DAVROC
TESTING LABORATORIES INC.

CONSULTING ENGINEERS •
Materials Testing ▪ and Inspection

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Geotechnical Investigation
Proposed Bluffer's Park Pavilion

1 Brimley Road South,
Toronto, Ontario

Prepared For:
City of Toronto
Parks, Forestry & Recreation Division

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Executive Summary

Davroc Testing Laboratories Inc. (Davroc) has been retained by The City of Toronto to carry out a geotechnical investigation to support the design and construction of the proposed Bluffer's Park Pavilion located at 1 Brimley Road South in Toronto, Ontario. It is Davroc's understanding that the proposed Bluffer's Park Pavilion will consist of single storey slab-on-grade structures/buildings along with the associated paved multi-use trail and permeable pavers. The structures/buildings will be constructed of masonry block walls without basement. The roof framing will consist of timber and steel beams.

The drilling work consisted of advancing a total of seven (7) exploratory geotechnical boreholes and installing three (3) monitoring wells within the area of the proposed structures/buildings. Select soil samples were collected and submitted for geotechnical laboratory testing and chemical analysis.

The topsoil and the fill soils present at the Site are in general considered unsuitable bearing subgrade for the support of the proposed new structure/buildings. Based on the data at the borehole locations and the results of the MASW completed at this Site, the depth to the competent natural/native subgrade soils is considered to be significant (approx. 6.1 to 7.6 mBGS). Commonly, unsuitable materials such as the existing fill are removed and replaced with structural (engineered) fill. Excavation to the depth (approx. 6 to 8 mBGS) and extent required is likely not economically feasible due to the complexity/risk associated with removing significant thickness of loose to very loose fill below groundwater table. As such, design of conventional spread and strip footings bearing on the native deposit may be considered unfeasible due to the significant depth of fill within the area of the proposed structures/buildings. In this case, it would be prudent to support the proposed building on augered piers/deep foundation or helical piles extending to the native deposit. Alternatively, the proposed structures/buildings foundations and slabs can be supported on improved ground. Options such as deep foundations or ground improvement for the proposed structures/buildings may be considered for this Site.

The amount of seepage into excavations will depend on the depth of excavation relative to the groundwater level at the time of construction and the hydraulic conductivity of the excavated soils. The measured groundwater levels within the installed monitoring wells were found to range from approximately 1.5 to 2.2 mBGS. It is expected that the seepage rate into the excavation within the fill and native sandy soils will be moderate to high. If the excavation is to be above the groundwater table, minor to moderate groundwater ingress can readily be handled by using installation of sumps and pumps at strategic locations at the base of excavation. If the excavation is to be extended to a greater depth and below local groundwater table, an active pre-construction dewatering system such as well points may be required depending on the depth and size of excavations. Due to the relatively shallow groundwater and generally permeable soils at this Site, a hydrogeological study may be required to assess the need for a Permit to Take Water (PTTW) for deeper and larger (in plan) excavations.

Considerations should be given to the possible presence of cobbles/boulders and/or rubble/debris at this Site and their impact on the excavation. The contractor should be prepared to deal with cobbles/boulders and/or rubble/debris that may exist at this Site.

Footings subject to frost action should have a minimum soil cover of at least 1.2 m according to OPSD 3090.101 for Southern Ontario or be protected using equivalent insulation.

Based on the results of the Multi-Channel Analysis of Surface Waves (MASW) testing completed within the building area, the Site with building foundations founded within the native soils can be classified as **Class "D"** for seismic load calculations subjected to code requirements.

Qualified geotechnical personnel should inspect all stages of the proposed development. Specifically, they should ensure that the materials and conditions comply with this geotechnical investigation report. In addition, qualified geotechnical personnel should provide material testing services prior to and during foundation preparation and construction.

1. Introduction

Davroc Testing Laboratories Inc. (Davroc) has been retained by the City of Toronto (City) to carry out a geotechnical investigation to support the design and construction of the proposed Bluffer's Park Pavilion located at 1 Brimley Road South in Toronto, Ontario (hereinafter referred to as "Site" or "Property"). A Site Location Map is provided on **Figure 1**.

It is Davroc's understanding that the proposed Bluffer's Park Pavilion will consist of single storey slab-on-grade structures/buildings along with the associated paved multi-use trail and permeable pavers. The structures/buildings will be constructed of masonry block walls without basement. The roof framing will consist of timber and steel beams.

The geotechnical investigation for this Site included advancing a total of seven (7) geotechnical exploratory boreholes and installing three (3) monitoring wells. The borehole locations are presented on **Figure 2**. In general, the objectives of the geotechnical investigation are as follows:

- Determine the subsurface soil and groundwater conditions at the borehole locations.
- Carry out laboratory testing on selected soil samples to assess geotechnical properties.
- Carry out chemical analysis on selected soil samples to assess the environmental quality.
- Conduct infiltration/percolation test to assess the infiltration rate at two locations.
- Conduct multichannel analysis of surface waves (MASW) to evaluate soil shear wave velocity and define Site classification for seismic site response.
- Provide professional opinions and recommendations regarding the design and construction of the proposed structures/buildings foundations, floor slab, pavement and to assess the anticipated construction conditions pertaining to excavation, backfilling, and groundwater control.

The geotechnical investigation was carried out in general accordance with Davroc's work plan dated November 30, 2022, in response to a Request for Geotechnical services issued by the City.

This report summarizes the activities and findings of the completed geotechnical investigation.

2. Field and Laboratory Procedures

The field investigation protocols and methodologies undertaken for the present geotechnical investigation are presented below and were undertaken in general accordance with Davroc's work plan.

2.1 Borehole Advancement and Field Testing

Drilling activities for the geotechnical investigation were conducted during the period between December 21 and 29, 2022, under the full-time supervision of an experienced Davroc technical representative. The field activities consisted of the advancement of seven (7) exploratory geotechnical boreholes (denoted as BH/MW1-22, BH2-22, BH3-22, BH4-22, BH/MW5-22, BH6-22, and BH/MW7-22) to approximate depths varying between 4.7 and 11.3 metres below ground surface (mBGS). In addition, monitoring wells were installed in three (3) of the completed boreholes (BH/MW1-22, BH/MW5-22, and BH/MW7-22). Borehole BH3-22 was terminated within the fill soils due to auger refusal on possible cobbles/boulders and/or rubble/debris contained within the fill layer. The approximate locations of the completed boreholes/monitoring wells are shown on **Figure 2**.

The boreholes were advanced using a truck mounted drill rig, supplied and operated by Walker Drilling Ltd. The boreholes were advanced from the ground surface using hollow stem augers and soil samples were generally collected

every 0.75 m depth intervals to 3.0 mBGS and at 1.5 m intervals thereafter to the termination depths. All samplings were conducted using a 50-millimetre (mm) outside diameter split spoon sampler in general accordance with the specifications of the Standard Penetration Test Method (ASTM D1586). The relative density or consistency of the subsurface soil layers were measured using the Standard Penetration Test (SPT) method, by counting the number of blows ('N') required to drive a conventional split barrel soil sampler 0.3 m depth.

The supervising technician logged the borings and examined the soil samples as they were obtained. The soil samples were transported to Davroc's geotechnical laboratory where they were further reviewed by a geotechnical engineer. The detailed results of the examination are recorded on the borehole logs presented in **Appendix A**.

Upon completion, the boreholes that were not instrumented as a monitoring well were backfilled in general accordance with Ontario Regulation 903.

Upon completion of drilling activities, the ground elevations at the borehole/monitoring well locations were surveyed by Simcoe Geoscience Limited using a Trimble R12i GPS and the UTM Coordinate System (UTM-17N). A summary of the survey information is presented in the table below.

Borehole Identification (ID)	Location – UTM Coordinate System		Ground Elevation (mAMSL)
	Northing	Easting	
BH/MW1-22	4841507	642789	77.39
BH2-22	4841513	642811	77.35
BH3-22	4841565	642803	77.15
BH4-22	4841511	642859	77.12
BH/MW5-22	4841502	642873	77.10
BH6-22	4841526	642821	77.19
BH/MW7-22	4841529	642829	77.25
Notes: **mAMSL: metres Above Mean Sea Level.**			

The estimated survey information (coordinates and elevations) is presented on the borehole logs provided in **Appendix A**. The elevations and coordinates of the boreholes are for use within the context of this report only and are considered approximate and therefore shouldn't be used for construction purposes.

2.2 Monitoring Well Installation

A total of three (3) monitoring wells were installed in select boreholes (BH/MW1-22, BH/MW5-22, and BH/MW7-22) for groundwater level monitoring.

Each monitoring well was instrumented with a 50 mm diameter, Schedule 40 PVC screen and completed with 50 mm diameter PVC riser pipe and J-plug. A silica sand pack was placed in the annular space between the PVC screen pipe and the borehole. A bentonite seal and hole plug were installed in the remaining borehole annulus above the sand pack. A protective casing was placed around each monitoring well. The details for each monitoring well are presented on the borehole logs provided in **Appendix A**.

2.3 Field Infiltration / Percolation Test

A percolation test was conducted at two (2) locations near boreholes BH6-22 and BH/MW7-22 on December 22, 2022. The approximate locations of the percolation tests are shown on **Figure 2**. The infiltration/percolation tests were carried out in general accordance with the Ontario Building Code (OBC) 2012 (Appendix A – Volume 2 – Section A-8.2.1.2. (3) of the OBC).

At each testing location, a PVC pipe with a 100-millimetre (mm) diameter was installed in an augered hole at an approximate depth of 1.5 mBGS. Both tests were completed in unsaturated fill soils (above the water table). The outflow of water at the testing depth was monitored over a period of 4 hours. The results of the infiltration testing are discussed in Section 4.7.

2.4 Multi-channel Analysis of Surface Waves (MASW)

In order to measure the ground shear wave velocity at the proposed structure/building locations and define the Site classification for seismic site response, a multi-channel analysis of surface waves (MASW) was carried out by Simcoe Geoscience Limited along two (2) select investigated lines within the Site. The purpose of the MASW survey was to determine the seismic site class in accordance with the Ontario Building Code (OBC 2012) by measuring the average shear wave velocity within the upper 30+ m of the soil/rock profile directly under the assumed founding level of the proposed structures/buildings.

The findings and the obtained results of the MASW survey are discussed in Section 4.6 and the related MASW report is provided in **Appendix C**.

2.5 Geotechnical Laboratory Testing

All geotechnical laboratory testing was completed in accordance with the latest editions of the ASTM standards and MTO standards for gradation. Geotechnical laboratory testing consisted of moisture content tests on all recovered soil samples, as well as grain size distribution analysis (sieve and hydrometer) on eight (8) select soil samples. Atterberg Limit testing was also conducted on three (3) soil samples selected for gradation analysis that had exhibited plasticity.

The results of moisture content determination tests, grain size analyses and Atterberg Limits are provided on the borehole logs in **Appendix A**. The gradation curves and plasticity charts are provided in **Appendix B**.

3. Site Geology and Subsurface Conditions

3.1 Regional Geology

The Site lies within the Iroquois Plain physiographic region, which is characterized by a sand plain (Chapman and Putnam 1984). This region is an area of gentle slope, from shoreline of Lake Ontario, back about 3-5 km. This plain is the remnant shoreline of glacial Lake Iroquois. The plain was smoothed over time by wave action and lacustrine deposits. This physiographic region is generally composed of glaciolacustrine sand and silty sand deposits.

According to Quaternary Geology of Ontario Map 2556[1], the subject Site is generally situated in an area of glaciolacustrine and undifferentiated older till deposits. The glaciolacustrine deposit generally consists of sand and gravel with minor silt and clay, and the undifferentiated older till deposit consists of sandy silt to silt matrix that may include stratified deposits.

[1] The Ministry of Northern Development and Mines – Quaternary Geology of Ontario – Southern Sheet- MAP 2556

Based on the Bedrock Geology of Ontario Map 2544[2], the overburden at this Site is overlying bedrock mapped as the Upper Ordovician Georgian Bay Formation, which is comprised of shale with limestone, and siltstone interbeds.

Based on the Bedrock Contours of Toronto Area[3], the depth to the bedrock surface at this Site is anticipated to range from 20 to 30 metres below ground surface or at elevations between 60 and 50 m.

3.2 Site Stratigraphy

It should be noted that the subsurface conditions are confirmed at the borehole locations only and may vary at other locations. The boundaries shown on the borehole logs represent an inferred transition between the various strata, rather than a precise plane of geological change. It must be understood that actual contacts between deposits will typically be gradational as a result of neutral geologic processes. Variation in the deposit boundaries from those described in the borehole logs must be anticipated. Therefore, design and construction equipment and procedures must be selected to accommodate significant variations in the deposit boundaries. Details of the subsurface conditions are provided on the borehole logs presented in **Appendix A**.

The collected soil samples were visually described/classified using the ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and ASTM D2487 - Standard Practice for Classification of Soils for engineering purposes (Unified Soil Classification System-USCS).

Based on the regional geology of the Site and the MASW testing results, the bedrock surface is anticipated to be encountered at approximate depths between 20 and 30 mBGS at this Site. The general stratigraphy at the Site consists of topsoil underlain by fill soils followed by sand with silt to sandy silt and/or lean clay/silty clay. A brief description of each stratum is summarized below:

3.2.1 Topsoil

A surficial layer of topsoil was encountered at the ground surface of boreholes BH/MW1-22, BH2-22 and BH/MW7-22. The thickness of the topsoil layer ranged from approximately 130 to 300 millimeters (mm). Classification of this material was based solely on visual and textural evidence. The assessed topsoil thickness values are approximate. To obtain the total thickness of topsoil for stripping purposes, a more accurate measure of the topsoil thickness should be carried out by excavating shallow test pits in the concerned areas. It should be noted that the thickness of topsoil can vary between borehole locations.

3.2.2 Fill

Earth fill was encountered in all boreholes at the surface or below the topsoil and extended to a depth varying from approximately 6.1 mBGS to 7.6 mBGS. Borehole BH3-22 was terminated at a relatively shallower depth due to auger refusal on possible cobbles/boulders and/or rubble/debris contained within the fill layer. The fill composition is in general heterogeneous, consisting of sandy silt to silty sand with clay and gravel. Organic inclusions, rootlets and construction rubble (brick, wood and asphalt fragments/pieces) were frequently observed within the soil samples extracted from the fill layer. SPT ‘N’ values obtained within the earth fill soil layer varied between 0 blows per 0.3 m of penetration and greater than 50 blows per 0.04 m of penetration (refusal), indicating a variable degree of compactness, but generally loose condition. The elevated SPT ‘N’ values encountered at some of the borehole locations is likely due to the presence of cobbles/boulders and/or rubble/debris within the fill layer. Cobbles/boulders and/or rubble/debris should be expected within the fill layers at this Site. It is possible that the thickness and quality of the fill (presence of deleterious materials or organics) can vary between borehole locations.

[2] The Ministry of Northern Development and Mines – Bedrock Geology of Ontario – Southern Sheet – Map 2544
[3] Ontario Department of Mines – Metropolitan Toronto – Preliminary Map P102 – Bedrock Contours

3.2.3 Sand with Silt to Sandy Silt

A deposit of sand with silt to sandy silt was encountered beneath the fill layer in boreholes BH/MW1-22, BH2-22, BH4-22, and BH6-22. SPT 'N' values obtained within this deposit varied between 14 and 23 blows per 0.3 m of penetration, indicating a compact relative density.

Gradation analysis was completed on selected samples of the sand with silt to sandy silt deposit. The results are presented in the borehole logs. The gradation analysis curves are presented in **Appendix B**.

3.2.4 Lean Clay (Silty Clay)

A deposit of lean clay/silty clay with sand to sandy was encountered in borehole BH/MW1-22 below the sand and in boreholes BH/MW5-22 and BH/MW7-22 below the fill layer. A pocket/layer of wet silty sand was encountered within the clay deposit at borehole BH/MW7-22.

This clay deposit exhibited SPT 'N' values between 11 and 20 blows per 0.3 m of penetration indicating a stiff to very stiff consistency. The low blow counts of 8 blows per 0.3 m of penetration within the wet silty sand pocket interbedded within the clay deposit is likely due to the silty sand pocket was being disturbed during the SPT testing below groundwater table.

Gradation analysis was completed on selected samples of the lean clay/silty clay deposit. The results are presented in the borehole logs. The gradation analysis curves are presented in **Appendix B**. Atterberg limits test was also performed on the soil samples that had exhibited plasticity. The results are presented on the borehole logs and the plasticity charts are presented in **Appendix B**.

3.3 Groundwater Conditions

As part of this geotechnical investigation, a total of three (3) monitoring wells were installed in select boreholes (BH/MW1-22, BH/MW5-22, and BH/MW7-22) for groundwater level monitoring. A summary of the groundwater level measurements within the installed monitoring wells is provided in the following table:

Borehole No.	Installation Date	Groundwater Level Depth (mBGS)[1] / Elevation (mAMSL)[2]	
		January 17, 2023	January 31, 2023
BH/MW1-22	December 29, 2022	1.98 / 75.41	1.50 / 75.89
BH/MW5-22	December 23, 2022	2.02 / 75.08	2.17 / 74.93
BH/MW7-22	December 21, 2022	1.79 / 75.46	1.60 / 75.65

Notes:

[1] metres Below Ground Surface (mBGS)

[2] metres Above Mean Sea Level (mAMSL)

The depth to the groundwater table at this Site ranged between 1.50 mBGS to 2.17 mBGS (elevation 75.89 to 74.93 m).

Due to the Site proximity to Ontario Lake, the groundwater level at this Site is anticipated to be relatively shallow and may be influenced by the water level in the Lake. In the long term, seasonal fluctuations of the groundwater level should be expected. Perched water table condition could develop in the fill after heavy precipitation and/or during spring thaw.

4. Engineering Discussion and Assessment

4.1 General Geotechnical Evaluation

It is Davroc's understanding that the proposed development activities at the Site will consist of single storey slab-on-grade structures/buildings along with the associated paved multi-use trail and permeable pavers. The proposed single storey pavilion structures are expected to be light weight structures. Further details of the proposed development activities at the Site are unknown to Davroc and specific information with regard to the proposed site grading, founding depths below the ground surface, footing/slab loading conditions and site features were not available at the time of preparation of this report.

The topsoil and the fill soils present at the Site are in general considered unsuitable bearing subgrade for the support of the proposed new structures/buildings. Based on the data at the borehole locations and the results of the MASW completed at this Site, the depth to the competent natural/native subgrade soils is considered to be significant (approx. 6.1 to 7.6 mBGS). Commonly, unsuitable materials such as the existing fill are removed and replaced with structural (engineered) fill. Excavation to the depth (approx. 6 to 8 mBGS) and extent required is likely not economically feasible due to the complexity/risk associated with removing significant thickness of loose to very loose fill below groundwater table. As such, design of conventional spread and strip footings bearing on the native deposit may be considered unfeasible due to the significant depth of fill within the area of the proposed structures/buildings. In this case, it would be prudent to support the proposed structures/buildings on augered piers/deep foundations or helical piles extending to the native deposit. Alternatively, the proposed structures/buildings foundations and slabs can be supported on improved ground. Options such as deep foundations or ground improvement for the proposed structures/buildings may be considered for this Site.

In general, the loose fill materials encountered at this site are not suitable for direct support of structures and may be susceptible to liquefaction under earthquake loadings. The ground improvement methods that may be appropriate for the existing miscellaneous fill materials that will support light weight structures include rapid impact compaction, vibro-replacement (stone columns) and aggregate piers. It is recommended that the expertise of an experienced ground improvement contractor be retained during selection of ground improvement method. Ground improvement will likely be required to mitigate bearing capacity and anticipated potential liquefaction. Evaluation of the liquefaction potential at this Site was not part of the current scope of work. For preliminary design purposes, recommendations are provided for deep foundations (cast-in-place concrete piles/caissons), helical piles, and ground improvement to support the proposed structures/buildings. Please refer to Section 4.3 for more details.

If the excavation extended into the sandy fill or native sand with silt / sandy silt and below groundwater table, then a dewatering system will likely be required prior to excavation to prevent basal instability of excavation from being liquefied/disturbed by upward groundwater flow/piping failure mechanisms due to the general permeable nature of the fill and native sandy soils at this Site. The contractor should be prepared to deal with such conditions.

The amount of seepage into excavations will depend on the depth of excavation relative to the groundwater level at the time of construction and the hydraulic conductivity of the excavated soils. The measured groundwater levels within the installed monitoring wells were found to range from approximately 1.5 to 2.2 mBGS. It is expected that the seepage rate into the excavation within the fill and native sandy soils will be moderate to high. If the excavation is to be above the groundwater table, minor to moderate groundwater ingress can readily be handled by using installation of sumps and pumps at strategic locations at the base of excavation. If the excavation is to be extended to a greater depth and below local groundwater table, an active pre-construction dewatering system such as well points may be required depending on the depth and size of excavations. Due to the relatively shallow groundwater and generally permeable soils at this Site, a hydrogeological study may be required to assess the need for a Permit to Take Water (PTTW) for deeper and larger (in plan) excavations.

Considerations should be given to the possible presence of cobbles/boulders and/or rubble/debris at this Site and their impact on the excavation. The contractor should be prepared to deal with cobbles/boulders and/or rubble/debris that may exist at this Site.

Footings subject to frost action should have a minimum soil cover of at least 1.2 m according to OPSD 3090.101 for Southern Ontario or be protected using equivalent insulation.

The following sections provide additional comments and recommendations on the above topics as well as other geotechnical related design and construction issues.

4.2 Site Preparation and Grading

Site preparation and grading works may be required to level the Site to achieve subgrade design elevations, as well as to provide positive drainage for surface runoff. To reduce accumulation of surface runoff and softening of the subgrade, site grades should be designed to minimize ponding of water on the surface and to provide positive drainage away from the proposed foundations and roadway areas as quickly as possible.

Based on the subsurface conditions encountered in the boreholes, the Site is primarily underlain by a layer of fill materials extending to a significant depth between approximately 6.1 and 7.6 mBGS. The fill materials were frequently observed to contain organics and construction debris.

From practical and economical point of view, the existing fill may be considered suitable to support the proposed landscaping areas and the associated paved muti-use trail and permeable pavers, provided the fill material is free of deleterious materials. However, large settlement/movement of the landscaping areas and the associated structures (i.e., paved muti-use trail and permeable pavers) should be expected due to the anticipated variation of the fill composition (i.e., fill may contain organics, construction debris, etc.). If a grade raise is considered for this Site, then it should be anticipated that this surcharge will result in some overall settlement of the underlying fill materials. Raising the site grade considerably without the use of ground improvement should be evaluated and carried out in stages and should be monitored during construction. If settlement from surcharge loads is not acceptable, then ground improvement should be implemented.

The topsoil and any portions of the earth fill materials found to contain deleterious material (debris and organics) should be removed prior to site grading activities and should not be used as backfill. The subgrade exposed after the removal of the unsuitable materials is expected to consist generally of clean earth fill. The subgrade soils should be visually inspected, compacted if required, and proof rolled using heavy equipment. Any soft, or unacceptable areas should be sub-excavated, removed as directed by the Geotechnical Engineer and replaced with suitable earth fill materials or imported granular materials placed in thin layers (200 mm thick or less) and compacted to a minimum of 98 percent Standard Proctor Maximum Dry Density (SPMDD). A great care must be used during construction when excavating or filling to avoid any potential ground failure resulting from the existing loose fill below the groundwater table. If the excavation is to be extended to a greater depth and below local groundwater table, an active pre-construction dewatering system such as well points may be required depending on the depth and size of excavations.

The clean earth fill soils encountered at the Site may be suitable for reuse as backfill to raise site grades (where required) or to be used as backfill against foundations or as trench backfill during installation of buried services, provided the material is free of deleterious materials and is within the optimum moisture content. The fill soils above groundwater table are anticipated to be generally near their optimum water content for compaction, whereas those soils below the groundwater level will likely be wet and well above their optimum water content for compaction. If the fill and native soils are to be reused as a backfill, it should be anticipated that reworking of the soils will be necessary to facilitate compaction through drying or slight wetting.

Installation of engineered fill, where required, must be continuously monitored on a full-time basis by qualified geotechnical personnel.

4.3 Foundations

Structural foundations at the Site can consist of deep foundation (cast-in-place concrete piles/caissons) or helical piles placed within the native soils or foundations on improved ground to support the proposed structures/buildings. The common practice for the Serviceability Limit State (SLS) design of most structure and building foundations is to limit the total and differential foundation settlements to 25 mm and 15 mm, respectively. Other serviceability criteria for the proposed structures/buildings may be determined by the structural engineer considering tolerable settlement that would not restrict the use or operation of the facilities.

The foundation design options are presented in more detail below.

4.3.1 Deep Foundation (Cast-in-Place Concrete Caissons)

Based on the boreholes data and the MASW testing, the proposed structures/buildings may be supported on deep foundations (cast-in-place concrete caissons) placed within the competent native soils at a minimum depth of 8.0 mBGS. If a deep foundation option such as cast-in-place concrete caissons is selected to support the proposed structures/buildings at this Site, then the caissons may be designed using the following relationships with SPT values (suggested by Decourt 1995):

$$q_{su} = \grave{\alpha} \times (2.8\ N' + 10)\ (kPa)$$

$$q_{tu} = K_b \times N_b\ (kPa)$$

where:

q_{su} = ultimate shaft resistance

q_{tu} = ultimate toe resistance

$\grave{\alpha}$ = 1 for displacement piles in any soil and non-displacement piles in clays, and 0.5 to 0.6 for non-displacement piles in granular soils

N' = average SPT index along the pile shaft

N_b = average SPT index in the vicinity of the pile toe

K_b = is a base factor given in the table below:

Soil Type	Displacement Piles	Non-Displacement Piles
Sand	325	165
Sandy Silt	205	115
Clayey Silt	165	100
Clay	100	80

The factored geotechnical resistance at ultimate limit states would then be obtained by multiplying the ultimate capacity by the geotechnical resistance factor of 0.3. Much of the effort in the design of caisson/pile foundations to support axial loads focuses on satisfying the ultimate limit state (ULS) using various methods of doing so. In most cases, the ULS controls the axial load design and produces piles settlement less than 15 mm under service loads. This is less than the allowable settlement for almost all structures, so the serviceability limit state (SLS) requirements for settlement are often assumed to be satisfied.

Based on the above equations and for preliminary design, the piles/caissons placed at a minimum depth of 8.0 mBGS within the competent (compact/stiff) native soils may be designed for a factored toe/end bearing resistance of 580 kPa.

The uplift/upward (tensile) load capacity of caissons/piles depends on the weight of the piles and side friction. A factored (allowable) side/shaft resistance of 6 kPa may be used for the design of the uplift. It is recommended that the uplift resistance should be ignored over the upper 2.0 m of the shaft to account for possible shrinkage of soil away from the shaft due to frost or weathering effect and the poor quality of the fill soils at this site.

As a general practice, the minimum required diameter of the augered cast-in-place caissons is 760 mm to allow for inspection and cleaning prior to placing concrete, as pile bases are required to be approved by the geotechnical engineer prior to concrete installation, to ensure that the subgrade conditions encountered are consistent with the Site investigation results.

Temporary groundwater control measures will be required during caisson installation, depending on the groundwater levels. Temporary casing and heavy mud drilling will likely be required when drilling through the sandy soils below the groundwater table to prevent sloughing and groundwater infiltration. Specialized rock bits may be required when drilling through the fill and native soils that contains cobbles/boulders or construction rubble to advance the caissons through the anticipated cobbles/boulders or construction rubble. The Contractor should determine the appropriate measures required in accordance with their equipment and methods to facilitate the caisson installations.

The caisson installation should be carried out under full time inspection by Davroc from the ground surface, to verify that a competent bearing surface has been established at each caisson unit. The bearing surface of each caisson should be evaluated by visual examination of the auger cuttings during auguring, particularly at the caisson base, observation of the progress of drilling operations and comparison of the observations and depth/elevation of each caisson with the information presented on the borehole logs.

All pile caps and other structure foundations should be provided with a minimum of 1.2 m of soil cover for frost protection, or equivalent insulation.

The deep foundations should be constructed in accordance with OPSS 903.

4.3.1.1 Group Effects

Piles are usually installed in groups of three or more and the proper spacing of piles in the group is important. If the piles are too close (i.e., less than about 2.5-3.0 diameters on center), there may not be enough room for errors in positioning and alignment. Conversely, if the spacing is too wide, the pile cap will be very large and expensive. Therefore, the minimum recommended pile spacing is 3 diameters on-center. Group effects are complex and depend on many factors and should be obtained from static load tests. The net effect is usually described in terms of the group efficiency factor (η):

$$P_{ng} = \eta\, N\, P_n$$

where;

P_{ng} = nominal axial load capacity of the pile group

η = group efficiency factor

N = number of piles in group

P_n = nominal axial load capacity of an individual pile

For drilled shafts, a group efficiency factor of 0.65 may be used for piles spaced 2.5 diameters on center in cohesionless soils, and 1.0 when 4.0 or more diameters on center and a linearly interpolated values between these spacing (AASHTO 2012).

4.3.1.2 Horizontal Subgrade Reaction

For piles subjected to a horizontal load, the lateral pile deflection can be determined using the modulus of horizontal subgrade reaction (K_h). The K_h depends on the soil type and relative density/consistency, stress level, and the geometry of the pile. However, for preliminary design and without conducting any verification test, the following simplified equation suggested by Terzaghi (1955) for cohesionless soils can be used to calculate the value of K_h at each depth:

$$K_h = n_h \times (z/d)$$

where;

K_h = modulus of horizontal subgrade reaction (kN/m^3)

n_h = Coefficient related to soil density (assume 1386 kN/m^3, typical value after Terzaghi 1955)

z = depth (m)

d = pile diameter (m)

Based on the borehole data, while the fill materials may offer some resistance, we recommend that the lateral and uplift resistance should be ignored over the upper 2.0 m of the shaft to account for possible shrinkage of soil away from the shaft due to frost or weathering effect.

Lateral displacement of the pile within the soil may be determined based on the pile-soil interaction behavior, expressed as p-y curves (where p is unit load or resistance, and y is lateral deflection). The p-y curves are developed by back calculating them from static load tests and combining this data with analytical models based on soil mechanics. The commonly used LPILE software that employ the p-y curve method can be used for modeling laterally loaded piles. Modeling laterally loaded piles using LPILE software are beyond the scope of our work and is expected to be carried out by the structural engineer.

This calculation and evaluation of the lateral displacement of the pile structure are beyond the scope of our work of present investigation and is expected to be carried out by the structural engineer, if required.

4.3.2 Helical Piles

As an alternative to cast-in-place concrete caissons, considerations could be given to support the proposed structures on helical piles foundation. Helical piles also called screw piles consist of steel screws that are torqued into the ground to form a foundation. Helical piles can be installed with relatively light equipment. The diameter of helical piles generally ranges from 300 to 1000 mm and have capacities that can exceed 2,000 kN, although 100 to 500 kN is more typical. Due to the anticipated cobbles/boulders and/or rubble/debris within the fill layers at this Site, the design for the helical piles should account for the presence of cobbles/boulders and/or construction rubble within the soils which may impact the installation of the helical piles (i.e., the helical piles may reach their design load at shallow depths and/or the helix may be damaged). As such, the option of using helical piles may not be suitable. However, a specialized contractor (e.g., EBS Geostructural Inc.) should be consulted to assess the suitability of this foundation option (helical piles).

The helical pile plates must be embedded into a competent native soil (minimum depth of 8.0 mBGS), depending on the design load. Piles may need to be extended further if the pile torque (during installation) does not meet the design loads. The torque must be monitored during installation to confirm the design load. The actual design must be discussed with the contractor and confirmed during installation. A geotechnical ULS factor of safety of 2.0 is commonly used for axially loaded helical piles where good construction quality control is exercised, including monitoring the installation torque for each pile.

The torque required to install helical piles can be measured during construction, and methods have been developed to correlate torque with capacity (ICC Evaluation Service, 2007). Construction quality control will be required during the installation of the helical piles. A specialized contractor must be retained to design and install the helical piles. If this foundation option is selected, it is recommended that at least two (2) helical piles be load tested.

4.3.3 Foundation on Improved Ground

The fill soils present at this Site are in general considered unsuitable bearing subgrade for the support of the proposed new structure/buildings. Based on the data at the borehole locations, the depth to the competent natural/native subgrade soils is considered to be significant (approx. 6.1 to 7.6 mBGS). As such, a shallow foundation option may not be a feasible option without the use of ground improvement. Ground improvement will improve the bearing capacity of the fill soils and will generally provide a uniformly compacted subgrade for the structures/building's foundations. The ground improvement methods that may be appropriate for the existing miscellaneous fill materials that will support light weight structures include rapid impact compaction, vibro-replacement (stone columns) and aggregate piers. It is recommended that the expertise of an experienced ground improvement contractor (i.e., Menard Canada) be retained during selection of ground improvement method.

For spread and strip foundations placed within areas where soil improvement has been carried out, it may be possible to obtain a factored geotechnical resistance at Ultimate Limit State (ULS) of 200 kPa, and a geotechnical reaction at Serviceability Limit State (SLS) of 100 kPa. This will need to be verified by the specialty soil improvement design-build subcontractor carrying out the work. The bearing capacity values would depend on the depth and extent of ground improvement carried out.

4.4 Slab-on-Grade

Subsurface conditions beneath a potential slab-on-grade within the investigated area are expected to comprise of existing fill. Based on the findings of the investigation, the existing miscellaneous fill materials are extending to a significant depth and are not considered suitable to support a slab-on-grade. Commonly, unsuitable materials such as the existing fill are removed and replaced with structural (engineered) fill. Excavation to the depth (approx. 6 to 8 mBGS) and extent required is likely not economically feasible due to the complexity/risk associated with removing significant thickness of loose to very loose fill below groundwater table.

If the proposed slab placed within the underlying loose miscellaneous fill materials, then it is anticipated that slab will experience large settlement which may result in future cracks and fractures. As such, a conventional slab on grade placed within the loose miscellaneous fill materials may not be suitable for this Site unless the slab is designed to accommodate large settlement. Therefore, an option of supporting the proposed slab on grade and shallow foundations for the proposed structures on improved ground as discussed in Section 4.3.3 could be considered for this project. Alternatively, the slab on grade can be supported on competent lightweight fill materials such as cellular concrete (foamed concrete), or uniform sand or geotechnical polyurethanes that will be used to replace the upper 1.0 m of the existing fill soils above the groundwater table. Removing approximately 1.0 m of the existing fill soils and replace the soil with lightweight materials may suffice, depending on the unit weight of the materials to be used for replacing the existing fill soils. Also, a cupolex slab system may be used for the slab on grade or the slab can be connected to the deep foundations system and designed as a structural slab. A cupolex slab system is a forming system for concrete slab foundations made from 100% recycled plastic. Concrete is poured over the modular dome forms to create a floating or structural concrete slab.

If the slab is to be placed on the existing ground or improved ground, then the floor slab should be placed on a 200 mm thick layer of well-graded granular base material consisting of 19 mm clear stone or crusher run limestone (or equivalent). For the structural design of the concrete slab-on-grade, a combined modulus of subgrade / granular base reaction coefficient (k) of 20 MPa/m may be used for the slab placed on improved ground. If a cupolex slab system is used, then there is no need for the 200 mm granular layer as the cupolex slab system will act as a moisture barrier.

Depending on the finished floor elevation and static groundwater table, a subfloor drainage system may be required beneath the slab. Alternatively, the slab can be connected to the deep foundations system and designed as a structural slab. This will eliminate the need to install and maintain the subfloor drains, but is otherwise likely to be more costly.

If the option of subfloor drainage system is selected, then the subfloor drainage system may consist of a 200 mm layer of 19 mm clear stone bedding to act as moisture barrier, separated from the underlying soils by filter fabric (Terrafix 270R, or equivalent), with 100 mm diameter perforated pipes placed a maximum of 5 m apart and discharged to appropriate sump structures for a positive outlet. However, It is Davroc's understanding that the long-term discharge of groundwater to a City sewer is not permitted in the City's Foundation Drainage Policy.

4.5 Lateral Earth Pressures

Structures subject to unbalanced earth pressures such as foundation walls, shoring systems, retaining walls and other similar structures should be designed to resist the lateral earth pressures. If required and depending on the type of shoring used during construction, the temporary shoring system for excavation support can be designed for the lateral earth pressures given in Sections 26.8, 26.9, and 26.10 of the Canadian Foundation Engineering Manual (CFEM) - 4th Edition. Surcharge loads and hydrostatic pressures should be considered as appropriate. The following table below summarizes the recommended soil parameters to be used for lateral earth pressure calculations at this Site:

Soil Type	Bulk Unit Weight	Effective Angle of Internal Friction (º)	Coefficient of Lateral Earth Pressure		
	γ (kN/m^3)	ϕ'	K_a	K_o	K_p
Fill Soils	18	25˚	0.40	0.58	2.46
Native Soils	19	28˚	0.36	0.53	2.77

If movement sensitive services exist close to the shoring, the lateral pressure should be computed using the coefficient of earth pressure at rest, K_0.

4.6 Seismic Site Classification

The latest Ontario Building Code (OBC) requires the assignment of a Seismic Site Class for calculations of earthquake design forces and the structural design based on a two percent probability of exceedance in 50 years. According to the latest OBC, the Seismic Site Class is a function of soil profile and is based on the average properties of the subsoil strata to a depth of 30 m below the ground surface. The OBC provides the following three methods to obtain the average properties for the top 30 m of the subsoil strata:

- Average shear wave velocity.
- Average Standard Penetration Test (SPT) values (uncorrected for overburden).
- Average undrained shear strength.

Based on the results of this investigation and the MASW report provided in **Appendix C**, the Site with building foundations placed on native soils can be classified as **Class "D"** for seismic load calculations subjected to code requirements.

4.7 Infiltration Test Results

The results of the percolation/infiltration tests are summarized in the following table:

Test-Hole ID.	Depth (mBGS)	Material Description	Percolation Time (min/cm)	Infiltration Rate (mm/hr)
TH-1 (BH6-22)	1.5	Silty Sand/Sandy Silt Fill	15.0	40.0
TH-2 (BH/MW7-22)	1.5	Silty Sand/Sandy Silt Fill	15.0	40.0
Average Infiltration Rate of Both Tests (mm/hr)				**40.0**

Based on the information presented in Table 2 and 3 of the Supplementary Standard SB-6 of the Ontario Building Code (OBC 2012) and the Ontario Ministry of Municipal Affairs and Housing (OMMAH), the approximate relationship between hydraulic conductivity, percolation time and infiltration rate are summarized in the following table:

Hydraulic Conductivity (cm/s)	Percolation Time (min/cm)	Infiltration Rate (mm/hr)
10^{-1}	2	300
10^{-2}	4	150
10^{-3}	8	75
10^{-4}	12	50
10^{-5}	20	30
10^{-6}	50	12

The infiltration rate used for design must incorporate a safety correction factor that compensates for potential reductions in soil permeability due to compaction or smearing during construction, gradual accumulation of fine sediments over the lifespan and uncertainty in measured values when less permeable soil horizons exist. Since the fill soil at this site is generally consisting of silty sand / sandy silt, then the recommended safety correction factor to calculate the design infiltration rate is 2.5 (Source: Wisconsin Department of Natural Resources. 2004. Conservation Practice Standards. Site Evaluation for Stormwater Infiltration (1002). Madison, WI). As such, the recommended design infiltration rate for the tested silty sand / sandy silt fill soils at this site is 40.0/2.5 = 16 mm/hr.

5. Construction Considerations

5.1 Excavation and Temporary Shoring

The Occupational Health and Safety Act (OHSA) regulations require that if workmen must enter an unsupported excavation deeper than 1.2 m, the excavation must be suitably sloped and/or braced in accordance with the OHSA requirements. OHSA specifies maximum slope of the excavations for four broad soil types as summarized in the following table:

Soil Type	Base of Slope	Maximum Slope Inclination
1	Within 1.2 m of bottom	1 horizontal to 1 vertical
2	Within 1.2 m of bottom of trench	1 horizontal to 1 vertical
3	From bottom of excavation	1 horizontal to 1 vertical
4	From bottom of excavation	3 horizontal to 1 vertical

Trench excavations should be carried out in strict conformance to the current Occupational Health and Safety Act (OHSA). For the purpose of interpreting the act, the fill and native soils within the Site above the groundwater table can be classified as Type 3 soils. If affected by groundwater seepage, the fill and native soils can be considered as Type 4 soils. The highest number soil type identified in an excavation must govern the excavation slopes from top to bottom of the excavation.

If the above recommended excavation side slopes cannot be maintained due to lack of space or any other reason, the excavation side walls must be supported by an engineered shoring system. The shoring system should be designed in accordance with Canadian Engineering Foundation Manual (4th Edition) and the OHSA Regulations for Construction Projects.

If a shoring system is selected to support the excavation walls, it is recommended that the expertise of an experienced shoring contractor be retained during selection of a shoring approach. It is also recommended that the shoring system required to stabilize the excavation sidewalls during construction be developed by the general and shoring contractors. Further recommendations for shoring may be required depending on the type of shoring system selected for this project.

It is anticipated that excavations within the overburden can be made with conventional equipment. Cobbles, boulders, and construction rubble should be expected within the overburden, and the contract should allow for the removal of cobbles/boulders and/or construction rubble. The selection of the excavation equipment to be used is the contractor's responsibility.

5.2 Excavation Base Stability

If the excavation extended into the sandy fill or native sand / sandy silt and below groundwater table, then a dewatering system will likely be required prior to excavation to prevent basal instability of excavation from being liquefied/disturbed by upward groundwater flow/piping failure mechanisms due to the general permeable nature of the fill and native sandy soils at this Site. The contractor should be prepared to deal with such conditions.

5.3 Temporary Ground Water Control

The amount of seepage into excavations will depend on the depth of excavation relative to the groundwater level at the time of construction and the hydraulic conductivity of the excavated soils. The measured groundwater levels within the installed monitoring wells were found to range from approximately 1.5 to 2.2 mBGS. It is expected that the seepage rate into the excavation within the fill and native sandy soils will be moderate to high. If the excavation is to be above the groundwater table, minor to moderate groundwater ingress can readily be handled by using installation of sumps and pumps at strategic locations at the base of excavation. If the excavation is to be extended to a greater depth and below local groundwater table, an active pre-construction dewatering system such as well points may be required depending on the depth and size of excavations.

If the excavation extended below groundwater table, then it is recommended that the groundwater level be maintained at least 0.5 m below the base of excavation to provide dry and stable/safe condition. A dewatering specialist should be consulted to determine the most appropriate measures to be undertaken to sufficiently lower the groundwater table below the lowest excavation depth. The possibility of settlement from the dewatering should be part of the methodology considerations. The selection of dewatering measures is the sole responsibility of the contactor.

Due to the relatively shallow groundwater and generally permeable soils at this Site, a supplementary hydrogeological study may be required to further define the groundwater levels, the rate of groundwater seepage, and the requirement for permit to take water (PTTW) for deeper and larger (in plan) excavations.

5.4 Suitability of On-Site Soils

The topsoil and any earth fill materials found to contain significant amounts of organics or deleterious materials should be removed and should not be used as backfill materials.

The clean earth fill soils encountered at the Site may be suitable for reuse as backfill to raise site grades (where required) or to be used as backfill against foundations or as trench backfill during installation of buried services, provided the material is free of deleterious materials and is within the optimum moisture content. The fill soils above groundwater table are anticipated to be generally near their optimum water content for compaction, whereas those soils below the groundwater level will likely be wet and well above their optimum water content for compaction.

If the fill and native soils are to be reused as a backfill, it should be anticipated that reworking of the soils will be necessary to facilitate compaction through drying or slight wetting.

All backfill operations and materials should be inspected and tested by qualified geotechnical personnel to confirm that proper material is utilized, and that adequate compaction is attained.

5.5 Site Servicing

From practical and economical point of view, considerations may be given to installing any site services within the shallow portion (upper 2 m) of the existing clean fill in order to avoid dewatering and shoring. If the service pipes placed on the existing fill, settlement of these pipes should be expected, and as such the service pipes may be sheared or distorted. This is especially troublesome with gravity flow lines, such as sewer pipes. Concrete bedding may be required to maintain the grade and integrity of the pipes. The design for shallow service pipes should consider the effect of frost action.

The subgrade soils used to support the service pipes, should be visually inspected. Wet, loose, or otherwise unsuitable fills should be sub-excavated and replaced with concrete bedding or clean fills compacted to minimum of 95% SPMDD.

6. Pavement Design

Earth fill was encountered immediately beneath the topsoil or at the ground surface in all boreholes. The fill materials were frequently observed to be variable in density and containing organics, and construction debris.

The fill condition may be suitable to support pavement and permeable paver for the potential multi-use trail, subject to proof-rolling, re-compaction and inspection. However, post construction settlement of the paved areas should be expected and regular maintenance and regrading will likely be required in the future to correct pavement profiles. The design of the paved areas should take into account the expected settlement after construction is complete.

6.1 Flexible Asphalt Pavement

6.1.1 Subgrade Preparation

As mentioned above, the existing earth fill may be suitable to support pavement for the potential multi-use trail areas provided the exposed subgrade is proof rolled, recompacted, and free of all loose and deleterious materials (i.e., topsoil, organics, debris, etc.). It is recommended that any subgrade comprising of existing fill be inspected for obvious soft/loose areas and presence of deleterious materials.

Due to the anticipated loose fill at this Site, raising the Site grade considerably may result in excessive settlement and should be carried out in stages and monitored, if required. The fill should be placed in large areas where it can be compacted by a heavy roller. Any fill placed to increase or level the grade must be compacted to a minimum 98 percent SPMDD in lifts not exceeding 200 mm. In-situ density testing to monitor the effectiveness of the compaction equipment in achieving the required densities is also recommended.

6.1.2 Recommended Pavement Structure

Due to the anticipated loose fill soils at the proposed pavement subgrade, it would be prudent to increase the thickness of the base and subbase layers. Also, considerations could be given to reinforcing/stabilizing the subgrade with geogrid.

The following table provides the recommended pavement structures for the multi-use trail.

Pavement Layer	Compaction Requirements	Recommended Pavement Layer Thickness (mm)
Surface Course Asphaltic Concrete HL3 (OPSS 1150)	92% Maximum Relative Density (OPSS 310)	40 mm
Base Course Asphaltic Concrete HL8 (OPSS 1150)	92% Maximum Relative Density (OPSS 310)	60 mm
Base Course: Granular 'A' 19mm Crusher Run (OPSS1010)	100% Standard Proctor Maximum Dry Density	150 mm
Sub-base Course: Granular 'B' 50mm Crusher Run (OPSS1010)	100% Standard Proctor Maximum Dry Density	350 mm

If pavement construction occurs in wet inclement weather, it may be necessary to provide additional subgrade support for construction traffic by increasing the thickness of the granular sub-base.

6.1.3 Drainage

Grading adjacent to pavement areas should be designed so that water is not allowed to pond adjacent to the outside edges of the pavement. Also, the pavement subgrade should be free of depressions and sloped (preferably at a minimum grade of two percent) to provide effective drainage toward the edge of pavement and toward catch basins.

6.2 Permeable Pavement

It is understood that the City requires recommendations for porous/permeable pavement to control the amount of runoff from the surrounding area by allowing precipitation and runoff to flow through the porous pavement. The following table provides the suggested porous/permeable pavement structures for the multi-use trail based generally on the United States Environmental Protection Agency (EPA) and the U.S Department of Transportation and the Federal Highway Administration (FHWA).

Porous / Permeable Pavement Layer	Recommended Layer Thickness (mm)
Surface course of an open-graded/porous Asphalt Mix (19mm aggregate asphaltic mix)	100 mm
Filter course (19mm crushed stone)	50 mm
Reservoir course (50mm crushed stone)	450 to 900 mm

The thickness of the reservoir course varies depending on the storage volume required and frost penetration. It is recommended that a filter fabric be placed between the subgrade and the reservoir course.

7. Analytical Tests

During the field activities of this investigation, soil samples were collected from the boreholes at various depths above and below 1.5 mBGS to generally determine the quality of the onsite soils. The collected samples were placed into the appropriate pre-labelled containers supplied by ALS Environmental. The soil samples were placed in iced-filled coolers to ensure that the samples were below 10°C upon arrival at the laboratory for analysis.

Field screening of the boreholes and split spoon samples was conducted using an RKI Eagle-II photoionization detector (PID) to assess which depths had the highest potential for Volatile Organic Compounds (VOCs) concentration. Soil from these depths were collected for submission to the laboratory.

Samples collected from above 1.5 mBGS were analysed for petroleum hydrocarbon (PHC) fractions F1 to F4, VOCs, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals & inorganics. Samples from below 1.5 mBGS were analysed for semi-volatile organic compounds (SVOCs) in addition to these parameters.

Five (5) representative leachate samples were submitted for metals and VOCs using a modified synthetic precipitation leaching procedure (mSPLP).

A composite sample was submitted for metals & inorganics, PAHs, PHCs, PCBs, and VOCs using a Toxicity Characteristic Leaching Procedure (TCLP).

The results of the chemical analyses are presented on the ALS Certificates of Analysis in **Appendix D**. The following table summarizes the Leachate and TCLP Analysis exceedances.

Analysis	Exceedance	Guideline Limit
mSPLP	Tetrachloroethylene* (Leachate 5, BH/MW1-22, 15' to 17' depth = 0.51 µg/L)	0.5 µg/L
TCLP	No Exceedance	

Notes:

Exceedances in **orange** meet O.Reg. 406/19 Table 3 ICC requirements but exceed RPI requirements.

Red exceeds ICC Standards

*An asterisk means the contaminant still meets O.Reg. 153/04 MECP Table 3 ICC concentration limits.

The following table summarizes the Bulk Analysis exceedance

Borehole ID	Exceedance	Guideline Limit
BH/MW1-22	Mercury* (BH1-S, 0' to 2' depth = 0.288 µg/g)	0.27 µg/g
BH2-22	No Exceedance	
BH3-22	**EC** (2.5' to 4.5' depth = 0.780 mS/cm) (5' to 7' depth = 0.769 mS/cm)	0.7 mS/cm
	SAR (2.5' to 4.5' depth = 6.18)	5
	Acenaphthylene* (5' to 7' depth = 0.144 µg/g)	0.093 µg/g
	Anthracene* (5' to 7' depth = 0.422 µg/g)	0.16 µg/g
	Benz(a)anthracene* (5' to 7' depth = 0.604 µg/g)	0.5 µg/g
	Fluoranthene* (5' to 7' depth = 1.30 µg/g)	0.69 µg/g
BH4-22	No Exceedances	
BH/MW5-22	No Exceedances	
BH6-22	No Exceedances	
BH/MW7-22	**SAR** (BH7-D, 10' to 12' depth = 5.14)	5

Notes:

Exceedances in **orange** meet O.Reg. 406/19 Table 3 ICC requirements but exceed RPI requirements.

Red exceeds ICC Standards

* An asterisk means the contaminant still meets O.Reg. 153/04 MECP Table 3 ICC concentrations limits.

Discussion

All properties within the City of Toronto are MECP Table 3 sites for soil and groundwater. Groundwater within the City Limits is non-potable.

O.Reg. 406/19 On-Site and Excess Soil Management standards for Residential, Parks, and Institutional land use (RPI) were applied to the bulk analysis. The mSPLP analysis was compared to O.Reg. 406/19 MECP Table 3.1 RPI Leachate Screening Levels and the TCLP analysis was compared to O.Reg. 347 Schedule 4 Leachate Quality Criteria to determine eligibility for landfill disposal.

Upon review of the lab results in **Appendix D**, BH/MW1-22 exceeded O.Reg. 406/19 MECP Table 3.1 concentration limits for mercury (Hg) (0.288 µg/g > 0.27 µg/g) but meets O.Reg. 153/04 MECP Table 3.1 ICC concentration limits (0.288 µg/g < 3.9 µg/g).

The results of the mSPLP analysis found that Leachate 5, which was also sampled from BH/MW1-22, exceeded the O.Reg. 406/19 MECP Table 3.1 Leachate Screening limit for tetrachloroethylene (PCE) (0.51 µg/g>0.5 µg/g). However, these samples comply with O.Reg. 153/04 ICC property use limits (0.51 µg/g < 1.9 µg/g), which apply to volumes of soil under 350 m3. Therefore, the soil from the BH/MW1-22 area can still be used at a Table 3 ICC property so long as the total volume transported offsite from the contaminated area is under 350 m^3.

Borehole BH3-22 exceeded O.Reg. 406/19 MECP Table 3.1 RPI limits for EC (>0.7 mS/cm), SAR (>5), acenaphthylene (>0.093 µg/g), anthracene (>0.16 µg/g), benzo(a)anthracene (>0.5 µg/g), and fluoranthene (>0.69 µg/g). However, these contaminants are all within O.Reg. 153/04 MECP Table 3 ICC concentration limits. Therefore, the soil from borehole BH3-22 area can still be used at another Table 3 ICC property so long as the total volume transported offsite from the contaminated area is under 350 $m^{3.}$

Borehole BH/MW7-22 exceeded MECP Table 3.1 RPI standards for SAR but not ICC property use standards. This soil can still be used in the project area under a paved roadway.

All other boreholes complied with O.Reg. 406/19 MECP Table 3.1 RPI concentration limits.

Recommendations

Up to 350 m^3 of soil each from the contaminated soils at the location of boreholes BH/MW1-22 and BH3-22 can be transported to separate MECP Table 3 ICC properties. After this, re-sampling of the excavated areas for mSPLP analysis is recommended to determine if the remainder complies with O.Reg. 406/19 MECP Table 3 ICC limits. Otherwise, the remainder must be disposed of at a secure landfill.

Soil from the contaminated soil at the location of borehole BH/MW7-22 can still be used under a paved roadway onsite. Otherwise, it must be transported to another MECP Table 3.1 ICC receiving site.

After the 350 m^3 of soil has been removed, then resample the areas to see if the previous exceedance to O.Reg 406/19 can now be met.

All other soil outside the contaminated areas meets O.Reg. 406/19 MECP Table 3.1 RPI Standards and can remain onsite or be transported to a new Table 3.1 RPI site.

Davroc makes no warranty, express or implied, as to whether or not excavated soils will be accepted by receivers. Off-site receivers will likely require additional testing prior to acceptance of any soils. They may also reject soils based on other criteria, such as presence of organic material, rubble, or elevated moisture content.

Notwithstanding the test results provided herein, soils with any evidence of anomalous fill, staining or odours should be stockpiled separately, covered with tarps, and this office should be immediately contacted so that additional testing may be performed to assess their environmental quality.

8. Limitations of the Investigation

This report is intended solely for City of Toronto, and their designers and is prohibited for use by others without Davroc's prior written consent. This report is considered Davroc's professional work product and shall remain the sole property of Davroc. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to Davroc. Client shall defend, indemnify and hold Davroc harmless from any liability arising from or related to Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

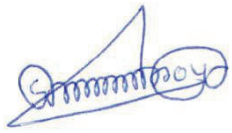
The recommendations made in this report are in accordance with our present understanding of the project, the current site use, ground surface elevation and conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of geotechnical engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

All details of design and construction are rarely known at the time of completion of a geotechnical study. The recommendations and comments made in the study report are based on our subsurface investigation and resulting understanding of the project, as defined at the time of the study. We should be retained to review our recommendations when the drawings and specifications are complete. Without this review, Davroc will not be liable for any misunderstanding of our recommendations or their application and adaptation into the final design.

By issuing this report, Davroc is the geotechnical engineer of record. It is recommended that Davroc be retained during construction of all foundations and during earthwork operations to confirm the conditions of the subsoil are actually similar to those observed during our study. The intent of this requirement is to verify that conditions encountered during construction are consistent with the findings in the report and that inherent knowledge developed as part of our study is correctly carried forward to the construction phases. It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the test locations only. The subsurface conditions confirmed at the test locations may vary at other locations. The subsurface conditions can also be significantly modified by the construction activities on site (e.g., excavation, dewatering and drainage, lasting, pile driving, etc.). These conditions can also be modified by exposure of soils or bedrock to humidity, dry periods or frost. Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during construction which could not be detected or anticipated at the time of our investigation. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations. If changed conditions are identified during construction, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by Davroc is completed.

We trust this report meets with your current requirements, should you require any further information, please do not hesitate to contact us.

Yours truly,
Davroc Testing Laboratories Inc.



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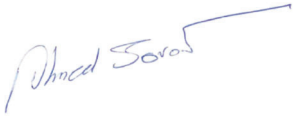

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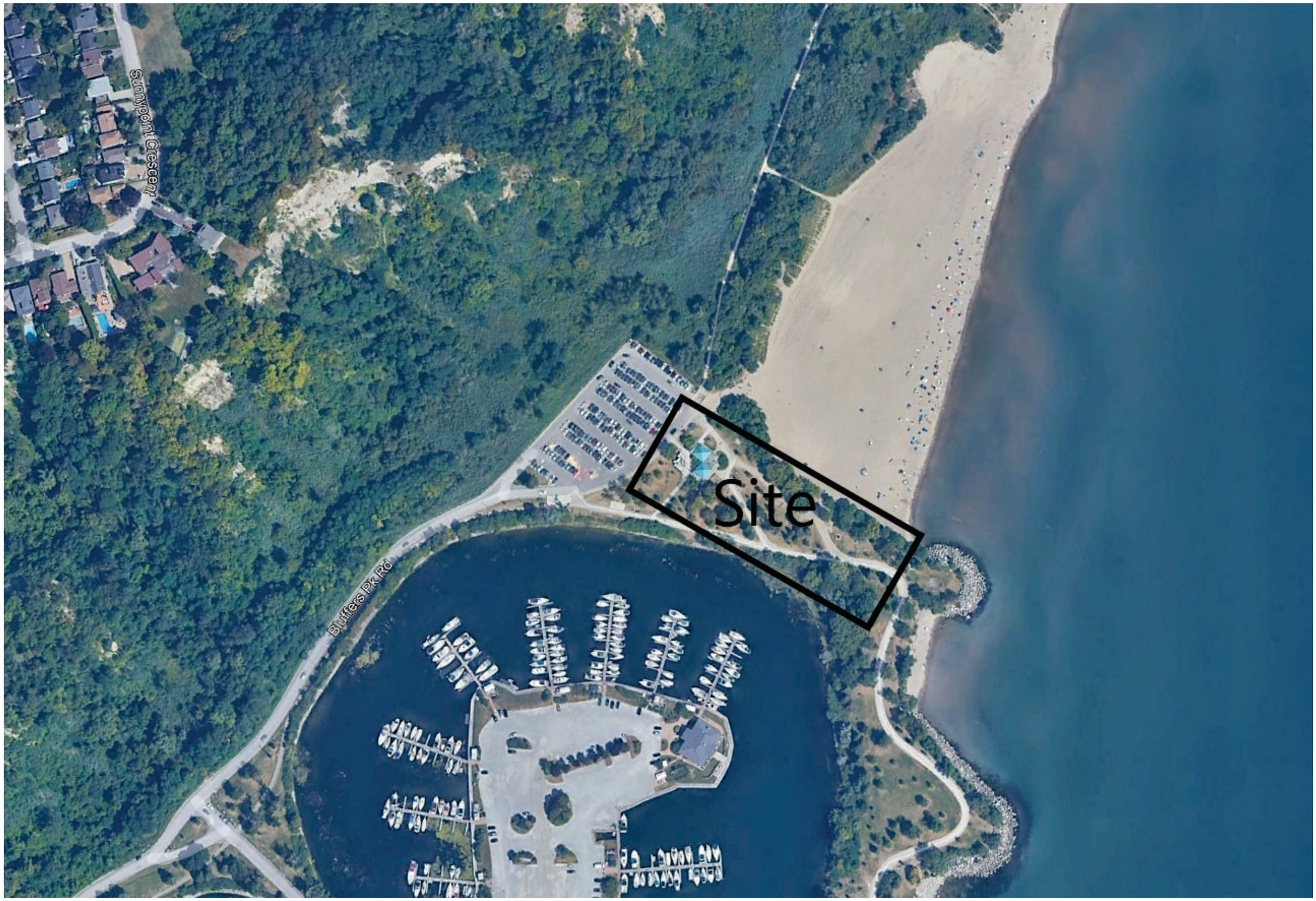
President

SR/AS/SF
22-0780-2 Geo-Report

Figure Index

Site Location Map

Figure 1



N

Site Location Map

City of Toronto
Geotechnical Investigation
1 Brimley Road South
Toronto, Ontario

2051 WILLIAMS PARKWAY UNIT 21
BRAMPTON, ONTARIO
CANADA L6S 5T4
TEL: (905) 792-7792
FAX: (905) 792-7829

DAVROC
& ASSOCIATES LTD.

DESIGN:	N/A
DRAWN:	N/A
APPROVED:	
SCALE:	N.T.S.
DATE:	Feb 2, 2023

JOB NO.: L22-0780GE

FIGURE. NO.: 1

Borehole Location Plan

Figure 2

N

Borehole Location Plan

LEGEND

- BH- Borehole Location
- BH/MW- Borehole/ Monitoring Well Location
- TH-Percolation Test Hole Location

City of Toronto
Geotechnical Investigation
1 Brimley Road South
Toronto, Ontario

2051 WILLIAMS PARKWAY UNIT 21
BRAMPTON, ONTARIO
CANADA L6S 5T4
TEL: (905) 792-7792
FAX: (905) 792-7829

DAVROC
& ASSOCIATES LTD.

DESIGN:	N/A
DRAWN:	N/A
APPROVED:	
SCALE:	N.T.S.
DATE:	Jan 25, 2023

JOB NO.: L22-0780GE

FIGURE NO.: 2

Appendix A

Record of Borehole Logs

BOREHOLE NUMBER BH/MW1-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 29-12-22 **COMPLETED** 29-12-22
GROUND ELEVATION 77.39 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 2.29 m / Elev 75.10 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING 6.75 m / Elev 70.64 m .
NOTES UTM Coordinates: Northing 4841507, Easting 642789
AFTER DRILLING 1.50 m / Elev 75.89 m .

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.39								
0.4	77.09		TOPSOIL: 300mm						
0.8	0.30		FILL SM/ML-SILTY SAND/SANDY SILT, some clay, some gravel, asphalt and cobble fragments, brown to grey, moist to wet, very dense to very loose		SS 1	59	4-7-13-50/.10 (20)		
1.2					SS 2	62	20-31-35-33 (66)		
1.6									
2.0			trace organic		SS 3	41	10-12-12-10 (24)		
2.4									
2.8			very loose		SS 4	33	1-1-2-2 (3)		
3.2					SS 5	67	2-1-1-3 (2)		
3.6									
4.0									
4.4									
4.8			wood fragments		SS 6	84	5-3-3-2 (6)		
5.2									
5.6									
6.0	71.29								
6.4	6.10		SP-SM-SAND with silt, grey, wet, compact Sand: 93%, Fines (Silt & Clay): 7%		SS 7	100	4-7-8-9 (15)		
6.8									
7.2									
7.6									
8.0	69.39				SS 8	87	8-10-13-21 (23)		
8.4	8.00		CL-LEAN CLAY (SILTY CLAY), grey, wet, very stiff						
8.8									
9.2									
9.6	67.64		Gravel 1%, Sand 9%, Silt 33%, and Clay 57%		SS 9	100	5-8-11-13 (19)		
	9.75		End of borehole at 9.75m						

N - Value (Blows/305mm)
24 48 72 96
PL MC LL
20 40 60 80
FINES CONTENT (%)
20 40 60 80

Water Level Measurements :

Date	Depth (mbgs)	Elev. (m)
17/01/2023	1.98	75.41
31/01/2023	1.5	75.89

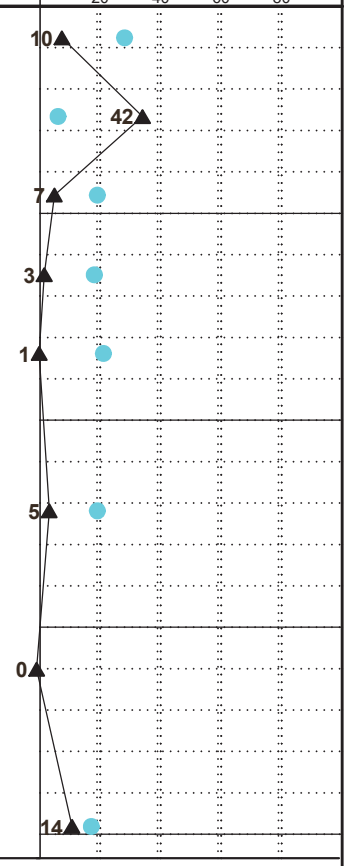
BORE HOLE NUMBER BH2-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 22-12-22 **COMPLETED** 22-12-22
GROUND ELEVATION 77.35 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 3.05 m / Elev 74.30 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING --- Not measured
NOTES UTM Coordinates: Northing 4841513, Easting 642811
AFTER DRILLING ---

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.35								
0.4	77.15 / 0.20		TOPSOIL: 200mm FILL SM/ML-SILTY SAND/SANDY SILT, trace organic, rootlets, brick fragments, dark brown to dark grey, moist to wet, dense to very loose cobble fragments		SS 1	67	**3-5-5-4 (10)**		
0.8									
1.2					SS 2	59	**5-12-30-20 (42)**		
1.6									
2.0			asphalt fragments		SS 3	49	**6-4-3-4 (7)**		
2.4									
2.8			trace organic, very loose		SS 4	8	**2-1-2-2 (3)**		
3.2			wet	▽	SS 5	30	**2-1-0-1 (1)**		
3.6									
4.0									
4.4									
4.8			wood fragments, trace organic		SS 6	59	**3-2-3-3 (5)**		
5.2									
5.6									
6.0									
6.4			no recovery		SS 7	0	**0-0-0-0 (0)**		
6.8									
7.2									
7.6	69.73								
8.0	7.62 / 69.12		SM-SILTY SAND, grey, wet, compact Gravel 3%, Sand 84%, Fines (Silt & Clay) 13%		SS 8	100	**5-6-8-16 (14)**		
	8.23		End of borehole at 8.23m						

▲ N - Value (Blows/305mm) ▲
24 48 72 96
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



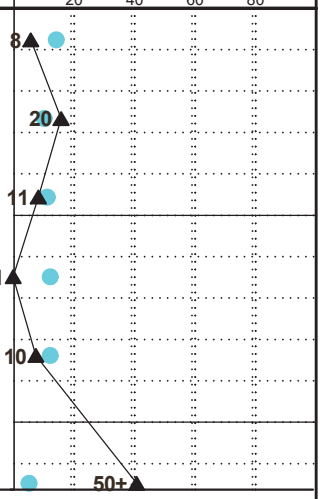
BOREHOLE NUMBER BH3-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 21-12-22 **COMPLETED** 21-12-22
GROUND ELEVATION 77.15 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING --- Not measured
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING --- Not measured
NOTES UTM Coordinates: Northing 4841565, Easting 642803
AFTER DRILLING ---

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.15								
0.4	0.00		FILL SM/ML-SILTY SAND/SANDY SILT, clay pockets, brown, moist, compact to very loose		SS 1	67	**7-4-4-8 (8)**		
0.8									
1.2			brick fragments, trace organic		SS 2	67	**5-9-11-11 (20)**		
1.6									
2.0			asphalt fragments		SS 3	49	**8-5-6-4 (11)**		
2.4									
2.8			brick fragments, trace organic		SS 4	25	**2-0-1-0 (1)**		
3.2									
3.6			clay pockets		SS 5	30	**5-6-4-7 (10)**		
4.0									
4.4	72.50								
	4.65		auger refusal on possible cobbles/boulders and/or rubble/debris End of borehole at 4.65m		SS 6	100	**50/0.04**		

▲ N - Value (Blows/305mm) ▲
24 48 72 96
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

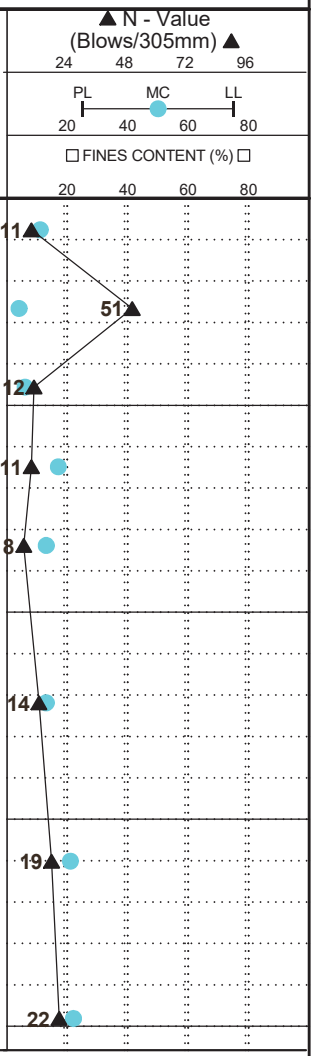


BORE HOLE NUMBER BH4-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 22-12-22 **COMPLETED** 22-12-22
GROUND ELEVATION 77.12 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 2.29 m / Elev 74.83 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING --- Not measured
NOTES UTM Coordinates: Northing 4841511, Easting 642859
AFTER DRILLING ---

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.12								
0.4	0.00		FILL SM/ML-SILTY SAND/SANDY SILT, rootlets, asphalt and brick fragments, cobble fragment, brown to grey, moist to wet, dense to loose		SS 1	67	**2-4-7-7 (11)**		
0.8									
1.2			asphalt fragments, trace organic		SS 2	67	**18-28-23-15 (51)**		
1.6									
2.0			trace organic, clay pocket		SS 3	49	**10-7-5-4 (12)**		
2.4				▽					
2.8			brick fragments, wet		SS 4	21	**3-1-10-47 (11)**		
3.2									
3.6			clay pocket, some gravel, cobble and asphalt fragments, wet		SS 5	41	**4-5-3-12 (8)**		
4.0									
4.4									
4.8			clay and silt pockets, some gravel, cobble fragments, wet		SS 6	16	**7-8-6-6 (14)**		
5.2									
5.6									
6.0	71.02								
6.4	6.10		SP-SM-SAND with silt, grey, wet, compact		SS 7	62	**2-7-12-9 (19)**		
6.8									
7.2									
7.6									
8.0			Sand 89%, Fines (Silt & Clay) 11%		SS 8	67	**8-9-13-18 (22)**		
	68.89								
	8.23		End of borehole at 8.23m						

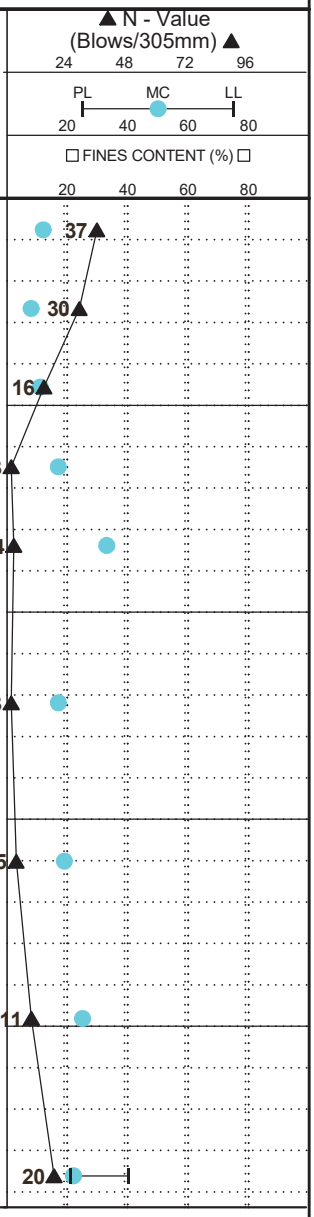


BOREHOLE NUMBER BH/MW5-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 23-12-22 **COMPLETED** 23-12-22
GROUND ELEVATION 77.1 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 3.00 m / Elev 74.10 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING 6.75 m / Elev 70.35 m .
NOTES UTM Coordinates: Northing 4841502, Easting 642873
AFTER DRILLING 2.17 m / Elev 74.93 m .

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.10								
0.4	0.00		FILL SM/ML-SILTY SAND/SANDY SILT, brick and cobble fragments, trace orgainc, brown to grey, moist to wet, dense to very loose		SS 1	67	**10-18-19-24 (37)**		
0.8									
1.2			brick fragments		SS 2	59	**3-13-17-30 (30)**		
1.6									
2.0			brick fragments, trace organic		SS 3	70	**6-11-5-7 (16)**		
2.4				▽					
2.8			rootlets, trace organic, very loose		SS 4	67	**2-2-1-3 (3)**		
3.2				▽					
3.6			rootlets, trace organic, clay pockets		SS 5	62	**2-2-2-3 (4)**		
4.0									
4.4									
4.8			clay pocket		SS 6	75	**1-2-1-2 (3)**		
5.2									
5.6									
6.0									
6.4			clay pocket, trace organic, wet		SS 7	87	**3-2-3-6 (5)**		
6.8				▽					
7.2									
7.6	69.48								
8.0	7.62		CL-LEAN CLAY (SILTY CLAY) with sand, sand pocket, grey, wet, stiff to very stiff		SS 8	100	**4-5-6-9 (11)**		
8.4									
8.8									
9.2									
9.6	67.35		Sand 19%, Silt 39%, and Clay 42%		SS 9	100	**7-8-12-15 (20)**		
	9.75		End of borehole at 9.75m						



Water Level Measurements :

Date	Depth (mbgs)	Elev. (m)
17/01/2023	2.02	75.08
31/01/2023	2.17	74.93

BORE HOLE NUMBER BH6-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 22-12-22 **COMPLETED** 22-12-22
GROUND ELEVATION 77.19 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 3.05 m / Elev 74.14 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING --- Not measured
NOTES UTM Coordinates: Northing 4841526, Easting 642821
AFTER DRILLING ---

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.19								
0.4	0.00		FILL SM/ML-SILTY SAND/SANDY SILT, asphalt and cobble fragments, rootlets, trace organic, brown to grey, moist to wet, very dense to very loose		SS 1	75	**7-9-8-13 (17)**		
0.8									
1.2			asphalt fragments, trace organic, rootlets, cobble fragments		SS 2	67	**13-33-31-13 (64)**		
1.6									
2.0			cobble fragments, clay pocket		SS 3	41	**3-3-3-2 (6)**		
2.4									
2.8			asphalt fragments, cobble fragments		SS 4	21	**4-4-3-5 (7)**		
3.2				▽					
3.6			clay pocket, trace organic, wet		SS 5	41	**8-4-1-1 (5)**		
4.0									
4.4									
4.8			asphalt fragments, clay pockets, very loose		SS 6	49	**3-2-1-2 (3)**		
5.2									
5.6									
6.0	71.09								
6.4	6.10		ML-SANDY SILT, clay pockets, grey, wet, compact Gravel 1%, Sand 40%, Silt 38%, and Clay 21%		SS 7	100	**8-9-9-7 (18)**		
6.8									
7.2									
7.6									
8.0					SS 8	100	**7-8-10-14 (18)**		
	68.96		clay pocket/layer						
	8.23		End of borehole at 8.23m						

▲ N - Value (Blows/305mm) ▲
24 48 72 96
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

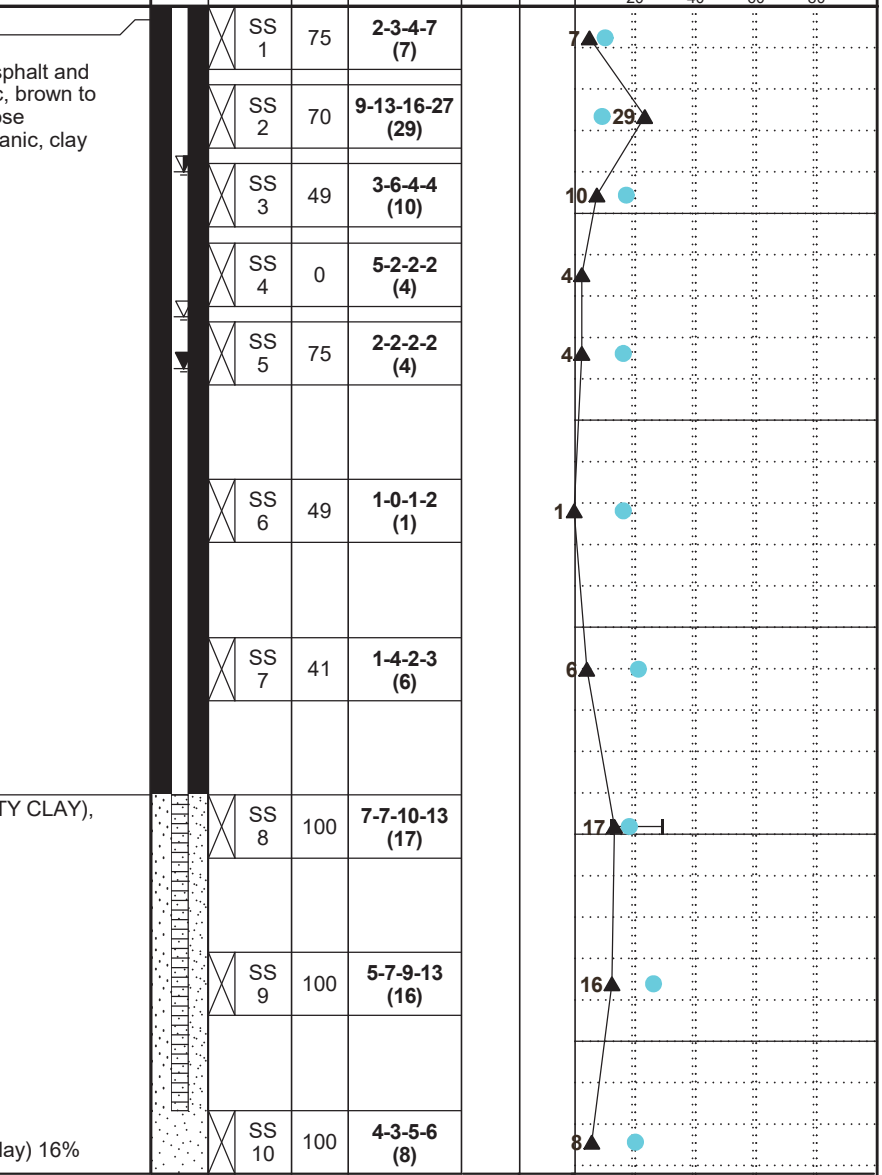
BORE HOLE NUMBER BH/MW7-22

DAVROC
Unit 21, 2051 Williams Parkway
Brampton, Ontario, L6Y-3R9
Telephone:(905)792-7792

CLIENT City of Toronto
PROJECT NAME Geotechnical Investigation
PROJECT NUMBER L22-0780GE
PROJECT LOCATION 1 Brimley Road South, Toronto, Ontario
DATE STARTED (dd/mm/yy) 21-12-22 **COMPLETED** 21-12-22
GROUND ELEVATION 77.25 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Walker Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow stem auger
AT TIME OF DRILLING 3.00 m / Elev 74.25 m .
LOGGED BY SR **CHECKED BY** AS
AT END OF DRILLING 3.50 m / Elev 73.75 m .
NOTES UTM Coordinates: Northing 4841529, Easting 642829
AFTER DRILLING 1.60 m / Elev 75.65 m .

DEPTH (m)	ELEV / DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)
	77.25								
0.4	77.12 / 0.13		TOPSOIL: 130mm FILL SM/ML-SILTY SAND/SANDY SILT, asphalt and brick fragments, rootlets, trace organic, brown to grey, moist to wet, compact to very loose		SS 1	75	**2-3-4-7 (7)**		
0.8									
1.2			asphalt and brick fragments, trace organic, clay pocket		SS 2	70	**9-13-16-27 (29)**		
1.6									
2.0			trace organic		SS 3	49	**3-6-4-4 (10)**		
2.4									
2.8			no recovery		SS 4	0	**5-2-2-2 (4)**		
3.2									
3.6			clay pocket, wet		SS 5	75	**2-2-2-2 (4)**		
4.0									
4.4									
4.8					SS 6	49	**1-0-1-2 (1)**		
5.2									
5.6									
6.0									
6.4					SS 7	41	**1-4-2-3 (6)**		
6.8									
7.2									
7.6	69.63								
8.0	7.62		CL-SANDY LEAN CLAY (SANDY SILTY CLAY), grey, wet, very stiff Sand 31%, Silt 43%, and Clay 26%		SS 8	100	**7-7-10-13 (17)**		
8.4									
8.8									
9.2									
9.6					SS 9	100	**5-7-9-13 (16)**		
10.0									
10.4									
10.8									
11.2	65.97		wet silty sand pocket/layer Gravel 1%, Sand 83%, Fines (Silt & Clay) 16%		SS 10	100	**4-3-5-6 (8)**		
	11.28		End of borehole at 11.28m						

N - Value (Blows/305mm)
24 48 72 96
PL MC LL
20 40 60 80
FINES CONTENT (%)
20 40 60 80

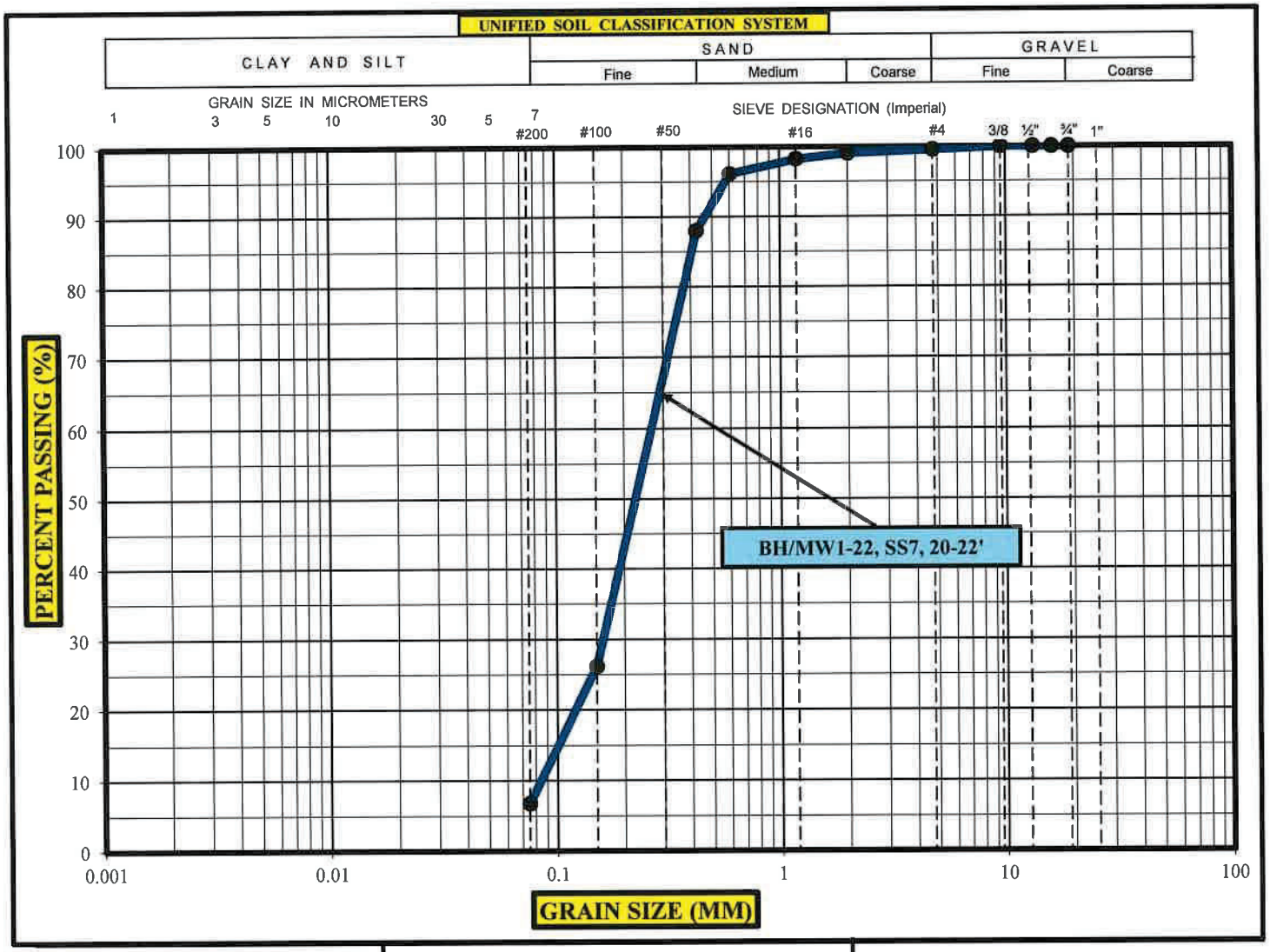


Water Level Measurements :

Date	Depth (mbgs)	Elev. (m)
17/01/2023	1.79	75.46
31/01/2023	1.6	75.65

Appendix B

Geotechnical Laboratory Test Results



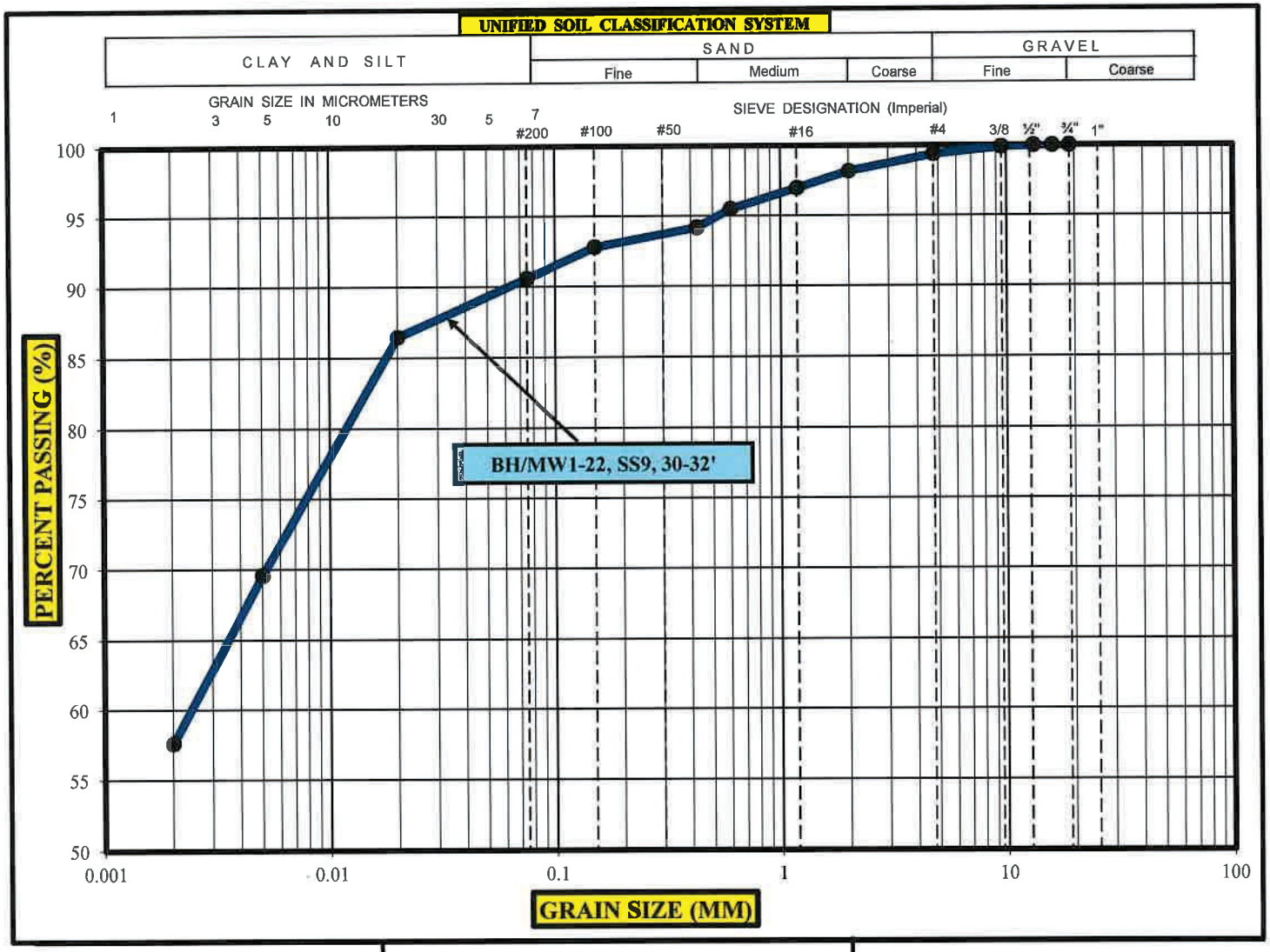
Davroc Testing Laboratories Inc.	GRAIN SIZE DISTRIBUTION	File No. : L22-0780 GE Client : City of Toronto (COT) BH/MW1-22, SS7, 20-22' Date Tested : Jan. 30, 2023 Tested By : Nasir Sample No. S 122-1

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President



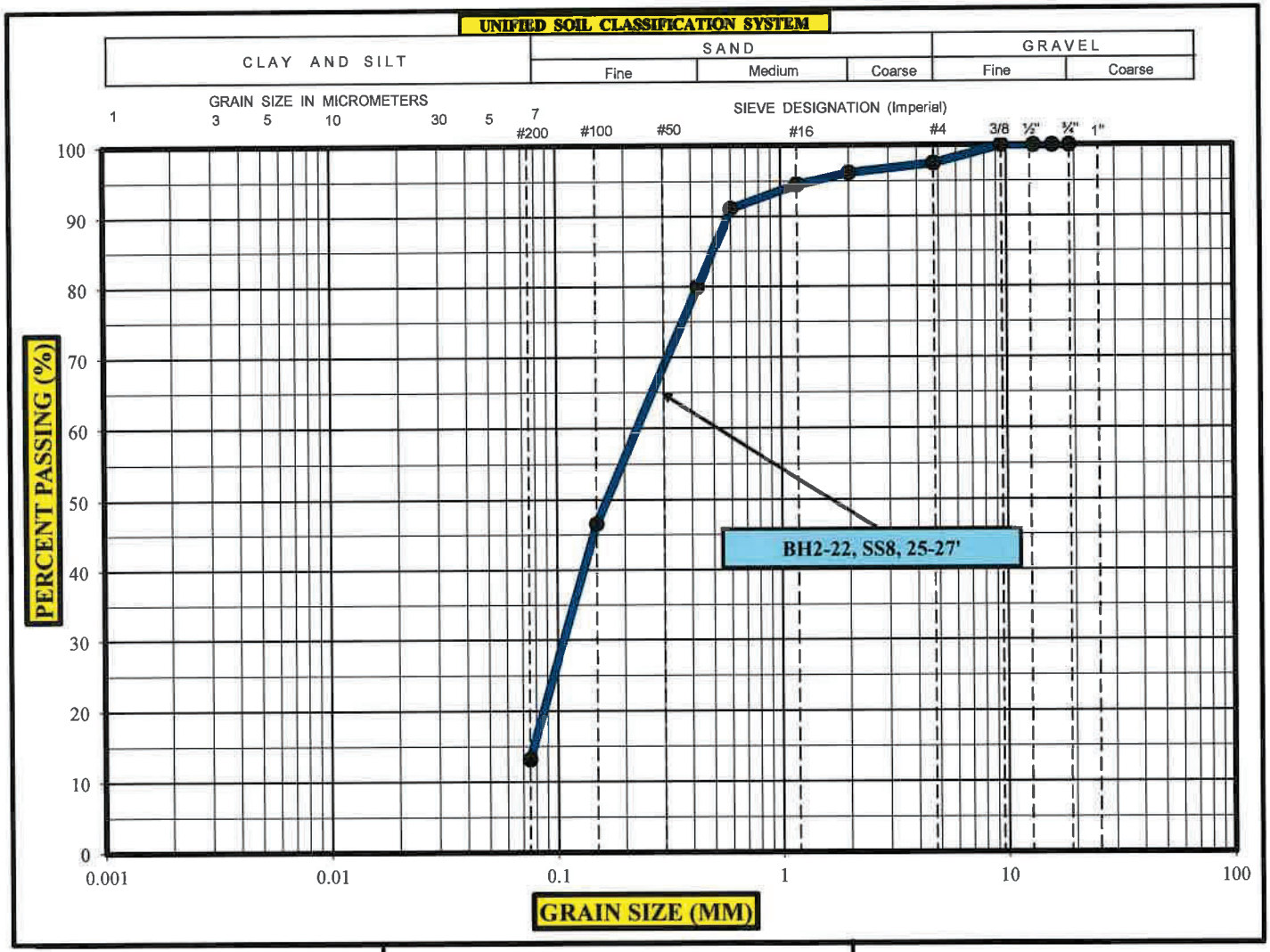
Davroc Testing Laboratories Inc.	GRAIN SIZE DISTRIBUTION	File No. : L22-0780 GE Client : City of Toronto (COT) BH/MW1-22, SS9, 30-32' Date Tested : Jan. 30, 2023 Tested By : Nasir Sample No. S 122-2

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President

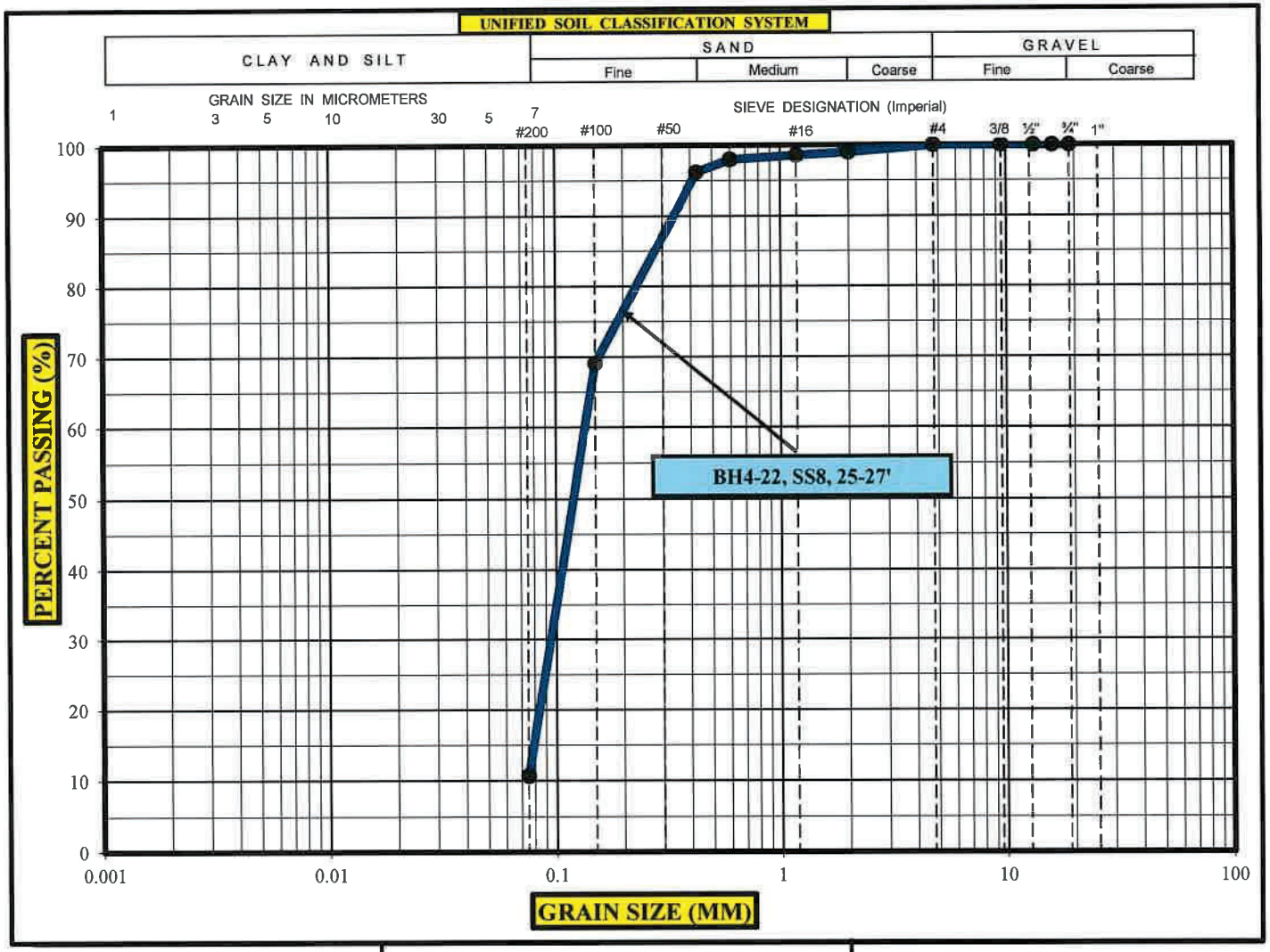


Davroc Testing Laboratories Inc.	GRAIN SIZE DISTRIBUTION	File No. : L22-0780 GE Client : City of Toronto (COT) BH2-22, SS8, 25-27' Date Tested : Jan. 30, 2023 Tested By : Nasir

Sample No.
S 122-3

Checked By : _____
Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____
Sal Fasullo, C.E.T.
Executive Vice President



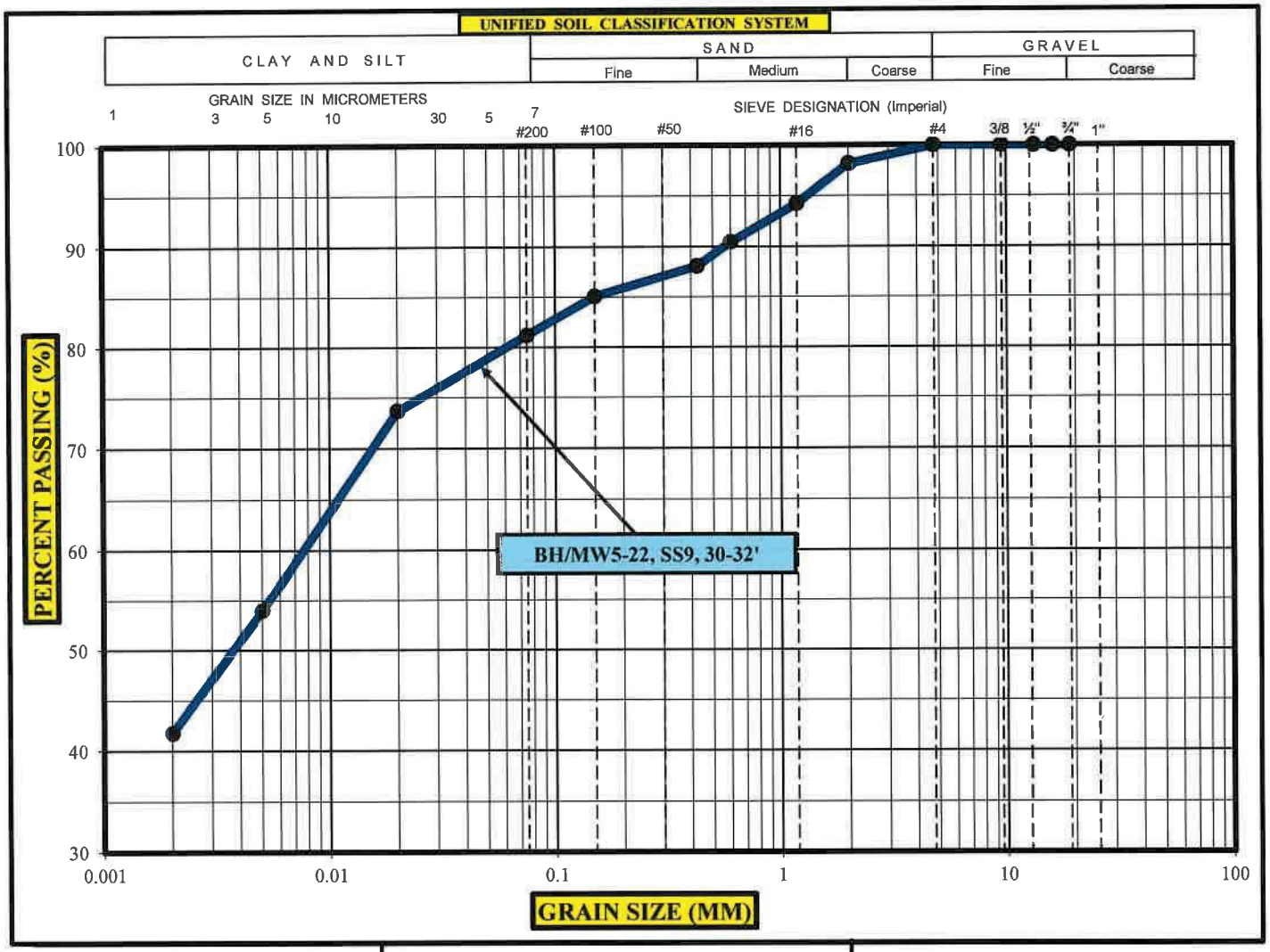
Davroc Testing Laboratories Inc.	GRAIN SIZE DISTRIBUTION	File No. : L22-0780 GE Client : City of Toronto (COT) BH4-22, SS8, 25-27' Date Tested : Jan. 30, 2023 Tested By : Nasir Sample No. S 122-4

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President



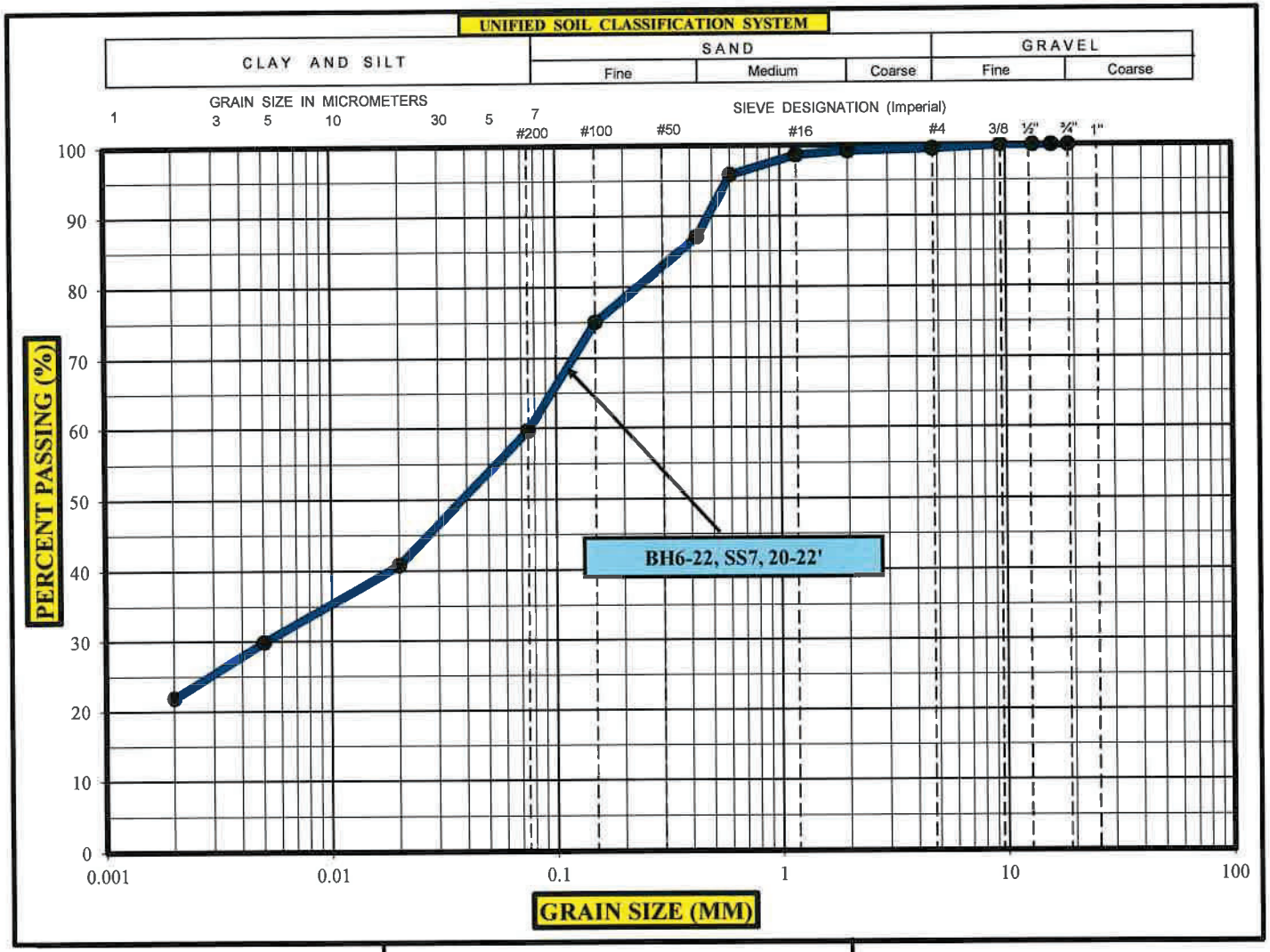
Davroc Testing Laboratories Inc.	GRAIN SIZE DISTRIBUTION	File No. : L22-0780 GE Client : City of Toronto (COT) BH/MW5-22, SS9, 30-32' Date Tested : Jan. 30, 2023 Tested By : Nasir Sample No. S 122-5

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President



Davroc Testing Laboratories Inc.

GRAIN SIZE DISTRIBUTION

File No. : L22-0780 GE

Client : City of Toronto (COT)

BH6-22, SS7, 20-22'

Sample No. S 122-6

Date Tested : Jan. 30, 2023

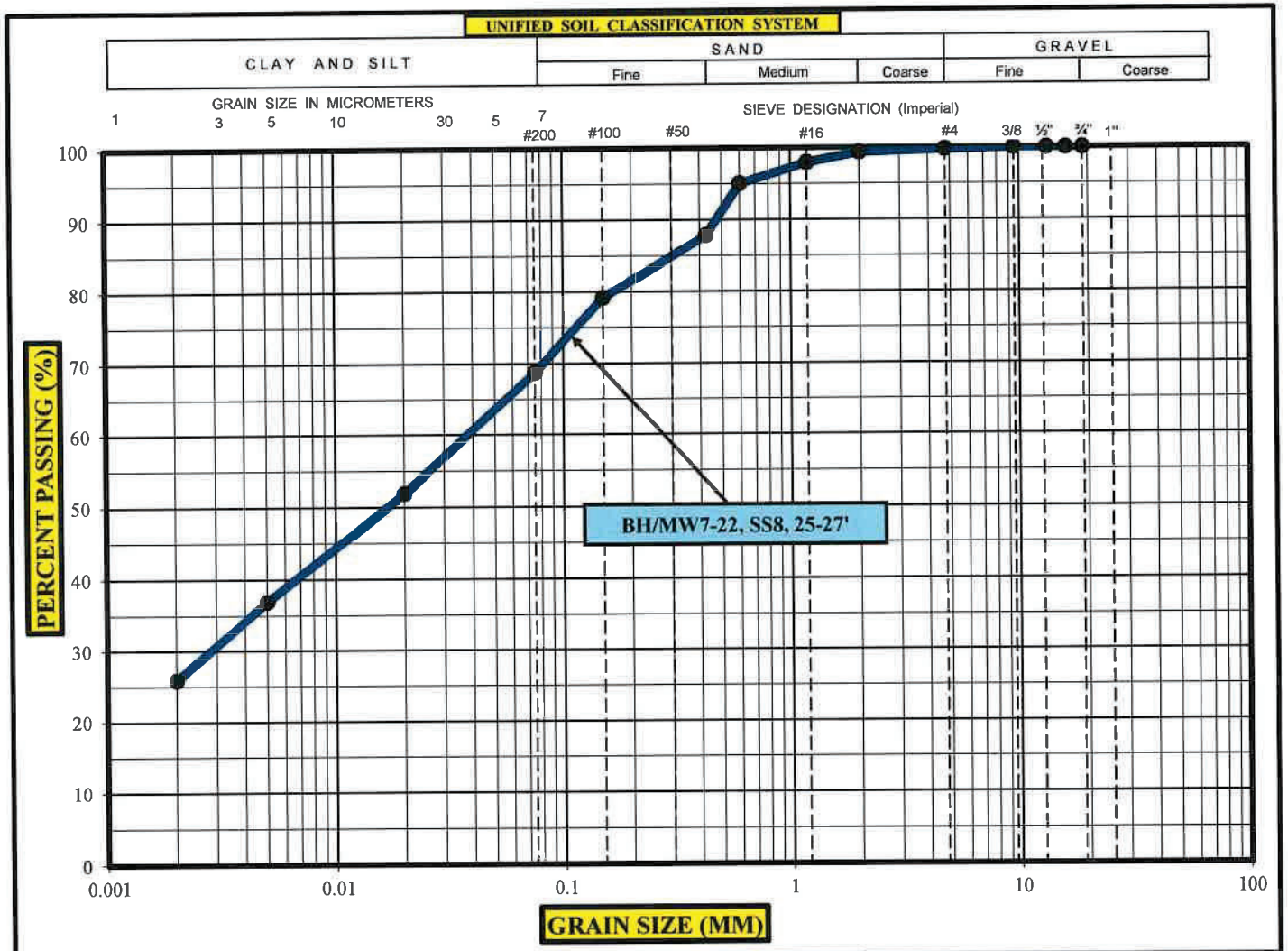
Tested By : Nasir

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President



Davroc Testing Laboratories Inc.

GRAIN SIZE DISTRIBUTION

File No. : L22-0780 GE

Client : City of Toronto (COT)

BH/MW7-22, SS8, 25-27'

Sample No. S 122-7

Date Tested : Jan. 30, 2023

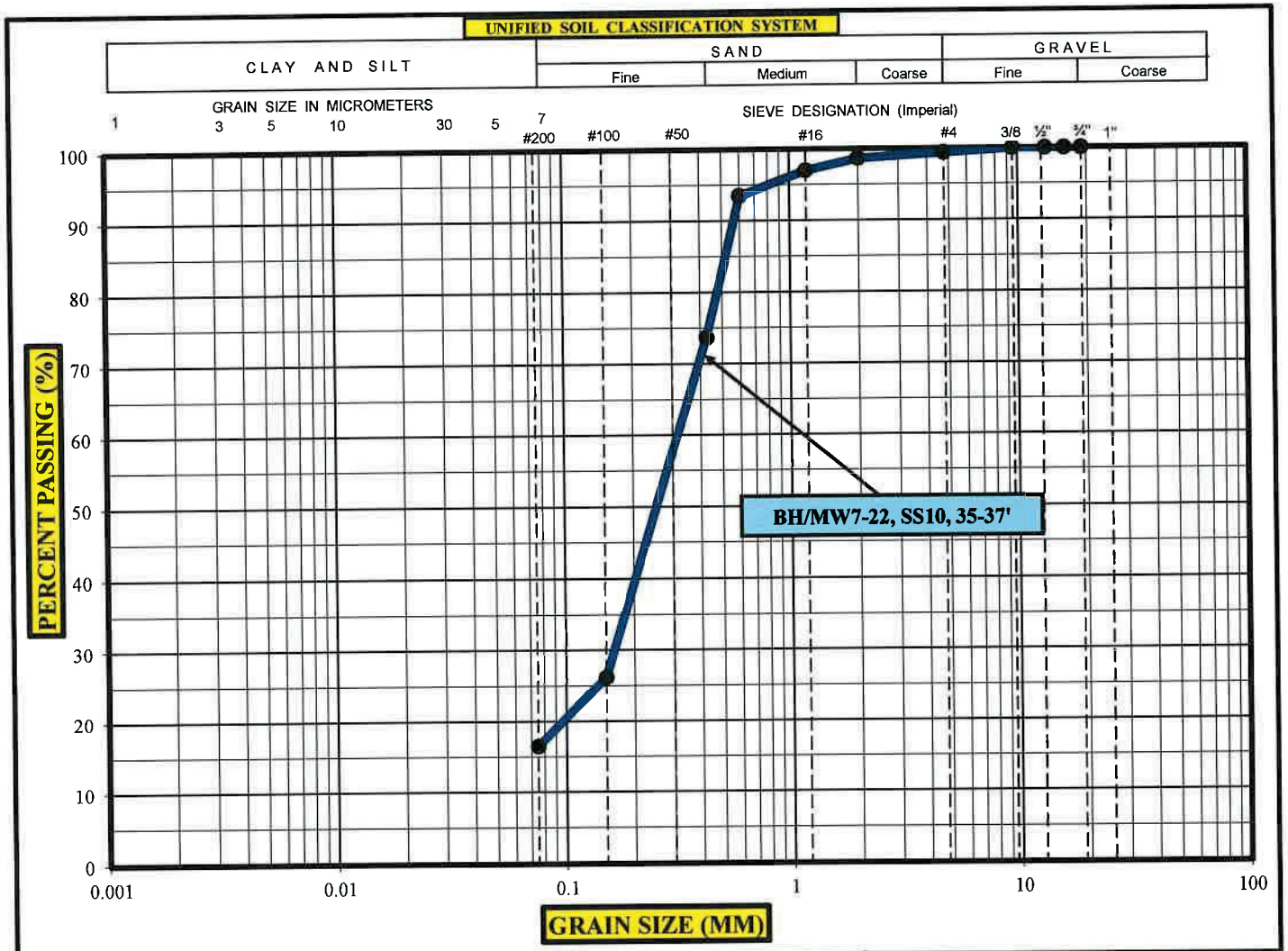
Tested By : Nasir

Checked By : _____

Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____

Sal Fasullo, C.E.T.
Executive Vice President



Davroc Testing Laboratories Inc.

GRAIN SIZE DISTRIBUTION

File No. : L22-0780 GE
Client : City of Toronto (COT)
BH/MW7-22, SS10, 35-37'
Date Tested : Jan. 30, 2023
Tested By : Nasir

Sample No.
S 122-8

Checked By : _____
Nasir Qureshi,
Lab. Supervisor Soil and Asphalt

Reviewed By : _____
Sal Fasullo, C.E.T.
Executive Vice President

ATTERBERG LIMITS

Test Procedure LS-703/704

Davroc Sample No. : S 122-2

BH/MW1-22 (SS9, 30-32')

File No. : L22-0780GE
Client : City of Toronto (COT)
Project : Geotechnical Lab. Testing Program'
Site Location : 1 Brimley Road South Toronto, ON.
Date Sampled : Jan. 23, 2023
Date Tested : Jan. 24, 2023
Sampled By : Amrit
Tested By: Nasir

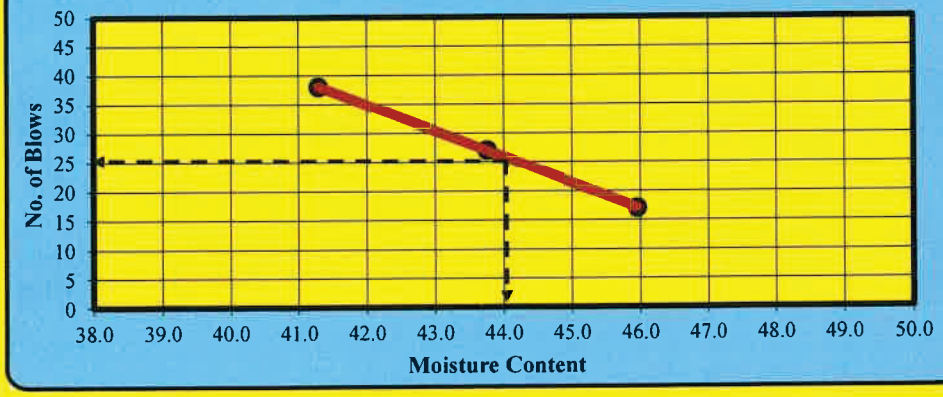
LIQUID LIMIT

Dish No.	A1	A2	A3
Dish+Wet Soil	34.608	36.034	34.814
Dish+Dry Soil	30.006	31.205	30.514
Wt. Of Dish	19.992	20.171	20.101
Wt. Of Water	4.602	4.829	4.3
Wt.of Dry Soil	10.014	11.034	10.413
%Moisture	46.0	43.8	41.3
No. of Blows	17	27	38

PLASTIC LIMIT

Dish No.	A9	A13	
Dish+Wet Soil	29.303	36.331	
Dish+Dry Soil	27.709	33.550	
Wt. Of Dish	20.007	20.112	
Wt. Of Water	1.594	2.781	
Wt.of Dry Soil	7.702	13.438	
%Moisture	20.696	20.695	20.695

ATTERBERG LIMITS



1 - Liquid Limit	44.0
2 - Plastic Limit	20.7
3 - Plasticity Index	23.3

Checked By: _____
Nasir Qureshi,
Laboratory. Supervisor

Reviewed By : _____
Sal Fasullo, C.E.T.
Executive Vice President

ATTERBERG LIMITS

Test Procedure LS-703/704

Davroc Sample No. : S 122-5

BH/MW5-22 (SS9, 30-32')

File No. : L22-0780GE
Client : City of Toronto (COT)
Project : Geotechnical Lab. Testing Program
Site Location : 1 Brimley Road South Toronto, ON.
Date Sampled : Jan. 23, 2023
Date Tested : Jan. 24, 2023
Sampled By : Amrit
Tested By: Nasir

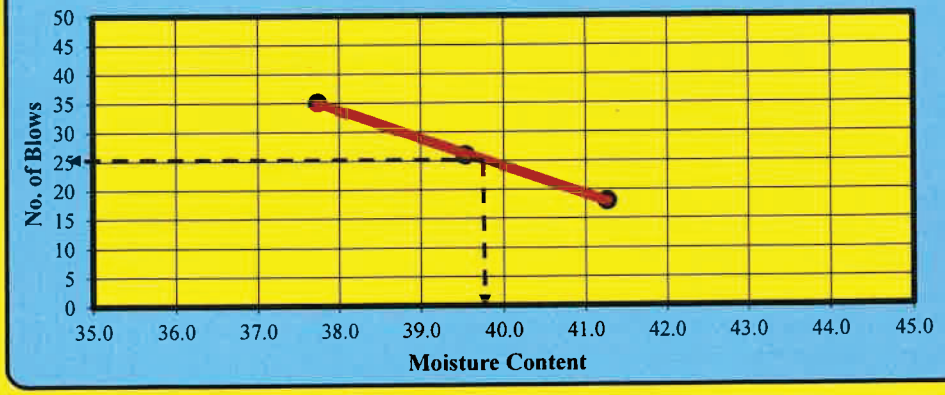
LIQUID LIMIT

Dish No.	A4	A5	A6
Dish+Wet Soil	34.523	34.649	34.944
Dish+Dry Soil	30.297	30.550	30.878
Wt. Of Dish	20.056	20.183	20.104
Wt. Of Water	4.226	4.099	4.066
Wt.of Dry Soil	10.241	10.367	10.774
%Moisture	41.3	39.5	37.7
No. of Blows	18	26	35

PLASTIC LIMIT

Dish No.	A11	A14	
Dish+Wet Soil	27.890	32.250	
Dish+Dry Soil	26.558	30.182	
Wt. Of Dish	20.073	20.112	
Wt. Of Water	1.332	2.068	
Wt.of Dry Soil	6.485	10.070	
%Moisture	20.540	20.536	20.538

ATTERBERG LIMITS



1 - Liquid Limit	39.8
2 - Plastic Limit	20.5
3 - Plasticity Index	19.3

Checked By: _____
Nasir Qureshi,
Laboratory. Supervisor

Reviewed By : _____
Sal Fasullo, C.E.T.
Executive Vice President

ATTERBERG LIMITS

Test Procedure LS-703/704

Davroc Sample No. : S 122-7

BH/MW7-22 (SS8, 25-27')

File No. : L22-0780GE
Client : City of Toronto (COT)
Project : Geotechnical Lab. Testing Program'
Site Location : 1 Brimley Road South Toronto, ON.
Date Sampled : Jan. 23, 2023
Date Tested : Jan. 24, 2023
Sampled By : Amrit
Tested By: Nasir

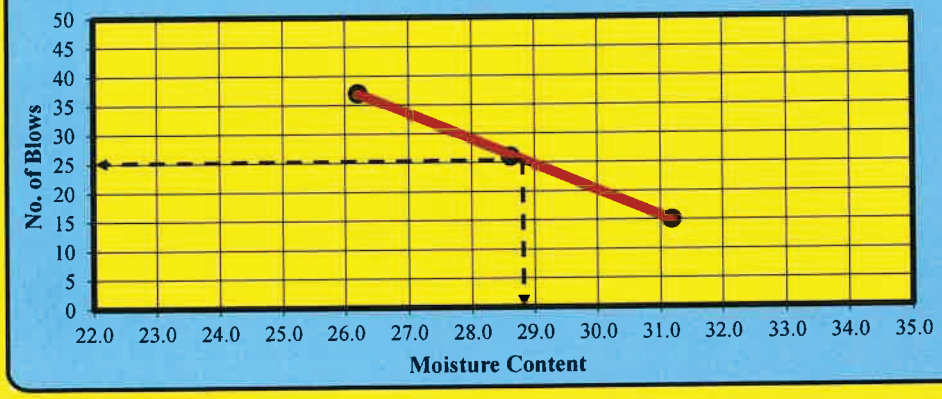
LIQUID LIMIT

Dish No.	A7	A8	A10
Dish+Wet Soil	34.890	38.447	37.868
Dish+Dry Soil	31.374	34.354	34.164
Wt. Of Dish	20.098	20.053	20.032
Wt. Of Water	3.516	4.093	3.704
Wt.of Dry Soil	11.276	14.301	14.132
%Moisture	31.2	28.6	26.2
No. of Blows	15	26	37

PLASTIC LIMIT

Dish No.	A12	A15	
Dish+Wet Soil	27.971	30.996	
Dish+Dry Soil	27.139	29.864	
Wt. Of Dish	19.977	20.112	
Wt. Of Water	0.832	1.132	
Wt.of Dry Soil	7.162	9.752	
%Moisture	11.617	11.608	11.612

ATTERBERG LIMITS



1 - Liquid Limit	28.8
2 - Plastic Limit	11.6
3 - Plasticity Index	17.2

Checked By: _____
Nasir Qureshi,
Laboratory. Supervisor

Reviewed By : _____
Sal Fasullo, C.E.T.
Executive Vice President

Appendix C

Multi-Channel Analysis of Surface Waves (MASW)

Affordable Intelligent Solutions

SIMCOE GEOSCIENCE
www.SimcoeGeoscience.com

MULTICHANNEL ANALYSIS OF SURFACE WAVES (MASW) SURVEY FOR SEISMIC SITE CLASSIFICATION AT 1 BRIMELY ROAD SOUTH, TORONTO – BLUFFERS PARK & BEACH

On Behalf of:

Davroc & Associates Ltd

2051 Williams Parkway
Brampton, Ontario
L6S 5T4

By:

SIMCOE GEOSCIENCE
13-11 Cardico Drive, Stouffville,
Ontario, Canada L4A 2G5

JANUARY 30, 2023 **Project # SGL-22161**

GENERAL OVERVIEW

Simcoe Geoscience Limited was commissioned to conduct Multichannel Analysis of Surface Waves (MASW) shear velocity testing for seismic site classification survey at 1 Brimley Road South at the Bluffers Park and Beach, Toronto, Ontario, on behalf of Davroc & Associates Ltd. The survey was conducted on December 22nd, 2022.

Two MASW soundings (MASW#1 & MASW#2) are acquired using receiver arrays of 3m geophone intervals. On the MASW#1 location, a 1m geophone interval sounding is acquired as well. The data is intended to provide high-resolution shear wave velocity information from surface down to over 30 m. The geophones were setup in the park area and the spreads laid out with both Northeast-Southwest (MASW#1) and Northwest-Southeast (MASW#2) orientations. ***Figure-1*** shows the site and the MASW test locations.

Four (4) active shots and ten (10) passive records were measured and recorded for each sounding. The site was quiet in terms of surrounding vibration sources. As a result, the quality of the data is excellent.

Figure-1: MASW Sounding Location at Bluffers Park and Beach, Toronto, Ontario.

FIELD PROCEDURE

The field setup of an MASW survey is to layout 24 geophones in a linear array, a similar set to that of a seismic refraction investigation. The MASW data acquisition principle involves generating an acoustic wave at the surface and digitally recording the surface waves from the moment of source impact (sledgehammer) "active source" with a linear series of geophones surface.

For this study, data was collected with ABEM Terraloc Pro 2 seismograph - 24 channels and 4.5 Hz geophones. A sledgehammer was used as the primary energy source with traces being recorded at 4 locations: approximately 6 m and 25 m off both ends. ***Figure-2*** shows typical field setup for 3-meter receiver interval.

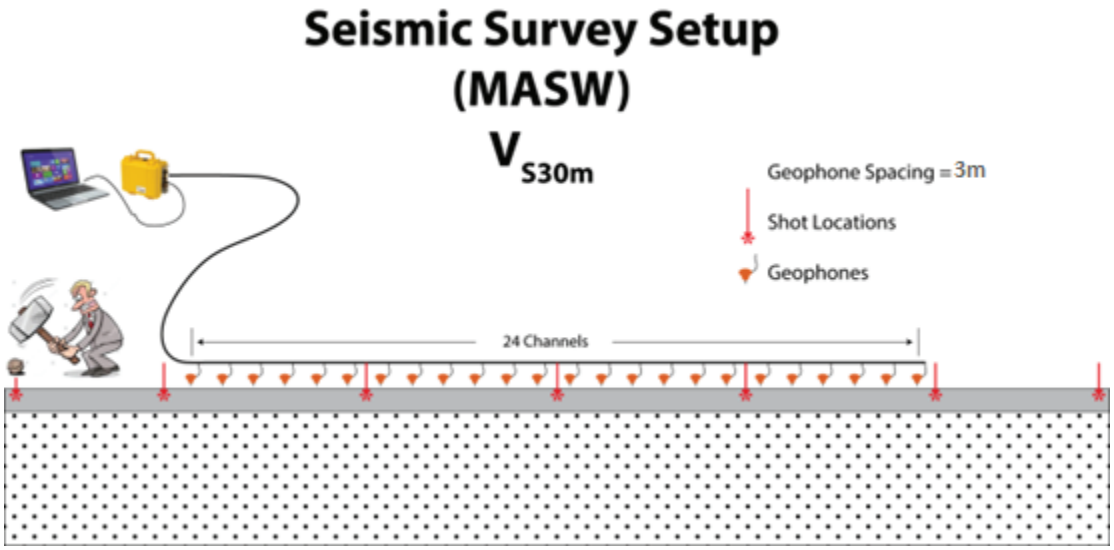


Figure-2: MASW 3-meter Spacing Field Setup, Geophones (orange), Shot Locations (red)

The passive survey (MAM) used the same geophone array set up as for the MASW survey. Unlike the MASW survey, the MAM method is considered a "passive source" method. There is no time break, and the motions recorded are from ambient energy generated by cultural noise such as traffic, wind, wave motion, etc. Data collection for the passive method involved recording approximately 10 minutes of background "noise" for each sounding.

The records generated by the MAM method contain lower frequency data, thus increasing the data modeling at greater depths. Typically, the MAM results help clarify the MASW results for depths greater than 20 m; however, the direction of noise propagation relative to the spread orientation can influence the results.

DATA PROCESSING AND INTERPRETATION

MASW data were processed and interpreted using SeisImager Surface Wave Analysis to generate a 1-D (depth) shear-wave velocity (Vs) profile. The active and passive data were post-processed, and individual dispersion curves were generated and were stacked to generate one average dispersion image of the highest signal-to-noise (S/N) ratio. Two separate dispersion images were generated, i.e., active, and passive records.

The passive image was prepared by stacking all individual dispersion images processed from ten (10) passive field records. This indicates surface wave energy accumulation at relatively lower frequencies (e.g., ≤ 10 Hz) where the active image significantly lacks any meaningful energy trend.

Finally, both active and passive dispersion images were combined to generate one combined dispersion curve that has the highest resolution and the broadest bandwidth in overall dispersion trend to extract the fundamental-mode dispersion curve (M0), which indicates that the modal interpretation of M0 is more confident in the combined image, and also the final 1-D velocity (Vs) profile will have an increased confidence level at deeper depths (e.g., ≥ 20 m) because of the lower frequencies (e.g., ≤ 10 Hz) can be extracted for the M0 curve. The M0 curve (***Figure-3***) was then used to generate the final 1-D shear-wave velocity (Vs) profile through the subsequent inversion process. A smoothing of the curve helped to minimize the noise of the data, which could produce extra layers in the 1D results.

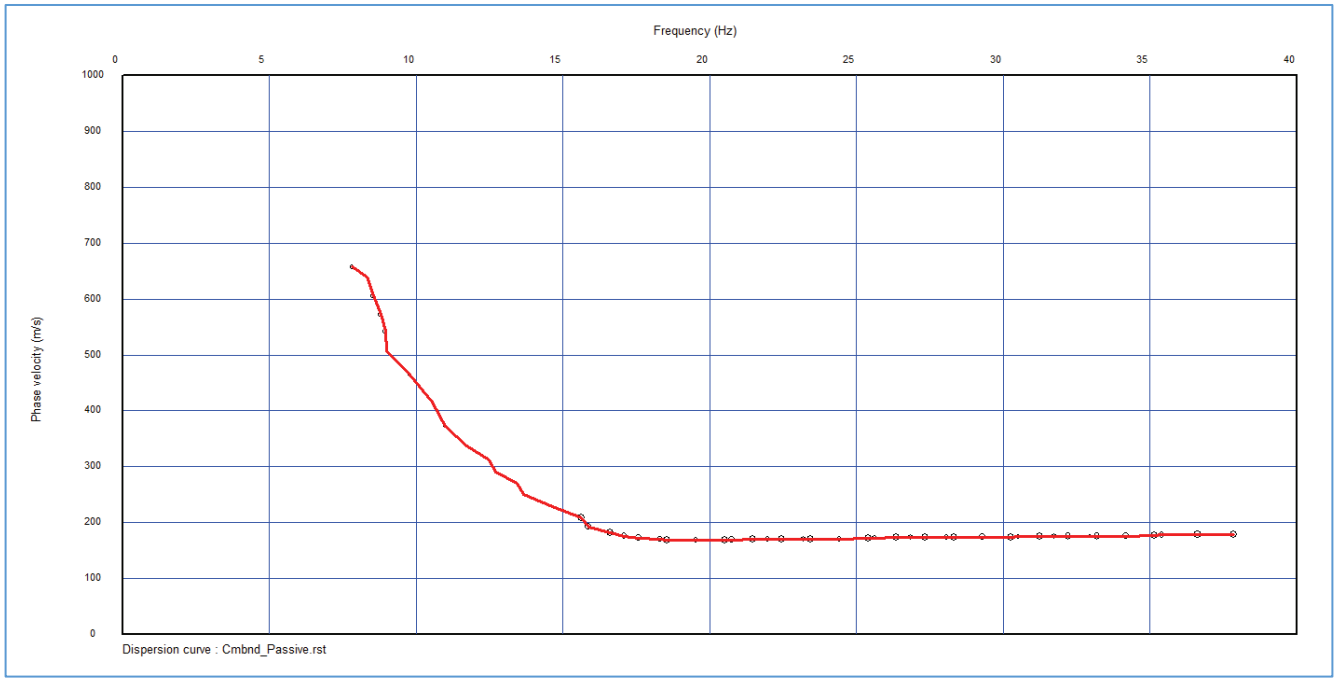


Figure-3: Combined Active-1m, Active-3m and Passive-3m Dispersion Curve for MASW#1.

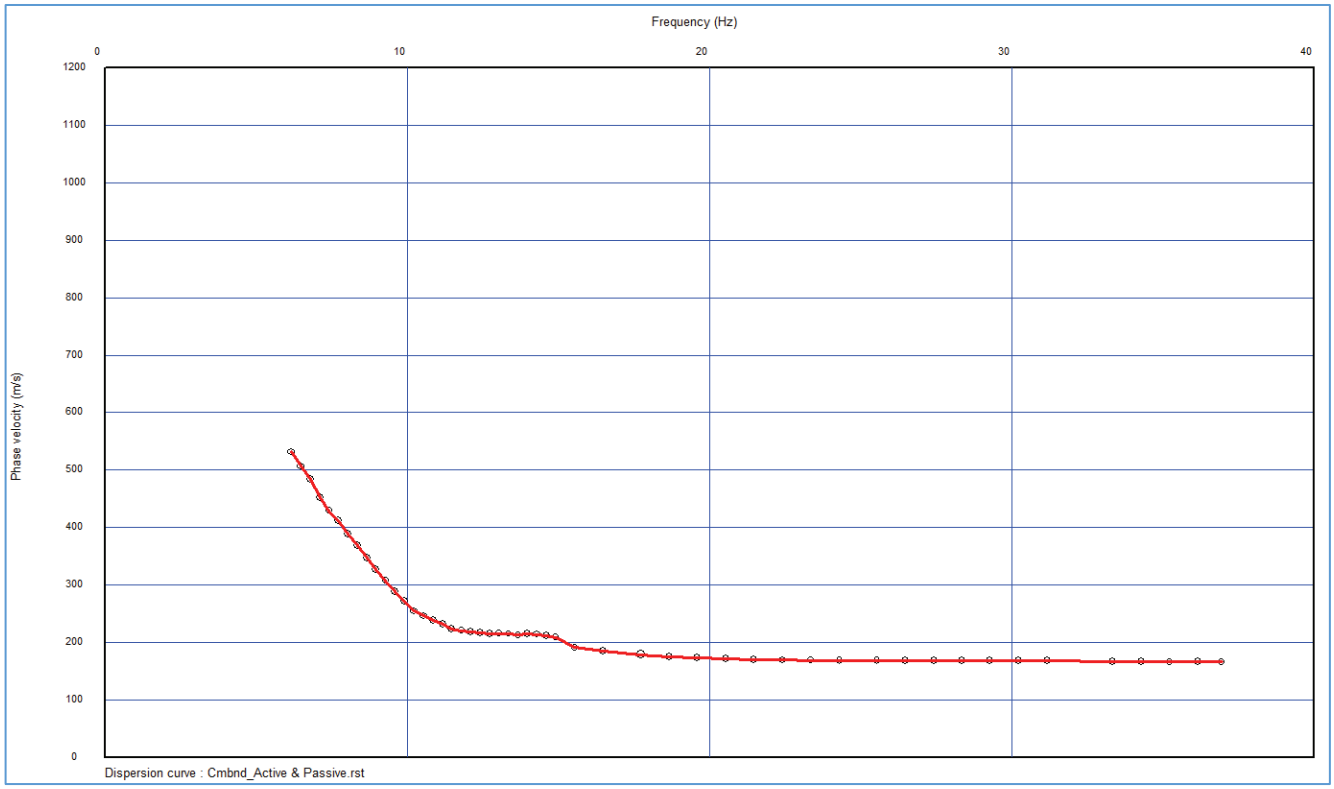


Figure-4: Combined Active and Passive Dispersion Curve for MASW#2.

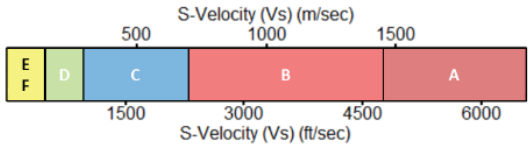
RESULTS

The calculated velocity profile indicates that the subsurface soils layers at the site consist of loose to compact soils in the upper 9 meters and compact to very dense soils below. Two separate models have been created for the two soundings. The 1D model generated with inversion results for MASW#1 and MASW#2 are shown in ***Figure-5*** and ***Figure-6***, respectively.

Sounding	Depth	Number of Layers	Vs30, (Seismic Site Class)
MASW-1	0 – 35m	10	**360.1 m/s (D)**
MASW-2	0 – 35m	10	**324.0 m/s (D)**

According to these 1-D Vs profiles, the average Vs30 value is just above 360m/s and would fall under a site **Class D** ("**Stiff Soil**") according to the seismic site classification codes adopted by National Building Codes of Canada and the International Building Code (IBC). The Seismic Site classification table is presented below. However, an error margin must be incorporated into every set of calculations. In this case there is modelling involved which means that there must be at least 10% error. In order to qualify for a site class C the Vs30 would have to be 400 m/s or more to cover this error margin.

Seismic Site Classification ($Vs^{30\text{-m}}$ or $Vs^{100\text{-ft}}$)



NBCC* Seismic site classification based on shear-velocity (Vs) ranges.

Site Class	S-Velocity (Vs) (ft/sec)	S-Velocity (Vs) (m/sec)
A (Hard Rock)	> 5,000	**> 1500**
B (Rock)	2,500 – 5000	**760 – 1500**
C (Very Dense Soil and Soft Rock)	1,200 – 2,500	**360 – 760**
D (Stiff Soil)	600 – 1,200	**180 – 360**
E (Soft Clay Soil)	< 600	**< 180**
F (Soils Requiring Add'l Response)	< 600, and meeting some additional conditions.	**< 180, and meeting some additional conditions.**

*** National Building Code of Canada**

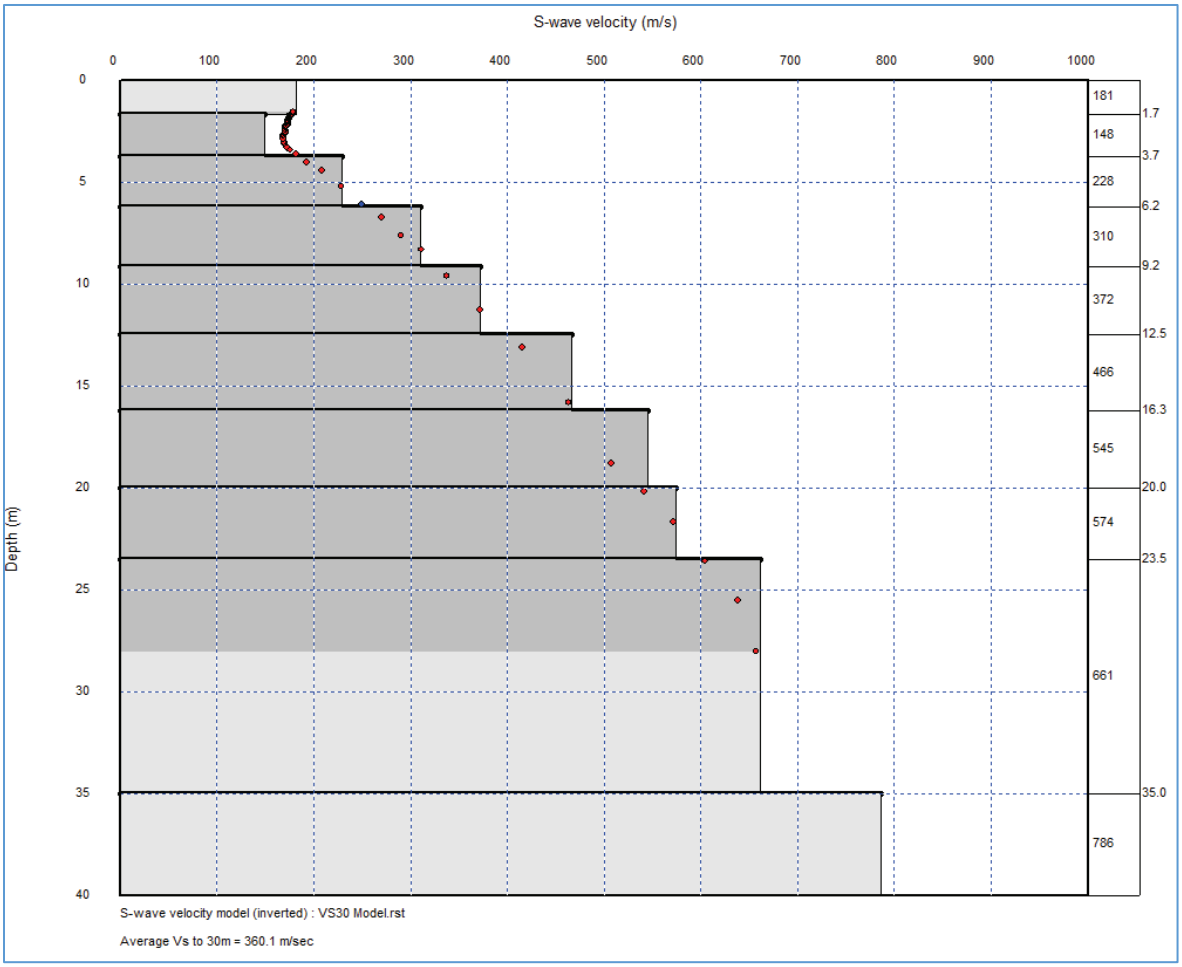


Figure-5: MASW-1 Sounding Layered Earth 1D Model

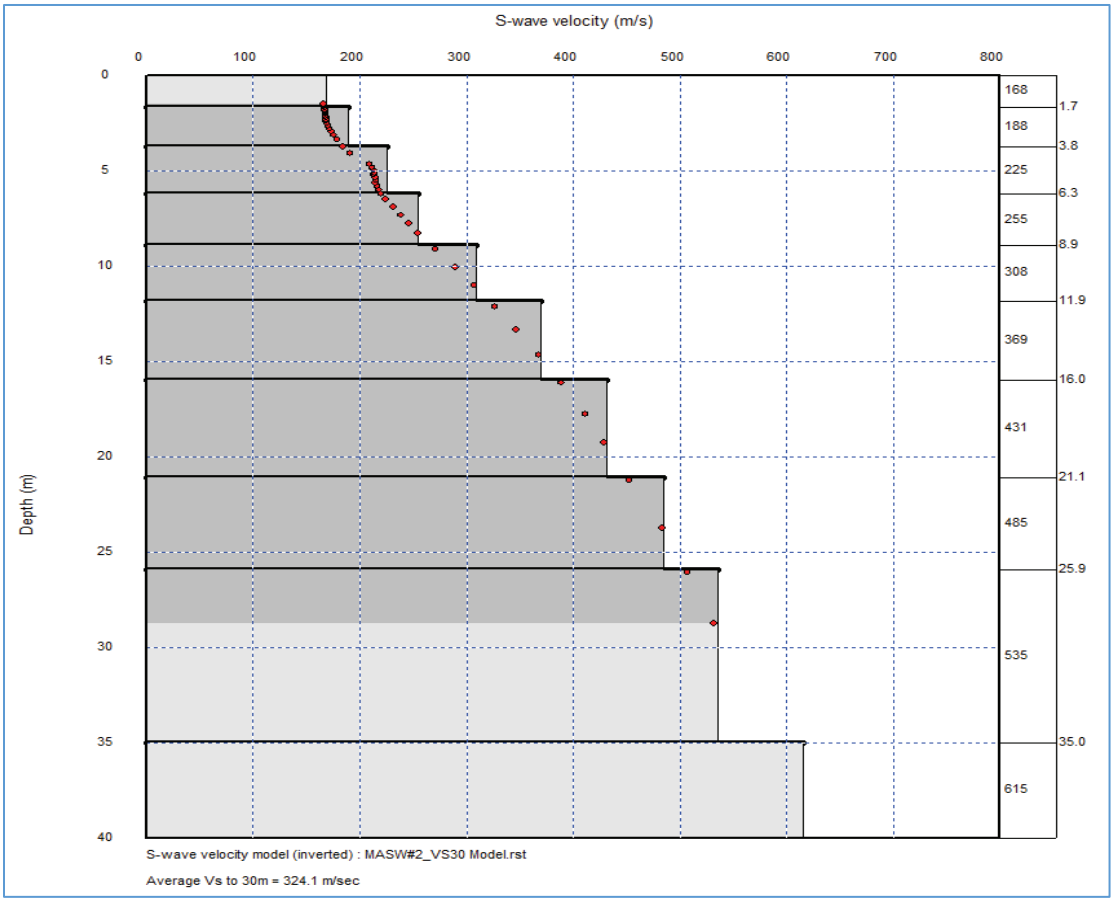


Figure-6: MASW-2 Sounding Layered Earth 1D Model

It is important to note that data analysis and seismic site classification described in this report is based on MASW method only. The results of MASW sounding can be superseded by other geotechnical information such as the presence of sensitive and/or liquefiable soils, more than 3 meters of soft clays, high moisture content, etc. It is important to consider other geotechnical information prior to further investigations on site. For more details about seismic site classification, the reader is referred to section 4.1.8.4 of the National Building Code of Canada, 2010 Edition.

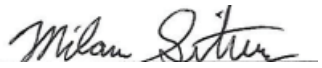
RECOMMENDATIONS

1) The two soundings produce a seismic site class of D as the Vs30 is under 360m/s once error margin has been factored in. MASW #1 has a higher Vs30 as it is further inland and likely has a combination of less fill material and bedrock less than 30 meters depth.

2) It is important to note that bedrock is not apparent in the upper 30 meters of MASW #2 but it may be present in the 23 to 30 meter range in the middle of MASW #1 which is further inland. If the bedrock depth is important, then there is another simple seismic method for calculating bedrock depth around the property using a method called HVSR.

We are committed to providing the next-generation ground and marine geophysical technologies and expertise to apply to all forms of engineering applications. Please review the proposal carefully and note that we are open to discussion on all options.

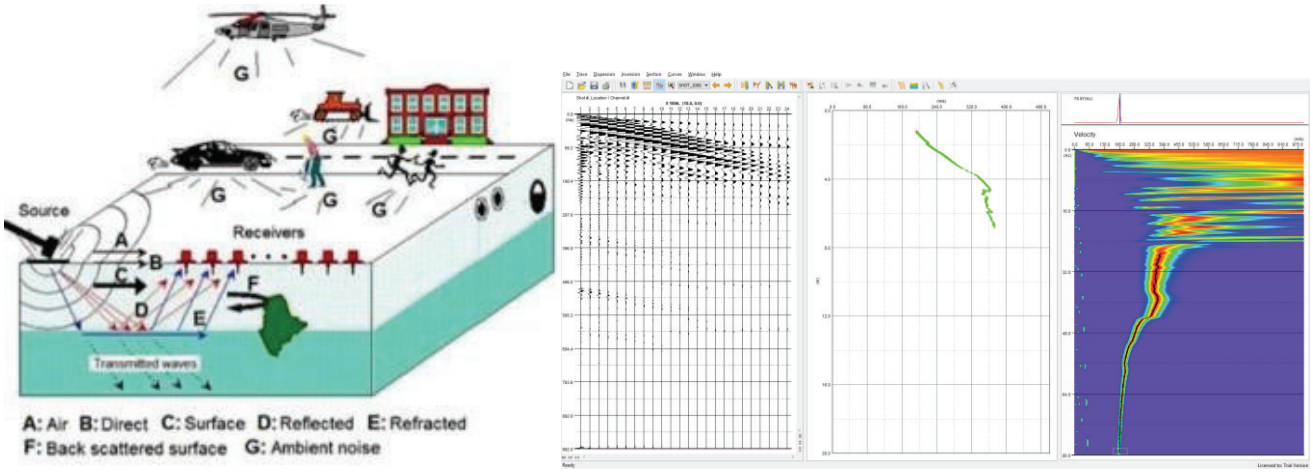
Respectfully submitted,

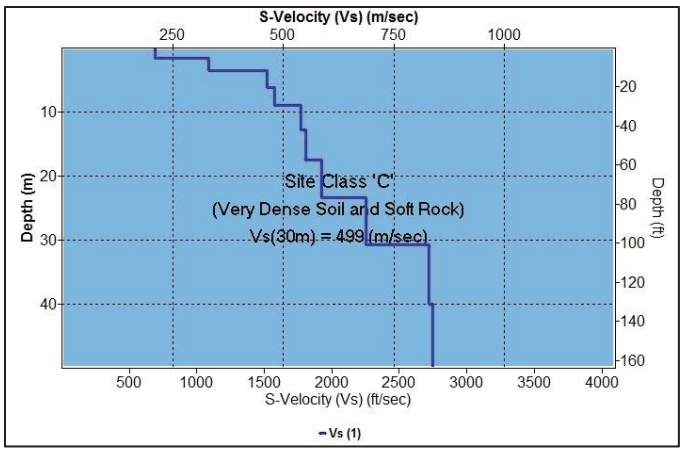


Milan Situm, P.Geo. FGC.
Vice President and Senior Geophysicist
Simcoe Geoscience Limited

MASW METHOD

First introduced in GEOPHYSICS (1999), the Multichannel Analysis of Surface Waves (MASW) method is one of the seismic survey methods evaluating the elastic condition (stiffness) of the ground for geotechnical engineering purposes. MASW first measures seismic surface waves generated from various types of seismic sources—such as sledgehammer—analyzes the propagation velocities of those surface waves, and then finally deduces shear-wave velocity (Vs) variations below the surveyed area that is most responsible for the analyzed propagation velocity pattern of surface waves. Shear-wave velocity (Vs) is one of the elastic constants and closely related to young's modulus. Under most circumstances, Vs is a direct indicator of the ground strength (stiffness) and therefore commonly used to derive load-bearing capacity. After a series of processing and modeling procedures, final Vs information is provided in 1D, 2D and 3D formats. Figures below outline the basic operating procedure for the MASW method and an example image of a typical MASW record and resulting 1D Vs model. The shear-wave depth profile is the average of the bulk area within the middle third of the geophone spread. The nominal maximum depth of penetration is half of the maximum seismic array length, which in practice is often influenced by the geology. A more detailed description of the method can be found in the paper *Multi-channel Analysis of Surface Waves,* Park, C.B., Miller, R.D. and Xia, J. Geophysics, Vol. 64, No. 3 (May-June 1999); P. 800–808.





MASW Field Procedures and typical MASW Shot Record, Phase Velocity/Frequency Curve and Resulting 1D Shear-Wave Velocity Model.

Appendix D

Laboratory Certificates of Analysis

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order: **WT2226280**		Page	: 1 of 13
Client		Laboratory	: Waterloo - Environmental
Contact		Account Manager	: Amanda Overholster
Address		Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone		Telephone	: 1 416 817 2944
Project:		Date Samples Received	: 29-Dec-2022 14:29
PO:		Date Analysis Commenced	: 29-Dec-2022
C-O-C number: 20-1002308		Issue Date	: 06-Jan-2023 13:12
Sampler:			
Site:			
Quote number: 2022 SOA			
No. of samples received: 2			
No. of samples analysed: 2			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Centralized Prep, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Kelsey Hesch	Analyst	Organics, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH1- S	Soil/Solid	mercury		ON406/20	T3.1-S-RPI	0.288 mg/kg	0.27 mg/kg

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

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUPH	Duplicate results outside ALS DQO, due to sample heterogeneity.
FR4	As per applicable reference method(s), soil:water ratio for Fixed Ratio Leach was modified to 1:4 due to high soil organic content.

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID: BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time: 29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix: Soil	Soil	----	----	----	----	----
			WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Physical Tests									
conductivity (1:2 leachate)	----	mS/cm	0.200	0.278	----	----	----	----	----
Moisture	----	%	21.8	14.3	----	----	----	----	----
pH (1:2 soil:CaCl2-aq)	----	pH units	7.14	7.32	----	----	----	----	----
Cyanides									
cyanide, weak acid dissociable	----	mg/kg	<0.050	<0.050	----	----	----	----	----
Fixed-Ratio Extractables									
calcium, soluble ion content	7440-70-2	mg/L	33.6	19.6	----	----	----	----	----
magnesium, soluble ion content	7439-95-4	mg/L	1.75	0.76	----	----	----	----	----
sodium, soluble ion content	17341-25-2	mg/L	6.11	45.9	----	----	----	----	----
sodium adsorption ratio [SAR]	----	-	0.28	2.77	----	----	----	----	----
Metals									
antimony	7440-36-0	mg/kg	0.54	0.32	----	----	----	----	----
arsenic	7440-38-2	mg/kg	1.79	3.01	----	----	----	----	----
barium	7440-39-3	mg/kg	29.1	52.0	----	----	----	----	----
beryllium	7440-41-7	mg/kg	0.18	0.44	----	----	----	----	----
boron	7440-42-8	mg/kg	<5.0	6.5	----	----	----	----	----
boron, hot water soluble	7440-42-8	mg/kg	0.79 FR4	0.57	----	----	----	----	----
cadmium	7440-43-9	mg/kg	0.462	0.243	----	----	----	----	----
chromium	7440-47-3	mg/kg	16.3	17.5	----	----	----	----	----
cobalt	7440-48-4	mg/kg	2.88	5.77	----	----	----	----	----
copper	7440-50-8	mg/kg	26.7	15.3	----	----	----	----	----
lead	7439-92-1	mg/kg	47.1	30.9	----	----	----	----	----
mercury	7439-97-6	mg/kg	0.288	0.0491	----	----	----	----	----
molybdenum	7439-98-7	mg/kg	0.74	0.56	----	----	----	----	----
nickel	7440-02-0	mg/kg	11.2	13.4	----	----	----	----	----
selenium	7782-49-2	mg/kg	<0.20	<0.20	----	----	----	----	----
silver	7440-22-4	mg/kg	0.26	<0.10	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time	29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix	Soil	Soil	----	----	----	----	----
				WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Metals										
thallium	7440-28-0	mg/kg		<0.050	0.105	----	----	----	----	----
uranium	7440-61-1	mg/kg		0.268	0.432	----	----	----	----	----
vanadium	7440-62-2	mg/kg		13.0	26.8	----	----	----	----	----
zinc	7440-66-6	mg/kg		59.4	48.9	----	----	----	----	----
Speciated Metals										
chromium, hexavalent [Cr VI]	18540-29-9	mg/kg		<0.10	<0.10	----	----	----	----	----
Volatile Organic Compounds										
Acetone	67-64-1	mg/kg		<0.50	<0.50	----	----	----	----	----
benzene	71-43-2	mg/kg		<0.0050	<0.0050	----	----	----	----	----
bromodichloromethane	75-27-4	mg/kg		<0.050	<0.050	----	----	----	----	----
bromoform	75-25-2	mg/kg		<0.050	<0.050	----	----	----	----	----
bromomethane	74-83-9	mg/kg		<0.050	<0.050	----	----	----	----	----
carbon tetrachloride	56-23-5	mg/kg		<0.050	<0.050	----	----	----	----	----
chlorobenzene	108-90-7	mg/kg		<0.050	<0.050	----	----	----	----	----
chloroform	67-66-3	mg/kg		<0.050	<0.050	----	----	----	----	----
dibromochloromethane	124-48-1	mg/kg		<0.050	<0.050	----	----	----	----	----
dibromoethane, 1,2-	106-93-4	mg/kg		<0.050	<0.050	----	----	----	----	----
dichlorobenzene, 1,2-	95-50-1	mg/kg		<0.050	<0.050	----	----	----	----	----
dichlorobenzene, 1,3-	541-73-1	mg/kg		<0.050	<0.050	----	----	----	----	----
dichlorobenzene, 1,4-	106-46-7	mg/kg		<0.050	<0.050	----	----	----	----	----
dichlorodifluoromethane	75-71-8	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloroethane, 1,1-	75-34-3	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloroethane, 1,2-	107-06-2	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloroethylene, 1,1-	75-35-4	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloroethylene, cis-1,2-	156-59-2	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloroethylene, trans-1,2-	156-60-5	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloromethane	75-09-2	mg/kg		<0.045	<0.045	----	----	----	----	----
dichloropropane, 1,2-	78-87-5	mg/kg		<0.050	<0.050	----	----	----	----	----
dichloropropylene, cis+trans-1,3-	542-75-6	mg/kg		<0.050	<0.050	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time	29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix	Soil	Soil	----	----	----	----	----
				WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Volatile Organic Compounds										
dichloropropylene, cis-1,3-	10061-01-5	mg/kg		<0.030	<0.030	----	----	----	----	----
dichloropropylene, trans-1,3-	10061-02-6	mg/kg		<0.030	<0.030	----	----	----	----	----
ethylbenzene	100-41-4	mg/kg		<0.015	<0.015	----	----	----	----	----
hexane, n-	110-54-3	mg/kg		<0.050	<0.050	----	----	----	----	----
methyl ethyl ketone [MEK]	78-93-3	mg/kg		<0.50	<0.50	----	----	----	----	----
methyl isobutyl ketone [MIBK]	108-10-1	mg/kg		<0.50	<0.50	----	----	----	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	mg/kg		<0.040	<0.040	----	----	----	----	----
styrene	100-42-5	mg/kg		<0.050	<0.050	----	----	----	----	----
tetrachloroethane, 1,1,1,2-	630-20-6	mg/kg		<0.050	<0.050	----	----	----	----	----
tetrachloroethane, 1,1,2,2-	79-34-5	mg/kg		<0.050	<0.050	----	----	----	----	----
tetrachloroethylene	127-18-4	mg/kg		<0.050	<0.050	----	----	----	----	----
toluene	108-88-3	mg/kg		<0.050	<0.050	----	----	----	----	----
trichloroethane, 1,1,1-	71-55-6	mg/kg		<0.050	<0.050	----	----	----	----	----
trichloroethane, 1,1,2-	79-00-5	mg/kg		<0.050	<0.050	----	----	----	----	----
trichloroethylene	79-01-6	mg/kg		<0.010	<0.010	----	----	----	----	----
trichlorofluoromethane	75-69-4	mg/kg		<0.050	<0.050	----	----	----	----	----
vinyl chloride	75-01-4	mg/kg		<0.020	<0.020	----	----	----	----	----
xylene, m+p-	179601-23-1	mg/kg		<0.030	<0.030	----	----	----	----	----
xylene, o-	95-47-6	mg/kg		<0.030	<0.030	----	----	----	----	----
xylenes, total	1330-20-7	mg/kg		<0.050	<0.050	----	----	----	----	----
BTEX, total	----	mg/kg		<0.10	<0.10	----	----	----	----	----
Hydrocarbons										
F1 (C6-C10)	----	mg/kg		<5.0	<5.0	----	----	----	----	----
F2 (C10-C16)	----	mg/kg		<10	<10	----	----	----	----	----
F2-naphthalene	----	mg/kg		<25	----	----	----	----	----	----
F3 (C16-C34)	----	mg/kg		131	52	----	----	----	----	----
F3-PAH	n/a	mg/kg		130	----	----	----	----	----	----
F4 (C34-C50)	----	mg/kg		108	56	----	----	----	----	----
F4G-sg	----	mg/kg		660	----	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time	29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix	Soil	Soil	----	----	----	----	----
				WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Hydrocarbons										
F1-BTEX	----	mg/kg		<5.0	<5.0	----	----	----	----	----
hydrocarbons, total (C6-C50)	----	mg/kg		239	108	----	----	----	----	----
chromatogram to baseline at nC50	n/a	-		NO	YES	----	----	----	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	%		81.1	79.8	----	----	----	----	----
dichlorotoluene, 3,4-	95-75-0	%		77.1	88.8	----	----	----	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	%		101	119	----	----	----	----	----
difluorobenzene, 1,4-	540-36-3	%		103	111	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
acenaphthene	83-32-9	mg/kg		<0.050	<0.050	----	----	----	----	----
acenaphthylene	208-96-8	mg/kg		<0.050	<0.050	----	----	----	----	----
anthracene	120-12-7	mg/kg		<0.050	<0.050	----	----	----	----	----
benz(a)anthracene	56-55-3	mg/kg		0.079	<0.050	----	----	----	----	----
benzo(a)pyrene	50-32-8	mg/kg		0.096	<0.050	----	----	----	----	----
benzo(b+j)fluoranthene	n/a	mg/kg		0.146	<0.050	----	----	----	----	----
benzo(g,h,i)perylene	191-24-2	mg/kg		0.074	<0.050	----	----	----	----	----
benzo(k)fluoranthene	207-08-9	mg/kg		0.052	<0.050	----	----	----	----	----
chrysene	218-01-9	mg/kg		0.088	<0.050	----	----	----	----	----
dibenz(a,h)anthracene	53-70-3	mg/kg		<0.050	<0.050	----	----	----	----	----
fluoranthene	206-44-0	mg/kg		0.181 DUPH	<0.050	----	----	----	----	----
fluorene	86-73-7	mg/kg		<0.050	<0.050	----	----	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg		0.081	<0.050	----	----	----	----	----
methylnaphthalene, 1-	90-12-0	mg/kg		<0.030	<0.030	----	----	----	----	----
methylnaphthalene, 1+2-	----	mg/kg		<0.050	<0.050	----	----	----	----	----
methylnaphthalene, 2-	91-57-6	mg/kg		<0.030	<0.030	----	----	----	----	----
naphthalene	91-20-3	mg/kg		<0.010	<0.010	----	----	----	----	----
phenanthrene	85-01-8	mg/kg		0.121 DUPH	<0.050	----	----	----	----	----
pyrene	129-00-0	mg/kg		0.151 DUPH	<0.050	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time	29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix	Soil	Soil	----	----	----	----	----
				WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Polycyclic Aromatic Hydrocarbons Surrogates										
acridine-d9	34749-75-2	%		88.9	91.8	----	----	----	----	----
chrysene-d12	1719-03-5	%		91.8	88.0	----	----	----	----	----
naphthalene-d8	1146-65-2	%		96.1	86.6	----	----	----	----	----
phenanthrene-d10	1517-22-2	%		97.2	94.7	----	----	----	----	----
Phthalate Esters										
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	mg/kg		----	<0.10	----	----	----	----	----
diethyl phthalate	84-66-2	mg/kg		----	<0.10	----	----	----	----	----
dimethyl phthalate	131-11-3	mg/kg		----	<0.10	----	----	----	----	----
Semi-Volatile Organics										
biphenyl	92-52-4	mg/kg		----	<0.050	----	----	----	----	----
bis(2-chloroethyl) ether	111-44-4	mg/kg		----	<0.10	----	----	----	----	----
bis(2-chloroisopropyl) ether	39638-32-9	mg/kg		----	<0.10	----	----	----	----	----
chloroaniline, 4-	106-47-8	mg/kg		----	<0.10	----	----	----	----	----
dichlorobenzidine, 3,3'-	91-94-1	mg/kg		----	<0.10	----	----	----	----	----
dinitrotoluene, 2,4-	121-14-2	mg/kg		----	<0.10	----	----	----	----	----
dinitrotoluene, 2,4 + 2,6-	n/a	mg/kg		----	<0.20	----	----	----	----	----
dinitrotoluene, 2,6-	606-20-2	mg/kg		----	<0.10	----	----	----	----	----
trichlorobenzene, 1,2,4-	120-82-1	mg/kg		----	<0.050	----	----	----	----	----
Semi-Volatile Organics Surrogates										
fluorobiphenyl, 2-	321-60-8	%		----	82.3	----	----	----	----	----
nitrobenzene-d5	4165-60-0	%		----	81.2	----	----	----	----	----
terphenyl-d14, p-	1718-51-0	%		----	81.3	----	----	----	----	----
Chlorinated Phenolics										
chlorophenol, 2-	95-57-8	mg/kg		----	<0.10	----	----	----	----	----
dichlorophenol, 2,4-	120-83-2	mg/kg		----	<0.10	----	----	----	----	----
pentachlorophenol [PCP]	87-86-5	mg/kg		----	<0.10	----	----	----	----	----
trichlorophenol, 2,4,5-	95-95-4	mg/kg		----	<0.10	----	----	----	----	----
trichlorophenol, 2,4,6-	88-06-2	mg/kg		----	<0.10	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH1- S	BH1- D	----	----	----	----	----
			Sampling date/time	29-Dec-2022 09:00	29-Dec-2022 10:00	----	----	----	----	----
			Sub-Matrix	Soil	Soil	----	----	----	----	----
				WT2226280-001	WT2226280-002	--------	--------	--------	--------	--------
Non-Chlorinated Phenolics										
dimethylphenol, 2,4-	105-67-9	mg/kg		----	<0.10	----	----	----	----	----
dinitrophenol, 2,4-	51-28-5	mg/kg		----	<1.0	----	----	----	----	----
phenol	108-95-2	mg/kg		----	<0.10	----	----	----	----	----
Phenolics Surrogates										
tribromophenol, 2,4,6-	118-79-6	%		----	51.7	----	----	----	----	----
Polychlorinated Biphenyls										
Aroclor 1016	12674-11-2	mg/kg		<0.010	<0.010	----	----	----	----	----
Aroclor 1221	11104-28-2	mg/kg		<0.010	<0.010	----	----	----	----	----
Aroclor 1232	11141-16-5	mg/kg		<0.010	<0.010	----	----	----	----	----
Aroclor 1242	53469-21-9	mg/kg		<0.160 DLM	<0.010	----	----	----	----	----
Aroclor 1248	12672-29-6	mg/kg		<0.010	<0.010	----	----	----	----	----
Aroclor 1254	11097-69-1	mg/kg		0.281 DUPH	<0.010	----	----	----	----	----
Aroclor 1260	11096-82-5	mg/kg		0.069 DUPH	<0.010	----	----	----	----	----
Aroclor 1262	37324-23-5	mg/kg		<0.010	<0.010	----	----	----	----	----
Aroclor 1268	11100-14-4	mg/kg		<0.010	<0.010	----	----	----	----	----
polychlorinated biphenyls [PCBs], total	----	mg/kg		0.350	<0.030	----	----	----	----	----
Polychlorinated Biphenyls Surrogates										
decachlorobiphenyl	2051-24-3	%		120	103	----	----	----	----	----
tetrachloro-m-xylene	877-09-8	%		89.0	82.4	----	----	----	----	----

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

Summary of Guideline Limits

Analyte	CAS Number	Unit	ON406/20 T3.1-S-RPI						
Physical Tests									
conductivity (1:2 leachate)	----	mS/cm	**0.7 mS/cm**						
Moisture	----	%							
pH (1:2 soil:CaCl2-aq)	----	pH units							
Cyanides									
cyanide, weak acid dissociable	----	mg/kg	**0.051 mg/kg**						
Fixed-Ratio Extractables									
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							
Metals									
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**						
Speciated Metals									
chromium, hexavalent [Cr VI]	18540-29-9	mg/kg	**8 mg/kg**						
Volatile Organic Compounds									
Acetone	67-64-1	mg/kg	**1.8 mg/kg**						
benzene	71-43-2	mg/kg	**0.02 mg/kg**						
bromodichloromethane	75-27-4	mg/kg	**5.8 mg/kg**						

Analyte	CAS Number	Unit	ON406/20 T3.1-S-RPI
Volatile Organic Compounds - Continued			
bromoform	75-25-2	mg/kg	**2.5 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	**0.28 mg/kg**
chloroform	67-66-3	mg/kg	**0.08 mg/kg**
dibromochloromethane	124-48-1	mg/kg	**5.5 mg/kg**
dibromoethane, 1,2-	106-93-4	mg/kg	**0.05 mg/kg**
dichlorobenzene, 1,2-	95-50-1	mg/kg	**3.4 mg/kg**
dichlorobenzene, 1,3-	541-73-1	mg/kg	**4.8 mg/kg**
dichlorobenzene, 1,4-	106-46-7	mg/kg	**0.05 mg/kg**
dichlorodifluoromethane	75-71-8	mg/kg	**1.8 mg/kg**
dichloroethane, 1,1-	75-34-3	mg/kg	**0.14 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	**0.05 mg/kg**
dichloroethylene, trans-1,2-	156-60-5	mg/kg	**0.05 mg/kg**
dichloromethane	75-09-2	mg/kg	**0.06 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	**1.9 mg/kg**
hexane, n-	110-54-3	mg/kg	**2.5 mg/kg**
methyl ethyl ketone [MEK]	78-93-3	mg/kg	**14 mg/kg**
methyl isobutyl ketone [MIBK]	108-10-1	mg/kg	**0.89 mg/kg**
methyl-tert-butyl ether [MTBE]	1634-04-4	mg/kg	**0.05 mg/kg**
styrene	100-42-5	mg/kg	**0.5 mg/kg**
tetrachloroethane, 1,1,1,2-	630-20-6	mg/kg	**0.05 mg/kg**
tetrachloroethane, 1,1,2,2-	79-34-5	mg/kg	**0.05 mg/kg**
tetrachloroethylene	127-18-4	mg/kg	**0.05 mg/kg**
toluene	108-88-3	mg/kg	**0.99 mg/kg**
trichloroethane, 1,1,1-	71-55-6	mg/kg	**0.11 mg/kg**
trichloroethane, 1,1,2-	79-00-5	mg/kg	**0.05 mg/kg**
trichloroethylene	79-01-6	mg/kg	**0.05 mg/kg**
trichlorofluoromethane	75-69-4	mg/kg	**0.46 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	ON406/20 T3.1-S-RPI
Volatile Organic Compounds - Continued			
xylenes, total	1330-20-7	mg/kg	**0.9 mg/kg**
Hydrocarbons			
chromatogram to baseline at nC50	n/a	-	
F1 (C6-C10)	----	mg/kg	**25 mg/kg**
F1-BTEX	----	mg/kg	**25 mg/kg**
F2 (C10-C16)	----	mg/kg	**10 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**
F4G-sg	----	mg/kg	**2800 mg/kg**
hydrocarbons, total (C6-C50)	----	mg/kg	
Polycyclic Aromatic Hydrocarbons			
acenaphthene	83-32-9	mg/kg	**14 mg/kg**
acenaphthylene	208-96-8	mg/kg	**0.093 mg/kg**
anthracene	120-12-7	mg/kg	**0.16 mg/kg**
benz(a)anthracene	56-55-3	mg/kg	**0.5 mg/kg**
benzo(a)pyrene	50-32-8	mg/kg	**0.57 mg/kg**
benzo(b+j)fluoranthene	n/a	mg/kg	**5.7 mg/kg**
benzo(g,h,i)perylene	191-24-2	mg/kg	**6.6 mg/kg**
benzo(k)fluoranthene	207-08-9	mg/kg	**5.7 mg/kg**
chrysene	218-01-9	mg/kg	**7 mg/kg**
dibenz(a,h)anthracene	53-70-3	mg/kg	**0.57 mg/kg**
fluoranthene	206-44-0	mg/kg	**0.69 mg/kg**
fluorene	86-73-7	mg/kg	**6.8 mg/kg**
indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	**0.38 mg/kg**
methylnaphthalene, 1+2-	----	mg/kg	**0.92 mg/kg**
methylnaphthalene, 1-	90-12-0	mg/kg	**0.92 mg/kg**
methylnaphthalene, 2-	91-57-6	mg/kg	**0.92 mg/kg**
naphthalene	91-20-3	mg/kg	**0.59 mg/kg**
phenanthrene	85-01-8	mg/kg	**6.2 mg/kg**
pyrene	129-00-0	mg/kg	**70 mg/kg**
Phthalate Esters			
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	mg/kg	**5 mg/kg**
diethyl phthalate	84-66-2	mg/kg	**0.5 mg/kg**
dimethyl phthalate	131-11-3	mg/kg	**0.5 mg/kg**
Semi-Volatile Organics			
biphenyl	92-52-4	mg/kg	**0.3 mg/kg**
bis(2-chloroethyl) ether	111-44-4	mg/kg	**0.5 mg/kg**

Analyte	CAS Number	Unit	ON406/20 T3.1-S-RPI						
Semi-Volatile Organics - Continued									
bis(2-chloroisopropyl) ether	39638-32-9	mg/kg	**0.5 mg/kg**						
chloroaniline, 4-	106-47-8	mg/kg	**0.5 mg/kg**						
dichlorobenzidine, 3,3'-	91-94-1	mg/kg	**1 mg/kg**						
dinitrotoluene, 2,4 + 2,6-	n/a	mg/kg	**0.92 mg/kg**						
dinitrotoluene, 2,4-	121-14-2	mg/kg							
dinitrotoluene, 2,6-	606-20-2	mg/kg							
trichlorobenzene, 1,2,4-	120-82-1	mg/kg	**0.17 mg/kg**						
Chlorinated Phenolics									
chlorophenol, 2-	95-57-8	mg/kg	**1.6 mg/kg**						
dichlorophenol, 2,4-	120-83-2	mg/kg	**1.7 mg/kg**						
pentachlorophenol [PCP]	87-86-5	mg/kg	**0.1 mg/kg**						
trichlorophenol, 2,4,5-	95-95-4	mg/kg	**3.1 mg/kg**						
trichlorophenol, 2,4,6-	88-06-2	mg/kg	**0.43 mg/kg**						
dimethylphenol, 2,4-	105-67-9	mg/kg	**45 mg/kg**						
dinitrophenol, 2,4-	51-28-5	mg/kg	**6.7 mg/kg**						
phenol	108-95-2	mg/kg	**5.3 mg/kg**						
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	mg/kg							
Aroclor 1221	11104-28-2	mg/kg							
Aroclor 1232	11141-16-5	mg/kg							
Aroclor 1242	53469-21-9	mg/kg							
Aroclor 1248	12672-29-6	mg/kg							
Aroclor 1254	11097-69-1	mg/kg							
Aroclor 1260	11096-82-5	mg/kg							
Aroclor 1262	37324-23-5	mg/kg							
Aroclor 1268	11100-14-4	mg/kg							
polychlorinated biphenyls [PCBs], total	----	mg/kg	**0.35 mg/kg**						

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

Key:

ON406/20	Ontario Regulation 406/19 - Excess Soils - 17-December-20
T3.1-S-RPI	406 T3.1 - Volume Independent Soil - Res/Park/Inst Property Use

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2226280**	Page	: 1 of 13
Client		Laboratory	: Waterloo - Environmental
Contact		Account Manager	: Amanda Overholster
Address		Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone		Telephone	: 1 416 817 2944
Project	:	Date Samples Received	: 29-Dec-2022 14:29
PO	:	Issue Date	: 06-Jan-2023 13:12
C-O-C number	: 20-1002308		
Sampler	:		
Site	:		
Quote number	: 2022 SOA		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) 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
Duplicate (DUP) RPDs								
Polycyclic Aromatic Hydrocarbons	WT2226280-001	BH1- S	fluoranthene	206-44-0	E641A	60.5 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	WT2226280-001	BH1- S	phenanthrene	85-01-8	E641A	0.126 % DUP-H, J	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).
Polycyclic Aromatic Hydrocarbons	WT2226280-001	BH1- S	pyrene	129-00-0	E641A	55.2 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polychlorinated Biphenyls	WT2226280-001	BH1- S	Aroclor 1254	11097-69-1	E687	104 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polychlorinated Biphenyls	WT2226280-001	BH1- S	Aroclor 1260	11096-82-5	E687	73.0 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

Laboratory Control Sample (LCS) Recoveries								
Metals	QC-MRG2-7912140 02	----	silver	7440-22-4	E440	78.9 % MES	80.0-120%	Recovery less than lower 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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap BH1- D	E655A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	02-Jan-2023	40 days	4 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH1- D	E336A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	03-Jan-2023	14 days	4 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH1- S	E336A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	03-Jan-2023	14 days	4 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH1- D	E484	29-Dec-2022	04-Jan-2023	180 days	6 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH1- S	E484	29-Dec-2022	04-Jan-2023	180 days	6 days	✓	04-Jan-2023	180 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1- D	E581.F1	29-Dec-2022	02-Jan-2023	14 days	5 days	✓	03-Jan-2023	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1- S	E581.F1	29-Dec-2022	02-Jan-2023	14 days	5 days	✓	03-Jan-2023	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap										
BH1- S	E601.F4G-L	29-Dec-2022	05-Jan-2023	14 days	7 days	✓	06-Jan-2023	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH1- D	E601.SG-L	29-Dec-2022	04-Jan-2023	14 days	6 days	✓	06-Jan-2023	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH1- S	E601.SG-L	29-Dec-2022	04-Jan-2023	14 days	6 days	✓	06-Jan-2023	40 days	2 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH1- D	E487	29-Dec-2022	04-Jan-2023	180 days	6 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH1- S	E487	29-Dec-2022	04-Jan-2023	180 days	6 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH1- D	E510	29-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	6 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH1- S	E510	29-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	6 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH1- D	E440	29-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH1- S	E440	29-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH1- D	E655A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	02-Jan-2023	40 days	4 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH1- D	E655A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	02-Jan-2023	40 days	4 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH1- D	E100-L	29-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH1- S	E100-L	29-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	30 days	7 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH1- D	E144	29-Dec-2022	----	----	----		29-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH1- S	E144	29-Dec-2022	----	----	----		29-Dec-2022	----	----	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH1- D	E108A	29-Dec-2022	30-Dec-2022	----	----		03-Jan-2023	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH1- S	E108A	29-Dec-2022	30-Dec-2022	----	----		03-Jan-2023	30 days	6 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH1- D	E687	29-Dec-2022	02-Jan-2023	----	----		04-Jan-2023	40 days	2 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH1- S	E687	29-Dec-2022	02-Jan-2023	----	----		04-Jan-2023	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH1- D	E641A	29-Dec-2022	04-Jan-2023	14 days	6 days	✓	05-Jan-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH1- S	E641A	29-Dec-2022	04-Jan-2023	14 days	6 days	✓	05-Jan-2023	40 days	1 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH1- D	E655A	29-Dec-2022	30-Dec-2022	14 days	1 days	✓	02-Jan-2023	40 days	4 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH1- D	E532	29-Dec-2022	30-Dec-2022	30 days	1 days	✓	03-Jan-2023	7 days	4 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH1- S	E532	29-Dec-2022	30-Dec-2022	30 days	1 days	✓	03-Jan-2023	7 days	4 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
BH1- D	E611D	29-Dec-2022	02-Jan-2023	14 days	5 days	✓	03-Jan-2023	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
BH1- S	E611D	29-Dec-2022	02-Jan-2023	14 days	5 days	✓	03-Jan-2023	40 days	1 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)							
BNA (ON 625-511 list) by GC-MS	E655A	791260	1	5	20.0	5.0	✓
Boron-Hot Water Extractable by ICPOES	E487	791219	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	792438	1	7	14.2	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	795441	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	793740	1	12	8.3	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	791218	1	2	50.0	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	791441	1	2	50.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	791215	1	2	50.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	791214	1	9	11.1	5.0	✓
Moisture Content by Gravimetry	E144	791256	1	13	7.6	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	793741	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	792431	1	2	50.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	791259	1	5	20.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	791217	1	2	50.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	792437	1	7	14.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	791440	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
BNA (ON 625-511 list) by GC-MS	E655A	791260	1	5	20.0	5.0	✓
Boron-Hot Water Extractable by ICPOES	E487	791219	2	2	100.0	10.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	792438	1	7	14.2	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	795441	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	793740	1	12	8.3	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	791218	2	2	100.0	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	791441	2	2	100.0	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	791215	2	2	100.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	791214	2	9	22.2	10.0	✓
Moisture Content by Gravimetry	E144	791256	1	13	7.6	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	793741	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	792431	1	2	50.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	791259	1	5	20.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	791217	2	2	100.0	10.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	792437	1	7	14.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	791440	1	3	33.3	5.0	✓
Method Blanks (MB)							
BNA (ON 625-511 list) by GC-MS	E655A	791260	1	5	20.0	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							
Boron-Hot Water Extractable by ICPOES	E487	791219	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	792438	1	7	14.2	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	795441	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	793740	1	12	8.3	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	791218	1	2	50.0	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	791441	1	2	50.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	791215	1	2	50.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	791214	1	9	11.1	5.0	✓
Moisture Content by Gravimetry	E144	791256	1	13	7.6	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	793741	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	792431	1	2	50.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	791217	1	2	50.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	792437	1	7	14.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	791440	1	3	33.3	5.0	✓
Matrix Spikes (MS)							
BNA (ON 625-511 list) by GC-MS	E655A	791260	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	792438	1	7	14.2	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	795441	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	793740	1	12	8.3	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	793741	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	792431	1	2	50.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	792437	1	7	14.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	791440	1	3	33.3	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 Waterloo - Environmental	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 CaCl2 Extraction) - As Received	E108A Waterloo - Environmental	Soil/Solid	MOEE E3137A	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.
Moisture Content by Gravimetry	E144 Waterloo - Environmental	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 Waterloo - Environmental	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	E440 Waterloo - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 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 Waterloo - Environmental	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.
Boron-Hot Water Extractable by ICPOES	E487 Waterloo - Environmental	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).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Mercury in Soil/Solid by CVAAS	E510 Waterloo - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 Waterloo - Environmental	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 Waterloo - Environmental	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.
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L Waterloo - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	A portion of the silica gel treated sample extract is filtered and dried at 105°C and the mass of the residual gravimetric heavy hydrocarbons (F4G) is determined gravimetrically.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L Waterloo - Environmental	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).
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	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 Hex:Ace GC-MS	E641A Waterloo - Environmental	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.
BNA (ON 625-511 list) by GC-MS	E655A Waterloo - Environmental	Soil/Solid	EPA 8270E (mod)	BNA are analyzed by GC-MS.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Soil/Solid	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
F1-BTEX	EC580 Waterloo - Environmental	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 Waterloo - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F2 to F3 minus PAH	EC600 Waterloo - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus select Polycyclic Aromatic Hydrocarbons (PAH) as per CCME Soil Tier 1

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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	EP440 Waterloo - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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.
BNA DCM-Acetone Shaker Extraction	EP655 Waterloo - Environmental	Soil/Solid	EPA 3570 (mod)	Samples are subsampled and BNA are extracted with 1:1 DCM:acetone using a mechanical shakerr.

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

QUALITY CONTROL REPORT

Work Order	: **WT2226280**	Page	: 1 of 22
Client	:	Laboratory	: Waterloo - Environmental
Contact		Account Manager	: Amanda Overholster
Address		Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: 1 416 817 2944
Project	: 2200728AE	Date Samples Received	: 29-Dec-2022 14:29
PO	: ----	Date Analysis Commenced	: 29-Dec-2022
C-O-C number	: 20-1002308	Issue Date	: 06-Jan-2023 13:12
Sampler	:		
Site	: :		
Quote number	2022 SOA		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- 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*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Centralized Prep, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Kelsey Hesch	Analyst	Waterloo Organics, 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: **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: 791218)											
WT2226280-001	BH1- S	conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.200 mS/cm	201	0.699%	20%	----
Physical Tests (QC Lot: 791256)											
WT2226273-001	Anonymous	Moisture	----	E144	0.25	%	13.4	14.2	6.39%	20%	----
Physical Tests (QC Lot: 791259)											
WT2226273-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.69	7.66	0.391%	5%	----
Cyanides (QC Lot: 791440)											
WT2226275-001	Anonymous	cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 791214)											
WT2226280-001	BH1- S	antimony	7440-36-0	E440	0.10	mg/kg	0.54	0.66	0.12	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	1.79	2.22	21.3%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	29.1	37.7	25.7%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.18	0.23	0.05	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	<5.0	6.5	1.5	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.462	0.592	24.6%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	16.3	21.5	27.5%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	2.88	3.69	24.5%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	26.7	35.6	28.4%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	47.1	63.9	30.3%	40%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	0.74	0.96	25.3%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	11.2	14.4	25.1%	30%	----
		selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.26	0.31	0.05	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	<0.050	0.057	0.007	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.268	0.312	0.044	Diff <2x LOR	----
		vanadium	7440-62-2	E440	0.20	mg/kg	13.0	16.7	25.1%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	59.4	76.4	25.0%	30%	----
Metals (QC Lot: 791215)											
WT2226280-001	BH1- S	mercury	7439-97-6	E510	0.0050	mg/kg	0.288	0.265	8.63%	40%	----
Metals (QC Lot: 791217)											
WT2226280-001	BH1- S	calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	33.6	34.3	2.06%	30%	----

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: 791217) - continued											
WT2226280-001	BH1- S	magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.75	1.79	0.04	Diff <2x LOR	----
		sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	6.11	6.04	1.15%	30%	----
Metals (QC Lot: 791219)											
WT2226280-001	BH1- S	boron, hot water soluble	7440-42-8	E487	0.20	mg/kg	0.79	0.78	0.02	Diff <2x LOR	----
Speciated Metals (QC Lot: 791441)											
WT2226280-001	BH1- S	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: 792437)											
WT2226206-001	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	----
		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	----

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: 792437) - continued											
WT2226206-001	Anonymous	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	----
Hydrocarbons (QC Lot: 792438)											
WT2226206-001	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 793740)											
WT2226280-001	BH1- S	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	131	72	59	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	108	57	51	Diff <2x LOR	----
Hydrocarbons (QC Lot: 795441)											
WT2226280-001	BH1- S	F4G-sg	----	E601.F4G-L	250	mg/kg	660	500	160	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 793741)											
WT2226280-001	BH1- S	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	0.067	0.017	Diff <2x LOR	----
		benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	0.079	0.168	0.089	Diff <2x LOR	----
		benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	0.096	0.169	0.073	Diff <2x LOR	----
		benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	0.146	0.241	0.095	Diff <2x LOR	----
		benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	0.074	0.092	0.018	Diff <2x LOR	----
		benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	0.052	0.094	0.042	Diff <2x LOR	----
		chrysene	218-01-9	E641A	0.050	mg/kg	0.088	0.168	0.080	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	0.181	0.338	60.5%	50%	DUP-H
		fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	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*
Polycyclic Aromatic Hydrocarbons (QC Lot: 793741) - continued											
WT2226280-001	BH1- S	indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	0.081	0.112	0.031	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	----
		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	0.121	# 0.248	0.126	Diff <2x LOR	DUP-H,J
		pyrene	129-00-0	E641A	0.050	mg/kg	0.151	0.266	55.2%	50%	DUP-H
Phthalate Esters (QC Lot: 791260)											
WT2225399-004	Anonymous	bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		diethyl phthalate	84-66-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dimethyl phthalate	131-11-3	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Semi-Volatile Organics (QC Lot: 791260)											
WT2225399-004	Anonymous	biphenyl	92-52-4	E655A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		bis(2-chloroethyl) ether	111-44-4	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		chloroaniline, 4-	106-47-8	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dichlorobenzidine, 3,3'-	91-94-1	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrotoluene, 2,4-	121-14-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrotoluene, 2,6-	606-20-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorobenzene, 1,2,4-	120-82-1	E655A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Chlorinated Phenolics (QC Lot: 791260)											
WT2225399-004	Anonymous	chlorophenol, 2-	95-57-8	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dichlorophenol, 2,4-	120-83-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		pentachlorophenol [PCP]	87-86-5	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorophenol, 2,4,5-	95-95-4	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorophenol, 2,4,6-	88-06-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Non-Chlorinated Phenolics (QC Lot: 791260)											
WT2225399-004	Anonymous	dimethylphenol, 2,4-	105-67-9	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrophenol, 2,4-	51-28-5	E655A	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
		phenol	108-95-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Polychlorinated Biphenyls (QC Lot: 792431)											
WT2226280-001	BH1- S	Aroclor 1016	12674-11-2	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Aroclor 1221	11104-28-2	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Aroclor 1232	11141-16-5	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Aroclor 1242	53469-21-9	E687	0.110	mg/kg	<0.160	<0.110	0.050	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*
Polychlorinated Biphenyls (QC Lot: 792431) - continued											
WT2226280-001	BH1- S	Aroclor 1248	12672-29-6	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Aroclor 1254	11097-69-1	E687	0.010	mg/kg	0.281	0.089	104%	50%	DUP-H
		Aroclor 1260	11096-82-5	E687	0.010	mg/kg	0.069	0.032	73.0%	50%	DUP-H
		Aroclor 1262	37324-23-5	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Aroclor 1268	11100-14-4	E687	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----

Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

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
Physical Tests (QCLot: 791218)						
conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 791256)						
Moisture	----	E144	0.25	%	<0.25	----
Cyanides (QCLot: 791440)						
cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 791214)						
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Metals (QCLot: 791215)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 791217)						
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	----
Metals (QCLot: 791219)						
boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Speciated Metals (QCLot: 791441)						
chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 792437)						
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	<0.045	----
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	----
tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	<0.050	----
toluene	108-88-3	E611D	0.05	mg/kg	<0.050	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 792437) - continued						
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	----
Hydrocarbons (QCLot: 792438)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 793740)						
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	----
Hydrocarbons (QCLot: 795441)						
F4G-sg	----	E601.F4G-L	250	mg/kg	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 793741)						
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	----
Phthalate Esters (QCLot: 791260)						

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Phthalate Esters (QCLot: 791260) - continued						
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.1	mg/kg	<0.10	----
diethyl phthalate	84-66-2	E655A	0.1	mg/kg	<0.10	----
dimethyl phthalate	131-11-3	E655A	0.1	mg/kg	<0.10	----
Semi-Volatile Organics (QCLot: 791260)						
biphenyl	92-52-4	E655A	0.05	mg/kg	<0.050	----
bis(2-chloroethyl) ether	111-44-4	E655A	0.1	mg/kg	<0.10	----
bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.1	mg/kg	<0.10	----
chloroaniline, 4-	106-47-8	E655A	0.1	mg/kg	<0.10	----
dichlorobenzidine, 3,3'-	91-94-1	E655A	0.1	mg/kg	<0.10	----
dinitrotoluene, 2,4-	121-14-2	E655A	0.1	mg/kg	<0.10	----
dinitrotoluene, 2,6-	606-20-2	E655A	0.1	mg/kg	<0.10	----
trichlorobenzene, 1,2,4-	120-82-1	E655A	0.05	mg/kg	<0.050	----
Chlorinated Phenolics (QCLot: 791260)						
chlorophenol, 2-	95-57-8	E655A	0.1	mg/kg	<0.10	----
dichlorophenol, 2,4-	120-83-2	E655A	0.1	mg/kg	<0.10	----
pentachlorophenol [PCP]	87-86-5	E655A	0.1	mg/kg	<0.10	----
trichlorophenol, 2,4,5-	95-95-4	E655A	0.1	mg/kg	<0.10	----
trichlorophenol, 2,4,6-	88-06-2	E655A	0.1	mg/kg	<0.10	----
Non-Chlorinated Phenolics (QCLot: 791260)						
dimethylphenol, 2,4-	105-67-9	E655A	0.1	mg/kg	<0.10	----
dinitrophenol, 2,4-	51-28-5	E655A	1	mg/kg	<1.0	----
phenol	108-95-2	E655A	0.1	mg/kg	<0.10	----
Polychlorinated Biphenyls (QCLot: 792431)						
Aroclor 1016	12674-11-2	E687	0.01	mg/kg	<0.010	----
Aroclor 1221	11104-28-2	E687	0.01	mg/kg	<0.010	----
Aroclor 1232	11141-16-5	E687	0.01	mg/kg	<0.010	----
Aroclor 1242	53469-21-9	E687	0.01	mg/kg	<0.010	----
Aroclor 1248	12672-29-6	E687	0.01	mg/kg	<0.010	----
Aroclor 1254	11097-69-1	E687	0.01	mg/kg	<0.010	----
Aroclor 1260	11096-82-5	E687	0.01	mg/kg	<0.010	----
Aroclor 1262	37324-23-5	E687	0.01	mg/kg	<0.010	----
Aroclor 1268	11100-14-4	E687	0.01	mg/kg	<0.010	----

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	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 791218)									
conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	97.4	90.0	110	----
Physical Tests (QCLot: 791256)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Physical Tests (QCLot: 791259)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Cyanides (QCLot: 791440)									
cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	2.5 mg/kg	95.9	80.0	125	----
Metals (QCLot: 791214)									
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	92.4	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	94.9	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	91.0	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	87.2	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	84.7	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	93.4	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	91.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	90.4	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	87.2	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	91.8	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	89.2	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	89.1	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	89.5	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	# 78.9	80.0	120	MES
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	89.9	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	87.3	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	93.5	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	87.4	80.0	120	----
Metals (QCLot: 791215)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	106	80.0	120	----
Metals (QCLot: 791217)									
calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	97.7	80.0	120	----
magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	93.4	80.0	120	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Metals (QCLot: 791217) - continued									
sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	95.8	80.0	120	----
Metals (QCLot: 791219)									
boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	1.33333 mg/kg	102	70.0	130	----
Speciated Metals (QCLot: 791441)									
chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	82.6	80.0	120	----
Volatile Organic Compounds (QCLot: 792437)									
Acetone	67-64-1	E611D	0.5	mg/kg	3.475 mg/kg	86.5	60.0	140	----
benzene	71-43-2	E611D	0.005	mg/kg	3.475 mg/kg	99.6	70.0	130	----
bromodichloromethane	75-27-4	E611D	0.05	mg/kg	3.475 mg/kg	90.1	50.0	140	----
bromoform	75-25-2	E611D	0.05	mg/kg	3.475 mg/kg	94.8	70.0	130	----
bromomethane	74-83-9	E611D	0.05	mg/kg	3.475 mg/kg	89.3	50.0	140	----
carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	3.475 mg/kg	90.0	70.0	130	----
chlorobenzene	108-90-7	E611D	0.05	mg/kg	3.475 mg/kg	104	70.0	130	----
chloroform	67-66-3	E611D	0.05	mg/kg	3.475 mg/kg	89.9	70.0	130	----
dibromochloromethane	124-48-1	E611D	0.05	mg/kg	3.475 mg/kg	93.0	60.0	130	----
dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	3.475 mg/kg	85.9	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	3.475 mg/kg	98.9	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	3.475 mg/kg	102	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	3.475 mg/kg	102	70.0	130	----
dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	3.475 mg/kg	70.3	50.0	140	----
dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	3.475 mg/kg	93.4	60.0	130	----
dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	3.475 mg/kg	83.8	60.0	130	----
dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	3.475 mg/kg	86.6	60.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	3.475 mg/kg	90.6	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	3.475 mg/kg	94.0	60.0	130	----
dichloromethane	75-09-2	E611D	0.045	mg/kg	3.475 mg/kg	88.0	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	3.475 mg/kg	91.3	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	3.475 mg/kg	93.8	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	3.475 mg/kg	94.6	70.0	130	----
ethylbenzene	100-41-4	E611D	0.015	mg/kg	3.475 mg/kg	104	70.0	130	----
hexane, n-	110-54-3	E611D	0.05	mg/kg	3.475 mg/kg	91.9	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	3.475 mg/kg	80.6	60.0	140	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	3.475 mg/kg	77.8	60.0	140	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	3.475 mg/kg	101	70.0	130	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 792437) - continued									
styrene	100-42-5	E611D	0.05	mg/kg	3.475 mg/kg	104	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.05	mg/kg	3.475 mg/kg	92.6	60.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.05	mg/kg	3.475 mg/kg	87.6	60.0	130	----
tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	3.475 mg/kg	101	60.0	130	----
toluene	108-88-3	E611D	0.05	mg/kg	3.475 mg/kg	105	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.05	mg/kg	3.475 mg/kg	90.1	60.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.05	mg/kg	3.475 mg/kg	95.2	60.0	130	----
trichloroethylene	79-01-6	E611D	0.01	mg/kg	3.475 mg/kg	91.1	60.0	130	----
trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	3.475 mg/kg	86.0	50.0	140	----
vinyl chloride	75-01-4	E611D	0.02	mg/kg	3.475 mg/kg	78.3	60.0	140	----
xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	6.95 mg/kg	99.3	70.0	130	----
xylene, o-	95-47-6	E611D	0.03	mg/kg	3.475 mg/kg	99.8	70.0	130	----
Hydrocarbons (QCLot: 792438)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.1875 mg/kg	110	80.0	120	----
Hydrocarbons (QCLot: 793740)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	883.825 mg/kg	83.2	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1385.22 mg/kg	76.2	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	797.55 mg/kg	85.2	70.0	130	----
Hydrocarbons (QCLot: 795441)									
F4G-sg	----	E601.F4G-L	250	mg/kg	1298.6 mg/kg	83.4	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 793741)									
acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	90.3	60.0	130	----
acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	94.4	60.0	130	----
anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	91.4	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	96.9	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	98.2	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	109	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	74.5	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	97.1	60.0	130	----
chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	94.0	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	84.0	60.0	130	----
fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	88.8	60.0	130	----
fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	90.8	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	83.4	60.0	130	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 793741) - continued									
methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	87.1	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	85.3	60.0	130	----
naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	85.4	60.0	130	----
phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	84.6	60.0	130	----
pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	87.8	60.0	130	----
Phthalate Esters (QCLot: 791260)									
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.1	mg/kg	3.2 mg/kg	77.3	50.0	140	----
diethyl phthalate	84-66-2	E655A	0.1	mg/kg	3.2 mg/kg	76.2	50.0	140	----
dimethyl phthalate	131-11-3	E655A	0.1	mg/kg	3.2 mg/kg	78.9	50.0	140	----
Semi-Volatile Organics (QCLot: 791260)									
biphenyl	92-52-4	E655A	0.05	mg/kg	0.8 mg/kg	83.5	50.0	140	----
bis(2-chloroethyl) ether	111-44-4	E655A	0.1	mg/kg	0.8 mg/kg	73.7	50.0	140	----
bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.1	mg/kg	0.8 mg/kg	69.9	50.0	140	----
chloroaniline, 4-	106-47-8	E655A	0.1	mg/kg	0.8 mg/kg	75.5	50.0	140	----
dichlorobenzidine, 3,3'-	91-94-1	E655A	0.1	mg/kg	0.8 mg/kg	68.0	50.0	140	----
dinitrotoluene, 2,4-	121-14-2	E655A	0.1	mg/kg	0.8 mg/kg	80.5	50.0	140	----
dinitrotoluene, 2,6-	606-20-2	E655A	0.1	mg/kg	0.8 mg/kg	82.6	50.0	140	----
trichlorobenzene, 1,2,4-	120-82-1	E655A	0.05	mg/kg	0.8 mg/kg	79.5	50.0	140	----
Chlorinated Phenolics (QCLot: 791260)									
chlorophenol, 2-	95-57-8	E655A	0.1	mg/kg	2.4 mg/kg	77.4	50.0	140	----
dichlorophenol, 2,4-	120-83-2	E655A	0.1	mg/kg	2.4 mg/kg	84.2	50.0	140	----
pentachlorophenol [PCP]	87-86-5	E655A	0.1	mg/kg	2.4 mg/kg	70.6	50.0	140	----
trichlorophenol, 2,4,5-	95-95-4	E655A	0.1	mg/kg	2.4 mg/kg	84.6	50.0	140	----
trichlorophenol, 2,4,6-	88-06-2	E655A	0.1	mg/kg	2.4 mg/kg	82.8	50.0	140	----
Non-Chlorinated Phenolics (QCLot: 791260)									
dimethylphenol, 2,4-	105-67-9	E655A	0.1	mg/kg	2.4 mg/kg	75.1	50.0	140	----
dinitrophenol, 2,4-	51-28-5	E655A	1	mg/kg	2.4 mg/kg	51.4	50.0	140	----
phenol	108-95-2	E655A	0.1	mg/kg	2.4 mg/kg	112	50.0	140	----
Polychlorinated Biphenyls (QCLot: 792431)									
Aroclor 1016	12674-11-2	E687	0.01	mg/kg	0.01 mg/kg	89.7	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.01	mg/kg	0.01 mg/kg	89.7	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.01	mg/kg	0.01 mg/kg	89.7	60.0	140	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polychlorinated Biphenyls (QCLot: 792431) - continued									
Aroclor 1242	53469-21-9	E687	0.01	mg/kg	0.01 mg/kg	89.7	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.01	mg/kg	0.01 mg/kg	80.5	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.01	mg/kg	0.01 mg/kg	82.8	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.01	mg/kg	0.01 mg/kg	97.4	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.01	mg/kg	0.01 mg/kg	97.4	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.01	mg/kg	0.01 mg/kg	97.4	60.0	140	----

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) 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
Cyanides (QCLot: 791440)										
WT2226275-001	Anonymous	cyanide, weak acid dissociable	----	E336A	1.11 mg/kg	2.5 mg/kg	90.3	70.0	130	----
Volatile Organic Compounds (QCLot: 792437)										
WT2226206-001	Anonymous	Acetone	67-64-1	E611D	2.01 mg/kg	3.125 mg/kg	87.7	50.0	140	----
		benzene	71-43-2	E611D	2.25 mg/kg	3.125 mg/kg	98.1	50.0	140	----
		bromodichloromethane	75-27-4	E611D	2.03 mg/kg	3.125 mg/kg	88.3	50.0	140	----
		bromoform	75-25-2	E611D	2.10 mg/kg	3.125 mg/kg	91.4	50.0	140	----
		bromomethane	74-83-9	E611D	2.19 mg/kg	3.125 mg/kg	95.4	50.0	140	----
		carbon tetrachloride	56-23-5	E611D	2.04 mg/kg	3.125 mg/kg	88.7	50.0	140	----
		chlorobenzene	108-90-7	E611D	2.33 mg/kg	3.125 mg/kg	101	50.0	140	----
		chloroform	67-66-3	E611D	2.04 mg/kg	3.125 mg/kg	88.9	50.0	140	----
		dibromochloromethane	124-48-1	E611D	2.08 mg/kg	3.125 mg/kg	90.7	50.0	140	----
		dibromoethane, 1,2-	106-93-4	E611D	1.96 mg/kg	3.125 mg/kg	85.6	50.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	2.19 mg/kg	3.125 mg/kg	95.5	50.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611D	2.28 mg/kg	3.125 mg/kg	99.4	50.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	2.26 mg/kg	3.125 mg/kg	98.6	50.0	140	----
		dichlorodifluoromethane	75-71-8	E611D	2.57 mg/kg	3.125 mg/kg	112	50.0	140	----
		dichloroethane, 1,1-	75-34-3	E611D	2.14 mg/kg	3.125 mg/kg	93.3	50.0	140	----
		dichloroethane, 1,2-	107-06-2	E611D	1.92 mg/kg	3.125 mg/kg	83.8	50.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611D	2.06 mg/kg	3.125 mg/kg	89.8	50.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	2.07 mg/kg	3.125 mg/kg	90.3	50.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	2.16 mg/kg	3.125 mg/kg	94.2	50.0	140	----
		dichloromethane	75-09-2	E611D	2.04 mg/kg	3.125 mg/kg	89.0	50.0	140	----
		dichloropropane, 1,2-	78-87-5	E611D	2.06 mg/kg	3.125 mg/kg	89.7	50.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	2.00 mg/kg	3.125 mg/kg	87.1	50.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	2.02 mg/kg	3.125 mg/kg	88.1	50.0	140	----
		ethylbenzene	100-41-4	E611D	2.31 mg/kg	3.125 mg/kg	101	50.0	140	----
		hexane, n-	110-54-3	E611D	2.23 mg/kg	3.125 mg/kg	97.0	50.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	1.92 mg/kg	3.125 mg/kg	83.8	50.0	140	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	1.74 mg/kg	3.125 mg/kg	75.8	50.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	2.27 mg/kg	3.125 mg/kg	98.8	50.0	140	----
		styrene	100-42-5	E611D	2.29 mg/kg	3.125 mg/kg	99.7	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: 792437) - continued										
WT2226206-001	Anonymous	tetrachloroethane, 1,1,1,2-	630-20-6	E611D	2.07 mg/kg	3.125 mg/kg	90.1	50.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	1.95 mg/kg	3.125 mg/kg	84.8	50.0	140	----
		tetrachloroethylene	127-18-4	E611D	2.27 mg/kg	3.125 mg/kg	99.0	50.0	140	----
		toluene	108-88-3	E611D	2.37 mg/kg	3.125 mg/kg	103	50.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611D	2.04 mg/kg	3.125 mg/kg	89.0	50.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611D	2.17 mg/kg	3.125 mg/kg	94.7	50.0	140	----
		trichloroethylene	79-01-6	E611D	2.03 mg/kg	3.125 mg/kg	88.5	50.0	140	----
		trichlorofluoromethane	75-69-4	E611D	2.15 mg/kg	3.125 mg/kg	93.5	50.0	140	----
		vinyl chloride	75-01-4	E611D	2.08 mg/kg	3.125 mg/kg	90.7	50.0	140	----
		xylene, m+p-	179601-23-1	E611D	4.42 mg/kg	6.25 mg/kg	96.2	50.0	140	----
		xylene, o-	95-47-6	E611D	2.22 mg/kg	3.125 mg/kg	96.5	50.0	140	----
Hydrocarbons (QCLot: 792438)										
WT2226206-001	Anonymous	F1 (C6-C10)	----	E581.F1	41.6 mg/kg	62.5 mg/kg	90.6	60.0	140	----
Hydrocarbons (QCLot: 793740)										
WT2226280-001	BH1- S	F2 (C10-C16)	----	E601.SG-L	547 mg/kg	883.825 mg/kg	82.0	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	769 mg/kg	1385.22 mg/kg	73.5	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	491 mg/kg	797.55 mg/kg	81.6	60.0	140	----
Hydrocarbons (QCLot: 795441)										
WT2226280-001	BH1- S	F4G-sg	----	E601.F4G-L	600 mg/kg	1298.6 mg/kg	61.0	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 793741)										
WT2226280-001	BH1- S	acenaphthene	83-32-9	E641A	0.338 mg/kg	0.5 mg/kg	90.0	50.0	140	----
		acenaphthylene	208-96-8	E641A	0.366 mg/kg	0.5 mg/kg	97.4	50.0	140	----
		anthracene	120-12-7	E641A	0.380 mg/kg	0.5 mg/kg	101	50.0	140	----
		benz(a)anthracene	56-55-3	E641A	0.373 mg/kg	0.5 mg/kg	99.3	50.0	140	----
		benzo(a)pyrene	50-32-8	E641A	0.380 mg/kg	0.5 mg/kg	101	50.0	140	----
		benzo(b+j)fluoranthene	n/a	E641A	0.359 mg/kg	0.5 mg/kg	95.7	50.0	140	----
		benzo(g,h,i)perylene	191-24-2	E641A	0.268 mg/kg	0.5 mg/kg	71.4	50.0	140	----
		benzo(k)fluoranthene	207-08-9	E641A	0.349 mg/kg	0.5 mg/kg	92.9	50.0	140	----
		chrysene	218-01-9	E641A	0.289 mg/kg	0.5 mg/kg	77.1	50.0	140	----
		dibenz(a,h)anthracene	53-70-3	E641A	0.320 mg/kg	0.5 mg/kg	85.3	50.0	140	----
		fluoranthene	206-44-0	E641A	0.258 mg/kg	0.5 mg/kg	68.8	50.0	140	----
		fluorene	86-73-7	E641A	0.349 mg/kg	0.5 mg/kg	93.0	50.0	140	----
		indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.314 mg/kg	0.5 mg/kg	83.6	50.0	140	----
		methylnaphthalene, 1-	90-12-0	E641A	0.334 mg/kg	0.5 mg/kg	88.9	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
Polycyclic Aromatic Hydrocarbons (QCLot: 793741) - continued										
WT2226280-001	BH1- S	methylnaphthalene, 2-	91-57-6	E641A	0.329 mg/kg	0.5 mg/kg	87.6	50.0	140	----
		naphthalene	91-20-3	E641A	0.336 mg/kg	0.5 mg/kg	89.6	50.0	140	----
		phenanthrene	85-01-8	E641A	0.285 mg/kg	0.5 mg/kg	75.8	50.0	140	----
		pyrene	129-00-0	E641A	0.279 mg/kg	0.5 mg/kg	74.3	50.0	140	----
Phthalate Esters (QCLot: 791260)										
WT2225399-004	Anonymous	bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	2.84 mg/kg	3.2 mg/kg	88.7	50.0	140	----
		diethyl phthalate	84-66-2	E655A	2.50 mg/kg	3.2 mg/kg	78.1	50.0	140	----
		dimethyl phthalate	131-11-3	E655A	2.60 mg/kg	3.2 mg/kg	81.0	50.0	140	----
Semi-Volatile Organics (QCLot: 791260)										
WT2225399-004	Anonymous	biphenyl	92-52-4	E655A	0.683 mg/kg	0.8 mg/kg	85.2	50.0	140	----
		bis(2-chloroethyl) ether	111-44-4	E655A	0.57 mg/kg	0.8 mg/kg	71.2	50.0	140	----
		bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.57 mg/kg	0.8 mg/kg	71.3	50.0	140	----
		chloroaniline, 4-	106-47-8	E655A	0.60 mg/kg	0.8 mg/kg	75.1	50.0	140	----
		dichlorobenzidine, 3,3'-	91-94-1	E655A	0.53 mg/kg	0.8 mg/kg	66.6	50.0	140	----
		dinitrotoluene, 2,4-	121-14-2	E655A	0.66 mg/kg	0.8 mg/kg	82.2	50.0	140	----
		dinitrotoluene, 2,6-	606-20-2	E655A	0.68 mg/kg	0.8 mg/kg	84.8	50.0	140	----
		trichlorobenzene, 1,2,4-	120-82-1	E655A	0.655 mg/kg	0.8 mg/kg	81.8	50.0	140	----
Chlorinated Phenolics (QCLot: 791260)										
WT2225399-004	Anonymous	chlorophenol, 2-	95-57-8	E655A	1.90 mg/kg	2.4 mg/kg	79.0	50.0	140	----
		dichlorophenol, 2,4-	120-83-2	E655A	2.07 mg/kg	2.4 mg/kg	86.2	50.0	140	----
		pentachlorophenol [PCP]	87-86-5	E655A	1.78 mg/kg	2.4 mg/kg	74.0	50.0	140	----
		trichlorophenol, 2,4,5-	95-95-4	E655A	2.10 mg/kg	2.4 mg/kg	87.6	50.0	140	----
		trichlorophenol, 2,4,6-	88-06-2	E655A	2.05 mg/kg	2.4 mg/kg	85.3	50.0	140	----
Non-Chlorinated Phenolics (QCLot: 791260)										
WT2225399-004	Anonymous	dimethylphenol, 2,4-	105-67-9	E655A	1.75 mg/kg	2.4 mg/kg	72.8	50.0	140	----
		dinitrophenol, 2,4-	51-28-5	E655A	1.2 mg/kg	2.4 mg/kg	50.2	50.0	140	----
		phenol	108-95-2	E655A	2.67 mg/kg	2.4 mg/kg	111	50.0	140	----
Polychlorinated Biphenyls (QCLot: 792431)										
WT2226280-001	BH1- S	Aroclor 1242	53469-21-9	E687	ND mg/kg	0.01 mg/kg	ND	50.0	150	----
		Aroclor 1254	11097-69-1	E687	ND mg/kg	0.01 mg/kg	ND	50.0	150	----
		Aroclor 1260	11096-82-5	E687	ND mg/kg	0.01 mg/kg	ND	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:

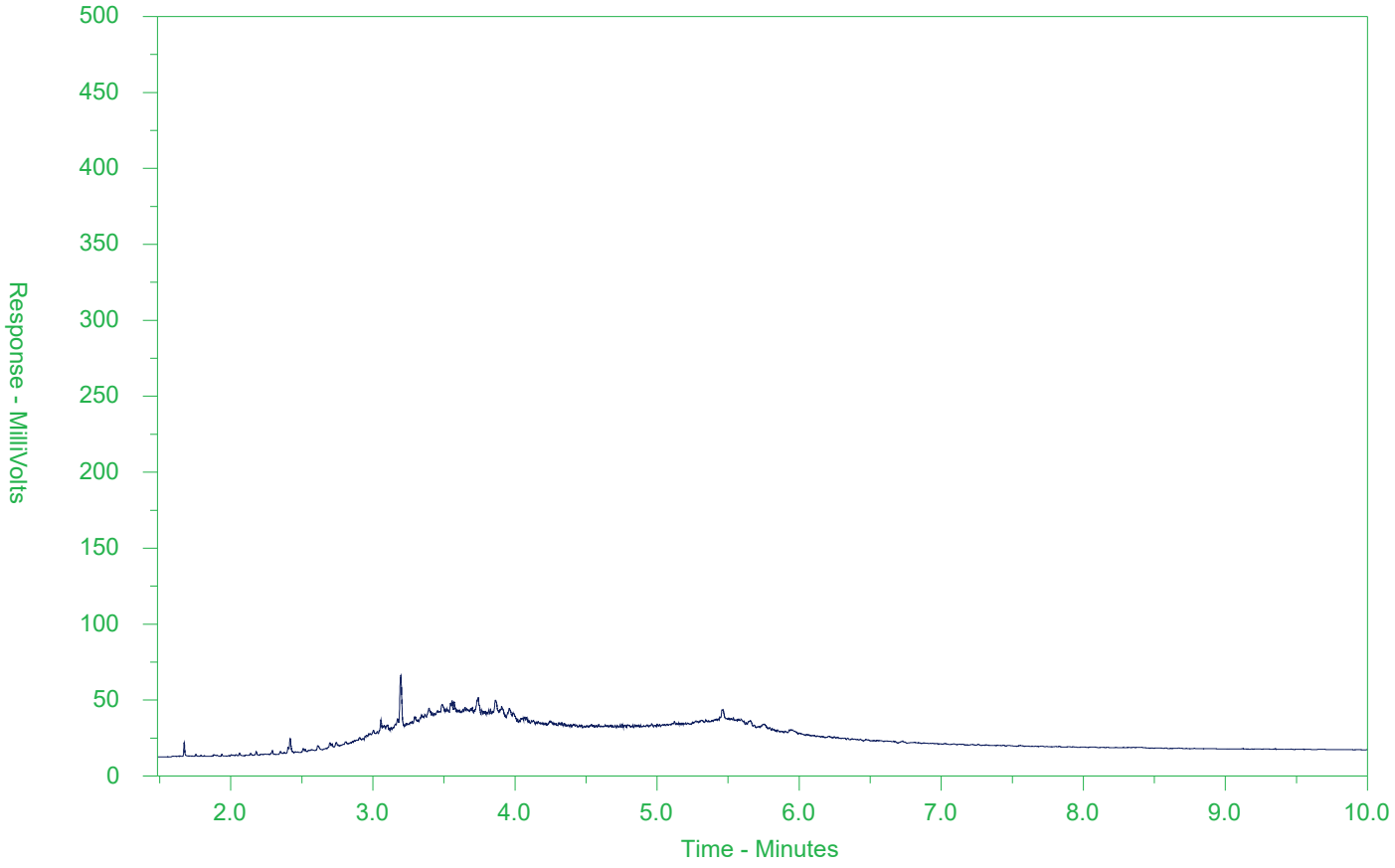
					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 791218)									
	RM	conductivity (1:2 leachate)	----	E100-L	1031.5 µS/cm	99.8	70.0	130	----
Metals (QCLot: 791214)									
	RM	antimony	7440-36-0	E440	3.99 mg/kg	92.7	70.0	130	----
	RM	arsenic	7440-38-2	E440	3.73 mg/kg	102	70.0	130	----
	RM	barium	7440-39-3	E440	105 mg/kg	103	70.0	130	----
	RM	beryllium	7440-41-7	E440	0.349 mg/kg	104	70.0	130	----
	RM	boron	7440-42-8	E440	8.5 mg/kg	114	40.0	160	----
	RM	cadmium	7440-43-9	E440	0.91 mg/kg	100	70.0	130	----
	RM	chromium	7440-47-3	E440	101 mg/kg	102	70.0	130	----
	RM	cobalt	7440-48-4	E440	6.9 mg/kg	95.8	70.0	130	----
	RM	copper	7440-50-8	E440	123 mg/kg	97.6	70.0	130	----
	RM	lead	7439-92-1	E440	267 mg/kg	99.3	70.0	130	----
	RM	molybdenum	7439-98-7	E440	1.03 mg/kg	104	70.0	130	----
	RM	nickel	7440-02-0	E440	26.7 mg/kg	95.4	70.0	130	----
	RM	silver	7440-22-4	E440	4.06 mg/kg	79.8	70.0	130	----
	RM	thallium	7440-28-0	E440	0.0786 mg/kg	102	40.0	160	----
	RM	uranium	7440-61-1	E440	0.52 mg/kg	92.6	70.0	130	----
	RM	vanadium	7440-62-2	E440	32.7 mg/kg	100	70.0	130	----
	RM	zinc	7440-66-6	E440	297 mg/kg	93.8	70.0	130	----
Metals (QCLot: 791215)									
	RM	mercury	7439-97-6	E510	0.0585 mg/kg	113	70.0	130	----
Metals (QCLot: 791217)									
	RM	calcium, soluble ion content	7440-70-2	E484	86.59 mg/L	110	70.0	130	----
	RM	magnesium, soluble ion content	7439-95-4	E484	25.74 mg/L	111	70.0	130	----
	RM	sodium, soluble ion content	17341-25-2	E484	30.05 mg/L	101	70.0	130	----
Metals (QCLot: 791219)									
	RM	boron, hot water soluble	7440-42-8	E487	1.4938 mg/kg	103	60.0	140	----
Speciated Metals (QCLot: 791441)									

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report: RM Target Concentration	Recovery (%): RM	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Speciated Metals (QCLot: 791441) - continued									
	RM	chromium, hexavalent [Cr VI]	18540-29-9	E532	172 mg/kg	96.2	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226280-001-E601.SG-L
Client Sample ID: BH1- S



←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.

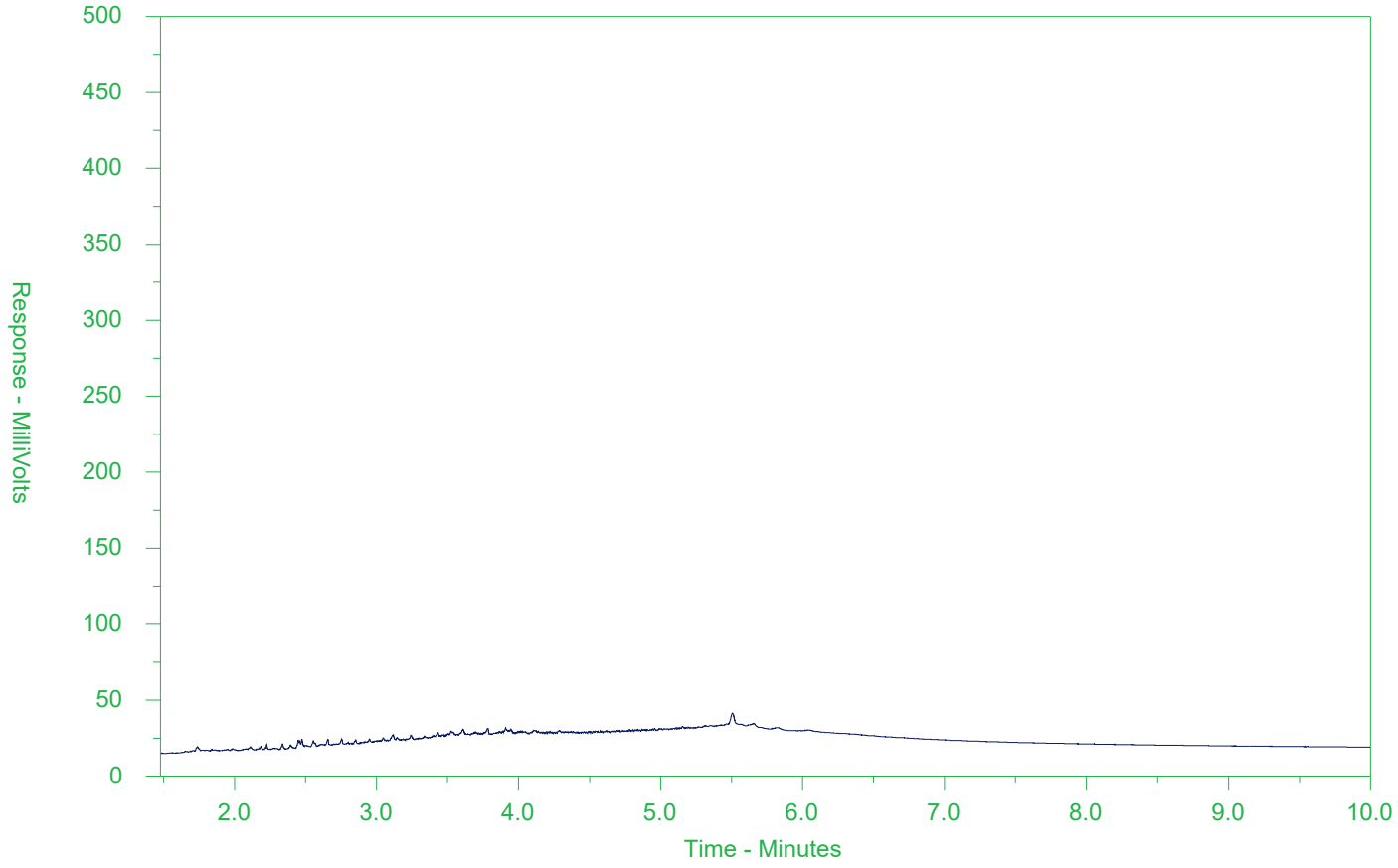
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226280-002-E601.SG-L
Client Sample ID: BH1- D



←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.

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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.

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CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2226808**	Page	: 1 of 13
Client	:	Laboratory	: Waterloo - Environmental
Contact	:	Account Manager	: Amanda Overholster
Address	:	Address	: X6 4 orthland 0 oadRwnit 1 WaterlooROntario Canada 4 2, 2VB
8eleThone	:	8eleThone	: 1 U1X B17 23UU
Propect	: 226672BAE	9 ate j amTles 0 eceived	: 2S-9 ec-2622 16:S6
PO	: ----	9 ate Analysis Commenced	: 2B-9 ec-2622
C-O-C number	: ----	Issue 9 ate	: 63-Jan-262S 1X:S2
j amTler	:		
j ite	:		
(uote number	2622 j OA		
4 o) of samTles received	: 12		
4 o) of samTles analysed	: 12		

8his reTort suTersedes any Trevious reTortxsGDith this reference) 0 esults aTTly to the samTlexsGas submitted) 8his document shall not be reTroducedRezceTt in full)

8his Certificate of Analysis contains the folloDing information:

- Qeneral Comments
- Analytical 0 esults
- Quideline ComTarison

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

8his document has been electronically signed by the authoriked signatories beloD) Electronic signing is conducted in accordance Dith wj K9 A 21 CK0 Part 11)

Signatories	*Position*	*Laboratory Department*
Amanda Qanouri-Lumsden	9 eTartment Manager - Microbiology and PreT	Centraliked PreTRWaterlooROntario
9 anielle Qravel	j uTervisor - j emi-, olatile Instrumentation	OrganicsRWaterlooROntario
Qreg PoHbcHy	j uTervisor - Inorganic	InorganicsRWaterlooROntario
Qreg PoHbcHy	j uTervisor - Inorganic	MetalsRWaterlooROntario
Jeremy Qingras	8eam Leader - j emi-, olatile Instrumentation	OrganicsRWaterlooROntario
Jocelyn / ennedy	9 eTartment Manager - j emi-, olatile Organics	OrganicsRWaterlooROntario
Jon Kisher	9 eTartment Manager - Inorganics	InorganicsRWaterlooROntario
Jon Kisher	9 eTartment Manager - Inorganics	MetalsRWaterlooROntario
j arah Virch	, OC j ection j uTervisor	OrganicsRWaterlooROntario

Summary of Guideline Breaches by Sample

j amTleI9 <Client I9	Matriz	Analyte	Analyte j ummary	Quideline	Category	0 esult	Limit
V. S-9	j oil<j olid	conductivity x1:2 leachateG		O4 U6X<26	8S)1-j -0 PI	6)7X3 mj <cm	6)7 mj <cm
	j oil<j olid	acenaThthylene		O4 U6X<26	8S)1-j -0 PI	6)1UU mg<Hg	6)63S mg<Hg
	j oil<j olid	anthracene		O4 U6X<26	8S)1-j -0 PI	6)U22 mg<Hg	6)1X mg<Hg
	j oil<j olid	benkxaGanthracene		O4 U6X<26	8S)1-j -0 PI	6)X6U mg<Hg	6)N mg<Hg
	j oil<j olid	fluoranthene		O4 U6X<26	8S)1-j -0 PI	1)S6 mg<Hg	6)X3 mg<Hg
V. S-j	j oil<j olid	conductivity x1:2 leachateG		O4 U6X<26	8S)1-j -0 PI	6)7B6 mj <cm	6)7 mj <cm
	j oil<j olid	sodium adsorTtion ratio "j A0 %		O4 U6X<26	8S)1-j -0 PI	X)1B -	N -
V. 7-9	j oil<j olid	sodium adsorTtion ratio "j A0 %		O4 U6X<26	8S)1-j -0 PI	N)1U -	N -

General Comments

8he analytical methods used by ALj are develoTed using internationally recogniked reference methods xDhere availableGR such as those Tublished by wj EPAR AP. A j tandard MethodsR Aj 8MF lj OR Environment CanadaR VC MOER and Ontario MOE) 0 efer to the ALj (uality Control InterTretive reTort x(CIG for aTTlicable references and methodology summaries) 0 eference methods may incorTorate modifications to imTrove Terformance)

Where a reTorted less than x>Gresult is higher than the LO0 Rthis may be due to Trimary samTle eztract<digestate dilution and<or insufficient samTle for analysis)
Where the LO0 of a reTorted result differs from standard LO0 Rthis may be due to high moisture contentRinsufficient samTle xreduced Deight emTloyedGor matriz interference)

Additional information Tertinent to this reTort Dill be found in the folloDing seTarate attachments: (uality Control 0 eTortR(A<(C ComTliance Assessment to assist Dith (uality 0 evieD and j amTle 0 eceiTt 4 otification)

When samTling time information is not Trovided by the clientRsamTling dates are shoDn Dithout a time comTonent) In these instancesRthe time comTonent has been assumed by the laboratory for Trocessing TurToses)

ATTlication of guidelines is Trovided qas isq Dithout Darranty of any HndR either ezTressed or imTliedR includingR but not limited to fitness for a Tarticular TurToseR or non -infringement) ALj assumes no resTonsibility for errors or omissions in the information) Quidelines are not adjusted for the hardnessR T. or temTerature of the samTle xthe most conservative values are usedG) Measurement uncertainty is not aTTlied to test results Trior to comTarison Dith sTecified criteria values)

/ ey : LO0 : Limit of 0 eTorting xdetection limitG)

Unit	*Description*
-	no units
Y	Tercent
mg<Hg	milligrams Ter Hlogram
mg<L	milligrams Ter litre
mj <cm	millisiemens Ter centimetre
T. units	T. units

[: greater than)
>: less than)
0 ed shading is aTTlied Dhere the result is greater than the Quideline wTTer Limit or the result is loDer than the Quideline LoDer Limit)
Kor drinHng Dater samTlesR0 ed shading is aTTlied Dhere the result for E)coliRfecal or total coliforms is greater than or e] ual to the Quideline wTTer Limit)

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
PRAR	PCB pattern most closely resembles Aroclor reported. Match is not exact.

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
			W8222X1S1	W8222X1S1-661	W8222X1S1-662	W8222X1S1-66S	W8222X1S1-66U	W8222X1S1-66N	W8222X1S1-66X	W8222X1S1-667
Physical Tests										
conductivity (8:2 leachate)	----	mj <cm		6)22U	6)2N7	6)7B6	6)7X3	6)163	6)U6S	6)21U
Moisture	----	Y		1X)1	1U)6	1S)S	1S)B	7)X3	26)2	1S)7
pH (8:2 soil:CaCl2 aq)	----	T. units		7)X3	7)76	7)72	7)UB	7)77	7)76	7)X3
Cyanides										
cyanide, weak acid dissociable	----	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
Fixed1Ratio Extractables										
calcium, soluble ion content	7UU6-76-2	mg<L		2U)2	2S)X	27)7	U1)N	1U)X	1S)3	S2)6
magnesium, soluble ion content	7US3-3N-U	mg<L		1)B2	U)6B	2)3N	U)32	6)XB	1)S7	2)67
sodium, soluble ion content	17SU1-2N-2	mg<L		2N)7	1X)6	12B	167	2)N3	XU)U	12)S
sodium adsorption ratio [SAR]	----	-		1)SX	6)B6	X)1B	U)1B	6)1B	U)U1	6)N7
Metals										
antimony	7UU6-SX-6	mg<+g		1)X3	>6)16	6)1S	6)1N	6)22	>6)16	6)17
arsenic	7UU6-SB-2	mg<+g		2)7N	1)BU	1)33	2)7S	2)1X	1)27	2)S2
barium	7UU6-S3-S	mg<+g		US)X	22)S	S2)6	NX)B	U7)S	1S)3	US)U
beryllium	7UU6-U1-7	mg<+g		6)S6	6)26	6)2U	6)U1	6)S2	6)11	6)SU
boron	7UU6-U2-B	mg<+g		N)N	>N)6	>N)6	X)U	X)S	>N)6	>N)6
boron, hot water soluble	7UU6-U2-B	mg<+g		6)N3	6)1X	6)23	6)2B	6)2X	>6)16	6)NU
cadmium	7UU6-US-3	mg<+g		6)17X	6)6N1	6)166	6)2S7	6)2XS	6)6N3	6)1X2
chromium	7UU6-U7-S	mg<+g		1S)7	11)6	3)3S	17)3	1X)X	N)X2	1U)6
cobalt	7UU6-UB-U	mg<+g		U)1N	S)2U	S)23	N)UB	U)SX	2)66	U)X1
copper	7UU6-N6-B	mg<+g		11)2	U)UB	X)3N	12)3	11)X	2)77	16)7
lead	7US3-32-1	mg<+g		U6)X	U)1B	1U)2	2U)S	1S)1	S)S6	3)62
mercury	7US3-37-X	mg<+g		6)6S3B	6)66NB	6)613N	6)626S	6)6131	>6)66N6	6)62B1
molybdenum	7US3-3B-7	mg<+g		6)SB	6)2B	6)2U	6)UX	6)UX	6)1S	6)27
nickel	7UU6-62-6	mg<+g		3)N1	X)33	7)US	1S)2	16)S	S)B6	16)U
selenium	77B2-U3-2	mg<+g		>6)26	>6)26	>6)26	>6)26	>6)26	>6)26	>6)26
silver	7UU6-22-U	mg<+g		>6)16	>6)16	>6)16	>6)16	6)12	>6)16	>6)16

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
				W8222X1S1-661	W8222X1S1-662	W8222X1S1-66S	W8222X1S1-66U	W8222X1S1-66N	W8222X1S1-66X	W8222X1S1-667
Metals										
thallium	7UU6-2B-6	mg+tg		6)677	>6)6N6	6)6X6	6)167	6)67B	>6)6N6	6)673
uranium	7UU6-X1-1	mg+tg		6)S7U	6)SXX	6)S67	6)N13	6)SB2	6)2US	6)SX3
vanadium	7UU6-X2-2	mg+tg		26)X	13)X	1N)X	2X)X	21)X	11)1	22)1
zinc	7UU6-XX-X	mg+tg		S7)B	1X)2	2N)S	NU)6	S6)B	1N)3	S2)1
Speciated Metals										
chromium, hexavalent [Cr VI]	1BNU6-23-3	mg+tg		>6)16	>6)16	>6)16	>6)16	>6)16	>6)16	>6)16
Volatile Organic Compounds										
Acetone	X7-XU-1	mg+tg		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6
benzene	71-US-2	mg+tg		>6)66N6	>6)66N6	>6)66N6	>6)66N6	>6)66N6	>6)66N6	>6)66N6
bromodichloromethane	7N-27-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
bromoform	7N-2N-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
bromomethane	7U-BS-3	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
carbon tetrachloride	NX-2S-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
chlorobenzene	16B-36-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
chloroform	X7-XX-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dibromochloromethane	12U-UB-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dibromoethane, 8,21	16X-3S-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichlorobenzene, 8,21	3N-N6-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichlorobenzene, 8,01	NU1-7S-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichlorobenzene, 8,-1	16X-UX-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichlorodifluoromethane	7N-71-B	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloroethane, 8,81	7N-SU-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloroethane, 8,21	167-6X-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloroethylene, 8,81	7N-SN-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloroethylene, cis-1,2-	1NX-N3-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloroethylene, trans-1,2-	1NX-X6-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloromethane	7N-63-2	mg+tg		>6)6UN	>6)6UN	>6)6UN	>6)6UN	>6)6UN	>6)6UN	>6)6UN
dichloropropane, 8,21	7B-B7-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
dichloropropylene, cis-3-trans-1,3-	NU2-7N-X	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
			W8222X1S1-	661	662	66S	66U	66N	66X	667
Volatile Organic Compounds										
dichloropropylene, cis18,01	166X1-61-N	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6
dichloropropylene, trans18,01	166X1-62-X	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6
ethylbenzene	166-U1-U	mg+tg		>6)61N	>6)61N	>6)61N	>6)61N	>6)61N	>6)61N	>6)61N
hexane, n1	116-NU-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
methyl ethyl ketone [MEK]	7B-3S-S	mg+tg		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6
methyl isobutyl ketone [MIBK]	16B-16-1	mg+tg		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	>6)N6
methyl1tert1butyl ether [MTBE]	1XSU-6U-U	mg+tg		>6)6U6	>6)6U6	>6)6U6	>6)6U6	>6)6U6	>6)6U6	>6)6U6
styrene	166-U2-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
tetrachloroethane, 8,8,8,21	XS6-26-X	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
tetrachloroethane, 8,8,2,21	73-SU-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
tetrachloroethylene	127-1B-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
toluene	16B-BB-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
trichloroethane, 8,8,81	71-NN-X	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
trichloroethane, 8,8,21	73-66-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
trichloroethylene	73-61-X	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
trichlorofluoromethane	7N-X3-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
vinyl chloride	7N-61-U	mg+tg		>6)626	>6)626	>6)626	>6)626	>6)626	>6)626	>6)626
xylene, m3p1	173X61-2S-1	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6
xylene, o1	3N-U7-X	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6
xylenes, total	1SS6-26-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6
BTE4, total	----	mg+tg		>6)16	>6)16	>6)16	>6)16	>6)16	>6)16	>6)16
Hydrocarbons										
F8 (C61C8+)	----	mg+tg		>N)6	>N)6	>N)6	>N)6	>N)6	>N)6	>N)6
F2 (C8+1C86)	----	mg+tg		>16	>16	>16	>16	>16	>16	>16
F21naphthalene	----	mg+tg		>2N	>2N	>2N	>2N	>2N	>2N	>2N
F0 (C861C0-)	----	mg+tg		>N6	>N6	>N6	NS	>N6	>N6	>N6
F01PAH	n<a	mg+tg		>N6	>N6	>N6	>N6	>N6	>N6	>N6
F- (C0-1CX+)	----	mg+tg		>N6	>N6	>N6	16U	>N6	>N6	>N6
F-G1sg	----	mg+tg		----	----	>2N6	726	----	----	>2N6

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
			W8222X1S1	W8222X1S1-661	W8222X1S1-662	W8222X1S1-66S	W8222X1S1-66U	W8222X1S1-66N	W8222X1S1-66X	W8222X1S1-667
Hydrocarbons										
F81BTE4	----	mg<+g		>N)6	>N)6	>N)6	>N)6	>N)6	>N)6	>N)6
hydrocarbons, total (C61CX+)	----	mg<+g		>B6	>B6	>B6	1N7	>B6	>B6	>B6
chromatogram to baseline at nCX+	n<a	-		FEj	FEj	FEj	4 O	FEj	FEj	FEj
Hydrocarbons Surrogates										
bromobenzotrifluoride, 21(F21F- surr)	S32-BS-X	Y		B7)6	B7)U	B3)2	B7)X	31)1	B7)S	BX)B
dichlorotoluene, 0,-1	3N-7N-6	Y		32)U	B3)X	BN)2	BB)7	36)X	B3)X	BX)B
Volatile Organic Compounds Surrogates										
bromofluorobenzene, -1	UX6-66-U	Y		11S	11X	163	121	113	11S	117
difluorobenzene, 8,-1	NU6-SX-S	Y		33)N	33)B	3S)N	16U	166	3U)B	3B)X
Polycyclic Aromatic Hydrocarbons										
acenaphthene	BS-S2-3	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)6B3	>6)6N6	>6)6N6	>6)6N6
acenaphthylene	26B-3X-B	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)1UU	>6)6N6	>6)6N6	>6)6N6
anthracene	126-12-7	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)U22	>6)6N6	>6)6N6	>6)6N6
benz(a)anthracene	NX-NN-S	mg<+g		>6)6N6	>6)6N6	6)161	6)X6U	>6)6N6	>6)6N6	>6)6N6
benzo(a)pyrene	N6-S2-B	mg<+g		>6)6N6	>6)6N6	6)11N	6)N23	>6)6N6	>6)6N6	>6)6N6
benzo(b3)fluoranthene	n<a	mg<+g		6)6NB	>6)6N6	6)1SN	6)XS3	>6)6N6	>6)6N6	6)6N3
benzo(g,h,i)perylene	131-2U-2	mg<+g		>6)6N6	>6)6N6	6)6NN	6)2U2	>6)6N6	>6)6N6	>6)6N6
benzo(k)fluoranthene	267-6B-3	mg<+g		>6)6N6	>6)6N6	6)6X6	6)2B7	>6)6N6	>6)6N6	>6)6N6
chrysene	21B-61-3	mg<+g		>6)6N6	>6)6N6	6)16X	6)N32	>6)6N6	>6)6N6	>6)6N6
dibenz(a,h)anthracene	NS-76-S	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)63B	>6)6N6	>6)6N6	>6)6N6
fluoranthene	26X-UU-6	mg<+g		6)67X	>6)6N6	6)2US	1)S6	>6)6N6	>6)6N6	6)6XN
fluorene	BX-7S-7	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)23N	>6)6N6	>6)6N6	>6)6N6
indeno(8,2,01c,d)pyrene	13S-S3-N	mg<+g		>6)6N6	>6)6N6	6)6XU	6)237	>6)6N6	>6)6N6	>6)6N6
methylnaphthalene, 81	36-12-6	mg<+g		>6)6S6	>6)6S6	6)6S3	6)1U6	>6)6S6	>6)6S6	>6)6S6
methylnaphthalene, 8321	----	mg<+g		>6)6N6	>6)6N6	>6)6N6	6)2XS	>6)6N6	>6)6N6	>6)6N6
methylnaphthalene, 21	31-N7-X	mg<+g		>6)6S6	>6)6S6	>6)6S6	6)12S	>6)6S6	>6)6S6	>6)6S6
naphthalene	31-26-S	mg<+g		>6)616	>6)616	6)6S1	6)16N	>6)616	>6)616	>6)616
phenanthrene	BN-61-B	mg<+g		>6)6N6	>6)6N6	6)1XU	1)U6	>6)6N6	>6)6N6	>6)6N6
pyrene	123-66-6	mg<+g		6)6XN	>6)6N6	6)26U	1)17	>6)6N6	>6)6N6	6)6NS

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
				W8222X1S1-661	W8222X1S1-662	W8222X1S1-66S	W8222X1S1-66U	W8222X1S1-66N	W8222X1S1-66X	W8222X1S1-667
Polycyclic Aromatic Hydrocarbons Surrogates										
acridine1dj	SU7U3-7N-2	Y		BU)1	3S)2	73)7	BN)S	BU)2	3U)B	36)2
chrysene1d82	1713-6S-N	Y		77)3	3X)2	X3)3	B2)1	7U)X	BX)X	7X)6
naphthalene1d9	11UX-XN-2	Y		B1)U	BU)U	7U)2	73)6	7N)3	BS)B	B2)1
phenanthrene1d8+	1N17-22-2	Y		BX)X	3N)7	B1)1	B7)X	BS)2	3S)S	31)6
Phthalate Esters										
bis(21ethylhexyl) phthalate [DEHP]	117-B1-7	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
diethyl phthalate	BU-XX-2	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
dimethyl phthalate	1S1-11-S	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
Semi1Volatile Organics										
biphenyl	32-N2-U	mg+tg		----	>6)6N6	----	6)276 9LM	----	>6)6N6	----
bis(21chloroethyl) ether	111-UU-U	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
bis(21chloroisopropyl) ether	S3XSB-S2-3	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
chloroaniline, -1	16X-U7-B	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
dichlorobenzidine, 0,0'1	31-3U-1	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
dinitrotoluene, 2,-1	121-1U-2	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
dinitrotoluene, 2,-3 2,61	n<a	mg+tg		----	>6)26	----	>6)2B	----	>6)26	----
dinitrotoluene, 2,61	X6X-26-2	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
trichlorobenzene, 8,2,-1	126-B2-1	mg+tg		----	>6)6N6	----	>6)166 9LM	----	>6)6N6	----
Semi1Volatile Organics Surrogates										
fluorobiphenyl, 21	S21-X6-B	Y		----	B6)U	----	B6)2	----	7B)U	----
nitrobenzene1dX	U1XN-X6-6	Y		----	73)2	----	7B)X	----	B7)6	----
terphenyl1d8-, p1	171B-N1-6	Y		----	B3)7	----	7B)2	----	BS)7	----
Chlorinated Phenolics										
chlorophenol, 21	3N-N7-B	mg+tg		----	>6)16	----	>6)16	----	>6)16	----
dichlorophenol, 2,-1	126-BS-2	mg+tg		----	>6)16	----	>6)16	----	>6)16	----
pentachlorophenol [PCP]	B7-BX-N	mg+tg		----	>6)16	----	>6)16	----	>6)16	----
trichlorophenol, 2,-,X1	3N-3N-U	mg+tg		----	>6)16	----	>6)16	----	>6)16	----
trichlorophenol, 2,-,61	BB-6X-2	mg+tg		----	>6)16	----	>6)16	----	>6)16	----

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH21S	BH21D	BH01S	BH01D	BH-1S	BH-1D	BH61S
			Sampling date/time	22-9 ec-2622 12:UN	22-9 ec-2622 1U:S6	21-9 ec-2622 11:66	21-9 ec-2622 11:S6	22-9 ec-2622 1N:UN	22-9 ec-2622 17:66	22-9 ec-2622 63:S6
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	j oil	j oil
				W8222X1S1-661	W8222X1S1-662	W8222X1S1-66S	W8222X1S1-66U	W8222X1S1-66N	W8222X1S1-66X	W8222X1S1-667
Non1Chlorinated Phenolics										
dimethylphenol, 2,-1	16N-X7-3	mg+tg		----	>6)16	----	>6)16	----	>6)16	----
dinitrophenol, 2,-1	N1-2B-N	mg+tg		----	>1)6	----	>1)6	----	>1)6	----
phenol	16B-3N-2	mg+tg		----	>6)16	----	>6)26 9LM	----	>6)16	----
Phenolics Surrogates										
tribromophenol, 2,-,61	11B-73-X	Y		----	NX)1	----	XU)6	----	76)U	----
Polychlorinated Biphenyls										
Aroclor 8+86	12X7U-11-2	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 8228	1116U-2B-2	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 8202	111U1-1X-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 82-2	NSUX3-21-3	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 82-9	12X72-23-X	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 82X-	11637-X3-1	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 826+	1163X-B2-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 8262	S7S2U-2S-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
Aroclor 8269	11166-1U-U	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	>6)616	>6)616
polychlorinated biphenyls [PCBs], total	----	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6
Polychlorinated Biphenyls Surrogates										
decachlorobiphenyl	26N1-2U-S	Y		16B	3B)N	31)U	161	3N)U	161	3X)X
tetrachloro1m1xylene	B77-63-B	Y		36)B	BN)7	B6)2	B2)U	B6)2	B3)X	B2)7

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Physical Tests										
conductivity (8:2 leachate)	----	mj <cm		6)S6B	6)261	6)SSB	6)266	6)S1N	----	----
Moisture	----	Y		13)X	11)1	1N)U	3)X3	17)U	----	----
pH (8:2 soil:CaCl21aq)	----	T. units		7)N1	7)X3	7)N6	7)7X	7)N7	----	----
Cyanides										
cyanide, weak acid dissociable	----	mg<tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
Fixed1Ratio Extractables										
calcium, soluble ion content	7UU6-76-2	mg<L		2B)1	2B)S	12)X	2X)7	27)7	----	----
magnesium, soluble ion content	7US3-3N-U	mg<L		N)B2	2)6S	1)1N	2)X1	N)BX	----	----
sodium, soluble ion content	17SU1-2N-2	mg<L		1X)N	2)XN	71)1	12)1	17)U	----	----
sodium adsorption ratio [SAR]	----	-		6)7U	6)1S	N)1U	6)X6	6)7B	----	----
Metals										
antimony	7UU6-SX-6	mg<tg		>6)16	6)S2	6)12	6)11	>6)16	----	----
arsenic	7UU6-SB-2	mg<tg		S)6S	1)N6	2)72	2)6X	S)6N	----	----
barium	7UU6-S3-S	mg<tg		BX)3	27)B	X7)6	SN)B	XN)U	----	----
beryllium	7UU6-U1-7	mg<tg		6)NX	6)1B	6)UB	6)2X	6)S3	----	----
boron	7UU6-U2-B	mg<tg		16)2	>N)6	X)B	>N)6	7)2	----	----
boron, hot water soluble	7UU6-U2-B	mg<tg		6)2X	6)71	6)2X	6)S6	6)2B	----	----
cadmium	7UU6-US-3	mg<tg		6)6N3	6)211	6)1S2	6)166	6)6N7	----	----
chromium	7UU6-U7-S	mg<tg		23)2	11)1	26)7	11)3	22)S	----	----
cobalt	7UU6-UB-U	mg<tg		B)N7	2)N2	X)UU	S)3U	X)X6	----	----
copper	7UU6-N6-B	mg<tg		1U)B	1U)2	1S)X	B)6N	11)6	----	----
lead	7US3-32-1	mg<tg		7)63	1U)6	12)2	12)S	N)XU	----	----
mercury	7US3-37-X	mg<tg		6)616S	6)632N	6)6132	6)6172	6)663U	----	----
molybdenum	7US3-3B-7	mg<tg		6)23	6)SB	6)U2	6)2X	6)27	----	----
nickel	7UU6-62-6	mg<tg		21)2	B)67	1U)B	B)NU	1N)B	----	----
selenium	77B2-U3-2	mg<tg		>6)26	>6)26	>6)26	>6)26	>6)26	----	----
silver	7UU6-22-U	mg<tg		>6)16	>6)16	>6)16	>6)16	>6)16	----	----
thallium	7UU6-2B-6	mg<tg		6)63X	>6)6N6	6)12S	6)6XU	6)67U	----	----
uranium	7UU6-X1-1	mg<tg		6)X61	6)2S2	6)U7B	6)SS7	6)U3B	----	----

Analytical Results Evaluation

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Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Metals										
vanadium	7UU6-X2-2	mg+tg		S2)6	12)S	SS)1	26)S	2N)N	----	----
zinc	7UU6-XX-X	mg+tg		U6)X	SS)2	US)2	23)U	S6)7	----	----
Speciated Metals										
chromium, hexavalent [Cr VI]	1BNU6-23-3	mg+tg		>6)16	6)16	>6)16	6)12	>6)16	----	----
Volatile Organic Compounds										
Acetone	X7-XU-1	mg+tg		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	----	----
benzene	71-US-2	mg+tg		>6)66N6	>6)66N6	>6)66N6	>6)66N6	>6)66N6	----	----
bromodichloromethane	7N-27-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
bromoform	7N-2N-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
bromomethane	7U-BS-3	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
carbon tetrachloride	NX-2S-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
chlorobenzene	16B-36-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
chloroform	X7-XX-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dibromochloromethane	12U-UB-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dibromoethane, 8,21	16X-3S-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichlorobenzene, 8,21	3N-N6-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichlorobenzene, 8,01	NU1-7S-1	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichlorobenzene, 8,- 1	16X-UX-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichlorodifluoromethane	7N-71-B	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloroethane, 8,81	7N-SU-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloroethane, 8,21	167-6X-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloroethylene, 8,81	7N-SN-U	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloroethylene, cis18,21	1NX-N3-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloroethylene, trans18,21	1NX-X6-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloromethane	7N-63-2	mg+tg		>6)6UN	>6)6UN	>6)6UN	>6)6UN	>6)6UN	----	----
dichloropropane, 8,21	7B-B7-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloropropylene, cis3trans18,01	NU2-7N-X	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
dichloropropylene, cis18,01	166X1-61-N	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	----	----
dichloropropylene, trans18,01	166X1-62-X	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	----	----

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Volatile Organic Compounds										
ethylbenzene	166-U1-U	mg<+g		>6)61N	>6)61N	>6)61N	>6)61N	>6)61N	----	----
hexane, n1	116-NU-S	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
methyl ethyl ketone [MEK]	7B-3S-S	mg<+g		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	----	----
methyl isobutyl ketone [MIBK]	16B-16-1	mg<+g		>6)N6	>6)N6	>6)N6	>6)N6	>6)N6	----	----
methyl1tert1butyl ether [MTBE]	1XSU-6U-U	mg<+g		>6)6U6	>6)6U6	>6)6U6	>6)6U6	>6)6U6	----	----
styrene	166-U2-N	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
tetrachloroethane, 8,8,8,21	XS6-26-X	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
tetrachloroethane, 8,8,2,21	73-SU-N	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
tetrachloroethylene	127-1B-U	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
toluene	16B-BB-S	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
trichloroethane, 8,8,81	71-NN-X	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
trichloroethane, 8,8,21	73-66-N	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
trichloroethylene	73-61-X	mg<+g		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
trichlorofluoromethane	7N-X3-U	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
vinyl chloride	7N-61-U	mg<+g		>6)626	>6)626	>6)626	>6)626	>6)626	----	----
xylene, m3p1	173X61-2S-1	mg<+g		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	----	----
xylene, o1	3N-U7-X	mg<+g		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	----	----
xylenes, total	1SS6-26-7	mg<+g		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
BTE4, total	----	mg<+g		>6)16	>6)16	>6)16	>6)16	>6)16	----	----
Hydrocarbons										
F8 (C61C8+)	----	mg<+g		>N)6	>N)6	>N)6	>N)6	>N)6	----	----
F2 (C8+1C86)	----	mg<+g		>16	>16	>16	>16	>16	----	----
F21naphthalene	----	mg<+g		>2N	>2N	>2N	>2N	>2N	----	----
F0 (C861C0-)	----	mg<+g		>N6	>N6	>N6	>N6	>N6	----	----
F01PAH	n<a	mg<+g		>N6	>N6	>N6	>N6	>N6	----	----
F- (C0- 1CX+)	----	mg<+g		>N6	>N6	>N6	113	>N6	----	----
F- G1sg	----	mg<+g		----	----	----	X76	----	----	----
F81BTE4	----	mg<+g		>N)6	>N)6	>N)6	>N)6	>N)6	----	----
hydrocarbons, total (C61CX+)	----	mg<+g		>B6	>B6	>B6	113	>B6	----	----

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Hydrocarbons										
chromatogram to baseline at nCX+	n<a	-		FEj	FEj	FEj	4 O	FEj	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 21(F21F- surr)	S32-BS-X	Y		BX)U	31)2	BB)7	B3)U	BX)U	----	----
dichlorotoluene, 0,- 1	3N-7N-6	Y		BN)N	32)1	B1)2	B7)U	BX)S	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, - 1	UX6-66-U	Y		116	11U	16U	112	163	----	----
difluorobenzene, 8,- 1	NU6-SX-S	Y		31)B	3U)B	BX)6	32)N	B3)X	----	----
Polycyclic Aromatic Hydrocarbons										
acenaphthene	BS-S2-3	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
acenaphthylene	26B-3X-B	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
anthracene	126-12-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
benz(a)anthracene	NX-NN-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)1NB	>6)6N6	----	----
benzo(a)pyrene	N6-S2-B	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)1B2	>6)6N6	----	----
benzo(b35)fluoranthene	n<a	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)2N6	>6)6N6	----	----
benzo(g,h,i)perylene	131-2U-2	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)1S3	>6)6N6	----	----
benzo(k)fluoranthene	267-6B-3	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)16N	>6)6N6	----	----
chrysene	21B-61-3	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)173	>6)6N6	----	----
dibenz(a,h)anthracene	NS-76-S	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
fluoranthene	26X-UU-6	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)S2B	>6)6N6	----	----
fluorene	BX-7S-7	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
indeno(8,2,01c,d)pyrene	13S-S3-N	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)1SB	>6)6N6	----	----
methylnaphthalene, 81	36-12-6	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S2 9LM	>6)6S6	----	----
methylnaphthalene, 8321	----	mg+tg		>6)6N6	>6)6N6	>6)6N6	>6)6N6	>6)6N6	----	----
methylnaphthalene, 21	31-N7-X	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S2 9LM	>6)6S6	----	----
naphthalene	31-26-S	mg+tg		>6)616	>6)616	>6)616	>6)6S2 9LM	>6)616	----	----
phenanthrene	BN-61-B	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)1SU	>6)6N6	----	----
pyrene	123-66-6	mg+tg		>6)6N6	>6)6N6	>6)6N6	6)2BN	>6)6N6	----	----
Polycyclic Aromatic Hydrocarbons Surrogates										
acridine1dj	SU7U3-7N-2	Y		B7)S	36)7	BS)U	B1)2	BU)B	----	----

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Polycyclic Aromatic Hydrocarbons Surrogates										
chrysene1d82	1713-6S-N	Y		7B)2	B2)2	B1)7	B2)X	BS)N	----	----
naphthalene1d9	11UX-XN-2	Y		7X)3	B2)S	77)N	B6)6	7B)U	----	----
phenanthrene1d8+	1N17-22-2	Y		BN)B	B3)3	BU)S	BU)U	BN)2	----	----
Phthalate Esters										
bis(21ethylhexyl) phthalate [DEHP]	117-B1-7	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
diethyl phthalate	BU-XX-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dimethyl phthalate	1S1-11-S	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
Semi1Volatile Organics										
biphenyl	32-N2-U	mg+tg		>6)6N6	----	>6)6N6	----	>6)6N6	----	----
bis(21chloroethyl) ether	111-UU-U	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
bis(21chloroisopropyl) ether	S3XSB-S2-3	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
chloroaniline, -1	16X-U7-B	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dichlorobenzidine, 0,0'1	31-3U-1	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dinitrotoluene, 2,-1	121-1U-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dinitrotoluene, 2,- 3 2,61	n<a	mg+tg		>6)26	----	>6)26	----	>6)26	----	----
dinitrotoluene, 2,61	X6X-26-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
trichlorobenzene, 8,2,-1	126-B2-1	mg+tg		>6)6N6	----	>6)6N6	----	>6)6N6	----	----
Semi1Volatile Organics Surrogates										
fluorobiphenyl, 21	S21-X6-B	Y		BS)3	----	7N)1	----	BN)6	----	----
nitrobenzene1dX	U1XN-X6-6	Y		BB)1	----	77)1	----	B3)6	----	----
terphenyl1d8-, p1	171B-N1-6	Y		B7)X	----	73)N	----	BX)B	----	----
Chlorinated Phenolics										
chlorophenol, 21	3N-N7-B	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dichlorophenol, 2,-1	126-BS-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
pentachlorophenol [PCP]	B7-BX-N	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
trichlorophenol, 2,-,X1	3N-3N-U	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
trichlorophenol, 2,-,61	BB-6X-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
Non1Chlorinated Phenolics										

Analytical Results Evaluation

Matriz: **Soil**

Analyte	CAS Number	Unit	Client sample ID	BH61D	BH/ 1S	BH/ 1D	DUP1S	DUP1D	1111	1111
			Sampling date/time	22-9 ec-2622 11:U6	21-9 ec-2622 12:66	21-9 ec-2622 12:S6	22-9 ec-2622	21-9 ec-2622 1U:26	----	----
			Sub-Matrix	j oil	j oil	j oil	j oil	j oil	----	----
				W8222X1S1-66B	W8222X1S1-663	W8222X1S1-616	W8222X1S1-611	W8222X1S1-612	--------	--------
Non1Chlorinated Phenolics										
dimethylphenol, 2,- 1	16N-X7-3	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
dinitrophenol, 2,- 1	N1-2B-N	mg+tg		>1)6	----	>1)6	----	>1)6	----	----
phenol	16B-3N-2	mg+tg		>6)16	----	>6)16	----	>6)16	----	----
Phenolics Surrogates										
tribromophenol, 2,- ,61	11B-73-X	Y		7S)X	----	XU)B	----	7N)6	----	----
Polychlorinated Biphenyls										
Aroclor 8+86	12X7U-11-2	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 8228	1116U-2B-2	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 8202	111U1-1X-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 82- 2	NSUX3-21-3	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 82- 9	12X72-23-X	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 82X-	11637-X3-1	mg+tg		>6)616	6)612 P0 A0	>6)616	>6)616	>6)616	----	----
Aroclor 826+	1163X-B2-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 8262	S7S2U-2S-N	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
Aroclor 8269	11166-1U-U	mg+tg		>6)616	>6)616	>6)616	>6)616	>6)616	----	----
polychlorinated biphenyls [PCBs], total	----	mg+tg		>6)6S6	>6)6S6	>6)6S6	>6)6S6	>6)6S6	----	----
Polychlorinated Biphenyls Surrogates										
decachlorobiphenyl	26N1-2U-S	Y		162	33)X	162	162	162	----	----
tetrachloro1m1xylene	B77-63-B	Y		BU)2	B1)6	BU)X	B6)X	BU)U	----	----

Please refer to the Qeneral Comments section for an ezTlanation of any] ualifiers detected)

Summary of Guideline Limits

Analyte	CAS Number	Unit	ON- +672+ T0.81S1RPI
Physical Tests			
conductivity x1:2 leachateG	----	mj <cm	+./ mS7cm
Moisture	----	Y	
T. x1:2 soil:CaCl2-a] G	----	T. units	
Cyanides			
cyanideRDeaHacid dissociable	----	mg<+g	+.+X8 mg7kg
Fixed1Ratio Extractables			
calciumRsoluble ion content	7UU6-76-2	mg<L	
magnesiumRsoluble ion content	7US3-3N-U	mg<L	
sodium adsorTtion ratio "j A0 %	----	-	X1
sodiumRsoluble ion content	17SU1-2N-2	mg<L	
Metals			
antimony	7UU6-SX-6	mg<+g	/ .X mg7kg
arsenic	7UU6-SB-2	mg<+g	89 mg7kg
barium	7UU6-S3-S	mg<+g	0j + mg7kg
beryllium	7UU6-U1-7	mg<+g	- mg7kg
boronRhot Dater soluble	7UU6-U2-B	mg<+g	8.X mg7kg
boron	7UU6-U2-B	mg<+g	82+ mg7kg
cadmium	7UU6-US-3	mg<+g	8.2 mg7kg
chromium	7UU6-U7-S	mg<+g	86+ mg7kg
cobalt	7UU6-UB-U	mg<+g	22 mg7kg
coTTer	7UU6-N6-B	mg<+g	8- + mg7kg
lead	7US3-32-1	mg<+g	82+ mg7kg
mercury	7US3-37-X	mg<+g	+.2/ mg7kg
molybdenum	7US3-3B-7	mg<+g	6.j mg7kg
nicHel	7UU6-62-6	mg<+g	8++ mg7kg
selenium	77B2-U3-2	mg<+g	2.- mg7kg
silver	7UU6-22-U	mg<+g	2+ mg7kg
thallium	7UU6-2B-6	mg<+g	8 mg7kg
uranium	7UU6-X1-1	mg<+g	20 mg7kg
vanadium	7UU6-X2-2	mg<+g	96 mg7kg
kinc	7UU6-XX-X	mg<+g	0- + mg7kg
Speciated Metals			
chromiumRhezavalent "Cr , I%	1BNU6-23-3	mg<+g	9 mg7kg
Volatile Organic Compounds			
Acetone	X7-XU-1	mg<+g	8.9 mg7kg
benkene	71-US-2	mg<+g	+.+2 mg7kg
bromodichloromethane	7N-27-U	mg<+g	X.9 mg7kg

Analyte	CAS Number	Unit	ON- +672+ T0.81S1RPI
Volatile Organic Compounds 1Continued			
bromoform	7N-2N-2	mg+tg	**2.X mg7kg**
bromomethane	7U-BS-3	mg+tg	**+.+X mg7kg**
V8E5Rtotal	----	mg+tg	
carbon tetrachloride	NX-2S-N	mg+tg	**+.+X mg7kg**
chlorobenkene	16B-36-7	mg+tg	**+.29 mg7kg**
chloroform	X7-XX-S	mg+tg	**+.+9 mg7kg**
dibromochloromethane	12U-UB-1	mg+tg	**X.X mg7kg**
dibromoethaneR1R2-	16X-3S-U	mg+tg	**+.+X mg7kg**
dichlorobenkeneR1R2-	3N-N6-1	mg+tg	**0.- mg7kg**
dichlorobenkeneR1RS-	NU1-7S-1	mg+tg	**- .9 mg7kg**
dichlorobenkeneR1RU-	16X-UX-7	mg+tg	**+.+X mg7kg**
dichlorodifluoromethane	7N-71-B	mg+tg	**8.9 mg7kg**
dichloroethaneR1R1-	7N-SU-S	mg+tg	**+.8- mg7kg**
dichloroethaneR1R2-	167-6X-2	mg+tg	**+.+X mg7kg**
dichloroethyleneR1R1-	7N-SN-U	mg+tg	**+.+X mg7kg**
dichloroethyleneRcis-1R2-	1NX-N3-2	mg+tg	**+.+X mg7kg**
dichloroethyleneRtrans-1R2-	1NX-X6-N	mg+tg	**+.+X mg7kg**
dichloromethane	7N-63-2	mg+tg	**+.+6 mg7kg**
dichloroTroTaneR1R2-	7B-B7-N	mg+tg	**+.+X mg7kg**
dichloroTroTyleneRcis+trans-1RS-	NU2-7N-X	mg+tg	**+.+X mg7kg**
dichloroTroTyleneRcis-1RS-	166X1-61-N	mg+tg	
dichloroTroTyleneRtrans-1RS-	166X1-62-X	mg+tg	
ethylbenkene	166-U1-U	mg+tg	**8.j mg7kg**
hezaneRn-	116-NU-S	mg+tg	**2.X mg7kg**
methyl ethyl Hetone "ME/ %	7B-3S-S	mg+tg	**8- mg7kg**
methyl isobutyl Hetone "MIV/ %	16B-16-1	mg+tg	**+.9j mg7kg**
methyl-tert-butyl ether "M8VE%	1XSU-6U-U	mg+tg	**+.+X mg7kg**
styrene	166-U2-N	mg+tg	**+.X mg7kg**
tetrachloroethaneR1R1R2-	XS6-26-X	mg+tg	**+.+X mg7kg**
tetrachloroethaneR1R2R2-	73-SU-N	mg+tg	**+.+X mg7kg**
tetrachloroethylene	127-1B-U	mg+tg	**+.+X mg7kg**
toluene	16B-BB-S	mg+tg	**+.j j mg7kg**
trichloroethaneR1R1R1-	71-NN-X	mg+tg	**+.88 mg7kg**
trichloroethaneR1R1R2-	73-66-N	mg+tg	**+.+X mg7kg**
trichloroethylene	73-61-X	mg+tg	**+.+X mg7kg**
trichlorofluoromethane	7N-X3-U	mg+tg	**+.- 6 mg7kg**
vinyl chloride	7N-61-U	mg+tg	**+.+2 mg7kg**
zyleneRm+T-	173X61-2S-1	mg+tg	
zyleneRo-	3N-U7-X	mg+tg	

Analyte	CAS Number	Unit	ON- +672+ T0.81S1RPI
Volatile Organic Compounds 1Continued			
zylenesRtotal	1SS6-26-7	mg+tg	+.j mg7kg
Hydrocarbons			
chromatogram to baseline at nCN6	n<a	-	
K1 xCX-C16G	----	mg+tg	2X mg7kg
K1-V8E5	----	mg+tg	2X mg7kg
K2 xC16-C1XG	----	mg+tg	8+ mg7kg
K2-naThthalene	----	mg+tg	
KS xC1X-CSUG	----	mg+tg	0++ mg7kg
KS-PA.	n<a	mg+tg	
KU xCSU-CN6G	----	mg+tg	29++ mg7kg
KUQ-sg	----	mg+tg	29++ mg7kg
hydrocarbonsRtotal xCX-CN6G	----	mg+tg	
Polycyclic Aromatic Hydrocarbons			
acenaThthene	BS-S2-3	mg+tg	8- mg7kg
acenaThthylene	26B-3X-B	mg+tg	+.+j 0 mg7kg
anthracene	126-12-7	mg+tg	+.86 mg7kg
benkxaGanthracene	NX-NN-S	mg+tg	+.X mg7kg
benkoxaGTyrene	N6-S2-B	mg+tg	+.X/ mg7kg
benkoxb+jGluoranthene	n<a	mg+tg	X./ mg7kg
benkoxgRhRGTerylene	131-2U-2	mg+tg	6.6 mg7kg
benkox+GluoranthenE	267-6B-3	mg+tg	X./ mg7kg
chrysene	21B-61-3	mg+tg	/ mg7kg
dibenkxaRhGanthracene	NS-76-S	mg+tg	+.X/ mg7kg
fluoranthene	26X-UU-6	mg+tg	+.6j mg7kg
fluorene	BX-7S-7	mg+tg	6.9 mg7kg
indenox1R2RS-cRdGTyrene	13S-S3-N	mg+tg	+.09 mg7kg
methylnaThthaleneR1+2-	----	mg+tg	+.j 2 mg7kg
methylnaThthaleneR1-	36-12-6	mg+tg	+.j 2 mg7kg
methylnaThthaleneR2-	31-N7-X	mg+tg	+.j 2 mg7kg
naThthalene	31-26-S	mg+tg	+.Xj mg7kg
Thenanthrene	BN-61-B	mg+tg	6.2 mg7kg
Tyrene	123-66-6	mg+tg	/ + mg7kg
Phthalate Esters			
bisx2-ethylhezylGThthalate "9E. P%	117-B1-7	mg+tg	X mg7kg
diethyl Ththalate	BU-XX-2	mg+tg	+.X mg7kg
dimethyl Ththalate	1S1-11-S	mg+tg	+.X mg7kg
Semi1Volatile Organics			
biThenyl	32-N2-U	mg+tg	+.0 mg7kg
bisx2-chloroethylGether	111-UU-U	mg+tg	+.X mg7kg

Analyte	CAS Number	Unit	ON- +672+ T0.81S1RPI						
Semi1Volatile Organics 1Continued									
bisx2-chloroisoTroTylGether	S3XSB-S2-3	mg<+g	+.X mg7kg						
chloroanilineRU-	16X-U7-B	mg<+g	+.X mg7kg						
dichlorobenkidineRSRS'-	31-3U-1	mg<+g	8 mg7kg						
dinitrotoluene R2RU + 2RX-	n<a	mg<+g	+.j 2 mg7kg						
dinitrotoluene R2RU-	121-1U-2	mg<+g							
dinitrotoluene R2RX-	X6X-26-2	mg<+g							
trichlorobenkene R1R2RU-	126-B2-1	mg<+g	+.8/ mg7kg						
Chlorinated Phenolics									
chloroThenolR2-	3N-N7-B	mg<+g	8.6 mg7kg						
dichloroThenolR2RU-	126-BS-2	mg<+g	8./ mg7kg						
TentachloroThenol "PCP%	B7-BX-N	mg<+g	+.8 mg7kg						
trichloroThenolR2RURN-	3N-3N-U	mg<+g	0.8 mg7kg						
trichloroThenolR2RURX-	BB-6X-2	mg<+g	+.- 0 mg7kg						
dimethylThenolR2RU-	16N-X7-3	mg<+g	- X mg7kg						
dinitroThenolR2RU-	N1-2B-N	mg<+g	6./ mg7kg						
Thenol	16B-3N-2	mg<+g	X.0 mg7kg						
Polychlorinated Biphenyls									
Aroclor 161X	12X7U-11-2	mg<+g							
Aroclor 1221	1116U-2B-2	mg<+g							
Aroclor 12S2	111U1-1X-N	mg<+g							
Aroclor 12U2	NSUX3-21-3	mg<+g							
Aroclor 12UB	12X72-23-X	mg<+g							
Aroclor 12NU	11637-X3-1	mg<+g							
Aroclor 12X6	1163X-B2-N	mg<+g							
Aroclor 12X2	S7S2U-2S-N	mg<+g							
Aroclor 12XB	11166-1U-U	mg<+g							
Tolychlorinated biThenyls "PCVs%Rtotal	----	mg<+g	+.0X mg7kg						

Please refer to the Qeneral Comments section for an ezTlanation of any] ualifiers detected)

Key:

O4 U6X-26 Ontario 0 egulation U6X<13 - Ezcess j oils - 17-9 ecember-26

8S)1-j -0 PI U6X 8S)1 - , olume IndeTendent j oil - 0 es<ParH-Hnst ProTerty wse

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2226131**	Page	: 1 of 32
Client	:	Laboratory	: Waterloo - Environmental
Contact	:	Account Manager	: Amanda Overholster
Address	:	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: 1 416 817 2944
Project	:	Date Samples Received	: 23-Dec-2022 10:30
PO	: ----	Issue Date	: 09-Jan-2023 16:32
C-O-C number	: ----		
Sampler	: 20-1002308		
Site			
Quote number	2022 SOA		
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 Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate 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
Duplicate (DUP) RPDs								
Physical Tests	WT2226131-001	BH2-S	Moisture	----	E144	28.8 % DUP-H	20%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E655A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E655A	21-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH2-D	E336A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	03-Jan-2023	14 days	5 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH4-D	E336A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH4-S	E336A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH2-S	E336A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH6-D	E336A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH6-S	E336A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
DUP-D	E336A	21-Dec-2022	29-Dec-2022	14 days	7 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
DUP-S	E336A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH3-D	E336A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH3-S	E336A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	03-Jan-2023	14 days	5 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH7-D	E336A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	03-Jan-2023	14 days	5 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap										
BH7-S	E336A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	03-Jan-2023	14 days	5 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH2-D	E484	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH2-S	E484	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH4-D	E484	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH4-S	E484	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH6-D	E484	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH3-D	E484	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH3-S	E484	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH6-S	E484	22-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH7-D	E484	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
BH7-S	E484	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
DUP-D	E484	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Fixed-Ratio Extractables : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap										
DUP-S	E484	22-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH2-D	E581.F1	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH2-S	E581.F1	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH4-D	E581.F1	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH4-S	E581.F1	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH6-D	E581.F1	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH6-S	E581.F1	22-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH7-D	E581.F1	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH7-S	E581.F1	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
DUP-D	E581.F1	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
DUP-S	E581.F1	22-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH3-D	E581.F1	21-Dec-2022	29-Dec-2022	14 days	9 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP]										
BH3-S	E581.F1	21-Dec-2022	29-Dec-2022	14 days	9 days	✓	30-Dec-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap										
BH6-S	E601.F4G-L	22-Dec-2022	30-Dec-2022	14 days	8 days	✓	05-Jan-2023	40 days	6 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap										
DUP-S	E601.F4G-L	22-Dec-2022	30-Dec-2022	14 days	8 days	✓	05-Jan-2023	40 days	6 days	✓
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-D	E601.F4G-L	21-Dec-2022	30-Dec-2022	14 days	9 days	✓	05-Jan-2023	40 days	6 days	✓
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-S	E601.F4G-L	21-Dec-2022	30-Dec-2022	14 days	9 days	✓	05-Jan-2023	40 days	6 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH2-D	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH2-S	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH4-D	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH4-S	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH6-D	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH6-S	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH7-D	E601.SG-L	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH7-S	E601.SG-L	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
DUP-D	E601.SG-L	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
DUP-S	E601.SG-L	22-Dec-2022	28-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-D	E601.SG-L	21-Dec-2022	28-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-S	E601.SG-L	21-Dec-2022	28-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	7 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH2-D	E487	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH2-S	E487	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH4-D	E487	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH4-S	E487	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH6-D	E487	22-Dec-2022	03-Jan-2023	180 days	12 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH3-D	E487	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH3-S	E487	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH6-S	E487	22-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH7-D	E487	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
BH7-S	E487	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
DUP-D	E487	21-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap										
DUP-S	E487	22-Dec-2022	03-Jan-2023	180 days	13 days	✓	04-Jan-2023	180 days	0 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH2-D	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH2-S	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH4-D	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH4-S	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH6-D	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH6-S	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH3-D	E510	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH3-S	E510	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH7-D	E510	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH7-S	E510	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
DUP-D	E510	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
DUP-S	E510	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	28 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH2-D	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH2-S	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH4-D	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH4-S	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH6-D	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH6-S	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH3-D	E440	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH3-S	E440	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH7-D	E440	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH7-S	E440	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
DUP-D	E440	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
DUP-S	E440	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	180 days	14 days	✓
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E655A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E655A	21-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Non-Chlorinated Phenolics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E655A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E655A	21-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Phthalate Esters : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH2-D	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH2-S	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH4-D	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH4-S	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH6-D	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-D	E100-L	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH3-S	E100-L	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH6-S	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH7-D	E100-L	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
BH7-S	E100-L	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
DUP-D	E100-L	21-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap										
DUP-S	E100-L	22-Dec-2022	03-Jan-2023	----	----		04-Jan-2023	30 days	14 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH2-D	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH2-S	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH3-D	E144	21-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH3-S	E144	21-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH4-D	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH4-S	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH6-D	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH6-S	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH7-D	E144	21-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH7-S	E144	21-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
DUP-D	E144	21-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
DUP-S	E144	22-Dec-2022	----	----	----		28-Dec-2022	----	----	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH2-D	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH2-S	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH4-D	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH4-S	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH6-D	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH6-S	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
DUP-S	E108A	22-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH3-D	E108A	21-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH3-S	E108A	21-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH7-D	E108A	21-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
BH7-S	E108A	21-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap										
DUP-D	E108A	21-Dec-2022	29-Dec-2022	----	----		30-Dec-2022	30 days	9 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-S	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E687	21-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-S	E687	21-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-S	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-S	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E687	21-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-S	E687	21-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E687	21-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-S	E687	22-Dec-2022	28-Dec-2022	----	----		04-Jan-2023	40 days	7 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E641A	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH2-S	E641A	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E641A	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH4-S	E641A	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E641A	22-Dec-2022	28-Dec-2022	14 days	6 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH6-S	E641A	22-Dec-2022	28-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	2 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E641A	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH7-S	E641A	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E641A	21-Dec-2022	28-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
DUP-S	E641A	22-Dec-2022	28-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E641A	21-Dec-2022	28-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap										
BH3-S	E641A	21-Dec-2022	28-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	2 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH2-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH4-D	E655A	22-Dec-2022	29-Dec-2022	14 days	6 days	✓	04-Jan-2023	40 days	6 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH6-D	E655A	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
DUP-D	E655A	21-Dec-2022	29-Dec-2022	14 days	7 days	✓	04-Jan-2023	40 days	6 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH3-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Semi-Volatile Organics : BNA (ON 625-511 list) by GC-MS										
Glass soil jar/Teflon lined cap										
BH7-D	E655A	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	04-Jan-2023	40 days	6 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH2-D	E532	22-Dec-2022	29-Dec-2022	30 days	6 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH4-D	E532	22-Dec-2022	29-Dec-2022	30 days	6 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH4-S	E532	22-Dec-2022	29-Dec-2022	30 days	6 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH2-S	E532	22-Dec-2022	29-Dec-2022	30 days	7 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH6-D	E532	22-Dec-2022	29-Dec-2022	30 days	7 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH6-S	E532	22-Dec-2022	29-Dec-2022	30 days	7 days	✓	30-Dec-2022	7 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
DUP-D	E532	21-Dec-2022	29-Dec-2022	30 days	7 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
DUP-S	E532	22-Dec-2022	29-Dec-2022	30 days	7 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH3-D	E532	21-Dec-2022	29-Dec-2022	30 days	8 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH3-S	E532	21-Dec-2022	29-Dec-2022	30 days	8 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH7-D	E532	21-Dec-2022	29-Dec-2022	30 days	8 days	✓	30-Dec-2022	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap										
BH7-S	E532	21-Dec-2022	29-Dec-2022	30 days	8 days	✓	30-Dec-2022	7 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
BH2-D	E611D	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
BH2-S	E611D	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
BH4-D	E611D	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH4-S	E611D	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH6-D	E611D	22-Dec-2022	29-Dec-2022	14 days	7 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH6-S	E611D	22-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH7-D	E611D	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH7-S	E611D	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] DUP-D	E611D	21-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] DUP-S	E611D	22-Dec-2022	29-Dec-2022	14 days	8 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH3-D	E611D	21-Dec-2022	29-Dec-2022	14 days	9 days	✓	30-Dec-2022	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH3-S	E611D	21-Dec-2022	29-Dec-2022	14 days	9 days	✓	30-Dec-2022	40 days	1 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)							
BNA (ON 625-511 list) by GC-MS	E655A	789961	1	7	14.2	5.0	✓
Boron-Hot Water Extractable by ICPOES	E487	789816	1	12	8.3	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	791288	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	796230	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	789959	2	20	10.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	789815	1	12	8.3	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	789956	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	789812	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	789813	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	789967	1	20	5.0	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	789958	1	14	7.1	5.0	✓
PCB Aroclors by GC-MS	E687	789760	1	20	5.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	789960	1	18	5.5	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	789814	1	12	8.3	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	791289	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	789957	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
BNA (ON 625-511 list) by GC-MS	E655A	789961	1	7	14.2	5.0	✓
Boron-Hot Water Extractable by ICPOES	E487	789816	2	12	16.6	10.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	791288	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	796230	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	789959	2	20	10.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	789815	2	12	16.6	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	789956	2	15	13.3	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	789812	2	12	16.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	789813	2	12	16.6	10.0	✓
Moisture Content by Gravimetry	E144	789967	1	20	5.0	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	789958	1	14	7.1	5.0	✓
PCB Aroclors by GC-MS	E687	789760	1	20	5.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	789960	1	18	5.5	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	789814	2	12	16.6	10.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	791289	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	789957	1	15	6.6	5.0	✓
Method Blanks (MB)							
BNA (ON 625-511 list) by GC-MS	E655A	789961	1	7	14.2	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							
Boron-Hot Water Extractable by ICPOES	E487	789816	1	12	8.3	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	791288	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	796230	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	789959	2	20	10.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	789815	1	12	8.3	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	789956	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	789812	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	789813	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	789967	1	20	5.0	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	789958	1	14	7.1	5.0	✓
PCB Aroclors by GC-MS	E687	789760	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	789814	1	12	8.3	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	791289	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	789957	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
BNA (ON 625-511 list) by GC-MS	E655A	789961	1	7	14.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	791288	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	796230	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	789959	2	20	10.0	5.0	✓
PAHs by Hex:Ace GC-MS	E641A	789958	1	14	7.1	5.0	✓
PCB Aroclors by GC-MS	E687	789760	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	791289	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	789957	1	15	6.6	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 Waterloo - Environmental	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 CaCl2 Extraction) - As Received	E108A Waterloo - Environmental	Soil/Solid	MOEE E3137A	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.
Moisture Content by Gravimetry	E144 Waterloo - Environmental	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 Waterloo - Environmental	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	E440 Waterloo - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 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 Waterloo - Environmental	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.
Boron-Hot Water Extractable by ICPOES	E487 Waterloo - Environmental	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).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Mercury in Soil/Solid by CVAAS	E510 Waterloo - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 Waterloo - Environmental	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 Waterloo - Environmental	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.
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L Waterloo - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	A portion of the silica gel treated sample extract is filtered and dried at 105°C and the mass of the residual gravimetric heavy hydrocarbons (F4G) is determined gravimetrically.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L Waterloo - Environmental	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).
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	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 Hex:Ace GC-MS	E641A Waterloo - Environmental	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.
BNA (ON 625-511 list) by GC-MS	E655A Waterloo - Environmental	Soil/Solid	EPA 8270E (mod)	BNA are analyzed by GC-MS.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Soil/Solid	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
F1-BTEX	EC580 Waterloo - Environmental	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 Waterloo - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F2 to F3 minus PAH	EC600 Waterloo - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus select Polycyclic Aromatic Hydrocarbons (PAH) as per CCME Soil Tier 1

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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	EP440 Waterloo - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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 Waterloo - Environmental	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.
BNA DCM-Acetone Shaker Extraction	EP655 Waterloo - Environmental	Soil/Solid	EPA 3570 (mod)	Samples are subsampled and BNA are extracted with 1:1 DCM:acetone using a mechanical shakerr.

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

QUALITY CONTROL REPORT

Work Order	: **WT2226808**	Page	: 1 of 23
Client	: :	Laboratory	: Waterloo - Environmental
Contact	:	Account Manager	: Amanda Overholster
Address		Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: 1 416 817 2944
Project	:	Date Samples Received	: 23-Dec-2022 10:30
PO	: ----	Date Analysis Commenced	: 28-Dec-2022
C-O-C number	: ----	Issue Date	: 09-Jan-2023 16:33
Sampler	:		
Site	:		
Quote number	: 2022 SOA		
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*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Centralized Prep, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
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Jon Fisher	Department Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo Organics, 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: **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: 79198) 5											
WT2226131-001	BH2-S	conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.224 mS/cm	216	3.64%	20%	----
Physical Tests (QC Lot: 79116n5											
WT2226131-001	BH2-S	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.69	7.71	0.260%	5%	----
Physical Tests (QC Lot: 7911675											
WT2226131-001	BH2-S	Moisture	----	E144	0.25	%	16.1	12.1	28.8%	20%	DUP-H
Cya4ides (QC Lot: 7911) 75											
WT2226131-001	BH2-S	cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 7919825											
WT2226131-001	BH2-S	mercury	7439-97-6	E510	0.0050	mg/kg	0.0398	0.0384	3.64%	40%	----
Metals (QC Lot: 7919805											
WT2226131-001	BH2-S	antimony	7440-36-0	E440	0.10	mg/kg	1.69	2.02	17.8%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	2.75	2.92	6.09%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	43.6	47.3	8.20%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.30	0.33	0.03	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	5.5	6.1	0.6	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.176	0.170	3.50%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	13.7	14.3	4.36%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	4.15	4.45	7.09%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	11.2	11.4	2.23%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	40.6	43.8	7.47%	40%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	0.38	0.37	0.01	Diff <2x LOR	----
		nickel	7440-02-0	E440	0.50	mg/kg	9.51	9.90	3.98%	30%	----
		selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.077	0.084	0.007	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.374	0.401	6.98%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	20.6	22.4	8.39%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	37.8	36.0	4.78%	30%	----
Metals (QC Lot: 79198- 5											
WT2226131-001	BH2-S	calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	24.2	22.6	6.84%	30%	----

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: 79198- 5 uco4ti4ped											
WT2226131-001	BH2-S	magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.82	1.66	0.16	Diff <2x LOR	----
		sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	25.7	25.8	0.388%	30%	----
Metals (QC Lot: 7919865											
WT2226131-001	BH2-S	boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	0.59	0.63	6.66%	40%	----
SVeciated Metals (QC Lot: 7911) 65											
WT2226131-001	BH2-S	chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
golatile Orm4ic Co3 Vop4ds (QC Lot: 7182915											
WT2225972-003	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	----
		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	----

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*
golatile Orma4ic Co3 Vop4ds (QC Lot: 7182915 uco4ti4ped											
WT2225972-003	Anonymous	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	----
Hydrocarbo4s (QC Lot: 7911) 15											
WT2226131-001	BH2-S	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	----
Hydrocarbo4s (QC Lot: 7182995											
WT2225972-003	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbo4s (QC Lot: 71620n5											
WT2226131-003	BH3-S	F4G-sg	----	E601.F4G-L	250	mg/kg	<250	<250	0	Diff <2x LOR	----
Hydrocarbo4s (QC Lot: 7162085											
WT2226131-003	BH3-S	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 Aro3 atic Hydrocarbo4s (QC Lot: 7911) 95											
WT2226131-001	BH2-S	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	0.058	<0.050	0.008	Diff <2x LOR	J
		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	----

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 Aro3 atic Hydrocarbo4s (QC Lot: 7911) 95 uco4ti4ped											
WT2226131-001	BH2-S	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	0.076	<0.050	0.026	Diff <2x LOR	J
		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	----
		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	0.065	<0.050	0.015	Diff <2x LOR	J
Phthalate Esters (QC Lot: 7911685											
WT2226131-002	BH2-D	bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		diethyl phthalate	84-66-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dimethyl phthalate	131-11-3	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Se3 iuɡolatile Orma4ics (QC Lot: 7911685											
WT2226131-002	BH2-D	biphenyl	92-52-4	E655A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		bis(2-chloroethyl) ether	111-44-4	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		chloroaniline, 4-	106-47-8	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dichlorobenzidine, 3,3'-	91-94-1	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrotoluene, 2,4-	121-14-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrotoluene, 2,6-	606-20-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorobenzene, 1,2,4-	120-82-1	E655A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Chlori4ated Phe4olics (QC Lot: 7911685											
WT2226131-002	BH2-D	chlorophenol, 2-	95-57-8	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dichlorophenol, 2,4-	120-83-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		pentachlorophenol [PCP]	87-86-5	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorophenol, 2,4,5-	95-95-4	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		trichlorophenol, 2,4,6-	88-06-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
No4ıChlori4ated Phe4olics (QC Lot: 7911685											
WT2226131-002	BH2-D	dimethylphenol, 2,4-	105-67-9	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		dinitrophenol, 2,4-	51-28-5	E655A	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
		phenol	108-95-2	E655A	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Polychlori4ated BiVhe4yls (QC Lot: 79176n5											

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*
Polychlori4ated BiVhe4yls (QC Lot: 79176n5 uco4ti4ped											
WT2225801-013	Anonymous	Aroclor 1016	12674-11-2	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1221	11104-28-2	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1232	11141-16-5	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1242	53469-21-9	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1248	12672-29-6	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1254	11097-69-1	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1260	11096-82-5	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1262	37324-23-5	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----
		Aroclor 1268	11100-14-4	E687	0.010	mg/kg	<0.010 µg/g	<0.010	0	Diff <2x LOR	----

Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

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
Physical Tests (QCLot: 79198) 5						
conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 7911675						
Moisture	----	E144	0.25	%	<0.25	----
Cya4ides (QCLot: 7911) 75						
cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 7919825						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 7919805						
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Metals (QCLot: 79198- 5						
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	----
Metals (QCLot: 7919865						
boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
SVeciated Metals (QCLot: 7911) 65						
chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
golatile Orma4ic Co3 Vop4ds (QCLot: 7182915						
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	<0.045	----
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	----
tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	<0.050	----
toluene	108-88-3	E611D	0.05	mg/kg	<0.050	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
golatile Orma4ic Co3 Vop4ds (QCLot: 7182915 uco4ti4ped						
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	----
Hydrocarbo4s (QCLot: 7911) 15						
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	----
Hydrocarbo4s (QCLot: 7182995						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbo4s (QCLot: 71620n5						
F4G-sg	----	E601.F4G-L	250	mg/kg	<250	----
Hydrocarbo4s (QCLot: 7162085						
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	----
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95						
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	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95 uco4ti4ped						
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	----
Phthalate Esters (QCLot: 7911685						
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.1	mg/kg	<0.10	----
diethyl phthalate	84-66-2	E655A	0.1	mg/kg	<0.10	----
dimethyl phthalate	131-11-3	E655A	0.1	mg/kg	<0.10	----
Se3 iuolatile Orm4ics (QCLot: 7911685						
biphenyl	92-52-4	E655A	0.05	mg/kg	<0.050	----
bis(2-chloroethyl) ether	111-44-4	E655A	0.1	mg/kg	<0.10	----
bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.1	mg/kg	<0.10	----
chloroaniline, 4-	106-47-8	E655A	0.1	mg/kg	<0.10	----
dichlorobenzidine, 3,3'-	91-94-1	E655A	0.1	mg/kg	<0.10	----
dinitrotoluene, 2,4-	121-14-2	E655A	0.1	mg/kg	<0.10	----
dinitrotoluene, 2,6-	606-20-2	E655A	0.1	mg/kg	<0.10	----
trichlorobenzene, 1,2,4-	120-82-1	E655A	0.05	mg/kg	<0.050	----
Chlori4ated Phe4olics (QCLot: 7911685						
chlorophenol, 2-	95-57-8	E655A	0.1	mg/kg	<0.10	----
dichlorophenol, 2,4-	120-83-2	E655A	0.1	mg/kg	<0.10	----
pentachlorophenol [PCP]	87-86-5	E655A	0.1	mg/kg	<0.10	----
trichlorophenol, 2,4,5-	95-95-4	E655A	0.1	mg/kg	<0.10	----
trichlorophenol, 2,4,6-	88-06-2	E655A	0.1	mg/kg	<0.10	----
No4uChlori4ated Phe4olics (QCLot: 7911685						
dimethylphenol, 2,4-	105-67-9	E655A	0.1	mg/kg	<0.10	----
dinitrophenol, 2,4-	51-28-5	E655A	1	mg/kg	<1.0	----
phenol	108-95-2	E655A	0.1	mg/kg	<0.10	----
Polychlori4ated BiVhe4yls (QCLot: 79176n5						
Aroclor 1016	12674-11-2	E687	0.01	mg/kg	<0.010	----
Aroclor 1221	11104-28-2	E687	0.01	mg/kg	<0.010	----
Aroclor 1232	11141-16-5	E687	0.01	mg/kg	<0.010	----
Aroclor 1242	53469-21-9	E687	0.01	mg/kg	<0.010	----
Aroclor 1248	12672-29-6	E687	0.01	mg/kg	<0.010	----
Aroclor 1254	11097-69-1	E687	0.01	mg/kg	<0.010	----
Aroclor 1260	11096-82-5	E687	0.01	mg/kg	<0.010	----
Aroclor 1262	37324-23-5	E687	0.01	mg/kg	<0.010	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polychlori4ated BiVhe4yls (QCLot: 79176n5 uco4ti4ped						
Aroclor 1268	11100-14-4	E687	0.01	mg/kg	<0.010	----

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	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 79198) 5									
conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	97.5	90.0	110	----
Physical Tests (QCLot: 79116n5									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 7911675									
Moisture	----	E144	0.25	%	50 %	99.1	90.0	110	----
Cya4ides (QCLot: 7911) 75									
cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	2.5 mg/kg	97.0	80.0	125	----
Metals (QCLot: 7919825									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	97.0	80.0	120	----
Metals (QCLot: 7919805									
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	92.5	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	97.9	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	94.4	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	92.1	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	89.0	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	94.4	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	94.8	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	90.8	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	93.6	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	92.2	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	94.1	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	91.6	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	82.8	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	95.4	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	90.3	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	97.1	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	94.5	80.0	120	----
Metals (QCLot: 79198- 5									
calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	107	80.0	120	----
magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	102	80.0	120	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 79198- 5 uco4ti4ped									
sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	105	80.0	120	----
Metals (QCLot: 7919865									
boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	1.33333 mg/kg	102	70.0	130	----
SVeciated Metals (QCLot: 7911) 65									
chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	81.7	80.0	120	----
golatile Orma4ic Co3 Vop4ds (QCLot: 7182915									
Acetone	67-64-1	E611D	0.5	mg/kg	3.475 mg/kg	87.2	60.0	140	----
benzene	71-43-2	E611D	0.005	mg/kg	3.475 mg/kg	93.8	70.0	130	----
bromodichloromethane	75-27-4	E611D	0.05	mg/kg	3.475 mg/kg	92.3	50.0	140	----
bromoform	75-25-2	E611D	0.05	mg/kg	3.475 mg/kg	96.5	70.0	130	----
bromomethane	74-83-9	E611D	0.05	mg/kg	3.475 mg/kg	90.9	50.0	140	----
carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	3.475 mg/kg	96.2	70.0	130	----
chlorobenzene	108-90-7	E611D	0.05	mg/kg	3.475 mg/kg	98.9	70.0	130	----
chloroform	67-66-3	E611D	0.05	mg/kg	3.475 mg/kg	94.5	70.0	130	----
dibromochloromethane	124-48-1	E611D	0.05	mg/kg	3.475 mg/kg	89.7	60.0	130	----
dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	3.475 mg/kg	91.2	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	3.475 mg/kg	92.7	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	3.475 mg/kg	93.4	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	3.475 mg/kg	92.2	70.0	130	----
dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	3.475 mg/kg	63.7	50.0	140	----
dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	3.475 mg/kg	96.8	60.0	130	----
dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	3.475 mg/kg	87.5	60.0	130	----
dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	3.475 mg/kg	92.0	60.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	3.475 mg/kg	91.2	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	3.475 mg/kg	92.7	60.0	130	----
dichloromethane	75-09-2	E611D	0.045	mg/kg	3.475 mg/kg	94.7	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	3.475 mg/kg	97.0	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	3.475 mg/kg	87.8	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	3.475 mg/kg	91.8	70.0	130	----
ethylbenzene	100-41-4	E611D	0.015	mg/kg	3.475 mg/kg	103	70.0	130	----
hexane, n-	110-54-3	E611D	0.05	mg/kg	3.475 mg/kg	92.0	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	3.475 mg/kg	79.6	60.0	140	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	3.475 mg/kg	83.9	60.0	140	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	3.475 mg/kg	97.4	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
golatile Orma4ic Co3 Vop4ds (QCLot: 7182915 uco4ti4ped									
styrene	100-42-5	E611D	0.05	mg/kg	3.475 mg/kg	98.1	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.05	mg/kg	3.475 mg/kg	93.4	60.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.05	mg/kg	3.475 mg/kg	94.6	60.0	130	----
tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	3.475 mg/kg	108	60.0	130	----
toluene	108-88-3	E611D	0.05	mg/kg	3.475 mg/kg	99.6	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.05	mg/kg	3.475 mg/kg	95.9	60.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.05	mg/kg	3.475 mg/kg	93.5	60.0	130	----
trichloroethylene	79-01-6	E611D	0.01	mg/kg	3.475 mg/kg	92.1	60.0	130	----
trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	3.475 mg/kg	91.9	50.0	140	----
vinyl chloride	75-01-4	E611D	0.02	mg/kg	3.475 mg/kg	85.5	60.0	140	----
xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	6.95 mg/kg	103	70.0	130	----
xylene, o-	95-47-6	E611D	0.03	mg/kg	3.475 mg/kg	98.7	70.0	130	----
Hydrocarbo4s (QCLot: 7911) 15									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	883.825 mg/kg	87.1	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1385.22 mg/kg	78.3	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	797.55 mg/kg	81.5	70.0	130	----
Hydrocarbo4s (QCLot: 7182995									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.1875 mg/kg	110	80.0	120	----
Hydrocarbo4s (QCLot: 71620n5									
F4G-sg	----	E601.F4G-L	250	mg/kg	1298.6 mg/kg	89.8	70.0	130	----
Hydrocarbo4s (QCLot: 7162085									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	883.825 mg/kg	92.7	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1385.22 mg/kg	83.4	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	797.55 mg/kg	91.8	70.0	130	----
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95									
acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	86.2	60.0	130	----
acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	93.4	60.0	130	----
anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	97.5	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	104	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	95.0	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	96.4	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	79.1	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	93.9	60.0	130	----
chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	98.0	60.0	130	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95 uco4ti4ped									
dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	85.9	60.0	130	----
fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	87.8	60.0	130	----
fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	88.8	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	83.5	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	85.6	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	84.5	60.0	130	----
naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	84.4	60.0	130	----
phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	85.3	60.0	130	----
pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	88.8	60.0	130	----
Phthalate Esters (QCLot: 7911685									
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	0.1	mg/kg	3.2 mg/kg	88.3	50.0	140	----
diethyl phthalate	84-66-2	E655A	0.1	mg/kg	3.2 mg/kg	89.6	50.0	140	----
dimethyl phthalate	131-11-3	E655A	0.1	mg/kg	3.2 mg/kg	89.8	50.0	140	----
Se3 iɢolatile Orm4ics (QCLot: 7911685									
biphenyl	92-52-4	E655A	0.05	mg/kg	0.8 mg/kg	95.2	50.0	140	----
bis(2-chloroethyl) ether	111-44-4	E655A	0.1	mg/kg	0.8 mg/kg	89.4	50.0	140	----
bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.1	mg/kg	0.8 mg/kg	86.0	50.0	140	----
chloroaniline, 4-	106-47-8	E655A	0.1	mg/kg	0.8 mg/kg	88.5	50.0	140	----
dichlorobenzidine, 3,3'-	91-94-1	E655A	0.1	mg/kg	0.8 mg/kg	87.9	50.0	140	----
dinitrotoluene, 2,4-	121-14-2	E655A	0.1	mg/kg	0.8 mg/kg	97.6	50.0	140	----
dinitrotoluene, 2,6-	606-20-2	E655A	0.1	mg/kg	0.8 mg/kg	89.9	50.0	140	----
trichlorobenzene, 1,2,4-	120-82-1	E655A	0.05	mg/kg	0.8 mg/kg	85.4	50.0	140	----
Chlori4ated Phe4olics (QCLot: 7911685									
chlorophenol, 2-	95-57-8	E655A	0.1	mg/kg	2.4 mg/kg	89.8	50.0	140	----
dichlorophenol, 2,4-	120-83-2	E655A	0.1	mg/kg	2.4 mg/kg	92.2	50.0	140	----
pentachlorophenol [PCP]	87-86-5	E655A	0.1	mg/kg	2.4 mg/kg	100	50.0	140	----
trichlorophenol, 2,4,5-	95-95-4	E655A	0.1	mg/kg	2.4 mg/kg	99.4	50.0	140	----
trichlorophenol, 2,4,6-	88-06-2	E655A	0.1	mg/kg	2.4 mg/kg	95.5	50.0	140	----
No4ıChlori4ated Phe4olics (QCLot: 7911685									
dimethylphenol, 2,4-	105-67-9	E655A	0.1	mg/kg	2.4 mg/kg	93.2	50.0	140	----
dinitrophenol, 2,4-	51-28-5	E655A	1	mg/kg	2.4 mg/kg	90.9	50.0	140	----
phenol	108-95-2	E655A	0.1	mg/kg	2.4 mg/kg	111	50.0	140	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polychlori4ated BiVhe4yls (QCLot: 79176n5									
Aroclor 1016	12674-11-2	E687	0.01	mg/kg	0.01 mg/kg	95.4	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.01	mg/kg	0.01 mg/kg	95.4	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.01	mg/kg	0.01 mg/kg	95.4	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.01	mg/kg	0.01 mg/kg	95.4	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.01	mg/kg	0.01 mg/kg	76.9	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.01	mg/kg	0.01 mg/kg	87.2	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.01	mg/kg	0.01 mg/kg	102	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.01	mg/kg	0.01 mg/kg	102	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.01	mg/kg	0.01 mg/kg	102	60.0	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: **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
Cya4ides (QCLot: 7911) 75										
WT2226131-001	BH2-S	cyanide, weak acid dissociable	----	E336A	1.23 mg/kg	2.5 mg/kg	99.9	70.0	130	----
golatile Orm4ic Co3 Vop4ds (QCLot: 7182915										
WT2225972-003	Anonymous	Acetone	67-64-1	E611D	2.58 mg/kg	3.125 mg/kg	94.9	50.0	140	----
		benzene	71-43-2	E611D	2.58 mg/kg	3.125 mg/kg	94.7	50.0	140	----
		bromodichloromethane	75-27-4	E611D	2.56 mg/kg	3.125 mg/kg	93.9	50.0	140	----
		bromoform	75-25-2	E611D	2.72 mg/kg	3.125 mg/kg	99.8	50.0	140	----
		bromomethane	74-83-9	E611D	2.41 mg/kg	3.125 mg/kg	88.6	50.0	140	----
		carbon tetrachloride	56-23-5	E611D	2.55 mg/kg	3.125 mg/kg	93.6	50.0	140	----
		chlorobenzene	108-90-7	E611D	2.70 mg/kg	3.125 mg/kg	99.0	50.0	140	----
		chloroform	67-66-3	E611D	2.59 mg/kg	3.125 mg/kg	95.2	50.0	140	----
		dibromochloromethane	124-48-1	E611D	2.48 mg/kg	3.125 mg/kg	91.0	50.0	140	----
		dibromoethane, 1,2-	106-93-4	E611D	2.59 mg/kg	3.125 mg/kg	95.1	50.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	2.51 mg/kg	3.125 mg/kg	92.2	50.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611D	2.47 mg/kg	3.125 mg/kg	90.7	50.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	2.45 mg/kg	3.125 mg/kg	89.9	50.0	140	----
		dichlorodifluoromethane	75-71-8	E611D	1.42 mg/kg	3.125 mg/kg	52.2	50.0	140	----
		dichloroethane, 1,1-	75-34-3	E611D	2.67 mg/kg	3.125 mg/kg	98.2	50.0	140	----
		dichloroethane, 1,2-	107-06-2	E611D	2.45 mg/kg	3.125 mg/kg	90.1	50.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611D	2.50 mg/kg	3.125 mg/kg	91.8	50.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	2.51 mg/kg	3.125 mg/kg	92.4	50.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	2.50 mg/kg	3.125 mg/kg	91.7	50.0	140	----
		dichloromethane	75-09-2	E611D	2.67 mg/kg	3.125 mg/kg	98.0	50.0	140	----
		dichloropropane, 1,2-	78-87-5	E611D	2.68 mg/kg	3.125 mg/kg	98.3	50.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	2.38 mg/kg	3.125 mg/kg	87.4	50.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	2.57 mg/kg	3.125 mg/kg	94.5	50.0	140	----
		ethylbenzene	100-41-4	E611D	2.76 mg/kg	3.125 mg/kg	102	50.0	140	----
		hexane, n-	110-54-3	E611D	2.50 mg/kg	3.125 mg/kg	91.8	50.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	2.40 mg/kg	3.125 mg/kg	88.1	50.0	140	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	2.48 mg/kg	3.125 mg/kg	91.1	50.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	2.62 mg/kg	3.125 mg/kg	96.4	50.0	140	----
		styrene	100-42-5	E611D	2.70 mg/kg	3.125 mg/kg	99.2	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
golatile Orma4ic Co3 Vop4ds (QCLot: 7182915 uco4ti4ped										
WT2225972-003	Anonymous	tetrachloroethane, 1,1,1,2-	630-20-6	E611D	2.54 mg/kg	3.125 mg/kg	93.2	50.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	2.75 mg/kg	3.125 mg/kg	101	50.0	140	----
		tetrachloroethylene	127-18-4	E611D	2.88 mg/kg	3.125 mg/kg	106	50.0	140	----
		toluene	108-88-3	E611D	2.72 mg/kg	3.125 mg/kg	100	50.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611D	2.56 mg/kg	3.125 mg/kg	94.1	50.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611D	2.64 mg/kg	3.125 mg/kg	97.2	50.0	140	----
		trichloroethylene	79-01-6	E611D	2.49 mg/kg	3.125 mg/kg	91.5	50.0	140	----
		trichlorofluoromethane	75-69-4	E611D	2.46 mg/kg	3.125 mg/kg	90.3	50.0	140	----
		vinyl chloride	75-01-4	E611D	2.17 mg/kg	3.125 mg/kg	79.8	50.0	140	----
		xylene, m+p-	179601-23-1	E611D	5.59 mg/kg	6.25 mg/kg	103	50.0	140	----
		xylene, o-	95-47-6	E611D	2.68 mg/kg	3.125 mg/kg	98.3	50.0	140	----
Hydrocarbo4s (QCLot: 7911) 15										
WT2226131-001	BH2-S	F2 (C10-C16)	----	E601.SG-L	637 mg/kg	883.825 mg/kg	88.5	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	943 mg/kg	1385.22 mg/kg	83.6	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	618 mg/kg	797.55 mg/kg	95.2	60.0	140	----
Hydrocarbo4s (QCLot: 7182995										
WT2225972-003	Anonymous	F1 (C6-C10)	----	E581.F1	56.4 mg/kg	62.5 mg/kg	104	60.0	140	----
Hydrocarbo4s (QCLot: 71620n5										
WT2226131-003	BH3-S	F4G-sg	----	E601.F4G-L	1210 mg/kg	1298.6 mg/kg	119	60.0	140	----
Hydrocarbo4s (QCLot: 7162085										
WT2226131-003	BH3-S	F2 (C10-C16)	----	E601.SG-L	659 mg/kg	883.825 mg/kg	94.9	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1000 mg/kg	1385.22 mg/kg	92.3	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	697 mg/kg	797.55 mg/kg	111	60.0	140	----
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95										
WT2226131-001	BH2-S	acenaphthene	83-32-9	E641A	0.386 mg/kg	0.5 mg/kg	90.6	50.0	140	----
		acenaphthylene	208-96-8	E641A	0.418 mg/kg	0.5 mg/kg	98.2	50.0	140	----
		anthracene	120-12-7	E641A	0.438 mg/kg	0.5 mg/kg	103	50.0	140	----
		benz(a)anthracene	56-55-3	E641A	0.393 mg/kg	0.5 mg/kg	92.3	50.0	140	----
		benzo(a)pyrene	50-32-8	E641A	0.416 mg/kg	0.5 mg/kg	97.8	50.0	140	----
		benzo(b+j)fluoranthene	n/a	E641A	0.373 mg/kg	0.5 mg/kg	87.6	50.0	140	----
		benzo(g,h,i)perylene	191-24-2	E641A	0.305 mg/kg	0.5 mg/kg	71.7	50.0	140	----
		benzo(k)fluoranthene	207-08-9	E641A	0.400 mg/kg	0.5 mg/kg	93.9	50.0	140	----
		chrysene	218-01-9	E641A	0.356 mg/kg	0.5 mg/kg	83.5	50.0	140	----
		dibenz(a,h)anthracene	53-70-3	E641A	0.386 mg/kg	0.5 mg/kg	90.6	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
Polycyclic Aro3 atic Hydrocarbo4s (QCLot: 7911) 95 uco4ti4ped										
WT2226131-001	BH2-S	fluoranthene	206-44-0	E641A	0.342 mg/kg	0.5 mg/kg	80.2	50.0	140	----
		fluorene	86-73-7	E641A	0.403 mg/kg	0.5 mg/kg	94.7	50.0	140	----
		indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.337 mg/kg	0.5 mg/kg	79.1	50.0	140	----
		methylnaphthalene, 1-	90-12-0	E641A	0.382 mg/kg	0.5 mg/kg	89.7	50.0	140	----
		methylnaphthalene, 2-	91-57-6	E641A	0.377 mg/kg	0.5 mg/kg	88.6	50.0	140	----
		naphthalene	91-20-3	E641A	0.387 mg/kg	0.5 mg/kg	90.9	50.0	140	----
		phenanthrene	85-01-8	E641A	0.369 mg/kg	0.5 mg/kg	86.7	50.0	140	----
		pyrene	129-00-0	E641A	0.354 mg/kg	0.5 mg/kg	83.0	50.0	140	----
Phthalate Esters (QCLot: 7911685										
WT2226131-002	BH2-D	bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655A	3.07 mg/kg	3.2 mg/kg	95.7	50.0	140	----
		diethyl phthalate	84-66-2	E655A	2.70 mg/kg	3.2 mg/kg	84.3	50.0	140	----
		dimethyl phthalate	131-11-3	E655A	2.69 mg/kg	3.2 mg/kg	83.8	50.0	140	----
Se3 iɹgolatile Orma4ics (QCLot: 7911685										
WT2226131-002	BH2-D	biphenyl	92-52-4	E655A	0.693 mg/kg	0.8 mg/kg	86.4	50.0	140	----
		bis(2-chloroethyl) ether	111-44-4	E655A	0.66 mg/kg	0.8 mg/kg	82.4	50.0	140	----
		bis(2-chloroisopropyl) ether	39638-32-9	E655A	0.63 mg/kg	0.8 mg/kg	78.5	50.0	140	----
		chloroaniline, 4-	106-47-8	E655A	0.68 mg/kg	0.8 mg/kg	84.2	50.0	140	----
		dichlorobenzidine, 3,3'-	91-94-1	E655A	0.73 mg/kg	0.8 mg/kg	91.4	50.0	140	----
		dinitrotoluene, 2,4-	121-14-2	E655A	0.73 mg/kg	0.8 mg/kg	90.7	50.0	140	----
		dinitrotoluene, 2,6-	606-20-2	E655A	0.68 mg/kg	0.8 mg/kg	84.8	50.0	140	----
		trichlorobenzene, 1,2,4-	120-82-1	E655A	0.632 mg/kg	0.8 mg/kg	78.9	50.0	140	----
Chlori4ated Phe4olics (QCLot: 7911685										
WT2226131-002	BH2-D	chlorophenol, 2-	95-57-8	E655A	2.00 mg/kg	2.4 mg/kg	83.3	50.0	140	----
		dichlorophenol, 2,4-	120-83-2	E655A	2.09 mg/kg	2.4 mg/kg	87.1	50.0	140	----
		pentachlorophenol [PCP]	87-86-5	E655A	2.08 mg/kg	2.4 mg/kg	86.7	50.0	140	----
		trichlorophenol, 2,4,5-	95-95-4	E655A	2.27 mg/kg	2.4 mg/kg	94.4	50.0	140	----
		trichlorophenol, 2,4,6-	88-06-2	E655A	2.16 mg/kg	2.4 mg/kg	89.9	50.0	140	----
No4uChlori4ated Phe4olics (QCLot: 7911685										
WT2226131-002	BH2-D	dimethylphenol, 2,4-	105-67-9	E655A	2.11 mg/kg	2.4 mg/kg	87.9	50.0	140	----
		dinitrophenol, 2,4-	51-28-5	E655A	1.7 mg/kg	2.4 mg/kg	69.0	50.0	140	----
		phenol	108-95-2	E655A	2.65 mg/kg	2.4 mg/kg	110	50.0	140	----
Polychlori4ated BiVhe4yls (QCLot: 79176n5										
WT2225801-013	Anonymous	Aroclor 1016	12674-11-2	E687	0.010 mg/kg	0.01 mg/kg	94.9	50.0	150	----
		Aroclor 1221	11104-28-2	E687	0.010 mg/kg	0.01 mg/kg	94.9	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
Polychlori4ated BiVhe4yls (QCLot: 79176n5 uco4ti4ped										
WT2225801-013	Anonymous	Aroclor 1232	11141-16-5	E687	0.010 mg/kg	0.01 mg/kg	94.9	50.0	150	----
		Aroclor 1242	53469-21-9	E687	0.010 mg/kg	0.01 mg/kg	94.3	50.0	150	----
		Aroclor 1248	12672-29-6	E687	0.010 mg/kg	0.01 mg/kg	94.9	50.0	150	----
		Aroclor 1254	11097-69-1	E687	0.009 mg/kg	0.01 mg/kg	87.7	50.0	150	----
		Aroclor 1260	11096-82-5	E687	0.011 mg/kg	0.01 mg/kg	106	50.0	150	----
		Aroclor 1262	37324-23-5	E687	0.011 mg/kg	0.01 mg/kg	108	50.0	150	----
		Aroclor 1268	11100-14-4	E687	0.011 mg/kg	0.01 mg/kg	108	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:

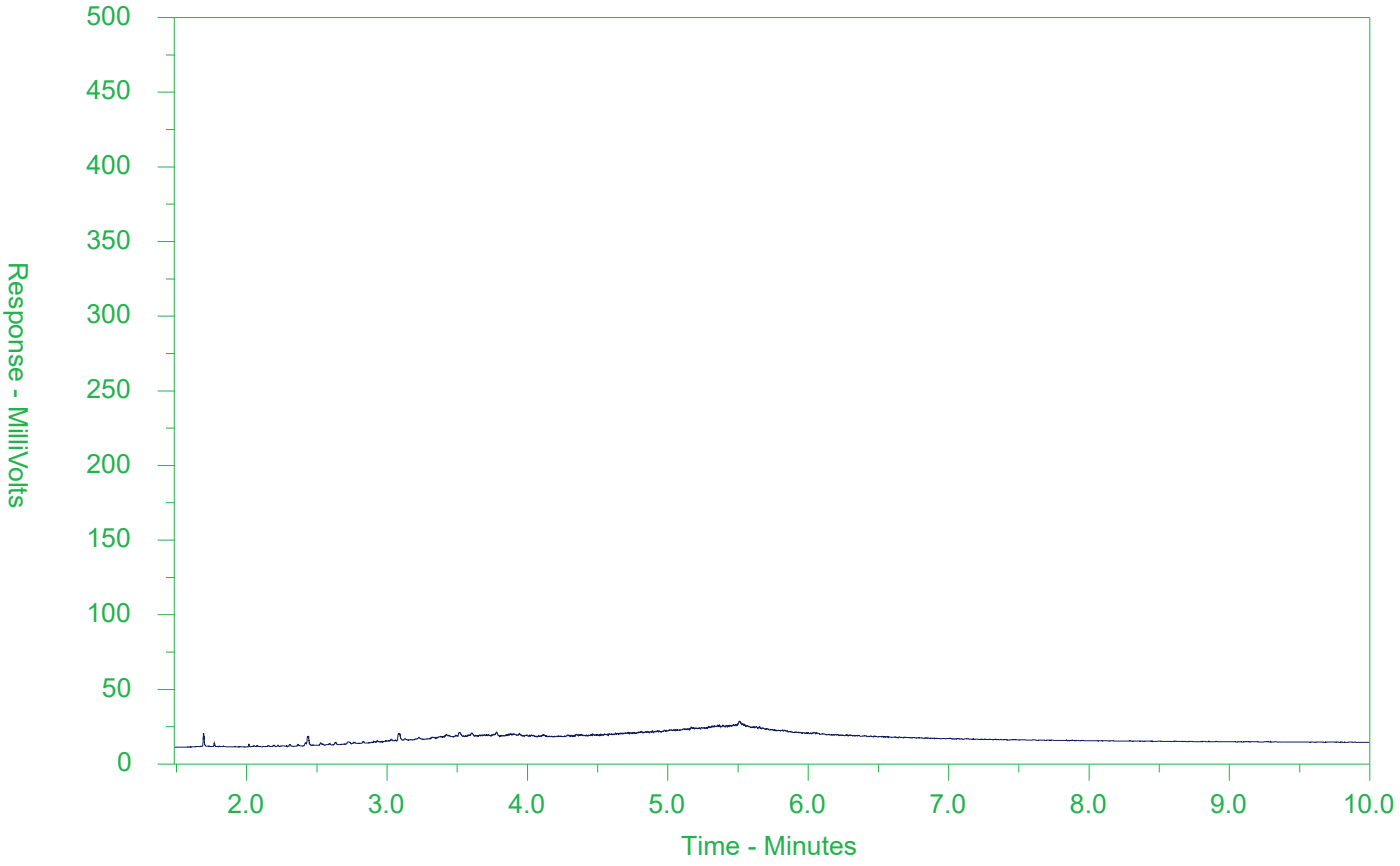
					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 79198) 5									
	RM	conductivity (1:2 leachate)	----	E100-L	1031.5 µS/cm	104	70.0	130	----
Metals (QCLot: 7919825									
	RM	mercury	7439-97-6	E510	0.0585 mg/kg	101	70.0	130	----
Metals (QCLot: 7919805									
	RM	antimony	7440-36-0	E440	3.99 mg/kg	88.9	70.0	130	----
	RM	arsenic	7440-38-2	E440	3.73 mg/kg	101	70.0	130	----
	RM	barium	7440-39-3	E440	105 mg/kg	96.6	70.0	130	----
	RM	beryllium	7440-41-7	E440	0.349 mg/kg	103	70.0	130	----
	RM	boron	7440-42-8	E440	8.5 mg/kg	107	40.0	160	----
	RM	cadmium	7440-43-9	E440	0.91 mg/kg	86.9	70.0	130	----
	RM	chromium	7440-47-3	E440	101 mg/kg	100	70.0	130	----
	RM	cobalt	7440-48-4	E440	6.9 mg/kg	94.7	70.0	130	----
	RM	copper	7440-50-8	E440	123 mg/kg	92.2	70.0	130	----
	RM	lead	7439-92-1	E440	267 mg/kg	96.0	70.0	130	----
	RM	molybdenum	7439-98-7	E440	1.03 mg/kg	113	70.0	130	----
	RM	nickel	7440-02-0	E440	26.7 mg/kg	97.8	70.0	130	----
	RM	silver	7440-22-4	E440	4.06 mg/kg	105	70.0	130	----
	RM	thallium	7440-28-0	E440	0.0786 mg/kg	94.6	40.0	160	----
	RM	uranium	7440-61-1	E440	0.52 mg/kg	90.2	70.0	130	----
	RM	vanadium	7440-62-2	E440	32.7 mg/kg	97.4	70.0	130	----
	RM	zinc	7440-66-6	E440	297 mg/kg	94.0	70.0	130	----
Metals (QCLot: 79198- 5									
	RM	calcium, soluble ion content	7440-70-2	E484	86.59 mg/L	107	70.0	130	----
	RM	magnesium, soluble ion content	7439-95-4	E484	25.74 mg/L	110	70.0	130	----
	RM	sodium, soluble ion content	17341-25-2	E484	30.05 mg/L	108	70.0	130	----
Metals (QCLot: 7919865									
	RM	boron, hot water soluble	7440-42-8	E487	1.4938 mg/kg	121	60.0	140	----
SVeciated Metals (QCLot: 7911) 65									

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
SVeciated Metals (QCLot: 7911) 65 uco4ti4ped									
	RM	chromium, hexavalent [Cr VI]	18540-29-9	E532	172 mg/kg	100	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-001-E601.SG-L
Client Sample ID: BH2-S



←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.

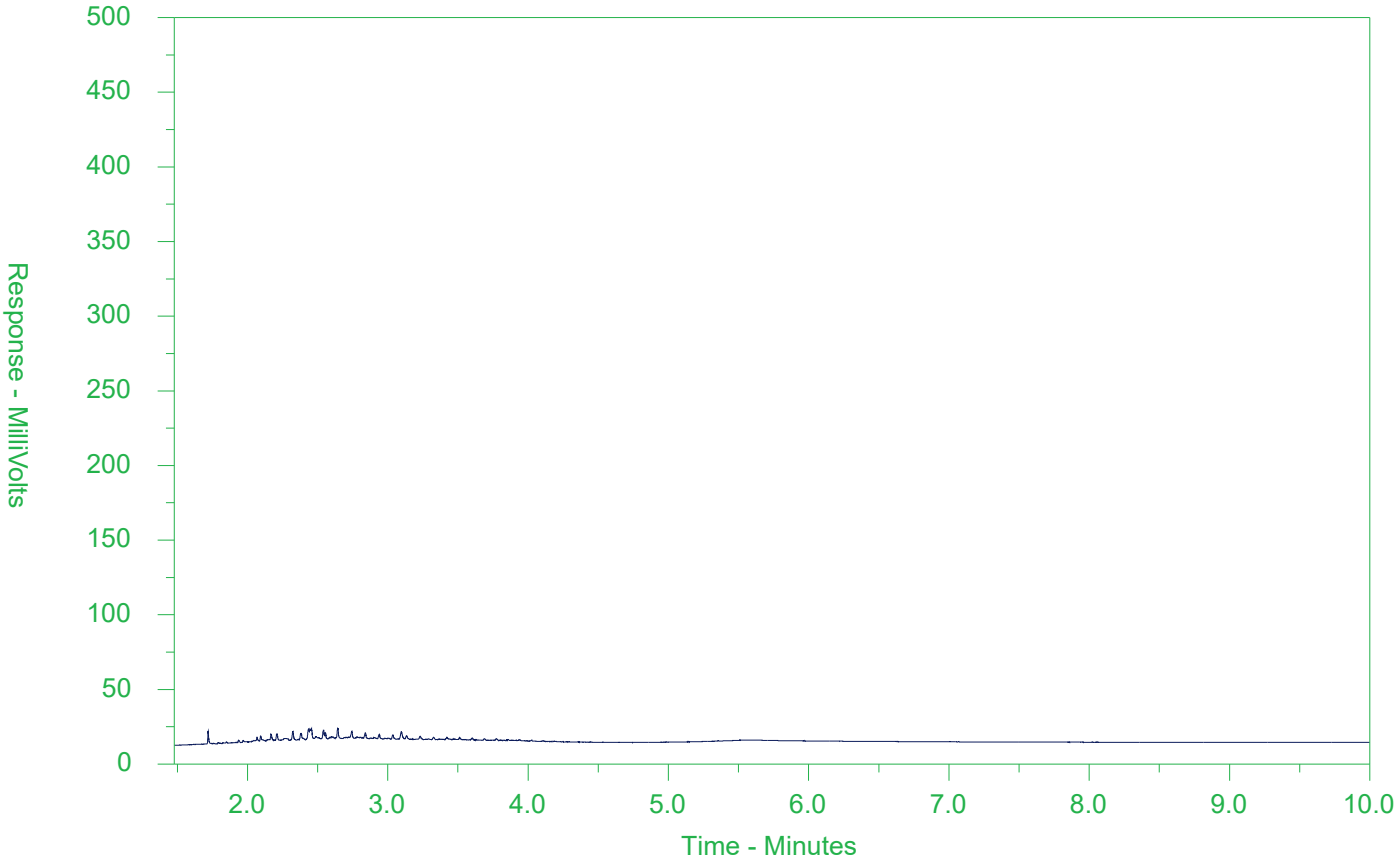
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-002-E601.SG-L
Client Sample ID: BH2-D



←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.

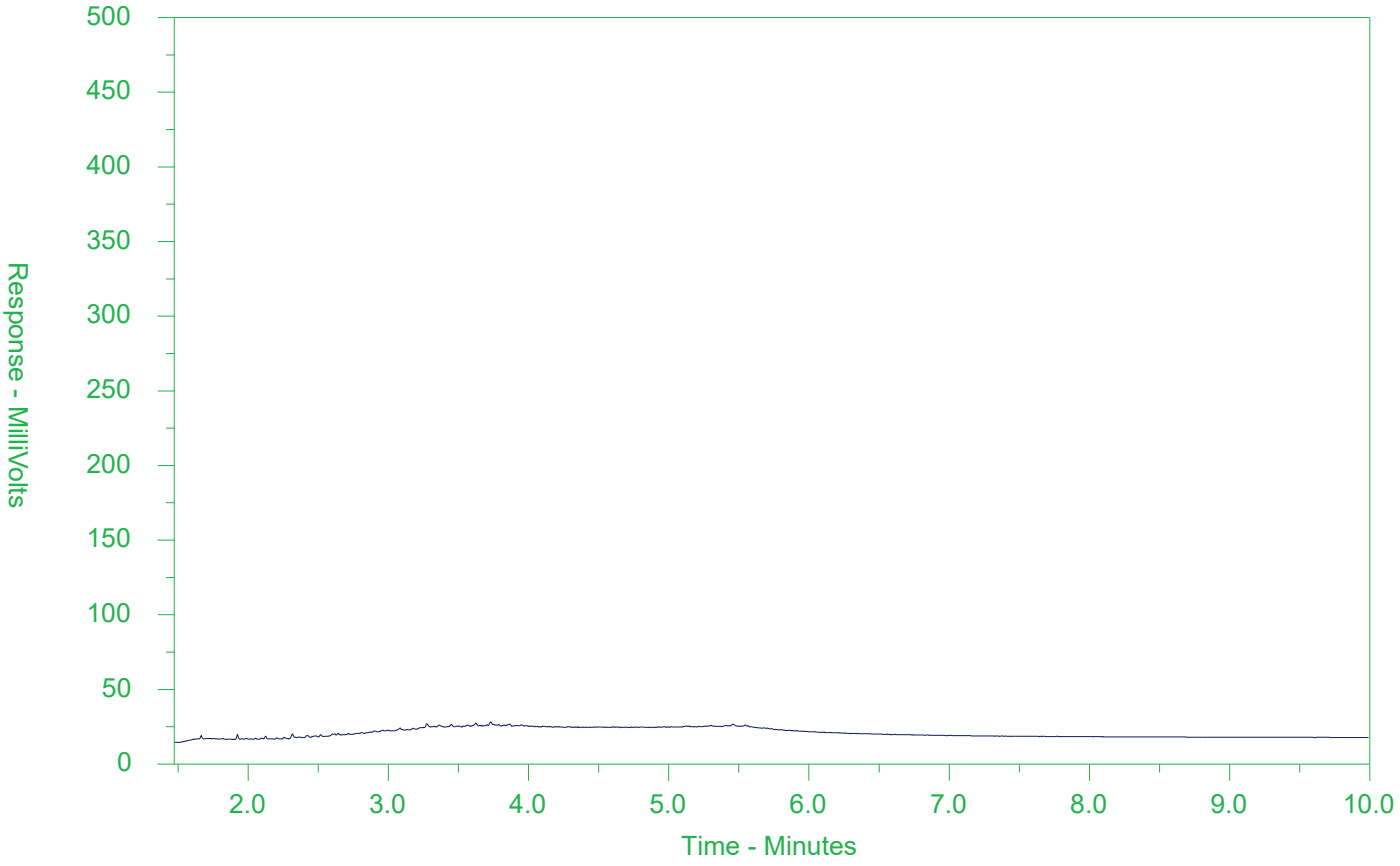
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-003-E601.SG-L
Client Sample ID: BH3-S



←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.

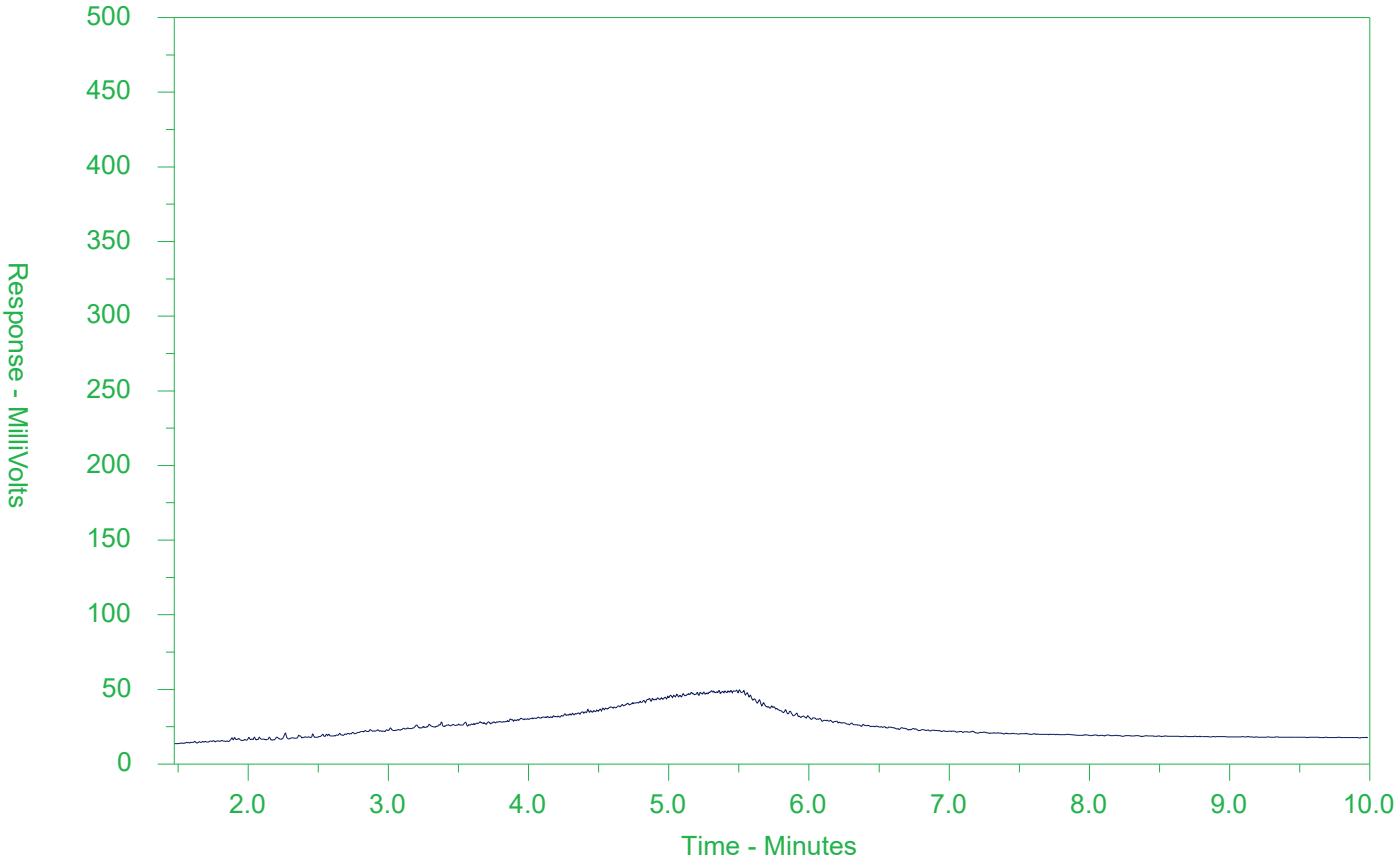
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-004-E601.SG-L
Client Sample ID: BH3-D



←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.

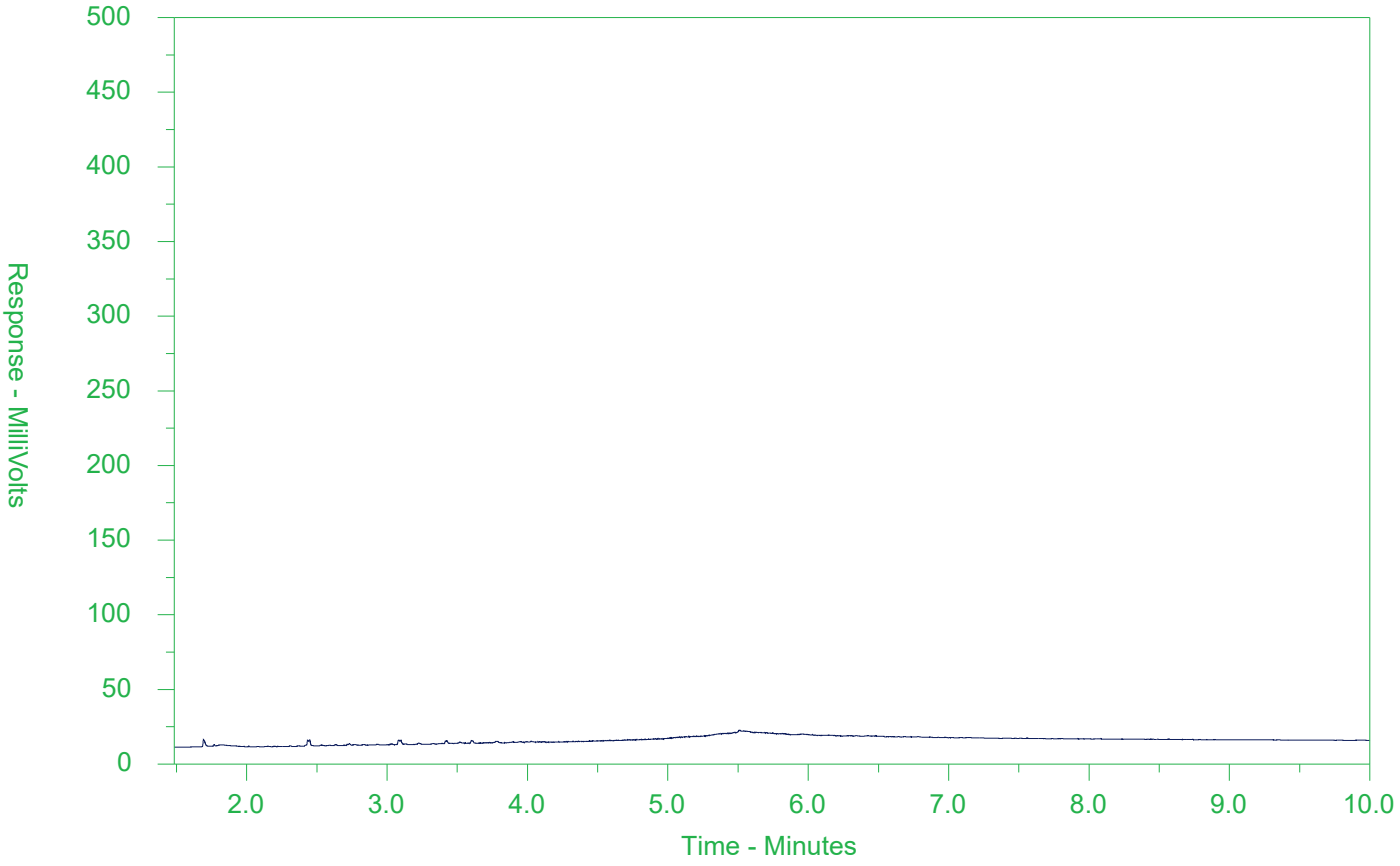
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-005-E601.SG-L
Client Sample ID: BH4-S



←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.

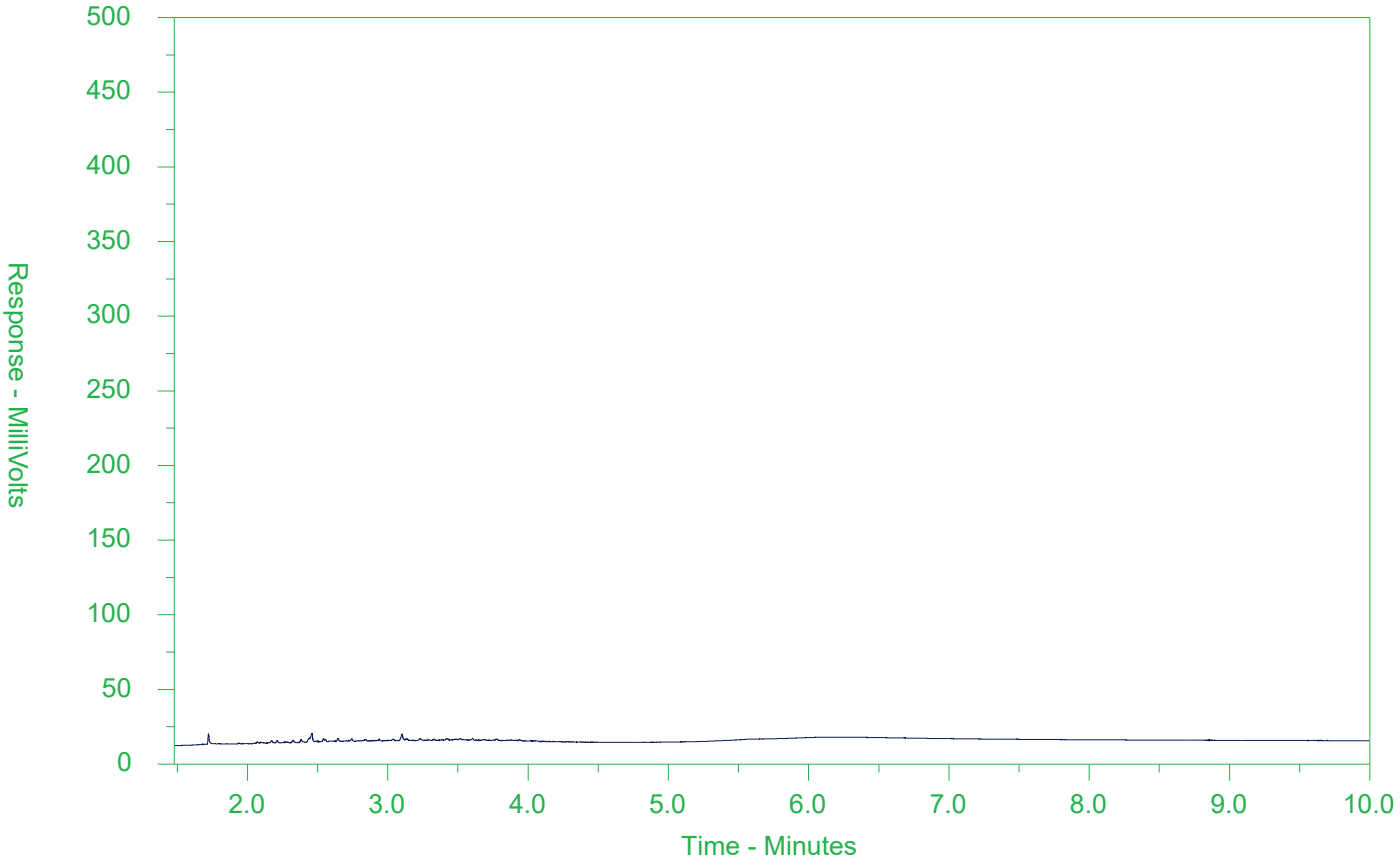
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-006-E601.SG-L
Client Sample ID: BH4-D



←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.

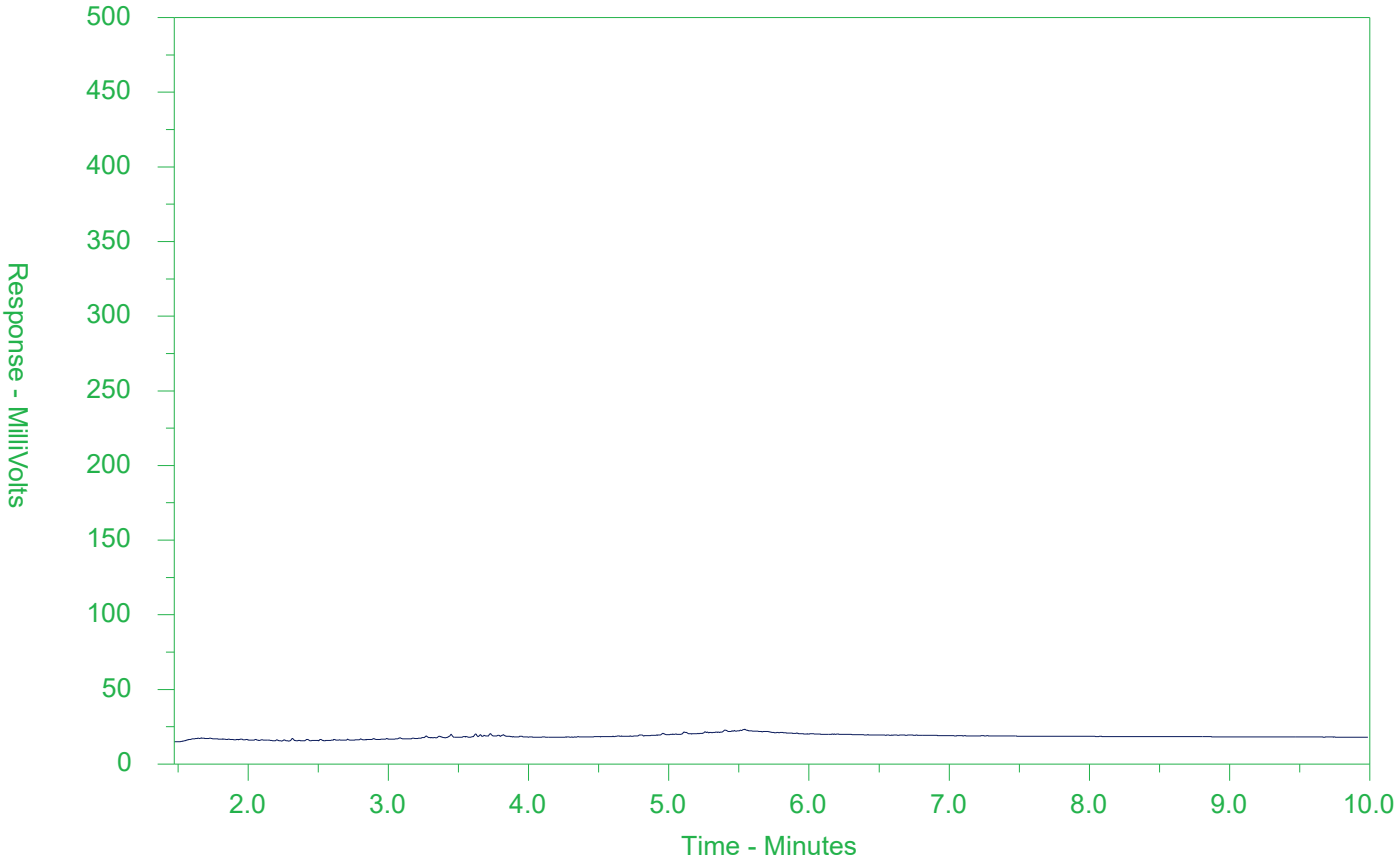
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-007-E601.SG-L
Client Sample ID: BH6-S



←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.

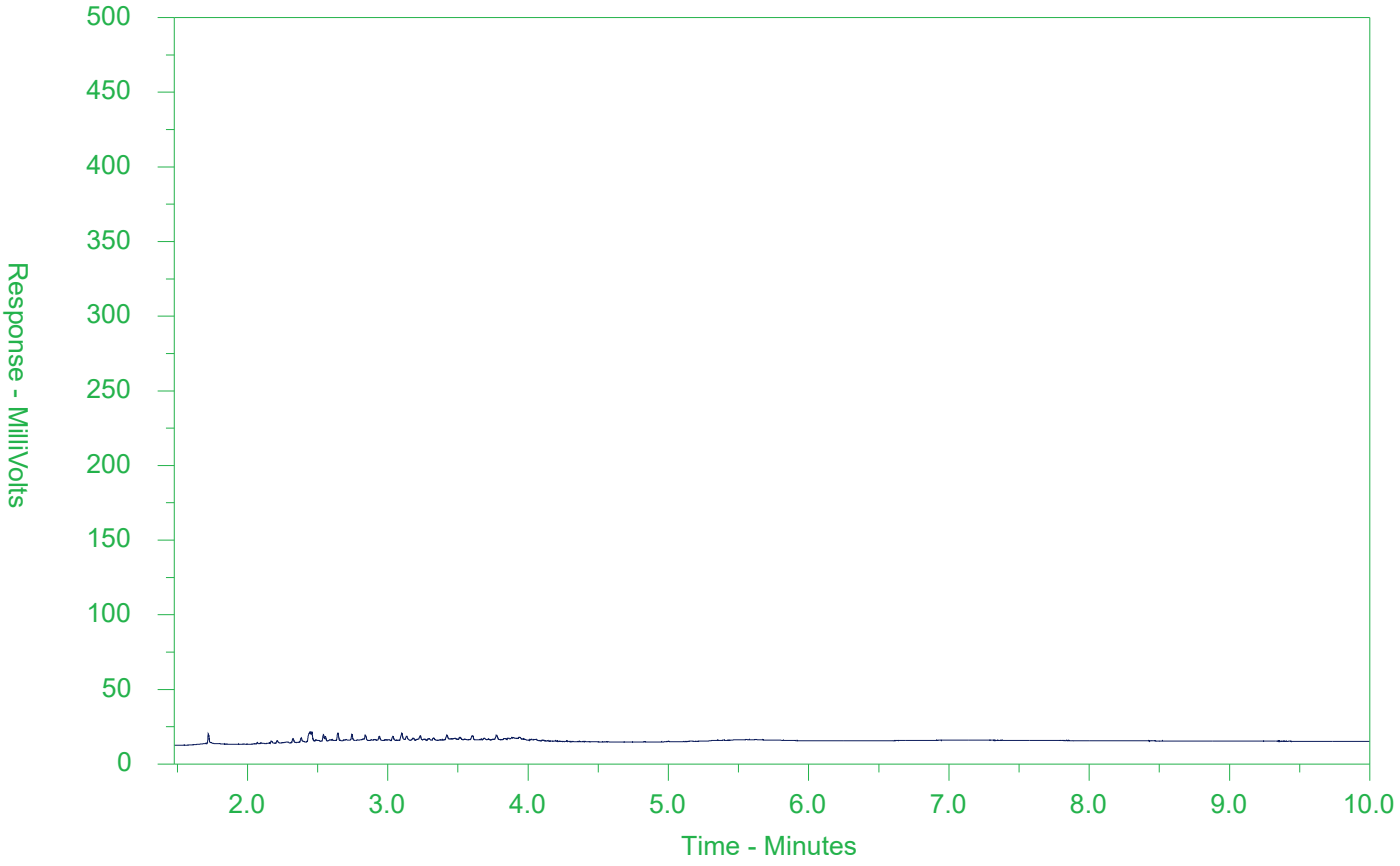
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-008-E601.SG-L
Client Sample ID: BH6-D



←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.

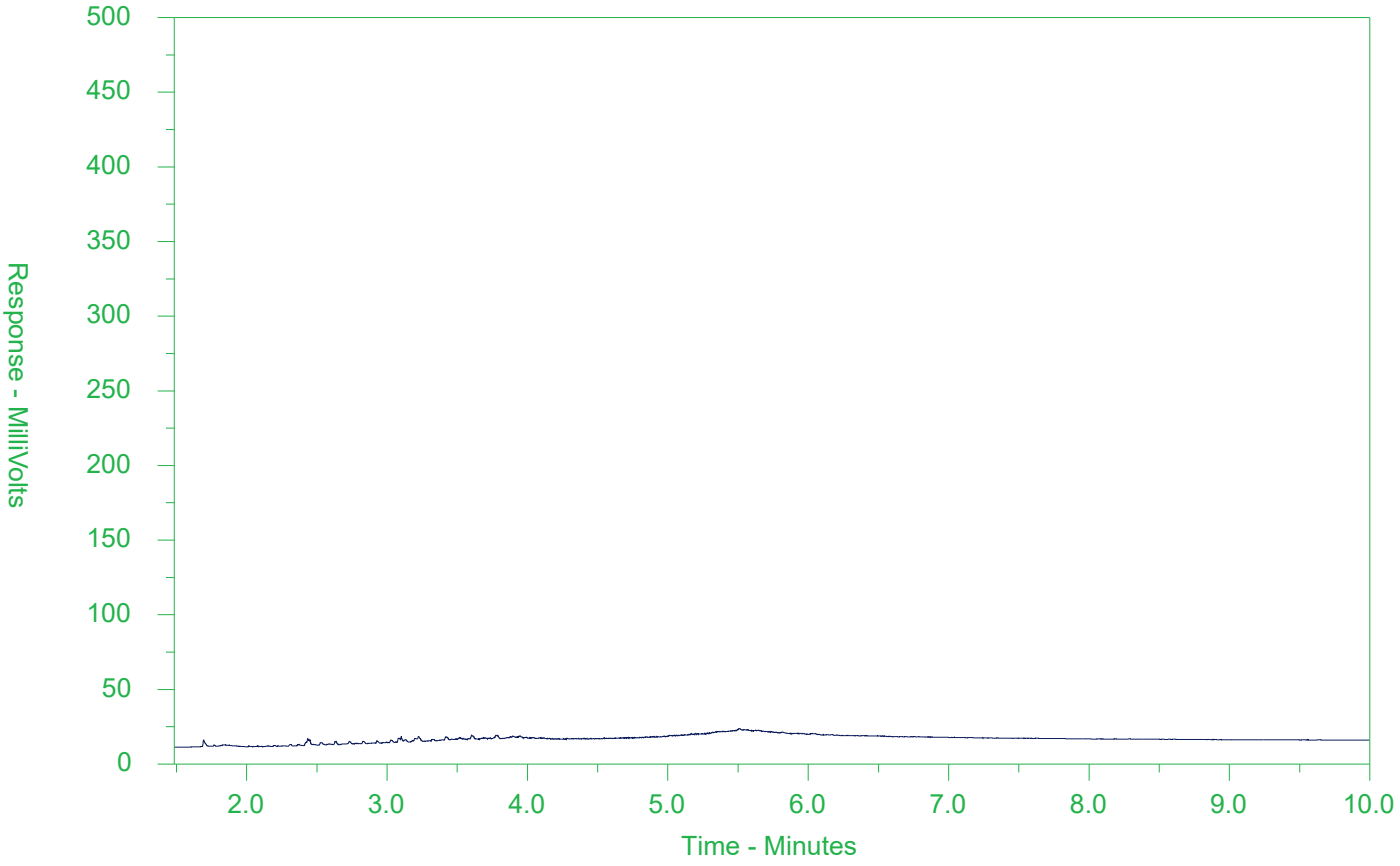
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-009-E601.SG-L
Client Sample ID: BH7-S



←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.

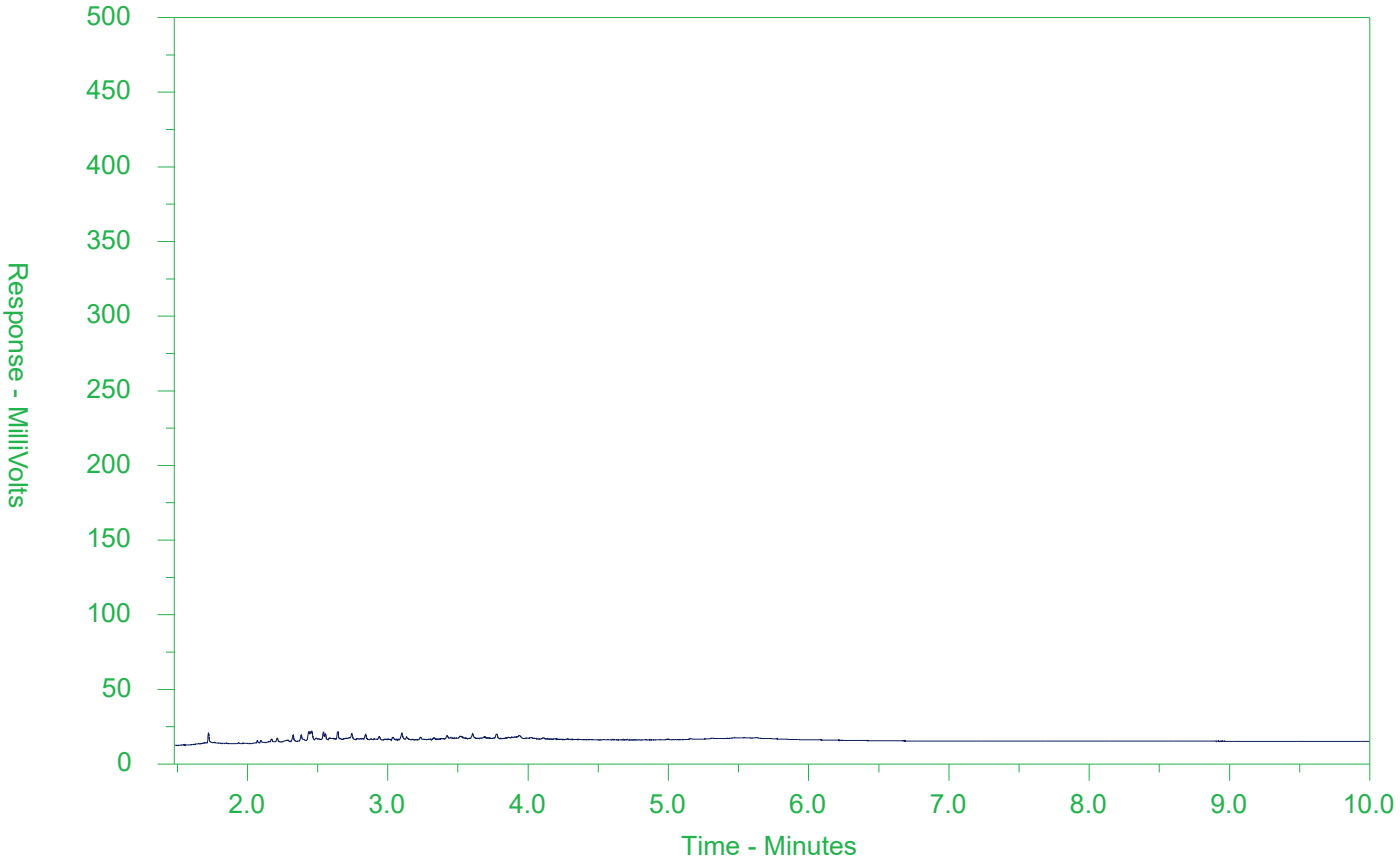
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-010-E601.SG-L
Client Sample ID: BH7-D



←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.

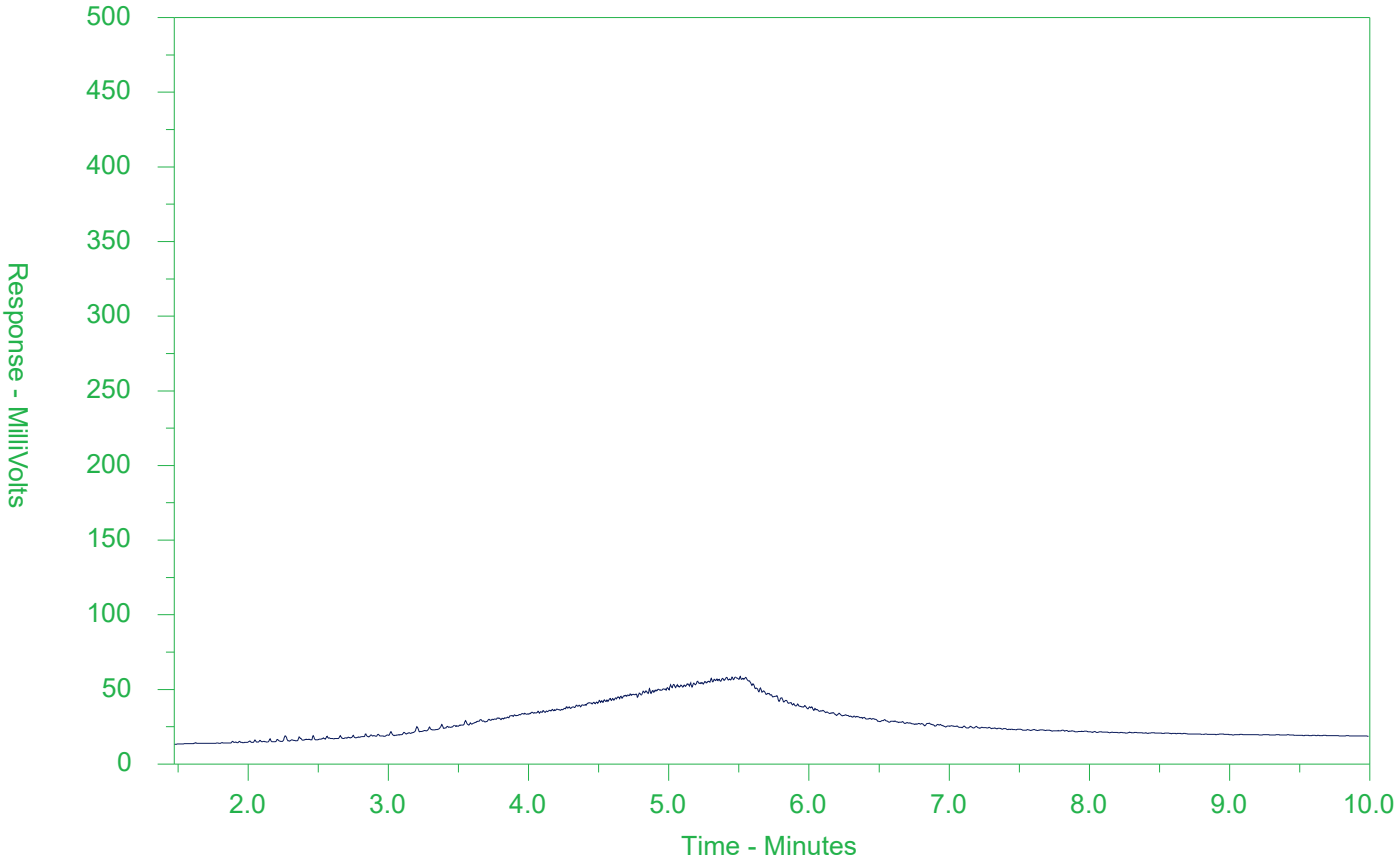
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-011-E601.SG-L
Client Sample ID: DUP-S



←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.

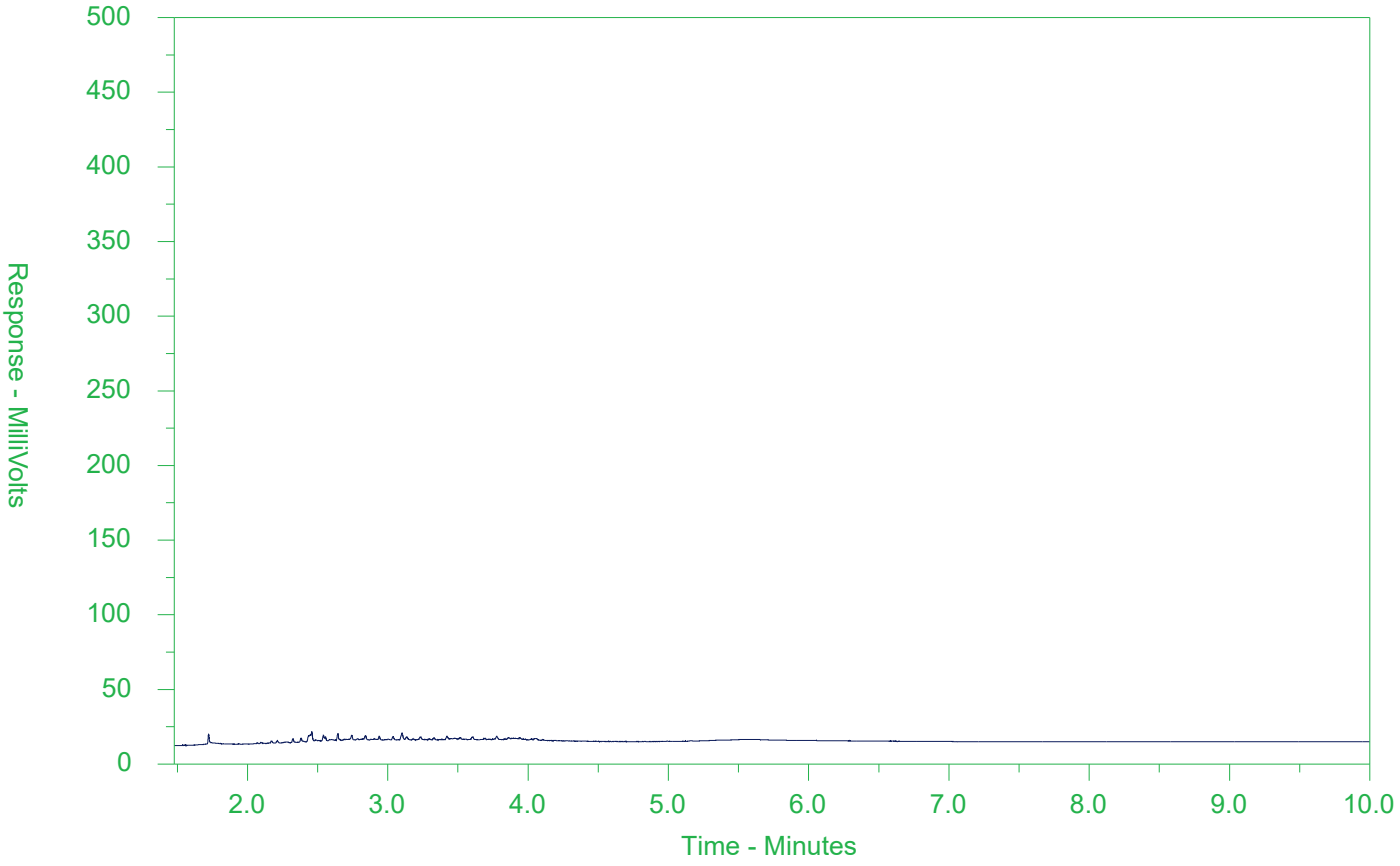
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2226131-012-E601.SG-L
Client Sample ID: DUP-D



←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.