

# PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

16469 10 Side Road | Halton Hills,  
Ontario

**PREPARED FOR:**

Russell Pines Property Corp  
5400 Yonge Street, Fifth Floor  
Toronto, ON

**ATTENTION:**

Maria Herrera

**Grounded Engineering Inc.**

File No. 24-048

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# 1 Executive Summary

Russell Pines Property Corp retained Grounded Engineering Inc. to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 16469 10 Side Road, Halton Hills, Ontario (Property). The Phase Two ESA was conducted to investigate the Areas of Potential Environmental Concern (APECs) that have been identified on the Property.

The results of the Phase Two ESA are summarized below:

<b>Applicable Site Condition Standards</b>	O.Reg 153/04 Table 2 RPI
<b>Soil Contaminants of Potential Concern (CoPCs) Investigated</b>	<ul style="list-style-type: none"> <li>Metals (M)</li> <li>Hydride-forming Metals (H-M) <ul style="list-style-type: none"> <li>Arsenic (As), Selenium (Se), Antimony (Sb)</li> </ul> </li> <li>Other Regulated Parameters (ORPs) <ul style="list-style-type: none"> <li>B-HWS, CN-, EC, SAR, Cr(VI), Hg</li> </ul> </li> <li>Polycyclic Aromatic Hydrocarbons (PAH)</li> <li>Petroleum Hydrocarbons (PHCs)</li> <li>Volatile Organic Compounds II - Benzene, Toluene, Ethylbenzene, Xylene (BTEX)</li> <li>Volatile Organic Compounds I (VOCs)</li> <li>Organochlorine Pesticides (OCs)</li> </ul>
<b>Groundwater CoPCs Investigated</b>	<ul style="list-style-type: none"> <li>Metals</li> <li>Hydride-forming Metals <ul style="list-style-type: none"> <li>As, Se, Sb</li> </ul> </li> <li>Other Regulated Parameters <ul style="list-style-type: none"> <li>Cr(VI), CN-, Hg, Cl-</li> </ul> </li> <li>Sodium (Na)</li> <li>PHCs</li> <li>BTEX</li> <li>VOC</li> </ul>
<b>Applicable Site Condition Standards Met for Soil? (Yes/No)</b>	Yes
<b>Applicable Site Condition Standards Met for Groundwater? (Yes/No)</b>	Yes

It is our understanding that the Phase Two ESA was completed for the draft plan approval process with the Region of Halton and thus was completed in compliance with O.Reg 153/04. It is our understanding that there will be no change to a more sensitive land use, and as such, a Record of Site Condition (RSC) will not be required.



## 2 Introduction

### 2.1 Site Description

Russell Pines Property Corp retained Grounded, to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the Property known as 16469 10 Side Road, Halton Hills, ON. The Property is bound by Winstone Churchill Blvd, 10 Side Road, 10<sup>th</sup> Line and Guelph Street. The Property location is presented in Figure 1.

The Property is irregular in shape, with an approximate area of 53.28 ha. The Property consists of undeveloped land, agricultural land, two residential homes and a former barn and other structures associated with farming operation. The Property is currently Agricultural Land use as defined in O.Reg.153/04. The Phase Two ESA has been prepared in accordance with Ontario Regulation 153/04 (O.Reg. 153/04) for the purpose of draft site approval.

### 2.2 Property Ownership

The Property information is provided below:

<b>Municipal Address</b>	16469 10 Side Road, Halton Hills, Ontario.
<b>Legal Description</b>	Part Lots 11 & 12 Con 11 Esquesing, Part 1, 20R21398
<b>PIN(s)</b>	25050-2997 (LT)
<b>Current Land Use</b>	Agriculture
<b>Property Owner Information</b>	Russell Pines Property Corp. 5400 Yonge Street, Fifth Floor Toronto, Ontario, M2N 5R5
<b>Person who has engaged the Qualified Person to conduct the Phase One ESA</b>	Maria Herrera

### 2.3 Current and Proposed Future Uses

The Property is considered to be in agricultural land use as defined by the Ontario Ministry of the Environment, Conservation and Parks (MECP) O.Reg 153/04.

It is understood that the Phase Two Property is proposed to be redeveloped with residential subdivisions. The Property will be considered to be residential land use as defined by the O.Reg 153/04.

### 2.4 Applicable Site Condition Standard

The applicable site condition standard for the Phase Two Property is determined to be Table 2 Full Depth Generic Site Condition Standards for residential Property use in a Potable Ground Water Condition (Table 2 RPI SCS), set out in the MECP document entitled **Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*** (April 2011 and updates), based on the following rationale:



<b>Current Land Use</b>	Agriculture
<b>Future Land Use</b>	Residential
<b>Soil Texture</b>	Medium to fine based on grain size analysis performed on the soil (Appendix C).
<b>Potable Water Source</b>	The Property is not serviced by municipal potable drinking water.
<b>Bedrock Depth</b>	Bedrock is located at a depth greater than 2 m for at least 2/3 of the area of the Property.
<b>Property located within 30 m of a surface water body (Yes/No)</b>	No
<b>Property located in or adjacent to a provincial park or an Area of Natural Significance (Yes/No)</b>	No

## 3 Background Information

### 3.1 Physical Setting

The Ministry of Natural Resources and Forestry (MNRF) and Ministry of Energy, Northern Development and Mines (MENDM) database were searched to obtain topographic and geological maps of Ontario for review. The information obtained are summarized below:

<b>Records</b>	<b>Information</b>
Topographic Maps	The approximate elevation of the Property is 229 meters above sea level (masl). The Property is generally flat with a slope towards the south and east.
Hydrology	<p>The nearest water body is a small tributary of the Credit River, which is located approximately to the northeast and a small tributary of Levi's Creek located southwest of the Property. The Credit River is located approximately 150 m east of the Property. Lake Ontario is located approximately 26 km south of the Property.</p> <p>Surface water flow is expected to infiltrate through the surface soil and flow with the groundwater. Groundwater is expected to flow northeast, towards Credit River or south towards Levi's Creek, and ultimately south to Lake Ontario. Lake Ontario is located approximately 26 km to the south of Property.</p>
Geological Maps	<p><u>Overburden:</u></p> <p>Fine-textured glaciolacustrine deposits comprised of silt and clay, minor sand, and gravel.</p> <p>Coarse-textured glaciolacustrine deposits comprised of sand, gravel, minor silt, and clay.</p> <p><u>Bedrock:</u></p> <p>Queenston Formation comprised of shale, limestone, dolostone, and siltstone.</p>

Maps from MNRF were reviewed to determine if water bodies were present on the Property and within the Study Area. The Ontario Ministry of Natural Resources National Heritage Information Centre database for Areas of Natural or Scientific Interest (ANSIs) was also reviewed as part of the Phase Two ESA. The information is summarized below:



<b>Water Bodies</b>	<p><u>Property:</u></p> <ul style="list-style-type: none"> <li>• A tributary of the Credit River is located northeast of the Property.</li> <li>• A tributary of Levi's Creek is located southwest of the Property</li> </ul> <p><u>Study Area:</u></p> <ul style="list-style-type: none"> <li>• Credit River is located 150 m east of the Property.</li> </ul>
<b>Wetlands</b>	<p><u>Property:</u></p> <ul style="list-style-type: none"> <li>• Unevaluated wetlands are located on the central to north-central portions of the Property.</li> </ul> <p><u>Study Area:</u></p> <ul style="list-style-type: none"> <li>• Provincially Significant wetlands are located 175 m south and 190 m northeast of the Property.</li> </ul>
<b>ANSIs</b>	<p><u>Property:</u></p> <ul style="list-style-type: none"> <li>• A Provincially Significant Life Science ANSI is located on the northern portion of the Property.</li> </ul> <p><u>Study Area:</u></p> <ul style="list-style-type: none"> <li>• A Provincially Significant Life Science ANSI is located adjacent north to the Property.</li> </ul>

The Areas of Natural Significances (ANSIs) and water bodies on or adjacent to the Property is shown in Figure 2, if present.

## 3.2 Past Investigations

The following environmental report was provided for review for the Property. The findings of the report are summarized below:

<b>Title and File No.</b>	Phase One Environmental Site Assessment, Proposed Residential Development, 15 Green Street (or 16469 10 Side Road) Town of Halton Hills. (File No. 1502-S023E)
<b>Report Date</b>	June 12, 2015
<b>Prepared By</b>	Soils Engineers Ltd.
<b>Prepared for</b>	Fieldgate Developments Inc.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• The Phase One ESA was completed for the purposes of identifying potential environmental concerns associated with the Property and was generally completed in accordance with O.Reg. 153/04.</li> <li>• At the time of the site inspection completed on March 27, 2015 the Property was mainly used for agricultural purposes and was occupied by the following: <ul style="list-style-type: none"> <li>○ One (1) residential building, one (1) garage, two (2) barns and a water pump house in the central portion of the Property (15 Green Street). <ul style="list-style-type: none"> <li>▪ The basement contained one (1) 200 L AST installed in 1997. No staining was observed beneath the AST, however, a large crack was observed on the concrete floor beside the AST.</li> <li>▪ Substance containers (gasoline jerry cans and used oil containers) were observed in the garage.</li> </ul> </li> <li>○ One (1) residential building and one (1) garage in the southeastern portion of the Property (35 Adamson Street South). <ul style="list-style-type: none"> <li>▪ The basement contained one (1) 200 L AST installed in 2009. No staining or crack was observed beneath the AST.</li> </ul> </li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>○ A wooded area and orchard located in the north-central portion of the Property.</li> <li>○ Agricultural fields in the remaining areas.</li> <li>○ The Property was reportedly heated by fuel oil fired boiler and serviced by a septic system and a water well.</li> <li>• Based on interviews previously conducted in 2015, it was noted that: <ul style="list-style-type: none"> <li>○ A series of ASTs and propane gas vessels were located along the southwest side of the residential building located in the central portion of the Property.</li> <li>○ A heating oil UST was formerly located on the east side of the residential building located in the central portion of the Property but was removed in 1997. During the removal of the UST, fuel spillage was observed.</li> </ul> </li> <li>• The report identified the following APEC causing PCAs: <ul style="list-style-type: none"> <li>○ Application of pesticides for agricultural activities was present on the entire Property.</li> <li>○ Application of pesticides for the orchard was present on the north-central portion of the Property.</li> <li>○ Historical gasoline station (Norval Gas Bar) with retail fuel storage tanks present at 488 Green Street (Grounded notes that this gas bar is listed as 488 Guelph Street in the ERIS report).</li> <li>○ Autobody shop (Arnie's Body Shop) present at 490 Green Street.</li> <li>○ USTs, ASTs, and substance containers were present on the central portion of the Property.</li> <li>○ Farm equipment and vehicle maintenance activities were present on the central portion of the Property.</li> </ul> </li> <li>• The report identified designated substances and special attention items to be considered prior to any renovation or demolition: <ul style="list-style-type: none"> <li>○ Lead and asbestos in building materials</li> <li>○ PCBs in light ballasts</li> </ul> </li> </ul>
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<b>Title and File No.</b>	A Geotechnical Investigation For Proposed Residential Development, 15 Green Street of Halton Hills. (File No. 2004-S054)
<b>Report Date</b>	August 27, 2020
<b>Prepared By</b>	Soils Engineers Ltd.
<b>Prepared for</b>	Russell Pines Property Corp.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• The report was completed for the purposes of determining design data required for the design and construction of a residential development.</li> <li>• The Property was reportedly occupied by an open field with tree areas.</li> <li>• Four (4) boreholes (BH101 to BH104) were advanced in June 2020 to a depth of 6.1 to 6.6 m below ground surface (bgs).</li> <li>• The soil stratigraphy encountered at the Property was generally a layer of topsoil overlying earth fill in certain areas, followed by native silty clay and silty clay till, with compact to very dense sand and silt deposits, overlying shale bedrock.</li> <li>• Groundwater was measured at approximately 1.2 to 2.6 mbgs.</li> <li>• No environmental sampling was conducted in the</li> </ul>





<b>Title and File No.</b>	Phase One Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 211-03319-00-Ph1ESA)
<b>Report Date</b>	August 19, 2021
<b>Prepared By</b>	WSP Canada Inc.
<b>Prepared for</b>	Russell Pines Property Corp.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>The Phase One ESA was completed for the purposes of identifying potential environmental concerns associated with the Property and was generally completed in accordance with O.Reg. 153/04.</li> <li>The site encompasses the north portion of the Property located at 16469 10 Sideroad, legally described as Pt. Lots 11 &amp; 12 Concession 11 ESQ; Part 1, 20R21398 Town of Halton Hills. The Phase One ESA was not completed on the entire Property.</li> <li>At the time of the site inspection completed on March 29, 2021 the Property was an undeveloped land covered by forested, grassed, and graveled areas. <ul style="list-style-type: none"> <li>No ASTs or USTs were identified on-site.</li> </ul> </li> <li>Based on interview previously conducted in 2021, it was noted that: <ul style="list-style-type: none"> <li>No fuel storage occurred on-site.</li> <li>Two farmsteads located approximately 100 m south and 400 m southeast of the site were heated by fuel oil ASTs that were installed in 1997 and 2009, respectively.</li> <li>A UST was removed from the property at 16469 10 Sideroad, south adjacent of the house. During removal fuel spillage was observed and no remediation was conducted. The location was backfilled with on-site material.</li> </ul> </li> <li>The report identified the following APEC causing PCAs: <ul style="list-style-type: none"> <li>Autobody shop (Arnie's Body Shop) with two ASTs present at 490 Guelph Street.</li> <li>Gas bar with two 18,000 L tanks at 488 Guelph Street.</li> </ul> </li> <li>Based on the Phase One ESA, a Phase Two ESA was recommended to further investigate the APECs identified.</li> </ul>

<b>Title and File No.</b>	Phase Two Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 211-03319-00-PhIIESA)
<b>Report Date</b>	January 6, 2022
<b>Prepared By</b>	WSP Canada Inc.
<b>Prepared for</b>	Russell Pines Property Corp.



<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>A Phase Two ESA was completed to further investigate the APECs identified in the Phase One ESA in support of the development application for the site.</li> <li>The site encompasses the north portion of the property located at 16469 10 Sideroad, legally described as Pt. Lots 11 &amp; 12 Concession 11 ESQ; Part 1, 20R21398 Town of Halton Hills.</li> <li>The investigation included the advancement of five (5) boreholes (MW21-1 to MW21-4) to depths of 5.3 to 8.3 m below ground surface (mbgs), all completed as monitoring wells.</li> <li>The soil stratigraphy encountered at the site was generally a layer of silty sand/sandy silt, underlain by clayey to sandy silt/silty clay with sand and gravel deposits, overlying weathered shale.</li> <li>Site Condition Standards were determined to be Table 1 site condition standards (SCS) for Residential / Parkland / Institutional / Industrial / Commercial / Community property use with coarse textured soils.</li> <li>Soil was not submitted for O.Reg 153/04 analysis. One composite TCLP sample was submitted for analysis.</li> <li>Groundwater was reportedly analyzed for chemical analysis of one or more of the following parameters: petroleum hydrocarbons F1-F4 fraction (PHC), volatile organic compounds (VOC), and Benzene, Ethylbenzene, Toluene and Xylene (BTEX).</li> <li>The results indicated that groundwater samples met MECP Table 1 SCS.</li> <li>The report concluded that no further investigation was recommended at that time.</li> </ul>
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<b>Title and File No.</b>	Phase I Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 24-048)
<b>Report Date</b>	May 8, 2024
<b>Prepared By</b>	Grounded Engineering Inc.
<b>Prepared for</b>	Russell Pines Property Corp.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>A Phase I ESA was completed for due diligence purposes.</li> <li>The Property is currently used for agricultural and residential purposes and consists of a mowed farm field, two residential homes and associated garages/sheds.</li> </ul> <p>The findings of the Phase I ESA are as follows:</p> <ul style="list-style-type: none"> <li>PCAs have been identified on the Property and within the Phase I Study Area. A summary of the PCAs and an assessment of their potential to affect the soil and groundwater at the Property is provided in Table 2. The PCAs identified resulted in the identification of APECs for the Property.</li> <li>Based on the information obtained and reviewed during this Phase I ESA, Grounded recommends that a Phase II ESA be conducted to determine if any soil and groundwater contamination at the Property.</li> </ul>

## 4 Scope of the Investigation

For discussion and illustration purposes, the information from the 2022 Phase Two ESA completed by WSP has been relied upon and included in the following sections of this Phase Two ESA report and figures.



## 4.1 Overview of Site Investigation

The scope of the Phase Two ESA is as follow:

<b>Boreholes and Monitoring Wells</b>	<b>WSP Drilling Investigation (January 2022)</b> <ul style="list-style-type: none"> <li>The investigation included the advancement of five (5) boreholes to depths of 5.3 to 8.3 m below ground surface (mbgs)– WSP-MW21-1 to 21-4</li> <li>Installation of five (5) monitoring wells – WSP-MW21-1 to 21-4</li> </ul> <b>Grounded Drilling Investigation (May 2024)</b> <ul style="list-style-type: none"> <li>Grounded advanced a total of 19 boreholes for environmental, geotechnical and hydrogeological purposes to depths of 6.1 to 21.3 m mBGS – BH101 to BH119</li> <li>Installation of 16 monitoring wells – BH 101 S/D, 102,103, 104 S/D, 106, 107, 190, 112, 114 and 115 to 119.</li> <li>Boreholes 103, 104, 107, 110, 114, 115 and 116 and monitoring wells 21-4, 106D, 115,117, 118 and 119 were advanced for environmental purposes, the information regarding the geotechnical and hydrogeological boreholes is provided under separate covers.</li> </ul>
	<ul style="list-style-type: none"> <li>6 soil samples were submitted for grain size analysis and soil classification.</li> <li>All boreholes and monitoring wells were surveyed to a geodetic benchmark.</li> <li>New and existing monitoring wells were developed prior to sampling.</li> <li>Groundwater level measurements were conducted in all accessible monitoring wells to determine groundwater elevation on the Property</li> </ul>

## 4.2 Media Investigated

### 4.2.1 Rationale for Exclusion and Inclusion of Media

Media	Included/Excluded	Rationale
Soil	Included	Based on the Phase One ESA, soil sampling was required to investigate the CoPCs related to the identified APECs.
Sediment	Excluded	Surface water bodies were not presented on the Property. No sediment sampling was conducted during the Phase Two ESA.
Groundwater	Included	Based on the Phase One ESA, groundwater sampling was required to investigate the CoPCs related to the identified APECs.
Surface Water	Excluded	Surface water bodies were not presented on the Property. No surface water sampling was conducted during the Phase Two ESA.

### 4.2.2 Overview of Field Investigation of Media

Soil sampling was conducted during the drilling investigation. Groundwater sampling was conducted from the new and existing monitoring wells installed on the Property.



### 4.3 Phase One Conceptual Site Model

The Phase One Conceptual Site Model (CSM) prepared as part of the Phase One ESA report is provided in Appendix A.

### 4.4 Deviations From Sampling and Analysis Plan

At the time of the drilling, staining and black material was observed at BH114 between

No other deviations from the sampling and analysis plan were observed. The Sampling and Analysis Plan is provided in Appendix B.

### 4.5 Impediments

No impediments were encountered during the Phase Two ESA.

## 5 Investigation Method

### 5.1 General

The Phase Two ESA followed the methods outlined in the Ontario Ministry of the Environment, Conservation, and Parks "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" (December 1996).

The methods used in the Phase Two ESA did not differ from the associated standard operating procedures.

### 5.2 Drilling

The Phase Two ESA drilling information is provided below:

<b>Boreholes</b>	<ul style="list-style-type: none"><li>• WSP-MW21-1 to 21-4</li><li>• BH101 to 119</li></ul>
<b>Date of Work</b>	<ul style="list-style-type: none"><li>• May 20 and 21 2022</li><li>• February 23, 2024</li></ul>
<b>Name of the Contractor(s)</b>	<ul style="list-style-type: none"><li>• Landshark</li><li>• 3D Drilling</li></ul>
<b>Equipment Used</b>	CME 55 Truck mount drill
<b>Measures for Cross-contamination Prevention</b>	The split spoon sampling device was washed between each sample to prevent cross-contamination. New well materials were used during install and drilling technicians donned new nitrile gloves to handle well materials prior to install.



<b>Sampling Frequency</b>	Please refer to the borehole logs in Appendix B for the sampling frequency.
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The borehole locations are provided in Figure 4.

## 5.3 Soil – Sampling

### 5.3.1 Equipment Used

Below is the equipment used during the soil sampling.

- Sampling containers supplied by the laboratories
- Nitrile gloves
- Cooler with ice
- RKI EAGLE 2 gas monitor

### 5.3.2 Geological Description

The borehole logs in Appendix C provide an overall geological description of each soil sample collected during the 2024 Grounded Phase Two ESA investigation.

## 5.4 Soil – Field Screening Measurements

Hydrocarbon vapour concentrations were screened in each soil sampling, using an RKI Eagle 2 gas monitor. The monitor is calibrated to *n*-hexane and isobutylene prior to field screening as per the calibration procedure outlined by RKI Instruments in “*Eagle 2 Operator’s Manual, Part Number:71-0154RK*” released March 12, 2019. The monitor has a range of 0 to 40,000 parts per million (ppm) and an accuracy of +/- 5%

Based on field screening measurements and visual and olfactory examination of all soil samples, selected samples were submitted for petroleum hydrocarbon (PHCs) and volatile organic compounds (VOCs) laboratory analysis. Complete field screening readings are provided on the borehole logs in Appendix C

## 5.5 Groundwater – Field Measurement of Water Quality Parameters

Water quality parameters including temperature, pH, specific conductivity, total dissolved solids were measured using a Hanna Instruments portable meter prior to sampling.

## 5.6 Groundwater – Monitoring Well Installation

The Phase Two ESA monitoring well installation information is provided below:

<b>Monitoring Wells</b>	<ul style="list-style-type: none"> <li>• MW WSP-MW21-1 to 21-4</li> <li>• MW 101 - 104, 106, 107, 109, 112, 114, 115 and 117-119.</li> </ul>
<b>Date of Work</b>	<ul style="list-style-type: none"> <li>• May 20 and 21 2022</li> <li>• February 23, 2024</li> </ul>





<b>Name of the Contractor(s)</b>	<ul style="list-style-type: none"> <li>Landshark</li> <li>3D Drilling</li> </ul>
<b>Equipment Used</b>	CME 55 Truck mount drill
<b>Measures for Cross-contamination Prevention</b>	<p>The split spoon sampling device was washed between each sample to prevent cross-contamination.</p> <p>New well materials were used during install and drilling technicians donned new nitrile gloves to handle well materials prior to install.</p>
<b>Sampling Frequency</b>	No groundwater samples were collected during drilling event.
<b>Well Construction</b>	The wells were constructed with 50 mm (2 in.) ID PVC screens and risers. Filter sand was placed around the well screen to approximately 0.6 m above the top of the screen. The wells were then backfilled with bentonite to approximately 0.3 m below ground surface (mbgs). The wells were finished with
<b>Well Development</b>	The new monitoring wells were developed prior to sampling on May 21 and 22 2024. A total of 172 L of water was removed during the well development process. Stabilization of parameters (pH, conductivity, temperature, etc.) of the purged water was monitored before a sample to ensure the samples are representative of the formation water.

The monitoring well locations are provided in Figure 4.

## 5.7 Groundwater – Sampling

The monitoring wells were purged and sampled using wattera and bailers. The groundwater was purged before sampling to ensure extraction of representative formation groundwater. Stabilization of water quality parameters of the purged water was monitored before a sample was taken to maintain the equilibrium with the surrounding formation water and produce samples that are representative of the formation water.

Sampling methodology from the Ontario Ministry of the Environment, Conservation and Parks (MECP) *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites In Ontario"*, MECP *"Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04"* and MECP *"Protocol for Analytical Methods Used in the Assessment of Properties under Par XV.1 of the Environmental Protection Act"* were followed in the collection of the groundwater samples.

## 5.8 Sediment – Sampling

No sediment sampling was conducted as part of this investigation.

## 5.9 Analytical Testing

Analytical Testing of all soil and groundwater samples was conducted by CALA accredited ALS.

## 5.10 Residue Management Procedures

Residues from the field investigation were managed accordingly as provided below:



Residues	Management Procedures
Soil Cuttings	Minimal soil cuttings were generated during the initial drilling investigation and as such, they were left on-site. Soil cuttings generated during the delineation investigation were collected and removed from the Property.
Groundwater	The purged water generated during the development was left on-site. No excess ground water was produced during subsequent ground water sampling events.
Fluids from Equipment Cleaning	The fluids from cleaning were removed from the Property and disposed by the drilling contractor.

## 5.11 Elevation Surveying

The elevation as well as the latitude and longitude coordinates of the boreholes on the Property were surveyed using a Sokkia survey system. The Sokkia is a differential global positioning system (GPS). The coordinates and elevations of each borehole on the Property are presented on the borehole logs in Appendix B. The average vertical degree of precision was 0.007 m and horizontal was 0.004 m.

## 5.12 Quality Assurance and Quality Control Measures

### 5.12.1 Containers, Preservation, Labelling, Handling and Chain of Custody

The following laboratory supplied sample containers were used for all sampling conducted on the Property.

Parameter/Group	Containers	
	Soil	Groundwater
Inorganic Parameters: Chromium hexavalent (CrVI), cyanide (CN-), pH, electrical conductivity (EC)  Soil only: boron, hot water soluble (B-HWS), sodium adsorption ratio (SAR)  Water only: chloride	250 g soil jar	500 mL PET 60 mL plastic (CrVI) 120 mL plastic (CN-)
Metals		250 mL HDPE (Metals)
Mercury (Hg)		60 mL amber glass (Hg)
Volatile Organic Compounds (VOCs) including benzene, toluene, ethylbenzene, xylene (BTEX) and trihalomethanes (THMs)	100 g soil jar 2 x 40 mL pre-weighed methanol 5 g soil plug	2 x 40 mL amber vial (zero headspace)
Petroleum hydrocarbons (PHCs) F1/ BTEX		
Organochlorine pesticides (OCP)	100 g soil jar	NA



Parameter/Group	Containers	
	Soil	Groundwater
PHCs (F2-F4)	100 g soil jar	2 x 100 mL bottles fill to top of label
Polycyclic aromatic hydrocarbons (PAHs)	100 g soil jar	NA
Toxicity characteristic leaching procedure (TCLP)	250 g soil jar	NA

All sampling containers were equipped with laboratory supplied labels. The labels indicated the following information:

- Sample ID
- Company name
- Date
- Project number

Samples were placed in coolers with ice after collection for transportation to the laboratory. Sample hold times were met for all submitted soil and groundwater samples. Laboratory supplied Chain of Custody forms were completed for all samples submitted for analysis.

### 5.12.2 Equipment Cleaning Procedures

Equipment	Cleaning Procedures
Soil sampling	Split spoon sampling device was washed between samples to prevent potential cross-contamination.
Groundwater sampling	Water level meter/ water quality monitoring meter was cleaned between monitoring wells.

All other dedicated equipment (nitrile gloves, terracores samplers, tubing) were changed between each sample to avoid cross-contamination.

### 5.12.3 Field Quality Control Measures and Deviations

For quality control purpose, the following actions were taken:

- At least one (1) duplicate sample is submitted for laboratory analysis for every ten (10) samples submitted for laboratory analysis for each sampled medium.
- Daily calibration of field instruments prior to sampling
- Groundwater trip blanks are used for Quality Assurance purposes for sampling of Volatile Organic Compounds.

No deviations from the quality assurance and quality control measures had occurred.



## 6 Review and Evaluation

### 6.1 Geology

Geological Units	Description	Elevation Range of Unit Interface (mASL)
<b>Topsoil</b> (25 to 230 mm thick)	Topsoil thicknesses were observed in individual borehole locations through the top of the open borehole. Thicknesses may vary between and beyond each borehole location. Boreholes 101, 102 and 104 to 119 encountered 100 – 250 mm of topsoil at ground surface.	Ground Surface
<b>Disturbed Native Earth Fill</b> (0.8 to 2.3 m thick)	Underlying the surficial materials, the boreholes observed a layer of disturbed native earth fill that extends to depths of 0.8 to 2.3 metres below grade (Elev. 230.5 to 223.9 metres). This layer varies in composition but generally consists of sand some silt trace clay to sandy silt, clayey with trace gravel, trace rootlets. This layer is typically brown to dark brown, and moist to wet.	231.2 to 224.2 mASL
<b>Sands</b> (1.7 to 9.0 m thick)	Underlying the topsoil or disturbed native earth fill, Boreholes 105, 106, 109, 110, 112, 113 and 118 encountered a stratum of undisturbed native cohesionless sand trace silt to silty sand at depths of 0.2 to 1.5 m below grade (Elev. 230.4 to 222.7 m) extending down to depths of 1.7 to 2.6 m below grade (Elev. 228.9 to 221.8 m). This unit contains trace clay, trace to some gravel, and is generally brown with orange to brown, and wet. Underlying the sands, Borehole 113 encountered a deposit of silty sand glacial till with some gravel and some clay. This unit was generally grey and wet to moist. Borehole 113 reached the target investigation depth in this stratum.	230.5 to 223.9 mASL
<b>Silts and Clays Till</b> (1.7 to 9.0 m thick)	Underlying the topsoil or disturbed native earth fill in Boreholes 101 to 104, 107, 108, 111, 114 to 117 and 119 and the sands in Boreholes 105, 106, 109, 110, 112, 113 and 118 the boreholes encountered a stratum of undisturbed native clayey silt to silt and clay glacial till at depths of 0.8 to 2.6 m below grade (Elev. 229.7 to 201.1 m) extending down to depths of 2.3 to 20.3 m below grade (Elev. 228.4 to 198.5 m). This unit contains some sand to sandy, trace to some gravel, and is generally brown with black to grey with orange, and moist to wet. Within the glacial till, Borehole 103, 111, 112, 114 and 117 encountered a deposit of non glacial till deposit of clayey silt to silt and clay with trace to some sand and trace gravel. This unit was generally grey and moist. Boreholes 104 to 112 and 114 to 119 reached the target investigation depth in this stratum.	228.9 to 221.8 mASL
<b>Bedrock</b>	Bedrock was inferred in Boreholes 101 to 103 underlying the silt and clay to clayey silt till at depths of 4.6 to 13.7 m below grade (Elev. 225.4 to	228.4 to 198.5 mASL (Bedrock interface)



Geological Units	Description	Elevation Range of Unit Interface (mASL)
	212.8 m). Rock coring was not included in our scope. The bedrock was inferred from observations of auger and split spoon resistance and limited sample recovery in the split spoons to depths of 6.2 to 15.3 below grade (Elev. 223.8 to 211.2 m), at which depths Boreholes 101 to 103 were terminated. The bedrock beneath the site is known to consist of reddish brown shale of the Queenston Formation, which typically has a weathered zone at the surface of the bedrock, which transitions to unweathered (sound) bedrock. Sound bedrock elevations were not determined in the boreholes, as this was not part of this scope of work.	

### 6.1.1 Properties of Aquifers and Aquitards

Aquifers/Aquitards	Description
Sands	The Sands on the Property is considered to be in an unconfined aquifer. The water likely drains into the silt and clay layer.
Silts and Clay Till	The Sands on the Property is considered to be in an unconfined aquifer. The water likely drains into the bedrock layer.
Bedrock	The Bedrock on the Property is considered to be an unconfined aquifer. The water likely drains through fractures and joints.

### 6.1.2 Rationale for Choice of Aquifers and Aquitards Investigated

The Silt and Clays unit was chosen for investigation. This stratum was chosen for investigation because:

- Possibility of free groundwater present
- The possible location of mobile contamination within the native overburden and lower units
- The likelihood of horizontal migration of groundwater across the site

## 6.2 Groundwater: Elevations and Flow Direction

Fourteen (14) monitoring wells were installed by Grounded. Monitoring wells were located within the APECs identified in the Phase I ESA for the Property (Grounded, 2024). Screened intervals of the monitoring wells were selected for the collection of ground water samples within the desired stratum.

Two (2) ground water level measurements were conducted by Grounded in the newly installed monitoring wells using a Solinst interface probe on the following dates:

- May 21, 2024
- May 27, 2024
- June 12, 2024

To calculate the ground water elevation in the monitoring well, the following calculation was completed:

- $\text{Geodetic Ground Elevation (mASL)} - \text{Measured Depth to Water Table (m)} + \text{Stick up of Well (m)} = \text{Groundwater Elevation (mASL)}$





No light non-aqueous phase liquids (LNAPL) or dense non-aqueous phase liquids (DNAPL) or free-flowing products were detected on the Property. The groundwater levels are presented in Table 1 and Figure 4. The shallowest groundwater depth was measured at 0.35 mbgs (228.45 masl) and was observed at BH112 located on the western portion side of the Property, on May 21, 2024.

Based on the groundwater elevations measured on the Property, the groundwater within the aquifer is encountered at a depth of approximately 0.35 to 18.17 mbgs (Elev. 228.45 to 206.53 masl) and was determined to flow locally to the east. Regional groundwater flow is expected to flow to the east towards The Credit River. Groundwater contours are presented in Figure 4.

Additional groundwater data will be required to assess seasonal variability in groundwater quantity and flow direction.

Based on the highest groundwater level of 0.53 mbgs observed at the Property, there is the potential that the buried utilities could influence the groundwater flow.

### 6.3 Groundwater: Hydraulic Gradients

<b>Horizontal Hydraulic Gradients</b>	The horizontal hydraulic gradient at the Property was determined to be approximately 0.006 based on the groundwater levels in boreholes BH 18 and 19.
<b>Vertical Hydraulic Gradients</b>	The vertical hydraulic gradient at the Property was determined to be approximately 1.31 downwards based on the groundwater levels in boreholes BH 104S and 104D.
<b>Hydraulic Conductivity</b>	<p>Silts – <math>10^{-5}</math> to <math>10^{-9}</math> m/s</p> <p>Glacial Till – <math>10^{-6}</math> to <math>10^{-12}</math></p> <p>Clays – <math>10^{-9}</math> to <math>10^{-12}</math></p> <p>Bedrock – <math>10^{-6}</math> to <math>10^{-13}</math></p>

### 6.4 Medium-Fine Soil Texture

Grain size analyses were completed for selected soil samples from the boreholes at the Property. The grain size analysis is provided in Appendix D.

Based on the grain size analysis completed, it was determined that at least 1/3 of the soil at the Property, measured by volume, consists of medium-fine textured soil. Therefore, the qualified person has determined that medium-fine textured soil standards will be applicable for this Property.

### 6.5 Soil – Field Screening

Based on field screening measurements and visual and olfactory examination of all soil samples, selected samples were submitted for petroleum hydrocarbon (PHCs) and volatile organic compounds (VOCs) laboratory analysis. Complete field screening readings are provided on the borehole logs in Appendix C. No anomalous organic vapour readings were identified to indicate the presence of any volatile contaminants.



## 6.6 Soil – Quality

### 6.6.1 Location and Depth of Samples

Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PAHs	PHC & BTEX	VOCs	OCs
	mbgs	masl							
BH103 SS1	0.0 - 0.6	226.5 - 225.9	SL-SN	1	✓				
BH103 SS2	0.8 - 1.4	225.7 - 225.1	SL-SN	1					✓
BH104 SS1	0.0 - 0.6	224.7 - 224.1	SL-SN	1	✓				
BH104 SS2	0.8 - 1.4	224.0 - 223.4	SL-SN	1					✓
BH106 SS2	0.8 - 1.4	223.4 - 222.8	SN	6			✓		
BH107 SS1	0.0 - 0.6	225.8 - 225.2	SN-SL	1					✓
BH107 SS2	0.8 - 1.4	225.0 - 224.4	SN-SL	1	✓				
BH110 SS1	0.0 - 0.6	229.1 - 228.5	SL-SN	1	✓				
BH110 SS2	0.8 - 1.4	228.3 - 227.7	SL-SN	1					✓
BH114 SS1	0.0 - 0.6	230.7 - 230.1	SN-CL-SL	1	✓				
BH114 2A	0.8 - 0.9	229.9 - 229.8	SN-CL-SL	1					✓
BH114 2C	1.0 - 1.4	229.7 - 229.3	CL-SL-TL	None (Site observations)		✓			
BH115 SS2	0.8 - 1.4	225.2 - 224.6	CL-SL-TL	7	✓				
BH115 SS3	1.5 - 2.1	224.5 - 223.9	CL-SL-TL	7			✓	✓	
BH116 SS1	0.0 - 0.6	225.8 - 225.2	CL-SL-TL	2					✓
BH116 SS2	0.8 - 1.4	225.1 - 224.5	CL-SL-TL	2	✓				
BH117 3A	1.5 - 1.8	224.5 - 224.2	CL-SL-TL	3			✓		



Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PAHs	PHC & BTEX	VOCs	OCs
	mbgs	masl							
BH118 SS3	1.5 - 2.1	224.6 - 224.0	SN	4			✓		
BH119 SS5	3.0 - 3.7	222.4 - 221.8	CL-SL-TL	5			✓		

## 6.6.2 Comparison to Applicable Standards

Selected soil samples were analyzed for Contaminants of Potential Concern (CoPCs) of the following:

- Metals
- Hydride-Forming Metals
  - Sb, As, Se
- Select ORPs
  - B-HWS
  - CN-
  - EC
  - SAR
  - Cr(VI)
  - Hg
- PAHs
- PHCs
- BTEX
- VOCs

The results of the analyses were compared to the applicable Site Condition Standard for the Phase Two Property Table 2 RPI MF. The laboratory certificates of analysis are provided in Appendix E, and the results of the soil chemical analysis are provided in Tables 2 – 7 and presented on Figure 5.

Comparison Table (Table 2 RPI MF SCS)		
Analyte Method Group	Meets/Exceeds	Notes
Metals	Meets	None
H-Ms	Meets	None
ORPs	Meets	None
PAHs	Meets	None
PHC	Meets	None



Comparison Table (Table 2 RPI MF SCS)		
Analyte Method Group	Meets/Exceeds	Notes
BTEX	Meets	None
VOCs	Meets	None
OCs	Meets	None

### 6.6.3 Leachate Analysis

In addition to the 4 analyses noted above, samples were submitted for analysis of O. Reg. 347 Schedule 4 parameters (TCLP analysis) for waste classification purposes. The analysis was conducted for the following parameters:

- Metals & Inorganics
- PCBs
- PAHs (benzo(a)pyrene)
- VOCs

The results of the analysis indicated that the soil is considered non-hazardous for waste disposal purposes and should be handled accordingly. The laboratory certificates of analysis are provided in Appendix D, and the results of the leachate analysis are provided in Table 8.

### 6.6.4 Contaminants of Concern

No Contaminants of Concern were identified within soil on the Property.

### 6.6.5 Contamination Impact on Other Media

No Contaminants of Concern were identified within soil on the Property. It is unlikely that other media on the Property will be impacted.

### 6.6.6 Chemical or Biological Transformations

No chemical or biological transformations are likely to occur since no Contaminants of Concern were identified in the soil on the Property.

### 6.6.7 Presence of Light or Dense Non-Aqueous Phase Liquids

No light non-aqueous phase liquids (LNAPL) or dense non-aqueous phase liquids (DNAPL) were detected in the soil on the Property.



## 6.7 Groundwater Quality

For discussion and illustration purposes, the analytical information from the 2022 Phase II ESA completed by WSP has been relied upon and included in the following sections of this Phase Two ESA report and figures.

### 6.7.1 Location and Depth of Samples

Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PHC & BTEX	VOCs
	mbgs	masl					
MW 21-4	1.2 - 4.7	204.8 - 201.7	SN-SL	-		✓	✓
BH106D	4.6 - 6.1	219.6 - 218.1	SN-SL-TL	1		✓	✓
BH115	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	2	✓	✓	✓
BH117	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	3	✓	✓	✓
BH118	1.5 - 4.6	224.6 - 221.5	SN	4		✓	✓
BH119	1.5 - 4.6	223.9 - 220.8	SL-TL	5		✓	✓

Field filtering as per the requirements of the MECP "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" July 2011, was completed.

### 6.7.2 Comparison to Applicable Standards

Selected groundwater samples were analyzed for Contaminants of Potential Concern (CoPCs) of the following:

- Metals
- Hydride-forming metals
  - Sb, As, Se
- Selected Other Regulated Parameters (ORPs)
  - Cr(VI), CN-, Hg, Cl-, Na
- PHCs
- BTEX
- VOCs

The results of the analysis were compared to the applicable Site Condition Standard for the Phase Two Property Table 2 CT. The laboratory certificates of analysis are provided in Appendix E, and the results of the groundwater chemical analysis are provided in Tables 9 - 12 and presented on Figure 6.





Comparison Table 2 SCS		
Analyte Method Group	Meets/Exceeds	Notes
Metals	Meets	None
H-Ms	Meets	None
ORPs	Meets	None
PAHs	Meets	None
PHC	Meets	None
BTEX	Meets	None
VOCs	Meets	None
OCs	Meets	None

### 6.7.3 Contaminants of Concern

No Contaminants of Concern were identified in the groundwater on the Property.

### 6.7.4 Contamination Impact on Other Media

No Contaminants of Concern were identified with the groundwater on the Property. It is unlikely that other media on the Property will be impacted.

### 6.7.5 Chemical or Biological Transformations

No chemical or biological transformations are likely to occur since no Contaminants of Concern were identified in the groundwater on the Property.

### 6.7.6 Presence of Light or Dense Non-Aqueous Phase Liquids

No light non-aqueous phase liquids (LNAPL) or dense non-aqueous phase liquids (DNAPL) were detected in the soil on the Property.

## 6.8 Sediment – Quality

Sediment was not present at the Property thus was not investigated as part of the Phase Two ESA.



## 6.9 Quality Assurance and Quality Control Results

Quality Assurance (QA) and Quality Control (QC) were maintained as per described in Section 5.12 above. In addition, laboratory results were compared to MECP standards for QA/QC under Ontario Regulation 153/04 which requires laboratory results to meet specific method detection limit (MDL) conditions. The sampling and analysis performed conformed with the following guidelines:

1. Ministry of the Environment, Conservation and Parks Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario.
2. Protocol of Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act of Ontario.

Duplicated samples were submitted at a rate of 10% for both soil and groundwater samples.

All the samples collected and submitted for analysis adhered to the holding times, preservation methods, storage requirement and container type as specified by the guidelines listed above.

### 6.9.1 Subsection 47 (3) of the Regulation

All certificates of analysis or analytical reports received pursuant to clause 47 (2) (b) of the regulation comply with subsection 47 (3). A certificate of analysis or analytical report has been received for each sample submitted for analysis. All certificates of analysis or analytical reports received have been in full in an appendix to the Phase Two ESA report.

### 6.9.2 Laboratory Qualification of Results

The laboratory did not make any significant comments that changed the outcome of the analytical results regarding the soil and groundwater samples.

### 6.9.3 Overall Quality of Field Data

Decision-making related to the quality of field data of the Property was not affected. The overall quality of the field data was considered by the Qualified Person to meet the objectives of the investigation and assessment.

## 6.10 Phase Two Conceptual Site Model

Phase Two Conceptual Site Model (CSM) is prepared for the Property and is provided in Appendix F.

## 7 Conclusions

The location and concentration of contamination is provided below:

<b>Land</b>	No exceedances of the applicable Site Condition Standards were identified in the soil on the Property.
<b>Groundwater</b>	No exceedances of the applicable Site Condition Standards were identified in the soil on the Property.



No exceedances of the applicable Site Condition Standards were identified for the soil and groundwater on the Property. As such, no remediation or a risk assessment (RA) will be required..

Whether applicable Site Condition Standards and standards specified in a risk assessment for contaminants on, in or under the phase two property were met as of the certification date is provided below:

<b>Soil</b>	The applicable Site Condition Standards were met in the soils located on the Property.
<b>Groundwater</b>	The applicable Site Condition Standards were met in the groundwater located on the Property.



## 7.1 Signatures

The Phase Two ESA has been completed in accordance with O. Reg. 153/04 by, Emma Leet, EIT under the direction and supervision of David MacGillivray, M.A.Sc., P.Geo., P.Eng. QP<sub>RA-ESA</sub>. The findings and conclusions presented in this report have been determined based on the information that was obtained and reviewed from previous investigations provided and on the current investigation for the Phase Two Property.

We trust that this report meets your requirements at present.

For and on behalf of our team,



Emma Leet, EIT  
Project Coordinator

Lindsay Levesque, BSc, EP  
Environmental Scientist

David MacGillivray, M.A.Sc., P.Geo., P.Eng. QP<sub>RA-ESA</sub>  
Associate





## 8 References

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## **9 Limitations and Restrictions**

The Phase Two ESA report was prepared for the purpose of identifying potential environmental concerns, including an assessment of the likelihood that the environmental quality of the soil and groundwater at the Property may have been adversely affected by past or present practices at the Property, and/or those of the adjacent properties prior to development of the Property. Any use of which a third party makes of this report, or any reliance on or decision to be made based on it, are the responsibility of such third parties. Grounded Engineering Inc. does not assume any responsibility for errors, omissions, damages or other limitation pertaining to third parties.

The information presented in this report is based on information collected during the completion of the subsurface investigation conducted by Grounded Engineering Inc. It is based on conditions at the Property at the time of the inspection. The subsurface conditions were assessed based on information collected at specific borehole and monitoring well locations. The actual subsurface conditions between sampling points may be different.

The conclusions presented in this report are based on work undertaken by trained professional and technical staff and are the product of professional care and competence. The report cannot be construed as legal advice or as an absolute guarantee.

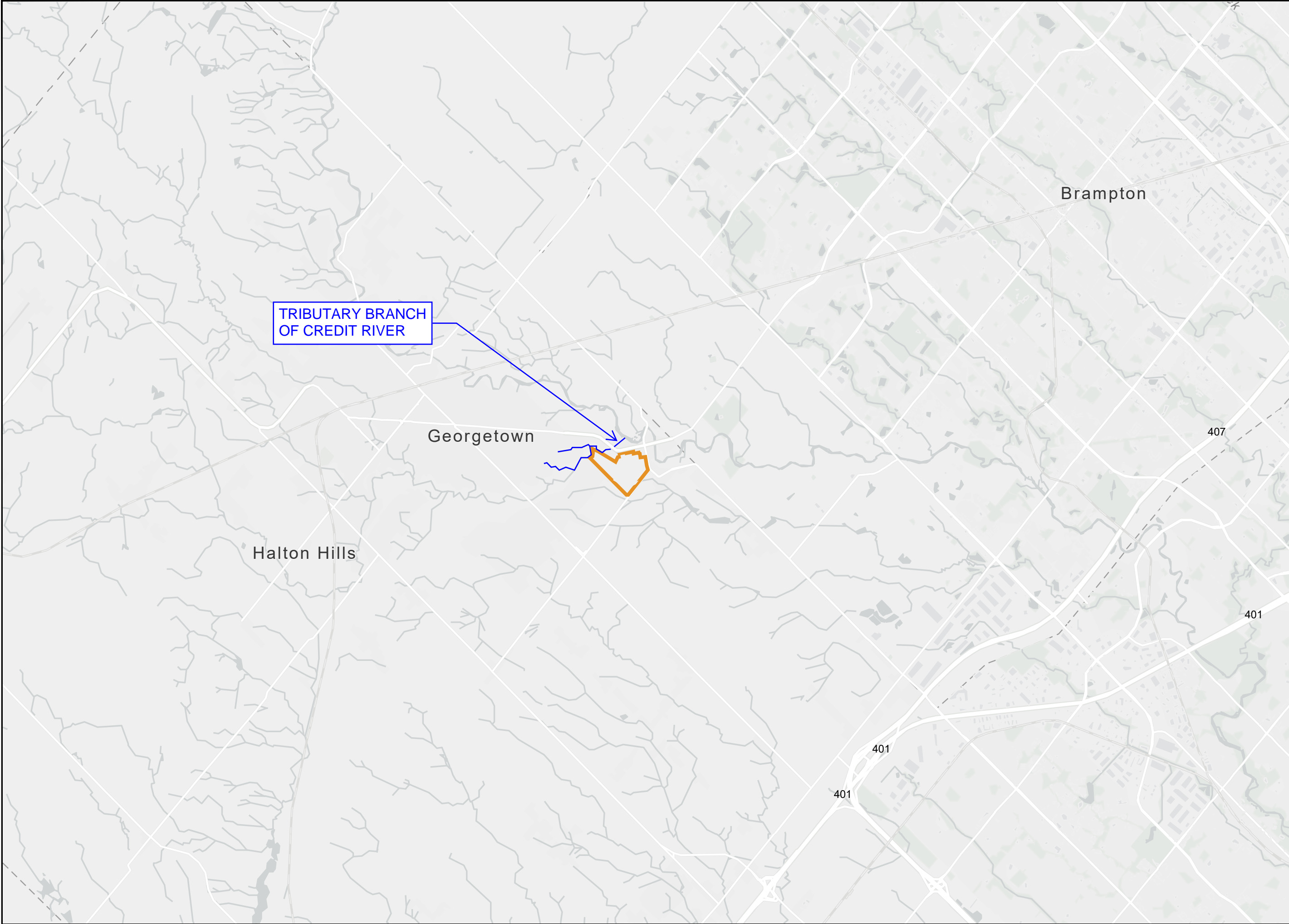
If new information regarding the environmental condition of the Phase Two Property is identified during future work, or outstanding responses from regulatory agencies indicate outstanding issues on file with respect to the Phase Two Property, Grounded Engineering Inc. should be notified so that we may re-evaluate the findings of this assessment and provide amendments.

### **9.1 Report Use**

The authorized users of this report are Russell Pines Property Corp, for whom this report has been prepared. Grounded Engineering Inc. maintains the copyright and ownership of this document. Reproduction of this report in any format or medium requires explicit prior authorization from Grounded Engineering Inc.

# FIGURES





**GROUND**  
ENGINEERING

1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3  
www.groundedeng.ca

**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- WATER BODY

Note

Reference

ArcGIS Online 2024

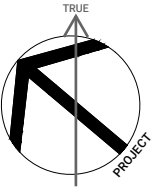
Project

**16469 10 SIDE ROAD,  
NORVAL, ONTARIO**

Figure Title

**SITE LOCATION PLAN**

North



Date

JULY 2024

Scale

0m 1000m 2000m

Job No

24-048

Figure No

**FIGURE 1**





**GROUND**  
ENGINEERING

1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3  
www.groundedeng.ca

**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE STUDY AREA BOUNDARY
- APPROXIMATE LOCATION OF EXISTING BUILDINGS
- INFERRED GROUNDWATER FLOW DIRECTION
- 10 - Commercial Autobody Shops
- 28 - Gasoline and Associated Products Storage in Fixed Tanks
- 40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications
- 52 - Storage, maintenance, fueling and repair of equipment, vehicles, and materials used to maintain transportation systems
- APEC 1
- APEC 2
- APEC 3
- APEC 4
- APEC 5
- APEC 6
- APEC 7

**Note**

GREEN - PCA NOT CAUSING APEC  
RED - PCA CAUSING APEC

**Reference**

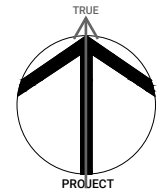
**Project**

Part of Lots 11 & 12,  
Concession 11, Town of  
Halton Hills, Ontario

**Figure Title**

PCA AND APEC  
LOCATIONS

**North**



**Date**

JULY 2024

**Scale**

AS INDICATED

**Job No**

24-048

**Figure No**

FIGURE 2



**LEGEND**

- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- CROSS SECTION LINE
- MONITORING WELL/BOREHOLE BY GROUND
- MONITORING WELL/BOREHOLE BY OTHERS

Note

**Reference**

Survey Drawing job no.  
15-30-736-00-2020Topo  
Dated March 06, 2020  
Prepared by J.D.BARNES LTD.  
Received on May 07, 2024.

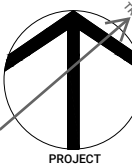
**Project**

16469 10 SIDE ROAD,  
NORVAL, ONTARIO

**Figure Title**

**BOREHOLE LOCATION  
PLAN - EXISTING  
CONDITIONS**

**North**



**Date**

JULY 2024

**Scale**

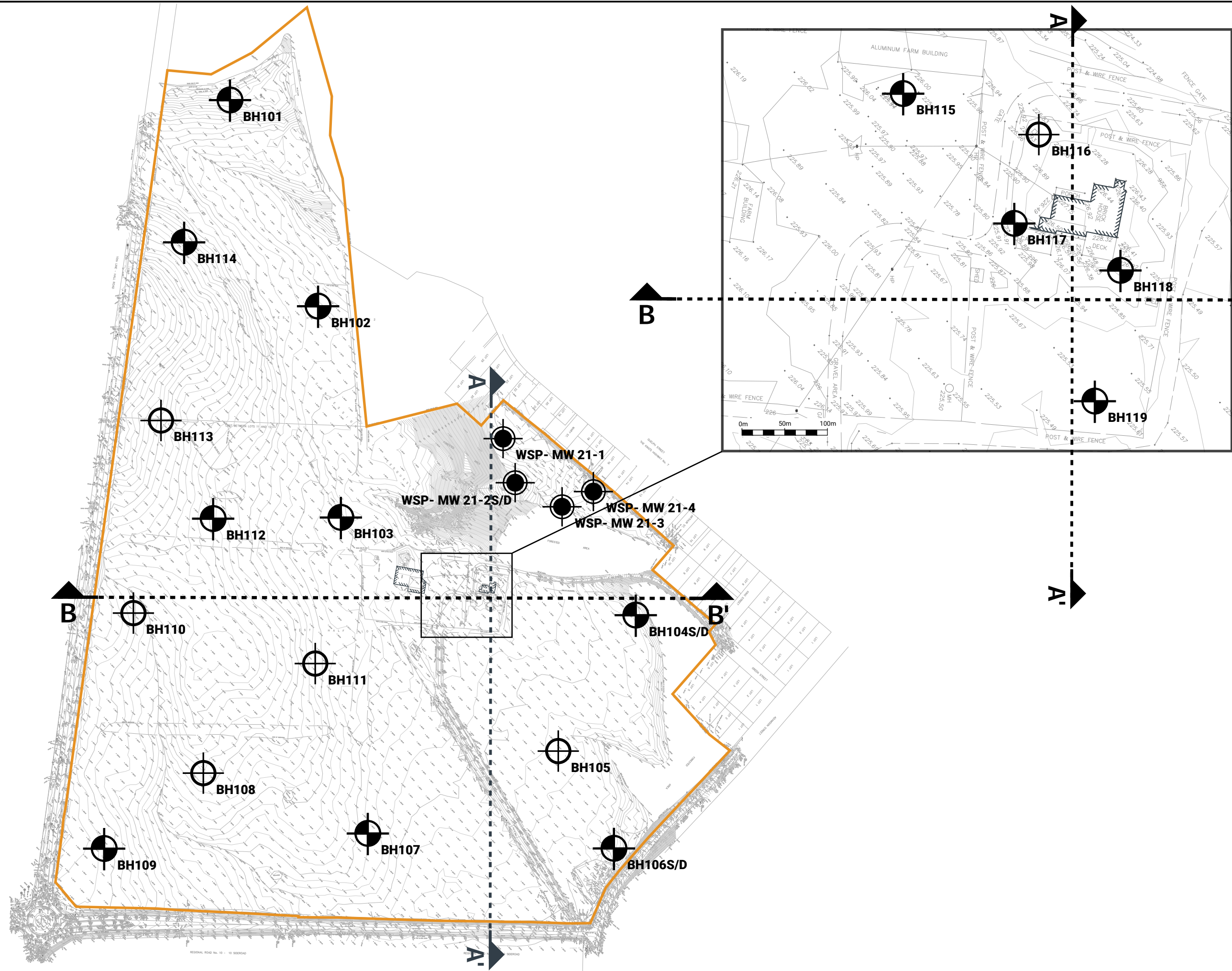
0m 50m 100m

**Job No**

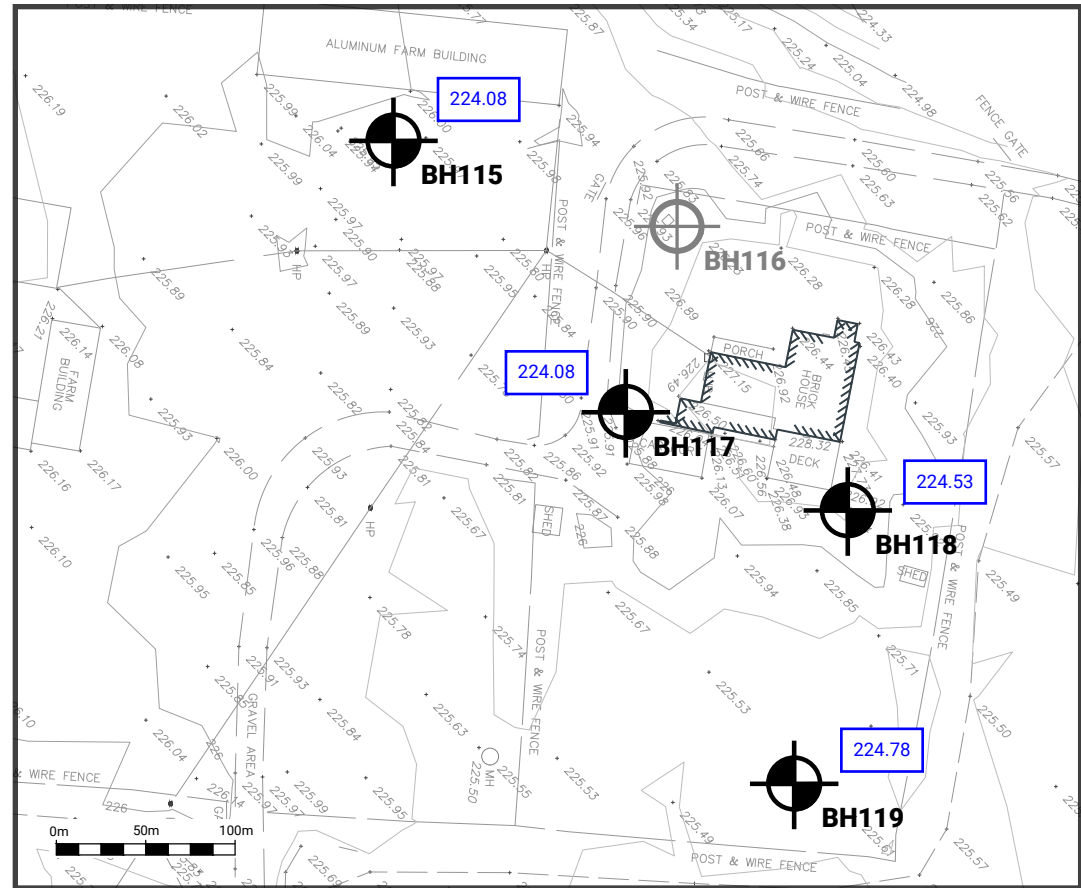
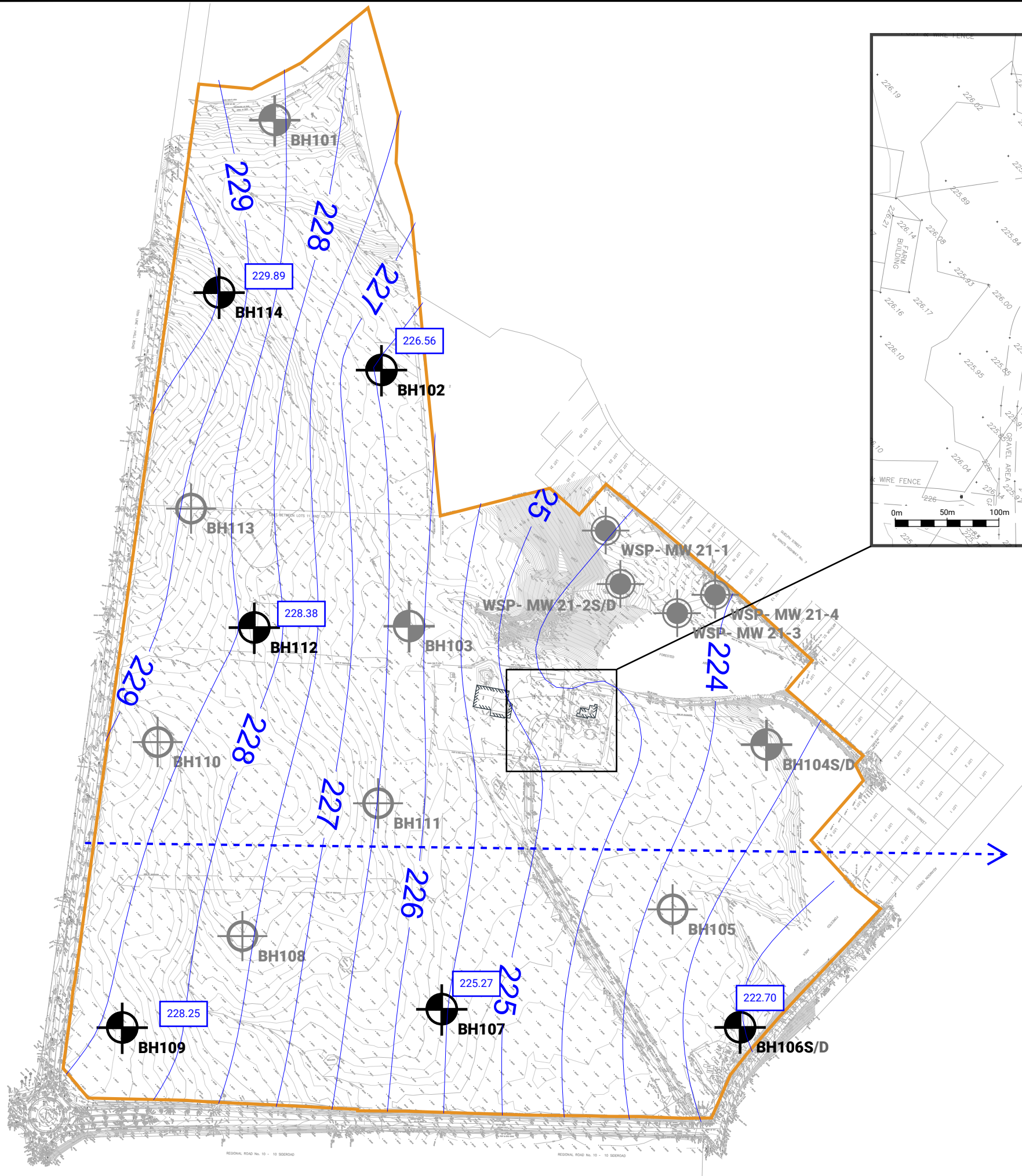
24-048

**Figure No**

**FIGURE 3**







**LEGEND**

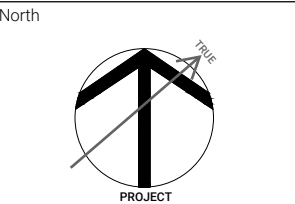
- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- MONITORING WELL/BOREHOLE BY GROUND
- MONITORING WELL/BOREHOLE BY OTHERS
- GROUNDWATER ELEVATIONS (masl)
- GROUNDWATER CONTOURS (masl)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- MONITORING WELL/BOREHOLE NOT USED IN CONTOUR

Note  
JUNE 3 2024 WATER LEVEL ELEVATIONS  
USED FOR CONTOURS

Reference  
Survey Drawing job no.  
15-30-736-00-2020Topo  
Dated March 06, 2020  
Prepared by J.D.BARNES LTD.  
Received on May 07, 2024.

Project  
**16469 10 SIDE ROAD,  
NORVAL, ONTARIO**

Figure Title  
**GROUNDWATER  
ELEVATIONS AND  
CONTOURS**



Date  
JULY 2024

Scale  
0m 50m 100m

Job No  
24-048

Figure No  
**FIGURE 4**



Sample ID	BH114-SS1	BH114-SS2A	BH114-SS2C
Sample Depth (m)	0.3 / 230.4	0.8 / 229.9	1.2 / 229.5
Sample Elevation (mASL)	0.0 - 0.6	0.8 - 0.9	1.0 - 1.4
Lab Job #	WT2412663	WT2412663	WT2412663
Sampling Date	15-May-2024	15-May-2024	15-May-2024
Metals and H-Metals	Meets		
OCs		Meets	
BTEX			Meets
PHCs			Meets
PAHs			Meets

Sample ID	BH115-SS2	BH115-SS3
Sample Depth (m)	1.1 / 224.9	1.8 / 224.2
Sample Elevation (mASL)	0.8 - 1.4	1.5 - 2.1
Lab Job #	WT2411995	WT2411995
Sampling Date	10-May-2024	10-May-2024
Metals and H-Metals	Meets	
BTEX		Meets
PHCs		Meets
VOCs		Meets

Sample ID	BH116-SS1	BH116-SS2
Sample Note		
Sample Depth (m)	0.3 / 225.5	1.1 / 224.8
Sample Elevation	0.0 - 0.6	0.8 - 1.4
Lab Job #	WT2411995	WT2411995
Sampling Date	10-May-2024	10-May-2024
Metals and H-Metals		Meets
OCs	Meets	

Sample ID	BH103-SS1	BH103-SS2
Sample Depth (m)	0.3 / 226.2	1.1 / 225.4
Sample Elevation (mASL)	0.0 - 0.6	0.8 - 1.4
Lab Job #	WT2412663	WT2412663
Sampling Date	16-May-2024	16-May-2024
Metals and H-Metals	Meets	
OCs		Meets

Sample ID	BH110-SS1	BH110-SS2
Sample Note		
Sample Depth (m)	0.3 / 228.8	1.1 / 228.0
Sample Elevation	0.0 - 0.6	0.8 - 1.4
Lab Job #	WT2412663	WT2412663
Sampling Date	14-May-2024	14-May-2024
Metals and H-Metals	Meets	
OCs		Meets

Sample ID	BH117-SS3A
Sample Depth (m)	1.7 / 224.4
Sample Elevation (mASL)	1.5 - 1.8
Lab Job #	WT2411995
Sampling Date	10-May-2024
BTEX	Meets
PHCs	Meets

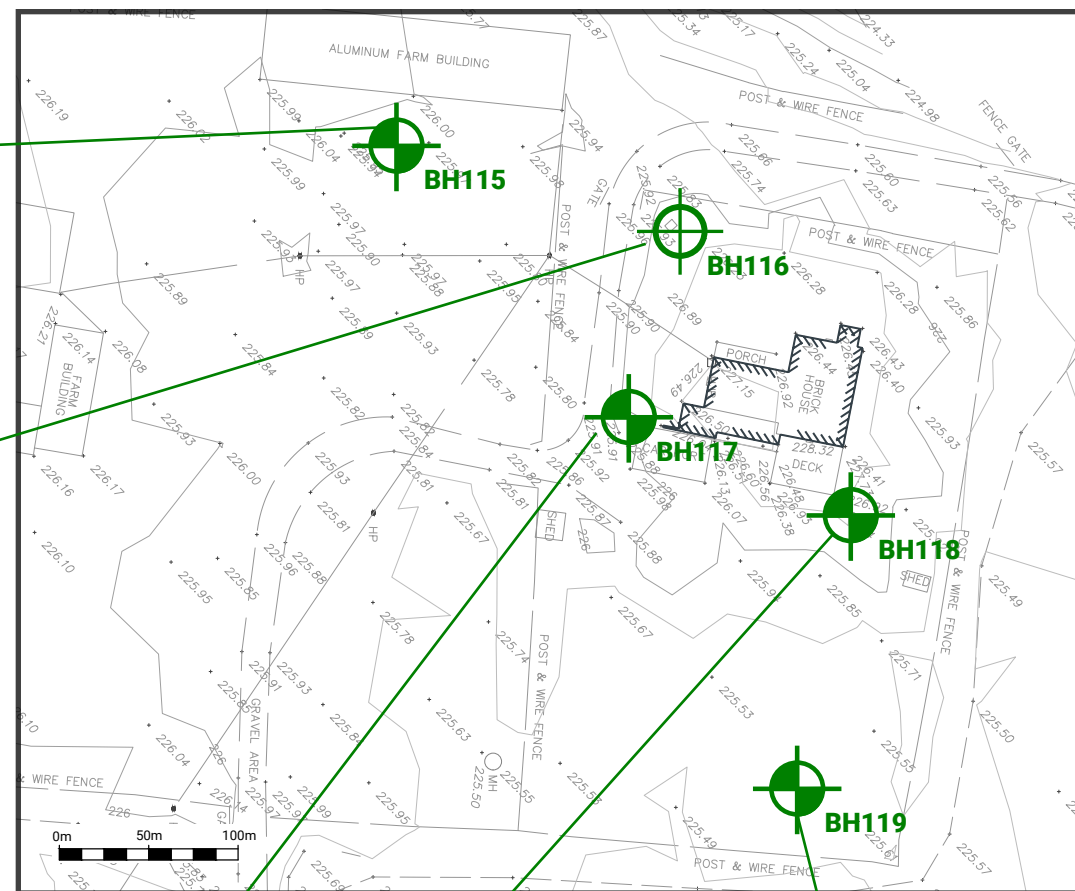
Sample ID	BH118-SS3
Sample Depth (m)	1.8 / 224.3
Sample Elevation (mASL)	1.5 - 2.1
Lab Job #	WT2411995
Sampling Date	13-May-2024
BTEX	Meets
PHCs	Meets

Sample ID	BH104-SS1	BH104-SS2	DUP-142 BH104-SS2
Sample Note			
Sample Depth (m)	0.3 / 224.4	1.1 / 223.7	1.1 / 223.7
Sample Elevation	0.0 - 0.6	0.8 - 1.4	0.8 - 1.4
Lab Job #	WT2412663	WT2412663	WT2412663
Sampling Date	17-May-2024	17-May-2024	17-May-2024
Metals and H-Metals	Meets		
OCs		Meets	Meets

Sample ID	BH106-SS2
Sample Depth (m)	1.1 / 223.1
Sample Elevation (mASL)	0.8 - 1.4
Lab Job #	WT2411995
Sampling Date	09-May-2024
BTEX	Meets
PHCs	Meets

Sample ID	BH119-SS5
Sample Depth (m)	3.4 / 222.1
Sample Elevation (mASL)	3.0 - 3.7
Lab Job #	WT2411995
Sampling Date	10-May-2024
BTEX	Meets
PHCs	Meets

Sample ID	BH107-SS1	BH107-SS2
Sample Note		
Sample Depth (m)	0.3 / 225.5	1.1 / 224.7
Sample Elevation	0.0 - 0.6	0.8 - 1.4
Lab Job #	WT2411995	WT2411995
Sampling Date	13-May-2024	13-May-2024
Metals and H-Metals		Meets
OCs	Meets	



**LEGEND**

- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- CROSS SECTION LINE
- MONITORING WELL/BOREHOLE BY GROUND
- MONITORING WELL/BOREHOLE BY OTHERS
- SAMPLE MEETS STANDARDS
- SAMPLE EXCEEDS STANDARDS
- LOCATION NOT TESTED
- APPROXIMATE EXTENT OF CONTAMINATION

Note

**Reference**

Survey Drawing job no.  
15-30-736-00-2020Topo  
Dated March 06, 2020  
Prepared by J.D.BARNES LTD.  
Received on May 07, 2024.

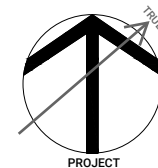
**Project**

**16469 10 SIDE ROAD,  
NORVAL, ONTARIO**

**Figure Title**

**ALL PARAMETERS - SOIL**

**North**



**Date**

JULY 2024

**Scale**

0m 50m 100m

**Job No**

24-048

**Figure No**

**FIGURE 5**



**LEGEND**

- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- CROSS SECTION LINE
- MONITORING WELL/BOREHOLE BY GROUND
- MONITORING WELL/BOREHOLE BY OTHERS
- SAMPLE MEETS STANDARDS
- SAMPLE EXCEEDS STANDARDS
- LOCATION NOT TESTED
- APPROXIMATE EXTENT OF CONTAMINATION

Note

**Reference**

Survey Drawing job no.  
15-30-736-00-2020Topo  
Dated March 06, 2020  
Prepared by J.D.BARNES LTD.  
Received on May 07, 2024.

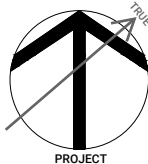
**Project**

16469 10 SIDE ROAD,  
NORVAL, ONTARIO

**Figure Title**

**ALL PARAMETERS -  
GROUNDWATER**

North



Date

JULY 2024

Scale

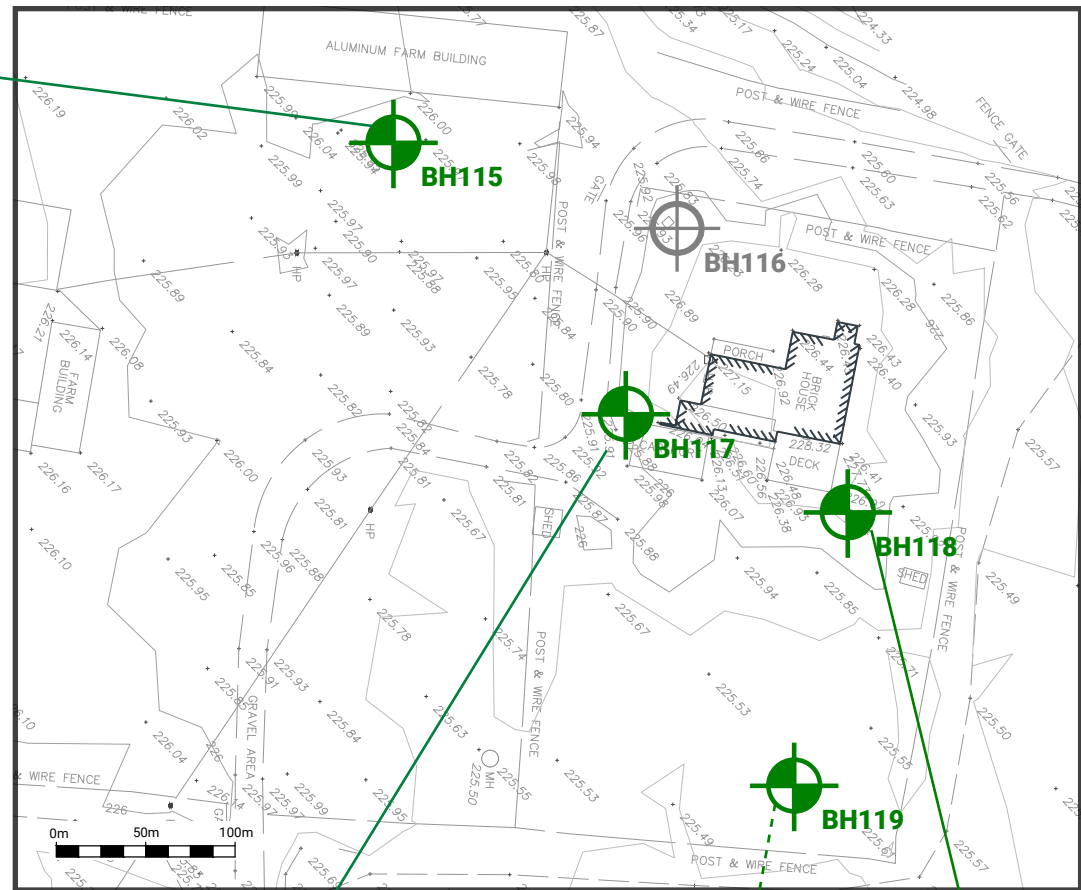
0m 50m 100m

Job No

24-048

Figure No

**FIGURE 6**



Sample ID	BH115	BH115
Sample Note		
Screened Depth (m)	1.5 - 4.6	1.5 - 4.6
Screened Interval (mASL/mAAD)	224.5 - 221.4	224.5 - 221.4
Lab Job #	WT2413097	WT2419302
Sampling Date	2020-05-22	2020-07-09
BTEX	Meets	Meets
Metals and H-Metals	Meets	
PHCs		Meets
VOCs	Meets	
ORPs	Meets	

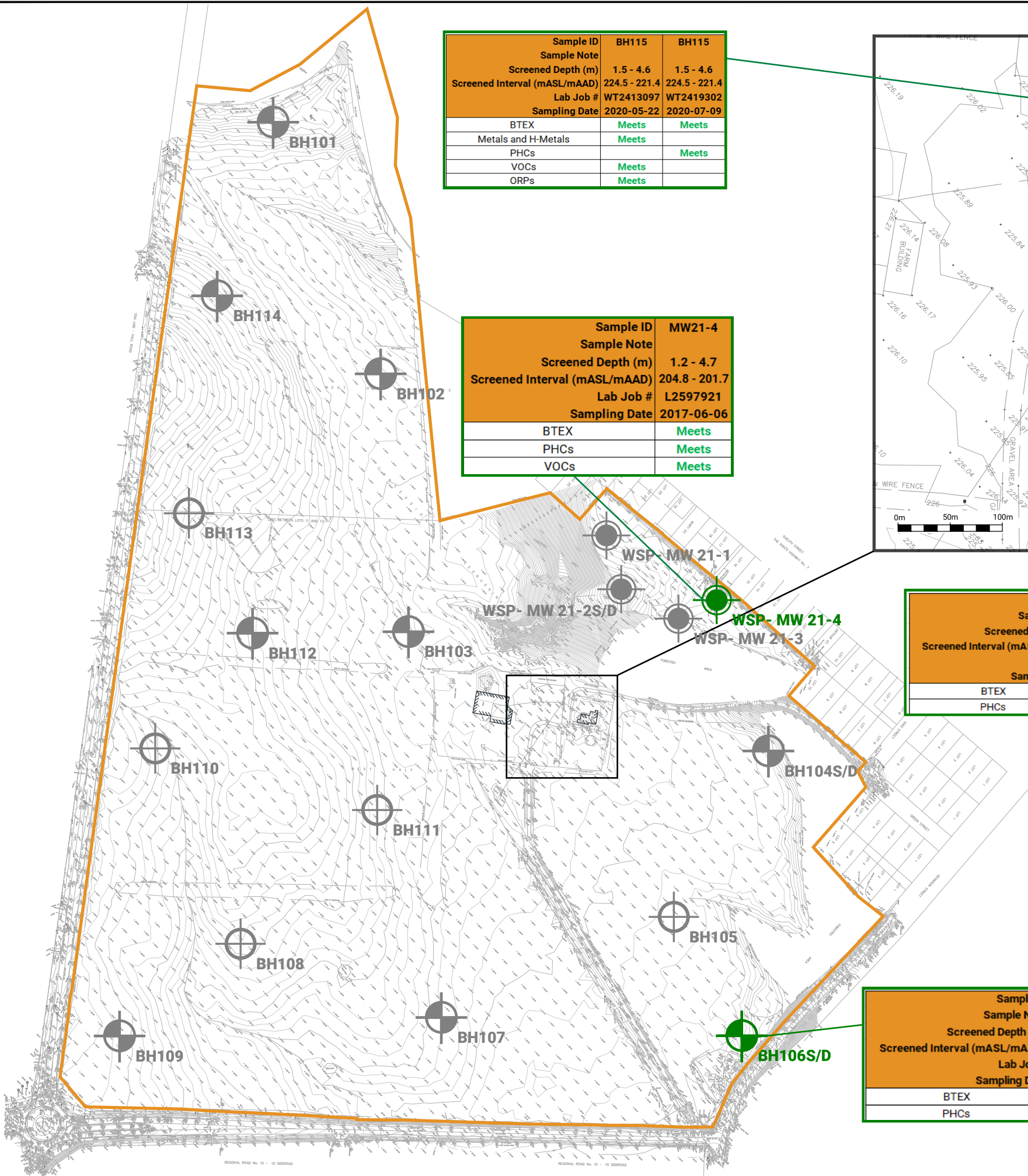
Sample ID	MW21-4
Sample Note	
Screened Depth (m)	1.2 - 4.7
Screened Interval (mASL/mAAD)	204.8 - 201.7
Lab Job #	L2597921
Sampling Date	2017-06-06
BTEX	Meets
PHCs	Meets
VOCs	Meets

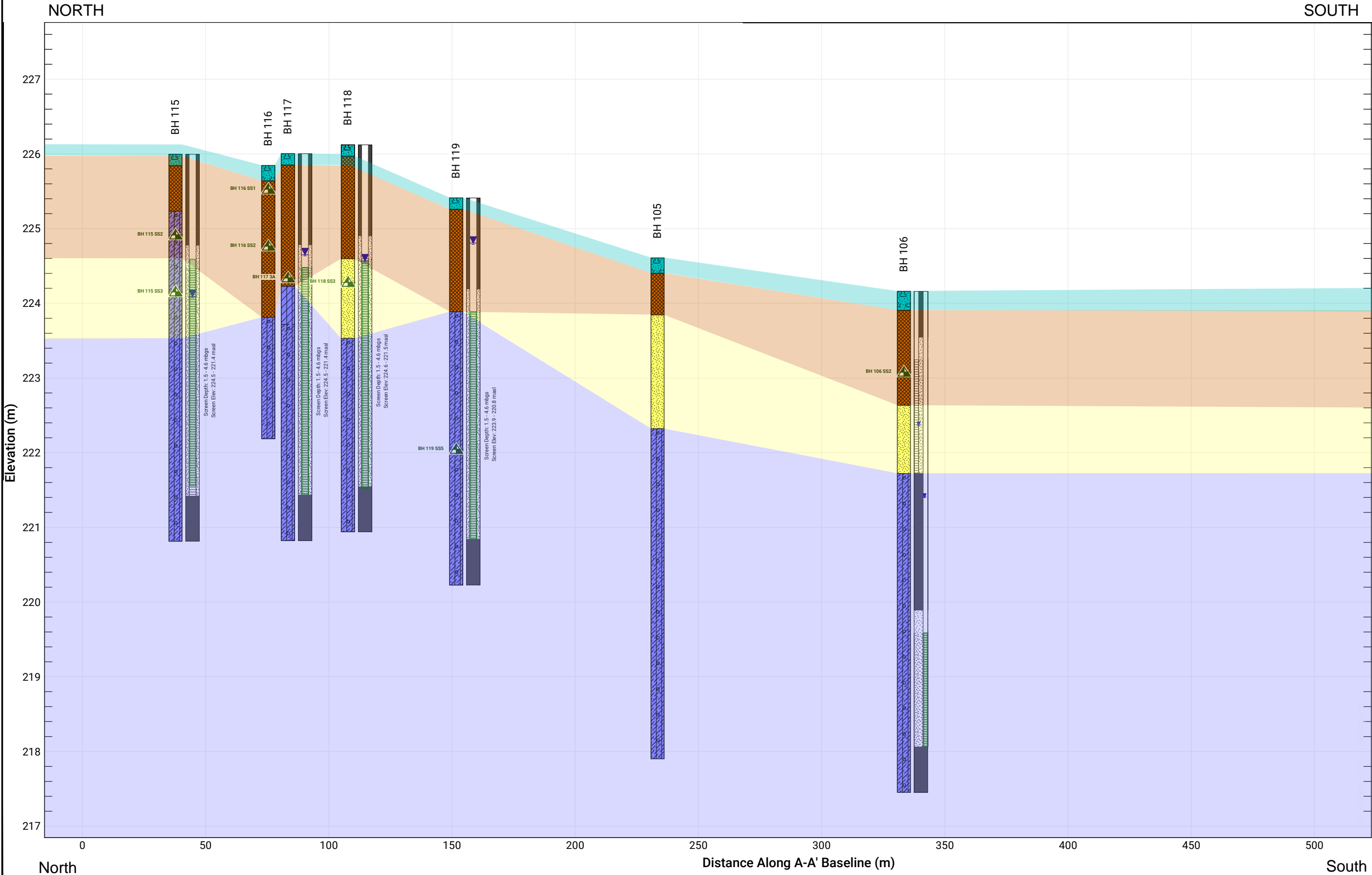
Sample ID	BH117	BH117
Sample Note		
Screened Depth (m)	1.5 - 4.6	1.5 - 4.6
Screened Interval (mASL/mAAD)	224.5 - 221.4	224.5 - 221.4
Lab Job #	WT2413097	WT2419302
Sampling Date	2020-05-22	2020-07-09
BTEX	Meets	Meets
PHCs		Meets

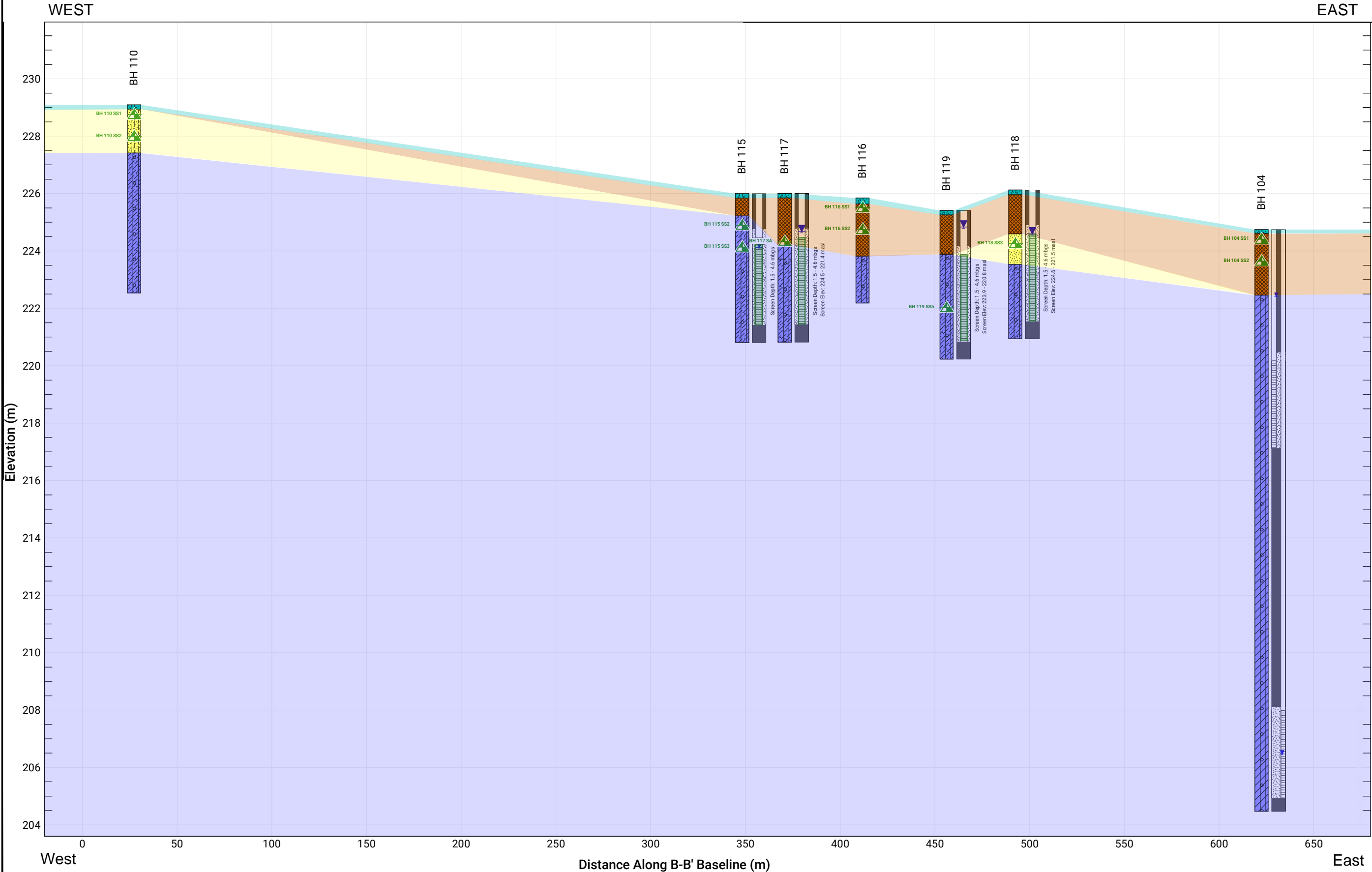
Sample ID	BH118	BH118
Sample Note		
Screened Depth (m)	1.5 - 4.6	1.5 - 4.6
Screened Interval (mASL/mAAD)	224.6 - 221.5	224.6 - 221.5
Lab Job #	WT2413097	WT2419302
Sampling Date	2020-05-22	2020-07-09
BTEX	Meets	Meets
PHCs		Meets

Sample ID	BH119	BH119
Sample Note		
Screened Depth (m)	1.5 - 4.6	1.5 - 4.6
Screened Interval (mASL/mAAD)	223.9 - 220.8	223.9 - 220.8
Lab Job #	WT2413097	WT2419302
Sampling Date	2020-05-22	2020-07-09
BTEX	Meets	Meets
PHCs		Meets

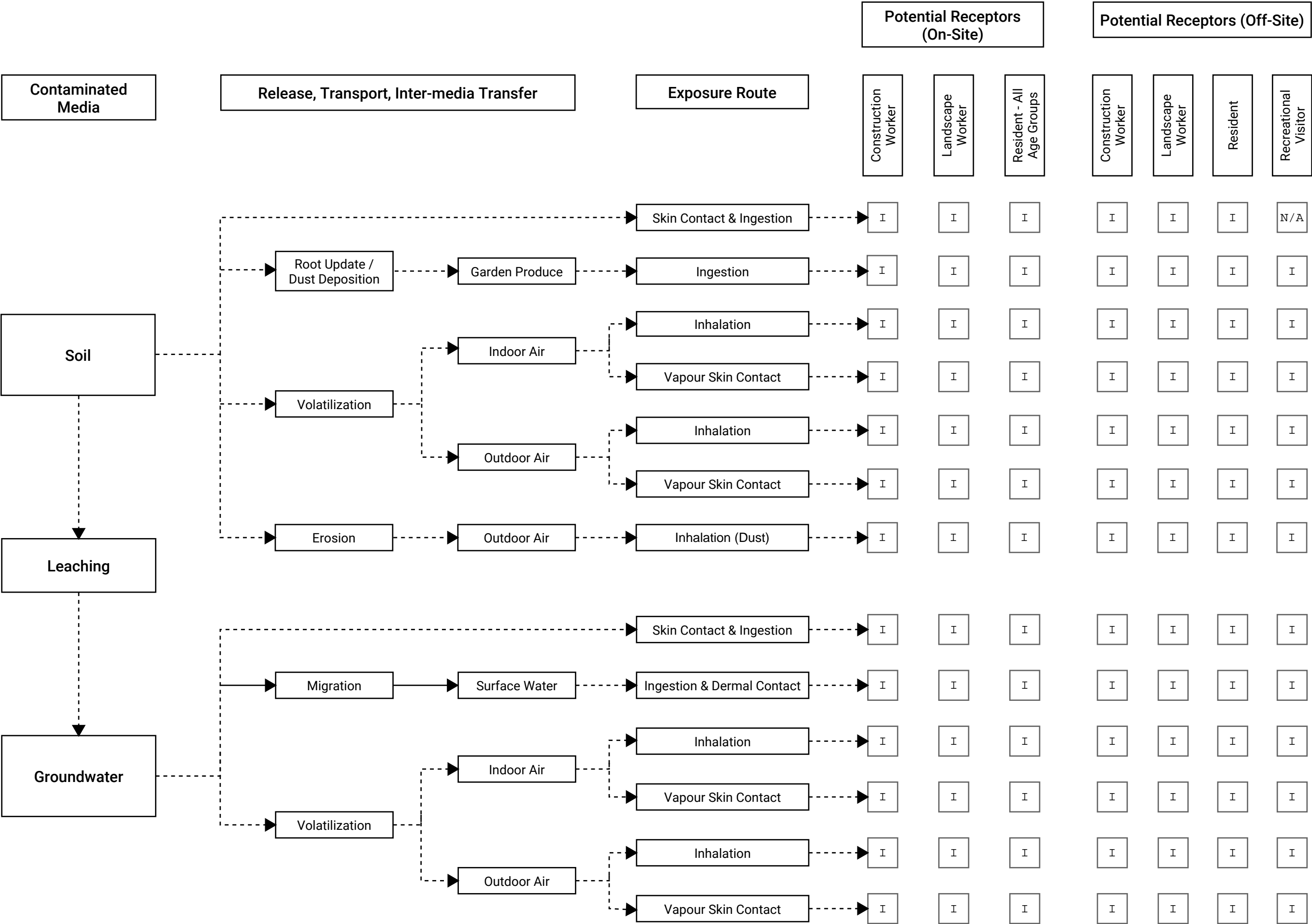
Sample ID	BH106D	BH106D
Sample Note		
Screened Depth (m)	4.6 - 6.1	4.6 - 6.1
Screened Interval (mASL/mAAD)	219.6 - 218.1	219.6 - 218.1
Lab Job #	WT2413097	WT2419302
Sampling Date	2020-05-22	2020-07-09
BTEX	Meets	Meets
PHCs		Meets











**GROUND  
ENGINEERING**

1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3  
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LEGEND

- C Pathway Complete
- I Pathway Incomplete
- X Pathway Blocked
- N/A Pathway Not Applicable for Receptor
- Pathway Completed
- - -> Pathway Incompleted

Note  
1. Constructions Workers are considered protective of Utility Workers  
2.Landscape Workers are considered protective of Trespassers  
3. Residents are considered protective of Long Term Workers, Short Term Works and Site Visitors

Project  
**16469 10 SIDE ROAD,  
NORVAL, ONTARIO**

Figure Title  
**HUMAN HEALTH  
CSM**

Reference

Date  
JULY 2024

Scale  
N/A

Job No  
24-048

Figure No  
**FIGURE 9**



Contaminated Media

Release, Transport, Inter-media Transfer

Exposure Route

Potential Receptors (On-Site)

Potential Receptors (Off-Site)

Soil

Leaching

Groundwater

Uptake and Accumulation by Flora and Fauna

Volatilization

Outdoor Air

Soil Vapour

Ingestion of Vegetation and Prey

Inhalation/Plant Uptake

Inhalation

Ingestion

Dermal/Root Contact

Erosion

Outdoor Air

Inhalation (Dust)/Foliar Deposition

Migration

Surface Water

Direct Contact (Dermal/Root Contact and Ingestion)

Uptake and Accumulation by Flora and Fauna

Ingestion of Vegetation and Prey

Direct Contact (Dermal/Root Contact and Ingestion)

Uptake and Accumulation by Flora and Fauna

Ingestion of Vegetation and Prey

Volatilization

Outdoor Air

Inhalation/Plant Uptake

Soil Vapour

Inhalation

Terrestrial Plants

Soil Invertebrates

Terrestrial Mammals

Terrestrial Birds

Terrestrial Plants

Soil Invertebrates

Terrestrial Mammals

Terrestrial Birds

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GROUND  
ENGINEERING

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LEGEND

C

Pathway Complete

I

Pathway Incomplete

X

Pathway Blocked

N/A

Pathway Not Applicable for Receptor



Pathway Completed



Pathway Incompleted

Note

1. Constructors Workers are considered protective of Utility Workers

2.Landscape Workers are considered protective of Trespassers

3. Residents are considered protective of Long Term Workers, Short Term Works and Site Visitors

Project

16469 10 SIDE ROAD,  
NORVAL, ONTARIO

Figure Title

ECOLOGICAL  
CSM

Reference

Date

JULY 2024

Scale

N/A

Job No

24-048

Figure No

FIGURE 10

# TABLES



TABLE 1  
GROUNDWATER LEVEL MONITORING SUMMARY  
16469 20 Side Road  
HALTON HILLS, ON  
PROJECT #24-048

					Grounded Engineering						Minimum Elev. (Lowest)		Maximum Elev. (Highest)		Seasonal Fluctuation
Well ID	Ground Surface Elevation (masl)	Screen Interval	Screen Interval	Soil Strata	May 21, 2024		May 27, 2024		June 3, 2024		(mbgs)	(masl)	(mbgs)	(masl)	(±m)
		(mbgs)	(masl)		(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)					
BH101	230.0	0.9 - 2.4	229.1 - 227.6	SN-SL-TL	DRY	-	2.48	227.52	Dry	-	2.48	227.52	2.48	227.52	0.00
BH102	227.4	2.1 - 5.2	225.2 - 222.2	SL-TL	0.49	226.91	0.96	226.44	0.84	226.56	0.96	226.44	0.49	226.91	0.47
BH103	226.5	9.1 - 12.2	217.3 - 214.3	SN-SL-TL	1.11	225.39	2.85	223.65	2.93	223.57	2.93	223.57	1.11	225.39	1.82
BH104S	224.7	4.6 - 7.6	220.2 - 217.1	SN-CL-SL-TL	2.38	222.32	2.42	222.28	2.34	222.36	2.42	222.28	2.34	222.36	0.08
BH104D	224.7	16.8 - 19.8	208.0 - 204.9	SN-CL-SL-TL	17.66	207.04	18.17	206.53	18.29	206.41	18.29	206.41	17.66	207.04	0.63
BH106S	224.2	0.9 - 2.4	223.2 - 221.7	SN-SL-TL	1.47	222.73	1.55	222.65	1.50	222.70	1.55	222.65	1.47	222.73	0.08
BH106D	224.2	4.6 - 6.1	219.6 - 218.1	SN-SL-TL	2.83	221.37	2.93	221.27	2.76	221.44	2.93	221.27	2.76	221.44	0.17
BH107	225.8	3.0 - 6.1	222.8 - 219.7	SN-SL-TL	0.57	225.23	0.61	225.19	0.53	225.27	0.61	225.19	0.53	225.27	0.08
BH109	229.1	3.0 - 6.1	226.1 - 223.0	SN-SL-TL	0.96	228.14	1.10	228.00	0.85	228.25	1.10	228.00	0.85	228.25	0.25
BH112	228.8	3.0 - 6.1	225.7 - 222.7	SL	0.35	228.45	0.40	228.40	0.42	228.38	0.42	228.38	0.35	228.45	0.07
BH114	230.7	1.8 - 4.9	228.9 - 225.8	SL	2.06	228.64	2.20	228.50	0.81	229.89	2.20	228.50	0.81	229.89	1.39
BH115	226.0	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	1.80	224.20	1.96	224.04	1.92	224.08	1.96	224.04	1.80	224.20	0.16
BH117	226.0	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	1.41	224.59	1.63	224.37	1.37	224.63	1.63	224.37	1.37	224.63	0.26
BH118	226.10	1.5 - 4.6	224.6 - 221.5	SN-SL-TL	1.54	224.56	1.56	224.54	1.57	224.53	1.57	224.53	1.54	224.56	0.03
BH119	225.40	1.5 - 4.6	223.9 - 220.8	SL-TL	0.89	224.51	0.54	224.86	0.62	224.78	0.89	224.51	0.54	224.86	0.35

**mbgs** = metres below existing ground surface  
**masl** = metres above sea level  
\* = unstabilized groundwater level  
NA = not available: unable to access monitoring well

**Table 2: Summary of Soil Quality Results  
Metals and Other Regulated Parameters  
16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Sample Depth (m) Sample Elevation (mASL) Lab Job # Sampling Date	O.Reg.153/04 Table 2 SCS RPI Med/Fine	Units	Max. Conc.	Max. Conc. Sample ID	BH103-SS1 0.3 / 226.2 0.0 - 0.6 WT2412663 16-May-2024	BH104-SS1 0.3 / 224.4 0.0 - 0.6 WT2412663 17-May-2024	BH107-SS2 1.1 / 224.7 0.8 - 1.4 WT2411995 13-May-2024	BH110-SS1 0.3 / 228.8 0.0 - 0.6 WT2412663 14-May-2024	BH114-SS1 0.3 / 230.4 0.0 - 0.6 WT2412663 15-May-2024	BH115-SS2 1.1 / 224.9 0.8 - 1.4 WT2411995 10-May-2024	DUP-1152 BH115-SS2 1.1 / 224.9 0.8 - 1.4 WT2411995 10-May-2024	BH116-SS2 1.1 / 224.8 0.8 - 1.4 WT2411995 10-May-2024
<b>Site Sensitivity (pH)</b>												
pH (surface soil, <1.5m)	5 to 9	unitless	0-0	#N/A	8	8	8	8	8	8	8	8
<b>Metals</b>												
Barium	390	µg/g	92	BH115-SS2	76.7	79	70.1	65.3	59	92	91.1	41.9
Beryllium	5	µg/g	0.71	BH115-SS2	0.67	0.61	0.68	0.49	0.58	0.71	0.7	0.36
Boron (total)	120	µg/g	11.6	BH103-SS1	11.6	6.4	7.6	6.7	6.8	9.7	9.2	6.1
Cadmium	1.2	µg/g	0.207	BH104-SS1	0.166	0.207	0.096	0.114	0.108	0.069	0.068	0.126
Chromium (total)	160	µg/g	22.8	DUP-1152	21.9	19.6	21.2	16.1	17.7	22.6	22.8	12.8
Cobalt	22	µg/g	14.3	DUP-1152	8.95	8.54	13.2	6.98	7.36	12	14.3	6.93
Copper	180	µg/g	54.4	BH104-SS1	41.3	54.4	44.2	38.2	28.7	30.3	32.7	51.2
Lead	120	µg/g	25	BH116-SS2	13.8	15.6	10.8	6.98	6.78	8.17	8.23	25
Molybdenum	6.9	µg/g	0.52	BH104-SS1	0.38	0.52	0.34	0.37	0.26	0.28	0.3	0.46
Nickel	130	µg/g	29.9	DUP-1152	19.3	17.4	27.5	14.8	16.1	26	29.9	14
Silver	25	µg/g	0.18	BH104-SS1	<0.10	0.18	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	1	µg/g	0.142	DUP-1152	0.134	0.127	0.135	0.099	0.102	0.134	0.142	0.101
Uranium	23	µg/g	0.581	BH104-SS1	0.53	0.581	0.51	0.508	0.368	0.489	0.483	0.474
Vanadium	86	µg/g	35.2	BH104-SS1	34.4	35.2	30.4	26.6	31.2	30.8	31.2	27.7
Zinc	340	µg/g	64.8	BH104-SS1	63	64.8	63.3	38.8	33.6	56.7	62	48.4
<b>Hydride-forming Metals</b>												
Antimony	7.5	µg/g	0.2	BH116-SS2	0.15	0.19	0.17	<0.10	<0.10	0.14	0.14	0.2
Arsenic	18	µg/g	9.26	BH107-SS2	6.17	5.74	9.26	5.82	4.58	6.72	7.69	7.21
Selenium	2.4	µg/g	0.26	BH103-SS1	0.26	0.22	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
<b>ORPs - Other Regulated Parameters</b>												
Boron (Hot Water Soluble)*	1.5	µg/g	0.14	BH104-SS1	0.11	0.14	<0.10	<0.10	0.1	0.13	0.1	<0.10
Chromium VI	10	µg/g	0.4	BH114-SS1	0.19	0.36	0.11	0.18	0.4	<0.10	<0.10	0.22
Cyanide (CN <sup>-</sup> )	0.051	µg/g	<0.05	Multiple	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Electrical Conductivity (EC)	0.7	mS/cm	0.3	Multiple	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1
Mercury	1.8	µg/g	0.0479	BH104-SS1	0.0286	0.0479	0.0177	0.0186	0.0265	0.0116	0.0157	0.0284
Sodium Adsorption Ratio (SAR)	5	unitless	2	BH110-SS1	0.94	<0.10	0.19	2	0.28	0.18	0.19	0.13

**Notes:**

Blanks indicate not analysed.

'NV': No Standard established

mASL means metres above mean sea level

O.Reg.153/04 Table 2 SCS RPI Med/Fine means Table 2: Full Depth Generic Site Condition

Standards for Soil for Residential/ Parkland/ Institutional Property Uses. Medium to fine

soil texture. Per Ontario Ministry of the Environment document "Soil, Ground Water and

Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March

2004, amended July 1, 2011. (O.Reg.153/04).

<b>100 (shaded light red fill, bold)</b>	Maximum analyte concentration exceeds the highlighted criterion
<b>100 (shaded fill)</b>	Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine
<b>100 (underlined)</b>	Detection Limit Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine

**Table 3: Summary of Soil Quality Results**  
**Acid/Base/Neutral Compounds, Polycyclic Aromatic Hydrocarbons, and Chlorophenols**  
**16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Sample Depth (m) Sample Elevation (mASL) Lab Job # Sampling Date	O.Reg.153/0 4 Table 2 SCS RPI Med/Fine	Units	Max. Conc.	BH114-SS2C  1.2 / 229.5 1.0 - 1.4 WT2412663 15-May-2024
<b>PAHs - Polycyclic Aromatic Hydrocarbons</b>				
Acenaphthene	29	µg/g	<0.05	<0.050
Acenaphthylene	0.17	µg/g	<0.05	<0.050
Anthracene	0.74	µg/g	<0.05	<0.050
Benz[a]anthracene	0.63	µg/g	<0.05	<0.050
Benzo[a]pyrene	0.3	µg/g	<0.05	<0.050
Benzo[b]fluoranthene	0.78	µg/g	<0.05	<0.050
Benzo[ghi]perylene	7.8	µg/g	<0.05	<0.050
Benzo[k]fluoranthene	0.78	µg/g	<0.05	<0.050
Chrysene	7.8	µg/g	<0.05	<0.050
Dibenz[a,h]anthracene	0.1	µg/g	<0.05	<0.050
Fluoranthene	0.69	µg/g	<0.05	<0.050
Fluorene	69	µg/g	<0.05	<0.050
Indeno[1,2,3-cd]pyrene	0.48	µg/g	<0.05	<0.050
Methylnaphthalene, 2-(1-)	3.4	µg/g	<0.03	<0.030
Methylnaphthalene, 1-	NV	µg/g	<0.05	<0.050
Methylnaphthalene, 2-	NV	µg/g	<0.03	<0.030
Naphthalene	0.75	µg/g	<0.01	<0.010
Phenanthrene	7.8	µg/g	<0.05	<0.050
Pyrene	78	µg/g	<0.05	<0.050

**Notes:**

Blanks indicate not analysed.

'NV' : No Standard established

mASL means metres above mean sea level

O.Reg.153/04 Table 2 SCS RPI Med/Fine means Table 2: Full Depth Generic

Site Condition Standards for Soil for Residential/ Parkland/ Institutional

Property Uses. Medium to fine soil texture. Per Ontario Ministry of the

Environment document "Soil, Ground Water and Sediment Standards for Use

Under Part XV.1 of the Environmental Protection Act, " March 2004, amended

<b>100</b>	Maximum concentration exceeds the highlighted criterio
<b>100 (shaded fill)</b>	Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine
<u>100 (underlined)</u>	Detection Limit Exceeds O.Reg.153/04 Table 2 SCS RPI I

**Table 4: Summary of Soil Quality Results  
Petroleum Hydrocarbons and BTEX  
16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Sample Depth (m) Sample Elevation (mASL) Lab Job # Sampling Date	O.Reg.153/04 Table 2 SCS RPI Med/Fine	Units	Max. Conc.	Max. Conc. Sample ID	BH106-SS2 1.1 / 223.1 0.8 - 1.4 WT2411995 09-May-2024	BH114-SS2C 1.2 / 229.5 1.0 - 1.4 WT2412663 15-May-2024	BH115-SS3 1.8 / 224.2 1.5 - 2.1 WT2411995 10-May-2024	DUP-1153 BH115-SS3 1.8 / 224.2 1.5 - 2.1 WT2411995 10-May-2024	BH117-SS3A 1.7 / 224.4 1.5 - 1.8 WT2411995 10-May-2024	BH118-SS3 1.8 / 224.3 1.5 - 2.1 WT2411995 13-May-2024	BH119-SS5 3.4 / 222.1 3.0 - 3.7 WT2411995 10-May-2024
<b>BTEX - Benzene, Toluene, Ethylbenzene, Xylene</b>											
Benzene	0.17	µg/g	<0.005	Multiple	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ethylbenzene	1.6	µg/g	<0.015	Multiple	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Toluene	6	µg/g	<0.05	Multiple	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Xylene Mixture	25	µg/g	<0.05	Multiple	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Xylene, m- & p-	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene, o-	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
<b>PHCs - Petroleum Hydrocarbons</b>											
Petroleum Hydrocarbons F1-BTEX	NV	µg/g	<5	Multiple	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Petroleum Hydrocarbons F1	65	µg/g	<5	Multiple	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Petroleum Hydrocarbons F2	150	µg/g	12	BH119-SS5	<10	<10	<10	<10	<10	<10	12
Petroleum Hydrocarbons F3	1300	µg/g	60	BH119-SS5	<50	<50	<50	<50	<50	<50	60
Petroleum Hydrocarbons F4	5600	µg/g	<50	Multiple	<50	<50	<50	<50	<50	<50	<50
Reached Baseline at C50	NV				YES	YES	YES		YES	YES	YES
Petroleum Hydrocarbons F4 (Gravimetric)	5600	µg/g	<0	#N/A							

**Notes:**

Blanks indicate not analysed.

'NV': No Standard established

mASL means metres above mean sea level

O.Reg.153/04 Table 2 SCS RPI Med/Fine means Table 2: Full Depth Generic Site Condition

Standards for Soil for Residential/ Parkland/ Institutional Property Uses. Medium to fine

soil texture. Per Ontario Ministry of the Environment document "Soil, Ground Water and

Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March

#N/A

<b>100</b>	Maximum concentration exceeds the highlighted criterion
<b>100 (shaded fill)</b>	Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine
<u>100 (underlined)</u>	Detection Limit Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine

**Table 5: Summary of Soil Quality Results**  
**Volatile Organic Compounds and Trihalomethanes**  
**16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Remediated Sample Depth (m) Sample Elevation (mASL) Lab Job # Sampling Date	O.Reg.153/04 Table 2 SCS RPI Med/Fine	Units	Max. Conc.	Max. Conc. Sample ID	BH115-SS3 1.8 / 224.2 1.5 - 2.1 WT2411995 10-May-2024	DUP-1153 BH115-SS3 1.8 / 224.2 1.5 - 2.1 WT2411995 10-May-2024
<b>THMs - Trihalomethanes</b>						
Bromodichloromethane	1.9	µg/g	<0.05	Multiple	<0.050	<0.050
Bromoform	0.26	µg/g	<0.05	Multiple	<0.050	<0.050
Chloroform	0.18	µg/g	<0.05	Multiple	<0.050	<0.050
Dibromochloromethane	2.9	µg/g	<0.05	Multiple	<0.050	<0.050
<b>VOCs - Volatile Organic Compounds</b>						
Acetone	28	µg/g	<0.5	Multiple	<0.50	<0.50
Carbon Tetrachloride	0.12	µg/g	<0.05	Multiple	<0.050	<0.050
Chlorobenzene	2.7	µg/g	<0.05	Multiple	<0.050	<0.050
Dichlorobenzene, 1,2-	1.7	µg/g	<0.05	Multiple	<0.050	<0.050
Dichlorobenzene, 1,3-	6	µg/g	<0.05	Multiple	<0.050	<0.050
Dichlorobenzene, 1,4-	0.097	µg/g	<0.05	Multiple	<0.050	<0.050
Dichlorodifluoromethane	25	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloroethane, 1,1-	0.6	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloroethane, 1,2-	0.05	µg/g	<0.05	Multiple	<0.05	<0.05
Dichloroethylene, 1,1-	0.05	µg/g	<0.05	Multiple	<0.05	<0.05
Dichloroethylene, 1,2-cis-	2.5	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloroethylene, 1,2-trans-	0.75	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloropropane, 1,2-	0.085	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloropropene, 1,3-	0.081	µg/g	<0.045	Multiple	<0.045	<0.045
Dichloropropylene, cis-1,3-	NV	µg/g	<0.05	Multiple	<0.050	<0.050
Dichloropropylene, trans-1,3-	NV	µg/g	<0.05	Multiple	<0.050	<0.050
Ethylene dibromide	0.05	µg/g	<0.03	Multiple	<0.030	<0.030
Hexane (n)	34	µg/g	<0.03	Multiple	<0.030	<0.030
Methyl Ethyl Ketone	44	µg/g	<0.05	Multiple	<0.050	<0.050
Methyl Isobutyl Ketone	4.3	µg/g	<0.5	Multiple	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	1.4	µg/g	<0.5	Multiple	<0.50	<0.50
Methylene Chloride	0.96	µg/g	<0.04	Multiple	<0.040	<0.040
Styrene	2.2	µg/g	<0.05	Multiple	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	0.05	µg/g	<0.05	Multiple	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	0.05	µg/g	<0.05	Multiple	<0.05	<0.05
Tetrachloroethylene	2.3	µg/g	<0.05	Multiple	<0.050	<0.050
Trichloroethane, 1,1,1-	3.4	µg/g	<0.05	Multiple	<0.050	<0.050
Trichloroethane, 1,1,2-	0.05	µg/g	<0.05	Multiple	<0.05	<0.05
Trichloroethylene	0.52	µg/g	<0.01	Multiple	<0.010	<0.010
Trichlorofluoromethane	5.8	µg/g	<0.05	Multiple	<0.050	<0.050
Vinyl Chloride	0.022	µg/g	<0.02	Multiple	<0.020	<0.020
<b>Bromomethane</b>						
Bromomethane	0.05	µg/g	<0.05	Multiple	<0.05	<0.05

**Notes:**

Blanks indicate not analysed.

'NV': No Standard established

mASL means metres above mean sea level

O.Reg.153/04 Table 2 SCS RPI Med/Fine means Table 2: Full Depth Generic Site

Condition Standards for Soil for Residential/ Parkland/ Institutional Property Uses.

Medium to fine soil texture. Per Ontario Ministry of the Environment document "Soil,

Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental

Protection Act, \* March 2004, amended July 1, 2011. (O.Reg.153/04).

100	Maximum concentration exceeds the highlighted criterion
100 (shaded fill)	Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine
100 (underlined)	Detection Limit Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine

**Table 6: Summary of Soil Quality Results**  
**Polychlorinated Biphenyls, Organochlorine Pesticides, and Dioxins and Furans**  
**16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Remediated Sample Depth (m) Sample Elevation (MASL) Lab Job # Sampling Date	O.Reg.153/04 Table 2 SCS RPI Med/Fine	Units	Max. Conc.	Max. Conc. Sample ID	BH103-SS2 1.1 / 225.4 0.8 - 1.4 WT2412663 16-May-2024	BH104-SS2 1.1 / 223.7 0.8 - 1.4 WT2412663 17-May-2024	DUP-142 BH104-SS2 1.1 / 223.7 0.8 - 1.4 WT2412663 17-May-2024	BH107-SS1 0.3 / 225.5 0.0 - 0.6 WT2411995 13-May-2024	BH110-SS2 1.1 / 228.0 0.8 - 1.4 WT2412663 14-May-2024	BH114-SS2A 0.8 / 229.9 0.8 - 0.9 WT2412663 15-May-2024	BH116-SS1 0.3 / 225.5 0.0 - 0.6 WT2411995 10-May-2024
<b>OCs - Organochlorine Pesticides</b>											
Aldrin	0.05	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chlordane	0.05	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Chlordane, a-	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chlordane, g-	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDD	3.3	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDD, op-	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDD, pp-	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
DDE	0.33	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDE, op-	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDE, pp-	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
DDT	1.4	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDT, op-	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
DDT, pp-	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Dieldrin	0.05	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Endosulfan	0.04	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Endosulfan I	NV	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Endosulfan II	NV	µg/g	<0.03	Multiple	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Endrin	0.04	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Heptachlor	0.15	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Heptachlor Epoxide	0.05	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Hexachlorobenzene	0.52	µg/g	<0.01	Multiple	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorobutadiene	0.014	µg/g	<0.01	Multiple	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorocyclohexane, gamma-	0.063	µg/g	<0.01	Multiple	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachloroethane	0.071	µg/g	<0.01	Multiple	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	0.13	µg/g	<0.02	Multiple	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

**Notes:**

Blanks indicate not analysed.

'NV' : No Standard established

MASL means metres above mean sea level

O.Reg.153/04 Table 2 SCS RPI Med/Fine means Table 2: Full Depth Generic Site Condition

Standards for Soil for Residential/ Parkland/ Institutional Property Uses. Medium to fine

soil texture. Per Ontario Ministry of the Environment document "Soil, Ground Water and

Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March

<b>100 (shaded light red fill, bold)</b>	Maximum analyte concentration exceeds the highlighted criterion
<b>100 (shaded fill)</b>	Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine
<u>100 (underlined)</u>	Detection Limit Exceeds O.Reg.153/04 Table 2 SCS RPI Med/Fine



**Table 7: Summary of Toxicity Characteristic Leaching Procedure Results**  
**16469 10 Side Road, Halton Hills, Ontario**



Sample ID Sample Note Sample Depth (m) Sample Elevation (mASL/mAAD) Lab Job # Sampling Date	O. Reg. 558 SCH. 4	Units	TCLP-1  WT2412667 2024-05-17
<b>TCLP Metals and Inorganics</b>			
Leachable Arsenic (As)	2.5	mg/L	<1.0
Leachable Barium (Ba)	100	mg/L	<2.5
Leachable Boron (B)	500	mg/L	<0.50
Leachable Cadmium (Cd)	0.5	mg/L	<0.050
Leachable Chromium (Cr)	5	mg/L	<0.25
Leachable Lead (Pb)	5	mg/L	<0.25
Leachable Selenium (Se)	1	mg/L	<0.10
Leachable Silver (Ag)	5	mg/L	<0.050
Leachable Uranium (U)	10	mg/L	<0.20
Final pH	NV	unitless	9.41
Initial pH	NV	unitless	5.93
<b>TCLP PAHs</b>			
Benzo(a)pyrene	0.001	mg/L	<0.00020
Chrysene	NV	mg/L	132
Naphthalene	NV	mg/L	98.4
Phenanthrene	NV	mg/L	115
<b>TCLP VOCs</b>			
Benzene	0.5	mg/L	<0.0050
Carbon tetrachloride	0.5	mg/L	<0.025
Chlorobenzene	8	mg/L	<0.025
Chloroform	10	mg/L	<0.10
Dichlorobenzene, 1,2-	20	mg/L	<0.025
Dichlorobenzene, 1,4-	0.5	mg/L	<0.025
Dichloroethane, 1,2-	0.5	mg/L	<0.025
Dichloroethylene, 1,1-	1.4	mg/L	<0.025
Dichloromethane	5	mg/L	<0.10
Methyl Ethyl Ketone	200	mg/L	<0.10
Tetrachloroethylene	3	mg/L	<0.025
Trichloroethylene	5	mg/L	<0.025
Vinyl chloride	0.2	mg/L	<0.050
<b>TCLP PCBs</b>			

**Notes:**

'NV' : No Standard established                      NA: Parameter not analyzed

O.Reg. 558 Sch. 4: Leachate Quality Criteria

<b>100 (red fill)</b>	Exceeds O. Reg. 558 Schedule 4 criterion
<u>100 (underline)</u>	Detection Limit Exceeds Applicable Standard

**Table 8: Summary of Ground Water Quality Results**  
**Metals and Other Regulated Parameters**  
**10 Side Road, Halton Hills**



Sample ID Sample Note Screened Depth (m) Screened Interval (mASL/mAAD) Lab Job # Sampling Date	O.Reg.153/04 Table 2	UNITS	Max. Sample Conc.	Max. Conc. Sample ID	BH115 1.5 - 4.6 224.5 - 221.4 WT2413097 2024-05-23	DUP- 115 BH115 1.5 - 4.6 224.5 - 221.4 WT2413097 2024-05-23	BH117 1.5 - 4.6 224.5 - 221.4 WT2413097 2024-05-23
pH (range shown)	NV - NV	unitless	8.07	115/BH115	8.1	8.1	8.1
<b>Metals</b>							
Barium (Ba)	1000	µg/L	80.8	BH117	74.8	76	80.8
Beryllium (Be)	4	µg/L	<0.02	Multiple	<0.020	<0.020	<0.020
Boron (B)	5000	µg/L	29	Multiple	29	29	28
Cadmium (Cd)	2.7	µg/L	0.0188	DUP- 115	0.0153	0.0188	0.018
Chromium (Cr)	50	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50
Cobalt (Co)	3.8	µg/L	0.24	BH115	0.24	0.2	0.18
Copper (Cu)	87	µg/L	0.78	DUP- 115	0.51	0.78	0.54
Lead (Pb)	10	µg/L	<0.05	Multiple	<0.050	<0.050	<0.050
Mercury (Hg)	0.29	µg/L	<0.005	Multiple	<0.0050	<0.0050	<0.0050
Molybdenum (Mo)	70	µg/L	1.83	BH115	1.83	1.72	1.52
Nickel (Ni)	100	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50
Silver (Ag)	1.5	µg/L	<0.01	Multiple	<0.010	<0.010	<0.010
Thallium (Tl)	2	µg/L	<0.01	Multiple	<0.010	<0.010	<0.010
Uranium (U)	20	µg/L	1.38	BH117	1.31	1.34	1.38
Vanadium (V)	6.2	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50
Zinc (Zn)	1100	µg/L	2	DUP- 115	1.5	2	1.5
<b>Hydride-forming Metals</b>							
Antimony (Sb)	6	µg/L	0.18	BH115	0.18	0.16	0.14
Arsenic (As)	25	µg/L	2.1	BH115	2.1	1.72	1.17
Selenium (Se)	10	µg/L	0.512	BH117	0.367	0.437	0.512
<b>Sodium</b>							
Sodium (Na)	490000	µg/L	16200	BH115	16200	15800	15500
<b>ORPs - Other Regulated Parameters</b>							
Chloride (Cl-)	790000	µg/L	17800	BH115	17800	17500	16100
Chromium VI	25	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50
Cyanide (CN-)	66	µg/L	<2	Multiple	<2.0	<2.0	<2.0

**Notes:**

Blanks indicate not analysed.

'NV' : No Standard established

O.Reg.153/04 Table 2 means O.Reg.153/04 Table 2 means: Table 2 Full Depth Generic Site Condition Standards for Ground Water for All Types of Property Uses. Coarse-textured soil. Per Ontario Ministry of the Environment, Conservation and Parks document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, as amended.

100 (shaded fill)	Exceeds O.Reg.153/04 Table 2
<100 (underlined)	Detection Limit Exceeds O.Reg.153/04 Table 2

**Table 9: Summary of Ground Water Quality Results**  
**Petroleum Hydrocarbons and BTEX**  
**10 Side Road, Halton Hills**



Sample ID Sample Note Screened Depth (m) Screened Interval (mASL/mAAD) Lab Job # Sampling Date	O.Reg.153/04 Table 2	UNITS	Max. Sample Conc.	Max. Conc. Sample ID	MW21-4 1.2 - 4.7 204.8 - 201.7 L2597921 2021-06-07	DUP 01 MW21-4 1.2 - 4.7 204.8 - 201.7 L2597921 2021-06-07	BH106D 4.6 - 6.1 219.6 - 218.1 WT2419302 2024-07-10	DUP-16D BH106D 4.6 - 6.1 219.6 - 218.1 WT2419302 2024-07-10	BH115 1.5 - 4.6 224.5 - 221.4 WT2419302 2024-07-10	BH117 1.5 - 4.6 224.5 - 221.4 WT2419302 2024-07-10	BH118 1.5 - 4.6 224.6 - 221.5 WT2419302 2024-07-10	BH119 1.5 - 4.6 223.9 - 220.8 WT2419302 2024-07-10
<b>BTEX - Benzene, Toluene, Ethylbenzene, X</b>												
Benzene	5	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	µg/L	0.71	BH106D	<0.50	<0.50	0.71	0.59	<0.50	<0.50	<0.50	<0.50
Xylene Mixture	300	µg/L	<0.5	Multiple	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylene, m- & p-	NV	µg/L	0.42	BH106D	<0.40	<0.40	0.42	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, o-	NV	µg/L	<0.3	Multiple	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
<b>PHCs - Petroleum Hydrocarbons</b>												
Petroleum Hydrocarbons F1	750	µg/L	<25	Multiple	<25	<25	<25	<25	<25	<25	<25	<25
Petroleum Hydrocarbons F1-BTEX	750	µg/L	<25	Multiple	<25	<25	<25	<25	<25	<25	<25	<25
Petroleum Hydrocarbons F2	150	µg/L	<100	Multiple	<100	<100	<100	<100	<100	<100	<100	<100
Petroleum Hydrocarbons F3	500	µg/L	<250	Multiple	<250	<250	<250	<250	<250	<250	<250	<250
Petroleum Hydrocarbons F4	500	µg/L	<250	Multiple	<25	<25	<250	<250	<250	<250	<250	<250
Reached Baseline at C50	NV	0	0	#N/A	YES	YES	YES	YES	YES	YES	YES	YES

**Notes:**

Blanks indicate not analysed.

'NV': No Standard established

O.Reg.153/04 Table 2 means O.Reg.153/04 Table 2 means: Table 2 Full Depth Generic Site Condition Standards for Ground Water for All Types of Property Uses. Coarse-textured soil. Per Ontario Ministry of the Environment, Conservation and Parks document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March 2004, as amended. (O.Reg.153/04).

100 (shaded fill)	Exceeds O.Reg.153/04 Table 2
<100 (underlined)	Detection Limit Exceeds O.Reg.153/04 Table 2



**Table 10: Summary of Ground Water Quality Results**  
**Volatile Organic Compounds and Trihalomethanes**  
**10 Side Road, Halton Hills**

Sample ID Sample Note Screened Depth (m) Screened Interval (mASL/mAAD) Lab Job # Sampling Date	O.Reg.153/04 Table 2	UNITS	Max. Sample Conc.	Max. Conc. Sample ID	MW21-4 1.2 - 4.7 204.8 - 201.7 L2597921 2021-06-07	DUP 01 MW21-4 1.2 - 4.7 204.8 - 201.7 L2597921 2021-06-07	BH115 1.5 - 4.6 224.5 - 221.4 WT2413097 2024-05-23
<b>VOCs - Volatile Organic Compounds</b>							
Acetone	2700	µg/L	<30	Multiple	<30	<30	<20
Bromodichloromethane	16	µg/L	<2	Multiple	<2.0	<2.0	<0.50
Bromoform	25	µg/L	<5	Multiple	<5.0	<5.0	<0.50
Bromomethane	0.89	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Carbon Tetrachloride	0.79	µg/L	<0.2	Multiple	<0.2	<0.2	<0.20
Chlorobenzene	30	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Chloroform	2.4	µg/L	<1	Multiple	<1.0	<1.0	<0.50
Dibromochloromethane	25	µg/L	<2	Multiple	<2.0	<2.0	<0.50
Ethylene dibromide	0.2	µg/L	<0.2	Multiple	<0.2	<0.2	<0.20
Dichlorobenzene, 1,2-	3	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichlorobenzene, 1,3-	59	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichlorobenzene, 1,4-	1	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichlorodifluoromethane	590	µg/L	<0.5	Multiple			<0.50
Dichloroethane, 1,1-	5	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloroethane, 1,2-	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloroethylene, 1,1-	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloroethylene, 1,2-cis-	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloroethylene, 1,2-trans-	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloropropane, 1,2-	5	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Dichloropropylene, cis-1,3-	NV	µg/L	<0.5	Multiple	<0.3	<0.3	<0.50
Dichloropropylene, trans-1,3	NV	µg/L	<0.3	Multiple	<0.3	<0.3	<0.30
Dichloropropylene, trans-1,3-	NV	µg/L	<0.3	Multiple			<0.30
Hexane (n)	51	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Methyl Ethyl Ketone	1800	µg/L	<20	Multiple	<20	<20	<20
Methyl Isobutyl Ketone	640	µg/L	<20	Multiple	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	15	µg/L	<2	Multiple	<2.0	<2.0	<0.50
Styrene	5.4	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Tetrachloroethane, 1,1,1,2-	1.1	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Tetrachloroethane, 1,1,2,2-	1	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Tetrachloroethylene	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Trichloroethane, 1,1,1-	200	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Trichloroethane, 1,1,2-	4.7	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Trichloroethylene	1.6	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50
Trichlorofluoromethane	150	µg/L	<5	Multiple	<5.0	<5.0	<0.50
Vinyl Chloride	0.5	µg/L	<0.5	Multiple	<0.5	<0.5	<0.50

**Notes:**

Blanks indicate not analysed.

'NV': No Standard established

O.Reg.153/04 Table 2 means O.Reg.153/04 Table 2 means: Table 2 Full Depth Generic Site Condition Standards for Ground Water for All Types of Property Uses. Coarse-textured soil. Per Ontario Ministry of the Environment, Conservation and Parks document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," March 2004, as amended. (O.Reg.153/04).

100 (shaded fill)	Exceeds O.Reg.153/04 Table 2
<100 (underlined)	Detection Limit Exceeds O.Reg.153/04 Table 2

# APPENDIX A



## Appendix B: Sampling and Analysis Plan

Areas of Potential Environmental Concern (APECs) & Location	Potentially Contaminating Activities (PCAs)	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)	Borehole or Monitoring Well Associated	Rationale
APEC 1 (Entire Property)	40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil	BH103, BH104, BH107, BH110, BH114	To assess the quality of the soil within the APEC (former agricultural use across the Property)
APEC 2	40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil	BH116	To assess the quality of the soil within the APEC (former orchard)
APEC 3	28 - Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH117	To assess the quality of the soil and groundwater within the APEC (AST in basement)
APEC 4	28 - Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH118	To assess the quality of the soil and groundwater within the APEC (former UST under the back deck)
APEC 5	28 - Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH119	To assess the quality of the soil and groundwater within the APEC (former ASTs)
APEC 6	28 - Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH106	To assess the quality of the soil and groundwater within the APEC (AST in basement)
APEC 7	52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Metals PHCs BTEX VOCs	Soil & Groundwater	BH115	To assess the quality of the soil and groundwater within the APEC

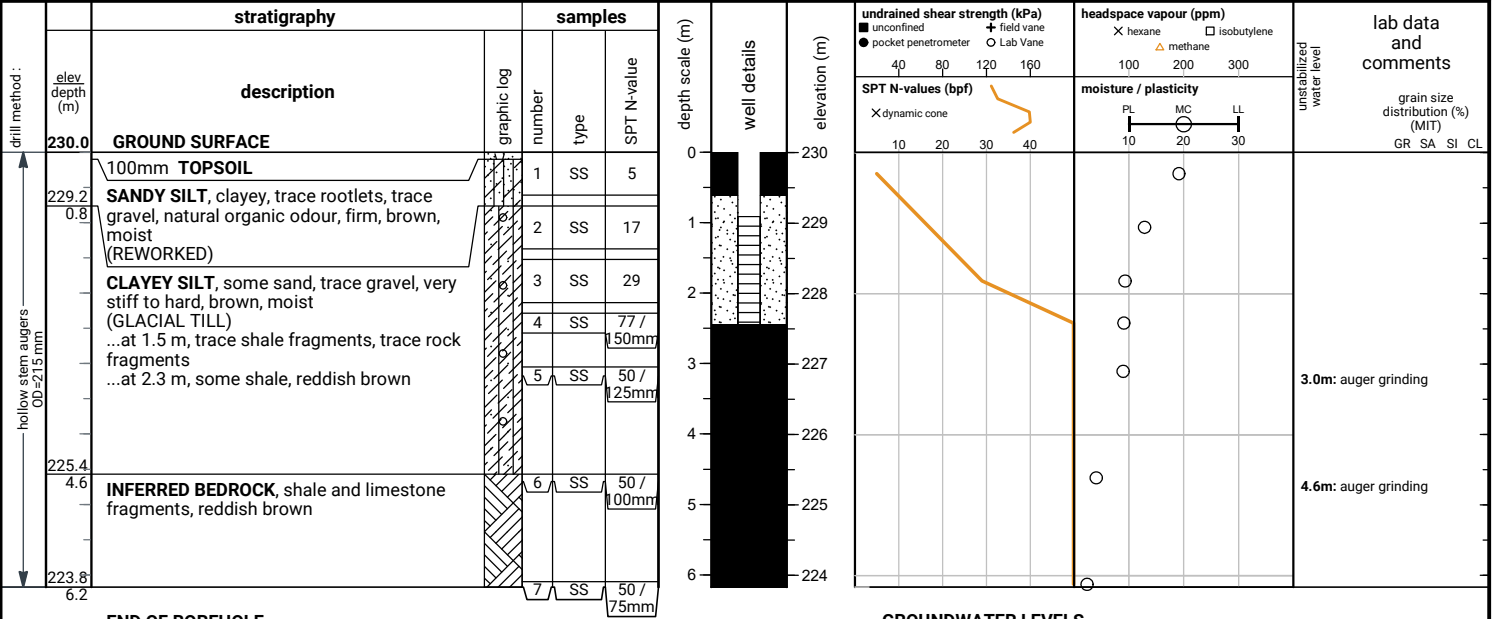
# APPENDIX B



File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.

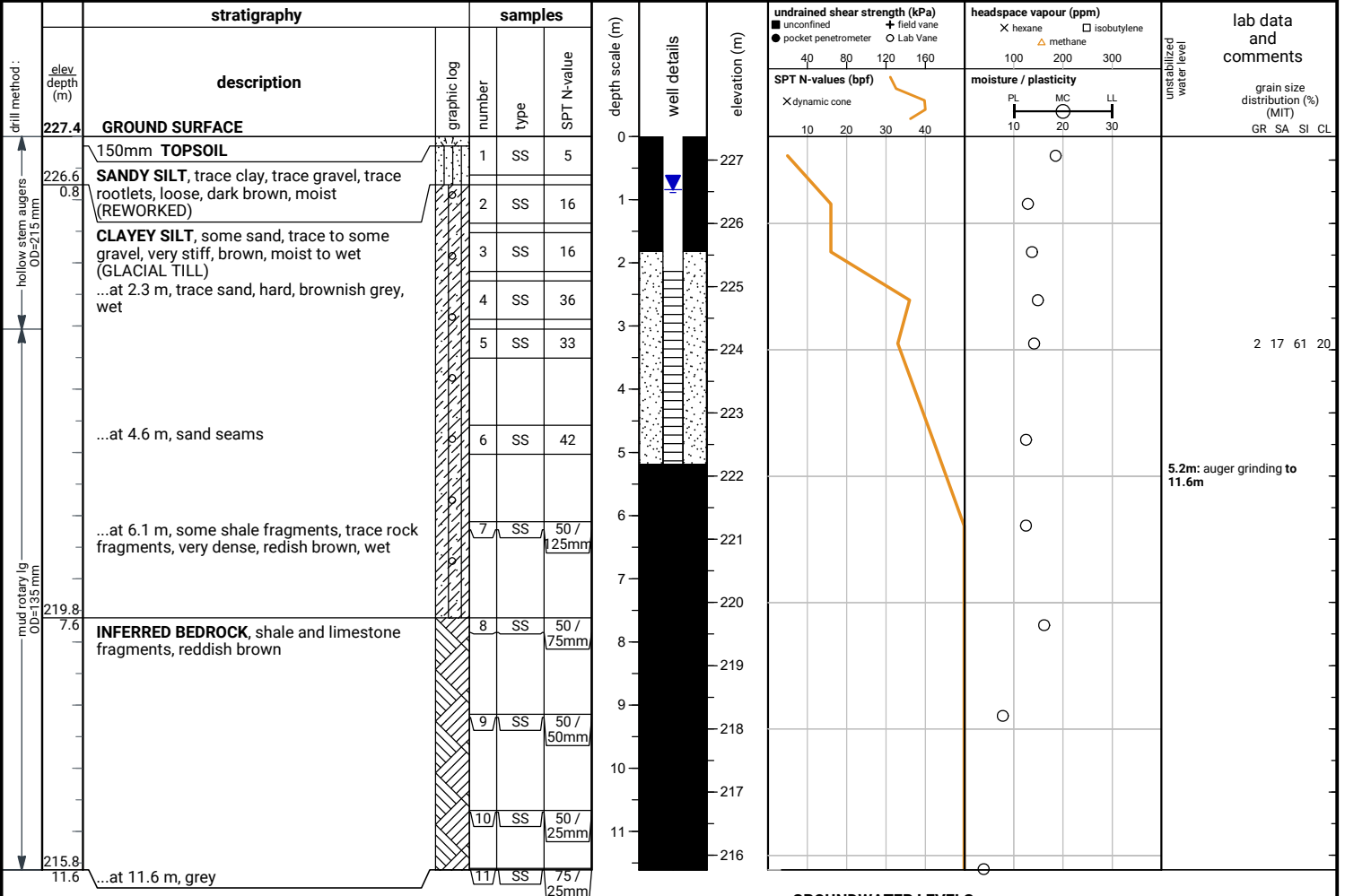




File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Contained drill water upon completion of drilling. Unstabilized water level not measured. Borehole was open.

50 mm dia. monitoring well installed.  
No. 10 screen

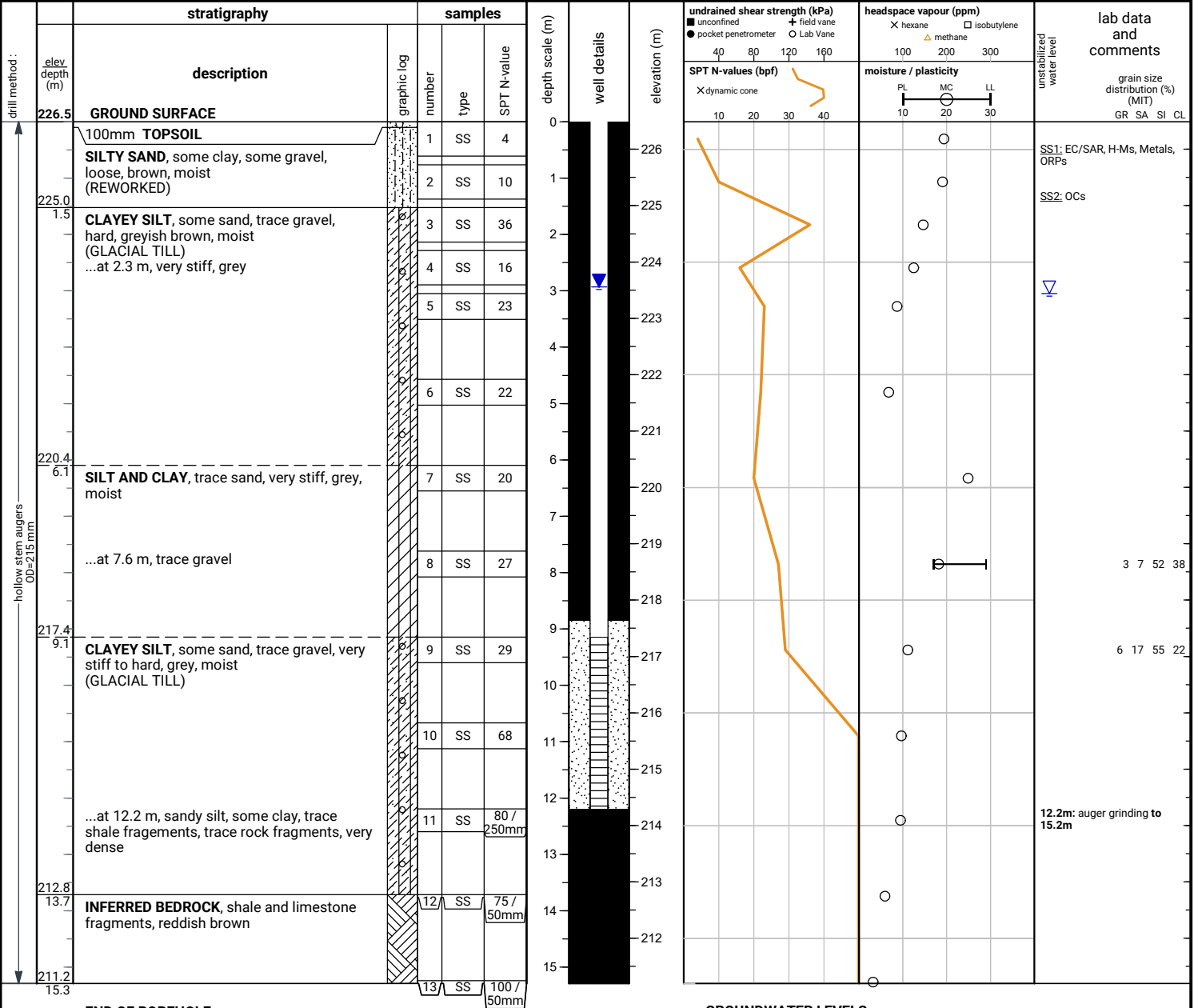
**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	1.0	226.4
Jun 3, 2024	0.8	226.6

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

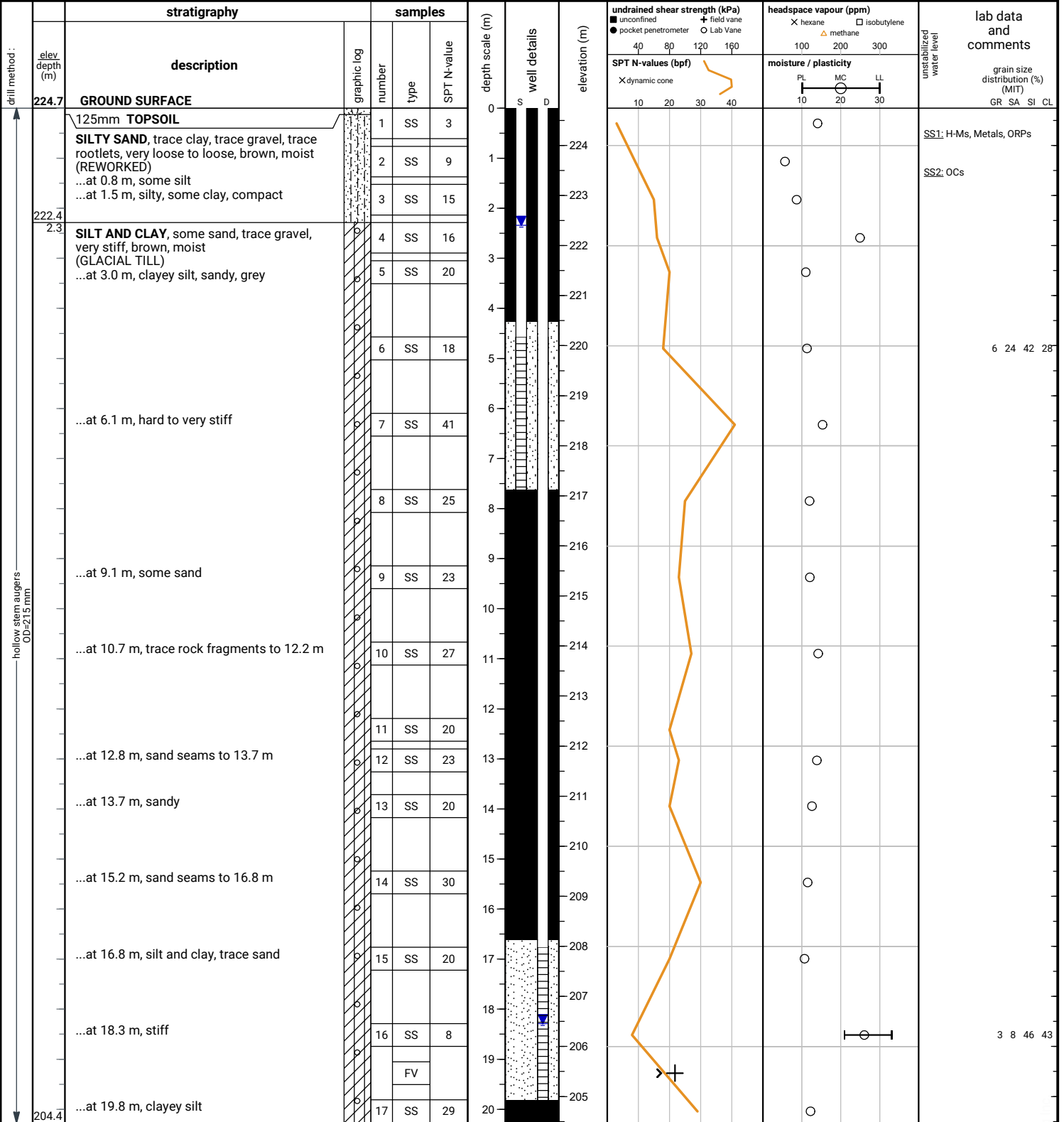
Unstabilized water level measured at 3.0 m below ground surface; caved to 11.6 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Borehole was dry and caved to 18.6 m below ground surface upon completion of drilling.

S: 50 mm dia. monitoring well installed.  
D: 50 mm dia. monitoring well installed.  
No. 10 screen

**104-S GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	2.4	222.3
Jun 3, 2024	2.3	222.4

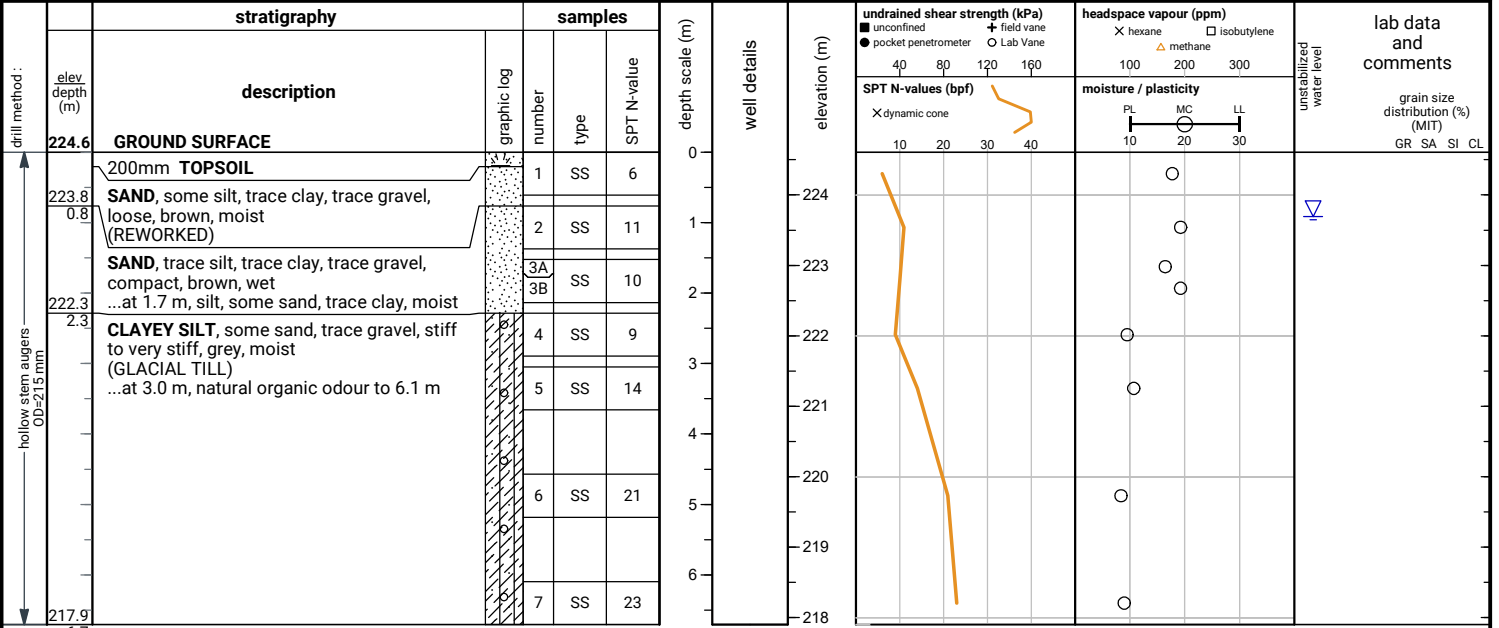
**104-D GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	18.2	206.5
Jun 3, 2024	18.3	206.4

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



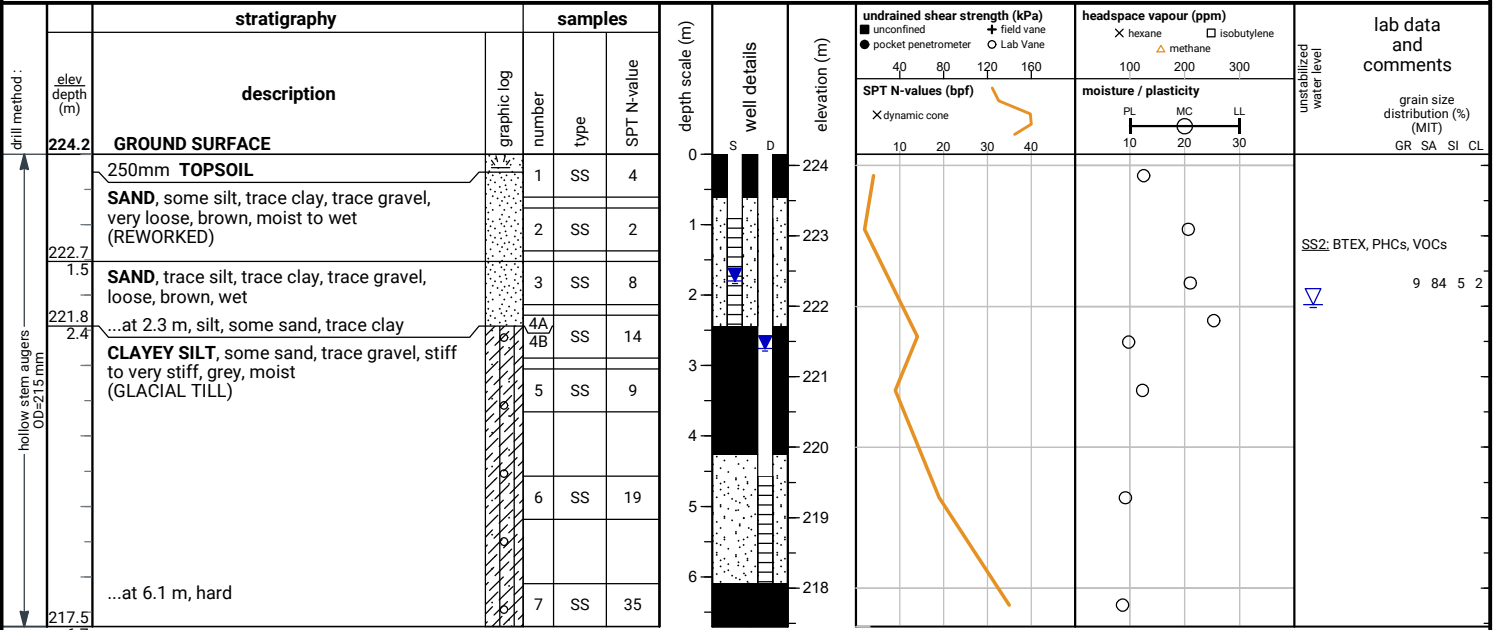
END OF BOREHOLE

Unstabilized water level measured at 0.9 m below ground surface; caved to 4.6 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 2.1 m below ground surface; open upon completion of drilling.

S: 50 mm dia. monitoring well installed.  
D: 50 mm dia. monitoring well installed.  
No. 10 screen

**106-S GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	1.6	222.6
Jun 3, 2024	1.8	222.4

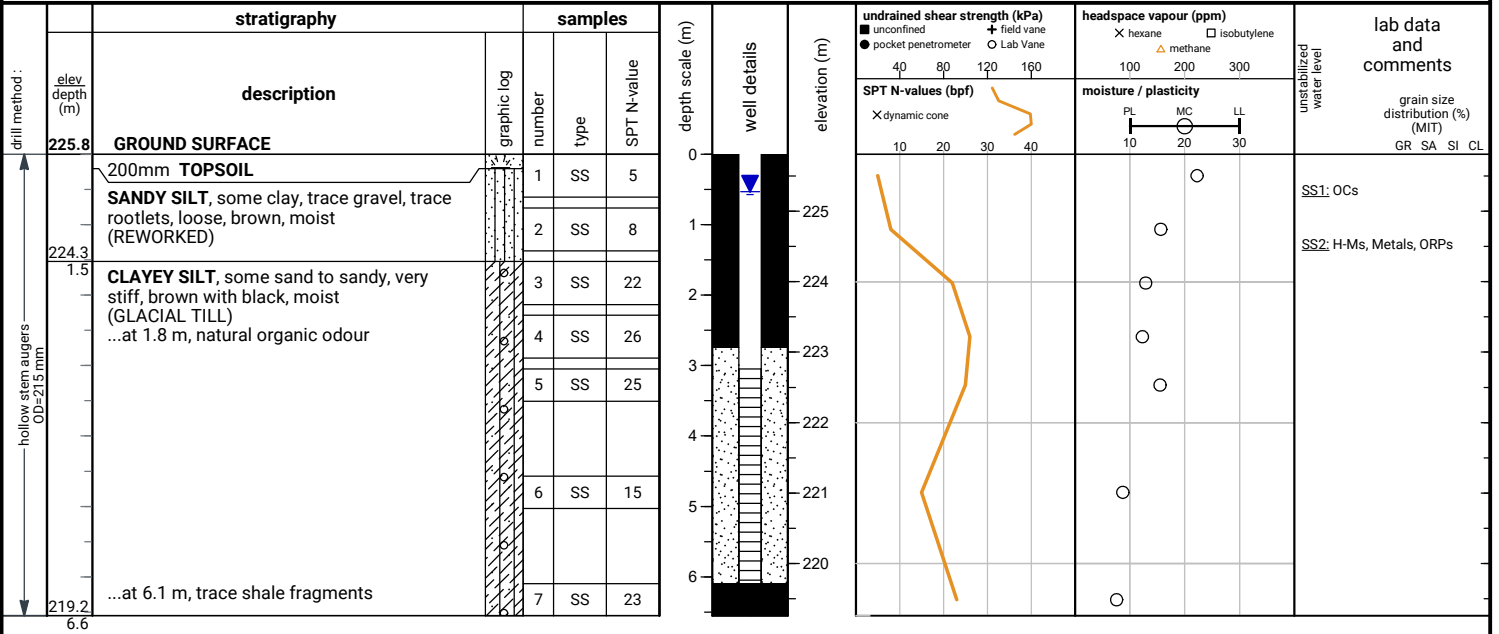
**106-D GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	2.9	221.3
Jun 3, 2024	2.8	221.4

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Dry and open upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

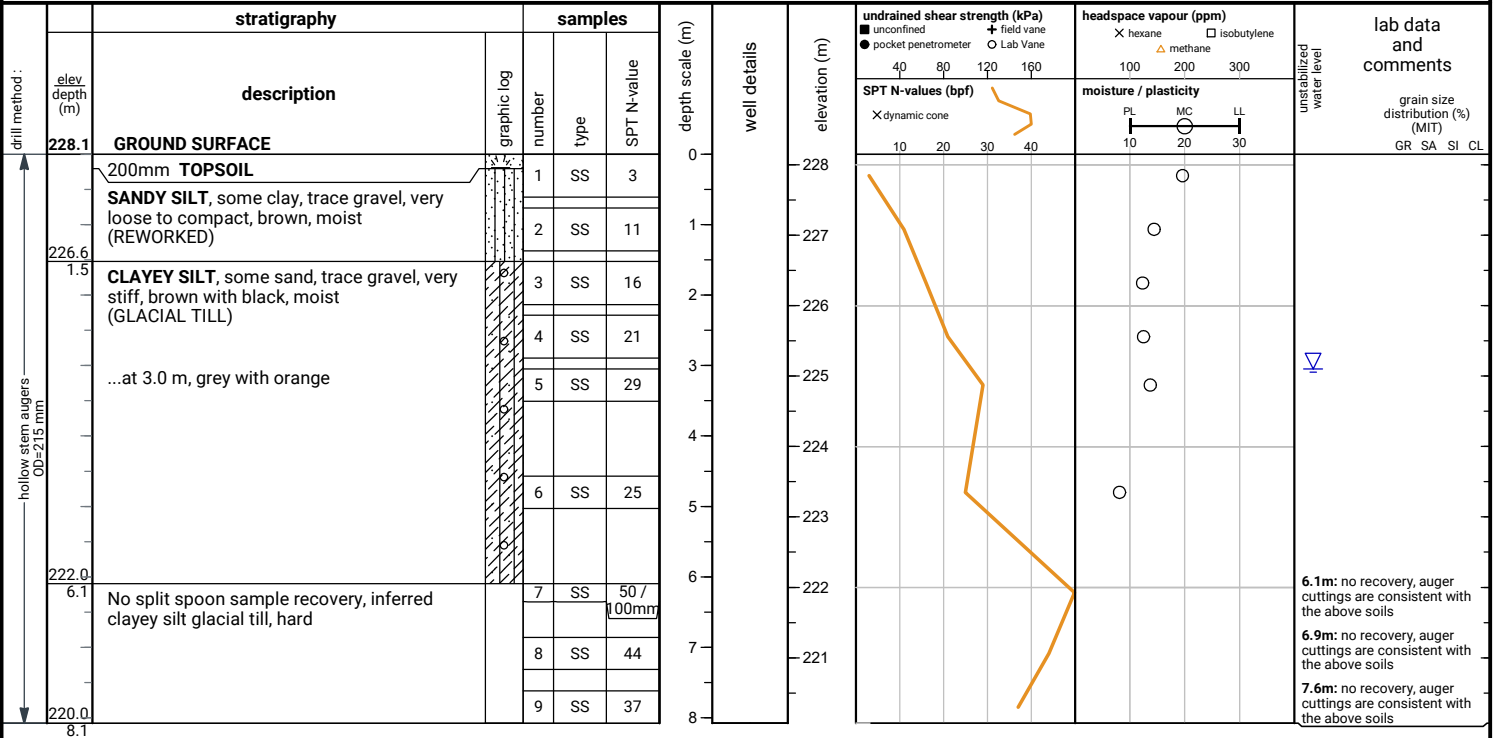
**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	0.6	225.2
Jun 3, 2024	0.5	225.3

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



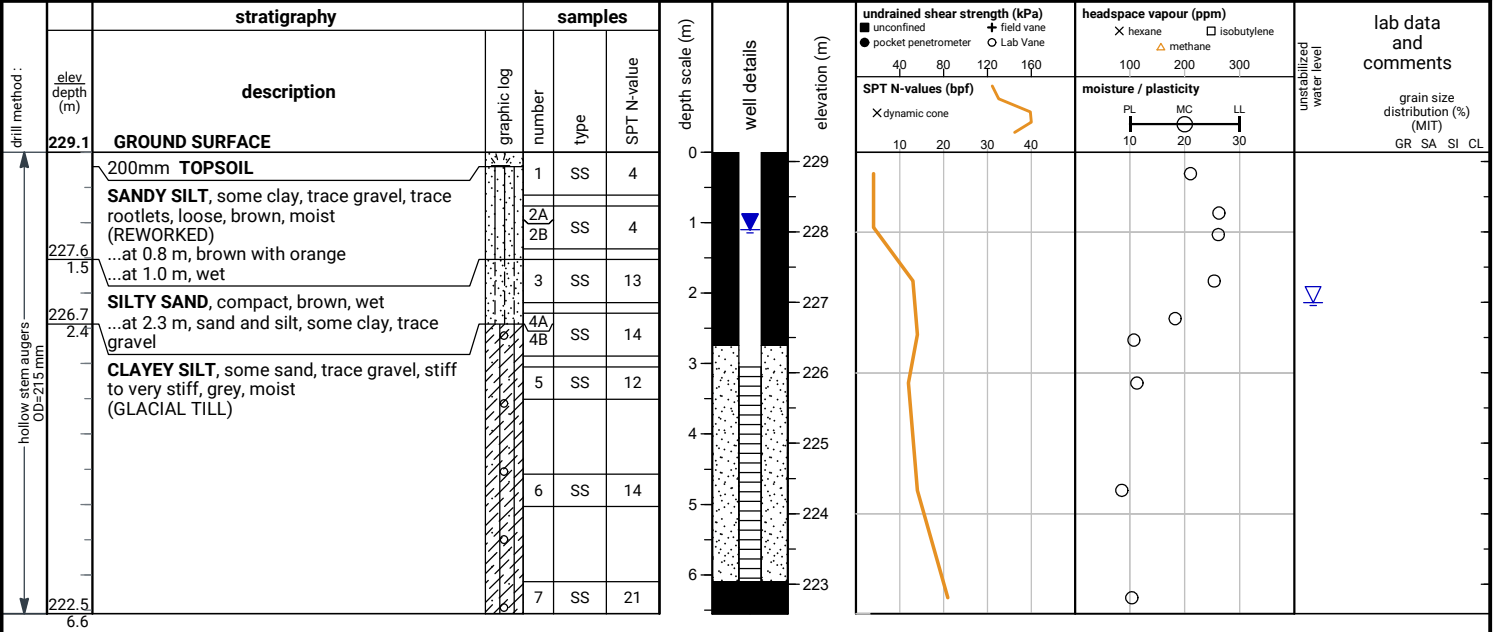
END OF BOREHOLE

Unstabilized water level measured at 3.0 m below ground surface; caved to 5.2 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 2.1 m below ground surface; caved to 4.6 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

**GROUNDWATER LEVELS**

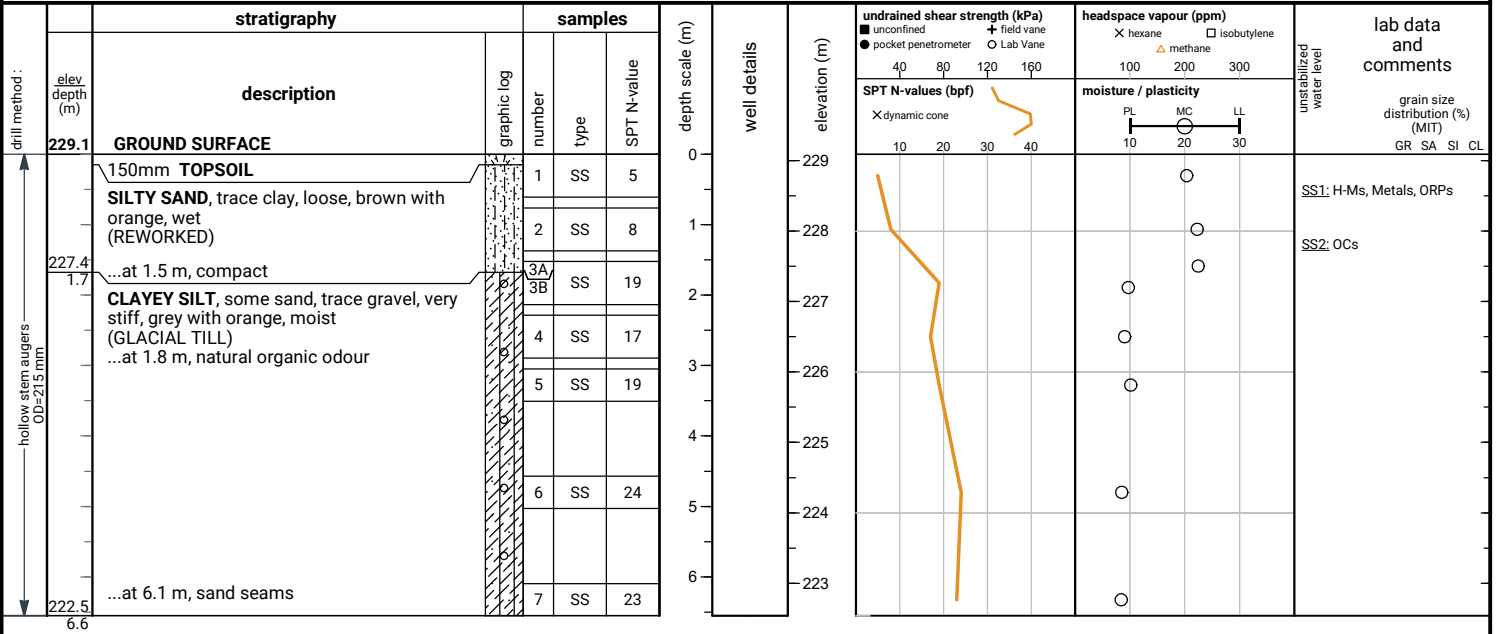
date	depth (m)	elevation (m)
May 27, 2024	0.9	228.2
Jun 3, 2024	1.1	228.0



File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



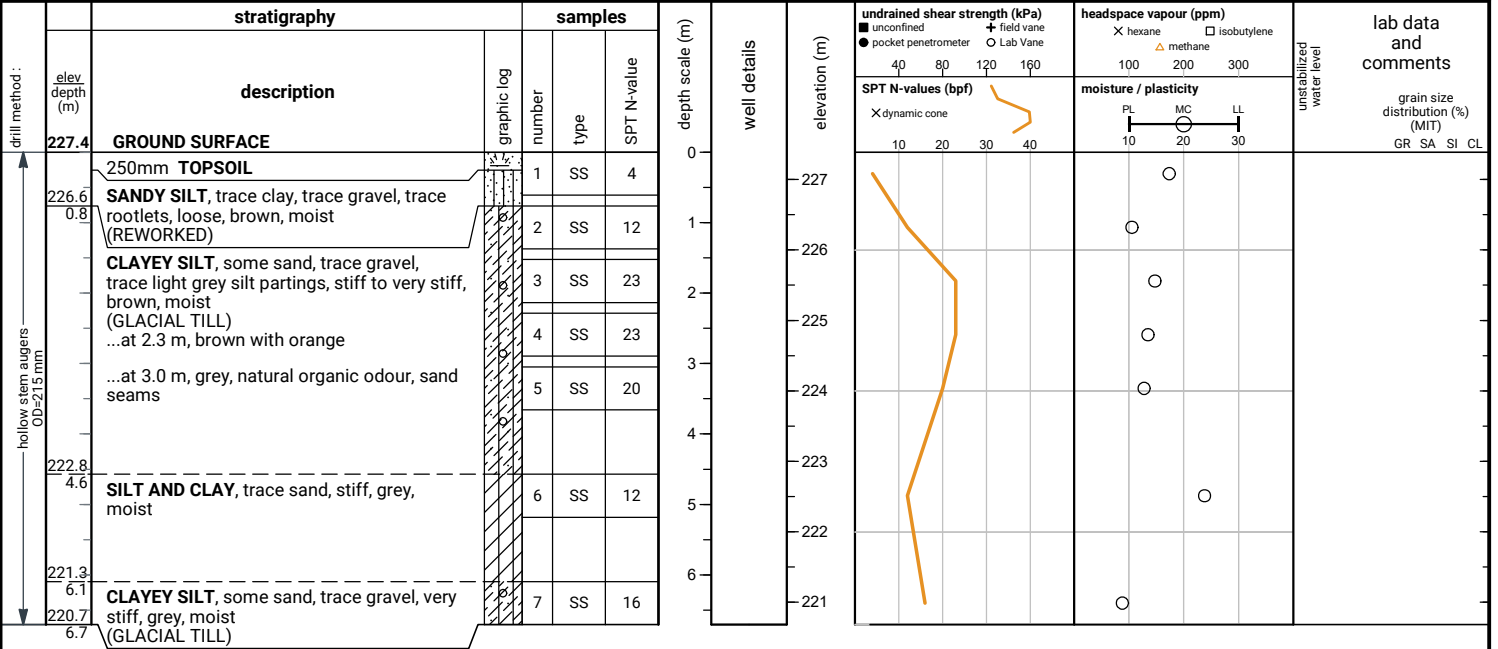
**END OF BOREHOLE**

Borehole was dry and caved to 5.5 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



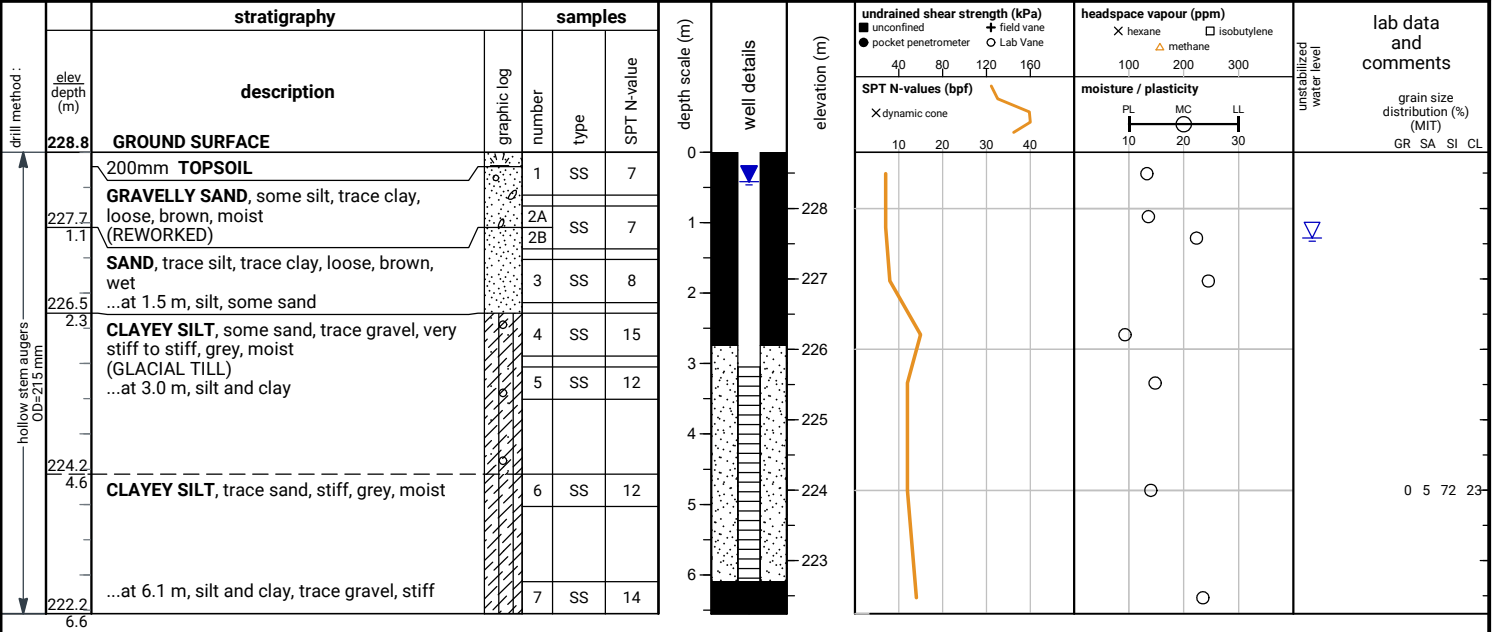
**END OF BOREHOLE**

Borehole was dry and caved to 5.8 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 1.2 m below ground surface; caved to 4.9 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

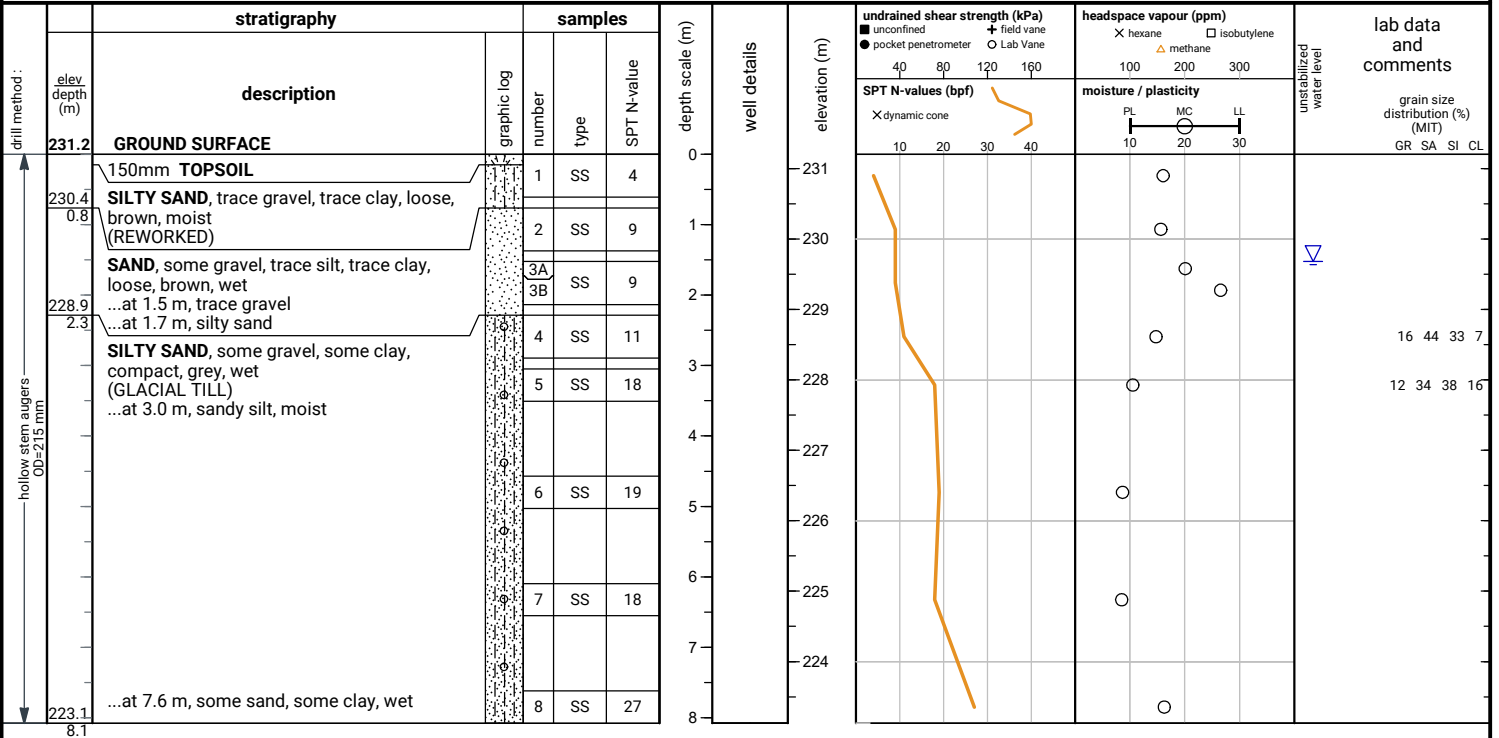
**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	0.4	228.4
Jun 3, 2024	0.4	228.4

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



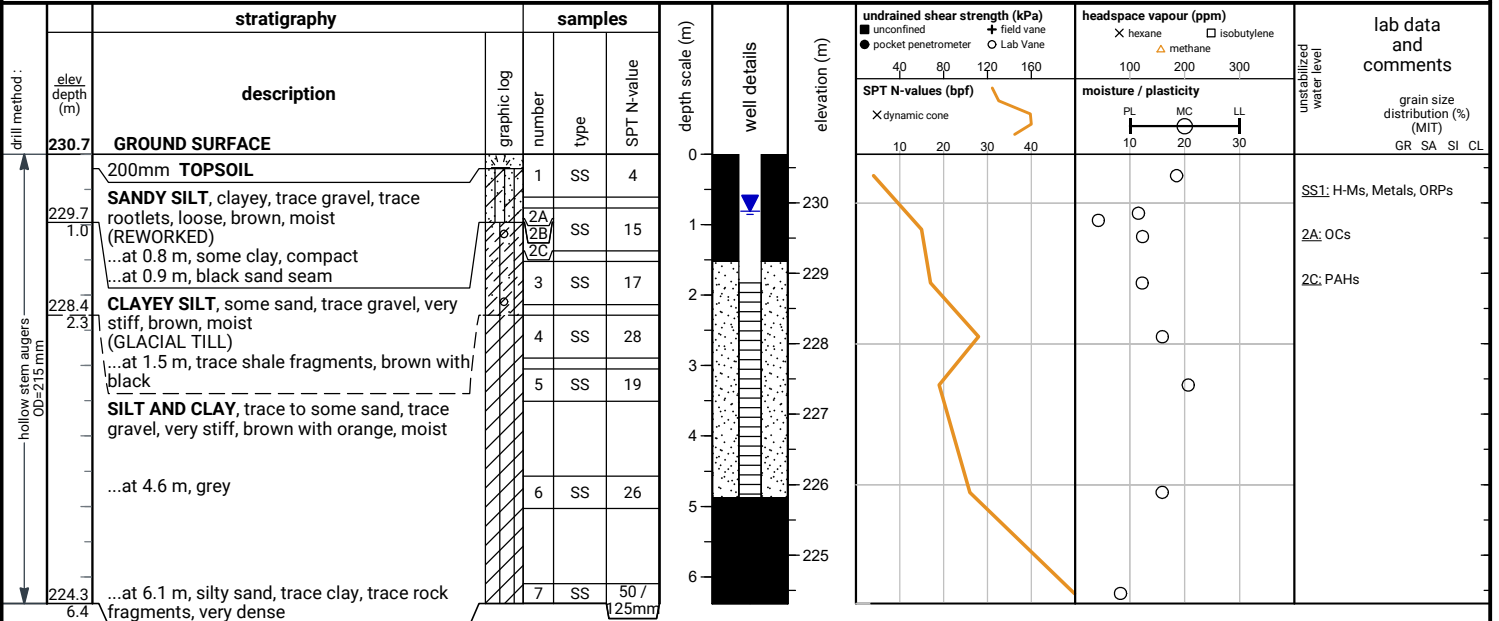
**END OF BOREHOLE**

Unstabilized water level measured at 1.5 m below ground surface; caved to 4.9 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



END OF BOREHOLE

Borehole was dry and caved to 5.5 m below ground surface upon completion of drilling.

**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	2.2	228.5
Jun 3, 2024	0.8	229.9

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.

stratigraphy		samples			depth scale (m)	well details	elevation (m)	undrained shear strength (kPa)	headspace vapour (ppm)	lab data and comments
elev. depth (m)	description	graphic log	number	type				■ unconfined ● pocket penetrometer X dynamic cone	+ field vane ○ Lab Vane X hexane △ methane □ isobutylene	
226.0	GROUND SURFACE				0					
225.2	150mm TOPSOIL		1	SS	3					
0.8	FILL, silty sand, some clay, trace gravel, very loose, dark brown, moist		2	SS	14					
	CLAYEY SILT, some sand, trace gravel, stiff to very stiff, brown, moist (GLACIAL TILL)		3	SS	23					
	...at 1.5 m, wet		4A/4B	SS	24					
	...at 2.4 m, grey, moist		5	SS	23					
220.8			6	SS	20					
5.2										

**END OF BOREHOLE**

Unstabilized water level measured at 1.5 m below ground surface; open upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	2.0	224.0
Jun 3, 2024	1.9	224.1

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.

stratigraphy		samples			depth scale (m)	well details	elevation (m)	undrained shear strength (kPa) ■ unconfined ● pocket penetrometer + field vane ○ Lab Vane	headspace vapour (ppm) X hexane △ methane □ isobutylene	moisture / plasticity PL MC LL 10 20 30	lab data and comments grain size distribution (%) (MIT) GR SA SI CL
elev. depth (m)	description	graphic log	number	type							
225.8	<b>GROUND SURFACE</b>				0						
	200mm <b>TOPSOIL</b>		1	SS	2						
	<b>FILL</b> , silty sand, trace clay, trace gravel, very loose, brown, moist ...at 0.8 m, some silt, some gravel, loose ...at 1.5 m, compact		2	SS	6						SS1: OCs
223.8			3A	SS	10						
223.8	<b>CLAYEY SILT</b> , some sand, trace gravel, very stiff, brown, moist (GLACIAL TILL) ...at 2.3 m, grey		3B								SS2: H-Ms, Metals, ORPs
222.1			4	SS	20						
222.1			5	SS	25						
3.7											

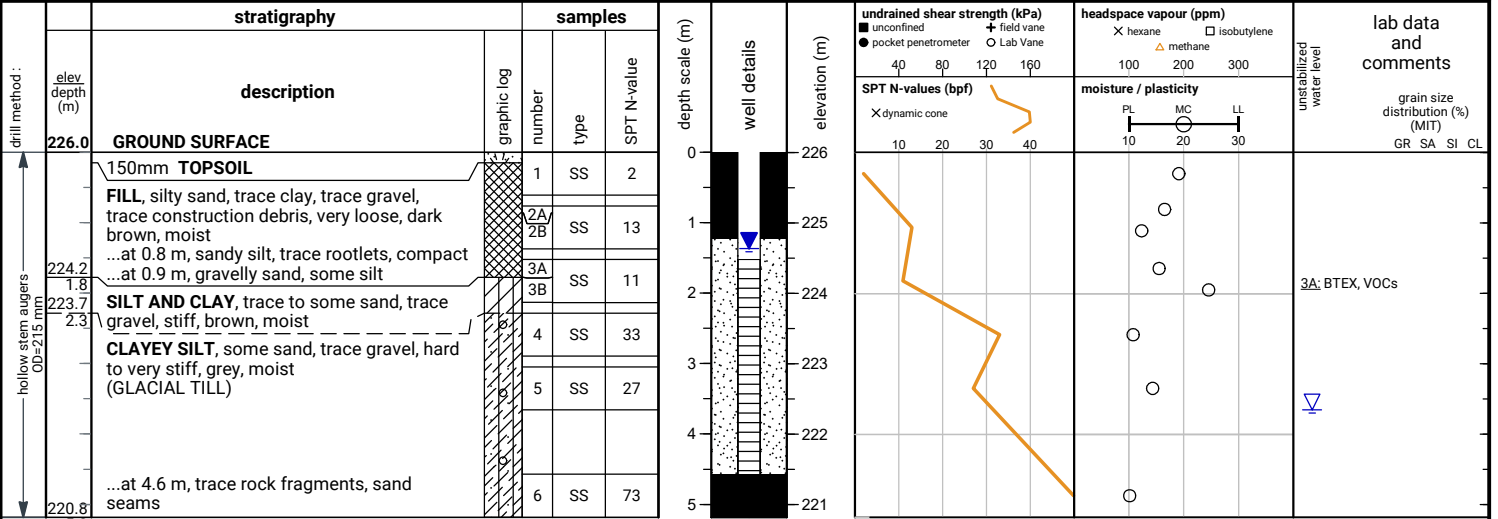
**END OF BOREHOLE**

Unstabilized water level measured at 1.5 m below ground surface; caved to 2.1 m below ground surface upon completion of drilling.

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 3.7 m below ground surface; open upon completion of drilling.

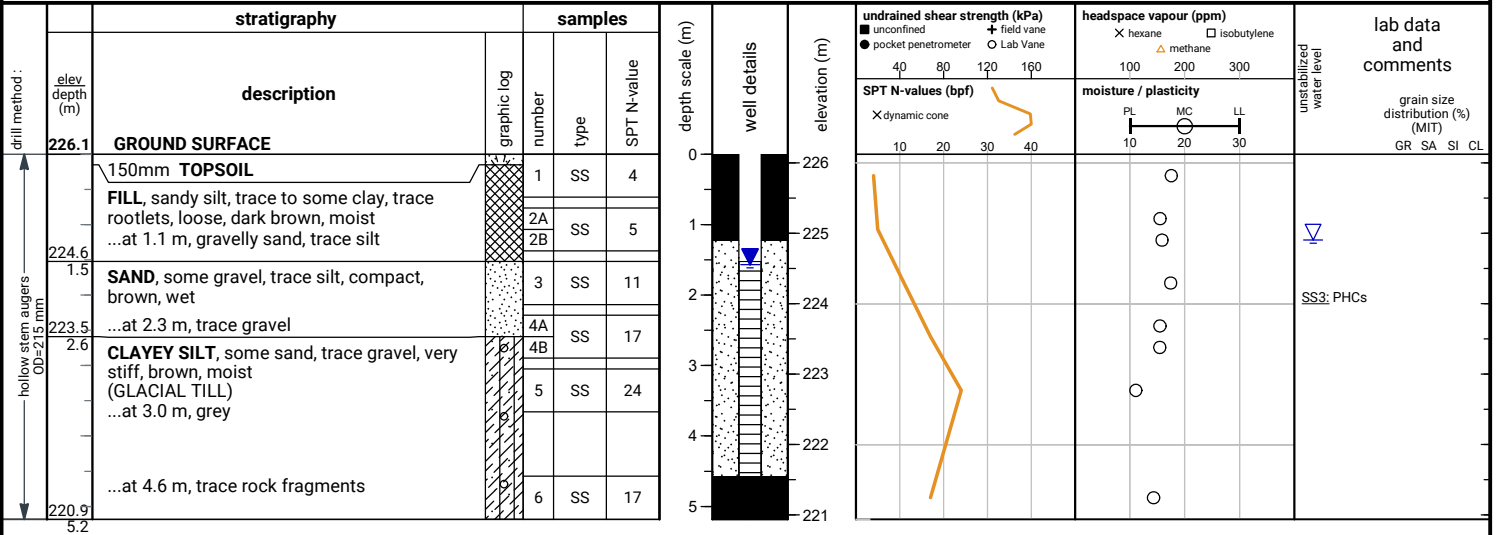
50 mm dia. monitoring well installed.  
No. 10 screen



File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 1.2 m below ground surface; caved to 4.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.  
No. 10 screen

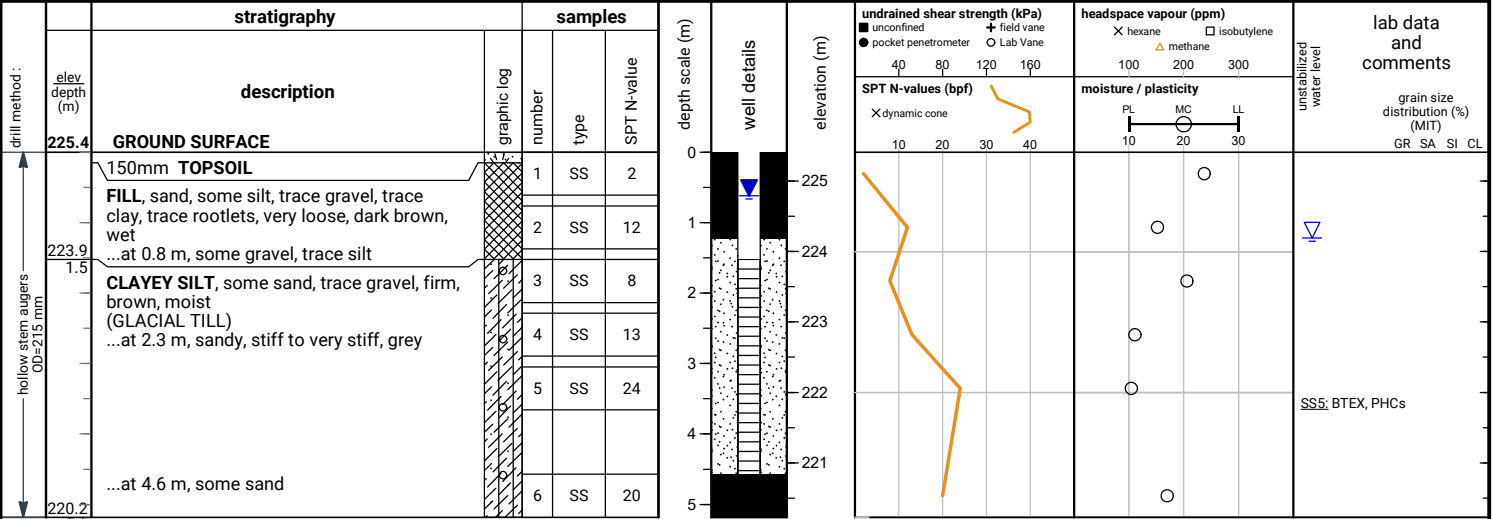
**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	1.6	224.5
Jun 3, 2024	1.6	224.5

File No. : 24-048

Project : 16469 10 Side Road, Halton Hills

Client : Russell Pines Property Corp.



**END OF BOREHOLE**

Unstabilized water level measured at 1.2 m below ground surface; open upon completion of drilling.

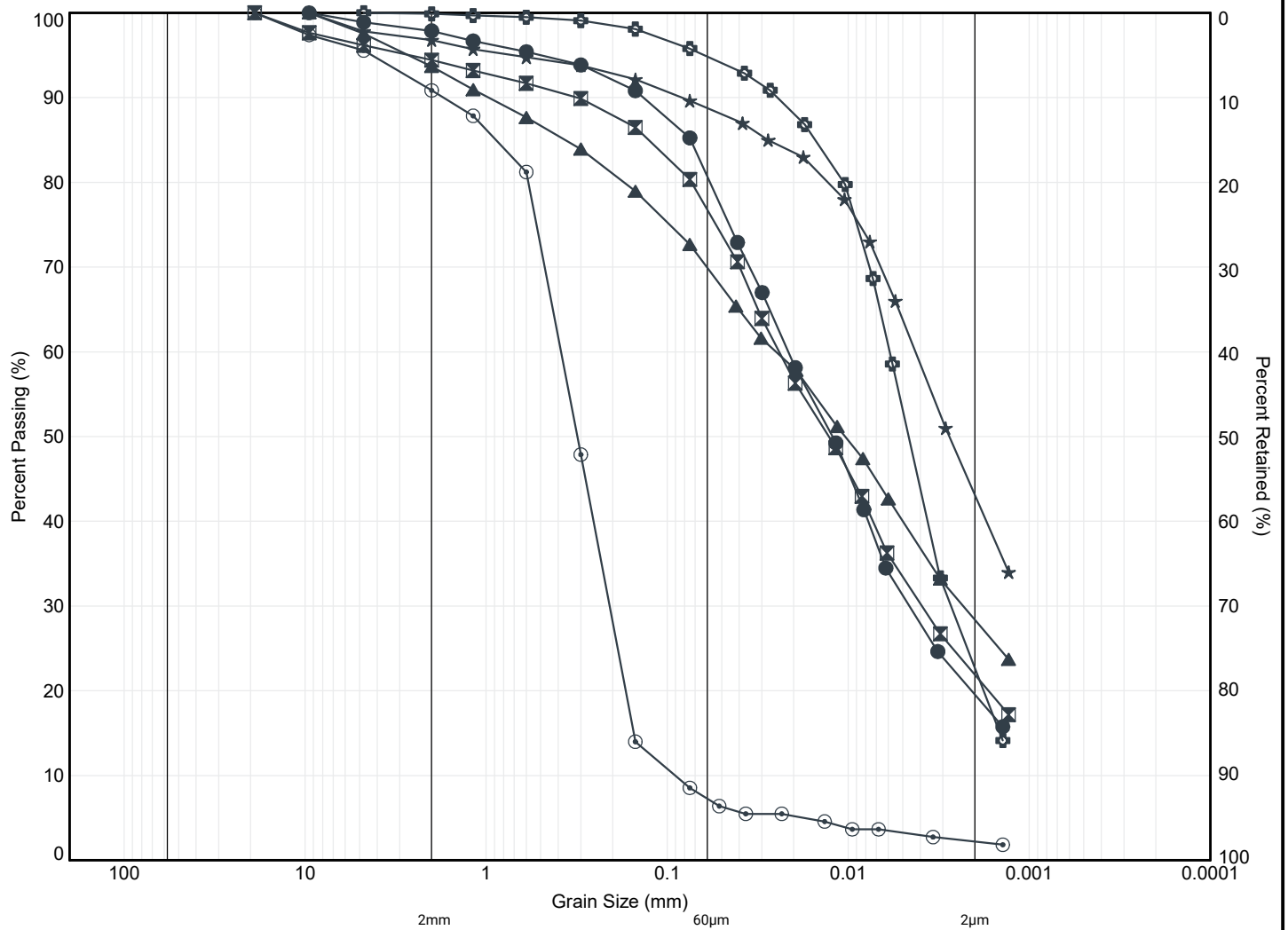
50 mm dia. monitoring well installed.  
No. 10 screen

**GROUNDWATER LEVELS**

date	depth (m)	elevation (m)
May 27, 2024	0.5	224.9
Jun 3, 2024	0.6	224.8

# APPENDIX C





MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

#### MIT SYSTEM

	Location	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
●	BH 102	SS5	3.3	224.1	2	17	61	20	(0)
⊠	BH 103	SS9	9.4	217.1	6	17	55	22	(0)
▲	BH 104	SS6	4.8	219.9	6	24	42	28	(0)
★	BH 104	SS16	18.5	206.2	3	8	46	43	(0)
⊙	BH 106	SS3	1.8	222.3	9	84	5	2	(0)
⊕	BH 112	SS6	4.8	224.0	0	5	72	23	(0)

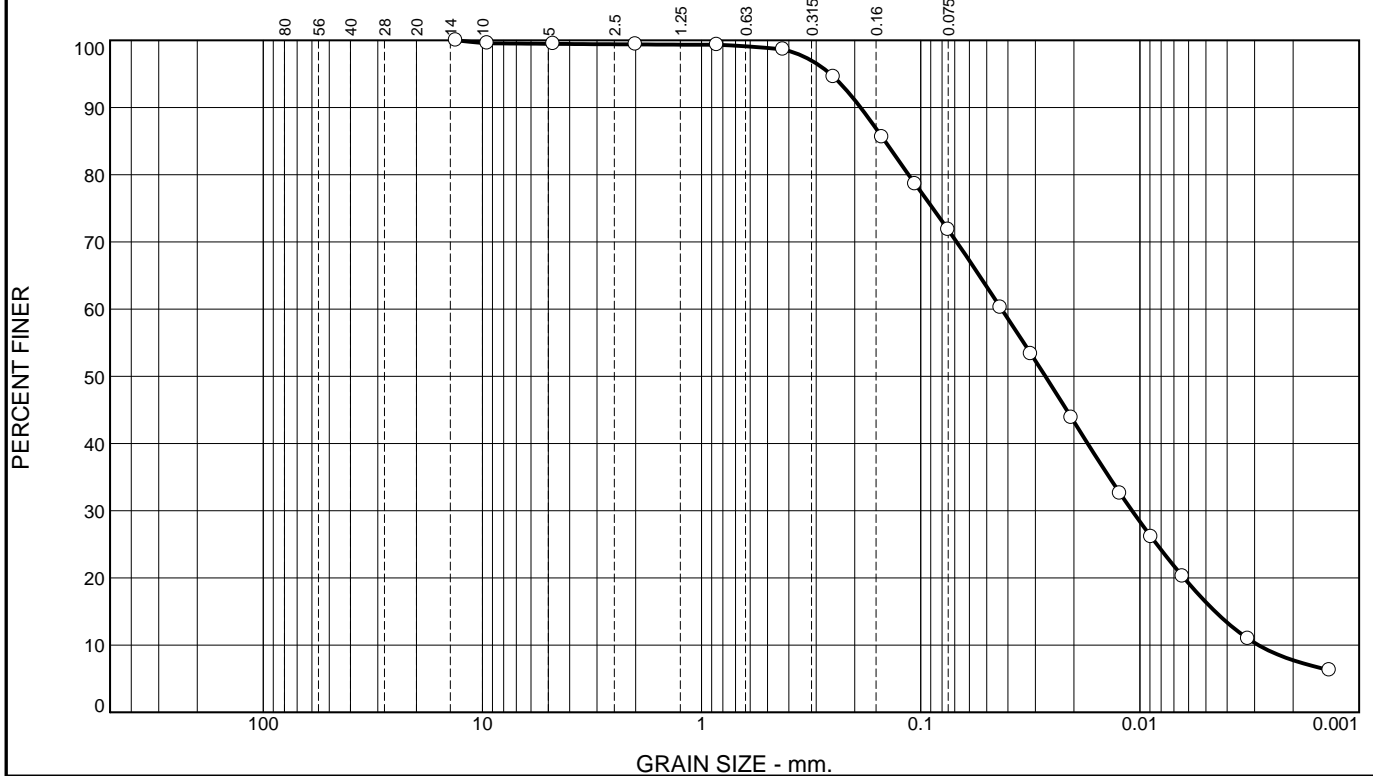
Title:

**GRAIN SIZE DISTRIBUTION  
(CAPTION HERE)**

File No.:

**24-048**

# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	0	0	27	64	8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
13.20	100		
9.50	100		
4.75	99		
2.00	99		
0.850	99		
0.425	99		
0.250	95		
0.150	86		
0.106	79		
0.075	72		
0.0433 mm.	60		
0.0314 mm.	53		
0.0205 mm.	44		
0.0123 mm.	33		
0.0089 mm.	26		
0.0064 mm.	20		
0.0032 mm.	11		
0.0014 mm.	6.3		

\* (no specification provided)

## Soil Description

Sandy silt with trace clay and gravel

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 0.1882

D<sub>85</sub>= 0.1457

D<sub>60</sub>= 0.0428

D<sub>50</sub>= 0.0270

D<sub>30</sub>= 0.0109

D<sub>15</sub>= 0.0045

D<sub>10</sub>= 0.0029

C<sub>u</sub>= 14.86

C<sub>c</sub>= 0.96

## Classification

USCS=

AASHTO=

## Remarks

Source of Sample: Site Drilling  
Sample Number: 21-1\_SS6B

Depth: 4.1 to 4.6 m

Date: Jun. 07, 2021



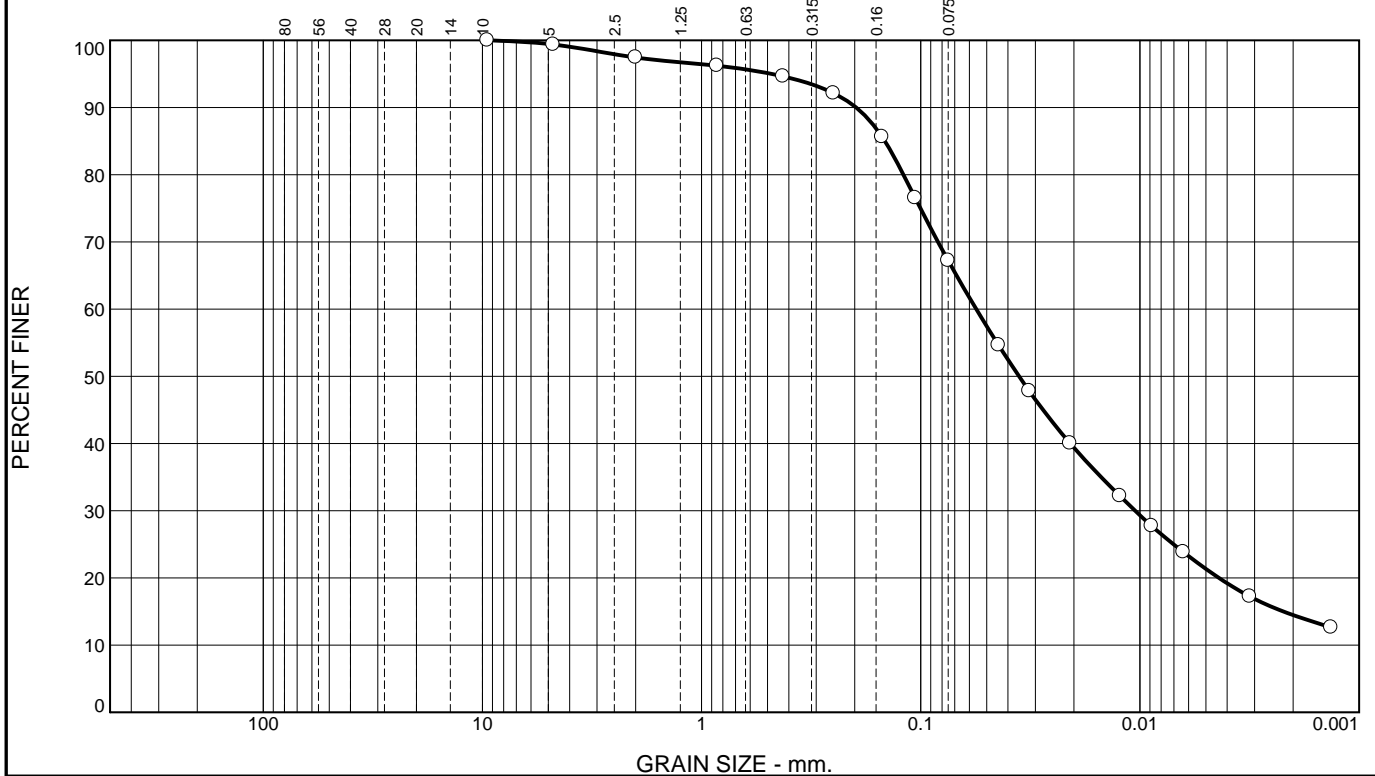
Client: Fieldgate Developments  
Project: Russell Pines

Project No: 211-03319-00

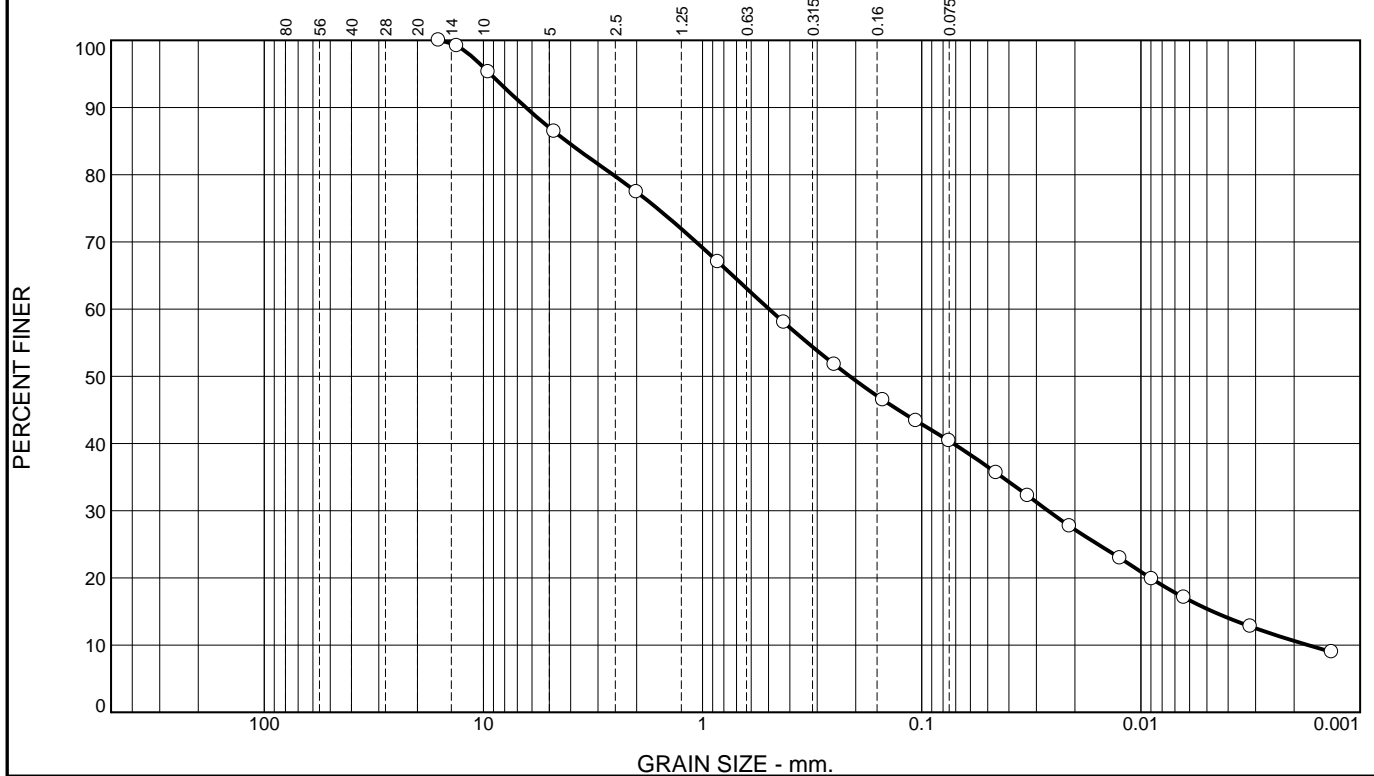
Figure R1699-H-1

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# Particle Size Distribution Report



# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	14	9	19	18	29	11

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
16.00	100		
13.20	99		
9.50	95		
4.75	86		
2.00	77		
0.850	67		
0.425	58		
0.250	52		
0.150	46		
0.106	43		
0.075	40		
0.0457 mm.	36		
0.0328 mm.	32		
0.0211 mm.	28		
0.0124 mm.	23		
0.0089 mm.	20		
0.0064 mm.	17		
0.0032 mm.	13		
0.0013 mm.	9.0		

\* (no specification provided)

## Soil Description

Silty sand with some clay and gravel

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 6.3958

D<sub>85</sub>= 4.1817

D<sub>60</sub>= 0.4974

D<sub>50</sub>= 0.2129

D<sub>30</sub>= 0.0266

D<sub>15</sub>= 0.0047

D<sub>10</sub>= 0.0017

C<sub>u</sub>= 288.43

C<sub>c</sub>= 0.82

## Classification

USCS=

AASHTO=

## Remarks

Source of Sample: Site Drilling  
Sample Number: 21-2D\_SS6

Depth: 3.8 to 4.6 m

Date: Jun. 07, 2021



Client: Fieldgate Developments

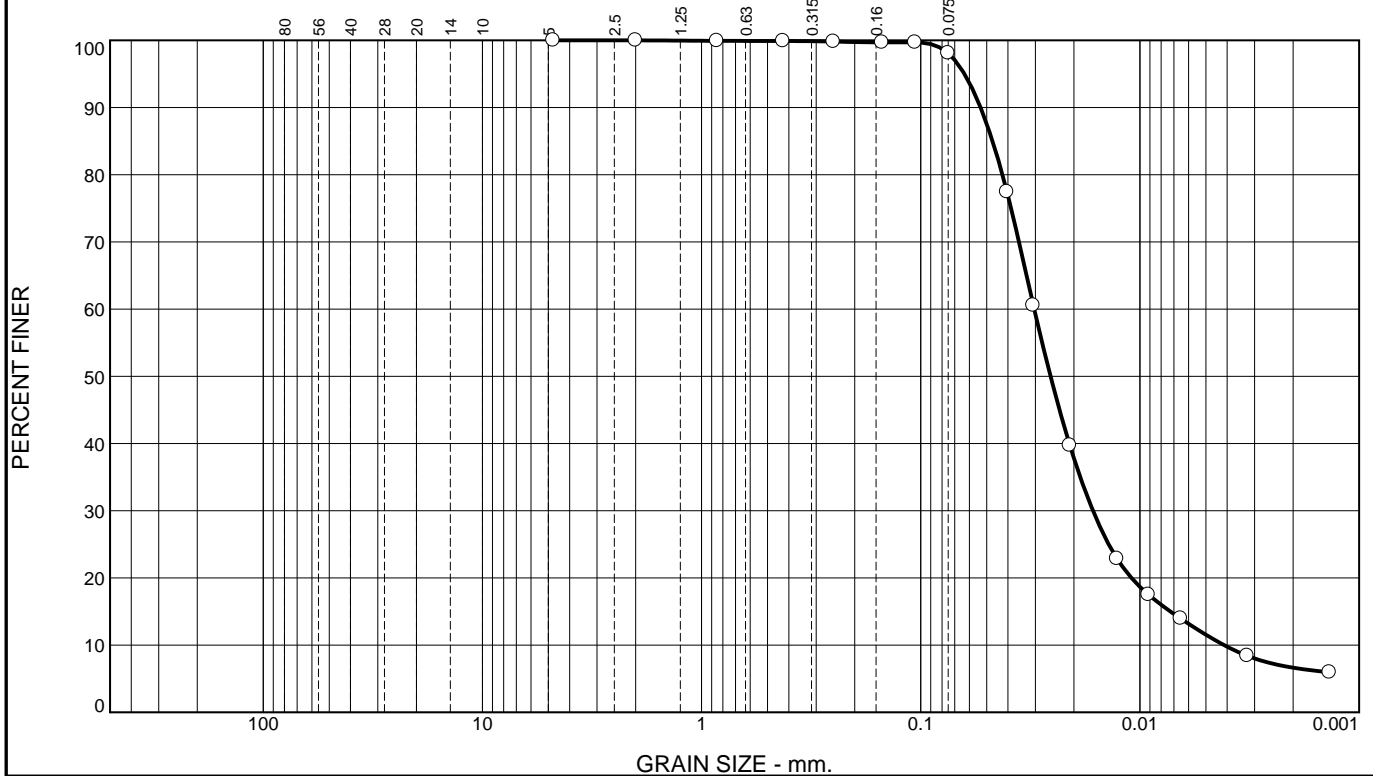
Project: Russell Pines

Project No: 211-03319-00

Figure R1699-H-3

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	2	91	7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4.75	100		
2.00	100		
0.850	100		
0.425	100		
0.250	100		
0.150	100		
0.106	100		
0.075	98		
0.0404 mm.	77		
0.0306 mm.	61		
0.0209 mm.	40		
0.0127 mm.	23		
0.0091 mm.	18		
0.0065 mm.	14		
0.0032 mm.	8.4		
0.0014 mm.	6.0		

\* (no specification provided)

## Soil Description

Silt with some clay, trace sand

## Atterberg Limits

PL=

LL=

PI=

## Coefficients

D<sub>90</sub>= 0.0533

D<sub>85</sub>= 0.0470

D<sub>60</sub>= 0.0304

D<sub>50</sub>= 0.0256

D<sub>30</sub>= 0.0164

D<sub>15</sub>= 0.0073

D<sub>10</sub>= 0.0041

C<sub>u</sub>= 7.35

C<sub>c</sub>= 2.14

## Classification

USCS=

AASHTO=

## Remarks

Source of Sample: Site Drilling  
Sample Number: 21-2D\_SS10

Depth: 6.9 to 7.6 m

Date: Jun. 07, 2021



Client: Fieldgate Developments  
Project: Russell Pines

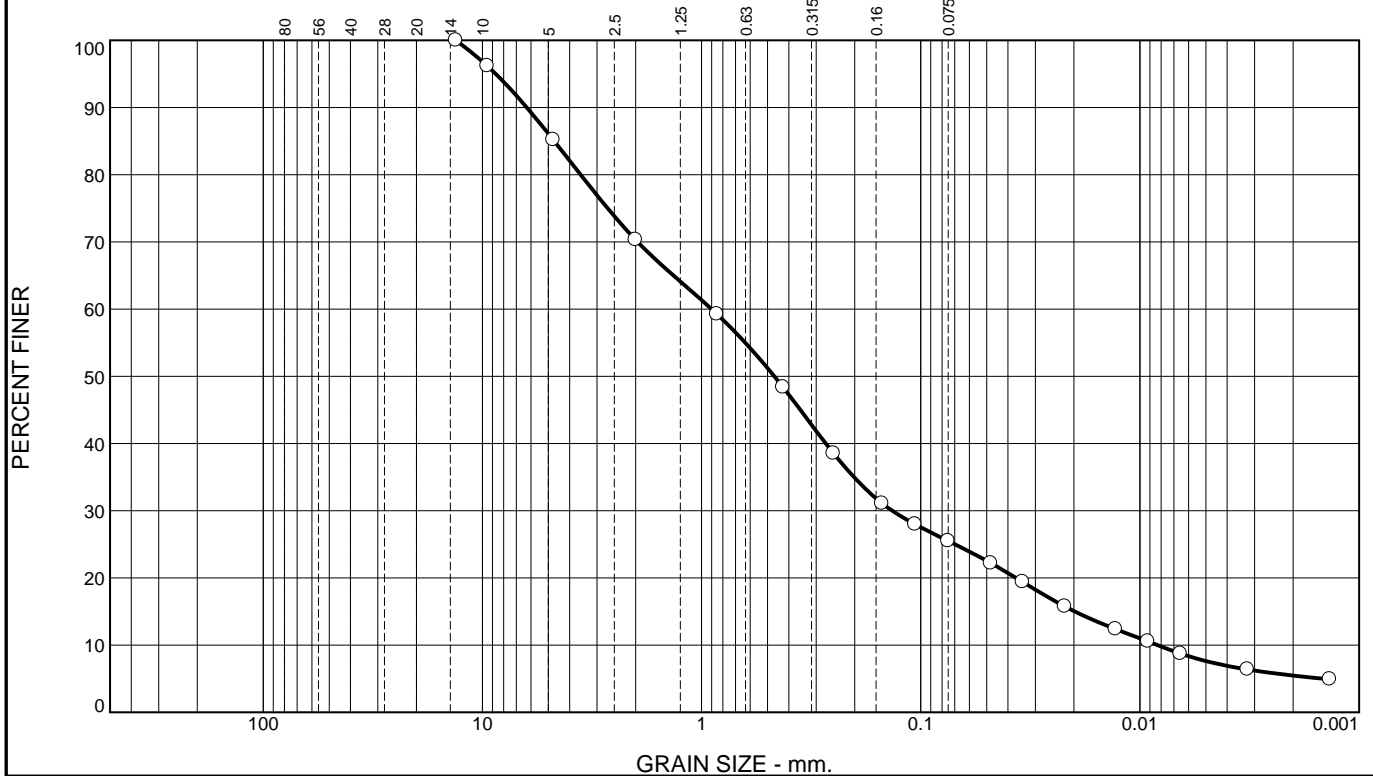
Project No: 211-03319-00

Figure R1699-H-4

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan



# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	15	15	22	23	20	5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
13.20	100		
9.50	96		
4.75	85		
2.00	70		
0.850	59		
0.425	48		
0.250	39		
0.150	31		
0.106	28		
0.075	25		
0.0475 mm.	22		
0.0343 mm.	19		
0.0220 mm.	16		
0.0129 mm.	12		
0.0092 mm.	11		
0.0065 mm.	8.7		
0.0032 mm.	6.4		
0.0014 mm.	4.9		

\* (no specification provided)

**Soil Description**  
 Silty sand with some gravel, trace clay

**Atterberg Limits**  
 PL=      LL=      PI=

**Coefficients**  
 D<sub>90</sub>= 6.2756      D<sub>85</sub>= 4.7017      D<sub>60</sub>= 0.9003  
 D<sub>50</sub>= 0.4659      D<sub>30</sub>= 0.1351      D<sub>15</sub>= 0.0198  
 D<sub>10</sub>= 0.0083      C<sub>u</sub>= 108.34      C<sub>c</sub>= 2.44

**Classification**  
 USCS=      AASHTO=

**Remarks**

Source of Sample: Site Drilling  
Sample Number: 21-3\_SS2B+SS3A

Depth: 1.1 to 1.8 m

Date: Jun. 07, 2021

	<b>Client:</b> Fieldgate Developments <b>Project:</b> Russell Pines
	<b>Project No:</b> 211-03319-00

**Figure** R1699-H-5

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	0	14	80	5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.50	100		
4.75	100		
2.00	99		
0.850	99		
0.425	99		
0.250	98		
0.150	98		
0.106	95		
0.075	85		
0.0446 mm.	52		
0.0338 mm.	33		
0.0224 mm.	17		
0.0131 mm.	11		
0.0093 mm.	9.9		
0.0066 mm.	8.3		
0.0033 mm.	6.0		
0.0014 mm.	4.3		

\* (no specification provided)

**Soil Description**  
 Silt with some sand, trace clay and gravel

**Atterberg Limits**  
 PL=      LL=      PI=

**Coefficients**  
 D<sub>90</sub>= 0.0852      D<sub>85</sub>= 0.0744      D<sub>60</sub>= 0.0496  
 D<sub>50</sub>= 0.0434      D<sub>30</sub>= 0.0323      D<sub>15</sub>= 0.0196  
 D<sub>10</sub>= 0.0096      C<sub>u</sub>= 5.17      C<sub>c</sub>= 2.19

**Classification**  
 USCS=      AASHTO=

**Remarks**

Source of Sample: Site Drilling  
Sample Number: 21-3\_SS5

Depth: 3.0 to 3.8 m

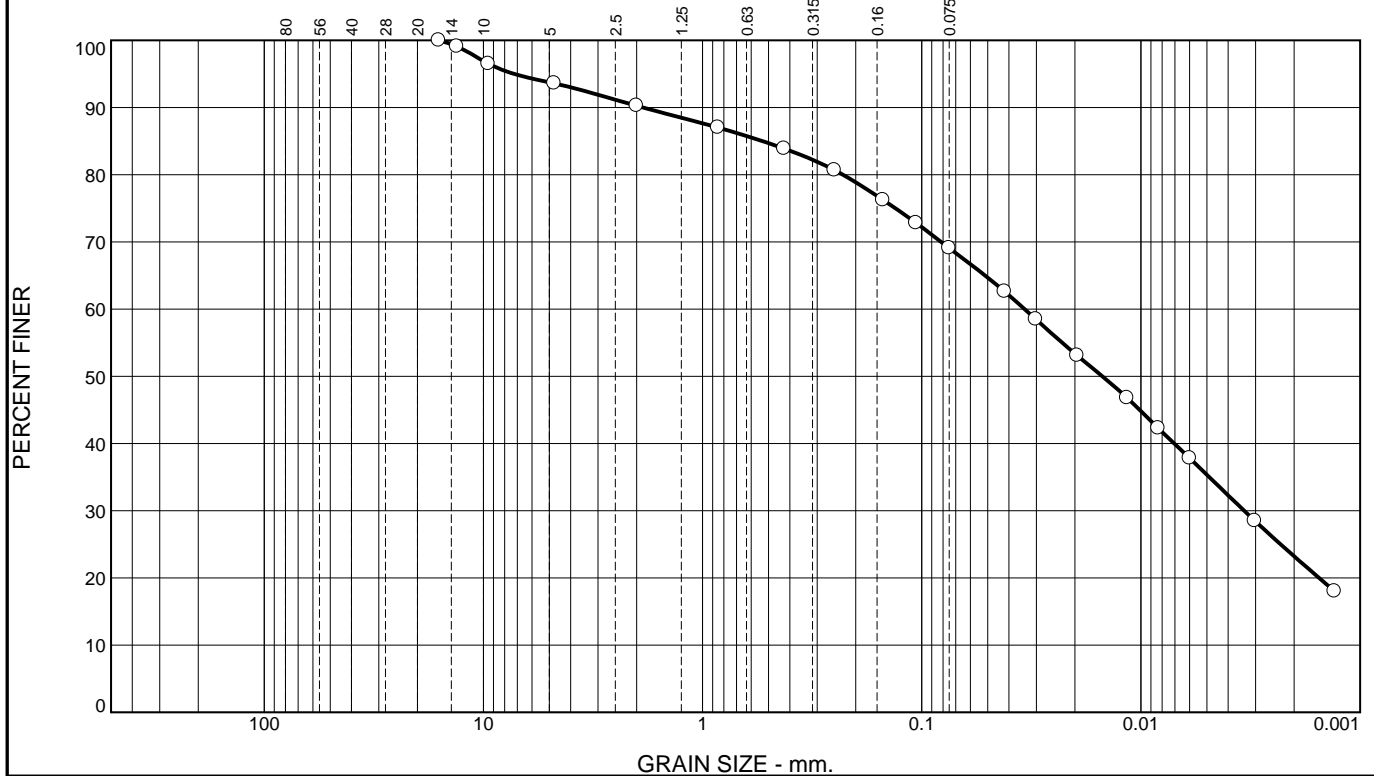
Date: Jun. 07, 2021

	<b>Client:</b> Fieldgate Developments <b>Project:</b> Russell Pines
	<b>Project No:</b> 211-03319-00

**Figure** R1699-H-6

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	6	4	6	15	46	23

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
16.00	100		
13.20	99		
9.50	97		
4.75	94		
2.00	90		
0.850	87		
0.425	84		
0.250	81		
0.150	76		
0.106	73		
0.075	69		
0.0419 mm.	63		
0.0302 mm.	58		
0.0195 mm.	53		
0.0116 mm.	47		
0.0083 mm.	42		
0.0060 mm.	38		
0.0030 mm.	29		
0.0013 mm.	18		

\* (no specification provided)

**Soil Description**  
 Sandy clayey silt with trace gravel

**Atterberg Limits**  
 PL=      LL=      PI=

**Coefficients**  
 D<sub>90</sub>= 1.8725      D<sub>85</sub>= 0.5338      D<sub>60</sub>= 0.0340  
 D<sub>50</sub>= 0.0150      D<sub>30</sub>= 0.0034      D<sub>15</sub>=  
 D<sub>10</sub>=      C<sub>u</sub>=      C<sub>c</sub>=

**Classification**  
 USCS=      AASHTO=

**Remarks**

Source of Sample: Site Drilling  
Sample Number: 21-4\_SS4

Depth: 2.3 to 3.0 m

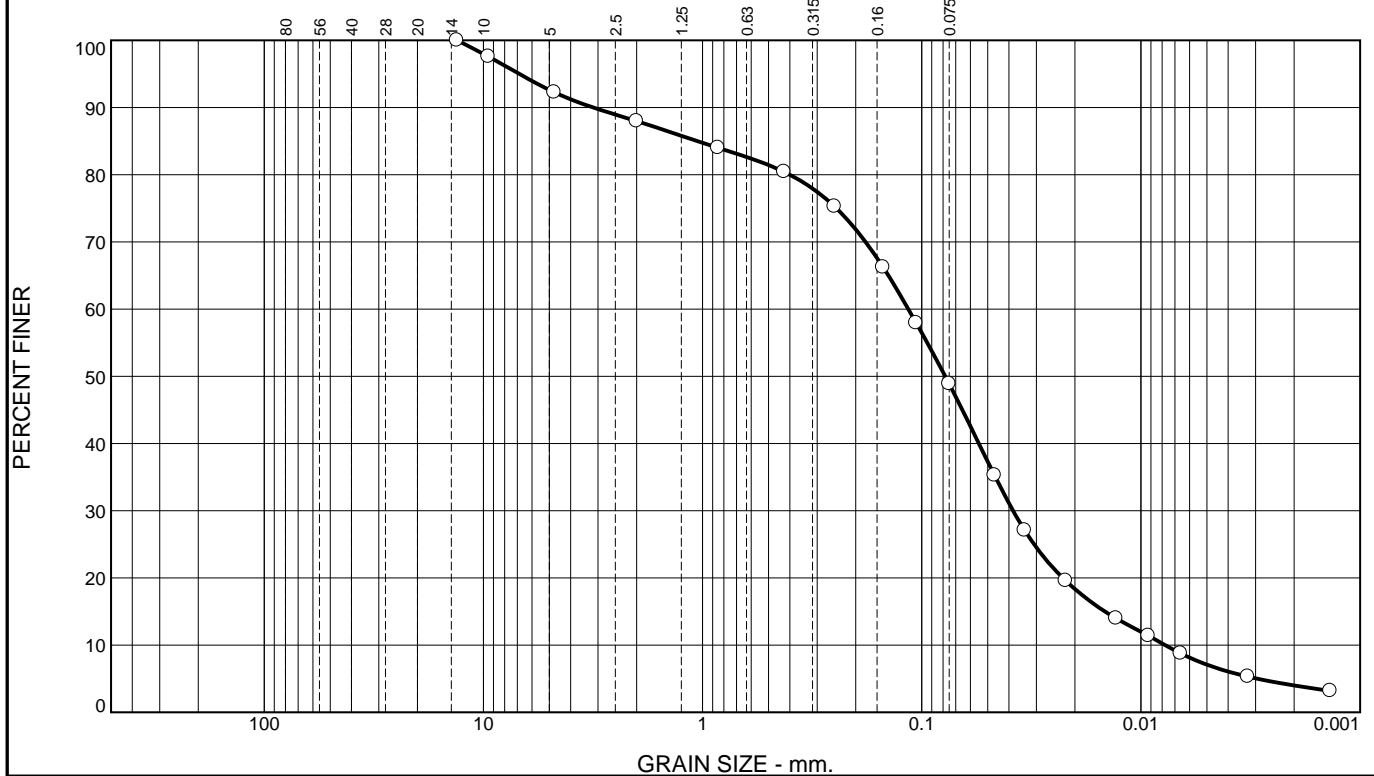
Date: Jun. 07, 2021

	Client: Fieldgate Developments
	Project: Russell Pines
	Project No: 211-03319-00

Figure R1699-H-7

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	8	4	8	31	45	4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
13.20	100		
9.50	98		
4.75	92		
2.00	88		
0.850	84		
0.425	80		
0.250	75		
0.150	66		
0.106	58		
0.075	49		
0.0466 mm.	35		
0.0339 mm.	27		
0.0220 mm.	20		
0.0130 mm.	14		
0.0092 mm.	11		
0.0066 mm.	8.8		
0.0033 mm.	5.3		
0.0014 mm.	3.2		

\* (no specification provided)

**Soil Description**  
 Sand and silt, trace clay and trace gravel

**Atterberg Limits**  
 PL=      LL=      PI=

**Coefficients**  
 D<sub>90</sub>= 3.1559      D<sub>85</sub>= 1.0575      D<sub>60</sub>= 0.1152  
 D<sub>50</sub>= 0.0781      D<sub>30</sub>= 0.0383      D<sub>15</sub>= 0.0146  
 D<sub>10</sub>= 0.0078      C<sub>u</sub>= 14.86      C<sub>c</sub>= 1.64

**Classification**  
 USCS=      AASHTO=

**Remarks**

Source of Sample: Site Drilling  
Sample Number: 21-4\_SS6

Depth: 3.8 to 4.6 m

Date: Jun. 07, 2021

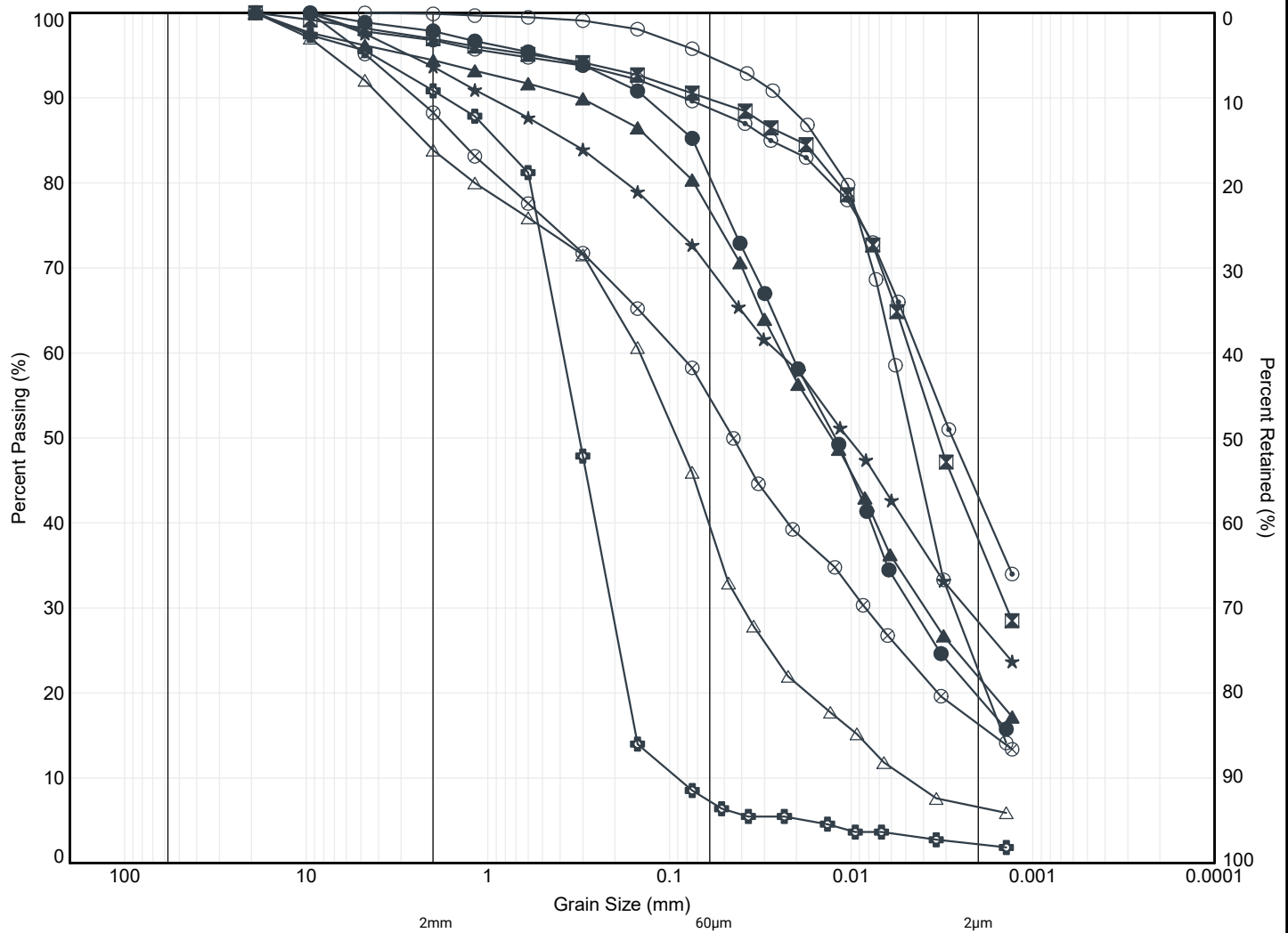
	Client: Fieldgate Developments
	Project: Russell Pines
	Project No: 211-03319-00

Figure R1699-H-8

Tested By: Bonnie Wang & Stacey Lin      Checked By: Bruce Shan

# APPENDIX D





MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

#### MIT SYSTEM

	Location	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
●	BH 102	SS5	3.3	224.1	2	17	61	20	(0)
⊠	BH 103	SS8	7.8	218.6	3	7	52	38	(0)
▲	BH 103	SS9	9.4	217.1	6	17	55	22	(0)
★	BH 104	SS6	4.8	219.9	6	24	42	28	(0)
⊙	BH 104	SS16	18.5	206.2	3	8	46	43	(0)
⊕	BH 106	SS3	1.8	222.3	9	84	5	2	(0)
○	BH 112	SS6	4.8	224.0	0	5	72	23	(0)
△	BH 113	SS4	2.6	228.6	16	44	33	7	(0)
⊗	BH 113	SS5	3.3	227.9	12	34	38	16	(0)

# APPENDIX E



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2413097	Page	: 1 of 9
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 23-May-2024 16:00
PO	: ----	Date Analysis Commenced	: 24-May-2024
C-O-C number	: 20-1085354	Issue Date	: 30-May-2024 09:54
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 7		
No. of samples analysed	: 6		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

Signatories

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

Signatories	Position	Laboratory Department
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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.

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

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

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

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

Unit	Description
-	no units
µg/L	micrograms per litre
mS/cm	millisiemens per centimetre
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



# Analytical Results Evaluation

Matrix: Groundwater				Client sample ID	BH117	BH115	BH119	BH118	BH106D	DUP- 115	----
				Sampling date/time	23-May-2024 09:35	23-May-2024 10:25	23-May-2024 12:20	23-May-2024 13:20	23-May-2024 14:40	23-May-2024 10:25	----
				Sub-Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	----
Analyte	CAS Number	Method/Lab	Unit		WT2413097-001	WT2413097-002	WT2413097-003	WT2413097-004	WT2413097-005	WT2413097-006	-----
Physical Tests											
Conductivity	----	E100/WT	mS/cm		0.617	0.625	----	----	----	0.618	----
pH	----	E108/WT	pH units		8.06	8.07	----	----	----	8.05	----
Anions and Nutrients											
Chloride	16887-00-6	E235.Cl/WT	µg/L		16100	17800	----	----	----	17500	----
Cyanides											
Cyanide, weak acid dissociable	----	E336/WT	µg/L		<2.0	<2.0	----	----	----	<2.0	----
Dissolved Metals											
Antimony, dissolved	7440-36-0	E421/WT	µg/L		0.14	0.18	----	----	----	0.16	----
Arsenic, dissolved	7440-38-2	E421/WT	µg/L		1.17	2.10	----	----	----	1.72	----
Barium, dissolved	7440-39-3	E421/WT	µg/L		80.8	74.8	----	----	----	76.0	----
Beryllium, dissolved	7440-41-7	E421/WT	µg/L		<0.020	<0.020	----	----	----	<0.020	----
Boron, dissolved	7440-42-8	E421/WT	µg/L		28	29	----	----	----	29	----
Cadmium, dissolved	7440-43-9	E421/WT	µg/L		0.0180	0.0153	----	----	----	0.0188	----
Chromium, dissolved	7440-47-3	E421/WT	µg/L		<0.50	<0.50	----	----	----	<0.50	----
Cobalt, dissolved	7440-48-4	E421/WT	µg/L		0.18	0.24	----	----	----	0.20	----
Copper, dissolved	7440-50-8	E421/WT	µg/L		0.54	0.51	----	----	----	0.78	----
Lead, dissolved	7439-92-1	E421/WT	µg/L		<0.050	<0.050	----	----	----	<0.050	----
Mercury, dissolved	7439-97-6	E509/WT	µg/L		<0.0050	<0.0050	----	----	----	<0.0050	----
Molybdenum, dissolved	7439-98-7	E421/WT	µg/L		1.52	1.83	----	----	----	1.72	----
Nickel, dissolved	7440-02-0	E421/WT	µg/L		<0.50	<0.50	----	----	----	<0.50	----
Selenium, dissolved	7782-49-2	E421/WT	µg/L		0.512	0.367	----	----	----	0.437	----
Silver, dissolved	7440-22-4	E421/WT	µg/L		<0.010	<0.010	----	----	----	<0.010	----
Sodium, dissolved	7440-23-5	E421/WT	µg/L		15500	16200	----	----	----	15800	----
Thallium, dissolved	7440-28-0	E421/WT	µg/L		<0.010	<0.010	----	----	----	<0.010	----
Uranium, dissolved	7440-61-1	E421/WT	µg/L		1.38	1.31	----	----	----	1.34	----
Vanadium, dissolved	7440-62-2	E421/WT	µg/L		<0.50	<0.50	----	----	----	<0.50	----
Zinc, dissolved	7440-66-6	E421/WT	µg/L		1.5	1.5	----	----	----	2.0	----



## Analytical Results Evaluation

Matrix: Groundwater

				Client sample ID	BH117	BH115	BH119	BH118	BH106D	DUP- 115	----
				Sampling date/time	23-May-2024 09:35	23-May-2024 10:25	23-May-2024 12:20	23-May-2024 13:20	23-May-2024 14:40	23-May-2024 10:25	----
				Sub-Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	----
Analyte	CAS Number	Method/Lab	Unit	WT2413097-001	WT2413097-002	WT2413097-003	WT2413097-004	WT2413097-005	WT2413097-006	WT2413097-006	-----
<b>Dissolved Metals</b>											
Dissolved mercury filtration location	----	EP509/WT	-	Field	Field	----	----	----	----	Field	----
Dissolved metals filtration location	----	EP421/WT	-	Field	Field	----	----	----	----	Field	----
<b>Speciated Metals</b>											
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A/WT	µg/L	<0.50	<0.50	----	----	----	----	<0.50	----
<b>Volatile Organic Compounds</b>											
Acetone	67-64-1	E611D/WT	µg/L	<20	<20	<20	<20	<20	<20	----	----
Benzene	71-43-2	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Bromodichloromethane	75-27-4	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Bromoform	75-25-2	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Bromomethane	74-83-9	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Carbon tetrachloride	56-23-5	E611D/WT	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	----	----
Chlorobenzene	108-90-7	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Chloroform	67-66-3	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dibromochloromethane	124-48-1	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dibromoethane, 1,2-	106-93-4	E611D/WT	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	----	----
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichlorodifluoromethane	75-71-8	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloroethane, 1,1-	75-34-3	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloroethane, 1,2-	107-06-2	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloroethylene, 1,1-	75-35-4	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloromethane	75-09-2	E611D/WT	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	----	----
Dichloropropane, 1,2-	78-87-5	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611D/WT	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	----	----



## Analytical Results Evaluation

				Client sample ID	BH117	BH115	BH119	BH118	BH106D	DUP- 115	----
Matrix: Groundwater				Sampling date/time	23-May-2024 09:35	23-May-2024 10:25	23-May-2024 12:20	23-May-2024 13:20	23-May-2024 14:40	23-May-2024 10:25	----
				Sub-Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	----
Analyte	CAS Number	Method/Lab	Unit		WT2413097-001	WT2413097-002	WT2413097-003	WT2413097-004	WT2413097-005	WT2413097-006	-----
<b>Volatile Organic Compounds</b>											
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30	----	----
Ethylbenzene	100-41-4	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Hexane, n-	110-54-3	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	µg/L		<20	<20	<20	<20	<20	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	µg/L		<20	<20	<20	<20	<20	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Styrene	100-42-5	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Tetrachloroethylene	127-18-4	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Toluene	108-88-3	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Trichloroethylene	79-01-6	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Trichlorofluoromethane	75-69-4	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Vinyl chloride	75-01-4	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
Xylene, m+p-	179601-23-1	E611D/WT	µg/L		<0.40	<0.40	<0.40	<0.40	<0.40	----	----
Xylene, o-	95-47-6	E611D/WT	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30	----	----
Xylenes, total	1330-20-7	E611D/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	----	----
BTEX, total	----	E611D/WT	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0	----	----
<b>Volatile Organic Compounds Surrogates</b>											
Bromofluorobenzene, 4-	460-00-4	E611D/WT	%		84.9	85.8	85.9	85.3	85.4	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	%		97.0	97.5	96.8	97.0	97.3	----	----
<b>Polycyclic Aromatic Hydrocarbons</b>											
Acenaphthene	83-32-9	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
Acenaphthylene	208-96-8	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
Anthracene	120-12-7	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
Benz(a)anthracene	56-55-3	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----



## Analytical Results Evaluation

Matrix: Groundwater

				Client sample ID	BH117	BH115	BH119	BH118	BH106D	DUP- 115	----
				Sampling date/time	23-May-2024 09:35	23-May-2024 10:25	23-May-2024 12:20	23-May-2024 13:20	23-May-2024 14:40	23-May-2024 10:25	----
				Sub-Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	----
Analyte	CAS Number	Method/Lab	Unit		WT2413097-001	WT2413097-002	WT2413097-003	WT2413097-004	WT2413097-005	WT2413097-006	-----
<b>Polycyclic Aromatic Hydrocarbons</b>											
<b>Benzo(a)pyrene</b>	50-32-8	E641A/WT	µg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	----	----
<b>Benzo(b+j)fluoranthene</b>	n/a	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Benzo(g,h,i)perylene</b>	191-24-2	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Benzo(k)fluoranthene</b>	207-08-9	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Chrysene</b>	218-01-9	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Dibenz(a,h)anthracene</b>	53-70-3	E641A/WT	µg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	----	----
<b>Fluoranthene</b>	206-44-0	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Fluorene</b>	86-73-7	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Indeno(1,2,3-c,d)pyrene</b>	193-39-5	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Methylnaphthalene, 1-</b>	90-12-0	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Methylnaphthalene, 1+2-</b>	----	E641A/WT	µg/L		<0.015	<0.015	<0.015	<0.015	<0.015	----	----
<b>Methylnaphthalene, 2-</b>	91-57-6	E641A/WT	µg/L		0.011	<0.010	<0.010	<0.010	<0.010	----	----
<b>Naphthalene</b>	91-20-3	E641A/WT	µg/L		<0.050	<0.050	<0.050	<0.050	<0.050	----	----
<b>Phenanthrene</b>	85-01-8	E641A/WT	µg/L		<0.020	<0.020	<0.020	<0.020	<0.020	----	----
<b>Pyrene</b>	129-00-0	E641A/WT	µg/L		<0.010	<0.010	<0.010	<0.010	<0.010	----	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>											
<b>Chrysene-d12</b>	1719-03-5	E641A/WT	%		128	117	144	122	121	----	----
<b>Naphthalene-d8</b>	1146-65-2	E641A/WT	%		113	96.2	88.1	100	80.9	----	----
<b>Phenanthrene-d10</b>	1517-22-2	E641A/WT	%		113	105	98.2	108	104	----	----

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

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



## Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All					
<b>Physical Tests</b>									
Conductivity	----	mS/cm	--	--					
pH	----	pH units	--	--					
<b>Anions and Nutrients</b>									
Chloride	16887-00-6	µg/L	790000 µg/L	790000 µg/L					
<b>Cyanides</b>									
Cyanide, weak acid dissociable	----	µg/L	66 µg/L	66 µg/L					
<b>Dissolved Metals</b>									
Antimony, dissolved	7440-36-0	µg/L	6 µg/L	6 µg/L					
Arsenic, dissolved	7440-38-2	µg/L	25 µg/L	25 µg/L					
Barium, dissolved	7440-39-3	µg/L	1000 µg/L	1000 µg/L					
Beryllium, dissolved	7440-41-7	µg/L	4 µg/L	4 µg/L					
Boron, dissolved	7440-42-8	µg/L	5000 µg/L	5000 µg/L					
Cadmium, dissolved	7440-43-9	µg/L	2.7 µg/L	2.7 µg/L					
Chromium, dissolved	7440-47-3	µg/L	50 µg/L	50 µg/L					
Cobalt, dissolved	7440-48-4	µg/L	3.8 µg/L	3.8 µg/L					
Copper, dissolved	7440-50-8	µg/L	87 µg/L	87 µg/L					
Dissolved mercury filtration location	----	-	--	--					
Dissolved metals filtration location	----	-	--	--					
Lead, dissolved	7439-92-1	µg/L	10 µg/L	10 µg/L					
Mercury, dissolved	7439-97-6	µg/L	0.29 µg/L	1 µg/L					
Molybdenum, dissolved	7439-98-7	µg/L	70 µg/L	70 µg/L					
Nickel, dissolved	7440-02-0	µg/L	100 µg/L	100 µg/L					
Selenium, dissolved	7782-49-2	µg/L	10 µg/L	10 µg/L					
Silver, dissolved	7440-22-4	µg/L	1.5 µg/L	1.5 µg/L					
Sodium, dissolved	7440-23-5	µg/L	490000 µg/L	490000 µg/L					
Thallium, dissolved	7440-28-0	µg/L	2 µg/L	2 µg/L					
Uranium, dissolved	7440-61-1	µg/L	20 µg/L	20 µg/L					
Vanadium, dissolved	7440-62-2	µg/L	6.2 µg/L	6.2 µg/L					
Zinc, dissolved	7440-66-6	µg/L	1100 µg/L	1100 µg/L					
<b>Speciated Metals</b>									
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	µg/L	25 µg/L	25 µg/L					
<b>Volatile Organic Compounds</b>									
Acetone	67-64-1	µg/L	2700 µg/L	2700 µg/L					
Benzene	71-43-2	µg/L	5 µg/L	5 µg/L					
Bromodichloromethane	75-27-4	µg/L	16 µg/L	16 µg/L					
Bromoform	75-25-2	µg/L	25 µg/L	25 µg/L					
Bromomethane	74-83-9	µg/L	0.89 µg/L	0.89 µg/L					



Analyte	CAS Number	Unit	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All					
<b>Volatile Organic Compounds - Continued</b>									
BTEX, total	----	µg/L	--	--					
Carbon tetrachloride	56-23-5	µg/L	0.79 µg/L	5 µg/L					
Chlorobenzene	108-90-7	µg/L	30 µg/L	30 µg/L					
Chloroform	67-66-3	µg/L	2.4 µg/L	22 µg/L					
Dibromochloromethane	124-48-1	µg/L	25 µg/L	25 µg/L					
Dibromoethane, 1,2-	106-93-4	µg/L	0.2 µg/L	0.2 µg/L					
Dichlorobenzene, 1,2-	95-50-1	µg/L	3 µg/L	3 µg/L					
Dichlorobenzene, 1,3-	541-73-1	µg/L	59 µg/L	59 µg/L					
Dichlorobenzene, 1,4-	106-46-7	µg/L	1 µg/L	1 µg/L					
Dichlorodifluoromethane	75-71-8	µg/L	590 µg/L	590 µg/L					
Dichloroethane, 1,1-	75-34-3	µg/L	5 µg/L	5 µg/L					
Dichloroethane, 1,2-	107-06-2	µg/L	1.6 µg/L	5 µg/L					
Dichloroethylene, 1,1-	75-35-4	µg/L	1.6 µg/L	14 µg/L					
Dichloroethylene, cis-1,2-	156-59-2	µg/L	1.6 µg/L	17 µg/L					
Dichloroethylene, trans-1,2-	156-60-5	µg/L	1.6 µg/L	17 µg/L					
Dichloromethane	75-09-2	µg/L	50 µg/L	50 µg/L					
Dichloropropane, 1,2-	78-87-5	µg/L	5 µg/L	5 µg/L					
Dichloropropylene, cis+trans-1,3-	542-75-6	µg/L	0.5 µg/L	0.5 µg/L					
Dichloropropylene, cis-1,3-	10061-01-5	µg/L	--	--					
Dichloropropylene, trans-1,3-	10061-02-6	µg/L	--	--					
Ethylbenzene	100-41-4	µg/L	2.4 µg/L	2.4 µg/L					
Hexane, n-	110-54-3	µg/L	51 µg/L	520 µg/L					
Methyl ethyl ketone [MEK]	78-93-3	µg/L	1800 µg/L	1800 µg/L					
Methyl isobutyl ketone [MIBK]	108-10-1	µg/L	640 µg/L	640 µg/L					
Methyl-tert-butyl ether [MTBE]	1634-04-4	µg/L	15 µg/L	15 µg/L					
Styrene	100-42-5	µg/L	5.4 µg/L	5.4 µg/L					
Tetrachloroethane, 1,1,1,2-	630-20-6	µg/L	1.1 µg/L	1.1 µg/L					
Tetrachloroethane, 1,1,1,2,2-	79-34-5	µg/L	1 µg/L	1 µg/L					
Tetrachloroethylene	127-18-4	µg/L	1.6 µg/L	17 µg/L					
Toluene	108-88-3	µg/L	24 µg/L	24 µg/L					
Trichloroethane, 1,1,1-	71-55-6	µg/L	200 µg/L	200 µg/L					
Trichloroethane, 1,1,2-	79-00-5	µg/L	4.7 µg/L	5 µg/L					
Trichloroethylene	79-01-6	µg/L	1.6 µg/L	5 µg/L					
Trichlorofluoromethane	75-69-4	µg/L	150 µg/L	150 µg/L					
Vinyl chloride	75-01-4	µg/L	0.5 µg/L	1.7 µg/L					
Xylene, m+p-	179601-23-1	µg/L	--	--					
Xylene, o-	95-47-6	µg/L	--	--					
Xylenes, total	1330-20-7	µg/L	300 µg/L	300 µg/L					
<b>Volatile Organic Compounds Surrogates</b>									



Analyte	CAS Number	Unit	ON153/04 T2-GW-C-All	ON153/04 T2-GW-F-All					
<b>Volatile Organic Compounds Surrogates - Continued</b>									
Bromofluorobenzene, 4-	460-00-4	%	--	--					
Difluorobenzene, 1,4-	540-36-3	%	--	--					
<b>Polycyclic Aromatic Hydrocarbons</b>									
Acenaphthene	83-32-9	µg/L	4.1 µg/L	4.1 µg/L					
Acenaphthylene	208-96-8	µg/L	1 µg/L	1 µg/L					
Anthracene	120-12-7	µg/L	2.4 µg/L	2.4 µg/L					
Benz(a)anthracene	56-55-3	µg/L	1 µg/L	1 µg/L					
Benzo(a)pyrene	50-32-8	µg/L	0.01 µg/L	0.01 µg/L					
Benzo(b+j)fluoranthene	n/a	µg/L	0.1 µg/L	0.1 µg/L					
Benzo(g,h,i)perylene	191-24-2	µg/L	0.2 µg/L	0.2 µg/L					
Benzo(k)fluoranthene	207-08-9	µg/L	0.1 µg/L	0.1 µg/L					
Chrysene	218-01-9	µg/L	0.1 µg/L	0.1 µg/L					
Dibenz(a,h)anthracene	53-70-3	µg/L	0.2 µg/L	0.2 µg/L					
Fluoranthene	206-44-0	µg/L	0.41 µg/L	0.41 µg/L					
Fluorene	86-73-7	µg/L	120 µg/L	120 µg/L					
Indeno(1,2,3-c,d)pyrene	193-39-5	µg/L	0.2 µg/L	0.2 µg/L					
Methylnaphthalene, 1+2-	----	µg/L	3.2 µg/L	3.2 µg/L					
Methylnaphthalene, 1-	90-12-0	µg/L	3.2 µg/L	3.2 µg/L					
Methylnaphthalene, 2-	91-57-6	µg/L	3.2 µg/L	3.2 µg/L					
Naphthalene	91-20-3	µg/L	11 µg/L	11 µg/L					
Phenanthrene	85-01-8	µg/L	1 µg/L	1 µg/L					
Pyrene	129-00-0	µg/L	4.1 µg/L	4.1 µg/L					
Chrysene-d12	1719-03-5	%	--	--					
Naphthalene-d8	1146-65-2	%	--	--					
Phenanthrene-d10	1517-22-2	%	--	--					

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

**Key:**

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T2-GW-C-All	153 T2-Ground Water (Coarse Soil)-All Types of Property Use
T2-GW-F-All	153 T2-Ground Water (Fine Soil)-All Types of Property Use



## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2413097	Page	: 1 of 10
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 23-May-2024 16:00
PO	: ----	Issue Date	: 30-May-2024 09:54
C-O-C number	: 20-1085354		
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 7		
No. of samples analysed	: 6		

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

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



**Outliers : Quality Control Samples**  
*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

Matrix: Water

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
<b>Method Blank (MB) Values</b>								
Polycyclic Aromatic Hydrocarbons	QC-MRG2-1460191001	----	Benzo(a)pyrene	50-32-8	E641A	0.0062 <sup>MB-LOR</sup> µg/L	0.005 µg/L	Blank result exceeds permitted value
Polycyclic Aromatic Hydrocarbons	QC-MRG2-1460191001	----	Dibenz(a,h)anthracene	53-70-3	E641A	0.0062 <sup>MB-LOR</sup> µg/L	0.005 µg/L	Blank result exceeds permitted value

**Result Qualifiers**

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



## 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	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] BH115	E235.Cl	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] BH117	E235.Cl	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] DUP- 115	E235.Cl	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Cyanides : WAD Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) BH115	E336	23-May-2024	24-May-2024	14 days	1 days	✓	24-May-2024	14 days	1 days	✓
Cyanides : WAD Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) BH117	E336	23-May-2024	24-May-2024	14 days	1 days	✓	24-May-2024	14 days	1 days	✓
Cyanides : WAD Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) DUP- 115	E336	23-May-2024	24-May-2024	14 days	1 days	✓	24-May-2024	14 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) BH115	E509	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 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	
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) BH117	E509	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) DUP- 115	E509	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) BH115	E421	23-May-2024	27-May-2024	180 days	4 days	✓	27-May-2024	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) BH117	E421	23-May-2024	27-May-2024	180 days	4 days	✓	27-May-2024	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) DUP- 115	E421	23-May-2024	27-May-2024	180 days	4 days	✓	27-May-2024	180 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH115	E100	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] BH117	E100	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] DUP- 115	E100	23-May-2024	27-May-2024	28 days	4 days	✓	28-May-2024	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] BH115	E108	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	14 days	5 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	
Physical Tests : pH by Meter										
HDPE [ON MECP] BH117	E108	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	14 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] DUP- 115	E108	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	14 days	5 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH117	E641A	23-May-2024	25-May-2024	14 days	2 days	✓	28-May-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH106D	E641A	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH115	E641A	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH118	E641A	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH119	E641A	23-May-2024	27-May-2024	14 days	4 days	✓	28-May-2024	40 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (NaOH+Buf) [ON MECP] BH115	E532A	23-May-2024	----	----	----		24-May-2024	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (NaOH+Buf) [ON MECP] BH117	E532A	23-May-2024	----	----	----		24-May-2024	28 days	1 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

<i>Analyte Group : Analytical Method</i>	<i>Method</i>	<i>Sampling Date</i>	<i>Extraction / Preparation</i>				<i>Analysis</i>			
<i>Container / Client Sample ID(s)</i>			<i>Preparation Date</i>	<i>Holding Times</i>		<i>Eval</i>	<i>Analysis Date</i>	<i>Holding Times</i>		<i>Eval</i>
				<i>Rec</i>	<i>Actual</i>			<i>Rec</i>	<i>Actual</i>	
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (NaOH+Buf) [ON MECP] DUP- 115	E532A	23-May-2024	----	----	----		24-May-2024	28 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH106D	E611D	23-May-2024	26-May-2024	14 days	3 days	✓	26-May-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH115	E611D	23-May-2024	26-May-2024	14 days	3 days	✓	26-May-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH117	E611D	23-May-2024	26-May-2024	14 days	3 days	✓	26-May-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH118	E611D	23-May-2024	26-May-2024	14 days	3 days	✓	26-May-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH119	E611D	23-May-2024	26-May-2024	14 days	3 days	✓	26-May-2024	14 days	3 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)							
Chloride in Water by IC	E235.Cl	1460976	1	18	5.5	5.0	✓
Conductivity in Water	E100	1460974	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1457956	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1460778	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1460293	1	19	5.2	5.0	✓
pH by Meter	E108	1460973	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1459933	1	20	5.0	5.0	✓
WAD Cyanide	E336	1458436	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Chloride in Water by IC	E235.Cl	1460976	1	18	5.5	5.0	✓
Conductivity in Water	E100	1460974	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1457956	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1460778	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1460293	1	19	5.2	5.0	✓
PAHs in Water by Hexane LVI GC-MS	E641A	1460192	2	15	13.3	5.0	✓
pH by Meter	E108	1460973	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1459933	1	20	5.0	5.0	✓
WAD Cyanide	E336	1458436	1	20	5.0	5.0	✓
Method Blanks (MB)							
Chloride in Water by IC	E235.Cl	1460976	1	18	5.5	5.0	✓
Conductivity in Water	E100	1460974	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1457956	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1460778	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1460293	1	19	5.2	5.0	✓
PAHs in Water by Hexane LVI GC-MS	E641A	1460192	2	15	13.3	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1459933	1	20	5.0	5.0	✓
WAD Cyanide	E336	1458436	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1460976	1	18	5.5	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1457956	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1460778	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1460293	1	19	5.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1459933	1	20	5.0	5.0	✓
WAD Cyanide	E336	1458436	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.
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.
WAD Cyanide	E336 ALS Environmental - Waterloo	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A ALS Environmental - Waterloo	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection.  sample pretreatment involved field or lab filtration following by sample preservation.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Water by Hexane LVI GC-MS	E641A ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421  ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO <sub>3</sub> .
Dissolved Mercury Water Filtration	EP509  ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581  ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601  ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: WT2413097	Page	: 1 of 15
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 23-May-2024 16:00
PO	: ----	Date Analysis Commenced	: 24-May-2024
C-O-C number	: 20-1085354	Issue Date	: 30-May-2024 09:54
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 7		
No. of samples analysed	: 6		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Laboratory Department
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario



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## 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

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

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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: 1460973)											
WT2413214-003	Anonymous	pH	----	E108	0.10	pH units	8.37	8.38	0.119%	4%	----
Physical Tests (QC Lot: 1460974)											
WT2413214-003	Anonymous	Conductivity	----	E100	1.0	µS/cm	801	800	0.125%	10%	----
Anions and Nutrients (QC Lot: 1460976)											
WT2413214-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	78.2	78.3	0.141%	20%	----
Cyanides (QC Lot: 1458436)											
TY2404913-001	Anonymous	Cyanide, weak acid dissociable	----	E336	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1460293)											
HA2401148-001	Anonymous	Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0275	0.0277	0.789%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00309	0.00321	3.86%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	0.000034	0.000031	0.000003	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000160	0.0000183	0.0000023	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	0.00010	0.0000003	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00042	0.00042	0.000008	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000321	0.000320	0.000002	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00054	0.00053	0.000002	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000072	0.000068	0.000005	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	3.26	3.30	1.16%	20%	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000094	0.000092	0.000002	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0062	0.0065	0.0003	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1460769)											
TY2404741-003	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1460778)											

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 Work Order : WT2413097  
 Client : Grounded Engineering Inc.  
 Project : 24-048



Sub-Matrix: <b>Water</b>					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
<b>Dissolved Metals (QC Lot: 1460778) - continued</b>											
TY2404810-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 1457956)</b>											
VA24B1493-001	Anonymous	Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 1459933)</b>											
WT2413017-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	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
Volatile Organic Compounds (QC Lot: 1459933) - continued											
WT2413017-001	Anonymous	Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----



## 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
<b>Physical Tests (QCLot: 1460974)</b>						
Conductivity	---	E100	1	µS/cm	1.1	---
<b>Anions and Nutrients (QCLot: 1460976)</b>						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Cyanides (QCLot: 1458436)</b>						
Cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Dissolved Metals (QCLot: 1460293)</b>						
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	---
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
<b>Dissolved Metals (QCLot: 1460769)</b>						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
<b>Dissolved Metals (QCLot: 1460778)</b>						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
<b>Speciated Metals (QCLot: 1457956)</b>						
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	---
<b>Volatile Organic Compounds (QCLot: 1459933)</b>						





Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1459933) - continued</b>						
Acetone	67-64-1	E611D	20	µg/L	<20	----
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
Bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1459933) - continued</b>						
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
Vinyl chloride	75-01-4	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 1458658)</b>						
Acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
Pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 1460192)</b>						
Acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	# 0.0062	MB-LOR
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	# 0.0062	MB-LOR



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1460192) - continued						
Fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
Pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----

Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



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: 1460973)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1460974)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	98.9	90.0	110	----
Anions and Nutrients (QCLot: 1460976)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.8	90.0	110	----
Cyanides (QCLot: 1458436)									
Cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	91.8	80.0	120	----
Dissolved Metals (QCLot: 1460293)									
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	96.2	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	103	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.012 mg/L	98.4	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	97.5	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	91.8	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	94.9	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.012 mg/L	100.0	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.012 mg/L	97.0	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.012 mg/L	98.0	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	98.4	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.012 mg/L	100	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	97.0	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	97.9	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	91.6	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	97.3	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0 mg/L	99.6	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	100	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	96.9	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	103	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	86.9	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
Speciated Metals (QCLot: 1457956)									
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.025 mg/L	107	80.0	120	----
Volatile Organic Compounds (QCLot: 1459933)									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	125	70.0	130	----
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	99.2	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	107	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	108	60.0	140	----
Carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	108	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	99.6	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	82.5	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	109	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	100	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	111	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	98.8	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	102	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	100	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	89.8	70.0	130	----
Hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	121	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	93.4	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	94.1	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	90.6	70.0	130	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1459933) - continued									
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	98.1	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	106	60.0	140	----
Vinyl chloride	75-01-4	E611D	0.5	µg/L	100 µg/L	96.7	60.0	140	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	92.8	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	91.7	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1458658)									
Acenaphthene	83-32-9	E641A	0.01	µg/L	0.526 µg/L	96.1	50.0	140	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	0.526 µg/L	95.2	50.0	140	----
Anthracene	120-12-7	E641A	0.01	µg/L	0.526 µg/L	94.9	50.0	140	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.526 µg/L	119	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.526 µg/L	97.8	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.526 µg/L	94.5	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.526 µg/L	114	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.526 µg/L	103	50.0	140	----
Chrysene	218-01-9	E641A	0.01	µg/L	0.526 µg/L	94.9	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.526 µg/L	95.5	50.0	140	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	0.526 µg/L	107	50.0	140	----
Fluorene	86-73-7	E641A	0.01	µg/L	0.526 µg/L	97.5	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.526 µg/L	113	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.526 µg/L	106	50.0	140	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.526 µg/L	103	50.0	140	----
Naphthalene	91-20-3	E641A	0.05	µg/L	0.526 µg/L	92.4	50.0	140	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	0.526 µg/L	104	50.0	140	----
Pyrene	129-00-0	E641A	0.01	µg/L	0.526 µg/L	112	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1460192)									
Acenaphthene	83-32-9	E641A	0.01	µg/L	0.526 µg/L	99.3	50.0	140	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	0.526 µg/L	92.1	50.0	140	----
Anthracene	120-12-7	E641A	0.01	µg/L	0.526 µg/L	104	50.0	140	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.526 µg/L	110	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.526 µg/L	102	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.526 µg/L	95.9	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.526 µg/L	106	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.526 µg/L	102	50.0	140	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1460192) - continued									
Chrysene	218-01-9	E641A	0.01	µg/L	0.526 µg/L	92.5	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.526 µg/L	100.0	50.0	140	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	0.526 µg/L	113	50.0	140	----
Fluorene	86-73-7	E641A	0.01	µg/L	0.526 µg/L	100	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.526 µg/L	124	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.526 µg/L	115	50.0	140	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.526 µg/L	110	50.0	140	----
Naphthalene	91-20-3	E641A	0.05	µg/L	0.526 µg/L	103	50.0	140	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	0.526 µg/L	113	50.0	140	----
Pyrene	129-00-0	E641A	0.01	µg/L	0.526 µg/L	119	50.0	140	----



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: 1460976)										
WT2413214-001	Anonymous	Chloride	16887-00-6	E235.Cl	96.7 mg/L	100 mg/L	96.7	75.0	125	----
Cyanides (QCLot: 1458436)										
TY2404913-001	Anonymous	Cyanide, weak acid dissociable	----	E336	0.119 mg/L	0.125 mg/L	95.1	75.0	125	----
Dissolved Metals (QCLot: 1460293)										
HA2401148-002	Anonymous	Antimony, dissolved	7440-36-0	E421	0.0487 mg/L	0.05 mg/L	97.4	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0513 mg/L	0.05 mg/L	102	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.0125 mg/L	0.012 mg/L	99.7	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.00514 mg/L	0.005 mg/L	103	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.046 mg/L	0.05 mg/L	91.8	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00515 mg/L	0.005 mg/L	103	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0125 mg/L	0.012 mg/L	100	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0123 mg/L	0.012 mg/L	98.5	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0125 mg/L	0.012 mg/L	100	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0244 mg/L	0.025 mg/L	97.8	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0121 mg/L	0.012 mg/L	96.8	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0247 mg/L	0.025 mg/L	98.9	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0555 mg/L	0.05 mg/L	111	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00450 mg/L	0.005 mg/L	90.0	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0494 mg/L	0.05 mg/L	98.7	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.000245 mg/L	0 mg/L	98.0	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0253 mg/L	0.025 mg/L	101	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.0262 mg/L	0.025 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 1460769)										
TY2404741-004	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000109 mg/L	0 mg/L	109	70.0	130	----
Dissolved Metals (QCLot: 1460778)										
TY2404810-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000966 mg/L	0 mg/L	96.6	70.0	130	----
Speciated Metals (QCLot: 1457956)										
VA24B1493-001	Anonymous	Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
Volatile Organic Compounds (QCLot: 1459933)										
WT2413017-001	Anonymous	Acetone	67-64-1	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		Benzene	71-43-2	E611D	97.0 µg/L	100 µg/L	97.0	60.0	140	----
		Bromodichloromethane	75-27-4	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Bromoform	75-25-2	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	----
		Bromomethane	74-83-9	E611D	103 µg/L	100 µg/L	103	60.0	140	----





Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1459933) - continued										
WT2413017-001	Anonymous	Carbon tetrachloride	56-23-5	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Chlorobenzene	108-90-7	E611D	94.7 µg/L	100 µg/L	94.7	60.0	140	----
		Chloroform	67-66-3	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		Dibromochloromethane	124-48-1	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	97.0 µg/L	100 µg/L	97.0	60.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Dichlorodifluoromethane	75-71-8	E611D	75.2 µg/L	100 µg/L	75.2	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611D	100.0 µg/L	100 µg/L	100.0	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	97.8 µg/L	100 µg/L	97.8	60.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichloromethane	75-09-2	E611D	107 µg/L	100 µg/L	107	60.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611D	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	98.6 µg/L	100 µg/L	98.6	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	95.3 µg/L	100 µg/L	95.3	60.0	140	----
		Ethylbenzene	100-41-4	E611D	87.3 µg/L	100 µg/L	87.3	60.0	140	----
		Hexane, n-	110-54-3	E611D	99.0 µg/L	100 µg/L	99.0	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	112 µg/L	100 µg/L	112	60.0	140	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	89 µg/L	100 µg/L	88.8	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	96.1 µg/L	100 µg/L	96.1	60.0	140	----
		Styrene	100-42-5	E611D	91.8 µg/L	100 µg/L	91.8	60.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Toluene	108-88-3	E611D	87.7 µg/L	100 µg/L	87.7	60.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	94.4 µg/L	100 µg/L	94.4	60.0	140	----
		Trichloroethylene	79-01-6	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Vinyl chloride	75-01-4	E611D	91.7 µg/L	100 µg/L	91.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	183 µg/L	200 µg/L	91.6	60.0	140	----
		Xylene, o-	95-47-6	E611D	89.8 µg/L	100 µg/L	89.8	60.0	140	----



EGC-003  
mm-633  
SC-747  
CW-829  
WV-229  
OR-173/174

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20-1085354

Page 1 of 1

Environmental Division  
Waterloo

Work Order Reference  
WT2413097



Telephone: +1 519 886 8910

Report To: Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

Company: Grounded Eng Inc.

Select Report Format: ☒ PDF ☐ EXCEL ☐ BDD (XSLTAL)

☒ Routine (R) if received by 3pm M-F - no surcharges apply

Contact: Erin Lyssac

Merge DO/COI Reports with COA ☒ YES ☐ NO ☐ N/A

☐ 4 day (4d) if received by 3pm M-F - 20% rush surcharge minimum

Phone: 647-361-5254

Compare Results to Criteria on report - provide details below if box checked

☐ 3 day (3d) if received by 3pm M-F - 25% rush surcharge minimum

Company address below will appear on the final report

Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

☐ 2 day (2d) if received by 3pm M-F - 50% rush surcharge minimum

Street: 1 Bannan St

Email 1 or Fax Herlyne Lyssac

☐ 1 day (1d) if received by 3pm M-F - 100% rush surcharge minimum

City/Province: Scarborough

Email 2

☐ Same day (SD) if received by 10am M-F - 200% rush surcharge. Addict may apply to rush requests on weekends, statutory holidays and non-rush

Postal Code: M4H 1G3

Email 3

Date and Time Required for all ERP TATs:

Invoice To: Same as Report To

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

For all tests with rush TATs requested, please see Analysis Req

Copy of Invoice with Report ☒ YES ☐ NO

Invoice Recipients

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

Project Information

Oil and Gas Required Fields (client use)

Analysis Req

ALS Account # / Quote #: 24-048

AFECOS Center: PO#

SAMPLES ON HOLD

Job #: 24-048

Major/Minor Code: Rolling Code:

EXTENDED STORAGE REQUIRED

PO / AFE:

Requisitioner: Location:

SUSPECTED HAZARD (see note)

LSD:

ALS Contact:

ALS Lab Work Order # (ALS use only):

Sampler:

Sample Identification and/or Coordinates  
(This description will appear on the report)

Date (dd-mm-yy) Time (hh:mm) Sample Type

NUMBER OF CONTAINERS

ALS Sample # (ALS use only)

BH117

23-05-24 9:35 GW

ORg 17/04 M&I

BH115

23-05-24 10:25 GW

ORg 15/04 PAMs

BH119

23-05-24 12:20 GW

ORg 15/04 VOLs

BH118

23-05-24 13:20 GW

BH166D

23-05-24 14:40 GW

DUP-115

23-05-24 10:25 GW

Drinking Water (DW) Samples (client use)

Notes / Specify Limits for result evaluation by selecting from drop-down below  
(Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Are samples taken from a Regulated DW System?

☐ YES ☐ NO

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

Are samples for human consumption/ use?

☐ YES ☐ NO

Submission Comments Identified on Sample Receipt Notification: ☐ YES ☐ NO

SHIPMENT RELEASE (client use)

INITIAL SHIPMENT RECEPTION (ALS use only)

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Released by: BJM

Date: 23-05-24 Time: 15:12

Received by: Kuram

SHIPMENT RELEASE (client use)

INITIAL SHIPMENT RECEPTION (ALS use only)

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Date: 23-05-24

Time: 15:12

Received by: LT

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

DATE: 2024 May 21

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.

ALS 2024 FORM



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2412667	Page	: 1 of 7
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Date Analysis Commenced	: 24-May-2024
C-O-C number	: 20-1085329	Issue Date	: 29-May-2024 10:05
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

Signatories

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

Signatories	Position	Laboratory Department
Andrea Armstrong	Department Manager - Air Quality and Volatiles	VOC, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Metals, Waterloo, Ontario
Robert Braun	Soils Team Supervisor	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.

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

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

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

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

Unit	Description
-	no units
°C	degrees celsius
µg/L	micrograms per litre
m/sec	metres per second
mg/L	milligrams per litre
mm/sec	millimetres per second
pH units	pH units
sec	seconds

>: 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.



## Qualifiers

Qualifier	Description
SUR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.



## Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	TCLP-1	----	----	----	----	----	----
				Sampling date/time	17-May-2024 00:00	----	----	----	----	----	----
				Sub-Matrix	Soil/Solid	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2412667-001	-----	-----	-----	-----	-----	-----	-----
Physical Tests											
Ignitability	----	E209/WT	-	Negative	----	----	----	----	----	----	----
Sample comment	----	E209/WT	-	BROWN SILTY CLAY	----	----	----	----	----	----	----
Time to ignition	----	E209/WT	sec	Not Determined	----	----	----	----	----	----	----
Burning rate	----	E209/WT	mm/sec	Not Determined	----	----	----	----	----	----	----
Temperature of test material	----	E209/WT	°C	20.1	----	----	----	----	----	----	----
Air velocity, fume hood	----	E209/WT	m/sec	0.41	----	----	----	----	----	----	----
TCLP Extractables											
Benzo(a)pyrene, TCLP	50-32-8	E644/WT	mg/L	<0.00020	----	----	----	----	----	----	----
TCLP Extractables Surrogates											
Chrysene-d12, TCLP	1719-03-5	E644/WT	%	132 <small>SUR-ND</small>	----	----	----	----	----	----	----
Naphthalene-d8, TCLP	1146-65-2	E644/WT	%	98.4	----	----	----	----	----	----	----
Phenanthrene-d10, TCLP	1517-22-2	E644/WT	%	115	----	----	----	----	----	----	----
TCLP Metals											
Arsenic, TCLP	7440-38-2	E444/WT	mg/L	<1.0	----	----	----	----	----	----	----
pH, TCLP 1st preliminary	----	EPP444/WT	pH units	9.41	----	----	----	----	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/WT	pH units	6.07	----	----	----	----	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/WT	pH units	2.87	----	----	----	----	----	----	----
pH, TCLP final	----	EPP444/WT	pH units	5.93	----	----	----	----	----	----	----
Barium, TCLP	7440-39-3	E444/WT	mg/L	<2.5	----	----	----	----	----	----	----
Boron, TCLP	7440-42-8	E444/WT	mg/L	<0.50	----	----	----	----	----	----	----
Cadmium, TCLP	7440-43-9	E444/WT	mg/L	<0.050	----	----	----	----	----	----	----
Chromium, TCLP	7440-47-3	E444/WT	mg/L	<0.25	----	----	----	----	----	----	----
Lead, TCLP	7439-92-1	E444/WT	mg/L	<0.25	----	----	----	----	----	----	----
Selenium, TCLP	7782-49-2	E444/WT	mg/L	<0.10	----	----	----	----	----	----	----
Silver, TCLP	7440-22-4	E444/WT	mg/L	<0.050	----	----	----	----	----	----	----
Uranium, TCLP	7440-61-1	E444/WT	mg/L	<0.20	----	----	----	----	----	----	----
Mercury, TCLP	7439-97-6	E512/WT	mg/L	<0.0010	----	----	----	----	----	----	----



### Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	TCLP-1	----	----	----	----	----	----
				Sampling date/time	17-May-2024 00:00	----	----	----	----	----	----
				Sub-Matrix	Soil/Solid	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2412667-001	-----	-----	-----	-----	-----	-----	-----
TCLP VOCs											
Benzene, TCLP	71-43-2	E615B/WT	mg/L	<0.0050	----	----	----	----	----	----	----
Carbon tetrachloride, TCLP	56-23-5	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Chlorobenzene, TCLP	108-90-7	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Chloroform, TCLP	67-66-3	E615B/WT	mg/L	<0.10	----	----	----	----	----	----	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Dichloromethane, TCLP	75-09-2	E615B/WT	mg/L	<0.10	----	----	----	----	----	----	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B/WT	mg/L	<0.10	----	----	----	----	----	----	----
Tetrachloroethylene, TCLP	127-18-4	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Trichloroethylene, TCLP	79-01-6	E615B/WT	mg/L	<0.025	----	----	----	----	----	----	----
Vinyl chloride, TCLP	75-01-4	E615B/WT	mg/L	<0.050	----	----	----	----	----	----	----
TCLP VOCs Surrogates											
Bromofluorobenzene, 4-, TCLP	460-00-4	E615B/WT	%	77.9	----	----	----	----	----	----	----
Difluorobenzene, 1,4-, TCLP	540-36-3	E615B/WT	%	95.3	----	----	----	----	----	----	----

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



## Summary of Guideline Limits

Analyte	CAS Number	Unit	ONWCR Sch. 4						
<b>Physical Tests</b>									
Air velocity, fume hood	----	m/sec	--						
Burning rate	----	mm/sec	--						
Ignitability	----	-	--						
Sample comment	----	-	--						
Temperature of test material	----	°C	--						
Time to ignition	----	sec	--						
<b>TCLP Extractables</b>									
Benzo(a)pyrene, TCLP	50-32-8	mg/L	0.001 mg/L						
<b>TCLP Extractables Surrogates</b>									
Chrysene-d12, TCLP	1719-03-5	%	--						
Naphthalene-d8, TCLP	1146-65-2	%	--						
Phenanthrene-d10, TCLP	1517-22-2	%	--						
<b>TCLP Metals</b>									
Arsenic, TCLP	7440-38-2	mg/L	2.5 mg/L						
Barium, TCLP	7440-39-3	mg/L	100 mg/L						
Boron, TCLP	7440-42-8	mg/L	500 mg/L						
Cadmium, TCLP	7440-43-9	mg/L	0.5 mg/L						
Chromium, TCLP	7440-47-3	mg/L	5 mg/L						
Lead, TCLP	7439-92-1	mg/L	5 mg/L						
Mercury, TCLP	7439-97-6	mg/L	0.1 mg/L						
pH, TCLP 1st preliminary	----	pH units	--						
pH, TCLP 2nd preliminary	----	pH units	--						
pH, TCLP extraction fluid initial	----	pH units	--						
pH, TCLP final	----	pH units	--						
Selenium, TCLP	7782-49-2	mg/L	1 mg/L						
Silver, TCLP	7440-22-4	mg/L	5 mg/L						
Uranium, TCLP	7440-61-1	mg/L	10 mg/L						
<b>TCLP VOCs</b>									
Benzene, TCLP	71-43-2	mg/L	0.5 mg/L						
Carbon tetrachloride, TCLP	56-23-5	mg/L	0.5 mg/L						
Chlorobenzene, TCLP	108-90-7	mg/L	8 mg/L						
Chloroform, TCLP	67-66-3	mg/L	10 mg/L						
Dichlorobenzene, 1,2-, TCLP	95-50-1	mg/L	20 mg/L						
Dichlorobenzene, 1,4-, TCLP	106-46-7	mg/L	0.5 mg/L						
Dichloroethane, 1,2-, TCLP	107-06-2	mg/L	0.5 mg/L						
Dichloroethylene, 1,1-, TCLP	75-35-4	mg/L	1.4 mg/L						
Dichloromethane, TCLP	75-09-2	mg/L	5 mg/L						



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 Work Order : WT2412667  
 Client : Grounded Engineering Inc.  
 Project : 24-048



Analyte	CAS Number	Unit	ONWCR Sch. 4						
<b>TCLP VOCs - Continued</b>									
Methyl ethyl ketone [MEK], TCLP	78-93-3	mg/L	200 mg/L						
Tetrachloroethylene, TCLP	127-18-4	mg/L	3 mg/L						
Trichloroethylene, TCLP	79-01-6	mg/L	5 mg/L						
Vinyl chloride, TCLP	75-01-4	mg/L	0.2 mg/L						
Bromofluorobenzene, 4-, TCLP	460-00-4	%	--						
Difluorobenzene, 1,4-, TCLP	540-36-3	%	--						

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

**Key:**

ONWCR

Ontario MECP, General Waste Control Regulation No. 347/90,558/00

Sch. 4

Schedule 4 Leachate Quality Criteria

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2412667	Page	: 1 of 7
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Issue Date	: 29-May-2024 10:05
C-O-C number	: 20-1085329		
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.

**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

### Workorder Comments

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.

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Work Order : WT2412667  
Client : Grounded Engineering Inc.  
Project : 24-048



**Regular Sample Surrogates**

Sub-Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
<b>Samples Submitted</b>							
TCLP Extractables Surrogates	WT2412667-001	TCLP-1	Chrysene-d12, TCLP	1719-03-5	132 %	60.0-130 %	Recovery greater than upper data quality objective



## Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

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	
Physical Tests : Ignitability (O. Reg. 347/558)										
Glass soil jar/Teflon lined cap [ON MECPL] TCLP-1	E209	17-May-2024	----	----	----		24-May-2024	30 days	7 days	✓
TCLP Extractables : PAHs by GC-MS (TCLP)										
Amber glass/Teflon lined cap (sodium bisulfate) TCLP-1	E644	24-May-2024	27-May-2024	21 days	11 days	✓	28-May-2024	40 days	1 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) TCLP-1	E512	24-May-2024	27-May-2024	35 days	10 days	✓	27-May-2024	35 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) TCLP-1	E444	24-May-2024	27-May-2024	187 days	10 days	✓	27-May-2024	187 days	10 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 14 day HT (e.g. CN, SVOC, NOx) TCLP-1	EPP444	17-May-2024	24-May-2024	----	----		----	14 days	7 days	✓
TCLP VOCs : VOCs by Headspace GC-MS (TCLP)										
Glass vial (sodium bisulfate) TCLP-1	E615B	26-May-2024	27-May-2024	23 days	10 days	✓	27-May-2024	23 days	10 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: **Soil/Solid**

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)							
Mercury by CVAAS (TCLP)	E512	1460282	1	7	14.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1460159	1	7	14.2	5.0	✔
PAHs by GC-MS (TCLP)	E644	1460897	1	6	16.6	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	1460405	1	8	12.5	5.0	✔
Laboratory Control Samples (LCS)							
Mercury by CVAAS (TCLP)	E512	1460282	1	7	14.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1460159	1	7	14.2	5.0	✔
PAHs by GC-MS (TCLP)	E644	1460897	1	6	16.6	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	1460405	1	8	12.5	5.0	✔
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1460282	1	7	14.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1460159	1	7	14.2	5.0	✔
PAHs by GC-MS (TCLP)	E644	1460897	1	6	16.6	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	1460405	1	8	12.5	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1460282	1	7	14.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1460159	1	7	14.2	5.0	✔
PAHs by GC-MS (TCLP)	E644	1460897	1	6	16.6	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	1460405	1	8	12.5	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
Ignitability (O. Reg. 347/558)	E209 ALS Environmental - Waterloo	Soil/Solid	EPA 1030 (mod)	Ignitability is determined by placing a sample on a ceramic tile and formed into a test strip. One end of the strip is then heated with a torch. Any burn rate for non-metallic samples that exceeds 2.2 mm/sec is considered to have a positive result. For metals, a burn rate of more than 0.17 mm/sec is considered to have a positive result.
Metals by CRC ICPMS (TCLP)	E444 ALS Environmental - Waterloo	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Waterloo	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
VOCs by Headspace GC-MS (TCLP)	E615B ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by GC-MS (TCLP)	E644 ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by GC-MS.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis (TCLP)	EP582 ALS Environmental - Waterloo	Soil/Solid	EPA 5021A (mod)	Liquid obtained after the TCLP process is prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Extraction (TCLP)	EP602 ALS Environmental - Waterloo	Soil/Solid	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Waterloo	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.
TCLP Leachate Preparation (VOCs)	EPP582 ALS Environmental - Waterloo	Soil/Solid	EPA 1311	An extract produced by the Toxicity Characteristic Leaching Procedure (TCLP) as per EPA 1311.





QUALITY CONTROL REPORT

Work Order	: WT2412667	Page	: 1 of 6
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Date Analysis Commenced	: 24-May-2024
C-O-C number	: 20-1085329	Issue Date	: 29-May-2024 10:05
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Laboratory Department
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo VOC, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Robert Braun	Soils Team Supervisor	Waterloo Inorganics, Waterloo, Ontario



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## 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: Soil/Solid					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
TCLP Extractables (QC Lot: 1460897)											
WT2413007-001	Anonymous	Benzo(a)pyrene, TCLP	50-32-8	E644	0.20	µg/L	<0.00020 mg/L	<0.20	0	Diff <2x LOR	----
TCLP Metals (QC Lot: 1460159)											
WT2412667-001	TCLP-1	Arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	0	Diff <2x LOR	----
		Boron, TCLP	7440-42-8	E444	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Cadmium, TCLP	7440-43-9	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
TCLP Metals (QC Lot: 1460282)											
WT2412667-001	TCLP-1	Mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
TCLP VOCs (QC Lot: 1460405)											
WT2413007-001	Anonymous	Benzene, TCLP	71-43-2	E615B	5.0	µg/L	<0.0050 mg/L	<5.0	0	Diff <2x LOR	----
		Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Chloroform, TCLP	67-66-3	E615B	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Dichloromethane, TCLP	75-09-2	E615B	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----
		Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----
		Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	<0.050 mg/L	<50	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: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>TCLP Extractables (QCLot: 1460897)</b>						
Benzo(a)pyrene, TCLP	50-32-8	E644	0.2	µg/L	<0.20	----
<b>TCLP Metals (QCLot: 1460159)</b>						
Arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
<b>TCLP Metals (QCLot: 1460282)</b>						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
<b>TCLP VOCs (QCLot: 1460405)</b>						
Benzene, TCLP	71-43-2	E615B	5	µg/L	<5.0	----
Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	<25	----
Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	<25	----
Chloroform, TCLP	67-66-3	E615B	100	µg/L	<100	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	<25	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	<25	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	<25	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	<25	----
Dichloromethane, TCLP	75-09-2	E615B	100	µg/L	<100	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	<100	----
Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	<25	----
Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	<25	----
Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	<50	----



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: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
TCLP Extractables (QCLot: 1460897)									
Benzo(a)pyrene, TCLP	50-32-8	E644	0.2	µg/L	0.526 µg/L	108	60.0	140	----
TCLP Metals (QCLot: 1460159)									
Arsenic, TCLP	7440-38-2	E444	1	mg/L	0.05 mg/L	107	70.0	130	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	0.012 mg/L	104	70.0	130	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	0.05 mg/L	94.6	70.0	130	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	0.005 mg/L	106	70.0	130	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	0.012 mg/L	106	70.0	130	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	0.025 mg/L	101	70.0	130	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	0.05 mg/L	103	70.0	130	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	0.005 mg/L	92.2	70.0	130	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	0 mg/L	99.9	70.0	130	----
TCLP Metals (QCLot: 1460282)									
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	0 mg/L	98.9	70.0	130	----
TCLP VOCs (QCLot: 1460405)									
Benzene, TCLP	71-43-2	E615B	5	µg/L	100 µg/L	98.5	70.0	130	----
Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	100 µg/L	99.4	60.0	140	----
Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	100 µg/L	93.6	70.0	130	----
Chloroform, TCLP	67-66-3	E615B	100	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	100 µg/L	93.5	70.0	130	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	100 µg/L	92.0	70.0	130	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	100 µg/L	114	70.0	130	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	100 µg/L	105	70.0	130	----
Dichloromethane, TCLP	75-09-2	E615B	100	µg/L	100 µg/L	114	70.0	130	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	100 µg/L	104	50.0	150	----
Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	100 µg/L	99.2	70.0	130	----
Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	100 µg/L	97.8	70.0	130	----
Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	100 µg/L	104	60.0	130	----



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: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
TCLP Extractables (QCLot: 1460897)										
WT2413007-001	Anonymous	Benzo(a)pyrene, TCLP	50-32-8	E644	0.56 µg/L	0.526 µg/L	107	50.0	140	----
TCLP Metals (QCLot: 1460159)										
WT2412667-001	TCLP-1	Arsenic, TCLP	7440-38-2	E444	5.4 mg/L	5 mg/L	109	50.0	140	----
		Barium, TCLP	7440-39-3	E444	13.2 mg/L	12.5 mg/L	105	50.0	140	----
		Boron, TCLP	7440-42-8	E444	9.90 mg/L	10 mg/L	99.0	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.250 mg/L	0.25 mg/L	100	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.35 mg/L	1.25 mg/L	108	50.0	140	----
		Lead, TCLP	7439-92-1	E444	9.76 mg/L	10 mg/L	97.6	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	5.25 mg/L	5 mg/L	105	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.087 mg/L	0.1 mg/L	86.7	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	5.07 mg/L	5 mg/L	101	50.0	140	----
TCLP Metals (QCLot: 1460282)										
WT2412667-001	TCLP-1	Mercury, TCLP	7439-97-6	E512	0.0037 mg/L	0.003 mg/L	124	50.0	140	----
TCLP VOCs (QCLot: 1460405)										
WT2413007-001	Anonymous	Benzene, TCLP	71-43-2	E615B	237 µg/L	250 µg/L	94.7	50.0	140	----
		Carbon tetrachloride, TCLP	56-23-5	E615B	227 µg/L	250 µg/L	90.7	50.0	140	----
		Chlorobenzene, TCLP	108-90-7	E615B	230 µg/L	250 µg/L	92.2	50.0	140	----
		Chloroform, TCLP	67-66-3	E615B	240 µg/L	250 µg/L	96.7	50.0	140	----
		Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	227 µg/L	250 µg/L	90.8	50.0	140	----
		Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	207 µg/L	250 µg/L	82.7	50.0	140	----
		Dichloroethane, 1,2-, TCLP	107-06-2	E615B	276 µg/L	250 µg/L	110	50.0	140	----
		Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	246 µg/L	250 µg/L	98.4	50.0	140	----
		Dichloromethane, TCLP	75-09-2	E615B	270 µg/L	250 µg/L	108	50.0	140	----
		Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	250 µg/L	250 µg/L	101	50.0	140	----
		Tetrachloroethylene, TCLP	127-18-4	E615B	220 µg/L	250 µg/L	87.9	50.0	140	----
		Trichloroethylene, TCLP	79-01-6	E615B	234 µg/L	250 µg/L	93.5	50.0	140	----
		Vinyl chloride, TCLP	75-01-4	E615B	234 µg/L	250 µg/L	93.4	50.0	140	----





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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 1085329

Page 1 of 1

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

Company: **Ground Eng Inc**

Contact: **Linley LeMay**

Phone: **416-361-5254**

Street: **1 Banigan Dr**

City/Province: **Toronto, ON**

Postal Code: **M4H 1S3**

Invoice To: **Same as Report To**

Copy of Invoice with Report: ☒ YES ☐ NO

Company: **Ground Eng Inc**

Contact: **Linley LeMay**

Project Information

ALS Account # / Quote #: **24-048**

Job #: **24-048**

PO / A/E: **24-048**

LSD: **WT2412667**

ALS Lab Work Order # (ALS use only): **WT2412667**

Sample Identification and/or Coordinates (This description will appear on the report): **TCLP-1**

ALS Sample # (ALS use only): **051124**

Date (dd-mm-yy): **051124**

Time (hh:mm): **18:30**

Sampler: **3011**

Sample Type: **3011**

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Drinking Water (DW) Samples (client use)

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

Are samples for human consumption use? ☐ YES ☐ NO

SHIPMENT RELEASE (client use)

Released by: **BSW**

Date: **05/11/24**

Time: **18:30**

Received by: **BSB**

Date: **05/11/24**

Time: **09:45**

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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.

Environmental Division

Waterloo

Work Order Reference

WT2412667

ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please call

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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Waterloo

Work Order Reference

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ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

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Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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Environmental Division

Waterloo

Work Order Reference

WT2412667

ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please call

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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Environmental Division

Waterloo

Work Order Reference

WT2412667

ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please call

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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

Environmental Division

Waterloo

Work Order Reference

WT2412667

ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please call

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

Analysis Request

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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.

Environmental Division

Waterloo

Work Order Reference

WT2412667

ROUTINE (R) if received by 3pm M-F - no surcharges apply

4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum

3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum

1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

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SAMPLES ON HOLD

EXTENDED STORAGE R

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Environmental Division

Waterloo

Work Order Reference

WT2412667

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3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum

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SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C: **4.1** FINAL COOLER TEMPERATURES °C: **4.1**

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Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE R

SUSPECTED HAZARD (S)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN

Submission Comments Identified on Sample Receipt Modification: ☐ YES ☐ NO

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2412663	Page	: 1 of 13
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Date Analysis Commenced	: 21-May-2024
C-O-C number	: 20-1085353	Issue Date	: 28-May-2024 14:22
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 Excess Soil Quote		
No. of samples received	: 10		
No. of samples analysed	: 10		

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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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.

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

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

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

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

Unit	Description
-	no units
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
mS/cm	millisiemens per centimetre
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



# Analytical Results Evaluation

Matrix: Soil/Solid

				Client sample ID	BH110-SS1	BH110-SS2	BH114-SS1	BH114-SS2A	BH114-SS2C	BH103-SS1	BH103-SS2
				Sampling date/time	14-May-2024 14:50	14-May-2024 14:55	15-May-2024 11:45	15-May-2024 11:50	15-May-2024 11:50	16-May-2024 14:55	16-May-2024 15:00
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Analyte	CAS Number	Method/Lab	Unit		WT2412663-001	WT2412663-002	WT2412663-003	WT2412663-004	WT2412663-005	WT2412663-006	WT2412663-007
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm		0.232	----	0.102	----	----	0.255	----
Moisture	----	E144/WT	%		13.3	17.0	16.8	11.3	11.7	18.7	17.1
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units		7.73	----	7.72	----	----	7.62	----
Cyanides											
Cyanide, weak acid dissociable	----	E336A/WT	mg/kg		<0.050	----	<0.050	----	----	<0.050	----
Fixed-Ratio Extractables											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L		11.9	----	8.72	----	----	22.4	----
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L		0.82	----	0.63	----	----	1.82	----
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L		26.4	----	3.22	----	----	17.2	----
Sodium adsorption ratio [SAR]	----	E484/WT	-		2.00	----	0.28	----	----	0.94	----
Metals											
Antimony	7440-36-0	E440C/WT	mg/kg		<0.10	----	<0.10	----	----	0.15	----
Arsenic	7440-38-2	E440C/WT	mg/kg		5.82	----	4.58	----	----	6.17	----
Barium	7440-39-3	E440C/WT	mg/kg		65.3	----	59.0	----	----	76.7	----
Beryllium	7440-41-7	E440C/WT	mg/kg		0.49	----	0.58	----	----	0.67	----
Boron	7440-42-8	E440C/WT	mg/kg		6.7	----	6.8	----	----	11.6	----
Boron, hot water soluble	7440-42-8	E487/WT	mg/kg		<0.10	----	0.10	----	----	0.11	----
Cadmium	7440-43-9	E440C/WT	mg/kg		0.114	----	0.108	----	----	0.166	----
Chromium	7440-47-3	E440C/WT	mg/kg		16.1	----	17.7	----	----	21.9	----
Cobalt	7440-48-4	E440C/WT	mg/kg		6.98	----	7.36	----	----	8.95	----
Copper	7440-50-8	E440C/WT	mg/kg		38.2	----	28.7	----	----	41.3	----
Lead	7439-92-1	E440C/WT	mg/kg		6.98	----	6.78	----	----	13.8	----
Mercury	7439-97-6	E510C/WT	mg/kg		0.0186	----	0.0265	----	----	0.0286	----
Molybdenum	7439-98-7	E440C/WT	mg/kg		0.37	----	0.26	----	----	0.38	----
Nickel	7440-02-0	E440C/WT	mg/kg		14.8	----	16.1	----	----	19.3	----
Selenium	7782-49-2	E440C/WT	mg/kg		<0.20	----	<0.20	----	----	0.26	----
Silver	7440-22-4	E440C/WT	mg/kg		<0.10	----	<0.10	----	----	<0.10	----



## Analytical Results Evaluation

				Client sample ID	BH110-SS1	BH110-SS2	BH114-SS1	BH114-SS2A	BH114-SS2C	BH103-SS1	BH103-SS2
Matrix: Soil/Solid				Sampling date/time	14-May-2024 14:50	14-May-2024 14:55	15-May-2024 11:45	15-May-2024 11:50	15-May-2024 11:50	16-May-2024 14:55	16-May-2024 15:00
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Analyte	CAS Number	Method/Lab	Unit		WT2412663-001	WT2412663-002	WT2412663-003	WT2412663-004	WT2412663-005	WT2412663-006	WT2412663-007
<b>Metals</b>											
Thallium	7440-28-0	E440C/WT	mg/kg		0.099	----	0.102	----	----	0.134	----
Uranium	7440-61-1	E440C/WT	mg/kg		0.508	----	0.368	----	----	0.530	----
Vanadium	7440-62-2	E440C/WT	mg/kg		26.6	----	31.2	----	----	34.4	----
Zinc	7440-66-6	E440C/WT	mg/kg		38.8	----	33.6	----	----	63.0	----
<b>Speciated Metals</b>											
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	mg/kg		0.18	----	0.40	----	----	0.19	----
<b>Volatile Organic Compounds</b>											
Benzene	71-43-2	E611A/WT	mg/kg		----	----	----	----	<0.0050	----	----
Ethylbenzene	100-41-4	E611A/WT	mg/kg		----	----	----	----	<0.015	----	----
Toluene	108-88-3	E611A/WT	mg/kg		----	----	----	----	<0.050	----	----
Xylene, m+p-	179601-23-1	E611A/WT	mg/kg		----	----	----	----	<0.030	----	----
Xylene, o-	95-47-6	E611A/WT	mg/kg		----	----	----	----	<0.030	----	----
Xylenes, total	1330-20-7	E611A/WT	mg/kg		----	----	----	----	<0.050	----	----
BTEX, total	----	E611A/WT	mg/kg		----	----	----	----	<0.10	----	----
<b>Hydrocarbons</b>											
F1 (C6-C10)	----	E581.F1/WT	mg/kg		----	----	----	----	<5.0	----	----
F2 (C10-C16)	----	E601.SG-L/WT	mg/kg		----	----	----	----	<10	----	----
F2-Naphthalene	----	EC600/WT	mg/kg		----	----	----	----	<25	----	----
F3 (C16-C34)	----	E601.SG-L/WT	mg/kg		----	----	----	----	<50	----	----
F3-PAH	n/a	EC600/WT	mg/kg		----	----	----	----	<50	----	----
F4 (C34-C50)	----	E601.SG-L/WT	mg/kg		----	----	----	----	<50	----	----
F1-BTEX	----	EC580/WT	mg/kg		----	----	----	----	<5.0	----	----
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	mg/kg		----	----	----	----	<80	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-		----	----	----	----	YES	----	----
<b>Hydrocarbons Surrogates</b>											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	%		----	----	----	----	85.0	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	%		----	----	----	----	102	----	----
<b>Volatile Organic Compounds Surrogates</b>											



## Analytical Results Evaluation

				Client sample ID	BH110-SS1	BH110-SS2	BH114-SS1	BH114-SS2A	BH114-SS2C	BH103-SS1	BH103-SS2
Matrix: Soil/Solid				Sampling date/time	14-May-2024 14:50	14-May-2024 14:55	15-May-2024 11:45	15-May-2024 11:50	15-May-2024 11:50	16-May-2024 14:55	16-May-2024 15:00
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Analyte	CAS Number	Method/Lab	Unit		WT2412663-001	WT2412663-002	WT2412663-003	WT2412663-004	WT2412663-005	WT2412663-006	WT2412663-007
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	%	----	----	----	----	----	101	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	%	----	----	----	----	----	106	----	----
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Acenaphthylene	208-96-8	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Anthracene	120-12-7	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Benz(a)anthracene	56-55-3	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Chrysene	218-01-9	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Fluoranthene	206-44-0	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Fluorene	86-73-7	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	mg/kg	----	----	----	----	----	<0.030	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	mg/kg	----	----	----	----	----	<0.030	----	----
Naphthalene	91-20-3	E641A/WT	mg/kg	----	----	----	----	----	<0.010	----	----
Phenanthrene	85-01-8	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Pyrene	129-00-0	E641A/WT	mg/kg	----	----	----	----	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	%	----	----	----	----	----	93.7	----	----
Chrysene-d12	1719-03-5	E641A/WT	%	----	----	----	----	----	85.6	----	----
Naphthalene-d8	1146-65-2	E641A/WT	%	----	----	----	----	----	90.8	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	%	----	----	----	----	----	97.3	----	----
Organochlorine Pesticides											



## Analytical Results Evaluation

				Client sample ID	BH110-SS1	BH110-SS2	BH114-SS1	BH114-SS2A	BH114-SS2C	BH103-SS1	BH103-SS2
Matrix: Soil/Solid				Sampling date/time	14-May-2024 14:50	14-May-2024 14:55	15-May-2024 11:45	15-May-2024 11:50	15-May-2024 11:50	16-May-2024 14:55	16-May-2024 15:00
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Analyte	CAS Number	Method/Lab	Unit		WT2412663-001	WT2412663-002	WT2412663-003	WT2412663-004	WT2412663-005	WT2412663-006	WT2412663-007
Organochlorine Pesticides											
Aldrin	309-00-2	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Chlordane, cis- (alpha)	5103-71-9	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Chlordane, total	57-74-9	E660F/WT	mg/kg	----	<0.030	----	<0.030	----	----	<0.030	
Chlordane, trans- (gamma)	5103-74-2	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDD, 2,4'-	53-19-0	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDD, 4,4'-	72-54-8	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDD, total	----	E660F/WT	mg/kg	----	<0.030	----	<0.030	----	----	<0.030	
DDE, 2,4'-	3424-82-6	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDE, 4,4'-	72-55-9	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDE, total	----	E660F/WT	mg/kg	----	<0.030	----	<0.030	----	----	<0.030	
DDT, 2,4'-	789-02-6	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDT, 4,4'-	50-29-3	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
DDT, total	----	E660F/WT	mg/kg	----	<0.030	----	<0.030	----	----	<0.030	
Dieldrin	60-57-1	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Endosulfan, alpha-	959-98-8	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Endosulfan, beta-	33213-65-9	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Endosulfan, total	----	E660F/WT	mg/kg	----	<0.030	----	<0.030	----	----	<0.030	
Endrin	72-20-8	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Heptachlor	76-44-8	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Heptachlor epoxide	1024-57-3	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Hexachlorobenzene	118-74-1	E660F/WT	mg/kg	----	<0.010	----	<0.010	----	----	<0.010	
Hexachlorobutadiene	87-68-3	E660F/WT	mg/kg	----	<0.010	----	<0.010	----	----	<0.010	
Hexachlorocyclohexane, gamma-	58-89-9	E660F/WT	mg/kg	----	<0.010	----	<0.010	----	----	<0.010	
Hexachloroethane	67-72-1	E660F/WT	mg/kg	----	<0.010	----	<0.010	----	----	<0.010	
Methoxychlor	72-43-5	E660F/WT	mg/kg	----	<0.020	----	<0.020	----	----	<0.020	
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%	----	106	----	103	----	----	110	
Tetrachloro-m-xylene	877-09-8	E660F/WT	%	----	98.1	----	94.5	----	----	95.6	

Page : 7 of 13  
Work Order : WT2412663  
Client : Grounded Engineering Inc.  
Project : 24-048



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

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



## Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	BH104-SS1	BH104-SS2	DUP-142	----	----	----	----
				Sampling date/time	17-May-2024 11:20	17-May-2024 11:30	17-May-2024 11:30	----	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2412663-008	WT2412663-009	WT2412663-010	-----	-----	-----	-----	-----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm	0.263	----	----	----	----	----	----	----
Moisture	----	E144/WT	%	11.8	6.84	9.97	----	----	----	----	----
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units	7.67	----	----	----	----	----	----	----
Cyanides											
Cyanide, weak acid dissociable	----	E336A/WT	mg/kg	<0.050	----	----	----	----	----	----	----
Fixed-Ratio Extractables											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L	34.0	----	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L	2.57	----	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L	1.75	----	----	----	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	-	<0.10	----	----	----	----	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	mg/kg	0.19	----	----	----	----	----	----	----
Arsenic	7440-38-2	E440C/WT	mg/kg	5.74	----	----	----	----	----	----	----
Barium	7440-39-3	E440C/WT	mg/kg	79.0	----	----	----	----	----	----	----
Beryllium	7440-41-7	E440C/WT	mg/kg	0.61	----	----	----	----	----	----	----
Boron	7440-42-8	E440C/WT	mg/kg	6.4	----	----	----	----	----	----	----
Boron, hot water soluble	7440-42-8	E487/WT	mg/kg	0.14	----	----	----	----	----	----	----
Cadmium	7440-43-9	E440C/WT	mg/kg	0.207	----	----	----	----	----	----	----
Chromium	7440-47-3	E440C/WT	mg/kg	19.6	----	----	----	----	----	----	----
Cobalt	7440-48-4	E440C/WT	mg/kg	8.54	----	----	----	----	----	----	----
Copper	7440-50-8	E440C/WT	mg/kg	54.4	----	----	----	----	----	----	----
Lead	7439-92-1	E440C/WT	mg/kg	15.6	----	----	----	----	----	----	----
Mercury	7439-97-6	E510C/WT	mg/kg	0.0479	----	----	----	----	----	----	----
Molybdenum	7439-98-7	E440C/WT	mg/kg	0.52	----	----	----	----	----	----	----
Nickel	7440-02-0	E440C/WT	mg/kg	17.4	----	----	----	----	----	----	----
Selenium	7782-49-2	E440C/WT	mg/kg	0.22	----	----	----	----	----	----	----
Silver	7440-22-4	E440C/WT	mg/kg	0.18	----	----	----	----	----	----	----
Thallium	7440-28-0	E440C/WT	mg/kg	0.127	----	----	----	----	----	----	----



## Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	BH104-SS1	BH104-SS2	DUP-142	----	----	----	----
				Sampling date/time	17-May-2024 11:20	17-May-2024 11:30	17-May-2024 11:30	----	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2412663-008	WT2412663-009	WT2412663-010	-----	-----	-----	-----	-----
Metals											
Uranium	7440-61-1	E440C/WT	mg/kg	0.581	----	----	----	----	----	----	----
Vanadium	7440-62-2	E440C/WT	mg/kg	35.2	----	----	----	----	----	----	----
Zinc	7440-66-6	E440C/WT	mg/kg	64.8	----	----	----	----	----	----	----
Speciated Metals											
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	mg/kg	0.36	----	----	----	----	----	----	----
Organochlorine Pesticides											
Aldrin	309-00-2	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Chlordane, cis- (alpha)	5103-71-9	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Chlordane, total	57-74-9	E660F/WT	mg/kg	----	<0.030	<0.030	----	----	----	----	----
Chlordane, trans- (gamma)	5103-74-2	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDD, 2,4'-	53-19-0	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDD, 4,4'-	72-54-8	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDD, total	----	E660F/WT	mg/kg	----	<0.030	<0.030	----	----	----	----	----
DDE, 2,4'-	3424-82-6	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDE, 4,4'-	72-55-9	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDE, total	----	E660F/WT	mg/kg	----	<0.030	<0.030	----	----	----	----	----
DDT, 2,4'-	789-02-6	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDT, 4,4'-	50-29-3	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
DDT, total	----	E660F/WT	mg/kg	----	<0.030	<0.030	----	----	----	----	----
Dieldrin	60-57-1	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Endosulfan, alpha-	959-98-8	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Endosulfan, beta-	33213-65-9	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Endosulfan, total	----	E660F/WT	mg/kg	----	<0.030	<0.030	----	----	----	----	----
Endrin	72-20-8	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Heptachlor	76-44-8	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Heptachlor epoxide	1024-57-3	E660F/WT	mg/kg	----	<0.020	<0.020	----	----	----	----	----
Hexachlorobenzene	118-74-1	E660F/WT	mg/kg	----	<0.010	<0.010	----	----	----	----	----
Hexachlorobutadiene	87-68-3	E660F/WT	mg/kg	----	<0.010	<0.010	----	----	----	----	----





Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	BH104-SS1	BH104-SS2	DUP-142	----	----	----	----
				Sampling date/time	17-May-2024 11:20	17-May-2024 11:30	17-May-2024 11:30	----	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2412663-008	WT2412663-009	WT2412663-010	-----	-----	-----	-----
Organochlorine Pesticides											
Hexachlorocyclohexane, gamma-	58-89-9	E660F/WT	mg/kg		----	<0.010	<0.010	----	----	----	----
Hexachloroethane	67-72-1	E660F/WT	mg/kg		----	<0.010	<0.010	----	----	----	----
Methoxychlor	72-43-5	E660F/WT	mg/kg		----	<0.020	<0.020	----	----	----	----
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%		----	94.5	106	----	----	----	----
Tetrachloro-m-xylene	877-09-8	E660F/WT	%		----	87.0	90.3	----	----	----	----

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

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



## Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Physical Tests</b>									
Conductivity (1:2 leachate)	----	mS/cm	0.7 mS/cm						
Moisture	----	%	--						
pH (1:2 soil:CaCl2-aq)	----	pH units	--						
<b>Cyanides</b>									
Cyanide, weak acid dissociable	----	mg/kg	0.051 mg/kg						
<b>Fixed-Ratio Extractables</b>									
Calcium, soluble ion content	7440-70-2	mg/L	--						
Magnesium, soluble ion content	7439-95-4	mg/L	--						
Sodium adsorption ratio [SAR]	----	-	5 -						
Sodium, soluble ion content	17341-25-2	mg/L	--						
<b>Metals</b>									
Antimony	7440-36-0	mg/kg	7.5 mg/kg						
Arsenic	7440-38-2	mg/kg	18 mg/kg						
Barium	7440-39-3	mg/kg	390 mg/kg						
Beryllium	7440-41-7	mg/kg	4 mg/kg						
Boron, hot water soluble	7440-42-8	mg/kg	1.5 mg/kg						
Boron	7440-42-8	mg/kg	120 mg/kg						
Cadmium	7440-43-9	mg/kg	1.2 mg/kg						
Chromium	7440-47-3	mg/kg	160 mg/kg						
Cobalt	7440-48-4	mg/kg	22 mg/kg						
Copper	7440-50-8	mg/kg	140 mg/kg						
Lead	7439-92-1	mg/kg	120 mg/kg						
Mercury	7439-97-6	mg/kg	0.27 mg/kg						
Molybdenum	7439-98-7	mg/kg	6.9 mg/kg						
Nickel	7440-02-0	mg/kg	100 mg/kg						
Selenium	7782-49-2	mg/kg	2.4 mg/kg						
Silver	7440-22-4	mg/kg	20 mg/kg						
Thallium	7440-28-0	mg/kg	1 mg/kg						
Uranium	7440-61-1	mg/kg	23 mg/kg						
Vanadium	7440-62-2	mg/kg	86 mg/kg						
Zinc	7440-66-6	mg/kg	340 mg/kg						
<b>Speciated Metals</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	mg/kg	8 mg/kg						
<b>Volatile Organic Compounds</b>									
Benzene	71-43-2	mg/kg	0.21 mg/kg						
BTEX, total	----	mg/kg	--						
Ethylbenzene	100-41-4	mg/kg	1.1 mg/kg						



Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Volatile Organic Compounds - Continued</b>									
Toluene	108-88-3	mg/kg	2.3 mg/kg						
Xylene, m+p-	179601-23-1	mg/kg	--						
Xylene, o-	95-47-6	mg/kg	--						
Xylenes, total	1330-20-7	mg/kg	3.1 mg/kg						
<b>Hydrocarbons</b>									
Chromatogram to baseline at nC50	n/a	-	--						
F1 (C6-C10)	----	mg/kg	55 mg/kg						
F1-BTEX	----	mg/kg	55 mg/kg						
F2 (C10-C16)	----	mg/kg	98 mg/kg						
F2-Naphthalene	----	mg/kg	--						
F3 (C16-C34)	----	mg/kg	300 mg/kg						
F3-PAH	n/a	mg/kg	--						
F4 (C34-C50)	----	mg/kg	2800 mg/kg						
Hydrocarbons, total (C6-C50)	n/a	mg/kg	--						
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	%	--						
Dichlorotoluene, 3,4-	95-75-0	%	--						
Bromofluorobenzene, 4-	460-00-4	%	--						
Difluorobenzene, 1,4-	540-36-3	%	--						
<b>Polycyclic Aromatic Hydrocarbons</b>									
Acenaphthene	83-32-9	mg/kg	7.9 mg/kg						
Acenaphthylene	208-96-8	mg/kg	0.15 mg/kg						
Anthracene	120-12-7	mg/kg	0.67 mg/kg						
Benz(a)anthracene	56-55-3	mg/kg	0.5 mg/kg						
Benzo(a)pyrene	50-32-8	mg/kg	0.3 mg/kg						
Benzo(b+j)fluoranthene	n/a	mg/kg	0.78 mg/kg						
Benzo(g,h,i)perylene	191-24-2	mg/kg	6.6 mg/kg						
Benzo(k)fluoranthene	207-08-9	mg/kg	0.78 mg/kg						
Chrysene	218-01-9	mg/kg	7 mg/kg						
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.1 mg/kg						
Fluoranthene	206-44-0	mg/kg	0.69 mg/kg						
Fluorene	86-73-7	mg/kg	62 mg/kg						
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	0.38 mg/kg						
Methylnaphthalene, 1+2-	----	mg/kg	0.99 mg/kg						
Methylnaphthalene, 1-	90-12-0	mg/kg	0.99 mg/kg						
Methylnaphthalene, 2-	91-57-6	mg/kg	0.99 mg/kg						
Naphthalene	91-20-3	mg/kg	0.6 mg/kg						
Phenanthrene	85-01-8	mg/kg	6.2 mg/kg						
Pyrene	129-00-0	mg/kg	78 mg/kg						
Acridine-d9	34749-75-2	%	--						



Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Polycyclic Aromatic Hydrocarbons Surrogates - Continued</b>									
Chrysene-d12	1719-03-5	%	--						
Naphthalene-d8	1146-65-2	%	--						
Phenanthrene-d10	1517-22-2	%	--						
<b>Organochlorine Pesticides</b>									
Aldrin	309-00-2	mg/kg	0.05 mg/kg						
Chlordane, cis- (alpha)	5103-71-9	mg/kg	--						
Chlordane, total	57-74-9	mg/kg	0.05 mg/kg						
Chlordane, trans- (gamma)	5103-74-2	mg/kg	--						
DDD, 2,4'-	53-19-0	mg/kg	--						
DDD, 4,4'-	72-54-8	mg/kg	--						
DDD, total	----	mg/kg	3.3 mg/kg						
DDE, 2,4'-	3424-82-6	mg/kg	--						
DDE, 4,4'-	72-55-9	mg/kg	--						
DDE, total	----	mg/kg	0.26 mg/kg						
DDT, 2,4'-	789-02-6	mg/kg	--						
DDT, 4,4'-	50-29-3	mg/kg	--						
DDT, total	----	mg/kg	1.4 mg/kg						
Dieldrin	60-57-1	mg/kg	0.05 mg/kg						
Endosulfan, alpha-	959-98-8	mg/kg	--						
Endosulfan, beta-	33213-65-9	mg/kg	--						
Endosulfan, total	----	mg/kg	0.04 mg/kg						
Endrin	72-20-8	mg/kg	0.04 mg/kg						
Heptachlor epoxide	1024-57-3	mg/kg	0.05 mg/kg						
Heptachlor	76-44-8	mg/kg	0.15 mg/kg						
Hexachlorobenzene	118-74-1	mg/kg	0.52 mg/kg						
Hexachlorobutadiene	87-68-3	mg/kg	0.012 mg/kg						
Hexachlorocyclohexane, gamma-	58-89-9	mg/kg	0.056 mg/kg						
Hexachloroethane	67-72-1	mg/kg	0.089 mg/kg						
Methoxychlor	72-43-5	mg/kg	0.13 mg/kg						
Decachlorobiphenyl	2051-24-3	%	--						
Tetrachloro-m-xylene	877-09-8	%	--						

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

**Key:**

ON153/04

Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)

T2-RPI-C

153 T2-Soil-Res/Park/Inst. Property Use (Coarse)

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2412663	Page	: 1 of 15
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Issue Date	: 28-May-2024 14:25
C-O-C number	: 20-1085353		
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 Excess Soil Quote		
No. of samples received	: 10		
No. of samples analysed	: 10		

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

- Reference Material (RM) Sample outliers occur - please see the following pages for full details.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



Matrix: Soil/Solid

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Reference Material (RM) Sample								
Metals	QC-MRG2-1452161 003	----	Boron	7440-42-8	E440C	136 % MES	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



## 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: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E336A	17-May-2024	21-May-2024	14 days	4 days	✓	22-May-2024	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E336A	16-May-2024	21-May-2024	14 days	5 days	✓	22-May-2024	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E336A	15-May-2024	21-May-2024	14 days	6 days	✓	22-May-2024	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E336A	14-May-2024	21-May-2024	14 days	7 days	✓	22-May-2024	14 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH114-SS2C	E581.F1	15-May-2024	21-May-2024	14 days	6 days	✓	23-May-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS2C	E601.SG-L	15-May-2024	22-May-2024	14 days	7 days	✓	23-May-2024	40 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E487	17-May-2024	23-May-2024	180 days	6 days	✓	23-May-2024	180 days	0 days	✓





Matrix: Soil/Solid

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	
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E487	16-May-2024	23-May-2024	180 days	7 days	✓	23-May-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E487	15-May-2024	23-May-2024	180 days	8 days	✓	23-May-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E487	14-May-2024	23-May-2024	180 days	9 days	✓	23-May-2024	180 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E510C	17-May-2024	23-May-2024	28 days	6 days	✓	24-May-2024	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E510C	16-May-2024	23-May-2024	28 days	7 days	✓	24-May-2024	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E510C	15-May-2024	23-May-2024	28 days	8 days	✓	24-May-2024	28 days	9 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E510C	14-May-2024	23-May-2024	28 days	9 days	✓	24-May-2024	28 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E440C	17-May-2024	23-May-2024	180 days	6 days	✓	23-May-2024	180 days	6 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E440C	16-May-2024	23-May-2024	180 days	7 days	✓	23-May-2024	180 days	7 days	✓



Matrix: Soil/Solid

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	
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E440C	15-May-2024	23-May-2024	180 days	8 days	✓	23-May-2024	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E440C	14-May-2024	23-May-2024	180 days	9 days	✓	23-May-2024	180 days	9 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E484	17-May-2024	23-May-2024	180 days	6 days	✓	23-May-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E484	16-May-2024	23-May-2024	180 days	7 days	✓	23-May-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E484	15-May-2024	23-May-2024	180 days	8 days	✓	23-May-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E484	14-May-2024	23-May-2024	180 days	9 days	✓	23-May-2024	180 days	0 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS2	E660F	17-May-2024	23-May-2024	60 days	6 days	✓	24-May-2024	40 days	1 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] DUP-142	E660F	17-May-2024	23-May-2024	60 days	6 days	✓	24-May-2024	40 days	1 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS2	E660F	16-May-2024	23-May-2024	60 days	7 days	✓	24-May-2024	40 days	1 days	✓



Matrix: Soil/Solid

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	
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS2A	E660F	15-May-2024	23-May-2024	60 days	8 days	✓	24-May-2024	40 days	1 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS2	E660F	14-May-2024	23-May-2024	60 days	9 days	✓	24-May-2024	40 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E100-L	17-May-2024	23-May-2024	30 days	6 days	✓	24-May-2024	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E100-L	16-May-2024	23-May-2024	30 days	7 days	✓	24-May-2024	30 days	8 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E100-L	15-May-2024	23-May-2024	30 days	8 days	✓	24-May-2024	30 days	9 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E100-L	14-May-2024	23-May-2024	30 days	9 days	✓	24-May-2024	30 days	10 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E144	17-May-2024	----	----	----		21-May-2024	----	4 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS2	E144	17-May-2024	----	----	----		21-May-2024	----	4 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] DUP-142	E144	17-May-2024	----	----	----		21-May-2024	----	4 days	



Matrix: Soil/Solid

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	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E144	16-May-2024	----	----	----		21-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS2	E144	16-May-2024	----	----	----		21-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E144	15-May-2024	----	----	----		21-May-2024	----	6 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS2A	E144	15-May-2024	----	----	----		21-May-2024	----	6 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS2C	E144	15-May-2024	----	----	----		21-May-2024	----	6 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E144	14-May-2024	----	----	----		21-May-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS2	E144	14-May-2024	----	----	----		21-May-2024	----	7 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E108A	17-May-2024	21-May-2024	30 days	4 days	✓	27-May-2024	30 days	10 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E108A	16-May-2024	21-May-2024	30 days	5 days	✓	27-May-2024	30 days	11 days	✓



Matrix: Soil/Solid

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	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E108A	15-May-2024	21-May-2024	30 days	6 days	✓	27-May-2024	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E108A	14-May-2024	21-May-2024	30 days	7 days	✓	27-May-2024	30 days	13 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS2C	E641A	15-May-2024	22-May-2024	60 days	7 days	✓	23-May-2024	40 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH104-SS1	E532	17-May-2024	21-May-2024	30 days	4 days	✓	24-May-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH103-SS1	E532	16-May-2024	21-May-2024	30 days	5 days	✓	24-May-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH114-SS1	E532	15-May-2024	21-May-2024	30 days	6 days	✓	24-May-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH110-SS1	E532	14-May-2024	21-May-2024	30 days	7 days	✓	24-May-2024	7 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH114-SS2C	E611A	15-May-2024	21-May-2024	14 days	6 days	✓	23-May-2024	40 days	2 days	✓

**Legend & Qualifier Definitions**

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



## Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

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)							
Boron-Hot Water Extractable by ICPOES	E487	1452160	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1452308	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1452309	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1452741	1	14	7.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1452159	1	20	5.0	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1452136	1	19	5.2	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1452161	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1452162	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1452288	1	20	5.0	5.0	✓
OCPs by GC-MS-MS or GC-MS	E660F	1455279	1	5	20.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1452740	1	17	5.8	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1452137	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1452158	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1452157	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1452160	2	20	10.0	10.0	✓
BTEX by Headspace GC-MS	E611A	1452308	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1452309	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1452741	1	14	7.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1452159	2	20	10.0	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1452136	2	19	10.5	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1452161	2	20	10.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1452162	2	20	10.0	10.0	✓
Moisture Content by Gravimetry	E144	1452288	1	20	5.0	5.0	✓
OCPs by GC-MS-MS or GC-MS	E660F	1455279	1	5	20.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1452740	1	17	5.8	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1452137	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1452158	2	20	10.0	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1452157	1	20	5.0	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1452160	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	1452308	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1452309	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1452741	1	14	7.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1452159	1	20	5.0	5.0	✓



Matrix: Soil/Solid

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							
Hexavalent Chromium (Cr VI) by IC	E532	1452136	1	19	5.2	5.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1452161	1	20	5.0	5.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1452162	1	20	5.0	5.0	✔
Moisture Content by Gravimetry	E144	1452288	1	20	5.0	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1455279	1	5	20.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1452740	1	17	5.8	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1452158	1	20	5.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1452157	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1452308	1	20	5.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	1452309	1	20	5.0	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1452741	1	14	7.1	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1455279	1	5	20.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1452740	1	17	5.8	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1452157	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 Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L  ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/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 soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl <sub>2</sub> Extraction) - As Received	E108A  ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode.  This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A  ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C  ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO <sub>3</sub> and HCl.  Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines.  Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484  ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.





Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487  ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.  Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C  ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO <sub>3</sub> and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532  ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4).  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A  ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A  ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
OCPs by GC-MS-MS or GC-MS	E660F  ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	OCPs are analyzed by GC-MS-MS or GC-MS



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.  Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

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Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.
Pesticides, PCB, PAH, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660  ALS Environmental - Waterloo	Soil/Solid	EPA 3570 (mod)	A homogenized subsample is extracted with organic solvents using a mechanical shaker.

QUALITY CONTROL REPORT

Work Order	: WT2412663	Page	: 1 of 15
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 21-May-2024 09:45
PO	: ----	Date Analysis Commenced	: 21-May-2024
C-O-C number	: 20-1085353	Issue Date	: 28-May-2024 14:47
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 Excess Soil Quote		
No. of samples received	: 10		
No. of samples analysed	: 10		

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
- Reference Material (RM) 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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario



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## 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

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

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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: Soil/Solid					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: 1452137)											
WT2412527-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.64	7.65	0.131%	5%	----
Physical Tests (QC Lot: 1452159)											
WT2412527-002	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.193 mS/cm	194	0.413%	20%	----
Physical Tests (QC Lot: 1452288)											
WT2412576-001	Anonymous	Moisture	----	E144	0.25	%	4.58	4.60	0.515%	20%	----
Cyanides (QC Lot: 1452157)											
WT2412527-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1452158)											
WT2412527-002	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	15.4	16.7	8.10%	30%	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	5.77	6.05	4.74%	30%	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	2.66	2.69	0.03	Diff <2x LOR	----
Metals (QC Lot: 1452160)											
WT2412527-001	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	<0.10	<0.10	0.0001	Diff <2x LOR	----
Metals (QC Lot: 1452161)											
WT2412527-001	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0079	0.0086	0.0006	Diff <2x LOR	----
Metals (QC Lot: 1452162)											
WT2412527-001	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	2.79	2.70	3.01%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	54.8	53.9	1.82%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.45	0.44	0.02	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	12.7	12.0	0.6	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.079	0.081	0.002	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	15.0	14.9	0.557%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	6.19	6.14	0.751%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	16.8	17.6	4.38%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	7.48	7.35	1.76%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.32	0.31	0.008	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	13.1	12.8	2.30%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

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Sub-Matrix: Soil/Solid					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
Metals (QC Lot: 1452162) - continued											
WT2412527-001	Anonymous	Thallium	7440-28-0	E440C	0.050	mg/kg	0.086	0.083	0.003	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.695	0.616	12.0%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	24.2	24.2	0.160%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	45.0	43.7	3.03%	30%	----
Speciated Metals (QC Lot: 1452136)											
WT2412527-001	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1452308)											
WT2412582-001	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015 µg/g	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050 µg/g	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030 µg/g	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030 µg/g	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1452309)											
WT2412582-001	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0 µg/g	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1452741)											
WT2412444-010	Anonymous	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1452740)											
WT2412444-010	Anonymous	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----

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Sub-Matrix: Soil/Solid					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
Polycyclic Aromatic Hydrocarbons (QC Lot: 1452740) - continued											
WT2412444-010	Anonymous	Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Organochlorine Pesticides (QC Lot: 1455279)											
WT2412663-002	BH110-SS2	Aldrin	309-00-2	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Chlordane, cis- (alpha)	5103-71-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Chlordane, trans- (gamma)	5103-74-2	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDD, 2,4'-	53-19-0	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDD, 4,4'-	72-54-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDE, 2,4'-	3424-82-6	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDE, 4,4'-	72-55-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDT, 2,4'-	789-02-6	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDT, 4,4'-	50-29-3	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Dieldrin	60-57-1	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endosulfan, alpha-	959-98-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endosulfan, beta-	33213-65-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endrin	72-20-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Heptachlor	76-44-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Heptachlor epoxide	1024-57-3	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Hexachlorobenzene	118-74-1	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachloroethane	67-72-1	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methoxychlor	72-43-5	E660F	0.020	mg/kg	<0.020	<0.020	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: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 1452159)</b>						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
<b>Physical Tests (QCLot: 1452288)</b>						
Moisture	----	E144	0.25	%	<0.25	----
<b>Cyanides (QCLot: 1452157)</b>						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
<b>Metals (QCLot: 1452158)</b>						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
<b>Metals (QCLot: 1452160)</b>						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
<b>Metals (QCLot: 1452161)</b>						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
<b>Metals (QCLot: 1452162)</b>						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Speciated Metals (QCLot: 1452136)</b>						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
<b>Volatile Organic Compounds (QCLot: 1452308)</b>						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
<b>Hydrocarbons (QCLot: 1452309)</b>						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
<b>Hydrocarbons (QCLot: 1452741)</b>						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 1452740)</b>						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----
<b>Organochlorine Pesticides (QCLot: 1455279)</b>						
Aldrin	309-00-2	E660F	0.02	mg/kg	<0.020	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.02	mg/kg	<0.020	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Organochlorine Pesticides (QCLot: 1455279) - continued</b>						
Chlordane, trans- (gamma)	5103-74-2	E660F	0.02	mg/kg	<0.020	----
DDD, 2,4'-	53-19-0	E660F	0.02	mg/kg	<0.020	----
DDD, 4,4'-	72-54-8	E660F	0.02	mg/kg	<0.020	----
DDE, 2,4'-	3424-82-6	E660F	0.02	mg/kg	<0.020	----
DDE, 4,4'-	72-55-9	E660F	0.02	mg/kg	<0.020	----
DDT, 2,4'-	789-02-6	E660F	0.02	mg/kg	<0.020	----
DDT, 4,4'-	50-29-3	E660F	0.02	mg/kg	<0.020	----
Dieldrin	60-57-1	E660F	0.02	mg/kg	<0.020	----
Endosulfan, alpha-	959-98-8	E660F	0.02	mg/kg	<0.020	----
Endosulfan, beta-	33213-65-9	E660F	0.02	mg/kg	<0.020	----
Endrin	72-20-8	E660F	0.02	mg/kg	<0.020	----
Heptachlor	76-44-8	E660F	0.02	mg/kg	<0.020	----
Heptachlor epoxide	1024-57-3	E660F	0.02	mg/kg	<0.020	----
Hexachlorobenzene	118-74-1	E660F	0.01	mg/kg	<0.010	----
Hexachlorobutadiene	87-68-3	E660F	0.01	mg/kg	<0.010	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.01	mg/kg	<0.010	----
Hexachloroethane	67-72-1	E660F	0.01	mg/kg	<0.010	----
Methoxychlor	72-43-5	E660F	0.02	mg/kg	<0.020	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1452137)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1452159)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	95.6	90.0	110	----
Physical Tests (QCLot: 1452288)									
Moisture	----	E144	0.25	%	50 %	99.1	90.0	110	----
Cyanides (QCLot: 1452157)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	96.5	80.0	120	----
Metals (QCLot: 1452158)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	103	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	97.8	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	98.8	80.0	120	----
Metals (QCLot: 1452160)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	105	70.0	130	----
Metals (QCLot: 1452161)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	111	80.0	120	----
Metals (QCLot: 1452162)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	112	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	114	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	105	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	109	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	108	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	105	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	110	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	106	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	105	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	102	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	111	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	104	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	108	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	98.0	80.0	120	----



Sub-Matrix: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1452162) - continued									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	103	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	102	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	110	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	103	80.0	120	----
Speciated Metals (QCLot: 1452136)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	101	80.0	120	----
Volatile Organic Compounds (QCLot: 1452308)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	102	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	98.8	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	97.5	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	104	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	102	70.0	130	----
Hydrocarbons (QCLot: 1452309)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	101	80.0	120	----
Hydrocarbons (QCLot: 1452741)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	714 mg/kg	103	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1480 mg/kg	104	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	777 mg/kg	106	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1452740)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	94.8	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	92.6	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	88.5	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	88.1	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	87.6	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	83.5	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	97.7	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	84.6	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	86.3	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	94.1	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	91.2	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	93.3	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	94.6	60.0	130	----



Sub-Matrix: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1452740) - continued									
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	88.8	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	96.3	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	94.4	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	90.7	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	88.9	60.0	130	----
Organochlorine Pesticides (QCLot: 1455279)									
Aldrin	309-00-2	E660F	0.02	mg/kg	0.012 mg/kg	78.6	50.0	150	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.02	mg/kg	0.012 mg/kg	63.1	50.0	150	----
Chlordane, trans- (gamma)	5103-74-2	E660F	0.02	mg/kg	0.012 mg/kg	79.4	50.0	150	----
DDD, 2,4'-	53-19-0	E660F	0.02	mg/kg	0.012 mg/kg	77.6	50.0	150	----
DDD, 4,4'-	72-54-8	E660F	0.02	mg/kg	0.012 mg/kg	78.7	50.0	150	----
DDE, 2,4'-	3424-82-6	E660F	0.02	mg/kg	0.012 mg/kg	72.8	50.0	150	----
DDE, 4,4'-	72-55-9	E660F	0.02	mg/kg	0.012 mg/kg	68.6	50.0	150	----
DDT, 2,4'-	789-02-6	E660F	0.02	mg/kg	0.012 mg/kg	85.7	50.0	150	----
DDT, 4,4'-	50-29-3	E660F	0.02	mg/kg	0.012 mg/kg	81.5	50.0	150	----
Dieldrin	60-57-1	E660F	0.02	mg/kg	0.012 mg/kg	75.1	50.0	150	----
Endosulfan, alpha-	959-98-8	E660F	0.02	mg/kg	0.012 mg/kg	76.6	50.0	150	----
Endosulfan, beta-	33213-65-9	E660F	0.02	mg/kg	0.012 mg/kg	77.8	50.0	150	----
Endrin	72-20-8	E660F	0.02	mg/kg	0.012 mg/kg	100	50.0	150	----
Heptachlor	76-44-8	E660F	0.02	mg/kg	0.012 mg/kg	99.7	50.0	150	----
Heptachlor epoxide	1024-57-3	E660F	0.02	mg/kg	0.012 mg/kg	64.6	50.0	150	----
Hexachlorobenzene	118-74-1	E660F	0.01	mg/kg	0.012 mg/kg	79.6	50.0	150	----
Hexachlorobutadiene	87-68-3	E660F	0.01	mg/kg	0.012 mg/kg	94.9	50.0	150	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.01	mg/kg	0.012 mg/kg	86.4	50.0	150	----
Hexachloroethane	67-72-1	E660F	0.01	mg/kg	0.012 mg/kg	65.2	50.0	150	----
Methoxychlor	72-43-5	E660F	0.02	mg/kg	0.012 mg/kg	96.1	50.0	150	----



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: Soil/Solid

Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Cyanides (QCLot: 1452157)										
WT2412527-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.25 mg/kg	1.24 mg/kg	101	70.0	130	----
Volatile Organic Compounds (QCLot: 1452308)										
WT2412582-001	Anonymous	Benzene	71-43-2	E611A	5.24 mg/kg	4.23 mg/kg	124	60.0	140	----
		Ethylbenzene	100-41-4	E611A	4.95 mg/kg	4.23 mg/kg	117	60.0	140	----
		Toluene	108-88-3	E611A	4.91 mg/kg	4.23 mg/kg	116	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	10.2 mg/kg	8.47 mg/kg	120	60.0	140	----
		Xylene, o-	95-47-6	E611A	5.09 mg/kg	4.23 mg/kg	120	60.0	140	----
Hydrocarbons (QCLot: 1452309)										
WT2412582-001	Anonymous	F1 (C6-C10)	----	E581.F1	86.6 mg/kg	84.7 mg/kg	102	60.0	140	----
Hydrocarbons (QCLot: 1452741)										
WT2412444-010	Anonymous	F2 (C10-C16)	----	E601.SG-L	569 mg/kg	584 mg/kg	97.5	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1190 mg/kg	1210 mg/kg	98.9	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	673 mg/kg	635 mg/kg	106	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1452740)										
WT2412444-010	Anonymous	Acenaphthene	83-32-9	E641A	0.379 mg/kg	0.416 mg/kg	91.2	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.388 mg/kg	0.416 mg/kg	93.4	50.0	140	----
		Anthracene	120-12-7	E641A	0.350 mg/kg	0.416 mg/kg	84.2	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.329 mg/kg	0.416 mg/kg	79.1	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.359 mg/kg	0.416 mg/kg	86.3	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.352 mg/kg	0.416 mg/kg	84.6	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.400 mg/kg	0.416 mg/kg	96.3	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.349 mg/kg	0.416 mg/kg	84.0	50.0	140	----
		Chrysene	218-01-9	E641A	0.346 mg/kg	0.416 mg/kg	83.3	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.393 mg/kg	0.416 mg/kg	94.5	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.378 mg/kg	0.416 mg/kg	90.9	50.0	140	----
		Fluorene	86-73-7	E641A	0.390 mg/kg	0.416 mg/kg	93.8	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.391 mg/kg	0.416 mg/kg	94.0	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.371 mg/kg	0.416 mg/kg	89.1	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.406 mg/kg	0.416 mg/kg	97.6	50.0	140	----
		Naphthalene	91-20-3	E641A	0.384 mg/kg	0.416 mg/kg	92.4	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.356 mg/kg	0.416 mg/kg	85.7	50.0	140	----
		Pyrene	129-00-0	E641A	0.375 mg/kg	0.416 mg/kg	90.1	50.0	140	----
Organochlorine Pesticides (QCLot: 1455279)										
WT2412663-002	BH110-SS2	Aldrin	309-00-2	E660F	0.008 mg/kg	0.01 mg/kg	77.0	50.0	150	----
		Chlordane, cis- (alpha)	5103-71-9	E660F	0.006 mg/kg	0.01 mg/kg	55.7	50.0	150	----
		Chlordane, trans- (gamma)	5103-74-2	E660F	0.006 mg/kg	0.01 mg/kg	64.6	50.0	150	----
		DDD, 2,4'-	53-19-0	E660F	0.008 mg/kg	0.01 mg/kg	75.7	50.0	150	----



Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Organochlorine Pesticides (QCLot: 1455279) - continued										
WT2412663-002	BH110-SS2	DDD, 4,4'-	72-54-8	E660F	0.008 mg/kg	0.01 mg/kg	75.7	50.0	150	----
		DDE, 2,4'-	3424-82-6	E660F	0.007 mg/kg	0.01 mg/kg	72.0	50.0	150	----
		DDE, 4,4'-	72-55-9	E660F	0.007 mg/kg	0.01 mg/kg	70.0	50.0	150	----
		DDT, 2,4'-	789-02-6	E660F	0.008 mg/kg	0.01 mg/kg	84.2	50.0	150	----
		DDT, 4,4'-	50-29-3	E660F	0.009 mg/kg	0.01 mg/kg	86.7	50.0	150	----
		Dieldrin	60-57-1	E660F	0.008 mg/kg	0.01 mg/kg	77.2	50.0	150	----
		Endosulfan, alpha-	959-98-8	E660F	0.008 mg/kg	0.01 mg/kg	83.8	50.0	150	----
		Endosulfan, beta-	33213-65-9	E660F	0.007 mg/kg	0.01 mg/kg	74.1	50.0	150	----
		Endrin	72-20-8	E660F	0.010 mg/kg	0.01 mg/kg	96.2	50.0	150	----
		Heptachlor	76-44-8	E660F	0.010 mg/kg	0.01 mg/kg	95.7	50.0	150	----
		Heptachlor epoxide	1024-57-3	E660F	0.006 mg/kg	0.01 mg/kg	65.7	50.0	150	----
		Hexachlorobenzene	118-74-1	E660F	0.008 mg/kg	0.01 mg/kg	78.0	50.0	150	----
		Hexachlorobutadiene	87-68-3	E660F	0.008 mg/kg	0.01 mg/kg	83.0	50.0	150	----
		Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.008 mg/kg	0.01 mg/kg	82.7	50.0	150	----
		Hexachloroethane	67-72-1	E660F	0.006 mg/kg	0.01 mg/kg	55.8	50.0	150	----
		Methoxychlor	72-43-5	E660F	0.009 mg/kg	0.01 mg/kg	91.9	50.0	150	----





Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

Sub-Matrix:					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method					
Physical Tests (QCLot: 1452159)									
QC-1452159-003	RM	Conductivity (1:2 leachate)	----	E100-L	3460 µS/cm	94.7	70.0	130	----
Metals (QCLot: 1452158)									
QC-1452158-003	RM	Calcium, soluble ion content	7440-70-2	E484	195 mg/L	90.3	70.0	130	----
QC-1452158-003	RM	Magnesium, soluble ion content	7439-95-4	E484	68.7 mg/L	93.5	70.0	130	----
QC-1452158-003	RM	Sodium, soluble ion content	17341-25-2	E484	117 mg/L	99.0	70.0	130	----
Metals (QCLot: 1452160)									
QC-1452160-003	RM	Boron, hot water soluble	7440-42-8	E487	1.93 mg/kg	105	60.0	140	----
Metals (QCLot: 1452161)									
QC-1452161-003	RM	Mercury	7439-97-6	E510C	0.058 mg/kg	109	70.0	130	----
Metals (QCLot: 1452162)									
QC-1452162-003	RM	Antimony	7440-36-0	E440C	3.99 mg/kg	117	70.0	130	----
QC-1452162-003	RM	Arsenic	7440-38-2	E440C	3.73 mg/kg	112	70.0	130	----
QC-1452162-003	RM	Barium	7440-39-3	E440C	105 mg/kg	120	70.0	130	----
QC-1452162-003	RM	Beryllium	7440-41-7	E440C	0.349 mg/kg	121	70.0	130	----
QC-1452162-003	RM	Boron	7440-42-8	E440C	8.5 mg/kg	# 136	70.0	130	MES
QC-1452162-003	RM	Cadmium	7440-43-9	E440C	0.91 mg/kg	106	70.0	130	----
QC-1452162-003	RM	Chromium	7440-47-3	E440C	101 mg/kg	119	70.0	130	----
QC-1452162-003	RM	Cobalt	7440-48-4	E440C	6.9 mg/kg	115	70.0	130	----
QC-1452162-003	RM	Copper	7440-50-8	E440C	123 mg/kg	118	70.0	130	----
QC-1452162-003	RM	Lead	7439-92-1	E440C	267 mg/kg	108	70.0	130	----
QC-1452162-003	RM	Molybdenum	7439-98-7	E440C	1.03 mg/kg	117	70.0	130	----
QC-1452162-003	RM	Nickel	7440-02-0	E440C	26.7 mg/kg	114	70.0	130	----
QC-1452162-003	RM	Silver	7440-22-4	E440C	4.06 mg/kg	100.0	70.0	130	----
QC-1452162-003	RM	Thallium	7440-28-0	E440C	0.079 mg/kg	116	70.0	130	----
QC-1452162-003	RM	Uranium	7440-61-1	E440C	0.52 mg/kg	109	70.0	130	----
QC-1452162-003	RM	Vanadium	7440-62-2	E440C	32.7 mg/kg	117	70.0	130	----
QC-1452162-003	RM	Zinc	7440-66-6	E440C	297 mg/kg	111	70.0	130	----
Speciated Metals (QCLot: 1452136)									
QC-1452136-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	226 mg/kg	90.0	70.0	130	----



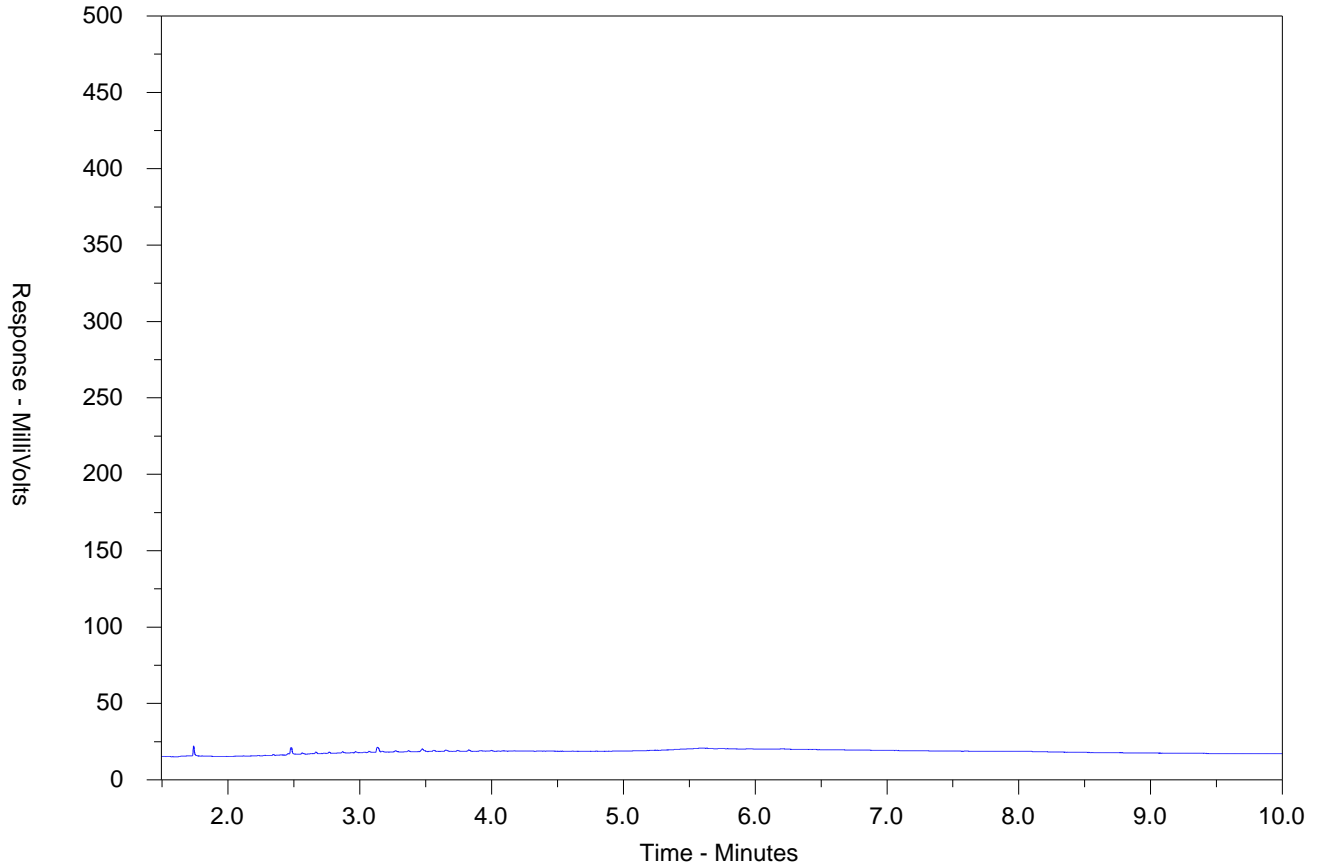
Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2412663-005-E601.SG-L  
 Client Sample ID: BH114-SS2C



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



## Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 1085353

Canada Toll Free: 1 800 668 9878

Page

of 1

www.alsglobal.com

Contact and company name below will appear on the final report

Report To  
 Company: **Groun Red Env Inc**  
 Contact: **Henry Hendrick**  
 Phone: **647-361-9294**

Company address below will appear on the final report

Street: **1 Vaniam Dr**  
 City/Province: **Toronto ON**  
 Postal Code: **M4H 1G3**

Invoice To  
 Same as Report To ☒ YES ☐ NO  
 Copy of Invoice with Report ☐ YES ☐ NO

Company:  
 Contact:

## Project Information

ALS Account # / Quote #: **24-048**  
 Job #: **24-048**  
 PO / AFE:  
 LSD:

ALS Lab Work Order # (ALS use only): **WT2412663**

Sample Identification and/or Coordinates  
 (This description will appear on the report)

**BH116-551**  
**BH116-552**  
**BH114-551**  
**BH114-552A**  
**BH114-552C**  
**BH103-551**  
**BH103-552**  
**BH104-551**  
**BH104-552**  
**Dup-142**

Drinking Water (DW) Samples' (client use)

Are samples taken from a Regulated DW System?

☐ YES ☒ NO

Are samples for human consumption/ use?

☐ YES ☒ NO

## SHIPMENT RELEASE (client use)

Released by: **WJW** Date: **05/17/24** Time: **18:30**

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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.

## 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: **Henry Hendrick**  
 Email 2  
 Email 3

## Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX  
 Email 1 or Fax: **Henry Hendrick**  
 Email 2

## Oil and Gas Required Fields (client use)

AFE/Coast Center:  
 Major/Minor Code:  
 Requisitioner:  
 Location:

ALS Contact:

Sampler:

Date (dd-mm-yy) Time (hh:mm) Sample Type  
**14-05-24 14:50 Soil**  
**14-05-24 14:55**  
**15-05-24 11:45**  
**11:50**  
**11:50**  
**16-05-24 14:55**  
**16-05-24 15:00**  
**17-05-24 11:20**  
**17-05-24 11:30**  
**17-05-24 11:30**

Notes / Specify Limits for result evaluation by selecting from drop-down below  
 (Excel COC only)

Page 2 RPI Coarst

## INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: **BB** Date: **05/21/24** Time: **9:41**

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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.

## 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 minimum  
☐ 3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum  
☐ 2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum  
☐ 1 day (E) if received by 3pm M-F - 100% rush surcharge minimum  
☐ Same day (E2) if received by 10am M-F - 200% rush surcharge. Additional requests on weekends, statutory holidays and non-routine may apply to rush requests on weekends, statutory holidays and non-routine

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please cc

## Analysis Rec

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

NUMBER OF CONTAINERS  
**Reg 1534y MCI**  
**Reg 1534y PAHs**  
**Reg 1534y PHC/BIEX**  
**Reg 1534y PAHs**  
**Reg 1534y PHC/BIEX**

## SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PICKS ☐ FROZEN ☐ COOLING INITIATEDSubmission Comments Identified on Sample Receipt Notification: ☐ YES ☐ NOCooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C FINAL COOLER TEMPERATURES °C

4.1

## FINAL SHIPMENT RECEPTION (ALS use only)

Received by: **BB** Date: **05/21/24** Time: **9:41**

SOL-112,111

CM 115-197

AUG 2023 FORM 1

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2411995	Page	: 1 of 15
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 13-May-2024 16:48
PO	: ----	Date Analysis Commenced	: 14-May-2024
C-O-C number	: 20-1085350	Issue Date	: 21-May-2024 18:01
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 12		
No. of samples analysed	: 12		

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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Centralized Prep, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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.

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

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

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

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

Unit	Description
-	no units
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
mS/cm	millisiemens per centimetre
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.





## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH106-SS2	BH115-SS2	BH115-SS3	DUP-1152	DUP-1153	BH116-SS1	BH116-SS2
				Sampling date/time	09-May-2024 13:55	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 13:10	10-May-2024 13:15
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	CAS Number	Method/Lab	Unit		WT2411995-001	WT2411995-002	WT2411995-003	WT2411995-004	WT2411995-005	WT2411995-006	WT2411995-007
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm	----	0.118	----	0.105	----	----	0.0849	
Moisture	----	E144/WT	%	14.2	15.5	18.6	13.0	15.8	12.9	14.6	
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units	----	7.79	----	7.86	----	----	7.54	
Cyanides											
Cyanide, weak acid dissociable	----	E336A/WT	mg/kg	----	<0.050	----	<0.050	----	----	<0.050	
Fixed-Ratio Extractables											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L	----	14.0	----	12.1	----	----	10.8	
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L	----	1.31	----	1.24	----	----	0.90	
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L	----	2.59	----	2.63	----	----	1.71	
Sodium adsorption ratio [SAR]	----	E484/WT	-	----	0.18	----	0.19	----	----	0.13	
Metals											
Antimony	7440-36-0	E440C/WT	mg/kg	----	0.14	----	0.14	----	----	0.20	
Arsenic	7440-38-2	E440C/WT	mg/kg	----	6.72	----	7.69	----	----	7.21	
Barium	7440-39-3	E440C/WT	mg/kg	----	92.0	----	91.1	----	----	41.9	
Beryllium	7440-41-7	E440C/WT	mg/kg	----	0.71	----	0.70	----	----	0.36	
Boron	7440-42-8	E440C/WT	mg/kg	----	9.7	----	9.2	----	----	6.1	
Boron, hot water soluble	7440-42-8	E487/WT	mg/kg	----	0.13	----	0.10	----	----	<0.10	
Cadmium	7440-43-9	E440C/WT	mg/kg	----	0.069	----	0.068	----	----	0.126	
Chromium	7440-47-3	E440C/WT	mg/kg	----	22.6	----	22.8	----	----	12.8	
Cobalt	7440-48-4	E440C/WT	mg/kg	----	12.0	----	14.3	----	----	6.93	
Copper	7440-50-8	E440C/WT	mg/kg	----	30.3	----	32.7	----	----	51.2	
Lead	7439-92-1	E440C/WT	mg/kg	----	8.17	----	8.23	----	----	25.0	
Mercury	7439-97-6	E510C/WT	mg/kg	----	0.0116	----	0.0157	----	----	0.0284	
Molybdenum	7439-98-7	E440C/WT	mg/kg	----	0.28	----	0.30	----	----	0.46	
Nickel	7440-02-0	E440C/WT	mg/kg	----	26.0	----	29.9	----	----	14.0	
Selenium	7782-49-2	E440C/WT	mg/kg	----	<0.20	----	<0.20	----	----	<0.20	
Silver	7440-22-4	E440C/WT	mg/kg	----	<0.10	----	<0.10	----	----	<0.10	



## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH106-SS2	BH115-SS2	BH115-SS3	DUP-1152	DUP-1153	BH116-SS1	BH116-SS2
				Sampling date/time	09-May-2024 13:55	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 13:10	10-May-2024 13:15
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	CAS Number	Method/Lab	Unit	WT2411995-001	WT2411995-002	WT2411995-003	WT2411995-004	WT2411995-005	WT2411995-006	WT2411995-007	
Metals											
Thallium	7440-28-0	E440C/WT	mg/kg	----	0.134	----	0.142	----	----	0.101	
Uranium	7440-61-1	E440C/WT	mg/kg	----	0.489	----	0.483	----	----	0.474	
Vanadium	7440-62-2	E440C/WT	mg/kg	----	30.8	----	31.2	----	----	27.7	
Zinc	7440-66-6	E440C/WT	mg/kg	----	56.7	----	62.0	----	----	48.4	
Speciated Metals											
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	mg/kg	----	<0.10	----	<0.10	----	----	0.22	
Volatile Organic Compounds											
Acetone	67-64-1	E611D/WT	mg/kg	<0.50	----	<0.50	----	<0.50	----	----	
Benzene	71-43-2	E611D/WT	mg/kg	<0.0050	----	<0.0050	----	<0.0050	----	----	
Bromodichloromethane	75-27-4	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Bromoform	75-25-2	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Bromomethane	74-83-9	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Carbon tetrachloride	56-23-5	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Chlorobenzene	108-90-7	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Chloroform	67-66-3	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dibromochloromethane	124-48-1	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dibromoethane, 1,2-	106-93-4	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichlorodifluoromethane	75-71-8	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloroethane, 1,1-	75-34-3	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloroethane, 1,2-	107-06-2	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloroethylene, 1,1-	75-35-4	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	
Dichloromethane	75-09-2	E611D/WT	mg/kg	<0.045	----	<0.045	----	<0.045	----	----	
Dichloropropane, 1,2-	78-87-5	E611D/WT	mg/kg	<0.050	----	<0.050	----	<0.050	----	----	





# Analytical Results Evaluation

				Client sample ID	BH106-SS2	BH115-SS2	BH115-SS3	DUP-1152	DUP-1153	BH116-SS1	BH116-SS2
Matrix: Soil				Sampling date/time	09-May-2024 13:55	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 13:10	10-May-2024 13:15
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	CAS Number	Method/Lab	Unit		WT2411995-001	WT2411995-002	WT2411995-003	WT2411995-004	WT2411995-005	WT2411995-006	WT2411995-007
Volatile Organic Compounds											
Dichloropropylene, cis+trans-1,3-	542-75-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	mg/kg		<0.030	----	<0.030	----	<0.030	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	mg/kg		<0.030	----	<0.030	----	<0.030	----	----
Ethylbenzene	100-41-4	E611D/WT	mg/kg		<0.015	----	<0.015	----	<0.015	----	----
Hexane, n-	110-54-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	mg/kg		<0.50	----	<0.50	----	<0.50	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	mg/kg		<0.50	----	<0.50	----	<0.50	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	mg/kg		<0.040	----	<0.040	----	<0.040	----	----
Styrene	100-42-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Tetrachloroethylene	127-18-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Toluene	108-88-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Trichloroethylene	79-01-6	E611D/WT	mg/kg		<0.010	----	<0.010	----	<0.010	----	----
Trichlorofluoromethane	75-69-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
Vinyl chloride	75-01-4	E611D/WT	mg/kg		<0.020	----	<0.020	----	<0.020	----	----
Xylene, m+p-	179601-23-1	E611D/WT	mg/kg		<0.030	----	<0.030	----	<0.030	----	----
Xylene, o-	95-47-6	E611D/WT	mg/kg		<0.030	----	<0.030	----	<0.030	----	----
Xylenes, total	1330-20-7	E611D/WT	mg/kg		<0.050	----	<0.050	----	<0.050	----	----
BTEX, total	----	E611D/WT	mg/kg		<0.10	----	<0.10	----	<0.10	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	mg/kg		<5.0	----	<5.0	----	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	mg/kg		<10	----	<10	----	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	mg/kg		<50	----	<50	----	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	mg/kg		<50	----	<50	----	----	----	----
F1-BTEX	----	EC580/WT	mg/kg		<5.0	----	<5.0	----	----	----	----



## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH106-SS2	BH115-SS2	BH115-SS3	DUP-1152	DUP-1153	BH116-SS1	BH116-SS2
				Sampling date/time	09-May-2024 13:55	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 13:10	10-May-2024 13:15
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	CAS Number	Method/Lab	Unit	WT2411995-001	WT2411995-002	WT2411995-003	WT2411995-004	WT2411995-005	WT2411995-006	WT2411995-007	
Hydrocarbons											
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	mg/kg	<80	----	<80	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	YES	----	YES	----	----	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	%	98.2	----	91.1	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	%	91.4	----	89.4	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611D/WT	%	106	----	102	----	93.2	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	%	112	----	108	----	94.9	----	----	----
Organochlorine Pesticides											
Aldrin	309-00-2	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Chlordane, cis- (alpha)	5103-71-9	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Chlordane, total	57-74-9	E660F/WT	mg/kg	----	----	----	----	----	<0.030	----	----
Chlordane, trans- (gamma)	5103-74-2	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDD, 2,4'-	53-19-0	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDD, 4,4'-	72-54-8	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDD, total	----	E660F/WT	mg/kg	----	----	----	----	----	<0.030	----	----
DDE, 2,4'-	3424-82-6	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDE, 4,4'-	72-55-9	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDE, total	----	E660F/WT	mg/kg	----	----	----	----	----	<0.030	----	----
DDT, 2,4'-	789-02-6	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDT, 4,4'-	50-29-3	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
DDT, total	----	E660F/WT	mg/kg	----	----	----	----	----	<0.030	----	----
Dieldrin	60-57-1	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Endosulfan, alpha-	959-98-8	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Endosulfan, beta-	33213-65-9	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Endosulfan, total	----	E660F/WT	mg/kg	----	----	----	----	----	<0.030	----	----
Endrin	72-20-8	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----
Heptachlor	76-44-8	E660F/WT	mg/kg	----	----	----	----	----	<0.020	----	----



Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH106-SS2	BH115-SS2	BH115-SS3	DUP-1152	DUP-1153	BH116-SS1	BH116-SS2
				Sampling date/time	09-May-2024 13:55	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 11:25	10-May-2024 11:30	10-May-2024 13:10	10-May-2024 13:15
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	CAS Number	Method/Lab	Unit		WT2411995-001	WT2411995-002	WT2411995-003	WT2411995-004	WT2411995-005	WT2411995-006	WT2411995-007
Organochlorine Pesticides											
Heptachlor epoxide	1024-57-3	E660F/WT	mg/kg	----	----	----	----	----	----	<0.020	----
Hexachlorobenzene	118-74-1	E660F/WT	mg/kg	----	----	----	----	----	----	<0.010	----
Hexachlorobutadiene	87-68-3	E660F/WT	mg/kg	----	----	----	----	----	----	<0.010	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F/WT	mg/kg	----	----	----	----	----	----	<0.010	----
Hexachloroethane	67-72-1	E660F/WT	mg/kg	----	----	----	----	----	----	<0.010	----
Methoxychlor	72-43-5	E660F/WT	mg/kg	----	----	----	----	----	----	<0.020	----
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%	----	----	----	----	----	----	110	----
Tetrachloro-m-xylene	877-09-8	E660F/WT	%	----	----	----	----	----	----	82.4	----

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

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



## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH117-SS3A	BH119-SS5	BH118-SS3	BH107-SS1	BH107-SS2	----	----
				Sampling date/time	10-May-2024 14:05	10-May-2024 15:55	13-May-2024 09:20	13-May-2024 12:05	13-May-2024 12:10	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2411995-008	WT2411995-009	WT2411995-010	WT2411995-011	WT2411995-012	-----	-----	
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm	----	----	----	----	0.131	----	----	
Moisture	----	E144/WT	%	11.0	11.8	13.9	19.2	17.4	----	----	
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units	----	----	----	----	7.54	----	----	
Cyanides											
Cyanide, weak acid dissociable	----	E336A/WT	mg/kg	----	----	----	----	<0.050	----	----	
Fixed-Ratio Extractables											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L	----	----	----	----	18.5	----	----	
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L	----	----	----	----	1.38	----	----	
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L	----	----	----	----	3.17	----	----	
Sodium adsorption ratio [SAR]	----	E484/WT	-	----	----	----	----	0.19	----	----	
Metals											
Antimony	7440-36-0	E440C/WT	mg/kg	----	----	----	----	0.17	----	----	
Arsenic	7440-38-2	E440C/WT	mg/kg	----	----	----	----	9.26	----	----	
Barium	7440-39-3	E440C/WT	mg/kg	----	----	----	----	70.1	----	----	
Beryllium	7440-41-7	E440C/WT	mg/kg	----	----	----	----	0.68	----	----	
Boron	7440-42-8	E440C/WT	mg/kg	----	----	----	----	7.6	----	----	
Boron, hot water soluble	7440-42-8	E487/WT	mg/kg	----	----	----	----	<0.10	----	----	
Cadmium	7440-43-9	E440C/WT	mg/kg	----	----	----	----	0.096	----	----	
Chromium	7440-47-3	E440C/WT	mg/kg	----	----	----	----	21.2	----	----	
Cobalt	7440-48-4	E440C/WT	mg/kg	----	----	----	----	13.2	----	----	
Copper	7440-50-8	E440C/WT	mg/kg	----	----	----	----	44.2	----	----	
Lead	7439-92-1	E440C/WT	mg/kg	----	----	----	----	10.8	----	----	
Mercury	7439-97-6	E510C/WT	mg/kg	----	----	----	----	0.0177	----	----	
Molybdenum	7439-98-7	E440C/WT	mg/kg	----	----	----	----	0.34	----	----	
Nickel	7440-02-0	E440C/WT	mg/kg	----	----	----	----	27.5	----	----	
Selenium	7782-49-2	E440C/WT	mg/kg	----	----	----	----	<0.20	----	----	
Silver	7440-22-4	E440C/WT	mg/kg	----	----	----	----	<0.10	----	----	
Thallium	7440-28-0	E440C/WT	mg/kg	----	----	----	----	0.135	----	----	



## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH117-SS3A	BH119-SS5	BH118-SS3	BH107-SS1	BH107-SS2	----	----
				Sampling date/time	10-May-2024 14:05	10-May-2024 15:55	13-May-2024 09:20	13-May-2024 12:05	13-May-2024 12:10	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2411995-008	WT2411995-009	WT2411995-010	WT2411995-011	WT2411995-012	-----	-----	
Metals											
Uranium	7440-61-1	E440C/WT	mg/kg	----	----	----	----	0.510	----	----	
Vanadium	7440-62-2	E440C/WT	mg/kg	----	----	----	----	30.4	----	----	
Zinc	7440-66-6	E440C/WT	mg/kg	----	----	----	----	63.3	----	----	
Speciated Metals											
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	mg/kg	----	----	----	----	0.11	----	----	
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	mg/kg	<0.0050	<0.0050	<0.0050	----	----	----	----	
Ethylbenzene	100-41-4	E611A/WT	mg/kg	<0.015	<0.015	<0.015	----	----	----	----	
Toluene	108-88-3	E611A/WT	mg/kg	<0.050	<0.050	<0.050	----	----	----	----	
Xylene, m+p-	179601-23-1	E611A/WT	mg/kg	<0.030	<0.030	<0.030	----	----	----	----	
Xylene, o-	95-47-6	E611A/WT	mg/kg	<0.030	<0.030	<0.030	----	----	----	----	
Xylenes, total	1330-20-7	E611A/WT	mg/kg	<0.050	<0.050	<0.050	----	----	----	----	
BTEX, total	----	E611A/WT	mg/kg	<0.10	<0.10	<0.10	----	----	----	----	
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	mg/kg	<5.0	<5.0	<5.0	----	----	----	----	
F2 (C10-C16)	----	E601.SG-L/WT	mg/kg	<10	12	<10	----	----	----	----	
F3 (C16-C34)	----	E601.SG-L/WT	mg/kg	<50	60	<50	----	----	----	----	
F4 (C34-C50)	----	E601.SG-L/WT	mg/kg	<50	<50	<50	----	----	----	----	
F1-BTEX	----	EC580/WT	mg/kg	<5.0	<5.0	<5.0	----	----	----	----	
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	mg/kg	<80	<80	<80	----	----	----	----	
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	YES	YES	YES	----	----	----	----	
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	%	95.0	96.1	93.6	----	----	----	----	
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	%	91.4	94.2	90.6	----	----	----	----	
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	%	86.0	82.5	88.2	----	----	----	----	
Difluorobenzene, 1,4-	540-36-3	E611A/WT	%	100	94.7	99.8	----	----	----	----	



## Analytical Results Evaluation

Matrix: Soil				Client sample ID	BH117-SS3A	BH119-SS5	BH118-SS3	BH107-SS1	BH107-SS2	----	----
				Sampling date/time	10-May-2024 14:05	10-May-2024 15:55	13-May-2024 09:20	13-May-2024 12:05	13-May-2024 12:10	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	Soil	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2411995-008	WT2411995-009	WT2411995-010	WT2411995-011	WT2411995-012	-----	-----	
Organochlorine Pesticides											
Aldrin	309-00-2	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Chlordane, cis- (alpha)	5103-71-9	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Chlordane, total	57-74-9	E660F/WT	mg/kg	----	----	----	<0.030	----	----	----	
Chlordane, trans- (gamma)	5103-74-2	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDD, 2,4'-	53-19-0	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDD, 4,4'-	72-54-8	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDD, total	----	E660F/WT	mg/kg	----	----	----	<0.030	----	----	----	
DDE, 2,4'-	3424-82-6	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDE, 4,4'-	72-55-9	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDE, total	----	E660F/WT	mg/kg	----	----	----	<0.030	----	----	----	
DDT, 2,4'-	789-02-6	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDT, 4,4'-	50-29-3	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
DDT, total	----	E660F/WT	mg/kg	----	----	----	<0.030	----	----	----	
Dieldrin	60-57-1	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Endosulfan, alpha-	959-98-8	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Endosulfan, beta-	33213-65-9	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Endosulfan, total	----	E660F/WT	mg/kg	----	----	----	<0.030	----	----	----	
Endrin	72-20-8	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Heptachlor	76-44-8	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Heptachlor epoxide	1024-57-3	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Hexachlorobenzene	118-74-1	E660F/WT	mg/kg	----	----	----	<0.010	----	----	----	
Hexachlorobutadiene	87-68-3	E660F/WT	mg/kg	----	----	----	<0.010	----	----	----	
Hexachlorocyclohexane, gamma-	58-89-9	E660F/WT	mg/kg	----	----	----	<0.010	----	----	----	
Hexachloroethane	67-72-1	E660F/WT	mg/kg	----	----	----	<0.010	----	----	----	
Methoxychlor	72-43-5	E660F/WT	mg/kg	----	----	----	<0.020	----	----	----	
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%	----	----	----	106	----	----	----	
Tetrachloro-m-xylene	877-09-8	E660F/WT	%	----	----	----	129	----	----	----	

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Work Order : WT2411995  
Client : Grounded Engineering Inc.  
Project : 24-048



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

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



## Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Physical Tests</b>									
Conductivity (1:2 leachate)	----	mS/cm	0.7 mS/cm						
Moisture	----	%	--						
pH (1:2 soil:CaCl2-aq)	----	pH units	--						
<b>Cyanides</b>									
Cyanide, weak acid dissociable	----	mg/kg	0.051 mg/kg						
<b>Fixed-Ratio Extractables</b>									
Calcium, soluble ion content	7440-70-2	mg/L	--						
Magnesium, soluble ion content	7439-95-4	mg/L	--						
Sodium adsorption ratio [SAR]	----	-	5 -						
Sodium, soluble ion content	17341-25-2	mg/L	--						
<b>Metals</b>									
Antimony	7440-36-0	mg/kg	7.5 mg/kg						
Arsenic	7440-38-2	mg/kg	18 mg/kg						
Barium	7440-39-3	mg/kg	390 mg/kg						
Beryllium	7440-41-7	mg/kg	4 mg/kg						
Boron, hot water soluble	7440-42-8	mg/kg	1.5 mg/kg						
Boron	7440-42-8	mg/kg	120 mg/kg						
Cadmium	7440-43-9	mg/kg	1.2 mg/kg						
Chromium	7440-47-3	mg/kg	160 mg/kg						
Cobalt	7440-48-4	mg/kg	22 mg/kg						
Copper	7440-50-8	mg/kg	140 mg/kg						
Lead	7439-92-1	mg/kg	120 mg/kg						
Mercury	7439-97-6	mg/kg	0.27 mg/kg						
Molybdenum	7439-98-7	mg/kg	6.9 mg/kg						
Nickel	7440-02-0	mg/kg	100 mg/kg						
Selenium	7782-49-2	mg/kg	2.4 mg/kg						
Silver	7440-22-4	mg/kg	20 mg/kg						
Thallium	7440-28-0	mg/kg	1 mg/kg						
Uranium	7440-61-1	mg/kg	23 mg/kg						
Vanadium	7440-62-2	mg/kg	86 mg/kg						
Zinc	7440-66-6	mg/kg	340 mg/kg						
<b>Speciated Metals</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	mg/kg	8 mg/kg						
<b>Volatile Organic Compounds</b>									
Acetone	67-64-1	mg/kg	16 mg/kg						
Benzene	71-43-2	mg/kg	0.21 mg/kg						
Bromodichloromethane	75-27-4	mg/kg	1.5 mg/kg						





Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Volatile Organic Compounds - Continued</b>									
Bromoform	75-25-2	mg/kg	0.27 mg/kg						
Bromomethane	74-83-9	mg/kg	0.05 mg/kg						
BTEX, total	----	mg/kg	--						
Carbon tetrachloride	56-23-5	mg/kg	0.05 mg/kg						
Chlorobenzene	108-90-7	mg/kg	2.4 mg/kg						
Chloroform	67-66-3	mg/kg	0.05 mg/kg						
Dibromochloromethane	124-48-1	mg/kg	2.3 mg/kg						
Dibromoethane, 1,2-	106-93-4	mg/kg	0.05 mg/kg						
Dichlorobenzene, 1,2-	95-50-1	mg/kg	1.2 mg/kg						
Dichlorobenzene, 1,3-	541-73-1	mg/kg	4.8 mg/kg						
Dichlorobenzene, 1,4-	106-46-7	mg/kg	0.083 mg/kg						
Dichlorodifluoromethane	75-71-8	mg/kg	16 mg/kg						
Dichloroethane, 1,1-	75-34-3	mg/kg	0.47 mg/kg						
Dichloroethane, 1,2-	107-06-2	mg/kg	0.05 mg/kg						
Dichloroethylene, 1,1-	75-35-4	mg/kg	0.05 mg/kg						
Dichloroethylene, cis-1,2-	156-59-2	mg/kg	1.9 mg/kg						
Dichloroethylene, trans-1,2-	156-60-5	mg/kg	0.084 mg/kg						
Dichloromethane	75-09-2	mg/kg	0.1 mg/kg						
Dichloropropane, 1,2-	78-87-5	mg/kg	0.05 mg/kg						
Dichloropropylene, cis+trans-1,3-	542-75-6	mg/kg	0.05 mg/kg						
Dichloropropylene, cis-1,3-	10061-01-5	mg/kg	--						
Dichloropropylene, trans-1,3-	10061-02-6	mg/kg	--						
Ethylbenzene	100-41-4	mg/kg	1.1 mg/kg						
Hexane, n-	110-54-3	mg/kg	2.8 mg/kg						
Methyl ethyl ketone [MEK]	78-93-3	mg/kg	16 mg/kg						
Methyl isobutyl ketone [MIBK]	108-10-1	mg/kg	1.7 mg/kg						
Methyl-tert-butyl ether [MTBE]	1634-04-4	mg/kg	0.75 mg/kg						
Styrene	100-42-5	mg/kg	0.7 mg/kg						
Tetrachloroethane, 1,1,1,2-	630-20-6	mg/kg	0.058 mg/kg						
Tetrachloroethane, 1,1,2,2-	79-34-5	mg/kg	0.05 mg/kg						
Tetrachloroethylene	127-18-4	mg/kg	0.28 mg/kg						
Toluene	108-88-3	mg/kg	2.3 mg/kg						
Trichloroethane, 1,1,1-	71-55-6	mg/kg	0.38 mg/kg						
Trichloroethane, 1,1,2-	79-00-5	mg/kg	0.05 mg/kg						
Trichloroethylene	79-01-6	mg/kg	0.061 mg/kg						
Trichlorofluoromethane	75-69-4	mg/kg	4 mg/kg						
Vinyl chloride	75-01-4	mg/kg	0.02 mg/kg						
Xylene, m+p-	179601-23-1	mg/kg	--						
Xylene, o-	95-47-6	mg/kg	--						



Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Volatile Organic Compounds - Continued</b>									
Xylenes, total	1330-20-7	mg/kg	3.1 mg/kg						
<b>Hydrocarbons</b>									
Chromatogram to baseline at nC50	n/a	-	--						
F1 (C6-C10)	----	mg/kg	55 mg/kg						
F1-BTEX	----	mg/kg	55 mg/kg						
F2 (C10-C16)	----	mg/kg	98 mg/kg						
F3 (C16-C34)	----	mg/kg	300 mg/kg						
F4 (C34-C50)	----	mg/kg	2800 mg/kg						
Hydrocarbons, total (C6-C50)	n/a	mg/kg	--						
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	%	--						
Dichlorotoluene, 3,4-	95-75-0	%	--						
Bromofluorobenzene, 4-	460-00-4	%	--						
Difluorobenzene, 1,4-	540-36-3	%	--						
<b>Organochlorine Pesticides</b>									
Aldrin	309-00-2	mg/kg	0.05 mg/kg						
Chlordane, cis- (alpha)	5103-71-9	mg/kg	--						
Chlordane, total	57-74-9	mg/kg	0.05 mg/kg						
Chlordane, trans- (gamma)	5103-74-2	mg/kg	--						
DDD, 2,4'-	53-19-0	mg/kg	--						
DDD, 4,4'-	72-54-8	mg/kg	--						
DDD, total	----	mg/kg	3.3 mg/kg						
DDE, 2,4'-	3424-82-6	mg/kg	--						
DDE, 4,4'-	72-55-9	mg/kg	--						
DDE, total	----	mg/kg	0.26 mg/kg						
DDT, 2,4'-	789-02-6	mg/kg	--						
DDT, 4,4'-	50-29-3	mg/kg	--						
DDT, total	----	mg/kg	1.4 mg/kg						
Dieldrin	60-57-1	mg/kg	0.05 mg/kg						
Endosulfan, alpha-	959-98-8	mg/kg	--						
Endosulfan, beta-	33213-65-9	mg/kg	--						
Endosulfan, total	----	mg/kg	0.04 mg/kg						
Endrin	72-20-8	mg/kg	0.04 mg/kg						
Heptachlor epoxide	1024-57-3	mg/kg	0.05 mg/kg						
Heptachlor	76-44-8	mg/kg	0.15 mg/kg						
Hexachlorobenzene	118-74-1	mg/kg	0.52 mg/kg						
Hexachlorobutadiene	87-68-3	mg/kg	0.012 mg/kg						
Hexachlorocyclohexane, gamma-	58-89-9	mg/kg	0.056 mg/kg						
Hexachloroethane	67-72-1	mg/kg	0.089 mg/kg						
Methoxychlor	72-43-5	mg/kg	0.13 mg/kg						

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 Work Order : WT2411995  
 Client : Grounded Engineering Inc.  
 Project : 24-048



Analyte	CAS Number	Unit	ON153/04 T2-RPI-C						
<b>Organochlorine Pesticides Surrogates - Continued</b>									
Decachlorobiphenyl	2051-24-3	%	--						
Tetrachloro-m-xylene	877-09-8	%	--						

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

**Key:**

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T2-RPI-C	153 T2-Soil-Res/Park/Inst. Property Use (Coarse)

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2411995	Page	: 1 of 17
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 13-May-2024 16:48
PO	: ----	Issue Date	: 21-May-2024 18:01
C-O-C number	: 20-1085350		
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 12		
No. of samples analysed	: 12		

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

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: Soil/Solid

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
<b>Method Blank (MB) Values</b>								
Volatile Organic Compounds	QC-MRG2-1442766 001	----	Dichloromethane	75-09-2	E611D	0.054 <sup>MB-LOR</sup> mg/kg	0.045 mg/kg	Blank result exceeds permitted value

### Result Qualifiers

Qualifier Description

MB-LOR Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

## Laboratory Control Sample (LCS) Recoveries

Volatile Organic Compounds	QC-1442766-002	----	Bromoform	75-25-2	E611D	68.8 % <sup>MES</sup>	70.0-130%	Recovery less than lower control limit
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### Result Qualifiers

Qualifier Description

MES Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

## Matrix Spike (MS) Recoveries

Volatile Organic Compounds	Anonymous	Anonymous	Acetone	67-64-1	E611D	149 % <sup>MES</sup>	50.0-140%	Recovery greater than upper data quality objective
Hydrocarbons	Anonymous	Anonymous	F4 (C34-C50)	----	E601.SG-L	170 % <sup>E</sup>	60.0-140%	Recovery greater than upper data quality objective

### Result Qualifiers

Qualifier Description

E Matrix Spike recovery outside ALS DQO due to heterogeneous analyte background in sample.  
 MES Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



## 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: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Holding and Evaluation			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH107-SS2	E336A	13-May-2024	16-May-2024	14 days	3 days	✓	16-May-2024	14 days	0 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH115-SS2	E336A	10-May-2024	16-May-2024	14 days	6 days	✓	16-May-2024	14 days	0 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH116-SS2	E336A	10-May-2024	16-May-2024	14 days	6 days	✓	16-May-2024	14 days	0 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap DUP-1152	E336A	10-May-2024	16-May-2024	14 days	6 days	✓	16-May-2024	14 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH118-SS3	E581.F1	13-May-2024	14-May-2024	40 days	2 days	✓	16-May-2024	40 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH117-SS3A	E581.F1	10-May-2024	14-May-2024	40 days	4 days	✓	16-May-2024	40 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH119-SS5	E581.F1	10-May-2024	14-May-2024	40 days	4 days	✓	16-May-2024	40 days	6 days	✓



Matrix: Soil/Solid

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	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH115-SS3	E581.F1	10-May-2024	15-May-2024	40 days	5 days	✓	15-May-2024	40 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH106-SS2	E581.F1	09-May-2024	15-May-2024	40 days	5 days	✓	15-May-2024	40 days	6 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH118-SS3	E601.SG-L	13-May-2024	17-May-2024	14 days	4 days	✓	21-May-2024	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH115-SS3	E601.SG-L	10-May-2024	17-May-2024	14 days	7 days	✓	21-May-2024	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH117-SS3A	E601.SG-L	10-May-2024	17-May-2024	14 days	7 days	✓	21-May-2024	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH119-SS5	E601.SG-L	10-May-2024	17-May-2024	14 days	7 days	✓	21-May-2024	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH106-SS2	E601.SG-L	09-May-2024	17-May-2024	14 days	8 days	✓	21-May-2024	40 days	4 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH116-SS2	E487	10-May-2024	21-May-2024	180 days	10 days	✓	21-May-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH115-SS2	E487	10-May-2024	21-May-2024	180 days	11 days	✓	21-May-2024	180 days	1 days	✓





Matrix: Soil/Solid

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	
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap DUP-1152	E487	10-May-2024	21-May-2024	180 days	11 days	✓	21-May-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH107-SS2	E487	13-May-2024	21-May-2024	180 days	8 days	✓	21-May-2024	180 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH116-SS2	E510C	10-May-2024	20-May-2024	28 days	10 days	✓	21-May-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH115-SS2	E510C	10-May-2024	20-May-2024	28 days	11 days	✓	21-May-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap DUP-1152	E510C	10-May-2024	20-May-2024	28 days	11 days	✓	21-May-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH107-SS2	E510C	13-May-2024	20-May-2024	28 days	7 days	✓	21-May-2024	28 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH116-SS2	E440C	10-May-2024	20-May-2024	180 days	10 days	✓	21-May-2024	180 days	11 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH115-SS2	E440C	10-May-2024	20-May-2024	180 days	11 days	✓	21-May-2024	180 days	11 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap DUP-1152	E440C	10-May-2024	20-May-2024	180 days	11 days	✓	21-May-2024	180 days	11 days	✓



Matrix: Soil/Solid

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	
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH107-SS2	E440C	13-May-2024	20-May-2024	180 days	7 days	✓	21-May-2024	180 days	8 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH116-SS2	E484	10-May-2024	21-May-2024	180 days	10 days	✓	21-May-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH115-SS2	E484	10-May-2024	21-May-2024	180 days	11 days	✓	21-May-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap DUP-1152	E484	10-May-2024	21-May-2024	180 days	11 days	✓	21-May-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH107-SS2	E484	13-May-2024	21-May-2024	180 days	8 days	✓	21-May-2024	180 days	1 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap BH107-SS1	E660F	13-May-2024	16-May-2024	14 days	3 days	✓	17-May-2024	40 days	1 days	✓
Organochlorine Pesticides : OCPs by GC-MS-MS or GC-MS										
Glass soil jar/Teflon lined cap BH116-SS1	E660F	10-May-2024	16-May-2024	14 days	6 days	✓	17-May-2024	40 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH116-SS2	E100-L	10-May-2024	21-May-2024	30 days	10 days	✓	21-May-2024	30 days	11 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH115-SS2	E100-L	10-May-2024	21-May-2024	30 days	11 days	✓	21-May-2024	30 days	11 days	✓



Matrix: Soil/Solid

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	
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap DUP-1152	E100-L	10-May-2024	21-May-2024	30 days	11 days	✓	21-May-2024	30 days	11 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH107-SS2	E100-L	13-May-2024	21-May-2024	30 days	8 days	✓	21-May-2024	30 days	8 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH107-SS1	E144	13-May-2024	----	----	----		15-May-2024	----	2 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH107-SS2	E144	13-May-2024	----	----	----		15-May-2024	----	2 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH118-SS3	E144	13-May-2024	----	----	----		15-May-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH115-SS2	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH115-SS3	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH116-SS1	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH116-SS2	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	



Matrix: Soil/Solid

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	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH117-SS3A	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH119-SS5	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap DUP-1152	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap DUP-1153	E144	10-May-2024	----	----	----		15-May-2024	----	5 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH106-SS2	E144	09-May-2024	----	----	----		15-May-2024	----	6 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH107-SS2	E108A	13-May-2024	16-May-2024	30 days	3 days	✓	17-May-2024	30 days	4 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH115-SS2	E108A	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH116-SS2	E108A	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap DUP-1152	E108A	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	30 days	7 days	✓



Matrix: Soil/Solid

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	
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH107-SS2	E532	13-May-2024	16-May-2024	30 days	3 days	✓	17-May-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH115-SS2	E532	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH116-SS2	E532	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap DUP-1152	E532	10-May-2024	16-May-2024	30 days	6 days	✓	17-May-2024	7 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH118-SS3	E611A	13-May-2024	14-May-2024	40 days	2 days	✓	16-May-2024	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH117-SS3A	E611A	10-May-2024	14-May-2024	40 days	4 days	✓	16-May-2024	40 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH119-SS5	E611A	10-May-2024	14-May-2024	40 days	4 days	✓	16-May-2024	40 days	6 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial BH115-SS3	E611D	10-May-2024	15-May-2024	40 days	5 days	✓	15-May-2024	40 days	5 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial DUP-1153	E611D	10-May-2024	15-May-2024	40 days	5 days	✓	15-May-2024	40 days	5 days	✓

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 Work Order : WT2411995  
 Client : Grounded Engineering Inc.  
 Project : 24-048



Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method		Method	Sampling Date	Extraction / Preparation			Analysis				
Container / Client Sample ID(s)				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
					Rec	Actual			Rec	Actual	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass soil methanol vial BH106-SS2		E611D	09-May-2024	15-May-2024	40 days	5 days	✓	15-May-2024	40 days	6 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: **Soil/Solid**

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)							
Boron-Hot Water Extractable by ICPOES	E487	1445320	1	7	14.2	5.0	✔
BTEX by Headspace GC-MS	E611A	1442768	1	20	5.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	1442767	2	39	5.1	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1444855	1	19	5.2	5.0	✔
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1445317	1	18	5.5	5.0	✔
Hexavalent Chromium (Cr VI) by IC	E532	1445090	1	20	5.0	5.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1445318	1	7	14.2	5.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1445319	1	18	5.5	5.0	✔
Moisture Content by Gravimetry	E144	1444859	2	40	5.0	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1446312	1	2	50.0	5.0	✔
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1445091	1	20	5.0	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1445316	1	16	6.2	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1442766	1	20	5.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1445089	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1445320	2	7	28.5	10.0	✔
BTEX by Headspace GC-MS	E611A	1442768	1	20	5.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	1442767	2	39	5.1	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1444855	1	19	5.2	5.0	✔
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1445317	2	18	11.1	10.0	✔
Hexavalent Chromium (Cr VI) by IC	E532	1445090	2	20	10.0	10.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1445318	2	7	28.5	10.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1445319	2	18	11.1	10.0	✔
Moisture Content by Gravimetry	E144	1444859	2	40	5.0	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1446312	1	2	50.0	5.0	✔
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1445091	1	20	5.0	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1445316	2	16	12.5	10.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1442766	1	20	5.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1445089	1	20	5.0	5.0	✔
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1445320	1	7	14.2	5.0	✔
BTEX by Headspace GC-MS	E611A	1442768	1	20	5.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	1442767	2	39	5.1	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1444855	1	19	5.2	5.0	✔
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1445317	1	18	5.5	5.0	✔



Matrix: Soil/Solid

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							
Hexavalent Chromium (Cr VI) by IC	E532	1445090	1	20	5.0	5.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1445318	1	7	14.2	5.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1445319	1	18	5.5	5.0	✔
Moisture Content by Gravimetry	E144	1444859	2	40	5.0	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1446312	1	2	50.0	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1445316	1	16	6.2	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1442766	1	20	5.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1445089	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1442768	1	20	5.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	1442767	2	39	5.1	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1444855	1	19	5.2	5.0	✔
OCPs by GC-MS-MS or GC-MS	E660F	1446312	1	2	50.0	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1442766	1	20	5.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	1445089	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 Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L  ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/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 soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl <sub>2</sub> Extraction) - As Received	E108A  ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode.  This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A  ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C  ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO <sub>3</sub> and HCl.  Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines.  Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484  ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487  ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.  Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C  ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO <sub>3</sub> and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532  ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L  ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4).  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A  ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D  ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
OCPs by GC-MS-MS or GC-MS	E660F  ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	OCPs are analyzed by GC-MS-MS or GC-MS



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl <sub>2</sub> - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO <sub>3</sub> and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.  Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

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Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Pesticides, PCB, PAH, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660  ALS Environmental - Waterloo	Soil/Solid	EPA 3570 (mod)	A homogenized subsample is extracted with organic solvents using a mechanical shaker.

QUALITY CONTROL REPORT

Work Order	: WT2411995	Page	: 1 of 18
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 13-May-2024 16:48
PO	: ----	Date Analysis Commenced	: 14-May-2024
C-O-C number	: 20-1085350	Issue Date	: 21-May-2024 18:01
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 12		
No. of samples analysed	: 12		

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
- Reference Material (RM) 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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
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Niki Goebel	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario



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## 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

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

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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: Soil/Solid					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: 1444859)											
WT2411871-001	Anonymous	Moisture	----	E144	0.25	%	19.2	19.9	3.31%	20%	----
Physical Tests (QC Lot: 1444861)											
WT2411858-025	Anonymous	Moisture	----	E144	0.25	%	10.5	8.67	19.1%	20%	----
Physical Tests (QC Lot: 1445091)											
WT2411626-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	12.5	12.5	0.160%	5%	----
Physical Tests (QC Lot: 1445317)											
WT2411858-025	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.514 mS/cm	521	1.35%	20%	----
Cyanides (QC Lot: 1445089)											
WT2411626-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1445316)											
WT2411858-025	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	32.6	31.7	2.80%	30%	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.92	1.87	0.05	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	71.7	73.0	1.80%	30%	----
Metals (QC Lot: 1445318)											
WT2411858-025	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0102	0.0108	0.0005	Diff <2x LOR	----
Metals (QC Lot: 1445319)											
WT2411858-025	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	2.53	2.59	2.01%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	47.0	47.3	0.527%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.32	0.34	0.01	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	6.2	6.0	0.2	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.073	0.082	0.009	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	13.4	13.6	0.920%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	5.49	5.53	0.634%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	11.9	12.3	3.65%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	7.78	7.65	1.73%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.38	0.36	0.01	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	12.4	12.9	3.88%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

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Sub-Matrix: Soil/Solid					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
Metals (QC Lot: 1445319) - continued											
WT2411858-025	Anonymous	Thallium	7440-28-0	E440C	0.050	mg/kg	0.107	0.101	0.005	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.444	0.423	4.89%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	21.9	21.6	1.44%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	34.1	34.2	0.158%	30%	----
Metals (QC Lot: 1445320)											
WT2411858-025	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	0.24	0.26	0.010	Diff <2x LOR	----
Speciated Metals (QC Lot: 1445090)											
WT2411626-001	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	2.13	1.77	18.6%	35%	----
Volatile Organic Compounds (QC Lot: 1442766)											
WT2412115-001	Anonymous	Acetone	67-64-1	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Benzene	71-43-2	E611D	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	0.045	mg/kg	<0.045	<0.045	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----





Sub-Matrix: Soil/Solid

Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1442766) - continued											
WT2412115-001	Anonymous	Methyl ethyl ketone [MEK]	78-93-3	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.040	mg/kg	<0.040	<0.040	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611D	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1442768)											
WT2412116-005	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1442767)											
WT2412115-001	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1442769)											
WT2412116-005	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1444855)											
WT2411858-026	Anonymous	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	52	2	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	118	156	38	Diff <2x LOR	----
Organochlorine Pesticides (QC Lot: 1446312)											
WT2411995-006	BH116-SS1	Aldrin	309-00-2	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Chlordane, cis- (alpha)	5103-71-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Chlordane, trans- (gamma)	5103-74-2	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDD, 2,4'-	53-19-0	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----



Sub-Matrix: Soil/Solid					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
Organochlorine Pesticides (QC Lot: 1446312) - continued											
WT2411995-006	BH116-SS1	DDD, 4,4'-	72-54-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDE, 2,4'-	3424-82-6	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDE, 4,4'-	72-55-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDT, 2,4'-	789-02-6	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		DDT, 4,4'-	50-29-3	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Dieldrin	60-57-1	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endosulfan, alpha-	959-98-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endosulfan, beta-	33213-65-9	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Endrin	72-20-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Heptachlor	76-44-8	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Heptachlor epoxide	1024-57-3	E660F	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Hexachlorobenzene	118-74-1	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Hexachloroethane	67-72-1	E660F	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methoxychlor	72-43-5	E660F	0.020	mg/kg	<0.020	<0.020	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: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 1444859)</b>						
Moisture	----	E144	0.25	%	<0.25	----
<b>Physical Tests (QCLot: 1444861)</b>						
Moisture	----	E144	0.25	%	<0.25	----
<b>Physical Tests (QCLot: 1445317)</b>						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
<b>Cyanides (QCLot: 1445089)</b>						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
<b>Metals (QCLot: 1445316)</b>						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
<b>Metals (QCLot: 1445318)</b>						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
<b>Metals (QCLot: 1445319)</b>						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Metals (QCLot: 1445320)</b>						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
<b>Speciated Metals (QCLot: 1445090)</b>						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
<b>Volatile Organic Compounds (QCLot: 1442766)</b>						
Acetone	67-64-1	E611D	0.5	mg/kg	<0.50	----
Benzene	71-43-2	E611D	0.005	mg/kg	<0.0050	----
Bromodichloromethane	75-27-4	E611D	0.05	mg/kg	<0.050	----
Bromoform	75-25-2	E611D	0.05	mg/kg	<0.050	----
Bromomethane	74-83-9	E611D	0.05	mg/kg	<0.050	----
Carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	<0.050	----
Chlorobenzene	108-90-7	E611D	0.05	mg/kg	<0.050	----
Chloroform	67-66-3	E611D	0.05	mg/kg	<0.050	----
Dibromochloromethane	124-48-1	E611D	0.05	mg/kg	<0.050	----
Dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	<0.050	----
Dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	<0.050	----
Dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	<0.050	----
Dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	<0.050	----
Dichloromethane	75-09-2	E611D	0.045	mg/kg	# 0.054	MB-LOR
Dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	<0.050	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	<0.030	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	<0.030	----
Ethylbenzene	100-41-4	E611D	0.015	mg/kg	<0.015	----
Hexane, n-	110-54-3	E611D	0.05	mg/kg	<0.050	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	<0.50	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	<0.50	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	<0.040	----
Styrene	100-42-5	E611D	0.05	mg/kg	<0.050	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.05	mg/kg	<0.050	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.05	mg/kg	<0.050	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 1442766) - continued</b>						
Tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	<0.050	----
Toluene	108-88-3	E611D	0.05	mg/kg	<0.050	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.05	mg/kg	<0.050	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.05	mg/kg	<0.050	----
Trichloroethylene	79-01-6	E611D	0.01	mg/kg	<0.010	----
Trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	<0.050	----
Vinyl chloride	75-01-4	E611D	0.02	mg/kg	<0.020	----
Xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611D	0.03	mg/kg	<0.030	----
<b>Volatile Organic Compounds (QCLot: 1442768)</b>						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
<b>Hydrocarbons (QCLot: 1442767)</b>						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
<b>Hydrocarbons (QCLot: 1442769)</b>						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
<b>Hydrocarbons (QCLot: 1444855)</b>						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
<b>Organochlorine Pesticides (QCLot: 1446312)</b>						
Aldrin	309-00-2	E660F	0.02	mg/kg	<0.020	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.02	mg/kg	<0.020	----
Chlordane, trans- (gamma)	5103-74-2	E660F	0.02	mg/kg	<0.020	----
DDD, 2,4'-	53-19-0	E660F	0.02	mg/kg	<0.020	----
DDD, 4,4'-	72-54-8	E660F	0.02	mg/kg	<0.020	----
DDE, 2,4'-	3424-82-6	E660F	0.02	mg/kg	<0.020	----
DDE, 4,4'-	72-55-9	E660F	0.02	mg/kg	<0.020	----
DDT, 2,4'-	789-02-6	E660F	0.02	mg/kg	<0.020	----
DDT, 4,4'-	50-29-3	E660F	0.02	mg/kg	<0.020	----
Dieldrin	60-57-1	E660F	0.02	mg/kg	<0.020	----
Endosulfan, alpha-	959-98-8	E660F	0.02	mg/kg	<0.020	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organochlorine Pesticides (QCLot: 1446312) - continued						
Endosulfan, beta-	33213-65-9	E660F	0.02	mg/kg	<0.020	----
Endrin	72-20-8	E660F	0.02	mg/kg	<0.020	----
Heptachlor	76-44-8	E660F	0.02	mg/kg	<0.020	----
Heptachlor epoxide	1024-57-3	E660F	0.02	mg/kg	<0.020	----
Hexachlorobenzene	118-74-1	E660F	0.01	mg/kg	<0.010	----
Hexachlorobutadiene	87-68-3	E660F	0.01	mg/kg	<0.010	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.01	mg/kg	<0.010	----
Hexachloroethane	67-72-1	E660F	0.01	mg/kg	<0.010	----
Methoxychlor	72-43-5	E660F	0.02	mg/kg	<0.020	----

Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



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: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1444859)									
Moisture	----	E144	0.25	%	50 %	99.2	90.0	110	----
Physical Tests (QCLot: 1444861)									
Moisture	----	E144	0.25	%	50 %	99.8	90.0	110	----
Physical Tests (QCLot: 1445091)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1445317)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	99.3	90.0	110	----
Cyanides (QCLot: 1445089)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	93.3	80.0	120	----
Metals (QCLot: 1445316)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	105	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	104	80.0	120	----
Metals (QCLot: 1445318)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	102	80.0	120	----
Metals (QCLot: 1445319)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	108	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	95.6	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	93.2	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	100	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	98.8	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	98.1	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	98.3	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	98.0	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	103	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	98.0	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	100	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	96.1	80.0	120	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
<b>Metals (QCLot: 1445319) - continued</b>									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	96.5	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	101	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	101	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	96.8	80.0	120	----
<b>Metals (QCLot: 1445320)</b>									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	106	70.0	130	----
<b>Speciated Metals (QCLot: 1445090)</b>									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	101	80.0	120	----
<b>Volatile Organic Compounds (QCLot: 1442766)</b>									
Acetone	67-64-1	E611D	0.5	mg/kg	3.48 mg/kg	110	60.0	140	----
Benzene	71-43-2	E611D	0.005	mg/kg	3.48 mg/kg	87.6	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.05	mg/kg	3.48 mg/kg	97.1	50.0	140	----
Bromoform	75-25-2	E611D	0.05	mg/kg	3.48 mg/kg	# 68.8	70.0	130	MES
Bromomethane	74-83-9	E611D	0.05	mg/kg	3.48 mg/kg	94.8	50.0	140	----
Carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	3.48 mg/kg	90.3	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.05	mg/kg	3.48 mg/kg	94.7	70.0	130	----
Chloroform	67-66-3	E611D	0.05	mg/kg	3.48 mg/kg	103	70.0	130	----
Dibromochloromethane	124-48-1	E611D	0.05	mg/kg	3.48 mg/kg	81.5	60.0	130	----
Dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	3.48 mg/kg	97.9	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	3.48 mg/kg	92.8	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	3.48 mg/kg	91.1	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	3.48 mg/kg	90.5	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	3.48 mg/kg	58.8	50.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	3.48 mg/kg	96.4	60.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	3.48 mg/kg	109	60.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	3.48 mg/kg	93.8	60.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	3.48 mg/kg	99.0	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	3.48 mg/kg	96.5	60.0	130	----
Dichloromethane	75-09-2	E611D	0.045	mg/kg	3.48 mg/kg	106	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	3.48 mg/kg	93.6	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	3.48 mg/kg	88.2	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	3.48 mg/kg	83.4	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.015	mg/kg	3.48 mg/kg	81.6	70.0	130	----
Hexane, n-	110-54-3	E611D	0.05	mg/kg	3.48 mg/kg	79.3	70.0	130	----





Sub-Matrix: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1442766) - continued									
Methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	3.48 mg/kg	102	60.0	140	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	3.48 mg/kg	88.3	60.0	140	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	3.48 mg/kg	96.4	70.0	130	----
Styrene	100-42-5	E611D	0.05	mg/kg	3.48 mg/kg	81.4	70.0	130	----
Tetrachloroethane, 1,1,1,2,-	630-20-6	E611D	0.05	mg/kg	3.48 mg/kg	87.2	60.0	130	----
Tetrachloroethane, 1,1,2,2,-	79-34-5	E611D	0.05	mg/kg	3.48 mg/kg	93.8	60.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	3.48 mg/kg	82.4	60.0	130	----
Toluene	108-88-3	E611D	0.05	mg/kg	3.48 mg/kg	82.1	70.0	130	----
Trichloroethane, 1,1,1,-	71-55-6	E611D	0.05	mg/kg	3.48 mg/kg	99.4	60.0	130	----
Trichloroethane, 1,1,2,-	79-00-5	E611D	0.05	mg/kg	3.48 mg/kg	101	60.0	130	----
Trichloroethylene	79-01-6	E611D	0.01	mg/kg	3.48 mg/kg	92.7	60.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	3.48 mg/kg	90.9	50.0	140	----
Vinyl chloride	75-01-4	E611D	0.02	mg/kg	3.48 mg/kg	78.6	60.0	140	----
Xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	6.95 mg/kg	84.1	70.0	130	----
Xylene, o-	95-47-6	E611D	0.03	mg/kg	3.48 mg/kg	84.3	70.0	130	----
Volatile Organic Compounds (QCLot: 1442768)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	102	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	100	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	103	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	100	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	106	70.0	130	----
Hydrocarbons (QCLot: 1442767)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	87.1	80.0	120	----
Hydrocarbons (QCLot: 1442769)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	89.9	80.0	120	----
Hydrocarbons (QCLot: 1444855)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	714 mg/kg	76.2	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1480 mg/kg	114	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	777 mg/kg	106	70.0	130	----
Organochlorine Pesticides (QCLot: 1446312)									
Aldrin	309-00-2	E660F	0.02	mg/kg	0.012 mg/kg	76.9	50.0	150	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.02	mg/kg	0.012 mg/kg	57.0	50.0	150	----
Chlordane, trans- (gamma)	5103-74-2	E660F	0.02	mg/kg	0.012 mg/kg	63.8	50.0	150	----
DDD, 2,4'-	53-19-0	E660F	0.02	mg/kg	0.012 mg/kg	94.6	50.0	150	----



Sub-Matrix: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Organochlorine Pesticides (QCLot: 1446312) - continued									
DDD, 4,4'-	72-54-8	E660F	0.02	mg/kg	0.012 mg/kg	88.4	50.0	150	----
DDE, 2,4'-	3424-82-6	E660F	0.02	mg/kg	0.012 mg/kg	76.7	50.0	150	----
DDE, 4,4'-	72-55-9	E660F	0.02	mg/kg	0.012 mg/kg	74.2	50.0	150	----
DDT, 2,4'-	789-02-6	E660F	0.02	mg/kg	0.012 mg/kg	109	50.0	150	----
DDT, 4,4'-	50-29-3	E660F	0.02	mg/kg	0.012 mg/kg	118	50.0	150	----
Dieldrin	60-57-1	E660F	0.02	mg/kg	0.012 mg/kg	70.6	50.0	150	----
Endosulfan, alpha-	959-98-8	E660F	0.02	mg/kg	0.012 mg/kg	81.0	50.0	150	----
Endosulfan, beta-	33213-65-9	E660F	0.02	mg/kg	0.012 mg/kg	80.5	50.0	150	----
Endrin	72-20-8	E660F	0.02	mg/kg	0.012 mg/kg	70.5	50.0	150	----
Heptachlor	76-44-8	E660F	0.02	mg/kg	0.012 mg/kg	87.0	50.0	150	----
Heptachlor epoxide	1024-57-3	E660F	0.02	mg/kg	0.012 mg/kg	62.2	50.0	150	----
Hexachlorobenzene	118-74-1	E660F	0.01	mg/kg	0.012 mg/kg	70.2	50.0	150	----
Hexachlorobutadiene	87-68-3	E660F	0.01	mg/kg	0.012 mg/kg	83.9	50.0	150	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.01	mg/kg	0.012 mg/kg	92.7	50.0	150	----
Hexachloroethane	67-72-1	E660F	0.01	mg/kg	0.012 mg/kg	76.0	50.0	150	----
Methoxychlor	72-43-5	E660F	0.02	mg/kg	0.012 mg/kg	133	50.0	150	----



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: Soil/Solid

Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Cyanides (QCLot: 1445089)										
WT2411626-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.16 mg/kg	1.24 mg/kg	94.2	70.0	130	----
Volatile Organic Compounds (QCLot: 1442766)										
WT2412115-001	Anonymous	Acetone	67-64-1	E611D	3.89 mg/kg	2.61 mg/kg	149	50.0	140	MES
		Benzene	71-43-2	E611D	3.08 mg/kg	2.61 mg/kg	118	50.0	140	----
		Bromodichloromethane	75-27-4	E611D	3.15 mg/kg	2.61 mg/kg	121	50.0	140	----
		Bromoform	75-25-2	E611D	3.01 mg/kg	2.61 mg/kg	115	50.0	140	----
		Bromomethane	74-83-9	E611D	3.11 mg/kg	2.61 mg/kg	119	50.0	140	----
		Carbon tetrachloride	56-23-5	E611D	2.92 mg/kg	2.61 mg/kg	112	50.0	140	----
		Chlorobenzene	108-90-7	E611D	2.82 mg/kg	2.61 mg/kg	108	50.0	140	----
		Chloroform	67-66-3	E611D	3.06 mg/kg	2.61 mg/kg	117	50.0	140	----
		Dibromochloromethane	124-48-1	E611D	2.99 mg/kg	2.61 mg/kg	114	50.0	140	----
		Dibromoethane, 1,2-	106-93-4	E611D	2.98 mg/kg	2.61 mg/kg	114	50.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	2.79 mg/kg	2.61 mg/kg	107	50.0	140	----
		Dichlorobenzene, 1,3-	541-73-1	E611D	2.73 mg/kg	2.61 mg/kg	105	50.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	2.75 mg/kg	2.61 mg/kg	105	50.0	140	----
		Dichlorodifluoromethane	75-71-8	E611D	2.70 mg/kg	2.61 mg/kg	103	50.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611D	3.24 mg/kg	2.61 mg/kg	124	50.0	140	----
		Dichloroethane, 1,2-	107-06-2	E611D	3.35 mg/kg	2.61 mg/kg	128	50.0	140	----
		Dichloroethylene, 1,1-	75-35-4	E611D	3.25 mg/kg	2.61 mg/kg	125	50.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	2.94 mg/kg	2.61 mg/kg	113	50.0	140	----
		Dichloroethylene, trans-1,2-	156-60-5	E611D	3.26 mg/kg	2.61 mg/kg	125	50.0	140	----
		Dichloromethane	75-09-2	E611D	3.28 mg/kg	2.61 mg/kg	126	50.0	140	----
		Dichloropropane, 1,2-	78-87-5	E611D	3.24 mg/kg	2.61 mg/kg	124	50.0	140	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	3.05 mg/kg	2.61 mg/kg	117	50.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	3.01 mg/kg	2.61 mg/kg	115	50.0	140	----
		Ethylbenzene	100-41-4	E611D	2.84 mg/kg	2.61 mg/kg	109	50.0	140	----
		Hexane, n-	110-54-3	E611D	3.32 mg/kg	2.61 mg/kg	127	50.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	3.44 mg/kg	2.61 mg/kg	132	50.0	140	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	3.44 mg/kg	2.61 mg/kg	132	50.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	2.83 mg/kg	2.61 mg/kg	108	50.0	140	----
		Styrene	100-42-5	E611D	2.84 mg/kg	2.61 mg/kg	109	50.0	140	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	2.78 mg/kg	2.61 mg/kg	107	50.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	3.55 mg/kg	2.61 mg/kg	136	50.0	140	----
		Tetrachloroethylene	127-18-4	E611D	2.79 mg/kg	2.61 mg/kg	107	50.0	140	----
		Toluene	108-88-3	E611D	2.91 mg/kg	2.61 mg/kg	112	50.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	2.84 mg/kg	2.61 mg/kg	109	50.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	3.06 mg/kg	2.61 mg/kg	117	50.0	140	----
		Trichloroethylene	79-01-6	E611D	2.78 mg/kg	2.61 mg/kg	106	50.0	140	----
		Trichlorofluoromethane	75-69-4	E611D	2.95 mg/kg	2.61 mg/kg	113	50.0	140	----



Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1442766) - continued										
WT2412115-001	Anonymous	Vinyl chloride	75-01-4	E611D	3.28 mg/kg	2.61 mg/kg	126	50.0	140	----
		Xylene, m+p-	179601-23-1	E611D	5.79 mg/kg	5.22 mg/kg	111	50.0	140	----
		Xylene, o-	95-47-6	E611D	2.86 mg/kg	2.61 mg/kg	110	50.0	140	----
Volatile Organic Compounds (QCLot: 1442768)										
WT2412116-005	Anonymous	Benzene	71-43-2	E611A	2.24 mg/kg	2.14 mg/kg	105	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.27 mg/kg	2.14 mg/kg	106	60.0	140	----
		Toluene	108-88-3	E611A	2.32 mg/kg	2.14 mg/kg	108	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.45 mg/kg	4.28 mg/kg	104	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.38 mg/kg	2.14 mg/kg	111	60.0	140	----
Hydrocarbons (QCLot: 1442767)										
WT2412115-001	Anonymous	F1 (C6-C10)	----	E581.F1	51.0 mg/kg	52.2 mg/kg	97.6	60.0	140	----
Hydrocarbons (QCLot: 1442769)										
WT2412116-005	Anonymous	F1 (C6-C10)	----	E581.F1	38.4 mg/kg	42.9 mg/kg	89.7	60.0	140	----
Hydrocarbons (QCLot: 1444855)										
WT2411858-026	Anonymous	F2 (C10-C16)	----	E601.SG-L	478 mg/kg	583 mg/kg	82.0	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1590 mg/kg	1210 mg/kg	132	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	1080 mg/kg	635 mg/kg	170	60.0	140	E
Organochlorine Pesticides (QCLot: 1446312)										
WT2411995-006	BH116-SS1	Aldrin	309-00-2	E660F	0.008 mg/kg	0.01 mg/kg	83.8	50.0	150	----
		Chlordane, cis- (alpha)	5103-71-9	E660F	0.006 mg/kg	0.01 mg/kg	62.7	50.0	150	----
		Chlordane, trans- (gamma)	5103-74-2	E660F	0.006 mg/kg	0.01 mg/kg	63.6	50.0	150	----
		DDD, 2,4'-	53-19-0	E660F	0.011 mg/kg	0.01 mg/kg	109	50.0	150	----
		DDD, 4,4'-	72-54-8	E660F	0.010 mg/kg	0.01 mg/kg	98.9	50.0	150	----
		DDE, 2,4'-	3424-82-6	E660F	0.006 mg/kg	0.01 mg/kg	59.8	50.0	150	----
		DDE, 4,4'-	72-55-9	E660F	0.007 mg/kg	0.01 mg/kg	67.4	50.0	150	----
		DDT, 2,4'-	789-02-6	E660F	0.008 mg/kg	0.01 mg/kg	78.9	50.0	150	----
		DDT, 4,4'-	50-29-3	E660F	0.012 mg/kg	0.01 mg/kg	116	50.0	150	----
		Dieldrin	60-57-1	E660F	0.006 mg/kg	0.01 mg/kg	62.3	50.0	150	----
		Endosulfan, alpha-	959-98-8	E660F	0.008 mg/kg	0.01 mg/kg	79.3	50.0	150	----
		Endosulfan, beta-	33213-65-9	E660F	0.008 mg/kg	0.01 mg/kg	76.4	50.0	150	----
		Endrin	72-20-8	E660F	0.010 mg/kg	0.01 mg/kg	101	50.0	150	----
		Heptachlor	76-44-8	E660F	0.012 mg/kg	0.01 mg/kg	115	50.0	150	----
		Heptachlor epoxide	1024-57-3	E660F	0.007 mg/kg	0.01 mg/kg	66.9	50.0	150	----
		Hexachlorobenzene	118-74-1	E660F	0.007 mg/kg	0.01 mg/kg	73.1	50.0	150	----
		Hexachlorobutadiene	87-68-3	E660F	0.007 mg/kg	0.01 mg/kg	71.5	50.0	150	----
		Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.009 mg/kg	0.01 mg/kg	94.7	50.0	150	----
		Hexachloroethane	67-72-1	E660F	0.009 mg/kg	0.01 mg/kg	94.8	50.0	150	----
		Methoxychlor	72-43-5	E660F	0.013 mg/kg	0.01 mg/kg	128	50.0	150	----



Qualifiers

Qualifier	Description
E	Matrix Spike recovery outside ALS DQO due to heterogeneous analyte background in sample.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

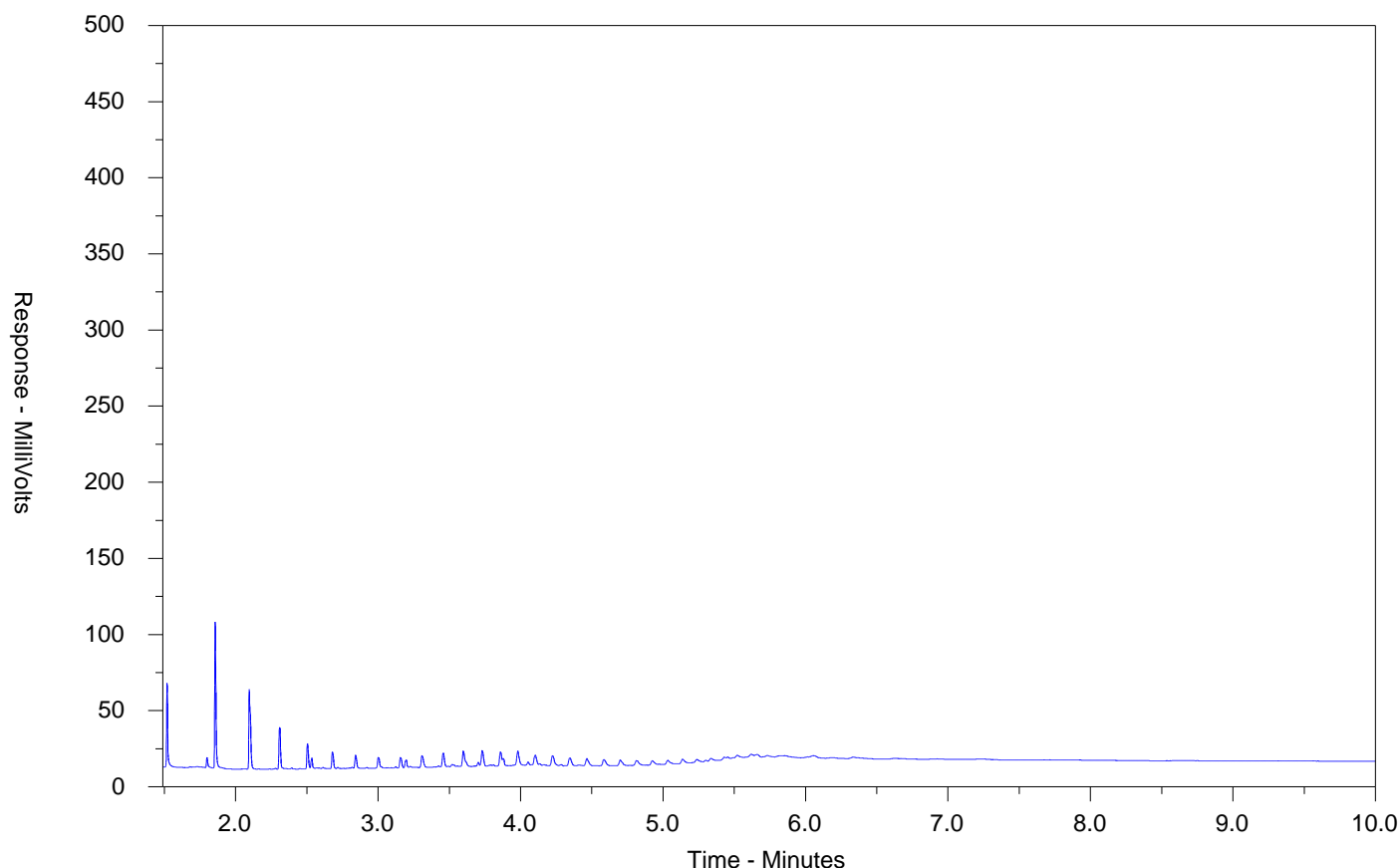
Sub-Matrix:

Sub-Matrix:					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method			Low	High	
Physical Tests (QCLot: 1445317)									
QC-1445317-003	RM	Conductivity (1:2 leachate)	----	E100-L	3460 µS/cm	92.4	70.0	130	----
Metals (QCLot: 1445316)									
QC-1445316-003	RM	Calcium, soluble ion content	7440-70-2	E484	195 mg/L	93.4	70.0	130	----
QC-1445316-003	RM	Magnesium, soluble ion content	7439-95-4	E484	68.7 mg/L	95.8	70.0	130	----
QC-1445316-003	RM	Sodium, soluble ion content	17341-25-2	E484	117 mg/L	98.1	70.0	130	----
Metals (QCLot: 1445318)									
QC-1445318-003	RM	Mercury	7439-97-6	E510C	0.058 mg/kg	99.2	70.0	130	----
Metals (QCLot: 1445319)									
QC-1445319-003	RM	Antimony	7440-36-0	E440C	3.99 mg/kg	100	70.0	130	----
QC-1445319-003	RM	Arsenic	7440-38-2	E440C	3.73 mg/kg	110	70.0	130	----
QC-1445319-003	RM	Barium	7440-39-3	E440C	105 mg/kg	103	70.0	130	----
QC-1445319-003	RM	Beryllium	7440-41-7	E440C	0.349 mg/kg	104	70.0	130	----
QC-1445319-003	RM	Boron	7440-42-8	E440C	8.5 mg/kg	117	70.0	130	----
QC-1445319-003	RM	Cadmium	7440-43-9	E440C	0.91 mg/kg	103	70.0	130	----
QC-1445319-003	RM	Chromium	7440-47-3	E440C	101 mg/kg	98.9	70.0	130	----
QC-1445319-003	RM	Cobalt	7440-48-4	E440C	6.9 mg/kg	101	70.0	130	----
QC-1445319-003	RM	Copper	7440-50-8	E440C	123 mg/kg	106	70.0	130	----
QC-1445319-003	RM	Lead	7439-92-1	E440C	267 mg/kg	99.4	70.0	130	----
QC-1445319-003	RM	Molybdenum	7439-98-7	E440C	1.03 mg/kg	103	70.0	130	----
QC-1445319-003	RM	Nickel	7440-02-0	E440C	26.7 mg/kg	102	70.0	130	----
QC-1445319-003	RM	Silver	7440-22-4	E440C	4.06 mg/kg	114	70.0	130	----
QC-1445319-003	RM	Thallium	7440-28-0	E440C	0.079 mg/kg	106	70.0	130	----
QC-1445319-003	RM	Uranium	7440-61-1	E440C	0.52 mg/kg	101	70.0	130	----
QC-1445319-003	RM	Vanadium	7440-62-2	E440C	32.7 mg/kg	101	70.0	130	----
QC-1445319-003	RM	Zinc	7440-66-6	E440C	297 mg/kg	99.7	70.0	130	----
Metals (QCLot: 1445320)									
QC-1445320-003	RM	Boron, hot water soluble	7440-42-8	E487	1.93 mg/kg	93.8	60.0	140	----
Speciated Metals (QCLot: 1445090)									
QC-1445090-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	226 mg/kg	89.6	70.0	130	----

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2411995-001-E601.SG-L  
Client Sample ID: BH106-SS2



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

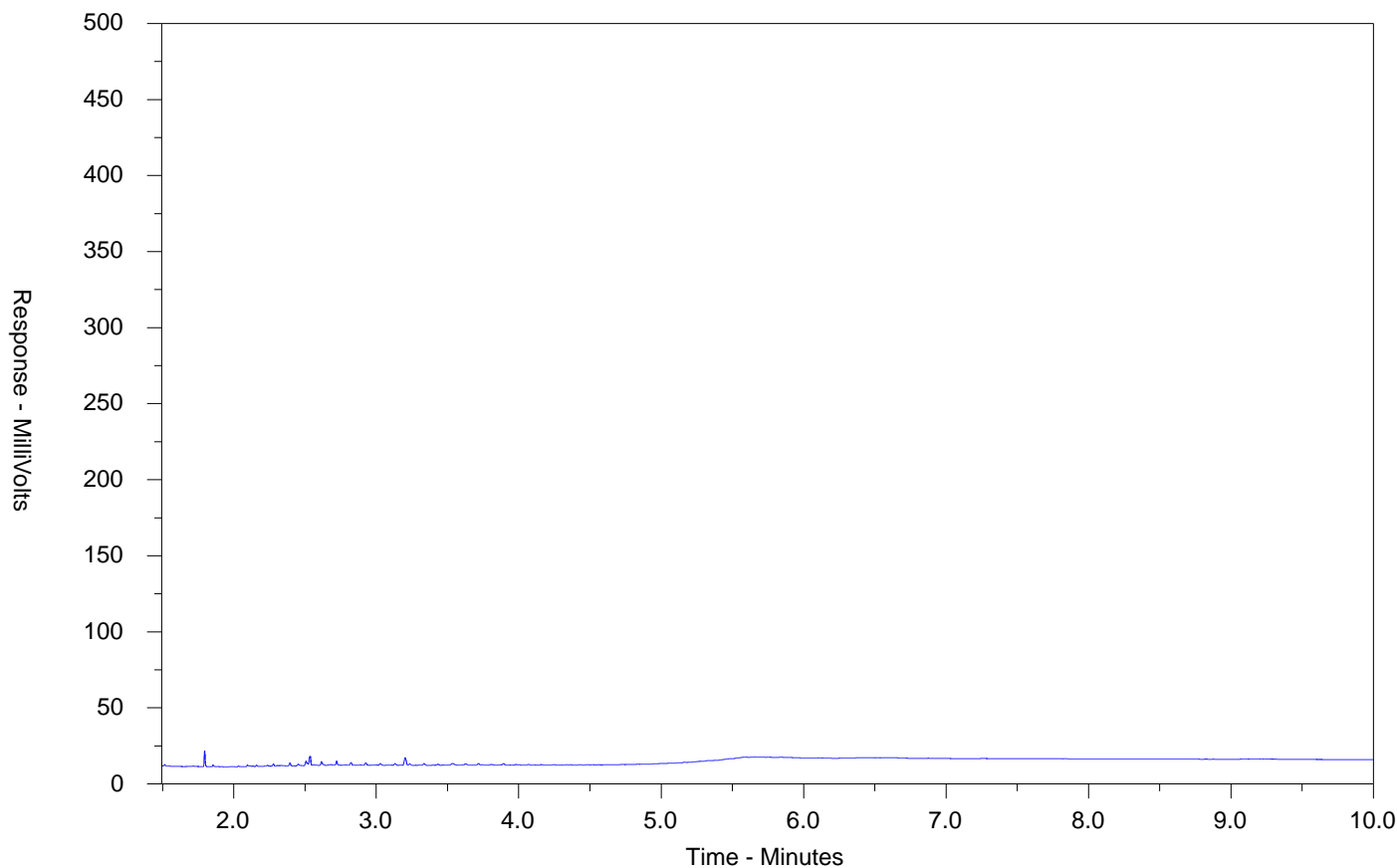
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2411995-003-E601.SG-L  
Client Sample ID: BH115-SS3



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

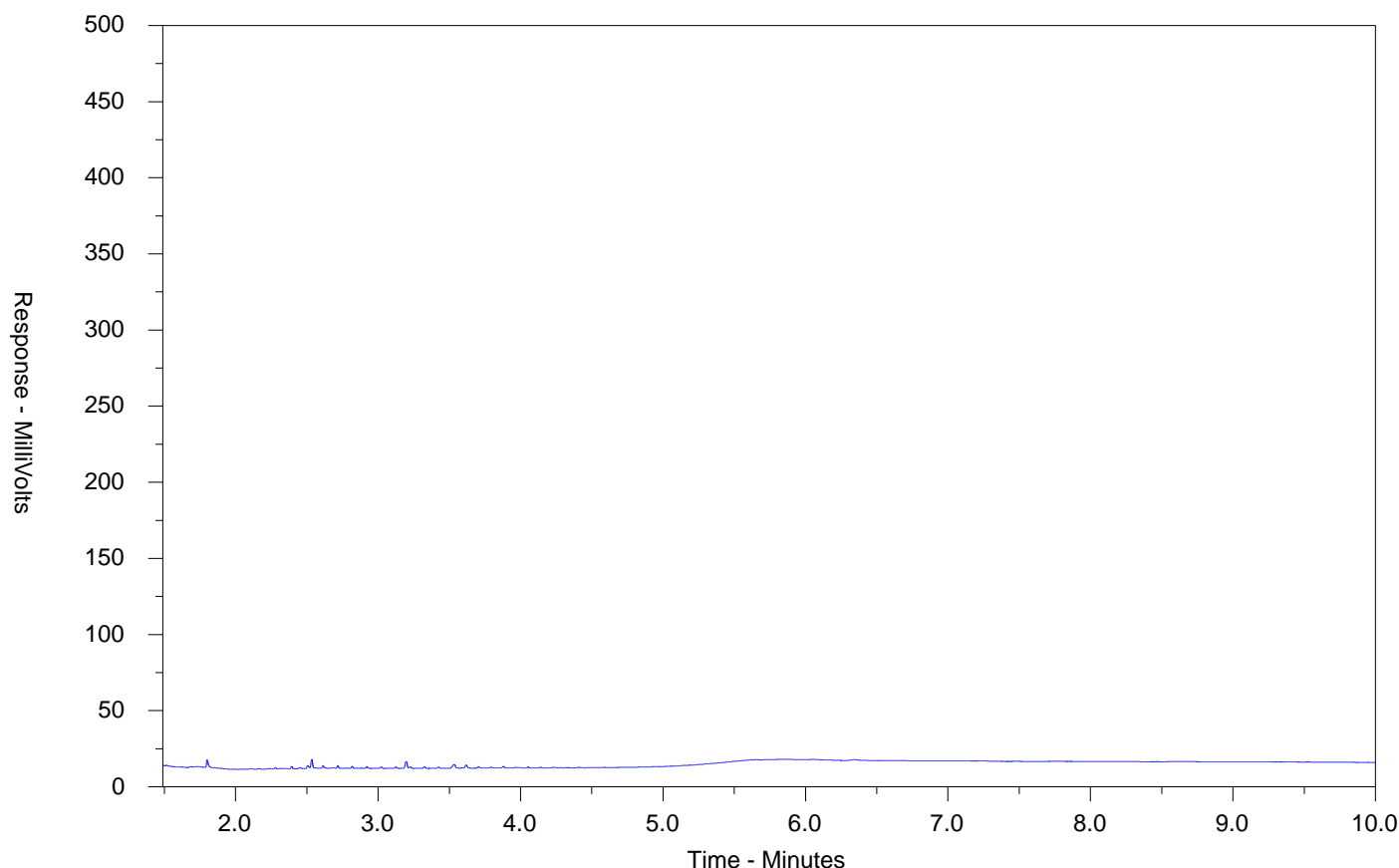
Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2411995-008-E601.SG-L  
Client Sample ID: BH117-SS3A



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

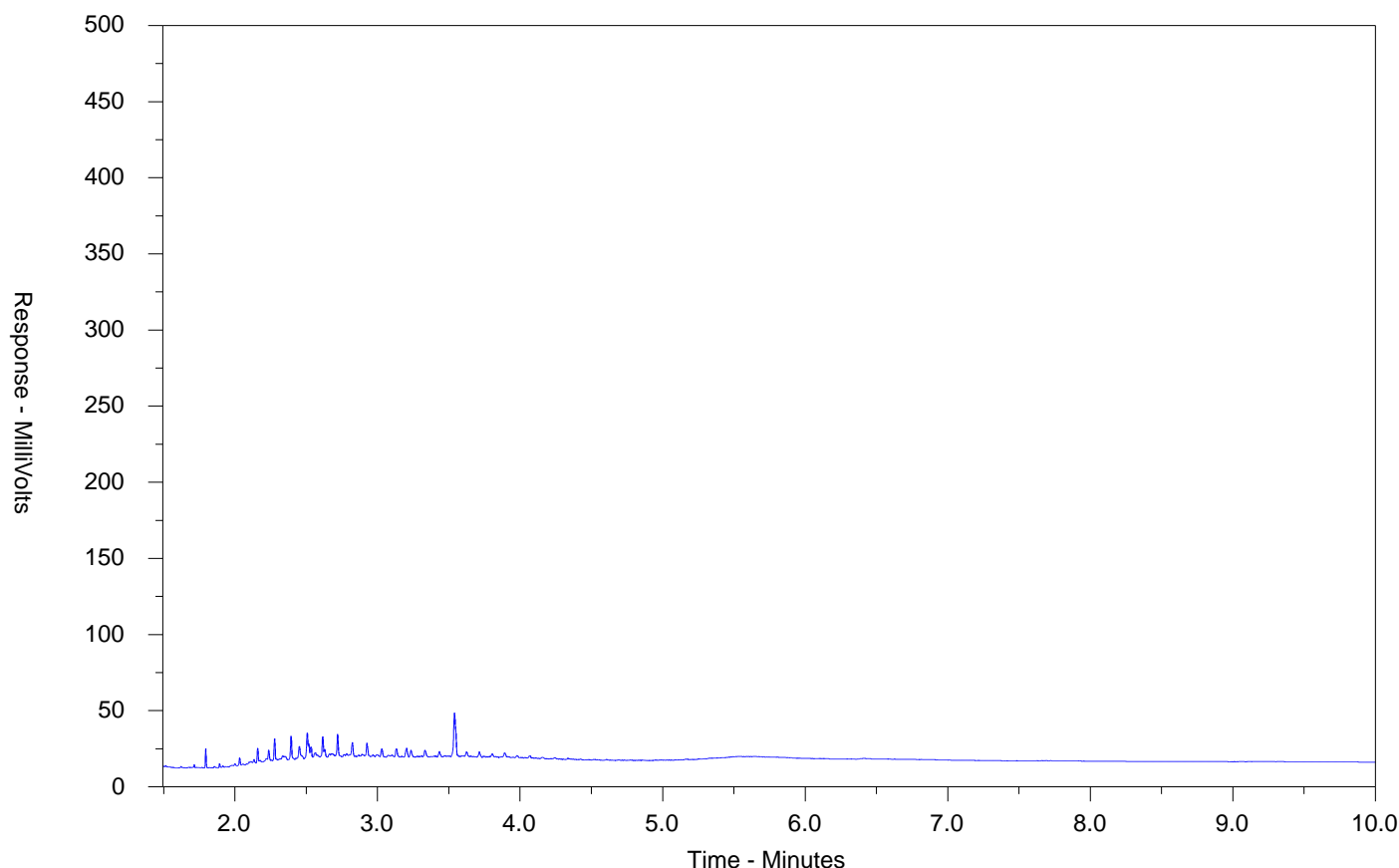
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2411995-009-E601.SG-L  
Client Sample ID: BH119-SS5



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

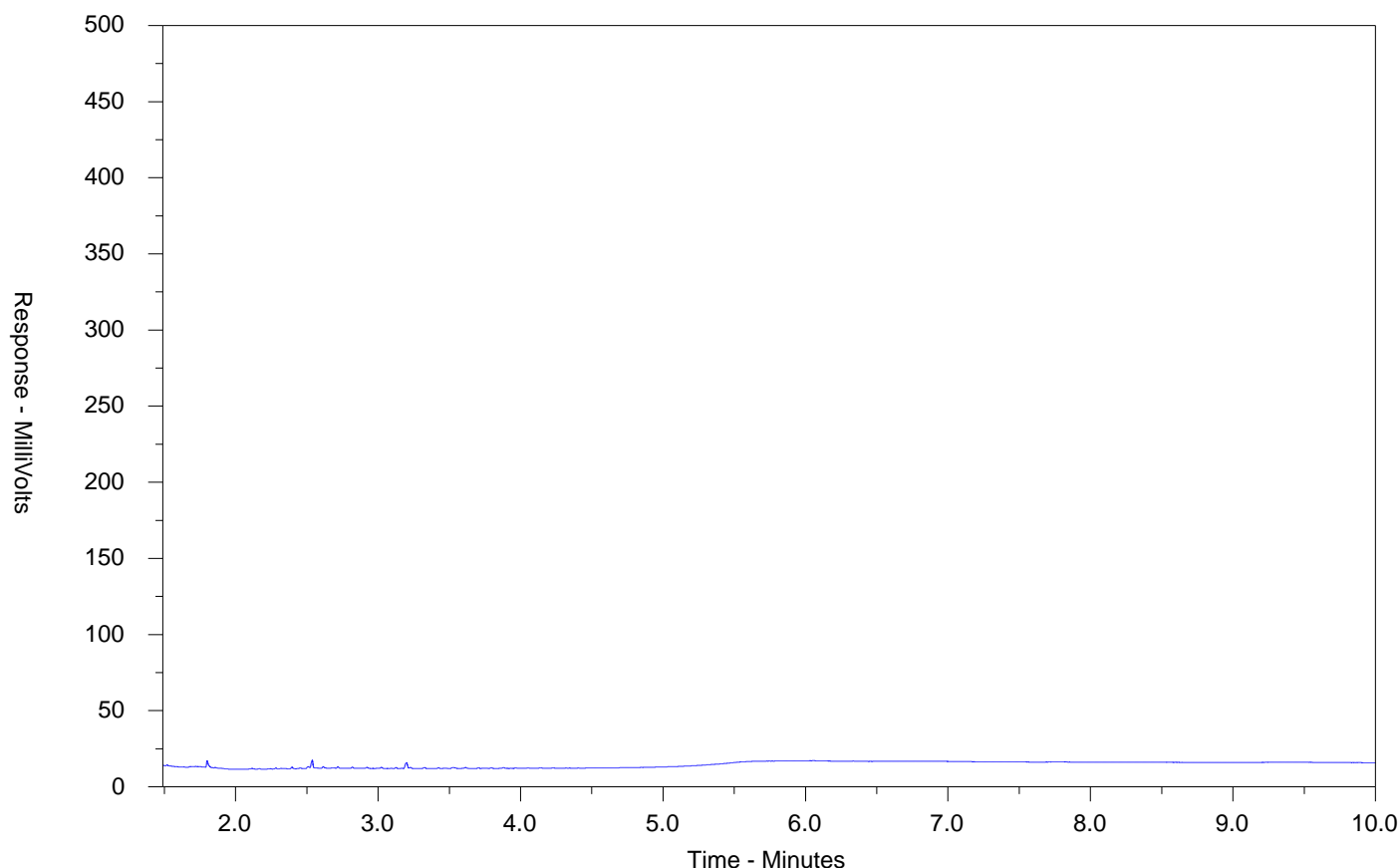
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2411995-010-E601.SG-L  
Client Sample ID: BH118-SS3



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).





COC Number: 20 - 1085350

Canada Toll Free: 1 800 668 9878

Page

Environmental Division  
Waterloo

Work Order Reference  
WT2411995

<b>Company:</b> Grounded Eng. Inc. <b>Contact:</b> Brady Levisque 647-361-5254 Company address below will appear on the final report		<b>Selected Report Format:</b> <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EOD (Digital) <input type="checkbox"/> Maps QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Compare Results to Criteria of Report - provide details below if box checked <b>Selected Distribution:</b> <input checked="" type="checkbox"/> Email <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	
<b>Address:</b> 1 Baniqa Dr Toronto, ON M4H 1B3		<b>Email 1 or Fax:</b> 11175966@groundedeng.ca <b>Email 2:</b> <b>Email 3:</b>	
<b>Province:</b> M4H 1B3		<b>Invoice Recipients:</b> <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	
<b>Copy of Invoice with Report:</b> <input type="checkbox"/> YES <input type="checkbox"/> NO		<b>Select Invoice Distribution:</b> <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>	
<b>LS Account # / Quote #:</b> 24-048		<b>AFE Cost Center:</b> <b>PO#:</b>	
<b>Job #:</b>		<b>Major/Minor Code:</b> <b>Routing Code:</b>	
<b>Q / AFE:</b>		<b>Requisitioner:</b>	
<b>SD:</b>		<b>Location:</b>	
<b>ALS Lab Work Order # (ALS use only):</b> U72411995		<b>ALS Contact:</b>	
<b>ALS Sample #</b> (ALS use only)	<b>Sample Identification and/or Coordinates</b> (This description will appear on the report)	<b>Date</b> (dd-mm-yy)	<b>Time</b> (hh:mm)
BH106-552 <del>BH115-552</del> BH115-552 BH115-553 DCP-1152 DCP-1153 BH116-551 BH116-552 BH117-553A BH119-555	01-05-24 <del>10-05-24</del> 10-05-24 11:25 11:30 11:25 11:30 11:30 13:15 14:05 15:05	13:55 <del>10:05</del> 11:25 11:30 11:25 11:30 13:15 14:05 15:05	Soil <del>Soil</del> Soil Soil Soil Soil Soil Soil Soil Soil
<b>Drinking Water (DW) Samples (client use)</b>		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below</b> (Excel COC only)	
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO		Are samples for human consumption use? <input type="checkbox"/> YES <input type="checkbox"/> NO	
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>	
<b>Released by:</b> BJSW	<b>Date:</b> 05/13/24	<b>Received by:</b> Karim	<b>Date:</b> 5/13/2024
<b>REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION</b>		<b>WHITE - LABORATORY COPY</b> <b>YELLOW - CLIENT COPY</b>	
If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.		<b>NUMBER OF CONTAINERS</b>	
Routine [R] if received by 3pm M-F - no surcharges apply 4 day [P4] if received by 3pm M-F - 25% rush surcharge minimum 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum Same day [E2] if received by 10am M-F - 200% rush surcharge, additional fee may apply to rush requests on weekends, statutory holidays and non-routine to		<b>Turnaround Time (TAT) Requested</b>	
<b>Date and Time Required for all EAP TATs:</b>		<b>Analysis Request</b>	
Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below		<b>SAMPLES ON HOLD</b>	
For all tests with rush TATs requested, please contact:		<b>EXTENDED STORAGE REQUIRED</b>	
<b>Telephone: +1 519 888 6910</b>		<b>SUSPECTED HAZARD (see notes)</b>	





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[illegible]

SHIPMENT RELEASE (Client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		FINAL SHIPMENT RECEPTION (ALS use only)	
Released by: <i>Bjm</i>	Date: <i>05/13/24</i>	Time: <i>16:40</i>	Received by: <i>Korman</i>	Date: <i>5/13/2024</i>	Time: <i>16:48</i>
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION			WHITE - LABORATORY COPY      YELLOW - CLIENT COPY		
<p>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.</p> <p>If any water samples are taken from a <b>Regulated Drinking Water (RDW) System</b>, please submit using an <b>Authorized DW CCC form</b>.</p>					
ALS 2023 FORM					

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WSP Canada Inc. (Oakville)  
ATTN: Amy Chiang  
610 Chartwell Road  
Suite 300  
Oakville ON L6J 4A5

Date Received: 07-JUN-21  
Report Date: 14-JUN-21 14:35 (MT)  
Version: FINAL

Client Phone: 905-829-6266

## Certificate of Analysis

Lab Work Order #: L2597621

Project P.O. #: 211-03319-00-200-2002

Job Reference: 211-03319-00-200-2002

C of C Numbers:

Legal Site Desc:

Emily Hansen  
Account Manager

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ADDRESS: 5730 Coopers Avenue, Unit #26, Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927  
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2597621-1	MW21-4							
Sampled By: CLIENT on 07-JUN-21 @ 11:00								
Matrix: WATER								
<b>Volatile Organic Compounds</b>								
Acetone		<30		30	ug/L		14-JUN-21	R5490019
Benzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Bromodichloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Bromoform		<5.0		5.0	ug/L		14-JUN-21	R5490019
Bromomethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Carbon tetrachloride		<0.20		0.20	ug/L		14-JUN-21	R5490019
Chlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dibromochloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Chloroform		<1.0		1.0	ug/L		14-JUN-21	R5490019
1,2-Dibromoethane		<0.20		0.20	ug/L		14-JUN-21	R5490019
1,2-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,3-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,4-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dichlorodifluoromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
1,1-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,2-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
trans-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methylene Chloride		<5.0		5.0	ug/L		14-JUN-21	R5490019
1,2-Dichloropropane		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
trans-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
1,3-Dichloropropene (cis & trans)		<0.50		0.50	ug/L		14-JUN-21	
Ethylbenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
n-Hexane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methyl Ethyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
Methyl Isobutyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
MTBE		<2.0		2.0	ug/L		14-JUN-21	R5490019
Styrene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Tetrachloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Toluene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichlorofluoromethane		<5.0		5.0	ug/L		14-JUN-21	R5490019
Vinyl chloride		<0.50		0.50	ug/L		14-JUN-21	R5490019
o-Xylene		<0.30		0.30	ug/L		14-JUN-21	R5490019
m+p-Xylenes		<0.40		0.40	ug/L		14-JUN-21	R5490019

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2597621-1 MW21-4 Sampled By: CLIENT on 07-JUN-21 @ 11:00 Matrix: WATER								
Volatile Organic Compounds								
Xylenes (Total)		<0.50		0.50	ug/L		14-JUN-21	
Surrogate: 4-Bromofluorobenzene		93.4		70-130	%		14-JUN-21	R5490019
Surrogate: 1,4-Difluorobenzene		98.4		70-130	%		14-JUN-21	R5490019
Hydrocarbons								
F1 (C6-C10)		<25		25	ug/L		14-JUN-21	R5490019
F1-BTEX		<25		25	ug/L		14-JUN-21	
F2 (C10-C16)		<100		100	ug/L	08-JUN-21	09-JUN-21	R5480626
F3 (C16-C34)		<250		250	ug/L	08-JUN-21	09-JUN-21	R5480626
F4 (C34-C50)		<250		250	ug/L	08-JUN-21	09-JUN-21	R5480626
Total Hydrocarbons (C6-C50)		<370		370	ug/L		14-JUN-21	
Chrom. to baseline at nC50		YES				08-JUN-21	09-JUN-21	R5480626
Surrogate: 2-Bromobenzotrifluoride		82.4		60-140	%	08-JUN-21	09-JUN-21	R5480626
Surrogate: 3,4-Dichlorotoluene		87.3		60-140	%		14-JUN-21	R5490019
L2597621-2 DUP 01 Sampled By: CLIENT on 07-JUN-21 @ 11:00 Matrix: WATER								
Volatile Organic Compounds								
Acetone		<30		30	ug/L		14-JUN-21	R5490019
Benzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Bromodichloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Bromoform		<5.0		5.0	ug/L		14-JUN-21	R5490019
Bromomethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Carbon tetrachloride		<0.20		0.20	ug/L		14-JUN-21	R5490019
Chlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dibromochloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Chloroform		<1.0		1.0	ug/L		14-JUN-21	R5490019
1,2-Dibromoethane		<0.20		0.20	ug/L		14-JUN-21	R5490019
1,2-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,3-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,4-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dichlorodifluoromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
1,1-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,2-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
trans-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methylene Chloride		<5.0		5.0	ug/L		14-JUN-21	R5490019
1,2-Dichloropropane		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
trans-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
1,3-Dichloropropene (cis & trans)		<0.50		0.50	ug/L		14-JUN-21	
Ethylbenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2597621-2     DUP 01 Sampled By:    CLIENT on 07-JUN-21 @ 11:00 Matrix:        WATER								
<b>Volatile Organic Compounds</b>								
n-Hexane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methyl Ethyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
Methyl Isobutyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
MTBE		<2.0		2.0	ug/L		14-JUN-21	R5490019
Styrene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Tetrachloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Toluene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichlorofluoromethane		<5.0		5.0	ug/L		14-JUN-21	R5490019
Vinyl chloride		<0.50		0.50	ug/L		14-JUN-21	R5490019
o-Xylene		<0.30		0.30	ug/L		14-JUN-21	R5490019
m+p-Xylenes		<0.40		0.40	ug/L		14-JUN-21	R5490019
Xylenes (Total)		<0.50		0.50	ug/L		14-JUN-21	
Surrogate: 4-Bromofluorobenzene		92.5		70-130	%		14-JUN-21	R5490019
Surrogate: 1,4-Difluorobenzene		98.5		70-130	%		14-JUN-21	R5490019
<b>Hydrocarbons</b>								
F1 (C6-C10)		<25		25	ug/L		14-JUN-21	R5490019
F1-BTEX		<25		25	ug/L		14-JUN-21	
F2 (C10-C16)		<100		100	ug/L	08-JUN-21	09-JUN-21	R5480626
F3 (C16-C34)		<250		250	ug/L	08-JUN-21	09-JUN-21	R5480626
F4 (C34-C50)		<250		250	ug/L	08-JUN-21	09-JUN-21	R5480626
Total Hydrocarbons (C6-C50)		<370		370	ug/L		14-JUN-21	
Chrom. to baseline at nC50		YES				08-JUN-21	09-JUN-21	R5480626
Surrogate: 2-Bromobenzotrifluoride		86.2		60-140	%	08-JUN-21	09-JUN-21	R5480626
Surrogate: 3,4-Dichlorotoluene		84.2		60-140	%		14-JUN-21	R5490019
L2597621-3     TRIP BLANK Sampled By:    CLIENT on 07-JUN-21 @ 11:00 Matrix:        WATER								
<b>Volatile Organic Compounds</b>								
Acetone		<30		30	ug/L		14-JUN-21	R5490019
Benzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Bromodichloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Bromoform		<5.0		5.0	ug/L		14-JUN-21	R5490019
Bromomethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Carbon tetrachloride		<0.20		0.20	ug/L		14-JUN-21	R5490019
Chlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dibromochloromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
Chloroform		<1.0		1.0	ug/L		14-JUN-21	R5490019

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2597621-3    TRIP BLANK								
Sampled By:    CLIENT on 07-JUN-21 @ 11:00								
Matrix:        WATER								
<b>Volatile Organic Compounds</b>								
1,2-Dibromoethane		<0.20		0.20	ug/L		14-JUN-21	R5490019
1,2-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,3-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,4-Dichlorobenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Dichlorodifluoromethane		<2.0		2.0	ug/L		14-JUN-21	R5490019
1,1-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,2-Dichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
trans-1,2-Dichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methylene Chloride		<5.0		5.0	ug/L		14-JUN-21	R5490019
1,2-Dichloropropane		<0.50		0.50	ug/L		14-JUN-21	R5490019
cis-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
trans-1,3-Dichloropropene		<0.30		0.30	ug/L		14-JUN-21	R5490019
1,3-Dichloropropene (cis & trans)		<0.50		0.50	ug/L		14-JUN-21	
Ethylbenzene		<0.50		0.50	ug/L		14-JUN-21	R5490019
n-Hexane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Methyl Ethyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
Methyl Isobutyl Ketone		<20		20	ug/L		14-JUN-21	R5490019
MTBE		<2.0		2.0	ug/L		14-JUN-21	R5490019
Styrene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2,2-Tetrachloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Tetrachloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Toluene		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,1-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
1,1,2-Trichloroethane		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichloroethylene		<0.50		0.50	ug/L		14-JUN-21	R5490019
Trichlorofluoromethane		<5.0		5.0	ug/L		14-JUN-21	R5490019
Vinyl chloride		<0.50		0.50	ug/L		14-JUN-21	R5490019
o-Xylene		<0.30		0.30	ug/L		14-JUN-21	R5490019
m+p-Xylenes		<0.40		0.40	ug/L		14-JUN-21	R5490019
Xylenes (Total)		<0.50		0.50	ug/L		14-JUN-21	
Surrogate: 4-Bromofluorobenzene		93.8		70-130	%		14-JUN-21	R5490019
Surrogate: 1,4-Difluorobenzene		98.3		70-130	%		14-JUN-21	R5490019
<b>Hydrocarbons</b>								
F1 (C6-C10)		<25		25	ug/L		14-JUN-21	R5490019
F1-BTEX		<25		25	ug/L		14-JUN-21	
Surrogate: 3,4-Dichlorotoluene		97.4		60-140	%		14-JUN-21	R5490019

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.  
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg ww - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid weight of sample*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



## Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

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Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>F1-HS-511-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-4</b>	<b>DUP</b>	<b>WG3554064-3</b>						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	14-JUN-21
<b>WG3554064-1</b>	<b>LCS</b>							
F1 (C6-C10)			96.2		%		80-120	14-JUN-21
<b>WG3554064-2</b>	<b>MB</b>							
F1 (C6-C10)			<25		ug/L		25	14-JUN-21
Surrogate: 3,4-Dichlorotoluene			89.6		%		60-140	14-JUN-21
<b>WG3554064-5</b>	<b>MS</b>	<b>L2597621-1</b>						
F1 (C6-C10)			88.9		%		60-140	14-JUN-21
<b>F2-F4-511-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5480626</b>							
<b>WG3549858-2</b>	<b>LCS</b>							
F2 (C10-C16)			116.4		%		70-130	08-JUN-21
F3 (C16-C34)			117.8		%		70-130	08-JUN-21
F4 (C34-C50)			103.1		%		70-130	08-JUN-21
<b>WG3549858-1</b>	<b>MB</b>							
F2 (C10-C16)			<100		ug/L		100	08-JUN-21
F3 (C16-C34)			<250		ug/L		250	08-JUN-21
F4 (C34-C50)			<250		ug/L		250	08-JUN-21
Surrogate: 2-Bromobenzotrifluoride			86.8		%		60-140	08-JUN-21
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-4</b>	<b>DUP</b>	<b>WG3554064-3</b>						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUN-21
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21



## Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

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Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-4</b>	<b>DUP</b>	<b>WG3554064-3</b>						
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	14-JUN-21
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUN-21
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUN-21
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUN-21
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	14-JUN-21
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUN-21
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUN-21
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUN-21
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	14-JUN-21
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUN-21
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUN-21
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUN-21
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUN-21
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUN-21
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUN-21
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUN-21
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUN-21
<b>WG3554064-1</b>	<b>LCS</b>							
1,1,1,2-Tetrachloroethane			94.2		%		70-130	14-JUN-21
1,1,2,2-Tetrachloroethane			96.7		%		70-130	14-JUN-21
1,1,1-Trichloroethane			89.8		%		70-130	14-JUN-21
1,1,2-Trichloroethane			98.3		%		70-130	14-JUN-21



## Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

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Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-1</b>	<b>LCS</b>							
1,1-Dichloroethane			76.1		%		70-130	14-JUN-21
1,1-Dichloroethylene			95.5		%		70-130	14-JUN-21
1,2-Dibromoethane			96.2		%		70-130	14-JUN-21
1,2-Dichlorobenzene			99.5		%		70-130	14-JUN-21
1,2-Dichloroethane			88.9		%		70-130	14-JUN-21
1,2-Dichloropropane			96.6		%		70-130	14-JUN-21
1,3-Dichlorobenzene			101.6		%		70-130	14-JUN-21
1,4-Dichlorobenzene			101.2		%		70-130	14-JUN-21
Acetone			106.6		%		60-140	14-JUN-21
Benzene			94.3		%		70-130	14-JUN-21
Bromodichloromethane			98.9		%		70-130	14-JUN-21
Bromoform			103.1		%		70-130	14-JUN-21
Bromomethane			106.3		%		60-140	14-JUN-21
Carbon tetrachloride			91.1		%		70-130	14-JUN-21
Chlorobenzene			99.8		%		70-130	14-JUN-21
Chloroform			97.5		%		70-130	14-JUN-21
cis-1,2-Dichloroethylene			98.6		%		70-130	14-JUN-21
cis-1,3-Dichloropropene			98.5		%		70-130	14-JUN-21
Dibromochloromethane			92.2		%		70-130	14-JUN-21
Dichlorodifluoromethane			98.0		%		50-140	14-JUN-21
Ethylbenzene			98.0		%		70-130	14-JUN-21
n-Hexane			97.5		%		70-130	14-JUN-21
m+p-Xylenes			101.7		%		70-130	14-JUN-21
Methyl Ethyl Ketone			100.3		%		60-140	14-JUN-21
Methyl Isobutyl Ketone			80.0		%		60-140	14-JUN-21
Methylene Chloride			103.7		%		70-130	14-JUN-21
MTBE			96.6		%		70-130	14-JUN-21
o-Xylene			105.0		%		70-130	14-JUN-21
Styrene			101.5		%		70-130	14-JUN-21
Tetrachloroethylene			101.7		%		70-130	14-JUN-21
Toluene			96.9		%		70-130	14-JUN-21
trans-1,2-Dichloroethylene			100.7		%		70-130	14-JUN-21
trans-1,3-Dichloropropene			99.4		%		70-130	14-JUN-21





## Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

Page 4 of 7

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-1</b>	<b>LCS</b>							
Trichloroethylene			95.5		%		70-130	14-JUN-21
Trichlorofluoromethane			97.3		%		60-140	14-JUN-21
Vinyl chloride			110.1		%		60-140	14-JUN-21
<b>WG3554064-2</b>	<b>MB</b>							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUN-21
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUN-21
1,1,1-Trichloroethane			<0.50		ug/L		0.5	14-JUN-21
1,1,2-Trichloroethane			<0.50		ug/L		0.5	14-JUN-21
1,1-Dichloroethane			<0.50		ug/L		0.5	14-JUN-21
1,1-Dichloroethylene			<0.50		ug/L		0.5	14-JUN-21
1,2-Dibromoethane			<0.20		ug/L		0.2	14-JUN-21
1,2-Dichlorobenzene			<0.50		ug/L		0.5	14-JUN-21
1,2-Dichloroethane			<0.50		ug/L		0.5	14-JUN-21
1,2-Dichloropropane			<0.50		ug/L		0.5	14-JUN-21
1,3-Dichlorobenzene			<0.50		ug/L		0.5	14-JUN-21
1,4-Dichlorobenzene			<0.50		ug/L		0.5	14-JUN-21
Acetone			<30		ug/L		30	14-JUN-21
Benzene			<0.50		ug/L		0.5	14-JUN-21
Bromodichloromethane			<2.0		ug/L		2	14-JUN-21
Bromoform			<5.0		ug/L		5	14-JUN-21
Bromomethane			<0.50		ug/L		0.5	14-JUN-21
Carbon tetrachloride			<0.20		ug/L		0.2	14-JUN-21
Chlorobenzene			<0.50		ug/L		0.5	14-JUN-21
Chloroform			<1.0		ug/L		1	14-JUN-21
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUN-21
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUN-21
Dibromochloromethane			<2.0		ug/L		2	14-JUN-21
Dichlorodifluoromethane			<2.0		ug/L		2	14-JUN-21
Ethylbenzene			<0.50		ug/L		0.5	14-JUN-21
n-Hexane			<0.50		ug/L		0.5	14-JUN-21
m+p-Xylenes			<0.40		ug/L		0.4	14-JUN-21
Methyl Ethyl Ketone			<20		ug/L		20	14-JUN-21
Methyl Isobutyl Ketone			<20		ug/L		20	14-JUN-21
Methylene Chloride			<5.0		ug/L		5	14-JUN-21



## Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

Page 5 of 7

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R5490019</b>							
<b>WG3554064-2 MB</b>								
MTBE			<2.0		ug/L		2	14-JUN-21
o-Xylene			<0.30		ug/L		0.3	14-JUN-21
Styrene			<0.50		ug/L		0.5	14-JUN-21
Tetrachloroethylene			<0.50		ug/L		0.5	14-JUN-21
Toluene			<0.50		ug/L		0.5	14-JUN-21
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUN-21
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUN-21
Trichloroethylene			<0.50		ug/L		0.5	14-JUN-21
Trichlorofluoromethane			<5.0		ug/L		5	14-JUN-21
Vinyl chloride			<0.50		ug/L		0.5	14-JUN-21
Surrogate: 1,4-Difluorobenzene			98.6		%		70-130	14-JUN-21
Surrogate: 4-Bromofluorobenzene			92.3		%		70-130	14-JUN-21
<b>WG3554064-5 MS</b>		<b>L2597621-1</b>						
1,1,1,2-Tetrachloroethane			94.5		%		50-140	14-JUN-21
1,1,2,2-Tetrachloroethane			94.3		%		50-140	14-JUN-21
1,1,1-Trichloroethane			91.4		%		50-140	14-JUN-21
1,1,2-Trichloroethane			95.3		%		50-140	14-JUN-21
1,1-Dichloroethane			94.2		%		50-140	14-JUN-21
1,1-Dichloroethylene			94.8		%		50-140	14-JUN-21
1,2-Dibromoethane			92.6		%		50-140	14-JUN-21
1,2-Dichlorobenzene			97.6		%		50-140	14-JUN-21
1,2-Dichloroethane			87.1		%		50-140	14-JUN-21
1,2-Dichloropropane			95.4		%		50-140	14-JUN-21
1,3-Dichlorobenzene			98.4		%		50-140	14-JUN-21
1,4-Dichlorobenzene			98.0		%		50-140	14-JUN-21
Acetone			97.9		%		50-140	14-JUN-21
Benzene			93.4		%		50-140	14-JUN-21
Bromodichloromethane			99.2		%		50-140	14-JUN-21
Bromoform			102.8		%		50-140	14-JUN-21
Bromomethane			101.6		%		50-140	14-JUN-21
Carbon tetrachloride			93.8		%		50-140	14-JUN-21
Chlorobenzene			98.2		%		50-140	14-JUN-21
Chloroform			97.8		%		50-140	14-JUN-21
cis-1,2-Dichloroethylene			97.6		%		50-140	14-JUN-21



# Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

Page 6 of 7

Client:

WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact:

Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5490019							
WG3554064-5	MS	L2597621-1						
cis-1,3-Dichloropropene			91.7		%		50-140	14-JUN-21
Dibromochloromethane			91.3		%		50-140	14-JUN-21
Dichlorodifluoromethane			94.0		%		50-140	14-JUN-21
Ethylbenzene			95.5		%		50-140	14-JUN-21
n-Hexane			95.3		%		50-140	14-JUN-21
m+p-Xylenes			99.6		%		50-140	14-JUN-21
Methyl Ethyl Ketone			89.4		%		50-140	14-JUN-21
Methyl Isobutyl Ketone			76.0		%		50-140	14-JUN-21
Methylene Chloride			102.4		%		50-140	14-JUN-21
MTBE			95.2		%		50-140	14-JUN-21
o-Xylene			103.0		%		50-140	14-JUN-21
Styrene			99.5		%		50-140	14-JUN-21
Tetrachloroethylene			101.2		%		50-140	14-JUN-21
Toluene			94.4		%		50-140	14-JUN-21
trans-1,2-Dichloroethylene			99.6		%		50-140	14-JUN-21
trans-1,3-Dichloropropene			89.4		%		50-140	14-JUN-21
Trichloroethylene			97.0		%		50-140	14-JUN-21
Trichlorofluoromethane			98.2		%		50-140	14-JUN-21
Vinyl chloride			106.8		%		50-140	14-JUN-21

# Quality Control Report

Workorder: L2597621

Report Date: 14-JUN-21

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Page 7 of 7

Contact: Amy Chiang

## Legend:

---

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

---

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

---

## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

---

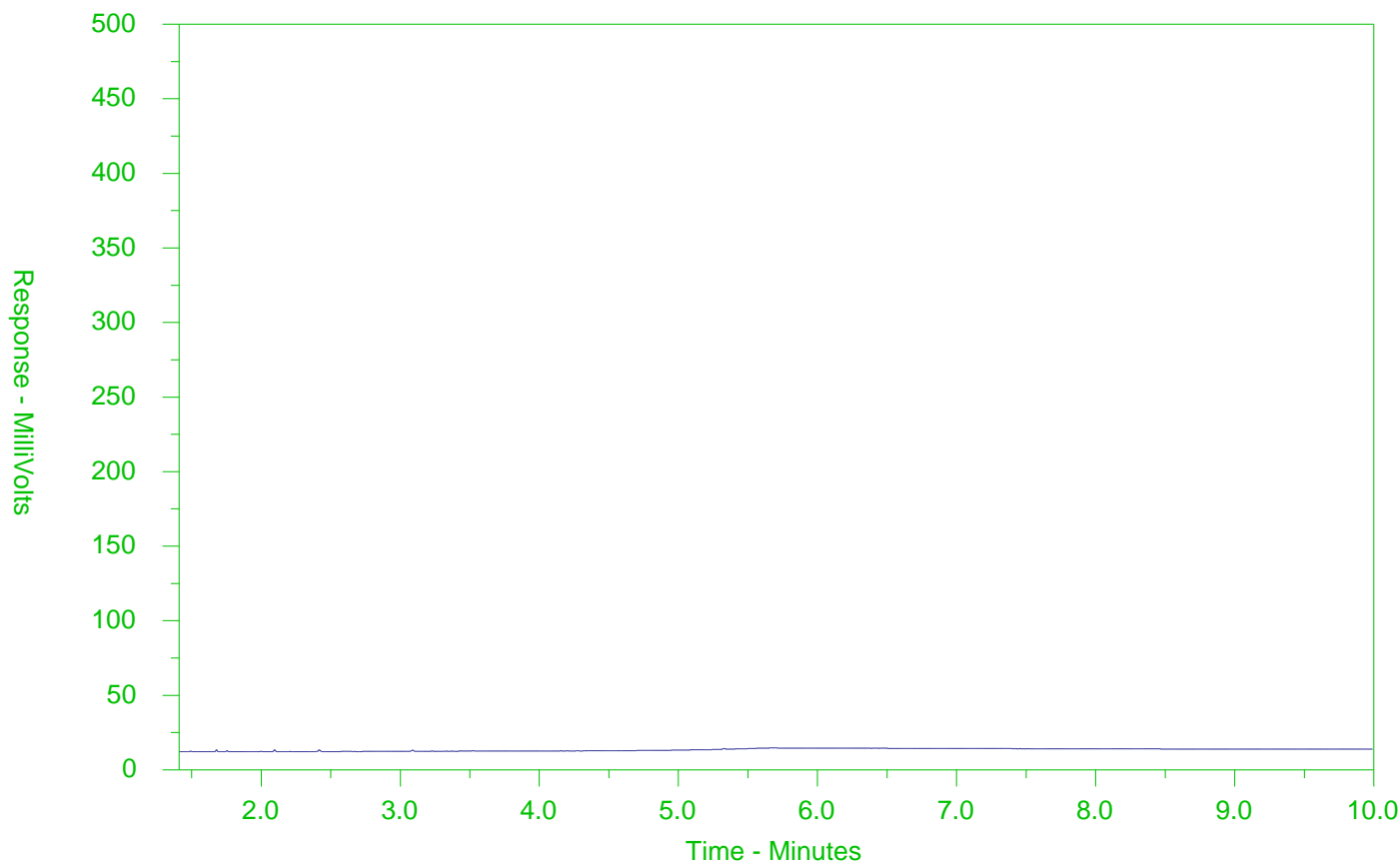
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2597621-1  
Client Sample ID: MW21-4



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

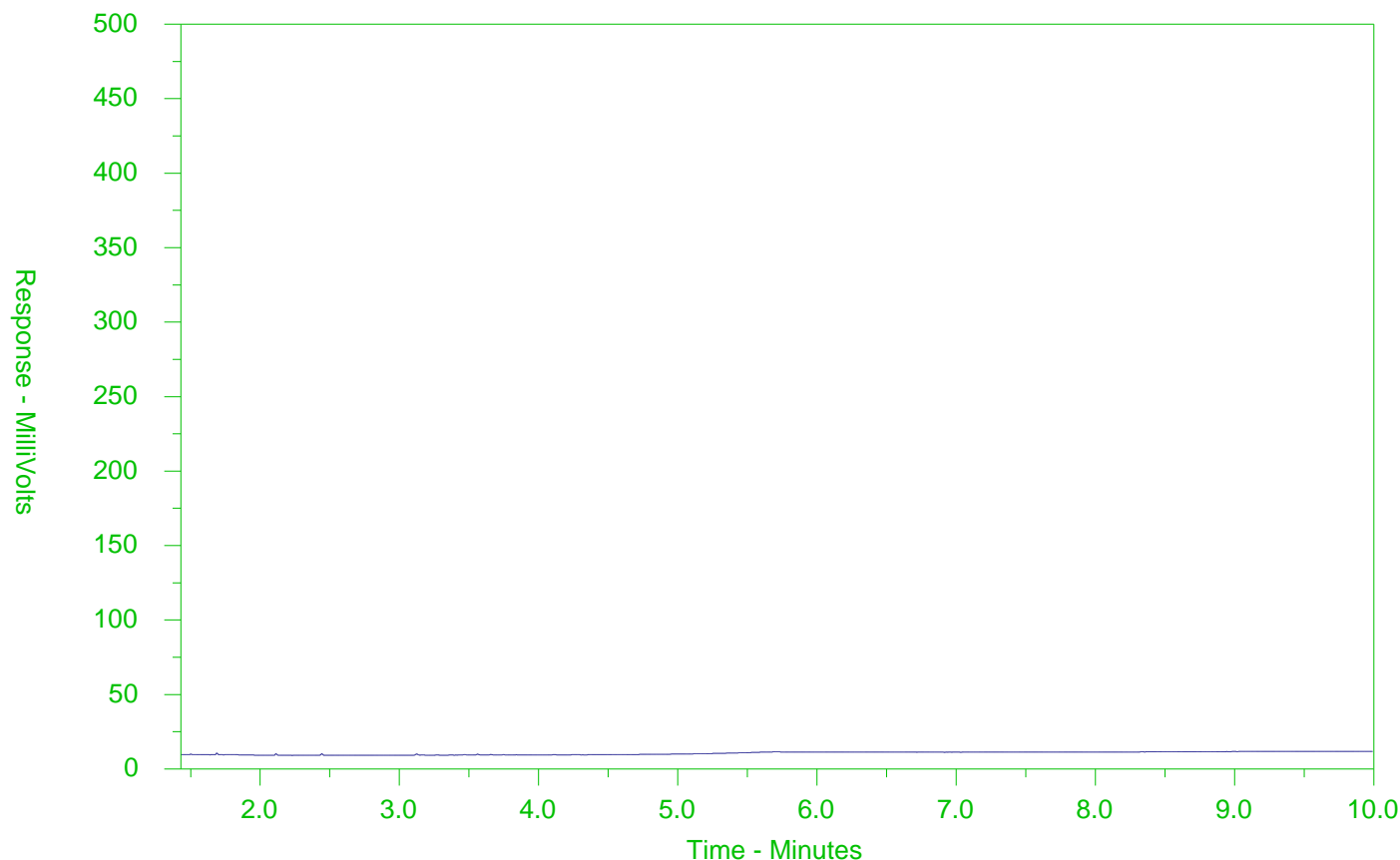
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2597621-2  
Client Sample ID: DUP 01



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

[illegible]

L2597621-COFC

COC Number: 20 - 911246

Page 0

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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**.

AUG 2020 EBC



WSP Canada Inc. (Oakville)  
ATTN: Amy Chiang  
610 Chartwell Road  
Suite 300  
Oakville ON L6J 4A5

Date Received: 28-MAY-21  
Report Date: 07-JUN-21 09:19 (MT)  
Version: FINAL

Client Phone: 289-982-4018

## Certificate of Analysis

Lab Work Order #: L2593575

Project P.O. #: 211-03319-00-200-2002

Job Reference: 211-03319-00-200-2002

C of C Numbers: 20-895007

Legal Site Desc:

Emily Hansen  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 5730 Coopers Avenue, Unit #26, Mississauga, ON L4Z 2E9 Canada | Phone: +1 905 507 6910 | Fax: +1 905 507 6927  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company







# ANALYTICAL REPORT

## Physical Tests - WASTE

		Lab ID	L2593575-1	
		Sample Date	20-MAY-21	
		Sample ID	TCLP	
Analyte	Unit	Guide Limits		
		#1	#2	
Air Velocity Of Fume Hood	m/sec	-	-	0.22
Burning Rate	mm/sec	-	-	NA
Ignitability-Class		-	-	NON-FLAMMABLE
Samp Comment		-	-	BROWN CLAYEY SOIL
Temperature Of Test Material	Deg. C	-	-	22.0
Time To Ignition	sec	-	-	NA

**Guide Limit #1: Ontario Ministry of the Environment, General Waste Control Regulation No. 347/90**

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.



## ANALYTICAL REPORT

## TCLP VOCs - WASTE

		Lab ID	L2593575-1	
		Sample Date	20-MAY-21	
		Sample ID	TCLP	
		Guide Limits		
Analyte	Unit	#1	#2	
1,1-Dichloroethylene	mg/L	1.4	-	<0.025
1,2-Dichlorobenzene	mg/L	20.0	-	<0.025
1,2-Dichloroethane	mg/L	0.5	-	<0.025
1,4-Dichlorobenzene	mg/L	0.5	-	<0.025
Benzene	mg/L	0.5	-	<0.025
Carbon tetrachloride	mg/L	0.5	-	<0.025
Chlorobenzene	mg/L	8	-	<0.025
Chloroform	mg/L	10	-	<0.10
Dichloromethane	mg/L	5.0	-	<0.50
Methyl Ethyl Ketone	mg/L	200.0	-	<1.0
Tetrachloroethylene	mg/L	3	-	<0.025
Trichloroethylene	mg/L	5	-	<0.025
Vinyl chloride	mg/L	0.2	-	<0.050
Surrogate: 4-Bromofluorobenzene	%	-	-	93.8

**Guide Limit #1: Ontario Ministry of the Environment, General Waste Control Regulation No. 347/90**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.



# ANALYTICAL REPORT

## Volatile Organic Compounds - WASTE

**Lab ID** L2593575-1  
**Sample Date** 20-MAY-21  
**Sample ID** TCLP

Analyte	Unit	Guide Limits		
		#1	#2	
Surrogate: 1,4-Difluorobenzene	%	-	-	101.4

**Guide Limit #1: Ontario Ministry of the Environment, General Waste Control Regulation No. 347/90**

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.  
 Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

# Reference Information

L2593575 CONT'D....  
 Job Reference: 211-03319-00-200-2002  
 PAGE 6 of 6  
 07-JUN-21 09:19 (MT)

## Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
<b>IGNITABILITY-WT</b>	Waste	O. Reg 347 Ignitability	EPA SW846, Method 1030, 1996
Preliminary Screening Test: Prepare a sample "as received" 250 mm long by 20 mm wide by 10 mm high. Apply the tip of the flame to the end of the sample strip. If the sample is non-metallic, hold the flame tip on the sample until the sample ignites or for a maximum of 2 minutes. If combustion occurs, begin timing with a stop watch and note whether the sample propagates up to the 200 mm mark within the 2 minute test period. If the sample is metal or metal alloy powder, hold the flame tip on the sample until the sample ignites or for a maximum of 5 minutes. If combustion occurs, begin timing with a stop watch and note whether the sample propagates up to the 200 mm mark within the 20 minute test period. Note: If the waste propagates burning of 200 mm of the test strip within 2 minutes (20 minutes for metals), the material must be evaluated by the burning rate test. Burning Rate Test: Refer to section 7.2 of EPA Method 1030. Samples that have a burning rate of greater than 2.2 mm/s are considered to have a positive result for ignitability according to DOT regulations. For metallic samples, the burning rate must be greater than 0.17 mm/s.			
<b>VOC-TCLP-WT</b>	Waste	VOC for O. Reg 347	SW846 8260
A sample of waste is leached in a zero headspace extractor at 30–2 rpm for 18–2.0 hours with the appropriate leaching solution. After tumbling the leachate is analyzed directly by headspace technology, followed by GC/MS using internal standard quantitation.			

\*\*ALS test methods may incorporate modifications from specified reference methods to improve performance.

## Chain of Custody Numbers:

20-895007

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

## GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg ww - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

*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. Guideline limits 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.*



## Quality Control Report

Workorder: L2593575

Report Date: 07-JUN-21

Page 1 of 3

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-TCLP-WT</b>		<b>Waste</b>						
<b>Batch</b>	<b>R5478938</b>							
<b>WG3548494-1</b>	<b>LCS</b>							
1,1-Dichloroethylene			103.6		%		70-130	05-JUN-21
1,2-Dichlorobenzene			101.1		%		70-130	05-JUN-21
1,2-Dichloroethane			85.3		%		70-130	05-JUN-21
1,4-Dichlorobenzene			93.3		%		70-130	05-JUN-21
Benzene			94.8		%		70-130	05-JUN-21
Carbon tetrachloride			103.7		%		60-140	05-JUN-21
Chlorobenzene			97.9		%		70-130	05-JUN-21
Chloroform			97.1		%		70-130	05-JUN-21
Dichloromethane			88.7		%		70-130	05-JUN-21
Methyl Ethyl Ketone			85.0		%		50-150	05-JUN-21
Tetrachloroethylene			103.1		%		70-130	05-JUN-21
Trichloroethylene			103.7		%		70-130	05-JUN-21
Vinyl chloride			111.0		%		60-130	05-JUN-21
<b>WG3548494-2</b>	<b>MB</b>							
1,1-Dichloroethylene			<0.025		mg/L		0.025	05-JUN-21
1,2-Dichlorobenzene			<0.025		mg/L		0.025	05-JUN-21
1,2-Dichloroethane			<0.025		mg/L		0.025	05-JUN-21
1,4-Dichlorobenzene			<0.025		mg/L		0.025	05-JUN-21
Benzene			<0.025		mg/L		0.025	05-JUN-21
Carbon tetrachloride			<0.025		mg/L		0.025	05-JUN-21
Chlorobenzene			<0.025		mg/L		0.025	05-JUN-21
Chloroform			<0.10		mg/L		0.1	05-JUN-21
Dichloromethane			<0.50		mg/L		0.5	05-JUN-21
Methyl Ethyl Ketone			<1.0		mg/L		1	05-JUN-21
Tetrachloroethylene			<0.025		mg/L		0.025	05-JUN-21
Trichloroethylene			<0.025		mg/L		0.025	05-JUN-21
Vinyl chloride			<0.050		mg/L		0.05	05-JUN-21
Surrogate: 1,4-Difluorobenzene			101.8		%		70-130	05-JUN-21
Surrogate: 4-Bromofluorobenzene			91.8		%		70-130	05-JUN-21
<b>WG3548494-4</b>	<b>MS</b>	<b>WG3548494-3</b>						
1,1-Dichloroethylene			105.6		%		50-140	05-JUN-21
1,2-Dichlorobenzene			102.1		%		50-140	05-JUN-21
1,2-Dichloroethane			89.8		%		50-140	05-JUN-21
1,4-Dichlorobenzene			92.5		%		50-140	05-JUN-21



## Quality Control Report

Workorder: L2593575

Report Date: 07-JUN-21

Page 2 of 3

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Contact: Amy Chiang

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-TCLP-WT	Waste							
Batch	R5478938							
WG3548494-4	MS	WG3548494-3						
Benzene			97.9		%		50-140	05-JUN-21
Carbon tetrachloride			105.4		%		50-140	05-JUN-21
Chlorobenzene			99.6		%		50-140	05-JUN-21
Chloroform			100.7		%		50-140	05-JUN-21
Dichloromethane			92.3		%		50-140	05-JUN-21
Methyl Ethyl Ketone			89.9		%		50-140	05-JUN-21
Tetrachloroethylene			102.8		%		50-140	05-JUN-21
Trichloroethylene			104.9		%		50-140	05-JUN-21
Vinyl chloride			114.6		%		50-140	05-JUN-21

# Quality Control Report

Workorder: L2593575

Report Date: 07-JUN-21

Client: WSP Canada Inc. (Oakville)  
610 Chartwell Road Suite 300  
Oakville ON L6J 4A5

Page 3 of 3

Contact: Amy Chiang

## Legend:

---

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

---

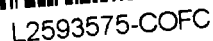
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.





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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

AUG 2020 FROM

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**.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2419302	Page	: 1 of 4
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 11-Jul-2024 09:00
PO	: ----	Date Analysis Commenced	: 12-Jul-2024
C-O-C number	: ----	Issue Date	: 17-Jul-2024 11:27
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

Signatories

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

Signatories	Position	Laboratory Department
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, 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.

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

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

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

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

Unit	Description
-	no units
µg/L	micrograms per litre

>: 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.

### Qualifiers

Qualifier	Description
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	BH115	BH117	BH118	BH119	BH106D	DUP-16D	----
				Sampling date/time	10-Jul-2024 09:15	10-Jul-2024 10:20	10-Jul-2024 11:30	10-Jul-2024 12:45	10-Jul-2024 15:15	10-Jul-2024 15:15	----
				Sub-Matrix	Water	Water	Water	Water	Water	Water	----
Analyte	CAS Number	Method/Lab	Unit		WT2419302-001	WT2419302-002	WT2419302-003	WT2419302-004	WT2419302-005	WT2419302-006	-----
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----
Ethylbenzene	100-41-4	E611A/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----
Toluene	108-88-3	E611A/WT	µg/L		<0.50	<0.50	<0.50	<0.50	0.71 <sup>OWP</sup>	0.59 <sup>OWP</sup>	----
Xylene, m+p-	179601-23-1	E611A/WT	µg/L		<0.40	<0.40	<0.40	<0.40	0.42 <sup>OWP</sup>	<0.40	----
Xylene, o-	95-47-6	E611A/WT	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	----
Xylenes, total	1330-20-7	E611A/WT	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	----
BTEX, total	----	E611A/WT	µg/L		<1.0	<1.0	<1.0	<1.0	1.1	<1.0	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1-L/WT	µg/L		<25	<25	<25	<25	<25	<25	----
F2 (C10-C16)	----	E601.SG/WT	µg/L		<100	<100	<100	<100	<100	<100	----
F3 (C16-C34)	----	E601.SG/WT	µg/L		<250	<250	<250	<250	<250	<250	----
F4 (C34-C50)	----	E601.SG/WT	µg/L		<250	<250	<250	<250	<250	<250	----
F1-BTEX	----	EC580/WT	µg/L		<25	<25	<25	<25	<25	<25	----
Hydrocarbons, total (C6-C50)	n/a	EC581SG/WT	µg/L		<370	<370	<370	<370	<370	<370	----
Chromatogram to baseline at nC50	n/a	E601.SG/WT	-		YES	YES	YES	YES	YES	YES	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG/WT	%		82.6	81.3	84.1	85.6	79.1	84.0	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1-L/WT	%		92.1	90.1	93.1	93.1	79.8	76.2	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	%		103	103	103	104	102	101	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	%		95.6	95.9	95.4	95.8	95.9	95.6	----

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

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



## Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T2-GW-C-All						
<b>Volatile Organic Compounds</b>									
Benzene	71-43-2	µg/L	5 µg/L						
BTEX, total	----	µg/L	--						
Ethylbenzene	100-41-4	µg/L	2.4 µg/L						
Toluene	108-88-3	µg/L	24 µg/L						
Xylene, m+p-	179601-23-1	µg/L	--						
Xylene, o-	95-47-6	µg/L	--						
Xylenes, total	1330-20-7	µg/L	300 µg/L						
<b>Hydrocarbons</b>									
Chromatogram to baseline at nC50	n/a	-	--						
F1 (C6-C10)	----	µg/L	750 µg/L						
F1-BTEX	----	µg/L	750 µg/L						
F2 (C10-C16)	----	µg/L	150 µg/L						
F3 (C16-C34)	----	µg/L	500 µg/L						
F4 (C34-C50)	----	µg/L	500 µg/L						
Hydrocarbons, total (C6-C50)	n/a	µg/L	--						
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	%	--						
Dichlorotoluene, 3,4-	95-75-0	%	--						
Bromofluorobenzene, 4-	460-00-4	%	--						
Difluorobenzene, 1,4-	540-36-3	%	--						

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

### Key:

ON153/04

Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)

T2-GW-C-All

153 T2-Ground Water (Coarse Soil)-All Types of Property Use

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2419302	Page	: 1 of 7
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 11-Jul-2024 09:00
PO	: ----	Issue Date	: 17-Jul-2024 11:28
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 6		
No. of samples analysed	: 6		

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)***

- No Analysis Holding Time Outliers exist.

### ***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	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) BH106D	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) DUP-16D	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) BH119	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) BH115	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) BH117	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) BH118	E581.F1-L	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BH106D	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓



Page : 4 of 7  
 Work Order : WT2419302  
 Client : Grounded Engineering Inc.  
 Project : 24-048



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	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BH115	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BH117	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BH118	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BH119	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DUP-16D	E601.SG	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	15-Jul-2024	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) BH106D	E611A	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP-16D	E611A	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) BH119	E611A	10-Jul-2024	12-Jul-2024	14 days	1 days	✓	12-Jul-2024	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) BH115	E611A	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓

Page : 5 of 7  
 Work Order : WT2419302  
 Client : Grounded Engineering Inc.  
 Project : 24-048



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	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) BH117	E611A	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) BH118	E611A	10-Jul-2024	12-Jul-2024	14 days	2 days	✓	12-Jul-2024	14 days	2 days	✓

Legend & Qualifier Definitions

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



## Quality Control Parameter Frequency Compliance

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

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	1540717	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1540716	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	1540717	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1540716	1	19	5.2	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	1540944	1	15	6.6	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	1540717	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1540716	1	19	5.2	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	1540944	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1540717	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1540716	1	19	5.2	5.0	✓



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L  ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1 (mod)	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG  ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1 (mod)	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4).  Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A  ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
F1-BTEX	EC580  ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
SUM F1 to F4 where F2-F4 is SG treated	EC581SG  ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fraction F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50), where F2-F4 have been treated with silica gel. F4G-sg is not used within this calculation due to overlap with other fractions.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581  ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601  ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: WT2419302	Page	: 1 of 5
Client	: Grounded Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Lindsay Levesque	Account Manager	: Amanda Overholster
Address	: 1 Banigan Drive Toronto ON Canada M4H 1G3	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 24-048	Date Samples Received	: 11-Jul-2024 09:00
PO	: ----	Date Analysis Commenced	: 12-Jul-2024
C-O-C number	: ----	Issue Date	: 17-Jul-2024 11:28
Sampler	: CLIENT		
Site	: ----		
Quote number	: 2024 SOA Pricing		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Laboratory Department
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario



General Comments

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

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 1540717)											
WT2419425-001	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1540716)											
WT2419425-001	Anonymous	F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	<25	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
Volatile Organic Compounds (QCLot: 1540717)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1540716)						
F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	----
Hydrocarbons (QCLot: 1540944)						
F2 (C10-C16)	----	E601.SG	100	µg/L	<100	----
F3 (C16-C34)	----	E601.SG	250	µg/L	<250	----
F4 (C34-C50)	----	E601.SG	250	µg/L	<250	----



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
Volatile Organic Compounds (QCLot: 1540717)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	112	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	113	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	115	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	115	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	113	70.0	130	----
Hydrocarbons (QCLot: 1540716)									
F1 (C6-C10)	----	E581.F1-L	25	µg/L	2000 µg/L	102	80.0	120	----
Hydrocarbons (QCLot: 1540944)									
F2 (C10-C16)	----	E601.SG	100	µg/L	4010 µg/L	88.0	70.0	130	----
F3 (C16-C34)	----	E601.SG	250	µg/L	8300 µg/L	95.3	70.0	130	----
F4 (C34-C50)	----	E601.SG	250	µg/L	4360 µg/L	114	70.0	130	----

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

Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1540717)										
WT2419425-001	Anonymous	Benzene	71-43-2	E611A	105 µg/L	100 µg/L	105	60.0	140	----
		Ethylbenzene	100-41-4	E611A	107 µg/L	100 µg/L	107	60.0	140	----
		Toluene	108-88-3	E611A	110 µg/L	100 µg/L	110	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	217 µg/L	200 µg/L	109	60.0	140	----
		Xylene, o-	95-47-6	E611A	107 µg/L	100 µg/L	107	60.0	140	----
Hydrocarbons (QCLot: 1540716)										
WT2419425-001	Anonymous	F1 (C6-C10)	----	E581.F1-L	1620 µg/L	2000 µg/L	81.0	60.0	140	----

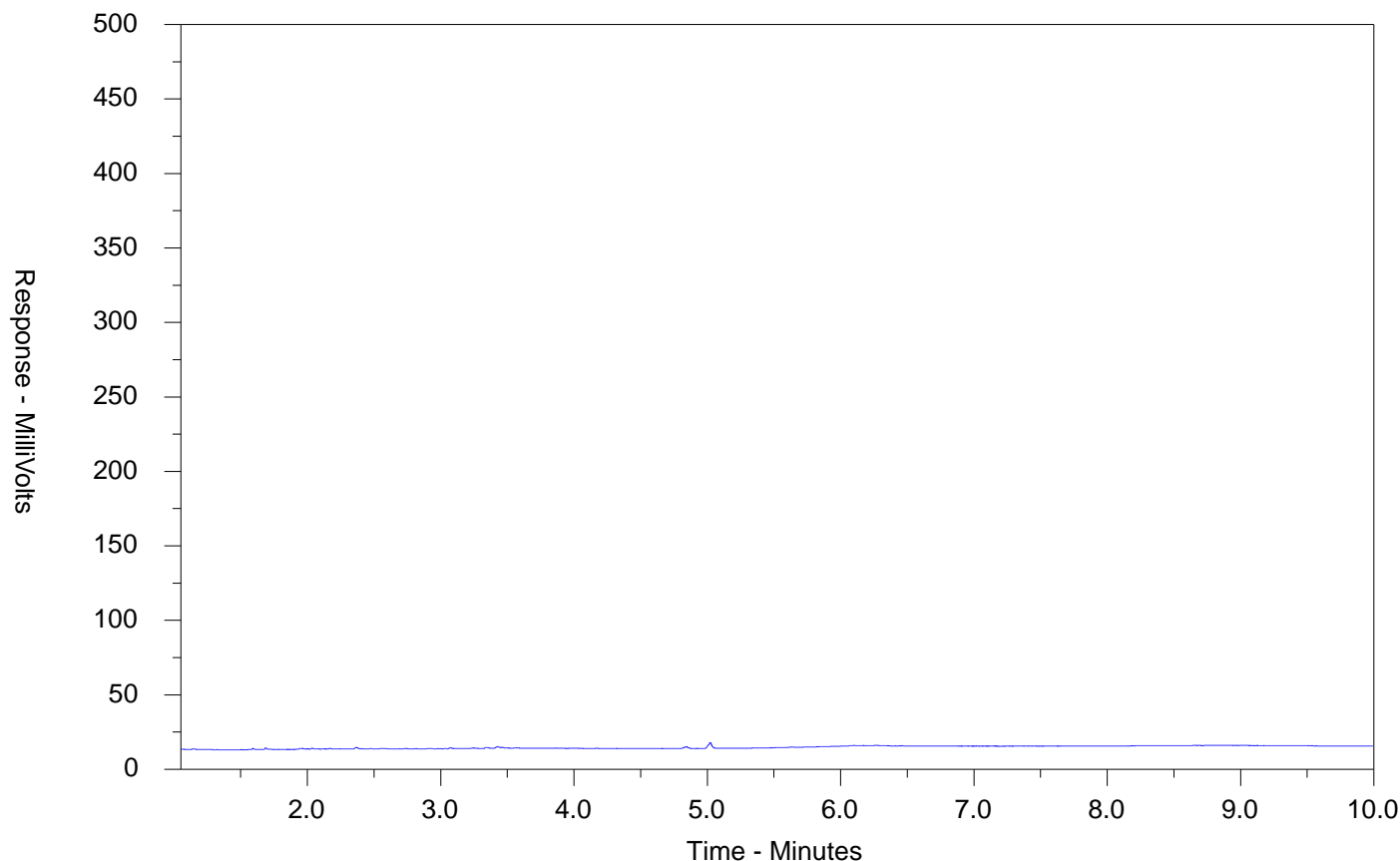




## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-001-E601.SG  
Client Sample ID: BH115



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

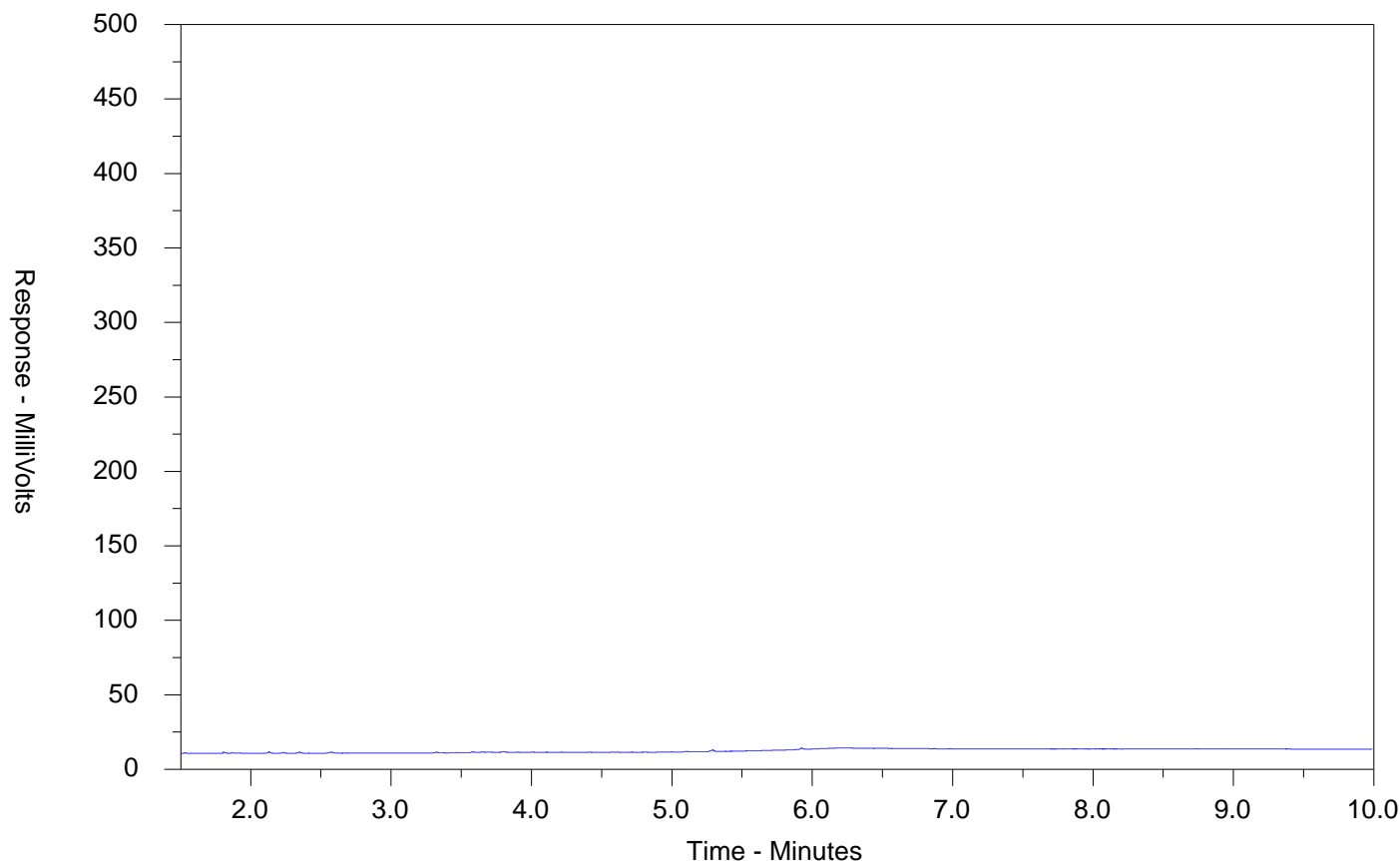
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-002-E601.SG  
Client Sample ID: BH117



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

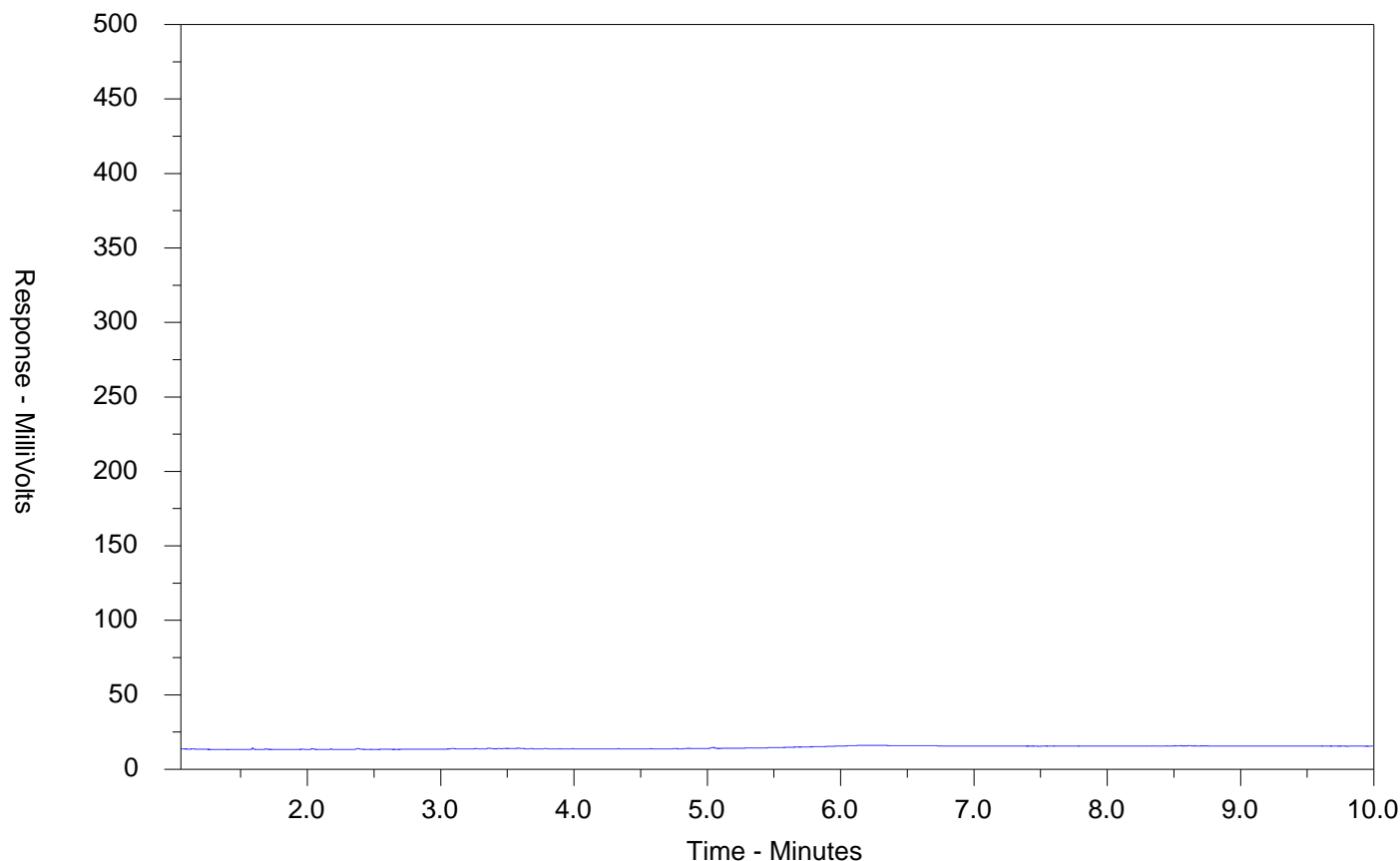
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-003-E601.SG  
 Client Sample ID: BH118



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

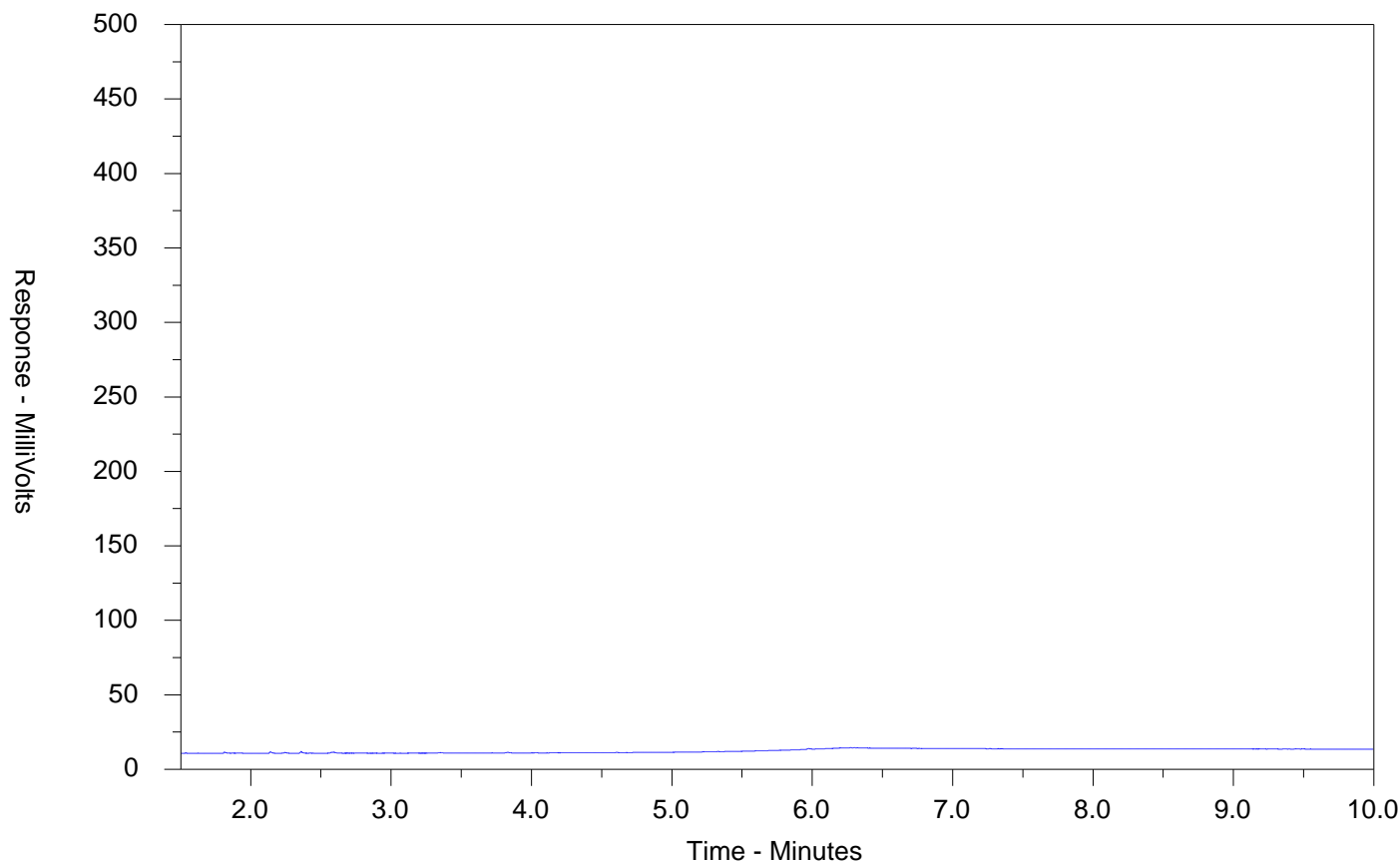
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-004-E601.SG  
 Client Sample ID: BH119



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

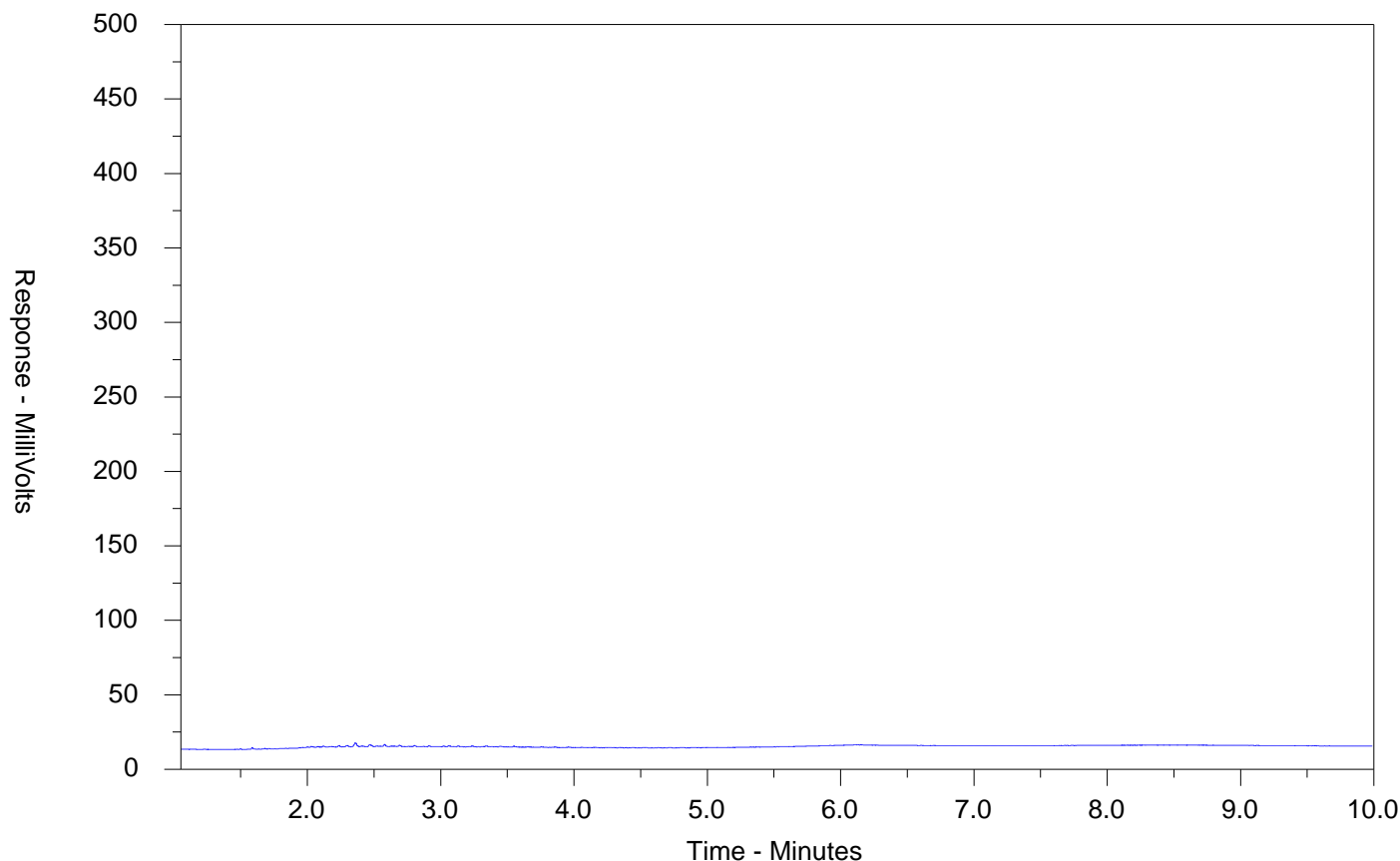
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-005-E601.SG  
 Client Sample ID: BH106D



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

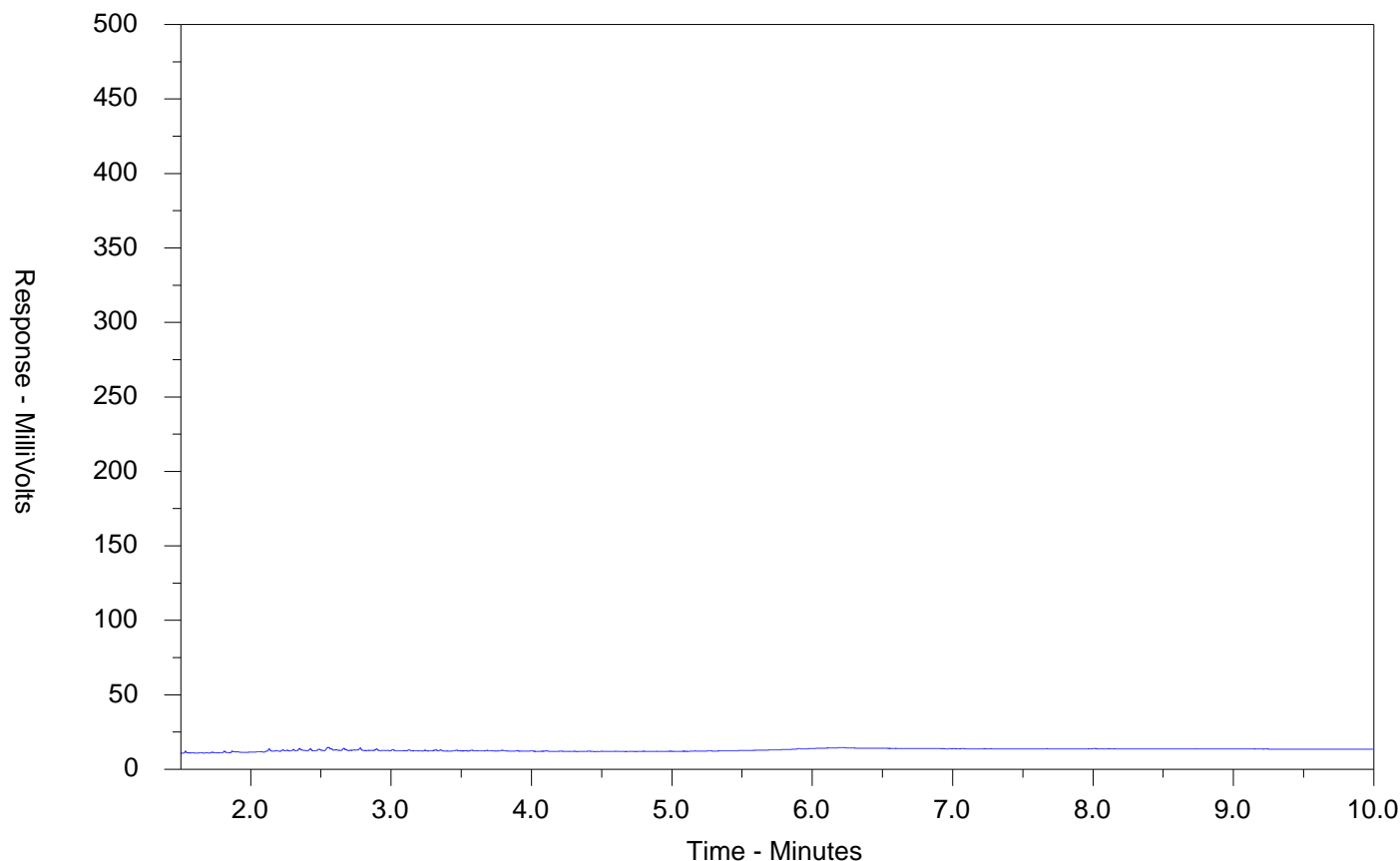
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

## CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2419302-006-E601.SG  
Client Sample ID: DUP-16D



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

**Note:** This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

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Canada Toll Free: 1 800 668 9878

Environmental Division  
Waterloo

www.alsglobal.com

Work Order Reference

WT2419302

<b>Report To</b> Company: Grounded Engineering Inc. Contact: Lindsay Levesque Phone: 647-361-5254 Company address below will appear on the final report Street: 1 Banigan Drive City/Province: Toronto, Ontario Postal Code: M4H 1G3 Invoice To: Same as Report To Copy of Invoice with Report: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Grounded Engineering Inc. Contact: Accounts Payable	<b>Reports / Recipients</b> Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDO (DIGITAL) Merge QC/QCI Reports with COA: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: lvevesque@groundedeng.ca Email 2: Email 3: Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: lvevesque@groundedeng.ca Email 2: Email 3:	<b>Turnaround Time (TAT) Request</b> <input checked="" type="checkbox"/> Routine (R) if received by 3pm M-F - no surcharge <input type="checkbox"/> 4 day (P4) if received by 3pm M-F - 20% rush sur <input type="checkbox"/> 3 day (P3) if received by 3pm M-F - 25% rush sur <input type="checkbox"/> 2 day (P2) if received by 3pm M-F - 50% rush sur <input type="checkbox"/> 1 day (E) if received by 3pm M-F - 100% rush sur <input type="checkbox"/> Same day (E2) if received by 10am M-S - 200% r Additional fees may apply to rush requests Data and Time Required for all E&P TATs: For all tests with rush TATs request:
---	--	---

<b>Project Information</b> ALS Account # / Quote # WT2024GENG1000001 Job #: 24-048 PO / AFE: LSD:		<b>Oil and Gas Required Fields (client use)</b> AFE/Cost Center: Major/Minor Code: Requisitioner: Location:		<b>ALS Contact:</b> Amanda Overholster Date: 10-07-24 Time (hh:mm): 11:15 Sample Type: GW BHL15 BHL17 BHL18 BHL19 BHL10LD BHL-16D		<b>Sampler:</b> Date: 10-07-24 Time (hh:mm): 10:30 11:30 12:45 15:15 15:15		<b>Field Parameters:</b> Field pH Field Temperature		<b>Analysis Request</b> SUSPECTED HAZARD (see notes) EXTENDED STORAGE REQUIRED SAMPLES ON HOLD	
---	--	---	--	---	--	--	--	---	--	---	--

<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b> Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO	<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b> Table 2 R1F CT		<b>SHIPMENT RELEASE (client use)</b> Released by: BSW Date: 10/07/24 Time: 17:30		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b> Received by: Date: Time:		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b> Received by: Date: July 11 2024 Time: 9:00	
<b>Submission Comments identified on Sample Receipt Notification:</b> <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> COOLING INITIATED <b>Cooler Custody Seals Intact:</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A <b>Sample Custody Seals Intact:</b> <input type="checkbox"/> YES <input type="checkbox"/> N/A <b>INITIAL COOLER TEMPERATURES °C:</b> <b>FINAL COOLER TEMPERATURES °C:</b>								

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION  
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



# PHASE TWO CONCEPTUAL SITE MODEL

**16469 10 Side Road | Halton Hills,  
Ontario**

**PREPARED FOR:**

Russel Pines Property Corp  
5400 Yonge Street, Fifth Floor  
Toronto, ON

**ATTENTION:**

Maria Herrera

**Grounded Engineering Inc.**

**File No.** 24-048

**Issued** August 8, 2024



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# 1 Introduction

## 1.1 Site Description

The Phase Two Property is located at the municipal address of 16469 10 Side Road, Halton Hills, Ontario (the Property). The site location is presented in Figure 1.

The Property is irregular in shape, with an approximate area of 53.28 ha. The Property consists of undeveloped land, agricultural land, two residential homes and a former barn and other structures associated with farming operation. The Property is currently Agricultural Land use as defined in O.Reg.153/04. The Phase Two ESA has been prepared for due diligence and in accordance with Ontario Regulation 153/04 (O.Reg. 153/04). It is understood that the Phase Two Property will be developed with a residential development. Under Ontario Regulation 153/04 (O.Reg. 153/04), the future land use of the Property would be considered residential.

## 1.2 Property Ownership

The Property information is provided below:

<b>Municipal Address</b>	16469 10 Side Road, Halton Hills, Ontario.
<b>Legal Description</b>	Part Lots 11 & 12 Con 11 Esquesing, Part 1, 20R21398
<b>PIN(s)</b>	25050-2997 (LT)
<b>Current Land Use</b>	Agriculture
<b>Property Owner Information</b>	Russell Pines Property Corp. 5400 Yonge Street, Fifth Floor Toronto, Ontario, M2N 5R5
<b>Person who has engaged the Qualified Person to conduct the Phase One ESA</b>	Maria Herrera

## 1.3 Summary of Previous Investigations

The following environmental report was provided for review for the Property. The findings of the report are summarized below:

<b>Title and File No.</b>	Phase One Environmental Site Assessment, Proposed Residential Development, 15 Green Street (or 16469 10 Side Road) Town of Halton Hills. (File No. 1502-S023E)
<b>Report Date</b>	June 12, 2015



<b>Prepared By</b>	Soils Engineers Ltd.
<b>Prepared for</b>	Fieldgate Developments Inc.



<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• The Phase One ESA was completed for the purposes of identifying potential environmental concerns associated with the Property and was generally completed in accordance with O.Reg. 153/04.</li> <li>• At the time of the site inspection completed on March 27, 2015 the Property was mainly used for agricultural purposes and was occupied by the following: <ul style="list-style-type: none"> <li>○ One (1) residential building, one (1) garage, two (2) barns and a water pump house in the central portion of the Property (15 Green Street). <ul style="list-style-type: none"> <li>▪ The basement contained one (1) 200 L AST installed in 1997. No staining was observed beneath the AST, however, a large crack was observed on the concrete floor beside the AST.</li> <li>▪ Substance containers (gasoline jerry cans and used oil containers) were observed in the garage.</li> </ul> </li> <li>○ One (1) residential building and one (1) garage in the southeastern portion of the Property (35 Adamson Street South). <ul style="list-style-type: none"> <li>▪ The basement contained one (1) 200 L AST installed in 2009. No staining or crack was observed beneath the AST.</li> </ul> </li> <li>○ A wooded area and orchard located in the north-central portion of the Property.</li> <li>○ Agricultural fields in the remaining areas.</li> <li>○ The Property was reportedly heated by fuel oil fired boiler and serviced by a septic system and a water well.</li> </ul> </li> <li>• Based on interviews previously conducted in 2015, it was noted that: <ul style="list-style-type: none"> <li>○ A series of ASTs and propane gas vessels were located along the southwest side of the residential building located in the central portion of the Property.</li> <li>○ A heating oil UST was formerly located on the east side of the residential building located in the central portion of the Property but was removed in 1997. During the removal of the UST, fuel spillage was observed.</li> </ul> </li> <li>• The report identified the following APEC causing PCAs: <ul style="list-style-type: none"> <li>○ Application of pesticides for agricultural activities was present on the entire Property.</li> <li>○ Application of pesticides for the orchard was present on the north-central portion of the Property.</li> <li>○ Historical gasoline station (Norval Gas Bar) with retail fuel storage tanks present at 488 Green Street (Grounded notes that this gas bar is listed as 488 Guelph Street in the ERIS report).</li> <li>○ Autobody shop (Arnie's Body Shop) present at 490 Green Street.</li> <li>○ USTs, ASTs, and substance containers were present on the central portion of the Property.</li> <li>○ Farm equipment and vehicle maintenance activities were present on the central portion of the Property.</li> </ul> </li> <li>• The report identified designated substances and special attention items to be considered prior to any renovation or demolition: <ul style="list-style-type: none"> <li>○ Lead and asbestos in building materials</li> <li>○ PCBs in light ballasts</li> </ul> </li> </ul>
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<b>Title and File No.</b>	A Geotechnical Investigation For Proposed Residential Development, 15 Green Street of Halton Hills. (File No. 2004-S054)
<b>Report Date</b>	August 27, 2020
<b>Prepared By</b>	Soils Engineers Ltd.
<b>Prepared for</b>	Russell Pines Property Corp.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• The report was completed for the purposes of determining design data required for the design and construction of a residential development.</li> <li>• The Property was reportedly occupied by an open field with tree areas.</li> <li>• Four (4) boreholes (BH101 to BH104) were advanced in June 2020 to a depth of 6.1 to 6.6 m below ground surface (bgs).</li> <li>• The soil stratigraphy encountered at the Property was generally a layer of topsoil overlying earth fill in certain areas, followed by native silty clay and silty clay till, with compact to very dense sand and silt deposits, overlying shale bedrock.</li> <li>• Groundwater was measured at approximately 1.2 to 2.6 mbgs.</li> <li>• No environmental sampling was conducted in the</li> </ul>

<b>Title and File No.</b>	Phase One Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 211-03319-00-Ph1ESA)
<b>Report Date</b>	August 19, 2021
<b>Prepared By</b>	WSP Canada Inc.
<b>Prepared for</b>	Russell Pines Property Corp.





<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• The Phase One ESA was completed for the purposes of identifying potential environmental concerns associated with the Property and was generally completed in accordance with O.Reg. 153/04.</li> <li>• The site encompasses the north portion of the Property located at 16469 10 Sideroad, legally described as Pt. Lots 11 &amp; 12 Concession 11 ESQ; Part 1, 20R21398 Town of Halton Hills. The Phase One ESA was not completed on the entire Property.</li> <li>• At the time of the site inspection completed on March 29, 2021 the Property was an undeveloped land covered by forested, grassed, and graveled areas. <ul style="list-style-type: none"> <li>○ No ASTs or USTs were identified on-site.</li> </ul> </li> <li>• Based on interview previously conducted in 2021, it was noted that: <ul style="list-style-type: none"> <li>○ No fuel storage occurred on-site.</li> <li>○ Two farmsteads located approximately 100 m south and 400 m southeast of the site were heated by fuel oil ASTs that were installed in 1997 and 2009, respectively.</li> <li>○ A UST was removed from the property at 16469 10 Sideroad, south adjacent of the house. During removal fuel spillage was observed and no remediation was conducted. The location was backfilled with on-site material.</li> </ul> </li> <li>• The report identified the following APEC causing PCAs: <ul style="list-style-type: none"> <li>○ Autobody shop (Arnie's Body Shop) with two ASTs present at 490 Guelph Street.</li> <li>○ Gas bar with two 18,000 L tanks at 488 Guelph Street.</li> </ul> </li> <li>• Based on the Phase One ESA, a Phase Two ESA was recommended to further investigate the APECs identified.</li> </ul>
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<b>Title and File No.</b>	Phase Two Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 211-03319-00-PhIIESA)
<b>Report Date</b>	January 6, 2022
<b>Prepared By</b>	WSP Canada Inc.
<b>Prepared for</b>	Russell Pines Property Corp.



<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• A Phase Two ESA was completed to further investigate the APECs identified in the Phase One ESA in support of the development application for the site.</li> <li>• The site encompasses the north portion of the property located at 16469 10 Sideroad, legally described as Pt. Lots 11 &amp; 12 Concession 11 ESQ; Part 1, 20R21398 Town of Halton Hills.</li> <li>• The investigation included the advancement of five (5) boreholes (MW21-1 to MW21-4) to depths of 5.3 to 8.3 m below ground surface (mbgs), all completed as monitoring wells.</li> <li>• The soil stratigraphy encountered at the site was generally a layer of silty sand/sandy silt, underlain by clayey to sandy silt/silty clay with sand and gravel deposits, overlying weathered shale.</li> <li>• Site Condition Standards were determined to be Table 1 site condition standards (SCS) for Residential / Parkland / Institutional / Industrial / Commercial / Community property use with coarse textured soils.</li> <li>• Soil was not submitted for O.Reg 153/04 analysis. One composite TCLP sample was submitted for analysis.</li> <li>• Groundwater were reportedly analyzed for chemical analysis of one or more of the following parameters: petroleum hydrocarbons F1-F4 fraction (PHC), volatile organic compounds (VOC), and Benzene, Ethylbenzene, Toluene and Xylene (BTEX).</li> <li>• The results indicated that groundwater samples met MECP Table 1 SCS.</li> <li>• The report concluded that no further investigation was recommended at that time.</li> </ul>
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<b>Title and File No.</b>	Phase I Environmental Site Assessment, 16469 10 Sideroad, Halton Hills (DRAFT). (File No. 24-048)
<b>Report Date</b>	May 8, 2024
<b>Prepared By</b>	Grounded Engineering Inc.
<b>Prepared for</b>	Russell Pines Property Corp.
<b>Description of Data, Analysis or Findings</b>	<ul style="list-style-type: none"> <li>• A Phase I ESA was completed for due diligence purposes.</li> <li>• The Property is currently used for agricultural and residential purposes and consists of a mowed farm field, two residential homes and associated garages/sheds.</li> </ul> <p>The findings of the Phase I ESA are as follows:</p> <ul style="list-style-type: none"> <li>• PCAs have been identified on the Property and within the Phase I Study Area. A summary of the PCAs and an assessment of their potential to affect the soil and groundwater at the Property is provided in Table 2. The PCAs identified resulted in the identification of APECs for the Property.</li> <li>• Based on the information obtained and reviewed during this Phase I ESA, Grounded recommends that a Phase II ESA be conducted to determine if any soil and groundwater contamination at the Property.</li> </ul>



## 2 Information from the Phase One Environmental Site Assessment

### 2.1 Areas Where Potential Contaminating Activity Has Occurred

Potential Contaminating Activity (PCAs) were identified in the Phase One ESA completed for the Property. The information regarding whether the PCAs have the potential to cause Areas of Potential Environmental Concerns (APECs) is provided below.

Location of PCA	PCA	APEC (Yes/No)	Rationalization
Phase One Property	#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Yes	Based on the site interview and previous Phase One ESA completed for the Property, applications of pesticides for farming activities were conducted on-site and was considered to contribute to an APEC for the Property.
1234 Yonge St. 15 m to the south	#40 – Pesticides (including herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Yes	Based on the site interview and previous Phase One ESA completed for the Property, applications of pesticides for a historic orchard was conducted on-site and was considered to contribute to an APEC for the Property.
Phase One Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes	Based on the Phase One site inspection, a double-wall fuel oil AST with no secondary containment was observed in the basement of the residential building on-site. Given its presence and contents, it is considered to lead to an APEC for the Property.
Phase One Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes	Based on the site interview and previous Phase One ESA completed for the Property, a UST was historically located under the deck on the south side of the building, reportedly used for fuel oil. Given its presence and contents, it is considered to lead to an APEC for the Property.
Phase One Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes	Based on the site interview and previous Phase One ESA completed for the Property, a series of ASTs containing fuel oil were located on-site. Given its presence and contents, it is considered to lead to an APEC for the Property.
Phase One Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes	Based on the Phase One site inspection, a single wall fuel oil AST with no secondary containment was observed in the basement of the residential building on-site. Given its



Location of PCA	PCA	APEC (Yes/No)	Rationalization
			presence and contents, it is considered to lead to an APEC for the Property.
Phase One Property	#52 – Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Yes	Based on the site interview and previous Phase One ESA completed for the Property, a garage for storage and maintenance of farming vehicles and equipment's was located on-site. Given its presence and contents, it is considered to lead to an APEC for the Property.
488 Guelph St Adjacent East	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	Based on the ERIS report and TSSA, the location operated as a gasoline service station and was occupied by a 18,000 L retail fuel storage tank registered under C&B Gas Bar and Norval Gas Bar Alice Williams. Given its down-gradient location with respect to the anticipated groundwater flow direction and 2022 WSP Canada Inc. environmental investigation findings of no soil and groundwater impacts on the property, it is not considered to lead to an APEC for the Property.
490 Guelph St Adjacent East	#10 –Commercial Autobody shops	No	Based on the Phase One site inspection and city directory search, Arnie's Collision Centre (formerly Arnie's Body Shop) operated at the address from 1991 to present day. Given its down-gradient location with respect to the anticipated groundwater flow direction and 2022 WSP Canada Inc. environmental investigation findings of no soil and groundwater impacts on the property, it is not considered to lead to an APEC for the Property.
	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	Based on the Phase One site inspection an AST was noted west of the main building on the property. Given its down-gradient location with respect to the anticipated groundwater flow direction and 2022 WSP Canada Inc. environmental investigation findings of no soil and groundwater impacts on the property, it is not considered to lead to an APEC for the Property.
481 Guelph Street 90 m East	#10 –Commercial Autobody shops	No	Based on the city directory search, Continental Service Centre Ltd operated from 1991 to 2012. Given its down-gradient location with respect to the anticipated groundwater flow direction, it is not considered to lead to an APEC for the Property.



Location of PCA	PCA	APEC (Yes/No)	Rationalization
9977 & 9978 Winston Churchill Blvd 100 m South	#40 – Pesticides (including herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	No	Based on the ERIS report, an operator of pesticides registered under Innovative Care of the Environment Inc from 2019 to 2023. Given its trans-gradient location with respect to the anticipated groundwater flow direction, it is not considered to lead to an APEC for the Property.
509 Guelph St 150 m East	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	Based on the ERIS report, a generator of waste class 221L (light fuels) registered under Dom-Meridian Construction Ltd. Given its down-gradient location with respect to the anticipated groundwater flow direction, it is not considered to lead to an APEC for the Property.
411 Draper St 180 m Northeast	#10 –Commercial Autobody shops	No	Based on the ERIS report, the address was listed as an automotive paint spray booth in 1995 and registered as an automotive refinishing facility in 2012. Given its down-gradient location with respect to the anticipated groundwater flow direction, it is not considered to lead to an APEC for the Property.

The locations of the PCAs and APECs are shown on Figure 2. The PCAs that were deemed to cause APECs are listed in Section 2.2 below.

## 2.2 Areas of Potential Environmental Concern

The following APECs resulting from PCAs were identified below and shown on Figure 2.

Areas of Potential Environmental Concern (APECs)	Location of APECs on Phase One Property	PCA	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)
APEC 1	Entire Property	#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil



Areas of Potential Environmental Concern (APECs)	Location of APECs on Phase One Property	PCA	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)
APEC 2	Central North portion of the Property	#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil
APEC 3	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater
APEC 4	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater
APEC 5	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater
APEC 6	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater
APEC 7	Central North Portion of the Property	#52 – Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Metals PHCs BTEX VOCs	Soil & Groundwater

## 2.3 Subsurface Structures and Utilities

The site inspection of the Property and utility locates conducted as part of the Phase One ESA found the following information regarding utilities and services at the Property:

- Electrical



Based on highest groundwater level observed on the Property at 0.35 mbgs, there is the potential that the utilities will intersect the groundwater table and affect the distribution and transportation of contaminants beneath the Property. However, no contaminants of concern were identified on the Property.



### 3 Physical Setting of the Phase Two Property

#### 3.1 Stratigraphy

Detailed geological information for the Property is presented on the borehole logs shown in appendix B. The geology at the Property is summarized below.

Geological Units	Description	Elevation Range of Unit Interface (mASL)
<b>Topsoil</b> (25 to 230 mm thick)	Topsoil thicknesses were observed in individual borehole locations through the top of the open borehole. Thicknesses may vary between and beyond each borehole location. Boreholes 101, 102 and 104 to 119 encountered 100 – 250 mm of topsoil at ground surface.	Ground Surface
<b>Disturbed Native Earth Fill</b> (0.8 to 2.3 m thick)	Underlying the surficial materials, the boreholes observed a layer of disturbed native earth fill that extends to depths of 0.8 to 2.3 metres below grade (Elev. 230.5 to 223.9 metres). This layer varies in composition but generally consists of sand some silt trace clay to sandy silt, clayey with trace gravel, trace rootlets. This layer is typically brown to dark brown, and moist to wet.	231.2 to 224.2 mASL
<b>Sands</b> (1.7 to 9.0 m thick)	Underlying the topsoil or disturbed native earth fill, Boreholes 105, 106, 109, 110, 112, 113 and 118 encountered a stratum of undisturbed native cohesionless sand trace silt to silty sand at depths of 0.2 to 1.5 m below grade (Elev. 230.4 to 222.7 m) extending down to depths of 1.7 to 2.6 m below grade (Elev. 228.9 to 221.8 m). This unit contains trace clay, trace to some gravel, and is generally brown with orange to brown, and wet. Underlying the sands, Borehole 113 encountered a deposit of silty sand glacial till with some gravel and some clay. This unit was generally grey and wet to moist. Borehole 113 reached the target investigation depth in this stratum.	230.5 to 223.9 mASL
<b>Silts and Clays Till</b> (1.7 to 9.0 m thick)	Underlying the topsoil or disturbed native earth fill in Boreholes 101 to 104, 107, 108, 111, 114 to 117 and 119 and the sands in Boreholes 105, 106, 109, 110, 112, 113 and 118 the boreholes encountered a stratum of undisturbed native clayey silt to silt and clay glacial till at depths of 0.8 to 2.6 m below grade (Elev. 229.7 to 201.1 m) extending down to depths of 2.3 to 20.3 m below grade (Elev. 228.4 to 198.5 m). This unit contains some sand to sandy, trace to some gravel, and is generally brown with black to grey with orange, and moist to wet. Within the glacial till, Borehole 103, 111, 112, 114 and 117 encountered a deposit of non glacial till deposit of clayey silt to silt and clay with trace to some sand and trace gravel. This unit was generally grey and moist. Boreholes 104 to 112 and 114 to 119 reached the target investigation depth in this stratum.	228.9 to 221.8 mASL





Geological Units	Description	Elevation Range of Unit Interface (mASL)
<b>Bedrock</b>	Bedrock was inferred in Boreholes 101 to 103 underlying the silt and clay to clayey silt till at depths of 4.6 to 13.7 m below grade (Elev. 225.4 to 212.8 m). Rock coring was not included in our scope. The bedrock was inferred from observations of auger and split spoon resistance and limited sample recovery in the split spoons to depths of 6.2 to 15.3 below grade (Elev. 223.8 to 211.2 m), at which depths Boreholes 101 to 103 were terminated. The bedrock beneath the site is known to consist of reddish brown shale of the Queenston Formation, which typically has a weathered zone at the surface of the bedrock, which transitions to unweathered (sound) bedrock. Sound bedrock elevations were not determined in the boreholes, as this was not part of this scope of work.	228.4 to 198.5 mASL (Bedrock interface)

### 3.2 Approximate Depth to Water Table

The Silt and Clays unit was chosen for investigation. This stratum was chosen for investigation because:

- Possibility of free groundwater present
- The possible location of mobile contamination within the native overburden and lower units
- The likelihood of horizontal migration of groundwater across the site

### 3.3 Groundwater: Elevations and Flow Direction

14 monitoring wells were installed by Grounded. Monitoring wells were located within the APECs identified in the Phase I ESA for the Property (Grounded, 2024). Screened intervals of the monitoring wells were selected for the collection of ground water samples within the desired stratum.

Two (2) ground water level measurements were conducted by Grounded in the newly installed monitoring wells using a Solinst interface probe on the following dates:

- May 21, 2024
- May 27, 2024
- June 12, 2024

To calculate the ground water elevation in the monitoring well, the following calculation was completed:

- $\text{Geodetic Ground Elevation (mASL)} - \text{Measured Depth to Water Table (m)} + \text{Stick up of Well (m)} = \text{Groundwater Elevation (mASL)}$

No light non-aqueous phase liquids (LNAPL) or dense non-aqueous phase liquids (DNAPL) or free-flowing products were detected on the Property. The groundwater levels are presented in Table 1 and Figure 4. The shallowest groundwater depth was measured at 0.35 mbgs (228.45



masl) and was observed at BH112 located on the western portion side of the Property, on May 21, 2024.

Based on the groundwater elevations measured on the Property, the groundwater within the aquifer is encountered at a depth of approximately 0.35 to 18.17 mbgs (Elev. 228.45 to 206.53 masl) and was determined to flow locally to the east. Regional groundwater flow is expected to flow to the east towards The Credit River. Groundwater contours are presented in Figure 4.

Additional groundwater data will be required to assess seasonal variability in groundwater quantity and flow direction.

Based on the highest groundwater level of 0.53 mbgs observed at the Property, there is the potential that the buried utilities could influence the groundwater flow.

### 3.4 Site Hydrogeological Characteristics

<b>Horizontal Hydraulic Gradients</b>	The horizontal hydraulic gradient at the Property was determined to be approximately 0.006 based on the groundwater levels in boreholes BH 18 and 19.
<b>Vertical Hydraulic Gradients</b>	The vertical hydraulic gradient at the Property was determined to be approximately 1.31 downwards based on the groundwater levels in boreholes BH 104S and 104D.
<b>Hydraulic Conductivity</b>	<p>Silts – <math>10^{-5}</math> to <math>10^{-9}</math> m/s</p> <p>Glacial Till – <math>10^{-6}</math> to <math>10^{-12}</math></p> <p>Clays – <math>10^{-9}</math> to <math>10^{-12}</math></p> <p>Bedrock – <math>10^{-6}</math> to <math>10^{-13}</math></p>

### 3.5 Approximate Depth to Bedrock

Bedrock was inferred in Boreholes 101 to 103, rock coring was not included in our scope. The bedrock was inferred from observations of auger and split spoon resistance and limited sample recovery in the split spoons to depths of 6.2 to 15.3 below grade (Elev. 223.8 to 211.2 m), at which depths Boreholes 101 to 103 were terminated. The bedrock beneath the site is known to consist of reddish brown shale of the Queenston Formation, which typically has a weathered zone at the surface of the bedrock, which transitions to unweathered (sound) bedrock. Sound bedrock elevations were not determined in the boreholes, as this was not part of this scope of work.

### 3.6 O.Reg. 153/04 Section 35

Section 35(2) of the Regulation does not apply to the Phase Two Property based on the following rationale:



- The Property, and all other properties located, in whole or in part, within 250 metres of the boundaries of the property, are supplied by a municipal drinking water system, as defined in the Safe Drinking Water Act, 2002.
- The record of site condition does not specify agricultural or other use as the type of property use for which the record of site condition is filed.
- The Property is not located in an area designated in the municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of groundwater.
- Neither the Property nor any of the properties in the Phase One study area has a well used or intended for use as a source of water for human consumption or agriculture.
- The owner has given the clerk of the municipality (City of Toronto) written notice of intention to apply the standards in preparing a record of site condition for the property, and the municipality has given written notice to the owner that it does not object to the application of the standards,

### **3.7 O.Reg. 153/04 Section 41**

Section 41 of the Regulation does not apply to the Phase Two Property based on the following rationale:

- The Property is not located within an area of natural significance;
- The Property does not include or is not adjacent to an area of natural significance or part of such an area;
- The Property does not include land that is within 30 m of an area of natural significance or part of such an area;
- The surface soil at the Property has a pH value that is not less than 5 or greater than 9; and
- The sub-surface soil at the Property has a pH value that is not less than 5 or greater than 11.

### **3.8 O.Reg. 153/04 Section 43.1**

Section 43.1 of the Regulation does not apply to the Phase Two Property based on the following rationale:

- The Property is not considered a shallow soil property; or
- The Property does not include all or part of a water body and is not adjacent to a water body and does not include land that is within 30 m of a water body.



### 3.9 Areas On, In or Under the Phase Two Property Where Excess Soil is Finally Placed

No excess soils have been imported or placed on, in or under the Phase Two Property since the site reconnaissance completed for the Phase One ESA on June 27, 2024.

### 3.10 Proposed Buildings

The Property is considered to be in agricultural land use as defined by the Ontario Ministry of the Environment, Conservation and Parks (MECP) O.Reg 153/04.

It is understood that the Phase Two Property is proposed to be redeveloped with residential houses. The Property will be considered to be in residential land use as defined by the O.Reg 153/04

## 4 Contamination In or Under the Phase Two Property

### 4.1 Applicable Site Condition Standard

The applicable site condition standard for the Phase Two Property is determined to be Table 2 Full Depth Generic Site Condition Standards for residential Property use in a Potable Ground Water Condition (Table 2 RPI SCS), set out in the MECP document entitled **Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*** (April 2011 and updates), based on the following rationale:

<b>Current Land Use</b>	Agriculture
<b>Future Land Use</b>	Residential
<b>Soil Texture</b>	Medium to fine based on grain size analysis performed on the soil (Appendix C).
<b>Potable Water Source</b>	The Property is not serviced by municipal potable drinking water.
<b>Bedrock Depth</b>	Bedrock is located at a depth greater than 2 m for at least 2/3 of the area of the Property.
<b>Property located within 30 m of a surface water body (Yes/No)</b>	No
<b>Property located in or adjacent to a provincial park or an Area of Natural Significance (Yes/No)</b>	No



## 4.2 Media Investigated (Section 4.1 Ph Two ESA)

Grounded Engineering Inc. conducted the following specific subsurface work at the Property:

<b>Boreholes and Monitoring Wells</b>	<p><b>WSP Drilling Investigation (January 2022)</b></p> <ul style="list-style-type: none"> <li>The investigation included the advancement of five (5) boreholes to depths of 5.3 to 8.3 m below ground surface (mbgs) – WSP-MW21-1 to 21-4</li> <li>Installation of five (5) monitoring wells – WSP-MW21-1 to 21-4</li> </ul> <p><b>Grounded Drilling Investigation (May 2024)</b></p> <ul style="list-style-type: none"> <li>Grounded advanced a total of 19 boreholes for environmental, geotechnical and hydrogeological purposes to depths of 6.1 to 21.3 m below ground surface (mBGS) – BH101 to BH119</li> <li>Installation of 16 monitoring wells – BH 101 S/D, 102,103, 104 S/D, 106, 107, 190, 112, 114 and 115 to 119.</li> <li>Boreholes 103, 104, 107, 110, 114, 115 and 116 and monitoring wells 21-4, 106D, 115,117, 118 and 119 were advanced for environmental purposes, the information regarding the geotechnical and hydrogeological boreholes is provided under separate covers.</li> </ul>
<b>Parameters Investigated for Soil</b>	<ul style="list-style-type: none"> <li>Metals (M)</li> <li>Hydride-forming Metals (H-M) <ul style="list-style-type: none"> <li>Arsenic (As), Selenium (Se), Antimony (Sb)</li> </ul> </li> <li>Other Regulated Parameters (ORPs) <ul style="list-style-type: none"> <li>B-HWS, CN-, EC, SAR, Cr(VI), Hg</li> </ul> </li> <li>Polycyclic Aromatic Hydrocarbons (PAH)</li> <li>Petroleum Hydrocarbons (PHCs)</li> <li>Volatile Organic Compounds II - Benzene, Toluene, Ethylbenzene, Xylene (BTEX)</li> <li>Volatile Organic Compounds I (VOCs)</li> <li>Organochlorine Pesticides (OCs)</li> </ul>
<b>Parameters Investigated for Groundwater</b>	<ul style="list-style-type: none"> <li>Metals</li> <li>Hydride-forming Metals <ul style="list-style-type: none"> <li>As, Se, Sb</li> </ul> </li> <li>Other Regulated Parameters <ul style="list-style-type: none"> <li>Cr(VI), CN-, Hg, Cl-</li> </ul> </li> <li>Sodium (Na)</li> <li>Polycyclic Aromatic Hydrocarbons (PAH)</li> <li>Petroleum Hydrocarbons (PHCs)</li> <li>Volatile Organic Compounds II - Benzene, Toluene, Ethylbenzene, Xylene (BTEX)</li> <li>Volatile Organic Compounds I (VOCs)</li> </ul>
<ul style="list-style-type: none"> <li>6 soil samples were submitted for grain size analysis and soil classification.</li> <li>All boreholes and monitoring wells were surveyed to a geodetic benchmark.</li> </ul>	



- New and existing monitoring wells were developed prior to sampling.
- Groundwater level measurements were conducted in all accessible monitoring wells to determine groundwater elevation on the Property

### 4.3 Sampling Rationale and Areas Where Contaminants are Present

The table below identified all APECs listed in the Phase One ESA as well as the boreholes that were used to evaluate each APEC. The findings with respect to any contaminant noted are also presented.

Areas of Potential Environmental Concern (APECs)	Location of APECs on Phase One Property	Potentially Contaminating Activities (PCAs)	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)	Borehole or Monitoring Well Associated	Exceedances
APEC 1	Entire Property	#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil	BH103, BH104, BH107, BH110, BH114	None



Areas of Potential Environmental Concern (APECs)	Location of APECs on Phase One Property	Potentially Contaminating Activities (PCAs)	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)	Borehole or Monitoring Well Associated	Exceedances
APEC 2	Central North portion of the Property	#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	OC Pesticides Metals	Soil	BH116	None
APEC 3	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH117	None
APEC 4	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH118	None
APEC 5	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH119	None
APEC 6	Central North portion of the Property	#28 – Gasoline and Associated Products Storage in Fixed Tanks	PHCs BTEX	Soil & Groundwater	BH106	None
APEC 7	Central North Portion of the Property	#52 – Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain	Metals PHCs BTEX VOCs	Soil & Groundwater	BH115	None



Areas of Potential Environmental Concern (APECs)	Location of APECs on Phase One Property	Potentially Contaminating Activities (PCAs)	Contaminants of Potential Concern (CoPCs)	Media Potentially Impacted (Groundwater, soil and/or sediment)	Borehole or Monitoring Well Associated	Exceedances
		transportation systems				

No exceedances were identified in the soil and groundwater.

#### 4.3.1 Location and Depth of Soil Samples

Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PAHs	PHC & BTEX	VOCs	OCs
	mbgs	masl							
BH103 SS1	0.3 / 226.2	0.0 - 0.6	226.5 - 225.9	1	✓				
BH103 SS2	1.1 / 225.4	0.8 - 1.4	225.7 - 225.1	1					✓
BH104 SS1	0.3 / 224.4	0.0 - 0.6	224.7 - 224.1	1	✓				
BH104 SS2	1.1 / 223.7	0.8 - 1.4	224.0 - 223.4	1					✓
BH106 SS2	1.1 / 223.1	0.8 - 1.4	223.4 - 222.8	6			✓	✓	
BH107 SS1	0.3 / 225.5	0.0 - 0.6	225.8 - 225.2	1					✓
BH107 SS2	1.1 / 224.7	0.8 - 1.4	225.0 - 224.4	1	✓				
BH110 SS1	0.3 / 228.8	0.0 - 0.6	229.1 - 228.5	1	✓				
BH110 SS2	1.1 / 228.0	0.8 - 1.4	228.3 - 227.7	1					✓
BH114 SS1	0.3 / 230.4	0.0 - 0.6	230.7 - 230.1	1	✓				
BH114 2A	0.8 / 229.9	0.8 - 0.9	229.9 - 229.8	1					✓
BH114 2C	1.2 / 229.5	1.0 - 1.4	229.7 - 229.3	1		✓			





Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PAHs	PHC & BTEX	VOCs	OCs
	mbgs	masl							
BH115 SS2	1.1 / 224.9	0.8 - 1.4	225.2 - 224.6	7	✓				
BH115 SS3	1.8 / 224.2	1.5 - 2.1	224.5 - 223.9	7			✓	✓	
BH116 SS1	0.3 / 225.5	0.0 - 0.6	225.8 - 225.2	2					✓
BH116 SS2	1.1 / 224.8	0.8 - 1.4	225.1 - 224.5	2	✓				
BH117 3A	1.7 / 224.4	1.5 - 1.8	224.5 - 224.2	3				✓	
BH118 SS3	1.8 / 224.3	1.5 - 2.1	224.6 - 224.0	4			✓		
BH119 SS5	3.4 / 222.1	3.0 - 3.7	222.4 - 221.8	5			✓		

#### 4.3.2 Location and Depth of Groundwater Samples

Sample ID	Depth		Strata	APEC Assessed	Metals, H-Metals & ORPs	PAHs	PHC & BTEX	VOCs
	mbgs	masl						
WSP 2021								
MW 21-4	1.2 – 4.7	204.8 – 201.7	SN-SL	none			✓	✓
Grounded Engineering 2024								
BH106D	4.6 - 6.1	219.6 - 218.1	SN-SL-TL	6		✓	✓	✓
BH115	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	7	✓	✓	✓	✓
BH117	1.5 - 4.6	224.5 - 221.4	SN-SL-TL	3	✓	✓	✓	✓
BH118	1.5 - 4.6	224.6 - 221.5	SN	4		✓	✓	✓
BH119	1.5 - 4.6	223.9 - 220.8	SL-TL	5		✓	✓	✓



#### 4.4 Contaminants Associated with Each Area

No Contaminants of Concerns (CoCs) were associated with Areas of Potential Concerns (APECs) identified on the Property.

APEC 1	APEC 2	APEC 3	APEC 4	APEC 5	APEC 6	APEC 7
None	None	None	None	None	None	None

#### 4.5 Medium in Which Contaminants are Associated

Soil and groundwater were investigated as part of the Phase Two ESA investigation. No CoCs were identified in the following media for the contaminants listed.

Metals	H-Metals	ORPs	PAHs	PHCs	BTEX	VOCs	PCBs	OCs
None	None	None	None	None	None	None	None	None

#### 4.6 Information Known about Each Contaminated Area

No contaminants were identified in the soil and groundwater on the Property. All the samples met the Table 2 RPI Standard.

#### 4.7 Distribution of Contaminant

No contaminants were identified in the soil or groundwater during the investigation. The cross sections of the Property are presented on Figures 7 and 8.

#### 4.8 Reasons for Discharge of Contaminant

No contaminants were identified in the soil or groundwater during the investigation. The cross sections of the Property are presented on Figures 7 and 8.

#### 4.9 Migration of Contaminant

No contaminants were identified on the Property. As such, there is no migration associated with contaminant on the Property.



## 4.10 Climatic or Meteorological Influences on Migration

No contaminants were identified on the Property. As such, there is no climatic or meteorological influences on migration on the Property.

## 4.11 Soil Vapour Intrusion into Buildings

No contaminants were identified in the soil or groundwater during the investigation.

## 4.12 Relevant Construction Features of Buildings

No buildings were present on the Property.

## 4.13 Building HVAC

Current and future HVAC systems present in [any] buildings on the Property will not affect the distribution and transport of contaminants because no volatile CoCs were identified.

## 4.14 Subsurface Structures and Utilities

The Property is considered to be in agricultural land use as defined by the Ontario Ministry of the Environment, Conservation and Parks (MECP) O.Reg 153/04.

It is understood that the Phase Two Property is proposed to be redeveloped with residential houses. The Property will considered to be in residential land use as defined by the O.Reg 153/04.

# 5 Potential Exposures Pathways and Receptors

## 5.1 Description of All Components

A list of all risk-based components of potential exposure pathways and receptors are presented below and presented on Figures 7 and 8.

Potential Pathway	Description
GW1	Groundwater for drinking water purposes
GW2	Groundwater for protection from movement to indoor air



Potential Pathway	Description
GW3	Groundwater for protection of aquatic life
S1	Soil for protection of a residential receptor from direct contact with surface soil
S2	Soil for protection from direct soil contact for a lower frequency and intensity exposure than residential surface soil, such as commercial or industrial scenarios
S3	Soil for direct soil contact for a low-frequency, high-intensity, human health exposure scenario without children present that is protective of a worker digging in the soil
S-IA	Soil for protection of movement to indoor air and human exposure
S-OA	Soil for protection of movement to outdoor air and human exposure
S-Odour	Soil for protection of movement to outdoor air and human exposure
S-GW1	Soil for protection from movement to groundwater for drinking water purposes
S-GW3	Soil for protection from movement to groundwater and then to aquatic life
Plants and Soil Organisms	Soil for protection against adverse effects to plants and soil dwelling organisms
Mammals and Birds	Soil for protection against adverse effects through direct soil and food ingestion to mammals and birds

## 5.2 Receptor Human Health

Potential Pathway	Sources	CoCs from Phase Two ESA	Potential Risks (Yes/No)			
			Source	Pathway	Receptor	Risk
GW1	Contamination not present in groundwater	None	No	Yes	Yes	No Risk
GW2	Contamination not present in groundwater	None	No	Yes	Yes	No Risk
GW3	Contamination not present in groundwater	None	No	No	Yes	No Risk
S1	Contamination not present in soil	None	No	Yes	Yes	No Risk
S2	Contamination not present in soil	None	No	No	No	No Risk



Potential Pathway	Sources	CoCs from Phase Two ESA	Potential Risks (Yes/No)			
			Source	Pathway	Receptor	Risk
S3	Contamination not present in soil	None	No	Yes	No	No Risk
S-IA	Contamination not present in soil	None	No	Yes	Yes	No Risk
S-OA	Contamination not present in soil	None	No	Yes	Yes	No Risk
S-Odour	Contamination not present in soil	None	No	Yes	Yes	No Risk
S-GW1	Contamination not present in soil	None	No	Yes	Yes	No Risk
S-GW3	Contamination not present in soil	None	No	Yes	No	No Risk

### 5.3 Receptor Terrestrial Environment

Potential Pathway	Sources	CoCs from Phase Two ESA	Potential Risks (Yes/No)			
			Source	Pathway	Receptor	Risk
Plants and Soil Organisms	Contamination not present in soil	None	No	Yes	Yes	No Risk
Mammals and Birds	Contamination not present in soil	None	No	Yes	Yes	No Risk

### 5.4 Receptor Aquatic Environment

Potential Pathway	Sources	CoCs from Phase Two ESA	Potential Risks (Yes/No)			
			Source	Pathway	Receptor	Risk
GW3	Contamination not present in groundwater	None	No	Yes	Yes	No Risk
S-GW3	Contamination not present in soil	None	No	Yes	Yes	No Risk



## **5.5 Summary of Potential Receptor Risks**

No Contaminants of Concern were identified during the Phase Two ESA investigation. There is no potential risk associated with the Human Receptor, the Terrestrial or the Aquatic Environment.