.016
de (Kozeny)	0.006
de (Zunker)	0.007
de (Zamarin)	0.007
Io (Alyameni)	-0.006

Other Useful Parameters	
Uniformity Coef.	61.51
n computed	0.26
g (cm/s^2)	980.00
ρ (g/cm^3)	0.9981
μ (g/cm s)	0.0098
ρg/μ (1/cm s)	9.9327E+04
tau (Sauerbrei)	1.053
$d_{geometric\ mean}$	0.098
σ_ϕ	4.150

mm	0	% in sample
>64	Boulder	
16 - 64	coarse gravel	
8 - 16	medium gravel	0.511279451
2 - 8	fine gravel	9.516058348
0.5 - 2	coarse sand	4.732562032
0.25 - 0.5	medium sand	8.025561468
0.063 - 0.25	fine sand	12.43422192
0.016 - 0.063	coarse silt	21.31759913
0.008 - 0.016	medium silt	13.03739181
0.002 - 0.008	fine silt	10.06051771
<0.002	clay	6.083641679

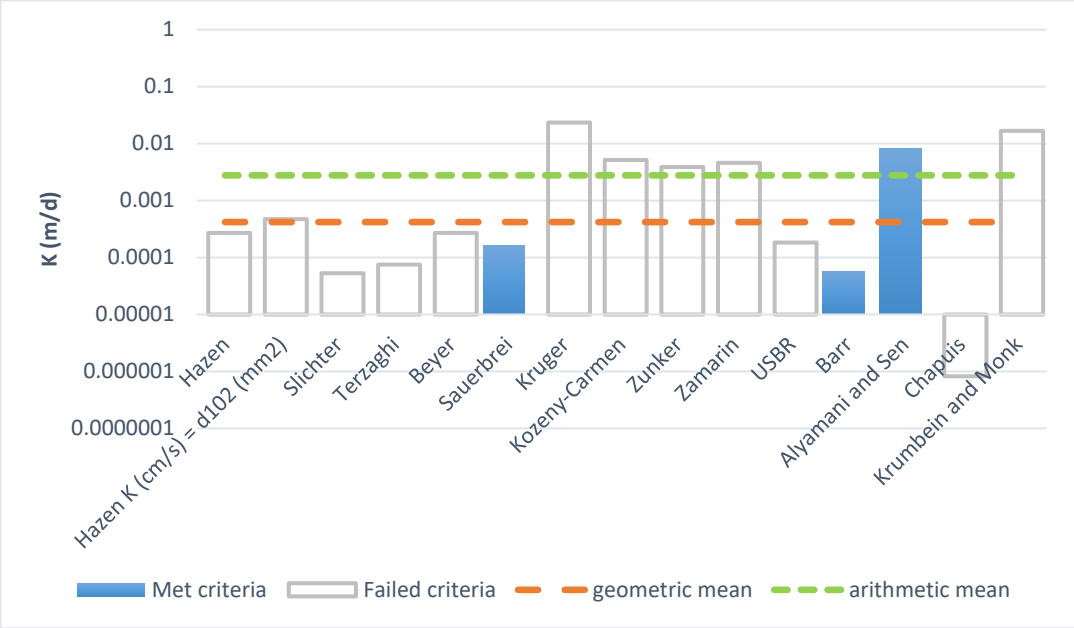
K from Grain Size Analysis Report Date: 2025-June-23

ENVISION CONSULTANTS LTD

Sample Name: BH25-1 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	3.11E-07	3.11E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	5.48E-07	5.48E-09	0.00	
Slichter	6.11E-08	6.11E-10	0.00	
Terzaghi	8.72E-08	8.72E-10	0.00	
Beyer	3.13E-07	3.13E-09	0.00	
Sauerbrei	1.86E-07	1.86E-09	0.00	
Kruger	2.70E-05	2.70E-07	0.02	
Kozeny-Carmen	5.93E-06	5.93E-08	0.01	
Zunker	4.51E-06	4.51E-08	0.00	
Zamarin	5.32E-06	5.32E-08	0.00	
USBR	2.13E-07	2.13E-09	0.00	
Barr	6.55E-08	6.55E-10	0.00	
Alyamani and Sen	9.35E-06	9.35E-08	0.01	
Chapuis	9.55E-10	9.55E-12	0.00	
Krumbein and Monk	1.95E-05	1.95E-07	0.02	
geometric mean	4.85E-07	4.85E-09	0.00	
arithmetic mean	3.20E-06	3.20E-08	0.00	

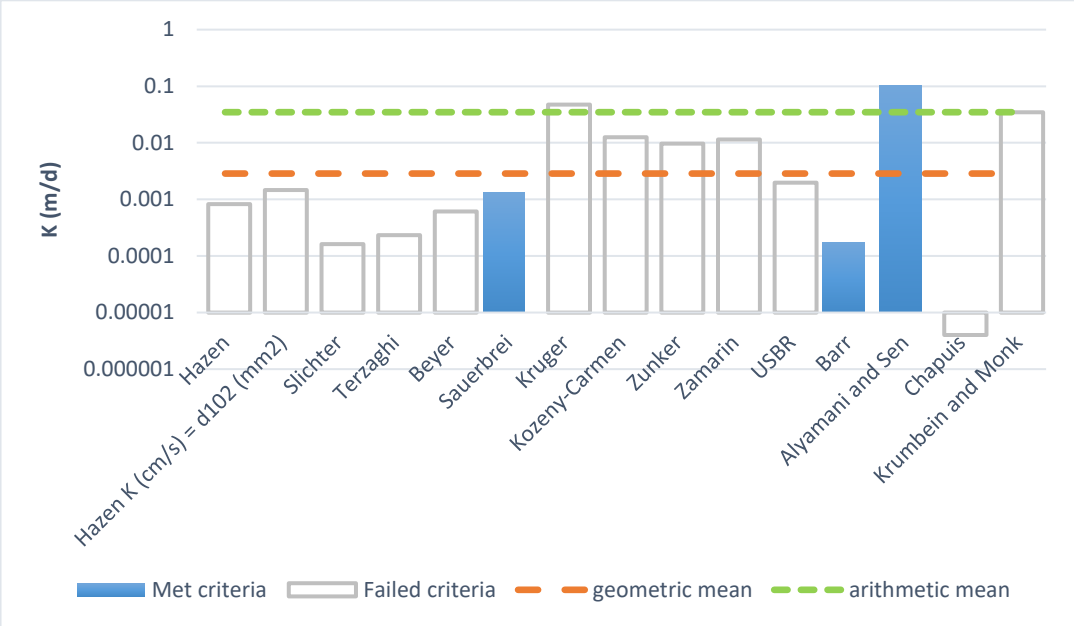
K from Grain Size Analysis Report Date: 2025-June-23

ENVISION CONSULTANTS LTD

Sample Name: BH25-2 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy gravelly silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	9.57E-07	9.57E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.69E-06	1.69E-08	0.00	
Slichter	1.88E-07	1.88E-09	0.00	
Terzaghi	2.68E-07	2.68E-09	0.00	
Beyer	7.04E-07	7.04E-09	0.00	
Sauerbrei	1.51E-06	1.51E-08	0.00	
Kruger	5.44E-05	5.44E-07	0.05	
Kozeny-Carmen	1.46E-05	1.46E-07	0.01	
Zunker	1.11E-05	1.11E-07	0.01	
Zamarin	1.32E-05	1.32E-07	0.01	
USBR	2.28E-06	2.28E-08	0.00	
Barr	2.02E-07	2.02E-09	0.00	
Alyamani and Sen	1.19E-04	1.19E-06	0.10	
Chapuis	4.64E-09	4.64E-11	0.00	
Krumbein and Monk	4.00E-05	4.00E-07	0.03	
geometric mean	3.31E-06	3.31E-08	0.00	
arithmetic mean	4.02E-05	4.02E-07	0.03	

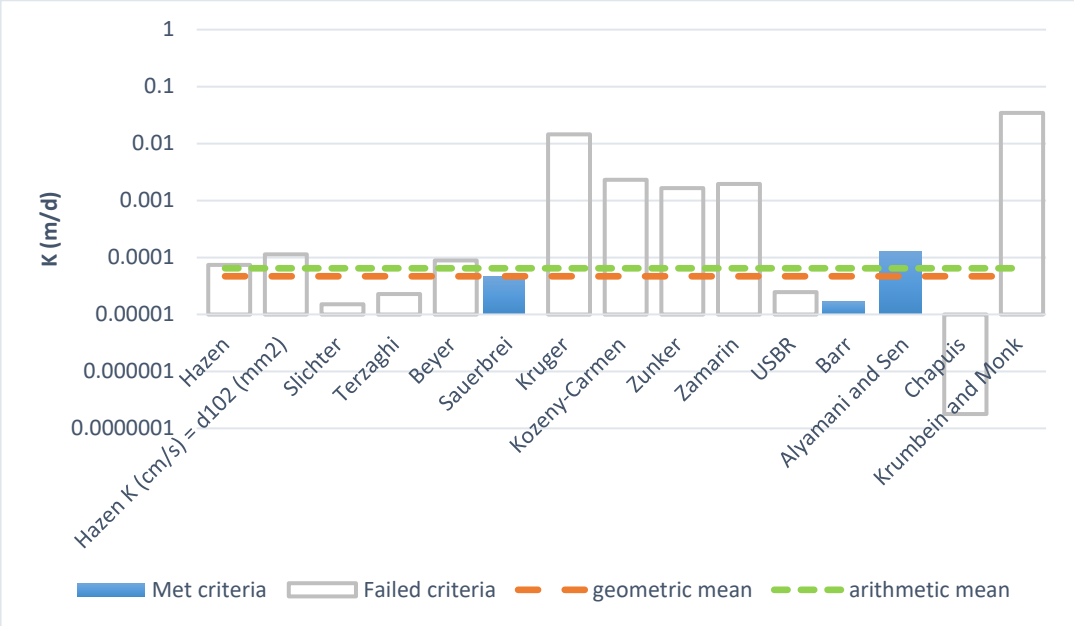
K from Grain Size Analysis Report Date: 2025-June-23

ENVISION CONSULTANTS LTD

Sample Name: BH25-3 SS4 From 2.3 to 2.9

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.59E-08	8.59E-10	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.32E-07	1.32E-09	0.00	
Slichter	1.76E-08	1.76E-10	0.00	
Terzaghi	2.63E-08	2.63E-10	0.00	
Beyer	1.03E-07	1.03E-09	0.00	
Sauerbrei	5.47E-08	5.47E-10	0.00	
Kruger	1.69E-05	1.69E-07	0.01	
Kozeny-Carmen	2.67E-06	2.67E-08	0.00	
Zunker	1.91E-06	1.91E-08	0.00	
Zamarin	2.25E-06	2.25E-08	0.00	
USBR	2.87E-08	2.87E-10	0.00	
Barr	1.93E-08	1.93E-10	0.00	
Alyamani and Sen	1.50E-07	1.50E-09	0.00	
Chapuis	2.05E-10	2.05E-12	0.00	
Krumbein and Monk	4.02E-05	4.02E-07	0.03	
geometric mean	5.41E-08	5.41E-10	0.00	
arithmetic mean	7.48E-08	7.48E-10	0.00	

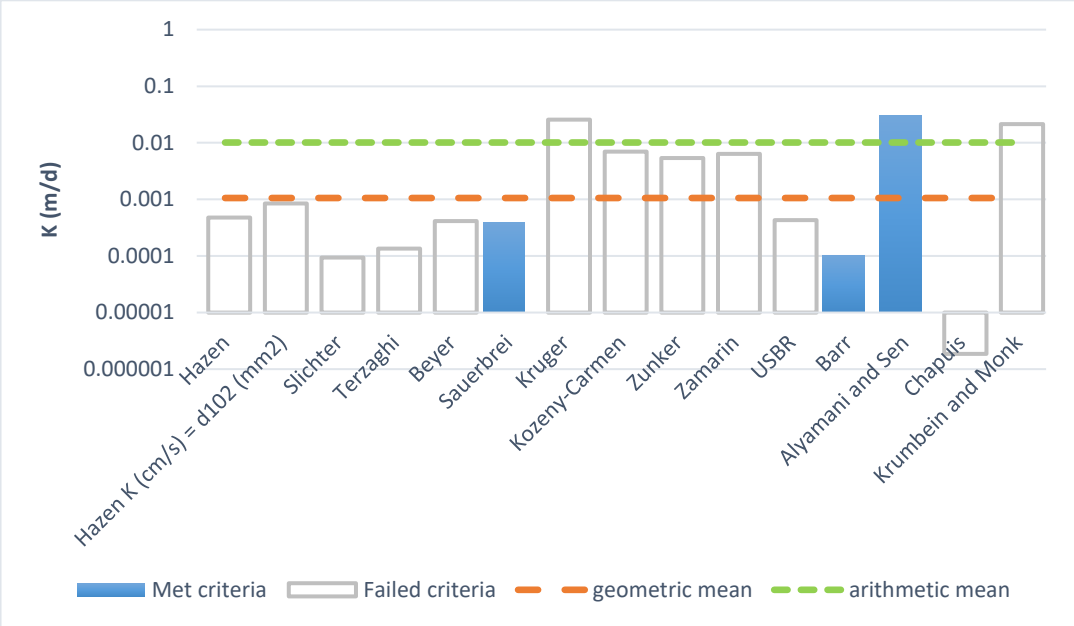
K from Grain Size Analysis Report Date: 2025-June-23

ENVISION CONSULTANTS LTD

Sample Name: BH25-4 SS5 From 3.1 to 3.7

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	5.54E-07	5.54E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	9.79E-07	9.79E-09	0.00	
Slichter	1.09E-07	1.09E-09	0.00	
Terzaghi	1.55E-07	1.55E-09	0.00	
Beyer	4.82E-07	4.82E-09	0.00	
Sauerbrei	4.54E-07	4.54E-09	0.00	
Kruger	2.97E-05	2.97E-07	0.03	
Kozeny-Carmen	8.13E-06	8.13E-08	0.01	
Zunker	6.23E-06	6.23E-08	0.01	
Zamarin	7.40E-06	7.40E-08	0.01	
USBR	4.99E-07	4.99E-09	0.00	
Barr	1.17E-07	1.17E-09	0.00	
Alyamani and Sen	3.46E-05	3.46E-07	0.03	
Chapuis	2.15E-09	2.15E-11	0.00	
Krumbein and Monk	2.47E-05	2.47E-07	0.02	
geometric mean	1.22E-06	1.22E-08	0.00	
arithmetic mean	1.17E-05	1.17E-07	0.01	

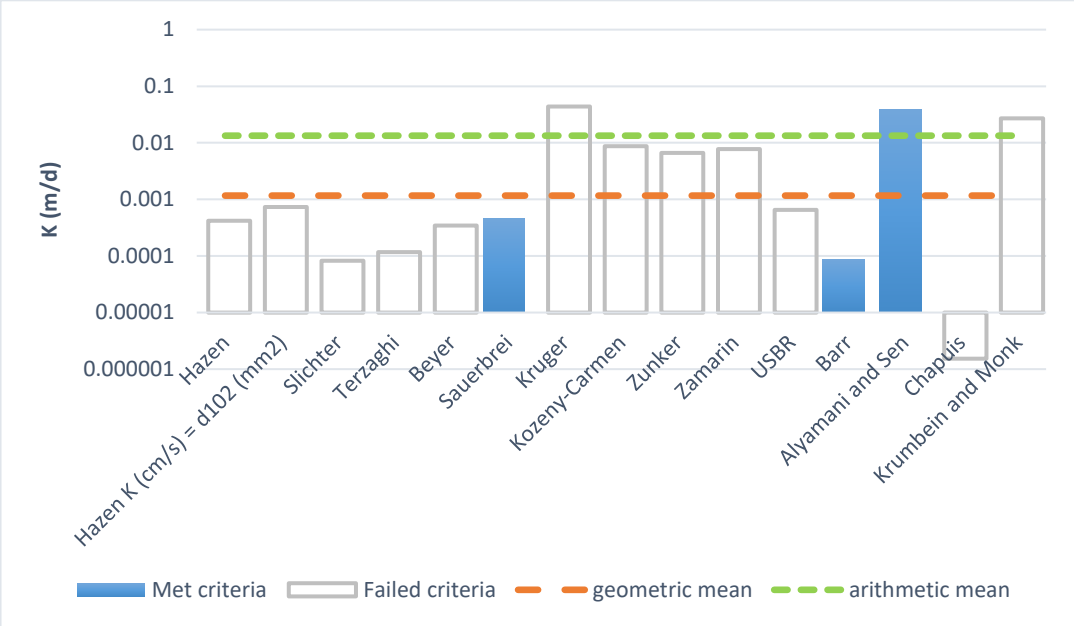
K from Grain Size Analysis Report Date: 2025-June-23

ENVISION CONSULTANTS LTD

Sample Name: BH25-4 SS10 From 9.1 to 9.7

Mass Sample (g): 50 T (oC) 21.5

Poorly sorted sandy gravelly silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	4.84E-07	4.84E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	8.54E-07	8.54E-09	0.00	
Slichter	9.50E-08	9.50E-10	0.00	
Terzaghi	1.35E-07	1.35E-09	0.00	
Beyer	4.01E-07	4.01E-09	0.00	
Sauerbrei	5.28E-07	5.28E-09	0.00	
Kruger	5.07E-05	5.07E-07	0.04	
Kozeny-Carmen	1.01E-05	1.01E-07	0.01	
Zunker	7.65E-06	7.65E-08	0.01	
Zamarin	8.99E-06	8.99E-08	0.01	
USBR	7.55E-07	7.55E-09	0.00	
Barr	1.02E-07	1.02E-09	0.00	
Alyamani and Sen	4.58E-05	4.58E-07	0.04	
Chapuis	1.78E-09	1.78E-11	0.00	
Krumbein and Monk	3.14E-05	3.14E-07	0.03	
geometric mean	1.35E-06	1.35E-08	0.00	
arithmetic mean	1.55E-05	1.55E-07	0.01	

APPENDIX D: *In-situ Hydraulic Conductivity tests*

Table D-1 - Infiltration Potential Assessment and Summary

Testing Location	Ground Surface Elevation	Horizontal Hydraulic Conductivity	Vertical Hydraulic Gradient	Estimated Infiltration Rate	In Situ Infiltration Rate	Testing Depth		Screen Interval	Soil Description	Grain Size Proportions (%)			
	(m ASL)	*(cm/s)*	*(cm/s)*	*(mm/hr)*	*(mm/hr)*	*(m BGS)*	*(m ASL)*	*(m BGS)*		*Gravel*	*Sand*	*Silt*	*Clay*
BH25-1 (SS4)	190.4	3.20E-06	3.20E-07	10	NA	2.3	188.1	NA	Cl Si Til	4	24	51	21
BH25-2 (SS4)	190.3	4.10E-05	4.10E-06	20	NA	2.3	188.0	NA	Cl Si Till	8	35	45	12
BH25-3 (SS4)	190.1	7.50E-08	7.50E-09	4	NA	2.3	187.8	NA	Si Cl Till	1	11	47	41
BH25-4 (SS4)	190.1	1.20E-05	1.20E-06	14	NA	3.1	187.0	NA			21	76	3
Single Well Response Testing													
BH25-1	190.4	3.74E-07	3.74E-08	6	NA	2.4	188.0	2.4 to 5.5	Cl Si Till	-	-	-	-
BH25-3D	190.1	1.90E-05	1.90E-06	16	NA	9.0	181.1	9.1 to 12.1	Si Cl Till	-	-	-	-
BH25-3S	190.1	7.14E-06	7.14E-07	12	NA	3.1	187.0	3.1 to 6.1	Si Cl Till	-	-	-	-
										-	-	-	-

Summary

Range	In-Situ Percolation Testing	Grain Size Approximation	Single Well Response Testing
	(mm/hr)	(mm/hr)	(mm/hr)
High	NA	20	16
Low	NA	4	6
Average	NA	12	11

All Sources	Estimated Infiltration Rate (mm/hr)	Safety Factor Application (Design Infiltration Rate) (mm/hr)
High	20	8
Low	4	1
Average	12	5

Safety Factor 2.5

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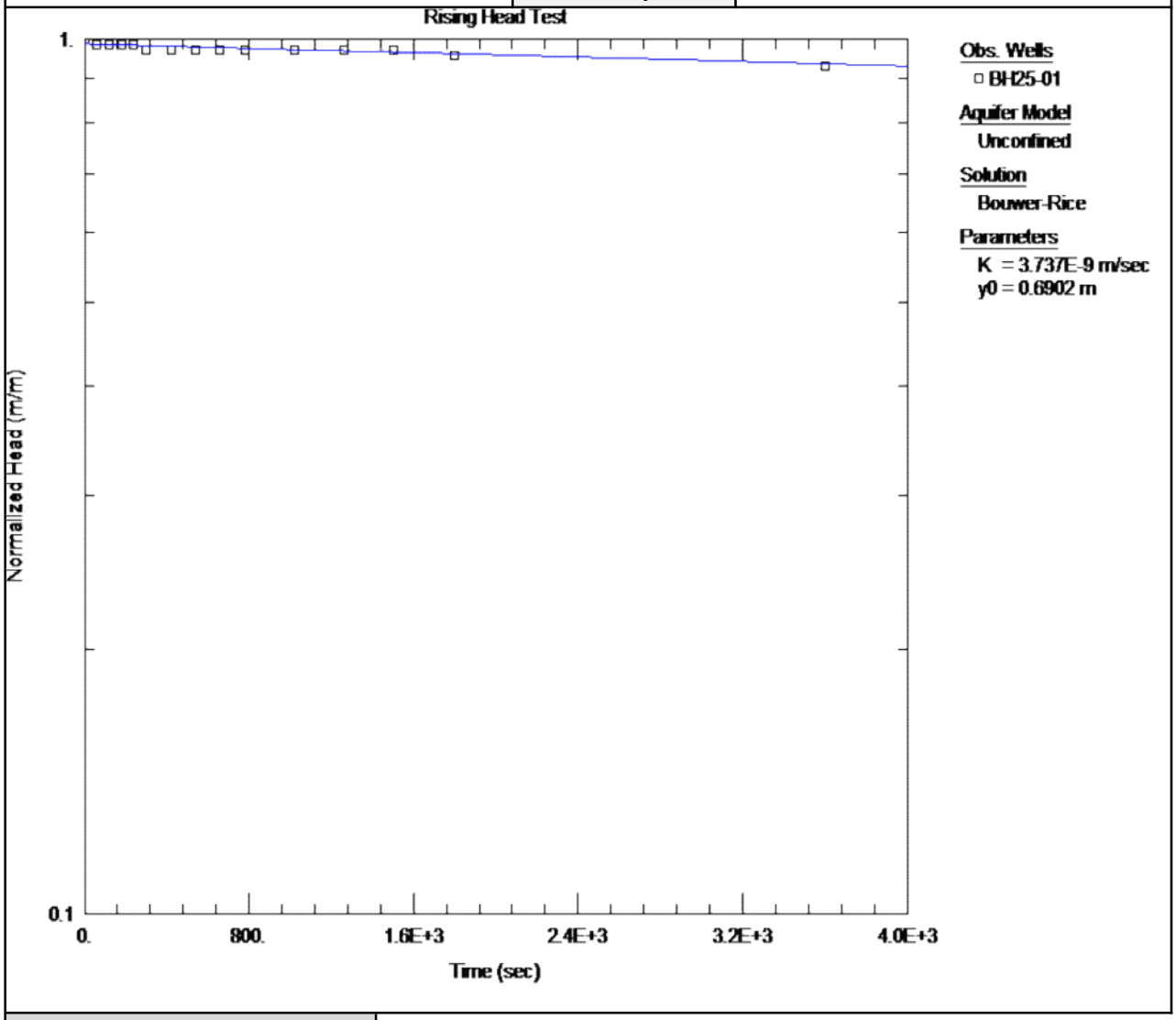
Single Well Response Test Analysis Report	
Project #:	24-0774
Project Location:	7072 Sixth Line, Milton, Ontario
Analysis Date:	26-Jun-25

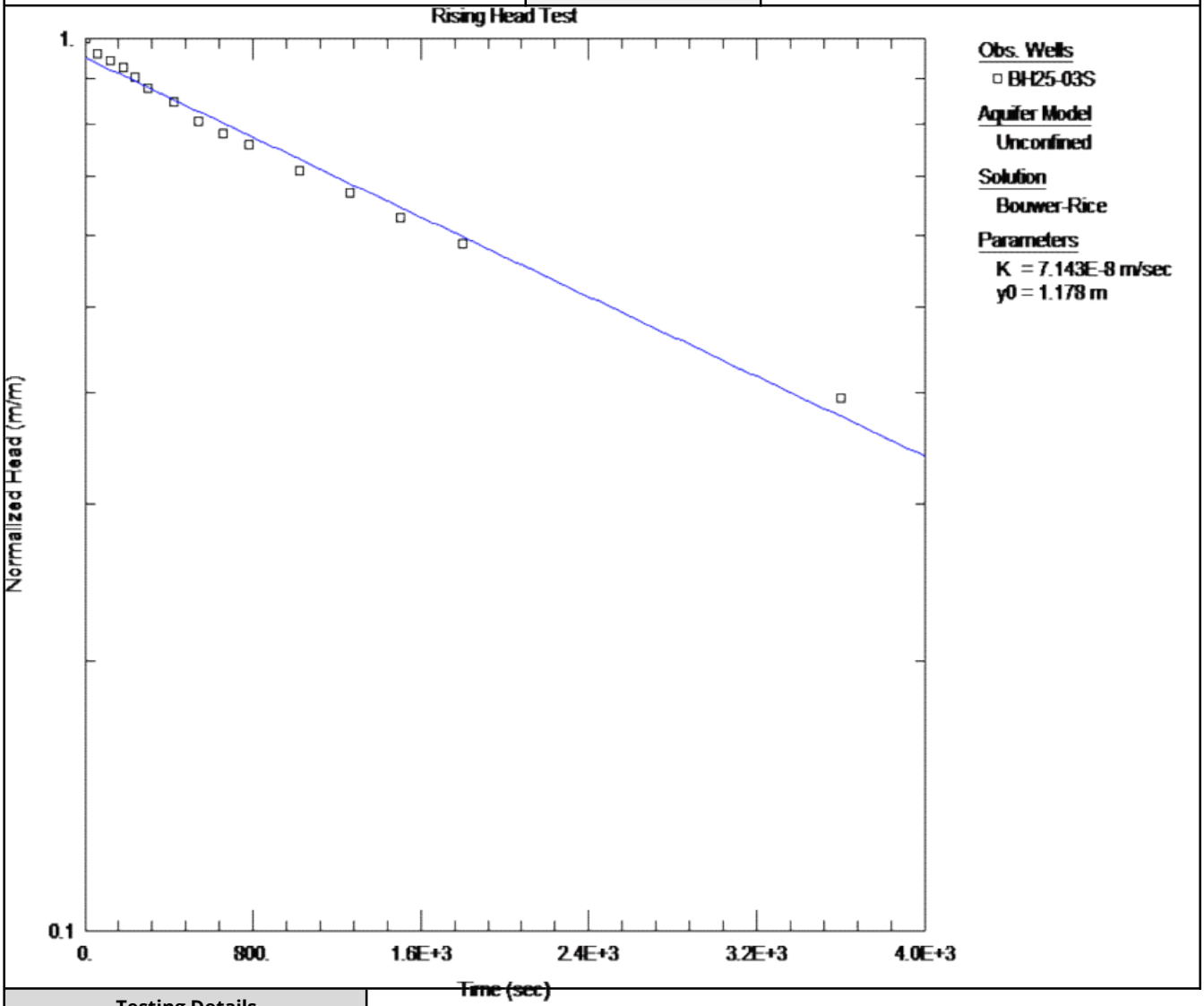


Testing Details	
Well ID:	BH25-01
Field Technician:	DD
Analysis By:	SH
Date of Analysis:	26-Jun-25

Well Details		
Top of Screen	2.4	m
Bottom of Screen	5.5	m
Diam. of well	50	mm
Static Water Level	3.09	m bgs
Formation Screened	Clay Till	

ENVISION CONSULTANTS LTD

Single Well Response Test Analysis Report	
Project #:	24-0774
Project Location:	7072 Sixth Line, Milton, Ontario
Analysis Date:	26-Jun-25

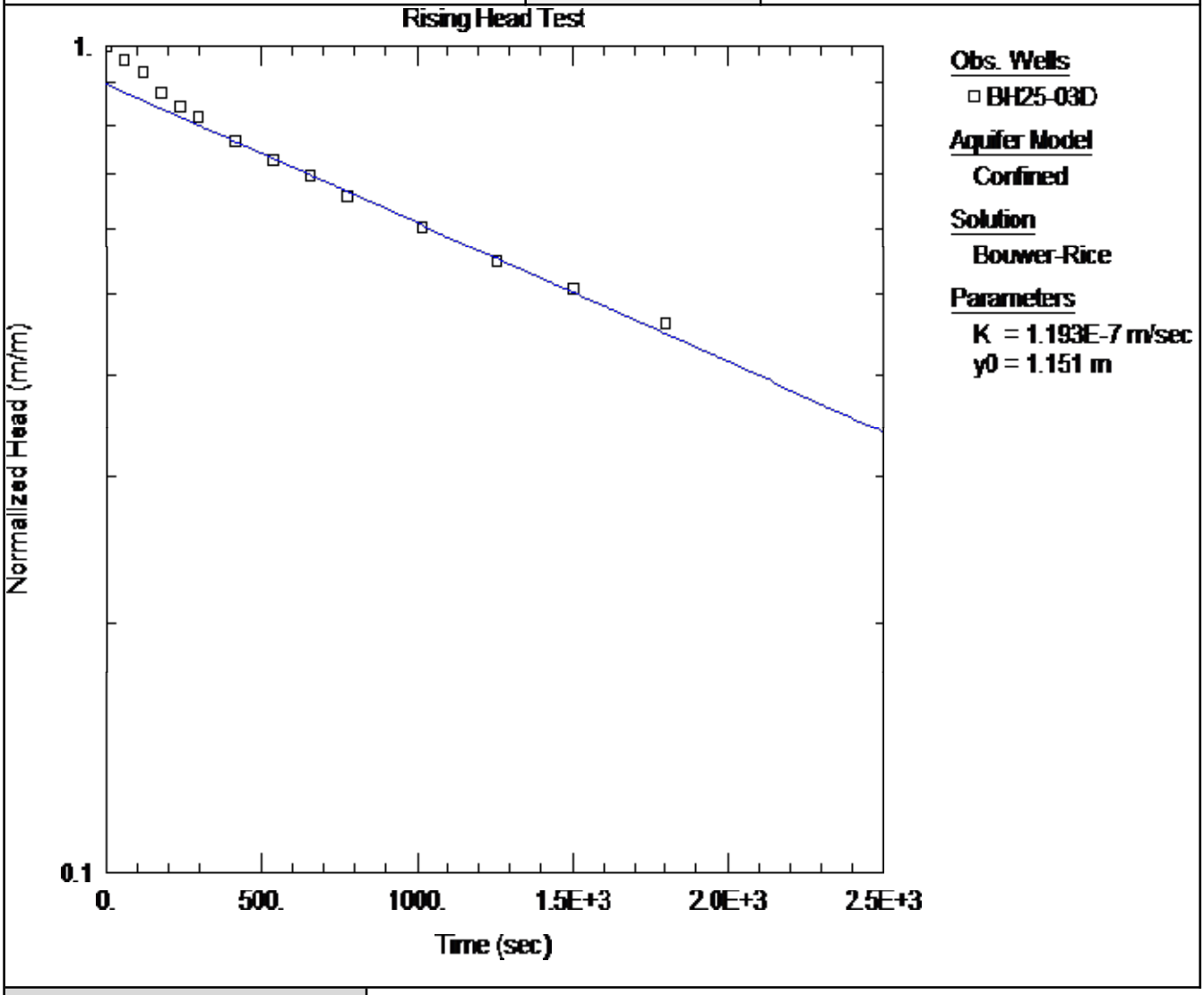


Testing Details	
Well ID:	BH25-03S
Field Technician:	DD
Analysis By:	SH
Date of Analysis:	26-Jun-25

Well Details		
Top of Screen	3.0	m
Bottom of Screen	6.1	m
Diam. of well	50	mm
Static Water Level	0.88	m bgs
Formation Screened	Clay Till	

ENVISION CONSULTANTS LTD

Single Well Response Test Analysis Report	
Project #:	24-0774
Project Location:	7072 Sixth Line, Milton, Ontario
Analysis Date:	26-Jun-25



Testing Details	
Well ID:	BH25-03S
Field Technician:	DD
Analysis By:	SH
Date of Analysis:	26-Jun-25

Well Details		
Top of Screen	9.1	m
Bottom of Screen	12.1	m
Diam. of well	50	mm
Static Water Level	4.7	m bgs
Formation Screened	Clay Till	

APPENDIX E: *Water Quality Results*

Sample Date			23-Apr-2025	23-Apr-2025
Sample Time			13:05	14:05
ALS Sample ID		Criteria	WT2509198-001	WT2509198-002
	UNITS	PWQO	BH25-01	BH25-02
Physical Tests (Matrix: Water)				
Conductivity	µS/cm		1170	1960
Alkalinity, bicarbonate (as HCO3)	mg/L		342	2680
Alkalinity, carbonate (as CO3)	mg/L		<0.6	0.0
Alkalinity, hydroxide (as OH)	mg/L		<0.3	0.00
Alkalinity, total (as CaCO3)	mg/L		280	2200
Colour, apparent	CU		570	52100
Hardness (as CaCO3), from total Ca/Mg	mg/L		521	659
Langelier index (@ 4°C)	-		0.640	1.55
Solids, total dissolved [TDS]	mg/L		787	1460
Solids, total dissolved [TDS], calculated	mg/L		760	1270
Turbidity	NTU		136	>4000
pH	pH units	6.5 -> 8.5	7.93	7.82
Langelier index (@ 20°C)	-		0.886	1.80
pH, saturation (@ 4°C)	pH units		7.29	6.27
pH, saturation (@ 20°C)	pH units		7.04	6.02
Anions and Nutrients (Matrix: Water)				
Ammonia, total (as N)	mg/L		0.141	1.10
Bromide	mg/L		<0.50	<0.50
Chloride	mg/L		75.6	67.8
Fluoride	mg/L		0.165	0.221
Nitrate (as N)	mg/L		<0.100	8.42
Nitrate + Nitrite (as N)	mg/L		<0.112	8.49
Nitrite (as N)	mg/L		0.062	0.073
Phosphate, ortho-, dissolved (as P)	mg/L		0.0076	<0.0010
Sulfate (as SO4)	mg/L		275	605
Organic / Inorganic Carbon (Matrix: Water)				
Carbon, dissolved organic [DOC]	mg/L		1.70	4.78
Metals (Matrix: Water)				
Sodium adsorption ratio [SAR]	-		0.98	2.24
Ion Balance (Matrix: Water)				
Anion sum	meq/L		13.5	59.1

Cation sum (total)	meq/L		12.8	21.4
Ion balance (cations/anions)	%		94.8	36.2
Ion balance (APHA)	%		-2.66	-46.8
Total Metals (Matrix: Water)				
Aluminum, total	mg/L		0.260	0.0389
Antimony, total	mg/L		0.00049	<0.00100
Arsenic, total	mg/L	0.1(U)	0.00174	<0.00100
Barium, total	mg/L		0.0528	0.0716
Beryllium, total	mg/L	0.011(U)	0.000024	<0.000200
Bismuth, total	mg/L		<0.000050	<0.000500
Boron, total	mg/L		0.075	<0.100
Cadmium, total	mg/L	0.0002(U)	0.0000176	<0.0000500
Calcium, total	mg/L		108	174
Cesium, total	mg/L		0.000058	<0.000100
Chromium, total	mg/L		0.00062	<0.00500
Cobalt, total	mg/L		0.00108	<0.00100
Copper, total	mg/L	0.005(U)	0.00100	<0.00500
Iron, total	mg/L	0.3(U)	**0.430**	<0.100
Lead, total	mg/L	0.025(U)	0.000954	<0.000500
Lithium, total	mg/L		0.0409	0.0161
Magnesium, total	mg/L		61.0	54.6
Manganese, total	mg/L		0.114	0.445
Molybdenum, total	mg/L		0.0122	0.00251
Nickel, total	mg/L	0.025(U)	0.00382	<0.00500
Phosphorus, total	mg/L		<0.050	<0.500
Potassium, total	mg/L		6.21	92.0
Rubidium, total	mg/L		0.00261	0.0151
Selenium, total	mg/L	0.1(U)	0.000398	<0.000500
Silicon (as SiO2), total	mg/L		19.0	11.8
Silicon, total	mg/L		8.87	5.53
Silver, total	mg/L	0.0001(U)	<0.000010	<0.000100
Sodium, total	mg/L		51.3	132
Strontium, total	mg/L		0.911	0.915
Sulfur, total	mg/L		103	204
Tellurium, total	mg/L		<0.00020	<0.00200
Thallium, total	mg/L		0.000014	<0.000100
Thorium, total	mg/L		0.00024	<0.00100
Tin, total	mg/L		<0.00010	<0.00100
Titanium, total	mg/L		<0.00600	<0.00300
Tungsten, total	mg/L		0.00054	<0.00100
Uranium, total	mg/L		0.00375	0.00561
Vanadium, total	mg/L		0.00105	<0.00500
Zinc, total	mg/L	0.03(U)	**0.0063**	<0.0300

Zirconium, total	mg/L		0.00025	<0.00200
PWQO Exceedance Count:			1	0
Notes				
Bold	Exceedance -Provincial Water Quality Objectives (MOEE Water Management documented Feb 1999)			

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**WT2509198**			
Amendment	:	**1**			
Client	:	**EnVision Consultants Ltd.**	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Rob Byers	Account Manager	:	Emily Hansen
Address	:	6415 Northwest Drive U37-40 Mississauga Ontario Canada L4V 1X1	Address	:	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	:	+1 519 886 6910
Project	:	24-0774.200	Date Samples Received	:	24-Apr-2025 09:00
PO	:	----	Date Analysis Commenced	:	26-Apr-2025
C-O-C number	:	23-1123762	Issue Date	:	26-Jun-2025 13:55
Sampler	:	DD			
Site	:	----			
Quote number	:	2024-2025 Standing Offer			
No. of samples received	:	2			
No. of samples analysed	:	2			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Greg Pokocky		Inorganics, Waterloo, Ontario
Nik Perkio		Metals, Waterloo, Ontario
Nik Perkio		Inorganics, Waterloo, Ontario
Nik Perkio		Centralized Prep, Waterloo, Ontario
Walt Kippenhuck		Inorganics, Waterloo, Ontario

No Breaches Found

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.

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

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

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

Unit	*Description*
-	no units
%	percent
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

>: greater than.
<: less than.

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

Workorder Comments

Amendment (26-JUNE-2025): This report has been amended to include requested guideline(s). All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLUI	Detection Limit Raised: Unknown interference generated an apparent false positive test result.
TMV	Turbidity exceeded upper limit of the nephelometric method. Minimum value reported.

Analytical Results Evaluation

Matrix: Water

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	BH24-01	BH24-02	----	----	----	----	----
				Client sampling date / time	23-Apr-2025 13:05	23-Apr-2025 14:05	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					WT2509198-001	WT2509198-002	----	----	----	----	----
					Result	Result	----	----	----	----	----
Sample Preparation											
Dissolved carbon filtration location	----	EP358/WT	-		lab	lab	----	----	----	----	----
Physical Tests											
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	mg/L		342	2680	----	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	mg/L		----	0.0	----	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	mg/L		<0.6	----	----	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	mg/L		----	0.00	----	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	mg/L		<0.3	----	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	mg/L		280	2200	----	----	----	----	----
Colour, apparent	----	E330/WT	CU		570	52100	----	----	----	----	----
Conductivity	----	E100/WT	µS/cm		1170	1960	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	mg/L		521	659	----	----	----	----	----
pH	----	E108/WT	pH units		7.93	7.82	----	----	----	----	----
Solids, total dissolved [TDS]	----	E162/WT	mg/L		787 DLDS	1460 DLDS	----	----	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103A/WT	mg/L		760	1270	----	----	----	----	----
Turbidity	----	E121/WT	NTU		136	>4000 TMV	----	----	----	----	----
Langelier index (@ 20°C)	----	EC105A/WT	-		0.886	1.80	----	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	-		0.640	1.55	----	----	----	----	----
pH, saturation (@ 20°C)	----	EC105A/WT	pH units		7.04	6.02	----	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	pH units		7.29	6.27	----	----	----	----	----

Matrix: Water			Client sample ID	BH24-01	BH24-02	----	----	----	----	----
			Client sampling date / time	23-Apr-2025 13:05	23-Apr-2025 14:05	----	----	----	----	----
			Sub-Matrix	Water	Water	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2509198-001	WT2509198-002	----	----	----	----	----
				Result	Result	----	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	mg/L	0.141	1.10	----	----	----	----	----
Bromide	24959-67-9	E235.Br/WT	mg/L	<0.50 DLDS	<0.50 DLDS	----	----	----	----	----
Chloride	16887-00-6	E235.Cl/WT	mg/L	75.6 DLDS	67.8 DLDS	----	----	----	----	----
Fluoride	16984-48-8	E235.F/WT	mg/L	0.165 DLDS	0.221 DLDS	----	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	mg/L	<0.100 DLDS	8.42 DLDS	----	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	mg/L	<0.112	8.49	----	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	mg/L	0.062 DLDS	0.073 DLDS	----	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	mg/L	0.0076	<0.0010	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	mg/L	275 DLDS	605 DLDS	----	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	mg/L	1.70	4.78	----	----	----	----	----
Metals										
Sodium adsorption ratio [SAR]	----	EC102/WT	-	0.98	2.24	----	----	----	----	----
Ion Balance										
Anion sum	----	EC101A/WT	meq/L	13.5	59.1	----	----	----	----	----
Cation sum (total)	----	EC101A/WT	meq/L	12.8	21.4	----	----	----	----	----
Ion balance (APHA)	----	EC101A/WT	%	-2.66	-46.8	----	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WT	%	94.8	36.2	----	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/WT	mg/L	0.260	0.0389 DLHC	----	----	----	----	----

Matrix: Water

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	BH24-01	BH24-02	----	----	----	----	----
				Client sampling date / time	23-Apr-2025 13:05	23-Apr-2025 14:05	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					WT2509198-001	WT2509198-002	----	----	----	----	----
					Result	Result	----	----	----	----	----
Total Metals											
Antimony, total	7440-36-0	E420/WT	mg/L		0.00049	<0.00100 DLHC	----	----	----	----	----
Arsenic, total	7440-38-2	E420/WT	mg/L		0.00174	<0.00100 DLHC	----	----	----	----	----
Barium, total	7440-39-3	E420/WT	mg/L		0.0528	0.0716 DLHC	----	----	----	----	----
Beryllium, total	7440-41-7	E420/WT	mg/L		0.000024	<0.000200 DLHC	----	----	----	----	----
Bismuth, total	7440-69-9	E420/WT	mg/L		<0.000050	<0.000500 DLHC	----	----	----	----	----
Boron, total	7440-42-8	E420/WT	mg/L		0.075	<0.100 DLHC	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	mg/L		0.0000176	<0.0000500 DLHC	----	----	----	----	----
Calcium, total	7440-70-2	E420/WT	mg/L		108	174 DLHC	----	----	----	----	----
Cesium, total	7440-46-2	E420/WT	mg/L		0.000058	<0.000100 DLHC	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	mg/L		0.00062	<0.00500 DLHC	----	----	----	----	----
Cobalt, total	7440-48-4	E420/WT	mg/L		0.00108	<0.00100 DLHC	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	mg/L		0.00100	<0.00500 DLHC	----	----	----	----	----
Iron, total	7439-89-6	E420/WT	mg/L		0.430	<0.100 DLHC	----	----	----	----	----
Lead, total	7439-92-1	E420/WT	mg/L		0.000954	<0.000500 DLHC	----	----	----	----	----
Lithium, total	7439-93-2	E420/WT	mg/L		0.0409	0.0161 DLHC	----	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	mg/L		61.0	54.6 DLHC	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	mg/L		0.114	0.445 DLHC	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/WT	mg/L		0.0122	0.00251 DLHC	----	----	----	----	----
Nickel, total	7440-02-0	E420/WT	mg/L		0.00382	<0.00500 DLHC	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/WT	mg/L		<0.050	<0.500 DLHC	----	----	----	----	----

Matrix: Water

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	BH24-01	BH24-02	----	----	----	----	----
				Client sampling date / time	23-Apr-2025 13:05	23-Apr-2025 14:05	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					WT2509198-001	WT2509198-002	----	----	----	----	----
					Result	Result	----	----	----	----	----
Total Metals											
Potassium, total	7440-09-7	E420/WT	mg/L		6.21	92.0 DLHC	----	----	----	----	----
Rubidium, total	7440-17-7	E420/WT	mg/L		0.00261	0.0151 DLHC	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	mg/L		0.000398	<0.000500 DLHC	----	----	----	----	----
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/ WT	mg/L		19.0	11.8	----	----	----	----	----
Silicon, total	7440-21-3	E420/WT	mg/L		8.87	5.53 DLHC	----	----	----	----	----
Silver, total	7440-22-4	E420/WT	mg/L		<0.000010	<0.000100 DLHC	----	----	----	----	----
Sodium, total	7440-23-5	E420/WT	mg/L		51.3	132 DLHC	----	----	----	----	----
Strontium, total	7440-24-6	E420/WT	mg/L		0.911	0.915 DLHC	----	----	----	----	----
Sulfur, total	7704-34-9	E420/WT	mg/L		103	204 DLHC	----	----	----	----	----
Tellurium, total	13494-80-9	E420/WT	mg/L		<0.00020	<0.00200 DLHC	----	----	----	----	----
Thallium, total	7440-28-0	E420/WT	mg/L		0.000014	<0.000100 DLHC	----	----	----	----	----
Thorium, total	7440-29-1	E420/WT	mg/L		0.00024	<0.00100 DLHC	----	----	----	----	----
Tin, total	7440-31-5	E420/WT	mg/L		<0.00010	<0.00100 DLHC	----	----	----	----	----
Titanium, total	7440-32-6	E420/WT	mg/L		<0.00600 DLUI	<0.00300 DLHC	----	----	----	----	----
Tungsten, total	7440-33-7	E420/WT	mg/L		0.00054	<0.00100 DLHC	----	----	----	----	----
Uranium, total	7440-61-1	E420/WT	mg/L		0.00375	0.00561 DLHC	----	----	----	----	----
Vanadium, total	7440-62-2	E420/WT	mg/L		0.00105	<0.00500 DLHC	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	mg/L		0.0063	<0.0300 DLHC	----	----	----	----	----
Zirconium, total	7440-67-7	E420/WT	mg/L		0.00025	<0.00200 DLHC	----	----	----	----	----

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

Summary of Guideline Limits

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2509198**	Page	: 1 of 12
Amendment	: **1**		
Client	: **EnVision Consultants Ltd.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Rob Byers	Account Manager	: Emily Hansen
Address	: 6415 Northwest Drive U37-40 Mississauga ON Canada L4V 1X1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 24-0774.200	Date Samples Received	: 24-Apr-2025 09:00
PO	: ----	Issue Date	: 26-Jun-2025 13:55
C-O-C number	: 23-1123762		
Sampler	: DD		
Site	: ----		
Quote number	: 2024-2025 Standing Offer		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

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 : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
BH24-01	E298	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	28-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
BH24-02	E298	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	28-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP]										
BH24-01	E235.Br	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP]										
BH24-02	E235.Br	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH24-01	E235.Cl	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH24-02	E235.Cl	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
BH24-01	E378-U	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP] BH24-02	E378-U	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH24-01	E235.F	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH24-02	E235.F	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] BH24-01	E235.NO3	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] BH24-02	E235.NO3	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] BH24-01	E235.NO2	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] BH24-02	E235.NO2	23-Apr-2025	26-Apr-2025	7 days	3 days	✓	29-Apr-2025	7 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] BH24-01	E235.SO4	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] BH24-02	E235.SO4	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	29-Apr-2025	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP] BH24-01	E358-L	23-Apr-2025	26-Apr-2025	3 days	3 days	✓	28-Apr-2025	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP] BH24-02	E358-L	23-Apr-2025	26-Apr-2025	3 days	3 days	✓	28-Apr-2025	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] BH24-01	E290	23-Apr-2025	26-Apr-2025	14 days	3 days	✓	26-Apr-2025	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] BH24-02	E290	23-Apr-2025	26-Apr-2025	14 days	3 days	✓	26-Apr-2025	14 days	3 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] BH24-02	E330	23-Apr-2025	----	----	----		29-Apr-2025	48 hrs	148 hrs	× EHT
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP] BH24-01	E330	23-Apr-2025	----	----	----		29-Apr-2025	48 hrs	149 hrs	× EHT
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH24-01	E100	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	26-Apr-2025	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH24-02	E100	23-Apr-2025	26-Apr-2025	28 days	3 days	✓	26-Apr-2025	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] BH24-01	E108	23-Apr-2025	26-Apr-2025	14 days	3 days	✓	26-Apr-2025	14 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / 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 : pH by Meter										
HDPE [ON MECP]										
BH24-02	E108	23-Apr-2025	26-Apr-2025	14 days	3 days	✓	26-Apr-2025	14 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
BH24-01	E162	23-Apr-2025	----	----	----		29-Apr-2025	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
BH24-02	E162	23-Apr-2025	----	----	----		29-Apr-2025	7 days	6 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP]										
BH24-02	E121	23-Apr-2025	----	----	----		26-Apr-2025	48 hrs	68 hrs	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP]										
BH24-01	E121	23-Apr-2025	----	----	----		26-Apr-2025	48 hrs	69 hrs	× EHT
Sample Data : Sample Hold Fee for Water										
HDPE [ON MECP]										
BH24-01	HOLD	23-Apr-2025	----	----	----		25-Apr-2025	----	----	
Sample Data : Sample Hold Fee for Water										
HDPE [ON MECP]										
BH24-02	HOLD	23-Apr-2025	----	----	----		25-Apr-2025	----	----	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH24-01	E420	23-Apr-2025	28-Apr-2025	180 days	5 days	✓	28-Apr-2025	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH24-02	E420	23-Apr-2025	28-Apr-2025	180 days	5 days	✓	28-Apr-2025	180 days	5 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)							
Conductivity in Water	E100	1967607	1	9	11.1	5.0	✓
pH by Meter	E108	1967605	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	1967645	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1971033	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	1967604	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1967602	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1967599	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967601	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967600	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1967603	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	1967606	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	1968085	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1971792	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1967609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1967608	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1968730	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	1967607	1	9	11.1	5.0	✓
pH by Meter	E108	1967605	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	1967645	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1971033	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	1967604	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1967602	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1967599	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967601	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967600	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1967603	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	1967606	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	1968085	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1971792	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1967609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1967608	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1968730	1	20	5.0	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	1967607	1	9	11.1	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Turbidity by Nephelometry	E121	1967645	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1971033	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	1967604	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1967602	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1967599	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967601	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967600	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1967603	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	1967606	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	1968085	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1971792	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1967609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1967608	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1968730	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC	E235.Br	1967604	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1967602	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1967599	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967601	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967600	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1967603	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	1968085	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1967609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1967608	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1968730	1	20	5.0	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
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	“Hardness (as CaCO3), from total Ca/Mg” is calculated from the sum of total Calcium and Magnesium concentrations, expressed as CaCO3 equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because hardness is a property of water due to dissolved divalent cations. In non-turbid waters, Hardness from total Ca/Mg is normally comparable to Dissolved Hardness, but may be biased high if particulate forms of Ca or Mg are present.
Ion Balance using Total Metals	EC101A ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sodium Adsorption Ratio [SAR] from Total Metals	EC102 ALS Environmental - Waterloo	Water	CCME Sodium Adsorption Ratio (SAR)	The Sodium Adsorption Ratio (SAR) for a water sample is calculated from the Sodium, Calcium, and Magnesium concentrations of the water, using the same calculations as would be used for a sediment paste extract.
TDS calculated from conductivity	EC103A ALS Environmental - Waterloo	Water	APHA 1030 E	Total dissolved solids (as mg/L) can be estimated by multiplying electrical conductance (in umhos/cm) by 0.65.
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2 ALS Environmental - Waterloo	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).
Sample Hold Fee for Water	HOLD ALS Environmental - Waterloo	Water		Fee for storing sample to meet sample integrity requirements and holding times.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

QUALITY CONTROL REPORT

Work Order	: **WT2509198**	Page	: 1 of 13
Amendment	: **1**		
Client	: EnVision Consultants Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Rob Byers	Account Manager	: Emily Hansen
Address	: 6415 Northwest Drive U37-40 Mississauga ON Canada L4V 1X1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 24-0774.200	Date Samples Received	: 24-Apr-2025 09:00
PO	: ----	Date Analysis Commenced	: 25-Apr-2025
C-O-C number	: 23-1123762	Issue Date	: 26-Jun-2025 13:56
Sampler	: DD		
Site	: ----		
Quote number	: 2024-2025 Standing Offer		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Ayesha Moughal	Account Manager Assistant	Waterloo Administration, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, 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: 1967605)											
WT2509171-005	Anonymous	pH	----	E108	0.10	pH units	8.21	8.21	0.00%	4%	----
Physical Tests (QC Lot: 1967606)											
WT2509171-005	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	208	207	0.125%	20%	----
Physical Tests (QC Lot: 1967607)											
WT2509171-005	Anonymous	Conductivity	----	E100	2.0	µS/cm	801	808	0.870%	10%	----
Physical Tests (QC Lot: 1967645)											
HA2501140-005	Anonymous	Turbidity	----	E121	0.10	NTU	12.1	12.7	4.83%	15%	----
Physical Tests (QC Lot: 1971033)											
BF2500005-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	121	126	4	Diff <2x LOR	----
Physical Tests (QC Lot: 1971792)											
WT2509198-001	BH24-01	Colour, apparent	----	E330	10.0	CU	570	568	0.326%	20%	----
Anions and Nutrients (QC Lot: 1967599)											
WT2509198-001	BH24-01	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.165	0.166	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967600)											
WT2509198-001	BH24-01	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967601)											
WT2509198-001	BH24-01	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	0.062	0.063	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967602)											
WT2509198-001	BH24-01	Chloride	16887-00-6	E235.Cl	2.50	mg/L	75.6	75.7	0.153%	20%	----
Anions and Nutrients (QC Lot: 1967603)											
WT2509198-001	BH24-01	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	275	275	0.122%	20%	----
Anions and Nutrients (QC Lot: 1967604)											
WT2509198-001	BH24-01	Bromide	24959-67-9	E235.Br	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967608)											
WT2509171-007	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0028	0.0026	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1968085)											
HA2500860-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0294	0.0292	0.0002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1967609)											
TY2503859-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.84	1.64	0.20	Diff <2x LOR	----
Total Metals (QC Lot: 1968730)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1968730) - continued											
HA2501159-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0067	0.0062	0.0005	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	0.00010	0.000001	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00283	0.00292	3.22%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000118	0.0000099	0.0000019	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	7.82	7.91	1.07%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000019	0.000019	0.0000005	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0563	0.0570	1.12%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.410 µg/L	0.000417	0.000007	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	0.435	0.440	1.15%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00297	0.00293	1.34%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00059	0.00057	0.00002	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.418	0.401	0.017	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.306	0.309	0.003	Diff <2x LOR	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00088	0.00093	0.00005	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	0.48	0.47	0.002	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	10.3	10.2	1.04%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.00789	0.00805	2.09%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	3.81	3.72	0.09	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1968730) - continued											
HA2501159-001	Anonymous	Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.169	0.166	1.71%	20%	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	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: 1967606)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1967607)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1967645)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1971033)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1971792)						
Colour, apparent	----	E330	2	CU	<2.0	----
Anions and Nutrients (QCLot: 1967599)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1967600)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1967601)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1967602)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1967603)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1967604)						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 1967608)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1968085)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 1967609)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1968730)						
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	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1968730) - continued						
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
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	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
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	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1967605)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1967606)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	102	85.0	115	----
Physical Tests (QCLot: 1967607)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	99.9	90.0	110	----
Physical Tests (QCLot: 1967645)									
Turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 1971033)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	96.7	85.0	115	----
Physical Tests (QCLot: 1971792)									
Colour, apparent	----	E330	2	CU	25 CU	95.4	85.0	115	----
Anions and Nutrients (QCLot: 1967599)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1967600)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 1967601)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1967602)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 1967603)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1967604)									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 1967608)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	98.6	80.0	120	----
Anions and Nutrients (QCLot: 1968085)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.2	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1967609)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	108	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1968730)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	104	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	105	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	104	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	102	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	102	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	98.7	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	101	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.002 mg/L	101	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	99.3	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	100	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	100	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	101	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	100	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.012 mg/L	100	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	110	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	99.0	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	100	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	102	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	99.1	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	98.6	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	101	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	98.6	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	98.7	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.012 mg/L	103	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	105	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	99.0	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	99.2	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	97.4	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	98.3	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	103	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0 mg/L	104	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1968730) - continued									
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	103	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	97.8	80.0	120	----

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: 1967599)										
WT2509198-001	BH24-01	Fluoride	16984-48-8	E235.F	5.18 mg/L	5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1967600)										
WT2509198-001	BH24-01	Nitrate (as N)	14797-55-8	E235.NO3	12.4 mg/L	12.5 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 1967601)										
WT2509198-001	BH24-01	Nitrite (as N)	14797-65-0	E235.NO2	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1967602)										
WT2509198-001	BH24-01	Chloride	16887-00-6	E235.Cl	502 mg/L	500 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1967603)										
WT2509198-001	BH24-01	Sulfate (as SO4)	14808-79-8	E235.SO4	499 mg/L	500 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1967604)										
WT2509198-001	BH24-01	Bromide	24959-67-9	E235.Br	2.58 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1967608)										
WT2509171-007	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0180 mg/L	0.02 mg/L	91.9	70.0	130	----
Anions and Nutrients (QCLot: 1968085)										
HA2500860-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0975 mg/L	0.1 mg/L	97.5	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1967609)										
TY2503859-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.10 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 1968730)										
HA2501159-002	Anonymous	Aluminum, total	7429-90-5	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0503 mg/L	0.05 mg/L	100	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0507 mg/L	0.05 mg/L	101	70.0	130	----
		Barium, total	7440-39-3	E420	0.0121 mg/L	0.012 mg/L	97.1	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.00473 mg/L	0.005 mg/L	94.5	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0490 mg/L	0.05 mg/L	98.1	70.0	130	----
		Boron, total	7440-42-8	E420	0.049 mg/L	0.05 mg/L	98.0	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00486 mg/L	0.005 mg/L	97.1	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00258 mg/L	0.002 mg/L	103	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0126 mg/L	0.012 mg/L	100	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Iron, total	7439-89-6	E420	0.051 mg/L	0.05 mg/L	101	70.0	130	----
		Lead, total	7439-92-1	E420	0.0246 mg/L	0.025 mg/L	98.5	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0115 mg/L	0.012 mg/L	92.3	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1968730) - continued										
HA2501159-002	Anonymous	Magnesium, total	7439-95-4	E420	2.68 mg/L	2.5 mg/L	107	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0130 mg/L	0.012 mg/L	104	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0126 mg/L	0.012 mg/L	101	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		Phosphorus, total	7723-14-0	E420	ND mg/L	----	ND	70.0	130	----
		Potassium, total	7440-09-7	E420	2.44 mg/L	2.5 mg/L	97.4	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.00516 mg/L	0.005 mg/L	103	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0473 mg/L	0.05 mg/L	94.7	70.0	130	----
		Silicon, total	7440-21-3	E420	0.48 mg/L	0.5 mg/L	95.2	70.0	130	----
		Silver, total	7440-22-4	E420	0.00486 mg/L	0.005 mg/L	97.2	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	0.0126 mg/L	0.012 mg/L	100	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	----	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.00464 mg/L	0.005 mg/L	92.8	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0480 mg/L	0.05 mg/L	95.9	70.0	130	----
		Thorium, total	7440-29-1	E420	0.00503 mg/L	0.005 mg/L	101	70.0	130	----
		Tin, total	7440-31-5	E420	0.0246 mg/L	0.025 mg/L	98.5	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0126 mg/L	0.012 mg/L	100	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.00502 mg/L	0.005 mg/L	100	70.0	130	----
		Uranium, total	7440-61-1	E420	0.000260 mg/L	0 mg/L	104	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0256 mg/L	0.025 mg/L	102	70.0	130	----
		Zinc, total	7440-66-6	E420	ND mg/L	----	ND	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.00494 mg/L	0.005 mg/L	98.8	70.0	130	----

MC-817
N-731
MM-817

Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1123762

Page of

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Canada Toll Free: 1 800 668 9878

Environmental Division
Waterloo
Work Order Reference
WT2509198

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Envision Consultants Ltd.
Contact:	Payden @ envisionconsultants.ca
Phone:	905-037-0202
	Company address below will appear on the final report
Street:	6415 Northwest Dr. units 37-40
City/Province:	Mississauga, ON
Postal Code:	L4V 1X1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	rhayes@envisionconsultants.ca
Email 2	dabrianty@envisionconsultants.ca
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Turnaround Time (TAT) Requested	
☒	Routine [R] if received by 3pm M-F - no surcharges apply
☐	4 day [P4] if received by 3pm M-F - 20% rush surcharge minimu
☐	3 day [P3] if received by 3pm M-F - 25% rush surcharge minimu
☐	2 day [P2] if received by 3pm M-F - 50% rush surcharge minimu
☐	1 day [E] if received by 3pm M-F - 100% rush surcharge minimu
☐	Same day [E2] if received by 10am M-S - 200% rush surcharge

Additional fees may apply to rush requests on weekend

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please

Project Information	
ALS Client Code / QUOTE #:	
Job / Project #:	24-0774.200
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 # (ALS use only): WT2509198

ALS Contact: Sampler: DJ

Analysis Request

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

ALS Sample # (ALS 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	General Chemistry	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH24-01	23/04/25	1:05	GW	4	X			
	BH24-02	23/04/25	2:05	GW	4	X			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	
Are samples for human consumption/ use? ☐ YES ☒ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
3.6	4.5

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	23/04/25	5:33	AM	04/24/25	9:00		4/24/25	11:15

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 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**.

APPENDIX F: *Water Balance Calculations*

TABLE F-1

CLIMATE NORMALS 1981-2010 (Georgetown WWTP Climate Station)

7072 Sixth Line, Milton, ON

	Thornthwaite (1948)					
Month	**Mean Temperature (°C)**	**Heat Index**	**Potential Evapotranspiration (mm)**	**Daylight Correction Value**	**Adjusted Potential Evapotranspiration (mm)**	**Total Precipitation (mm)**
January	-6.3	0.0	0.0	0.78	0.0	67.8
February	-5.2	0.0	0.0	0.88	0.0	60.0
March	-0.9	0.0	0.0	0.99	0.0	57.2
April	6.0	1.3	28.0	1.12	31.4	76.5
May	12.3	3.9	59.7	1.22	72.9	79.3
June	17.4	6.6	86.1	1.28	110.2	74.8
July	20.0	8.2	99.8	1.25	124.7	73.5
August	19.0	7.5	94.5	1.15	108.7	79.3
September	14.8	5.2	72.6	1.04	75.5	86.2
October	8.4	2.2	39.9	0.92	36.7	68.3
November	2.8	0.4	12.5	0.8	10.0	88.5
December	-2.9	0.0	0.0	0.76	0.0	65.9
TOTALS		**35.3**	**493.2**		**570.1**	**877.3**

NOTES:

1) Water budget adjusted for latitude and daylight.

2) (°C) – Represents calculated mean of avarage daily temperatures for the month.

3) Precipitation and Temperature data from Georgetown WWTP Climate Station located at latitude 43°38'24.018" N , longitude 79°52'45.018" W , elevation 221.00 m.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as a total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

TABLE F-2

Hydrologic Cycle Component Values

7072 Sixth Line, Milton, ON

			Month												Total
			March	April	May	June	July	August	September	October	November	December	January	February	
APE - Adjusted Potential Evapotranspiration (mm)			0.0	31.4	72.9	110.2	124.7	108.7	75.5	36.7	10.0	0.0	0.0	0.0	**570.1**
P - Total Precipitation (mm)			57.2	76.5	79.3	74.8	73.5	79.3	86.2	68.3	88.5	65.9	67.8	60.0	**877.3**
P-PET (mm)			57.2	45.1	6.4	-35.4	-51.2	-29.4	10.7	31.6	78.5	65.9	67.8	60.0	-
Soil Moisture Deficit (mm)			0.0	0.0	0.0	-35.4	-86.7	-116.0	-105.3	-73.8	0.0	0.0	0.0	0.0	-
Urban Lawns/Shallow Rooted Crops (spinach, beans, beets, carrots)	Fine Sand (A)	Δ ST (mm)	50.0	50.0	50.0	14.6	0.0	0.0	10.7	42.3	50.0	50.0	50.0	50.0	-
		AET (mm)	0.0	31.4	72.9	97.7	81.0	79.3	75.5	36.7	10.0	0.0	0.0	0.0	**484.4**
	Fine Sandy Loam, Clay (B and D)	Δ ST (mm)	75.0	75.0	75.0	39.6	0.0	0.0	10.7	42.3	75.0	75.0	75.0	75.0	-
		AET (mm)	0.0	31.4	72.9	101.9	87.0	79.3	75.5	36.7	10.0	0.0	0.0	0.0	**494.7**
	Silt Loam (C)	Δ ST (mm)	125.0	125.0	125.0	89.6	38.3	9.0	19.7	51.2	125.0	125.0	125.0	125.0	-
		AET (mm)	0.0	31.4	72.9	105.2	99.7	84.9	75.5	36.7	10.0	0.0	0.0	0.0	**516.3**
	Clay Loam (D)	Δ ST (mm)	100.0	100.0	100.0	64.6	13.3	0.0	10.7	42.3	100.0	100.0	100.0	100.0	-
		AET (mm)	0.0	31.4	72.9	104.0	93.4	81.3	75.5	36.7	10.0	0.0	0.0	0.0	**505.2**
Moderately Rooted Crops (corn and cereal grains)	Fine Sand (A)	Δ ST (mm)	75.0	75.0	75.0	39.6	0.0	0.0	10.7	42.3	75.0	75.0	75.0	75.0	-
		AET (mm)	0.0	31.4	72.9	101.9	87.0	79.3	75.5	36.7	10.0	0.0	0.0	0.0	**494.7**
	Fine Sandy Loam, Clay (B and D)	Δ ST (mm)	150.0	150.0	150.0	114.6	63.3	34.0	44.7	76.2	150.0	150.0	150.0	150.0	-
		AET (mm)	0.0	31.4	72.9	106.1	103.9	88.8		36.7	10.0	0.0	0.0	0.0	**449.7**
	Silt Loam, Clay Loam (C and CD)	Δ ST (mm)	200.0	200.0	200.0	164.6	113.3	84.0	94.7	126.2	200.0	200.0	200.0	200.0	-
		AET (mm)	0.0	31.4	72.9	107.1	109.1	93.8	75.5	36.7	10.0	0.0	0.0	0.0	**536.5**
Pasture and Shrubs	Fine Sand (A)	Δ ST (mm)	100.0	100.0	100.0	64.6	13.3	0.0	10.7	42.3	100.0	100.0	100.0	100.0	-
		AET (mm)	0.0	31.4	72.9	104.0	93.4	81.3	75.5	36.7	10.0	0.0	0.0	0.0	**505.2**
	Fine Sandy Loam (B)	Δ ST (mm)	150.0	150.0	150.0	114.6	63.3	34.0	44.7	76.2	150.0	150.0	150.0	150.0	-
		AET (mm)	0.0	31.4	72.9	106.1	103.9	88.8	75.5	36.7	10.0	0.0	0.0	0.0	**525.2**
	Silt Loam, Clay Loam (C and CD)	Δ ST (mm)	250.0	250.0	250.0	214.6	163.3	134.0	144.7	176.2	250.0	250.0	250.0	250.0	-
		AET (mm)	0.0	31.4	72.9	107.7	112.2	96.8	75.5	36.7	10.0	0.0	0.0	0.0	**543.2**
	Clay (D)	Δ ST (mm)	200.0	200.0	200.0	164.6	113.3	84.0	94.7	126.2	200.0	200.0	200.0	200.0	-
		AET (mm)	0.0	31.4	72.9	107.1	109.1	93.8	75.5	36.7	10.0	0.0	0.0	0.0	**536.5**

NOTES:

1) PET and P Taken from Table 1

2) Soil Moisture Deficit (mm) is a function of the accumulation of P-Pet once there is a shortage of P to satisfy PET and terminated once the defficit is eliminated

3) Water Holding Capacity (mm) of soils types taken from Table 3.1, SWM Planning & Design Manual (MOE, March 2003) and applied to March

4) Actual Evapotranspiration (AET) is a function of Adjusted Potential Evapotranspiration (PET) and change in Groundwater Storage (Δ ST) for a given soil type as shown in Table 2

AET Calculation for Areas Receiving Roof Runoff

			Month												Total
			March	April	May	June	July	August	September	October	November	December	January	February	
P - Total Precipitation (mm)			57.2	76.5	79.3	74.8	73.5	79.3	86.2	68.3	88.5	65.9	67.8	60.0	**877.3**
Precipitation from Roof (80% of P) (mm)			45.8	61.2	63.4	59.8	58.8	63.4	69.0	54.6	70.8	52.7	54.2	48.0	**701.8**
Runoff Volume (Roof Area:Area Accepting Roof Runoff) (mm)			28.8	38.6	40.0	37.7	37.1	40.0	43.5	34.4	44.6	33.2	34.2	30.3	**442.4**
Total Load onto Lawns (P + Runoff) (mm)			86.0	115.1	119.3	112.5	110.6	119.3	129.7	102.7	133.1	99.1	102.0	90.3	**1319.7**
Urban Lawns	Silt Loam (C)	Δ ST (mm)	125.0	112.9	74.2	32.4	105.9	125.0	125.0	125.0	125.0	112.4	114.3	106.5	-
		AET (mm)	0.0	31.4	72.9	111.5	118.4	108.7	75.5	36.7	10.0	0.0	0.0	0.0	**565.1**

NOTES:

1) PET and P Taken from Table 1

2) Soil Moisture Deficit (mm) is a function of the accumulation of P-Pet once there is a shortage of P to satisfy PET and terminated once the defficit is eliminated

3) Water Holding Capacity (mm) of soils types taken from Table 3.1, SWM Planning & Design Manual (MOE, March 2003) and applied to March

4) Actual Evapotranspiration (AET) is a function of Adjusted Potential Evapotranspiration (PET) and change in Groundwater Storage (Δ ST) for a given soil type as shown in Table 2

Roof Area:	1,809	m^2
Area Accepting Roof Runoff:	2,870	m^2

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TABLE F-3

WATER BUDGET - PRE-DEVELOPMENT (Existing) CONDITIONS

7072 Sixth Line, Milton, ON

Catchment Designation	Site			
	Building	Uncultivated (Shrubs and Pasture)	Parking Areas (Dirt/Gravel Road)	Totals
Area (m^2)	348	2,353	8,028	**10,729.0**
Pervious Area (m^2)	0	2,353	8,028	**10,381**
Impervious Area (m^2)	348	0	0	**348**
Infiltration Factors				
Topography Infiltration Factor	0.30	0.30	0.30	
Soil Infiltration Factor	0.15	0.15	0.15	
Land Cover Infiltration Factor	0.10	0.15	0.10	
MOECC Infiltration Factor	0.55	0.60	0.55	
Actual Infiltration Factor	0.55	0.60	0.55	
Run-Off Coefficient	0.45	0.40	0.45	
Run-Off from Impervious Surfaces*	0.85	0.85	0.85	
Inputs (per Unit Area)				
Precipitation (mm/yr)	877	877	877	
Run-On (mm/yr)	0	0	0	
Other Inputs (mm/yr)	0	0	0	
Outputs (per Unit Area)				
Precipitation Surplus (mm/yr)	341	334	361	
Net Surplus (mm/yr)	341	334	361	
Actual Evapotranspiration (mm/yr)	536	543	516	
Evaporation (mm/yr)	132	132	132	
Infiltration (mm/yr)	187	200	199	
Runoff Pervious Areas	153	134	162	
Runoff Impervious Areas	746	746	746	
Inputs (Volumes)				
Precipitation (m^3/yr)	305	2,064	7,043	**9,413**
Total Inputs (m^3/yr)	**305**	**2,064**	**7,043**	**9,413**
Outputs (Volumes)				
Precipitation Surplus (m^3/yr)	119	786	2,898	**3,944**
Net Surplus (m^3/yr)	119	786	2,898	**3,944**
Actual Evapotranspiration (m^3/yr)	0	1,278	4,145	**5,423**
Evaporation (mm/yr)	46	0	0	**46**
Infiltration (m^3/yr)	0	472	1,594	**2,066**
Total Infiltration (m^3/yr)	0	472	1,594	**2,066**
Runoff Pervious Areas (m^3/yr)	0	314	1,304	**1,619**
Runoff Impervious Areas (m^3/yr)	260	0	0	**260**
Total Runoff (m^3/yr)	260	314	1,304	**1,878**
Total Outputs (m^3/yr)	**305**	**2,064**	**7,043**	**9,413**
Difference (Inputs - Outputs)	**0**	**0**	**0**	**0**

* Evaporation from impervious areas assumed to be 20% of precipitation

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TABLE F-4

WATER BUDGET - POST-DEVELOPMENT CONDITIONS

7072 Sixth Line, Milton, ON

Catchment Designation	Site					
	Building Areas (Rooftop)	Concrete	Lawn	Parking Lot	Uncultivated	Totals
Area (m^2)	720	142	644	5,382	3,842	**10,730.0**
Pervious Area (m^2)	0	0	644	0	3,842	**4,486**
Impervious Area (m^2)	720	142	0	5,382	0	**6,244**
Infiltration Factors						
Topography Infiltration Factor	0.30	0.30	0.30	0.30	0.30	
Soil Infiltration Factor	0.15	0.15	0.15	0.15	0.15	
Land Cover Infiltration Factor	0.10	0.10	0.10	0.10	0.10	
MOE Infiltration Factor	0.55	0.55	0.55	0.55	0.55	
Actual Infiltration Factor**	0.50	0.50	0.50	0.50	0.50	
Run-Off Coefficient	0.51	0.51	0.51	0.51	0.51	
Run-Off from Impervious Surfaces***	0.85	0.85	0.85	0.85	0.85	
Inputs (per Unit Area)						
Precipitation (mm/yr)	877	877	877	877	877	
Run-On (mm/yr)	0	0	0	0	0	
Other Inputs (mm/yr)	0	0	0	0	0	
Outputs (per Unit Area)						
Precipitation Surplus (mm/yr)	361	877	361	361	361	
Net Surplus (mm/yr)	361	877	361	361	361	
Actual Evapotranspiration (mm/yr)	516	0	516	516	516	
Evaporation (mm/yr)	132	132	132	132	132	
Infiltration (mm/yr)	179	434	179	179	179	
Runoff Pervious Areas	182	443	182	182	182	
Runoff Impervious Areas	746	746	746	746	746	
Inputs (Volumes)						
Precipitation (m^3/yr)	632	125	565	4,722	3,371	**9,413**
Run-On (m^3/yr)	0	0	0	0	0	**0**
Other Inputs (m^3/yr)	0	0	0	0	0	**0**
Total Inputs (m^3/yr)	**632**	**125**	**565**	**4,722**	**3,371**	9,413
Outputs (Volumes)						
Precipitation Surplus (m^3/yr)	260	125	233	1,943	1,387	**6,276**
Net Surplus (m^3/yr)	260	125	233	1,943	1,387	**6,276**
Actual Evapotranspiration (m^3/yr)	0	0	332	0	1,983	**2,316**
Evaporation (m^3/yr)	95	19	0	708	0	**822**
Infiltration (m^3/yr)	0	0	115	0	687	**802**
Total Infiltration (m^3/yr)	0	0	115	0	687	**802**
Runoff Pervious Areas (m^3/yr)	0	0	118	0	700	**818**
Runoff Impervious Areas (m^3/yr)	537	106	0	4,013	0	**4,656**
Total Runoff (m^3/yr)	2	106	118	4,013	700	**4,939**
Total Outputs (m^3/yr)	**97**	**125**	**565**	**4,722**	**3,371**	8,879
Difference (Inputs - Outputs)	**535**	**0**	**0**	**0**	**0**	535

*It is assumed that 15% of the rainfall on rooftop will evaporate.

**Post-development infiltration is reduced by 10% due to soil compaction from construction

*** Evaporation from impervious areas assumed to be 15% of precipitation

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TABLE F-5

Water Balance Summary

7072 Sixth Line, Milton, ON

Characteristic	Site			
	Pre-Development	Post-Development	Change (Pre- to Post)	% Change (Pre- to Post-)
Inputs (Volumes)				
Precipitation (m^3/yr)	9,412.6	9,413.4	0	0%
Run-On (m^3/yr)	0	0	0	0%
Other Inputs (m^3/yr)	0	0	0	0%
Total Inputs (m^3/yr)	**9,413**	**9,413**	0	**0%**
Outputs (Volumes)				
Precipitation Surplus (m^3/yr)	3,944	6,276	2,332	59%
Net Surplus (m^3/yr)	3,944	6,276	2,332	59%
Actual Evapotranspiration (m^3/yr)	5,423	2,316	-3,107	-57%
Evaporation (m^3/yr)	46	822	776	1694%
Infiltration (m^3/yr)	2,066	802	-1,264	-61%
Total Infiltration (m^3/yr)	2,066	802	-1,264	-61%
Runoff Pervious Areas (m^3/yr)	1,619	818	-801	-49%
Runoff Impervious Areas (m^3/yr)	260	4,656	4,397	1694%
Total Runoff (m^3/yr)	1,878	4,939	3,061	163%
Total Outputs (m^3/yr)	**9,413**	**8,879**	**0**	**-6%**

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