Phase Two Environmental Site Assessment
381 Kent Street, Ottawa, Ontario

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Executive Summary

EXP Services Inc. (EXP) was retained by Katasa Groupe to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 381 Kent Street in Ottawa, Ontario hereinafter referred to as the 'Phase Two property'. The objective of the Phase Two ESA was to address areas of potential environmental concern (APEC) identified in a Phase One ESA conducted at the Phase Two property by EXP. It is understood that this report is required as part of the permitting process with the City of Ottawa. We understand that a Record of Site Condition (RSC) is required due to a proposed change to a more sensitive land use.

The findings of a Phase One ESA were presented in a report entitled *Phase One Environmental Site Assessment, 381 Kent Street, Ottawa, Ontario* dated November 18, 2021. The Phase One ESA identified the following APECs:

Table EX.1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase One property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, polycyclic aromatic hydrocarbons (PAH)	Soil
APEC #2	Phase One property, south property line	PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	PHC, BTEX	Groundwater
APEC #3	Phase One property, south property line	PCA #10 – Commercial Autobody Shops	Off-Site	PHC, VOC, Metals	Groundwater
APEC #4	Phase One property, south property line	PCA #0ther – Former heating oil spill	Off-Site	PHC, BTEX	Groundwater
APEC #5	Phase One property, south property line	PCA#10 – Commercial Autobody Shop	Off-Site	PHC, VOC, Metals	Groundwater

Based on the Phase One ESA findings, EXP recommended conducting a Phase Two ESA at the Phase Two property. The Phase Two ESA consisted of advancing boreholes and completing them as groundwater monitoring wells. Soil and groundwater samples were collected and submitted for laboratory analysis of one or more of the following parameters: BTEX and PHC, VOC, PAH and metals.

For assessment purposes, EXP selected the Site Condition Standards (SCS), provided in Table 3 of *Soil, Groundwater and Sediment Standards for use Under Part XV.1 of the Environmental Protection Act*, Ministry of the Environment, Conservation and Parks (MECP), 2011 for residential land use at a site with fine textured soil in accordance with Ontario Regulation 153/04 (as amended).

Based on the Phase Two ESA results, the following summary is provided:

- From November 30 to December 2, 2021, a total of 4 boreholes BH/MW21-1 to BH/MW21-4) were advanced at the Phase Two property and each were instrumented with a monitoring well.
- Fill was contacted beneath the pavement structure in all of the boreholes. The fill consists of gravel with some silt and sand. The fill contains a trace of brick debris. The fill extended to depths ranging from 1.1 m to 1.8 m. The fill in each borehole was underlain by a silty clay layer from 1.1 m to 6.1 m depths. Silty sand and gravel glacial till are present below the silty clay and extends to 7.6 m to 12.7 m depths. The glacial till contains shale fragments, cobbles and boulders. No staining or petroleum odours were observed in the fill or native soil.
- Dynamic cone and auger refusal was met in all boreholes from 7.6 m to 12.7 m depths. Conventional core drilling techniques were used to advance BH/MW21-1 and BH/MW21-4 beyond the auger refusal depths to termination depths of 20.35 m and 20.85 m confirming that auger refusal was met on shale bedrock.
- Groundwater elevations and water levels were measured at the Phase Two property on December 8, 2021. Groundwater was encountered at a depth of 2.80 m bgs in BH/MW21-2 and 5.80 m bgs in BH/MW21-4. No petroleum sheens were observed in the monitoring wells during either sampling event. Based on the groundwater elevations, the groundwater flow direction is to the southeast.
- Based on the results of the investigation, the concentrations of lead in BH/MW21-3, and barium, cobalt, vanadium and zinc in BH/MW21-4, and several PAH parameters in BH/MW21-2 and BH/MW21-3 exceeded the MECP Table 3 SCS. Both soil samples were collected from depths of 0.8 m to 1.4 m.
- All groundwater samples had concentrations of PHC and VOC that were less than the MECP Table 3 SCS, therefore no impacted groundwater was identified on the Phase Two property.
- It is recommended that the extent of impacted soil on the Phase Two property be delineated prior to being removed from the Phase Two property.

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1 Introduction

EXP Services Inc. (EXP) was retained by Katasa Groupe to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 381 Kent Street in Ottawa, Ontario hereinafter referred to as the 'Phase Two property'. The objective of the Phase Two ESA was to address areas of potential environmental concern (APEC) identified in a Phase One ESA conducted at the Phase Two property by EXP. It is understood that this report is required as part of the permitting process with the City of Ottawa as the site is to be redeveloped. We understand that a Record of Site Condition (RSC) is required due to a proposed change in land use from commercial to residential.

This report has been prepared in accordance with the Phase Two ESA standard as defined by Ontario Regulation 153/04 (as amended), and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third-party reliance are outlined in Section 7 of this report.

1.1 Site Description

The Phase Two property is located on the northeast corner of the intersection of Kent Street and James Street. The Phase Two property is irregular in shape and has an approximate area of 0.4 hectares (1.0 acres). The Phase Two property is occupied by a five-storey building containing various medical offices. A pharmacy and restaurant are present on the ground level. A Site Location Plan is provided as Figure 1 in Appendix A.

The Phase Two property is legally described as Lots 32, 33, 34 and 35, Plan 30671, N/S of James Street; Lots 32, 33 and 34, Plan 30671, S/S pf Gilmour Street; and Part Lot 35, Plan 30671, S/S of Gilmour Street, as in NS207100 City of Ottawa. The Phase Two property has the property identification number (PIN) 041190081.

The approximate Universal Transverse Mercator (UTM) coordinates for the Phase Two property centroid are Zone 18, 445476 m E and 5029047 m N. The UTM coordinates are based on measurements from Google Earth Pro, published by the Google Limited Liability Company (LLC). The accuracy of the centroid is estimated to be less than 10 m.

The closest body of water is the Rideau Canal approximately 1 km to the east. The Ottawa River is located approximately 1.2 km north of the Phase Two property. Topographically, the area slopes down to the north. Based on local topography, the groundwater flow at the Phase Two property is anticipated to be north towards the Ottawa River.

1.2 Property Ownership

At the time of the investigation, the Phase Two Property was owned by 11061917 Canada Incorporated.

Owner Contact: Ms. Chaxu Baria.
Katasa Groupe
69 rue Jean-Proulx Unit 301
Gatineau, QC J8Z 1W2

1.3 Current and Proposed Future Uses

At the time of the Phase Two ESA investigation, the Phase Two Property had a commercial land use. The future land use will be residential.

1.4 Applicable Site Condition Standards

Analytical results obtained for Phase Two property soil and groundwater samples were assessed against Site Condition Standards (SCS) as established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document Ontario Ministry of Environment, Conservation and Parks (MECP) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", ("SGWS" Standards), (MECP, 2011a). Tabulated background SCS (Table 1) applicable to environmentally sensitive Sites and effects based generic SCS (Tables 2 to 9) applicable to non-environmentally sensitive Sites are provided in MECP (2011a). The effects based SCS (Tables 2 to 9) are protective of human health and the environment for different groundwater conditions (potable and non-potable), land use scenarios (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil texture (coarse or medium/fine) and restoration depth (full or stratified).

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH (i.e. surface and subsurface soil), thickness and extent of overburden material, (i.e. shallow soil conditions), and proximity to an area of environmental sensitivity or of natural significance. For some chemical constituents, consideration is also given to soil textural classification with SCS having been derived for both coarse and medium-fine textured soil conditions.

For assessment purposes, EXP selected the MECP (2011) Table 3: Full Depth Generic Site Condition Standards (SCS) in a non-potable groundwater condition for a residential/parkland/institutional property use and fine textured soil. The selection of this category was based on the following factors:

- The predominant soil type on the Phase Two property was considered to be fine textured (refer to the results of the Grain Size Analysis as provided in the Certificates of Analysis presented in Appendix E);
- There was no intention to carry out a stratified restoration at the Phase Two property;
- More than two-thirds of the Phase Two property has an overburden thickness greater than 2 m;
- The Phase Two property is not located within 30 m of a surface water body or an area of natural significance;
- The soil at the Phase Two property has a pH value between 5 and 9 for surficial soils; and, between 5 and 11 for subsurface soils;
- The property is not within an area of natural significance; does not include, nor is it adjacent to an area of natural significance, nor is it part of such an area; and, it does not include land that is within 30 m of an area of natural significance, nor is it part of such an area;
- The Phase Two property is serviced by the City of Ottawa's water distribution system and the surrounding properties are municipally serviced; and,
- The Phase Two property is planned for future residential use.

2 Background Information

2.1 Physical Setting

The Phase Two property is located on the northeast corner of the intersection of Kent Street and James Street and has an area of 0.40 hectares and is shown on Figure 2. The property is currently occupied by a five-storey building containing various medical offices as shown in Figure 3 in Appendix A. A pharmacy and restaurant are present on the ground level. The remainder of the site is asphalt covered and used for commercial parking.

The Phase Two property is located within a municipally serviced area of the City of Ottawa (Figure 2 in Appendix A). Local Ontario Ministry of Environment, Conservation and Parks (MECP) water wells records show that bedrock is present at 8 - 10 m depths below ground surface. The bedrock in the general area is shale. With respect to surficial geology, beneath any fill, the Phase Two property is underlain by silty clay overlying gravel and sand glacial till.

The Phase Two property is zoned for residential use. The remainder of the properties in the Phase One study area are zoned primarily residential. Some mixed-use zoned properties are also present. The general topography of the are slopes down to the north. The inferred groundwater flow direction is north towards the Ottawa River.

2.2 First Developed Use Determination

Based on a review of historical aerial photographs, fire insurance plans and other records review, it appears the subject site was first developed with multiple residences prior to 1888. The residences were demolished, and the existing building and parking lot were constructed circa 1965.

2.3 Past Investigations

The following previous reports were provided to EXP for review.

- Revised Phase I Environmental Site Assessment, 381 Kent Street, Ottawa, Ontario, January 2018 by Pinchin Ltd.
- *Phase One Environmental Site Assessment 381 Kent Street, Ottawa, Ontario* dated November 18, 2021 prepared by EXP Services Inc.

The findings of the EXP Phase One ESA identified the following APECs:

Table 2.1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase One property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, polycyclic aromatic hydrocarbons (PAH)	Soil
APEC #2	Phase One property, south property line	PCA #0ther – Former heating oil spill	Off-Site (20 m south)	PHC, BTEX	Groundwater

The Phase One ESA was done in accordance with Regulation 153/04. Based on the results of the Phase One ESA, EXP recommended that a Phase Two ESA be completed to assess the soil and groundwater quality at the Phase Two property.

3 Scope of the Investigation

3.1 Overview of Site Investigation

The purpose of the Phase Two ESA was to investigate the soil and groundwater quality at the Phase Two property and to obtain soil and groundwater data to further characterize conditions in the surficial fill/shallow overburden soils.

It is understood that the Phase Two property is to be re-developed with a residential development. As part of the permitting process, the City of Ottawa requires that a Phase Two ESA be completed in accordance with Ontario Regulation 153/04 (as amended).

3.2 Scope of Work

The scope of work for the Phase Two ESA was as follows:

- Request local utility locating companies (e.g., cable, telephone, gas, hydro) to mark any underground utilities present at the Phase Two property;
- Retain a private utility locating company to mark any underground utilities present in the vicinity of the borehole locations and to clear the individual borehole locations;
- Advance a total of four (4) boreholes and complete them as groundwater monitoring wells;
- Collect representative soil samples for chemical analysis of metals, VOC, PAH, PHC, and BTEX;
- Collect representative groundwater samples for chemical analysis of VOC, PHC, and BTEX;
- Measure groundwater levels in the monitoring wells;
- Complete a survey of the borehole locations relative to a geodetic or other permanent benchmark and in reference with the Universal Transverse Mercator (UTM) coordinate system for vertical and horizontal control; and,
- Review the analytical data and prepare a report of the findings.

Mark Devlin B. Sc. and Jeremy Eckert conducted assessment work for this project and were supervised by Mark McCalla, P.Geo., QP_{ESA}. Mark McCalla is a qualified person as defined by O. Reg. 153/04.

3.3 Media Investigated

The Phase Two ESA included the investigation of on-site soil and groundwater. As there are no water bodies on the Phase Two property, no surface water or sediment sampling was required.

The potential contaminants of concern (PCOCs) identified in EXP's (2019) Phase One ESA were identified as target parameters for this Phase Two ESA. The areas of potential environmental concern (APEC) and PCOCs identified in the Phase One ESA are outlined in Table 2.1.

The rationale for the selection of borehole and monitoring well locations during this investigation are to place them on the property to assess the soil and groundwater conditions in the APECs. A copy of the Sampling and Analysis Plan prepared for the Phase Two property is provided in Appendix B.

3.4 Phase One ESA Conceptual Site Model

In order to develop a conceptual model for the Phase Two property and surrounding study area, the following physical characteristics and pathways were considered.

3.4.1 Current and Past Uses

Based on a review of historical aerial photographs, fire insurance plans and other records review, it appears the subject site was first developed with multiple residences prior to 1888. The residences were demolished, and the existing medical services building was constructed circa 1965.

3.4.2 Summary of Potentially Contaminating Activities

Ontario Regulation (O. Reg.) 153/04 defines a Potential Contaminating Activity (PCA) as one of fifty-nine (59) industrial operations set out in Table 2 of Schedule D that occurs or has occurred in the Phase One study area. The following PCA were identified for the Phase One property and the Phase One study area:

The following PCAs were identified:

- **PCA 1** – 301/303 Bank Street (190 m north) – Former automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 2** – 390 Bank Street (90 m east) – Former retail fuel outlet (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 3** – 428 Gladstone Avenue (130 m south) – Automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;
- **PCA 4** – 136 Florence Street (225 m southwest) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 5** – 431 Bank Street (200 m southeast) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 6** – 383 Bank Street (225 m southeast) – Storage garage with one 920-gallon fuel UST (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 7** – 282 Bank Street (220 m north) – Former Chinese laundry (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 8** – 429 Somerset Street W (190 m northwest) – Former retail fuel outlet with four fuel USTs (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 9** – 294 Bank Street (150 m west) – Former automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 10** – 294 Bank Street (150 m west) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;

- **PCA 11** – 443 Somerset Street W (190 north) – Former retail fuel outlet (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 12** – 3-9 Redstock Private (150 m north) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 13** – 498 Somerset Street W (210 m northwest) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 14** – 487 Gilmour Street (170 m east) – Former automotive service garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 15** – 390 Bank Street (90 m east) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 16** – 19 Florence Street (110 m east) – Former automotive service garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 17** – 19 Florence Street (110 m east) – Former fuel UST (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 18** – 450 Bank Street (240 m southeast) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 19** – 429 Kent Street (130 m south) – Retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;
- **PCA 20** – 433 Lyon Street (200 m southwest) – Ottawa Hydro substation (PCA #55 – Transformer Manufacturing, Processing and Use). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 21** – 310 Bank Street (150 m northeast) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 22** – 290 Kent Street (240 m north) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being down-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 23** – 410 Gladstone Avenue (180 m southwest) – ECA issued to Axle Automotive Inc. for a waste management system (PCA #58 – Waste Disposal and Waste Management, including thermal treatment, landfilling, and transfer of waste, other than use of biosoils as soil conditioners). As use of this waste management system is limited to the collection, handling and transportation of waste, and based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;

- **PCA 24** – 50 James Street (20 m south) – Former fuel oil spill (PCA# other – Fuel oil spill). This represents **APEC 2**;
- **PCA 25** – 410 Gladstone Avenue (180 m southwest) – Automotive service garage (PCA #10 – Commercial Autobody Shops). Based on the cross-gradient location and distance from the Site, this does not result in an APEC;
- **PCA 26** – Phase One property – Previous investigations identified fill material on the Phase One property (PCA #30 – Imported Fill Material of Unknown Quality). This represents **APEC 1**;
- **PCA 27** – 422 Gladstone Avenue (180 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance this does not result in an APEC;
- **PCA 28** – 426 Gladstone Avenue (180 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance this does not result in an APEC;
- **PCA 29** – 457 Gladstone Avenue (150 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;

No other PCAs that took place within the vicinity of the Phase One property (approximately 250 m radius) were identified.

3.4.3 Areas of Potential Environmental Concern

Ontario Regulation 153/04 defines an APEC as an area on a property where one or more contaminants are potentially present. Based on this Phase Two ESA, the following APEC was identified:

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase One property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, polycyclic aromatic hydrocarbons (PAH)	Soil
APEC #2	Phase One property, south property line	PCA #0ther – Former heating oil spill	Off-Site (20 m south)	PHC, BTEX	Groundwater

The above APECs were identified on the Phase Two property as shown on Figures 4 and 5 in Appendix A. It is noted that any uncertainty or absence of information has the ability to affect the Phase One Conceptual Site Model. However, based on the information and findings presented within the Phase One ESA, it is EXP's opinion that any uncertainty would be minimal, and it would not alter the validity of the model presented above.

3.4.4 Topography and Geology

There are no water bodies on the Phase One property. The closest body of water is the Rideau Canal approximately 1 km to the east. The Ottawa River is located approximately 1.2 km north of the Phase One property. Topographically, the Phase One study area slopes down to the north. Based on local topography, the groundwater flow at the Phase One property is anticipated to be north towards the Ottawa River.

Based on the surficial geology map examined, beneath any fill, the surficial geology of the subject site is characterised by fine textured glaciomarine deposits of silt and clay. An examination of the bedrock geology map shows the subject

site is underlain by limestone, dolostone and shale of the Ottawa Group. The depth to bedrock is approximately 8 to 10 m below grade.

3.4.5 Estimated Groundwater Flow Direction

Topographically, the Phase One study area slopes down to the north. Based on local topography, the groundwater flow at the Phase One property is anticipated to be north towards the Ottawa River.

3.4.6 Underground Utilities

The Phase Two property is connected to the municipal water and sewage systems, the natural gas distribution network, and overhead Hydro/telephone/cable lines.

3.5 Deviations from Sampling and Analysis Plan

The field investigative and sampling program was carried out following the requirements of the Site Sampling and Analysis Plan (SAAP in Appendix B). No significant deviations from the Sampling and Analysis Plan were reported that affected the sampling and data quality objectives for the Phase Two property.

3.6 Impediments

No physical impediments were encountered during the field investigation. The entire Phase Two property was accessible at the time of the investigation.

4 Investigation Method

4.1 General

The Phase Two property investigative activities consisted of drilling boreholes to facilitate the collection of soil samples for chemical analysis and the installation of monitoring wells for hydrogeological property characterization and the collection of groundwater samples for chemical analysis.

4.2 Borehole Drilling

Prior to the commencement of drilling, the locations of underground public utilities including telephone, natural gas and electrical lines were marked at the Phase Two property by locating companies. A private utility locating contractor was also retained to clear the individual borehole locations.

From November 30 to December 2, 2020, a total of 4 boreholes (BH/MW21-1 to BH/MW21-4) were advanced at the Phase Two property by Marathon Drilling, a licensed well contractor, under the full-time supervision of EXP staff. A truck mounted CME drill rig with split spoon samplers was used to collect the soil samples. A monitoring well was installed in each of the boreholes to facilitate groundwater sampling. The locations of the boreholes and monitoring wells are presented on Figure 4 in Appendix A.

No petroleum-based greases or solvents were used during drilling activities. EXP staff continuously monitored the drilling activities and recorded the depth of soil sample collection and total depth of boring. Field observations are summarized on the borehole logs provided in Appendix C.

The split spoon samplers were decontaminated between sampling intervals by the drilling contractor using a potable water/phosphate-free detergent solution followed by rinses with potable water. A tube sampler with a disposable acetate liner was used by Strata soil to collect the soil samples.

4.3 Soil: Sampling

The soil sampling during the completion of this Phase Two ESA was undertaken in general accordance with the SAAP presented in Appendix B.

Soil samples for geologic characterization were collected on a continuous basis in the overburden materials using 5 cm diameter, 61 cm long, split spoon samplers advanced into the subsurface using the drilling rig. The soil cores were removed from the samplers upon retrieval by drilling personnel. Geologic details of the recovered cores were logged by EXP field staff. EXP staff continuously monitored the drilling activities to log the stratigraphy observed from the recovered soil cores, to record the depth of soil sample collection, to record total depths of borings, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix C.

Soil samples identified for possible laboratory analysis were collected from the split spoon sampler and placed directly into pre-cleaned, laboratory-supplied glass sample jars/vials. Samples to be analysed for VOC, PHC fraction F1 and BTEX were collected using a soil core sampler and placed into vials containing methanol as a preservative. The jars and vials were sealed with Teflon-lined lids to minimize head-space and reduce the potential for induced volatilization during storage/transport prior to analysis. All soil samples were placed in clean coolers containing ice prior to and during transportation to the subcontract laboratory, Bureau Veritas (BV) of Ottawa, Ontario. The samples were transported/submitted within 24 hours of collection to the laboratory following chain of custody protocols for chemical analysis.

4.4 Field Screening Measurements

Where there was sufficient recovery, readings of petroleum vapour concentrations in the soil samples collected during the drilling investigation were recorded using a RKI Eagle 2. This instrument is designed to detect and measure concentrations of combustible gas in the atmosphere to within 5 parts per million by volume (ppmv) from 0 ppmv to 200 ppmv, 10 ppmv increments from 200 ppmv to 1,000 ppmv, 50 ppmv increments from 1,000 ppmv to 10,000 ppmv, and 250 ppmv increments above 10,000 ppmv. It is equipped with two ranges of measurement, reading concentrations in ppmv or in percentage lower explosive limit (% LEL). The RKI Eagle 2 instrument can determine combustible vapour concentrations in the range equivalent to 0 to 11,000 ppmv of hexane.

The instrument was configured to eliminate any response from methane for all sampling conducted at the subject property. Instrument calibration is checked on a daily basis in both the ppmv range and % LEL range using standard gases comprised of known concentrations of hexane (400 ppmv, 40% LEL) in air. If the instrument readings are within ±10% of the standard gas value, then the instrument is deemed to be calibrated, however if the readings are greater than ±10% of the standard gas value then the instrument is re-calibrated prior to use.

A portion of each soil sample collected from the boreholes was placed in a sealed "zip-lock" plastic bag and allowed to reach ambient temperature prior to field screening using an RKI Eagle combustible vapour meter, calibrated to hexane. The samples are left to equilibrate within the bag at a temperature above 15^{o}C for thirty minutes before measurement of the peak headspace concentration is taken. The measurements were made by inserting the instrument's probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These readings provide a real-time indication of the relative concentration of combustible vapours encountered in the subsurface during drilling and are used to aid in the assessment of the vertical and horizontal extent of contamination and the selection of soil samples for analysis The field screening measurements, in parts per million (ppm) hexane equivalents, are presented with the borehole logs provided in Appendix C.

4.5 Soil Sample Submission

Soil samples were selected for laboratory analysis based on combustible vapour measurements and visual and olfactory evidence of impacts, where observed. One worst case soil sample from each borehole was submitted for laboratory analysis of metals, VOC, PAH, PHC, and/or BTEX.

4.6 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed in the four boreholes. The monitoring wells were installed in general accordance with the Ontario Water Resources Act - R.R.O. 1990, Regulation 903 (as-amended).

The monitoring wells consisted of a 3.0 m length of 37 mm diameter Schedule 40 PVC screen and an appropriate length of PVC riser pipe. The annular space around the well was backfilled with sand to an average height of 0.3 m above the top of the screen. A bentonite seal was added from the top of the sand pack to approximately 0.3 m below ground surface. The monitoring wells were completed with flush mount protector at the surface grade. Details of the monitoring well installations are shown on the Borehole Logs provided in Appendix C.

The installation details of the installed monitoring wells are summarized in Table 4.1.

Table 4.1: Monitoring Well Installation Details

Monitoring Well/Piezometer	Ground Elevation (MASL)	Top of Sand Elevation (m)	Top of Screen Elevation (m)	Bottom of Screen Elevation (m)	Bottom of Borehole Elevation (m)	Depth of Borehole (mbgs)
BH/MW21-1	72.47	69.67	69.37	66.37	52.10	20.35
BH/MW21-1	72.66	69.86	69.56	66.56	60.00	12.66
BH/MW21-1	72.44	69.64	69.34	66.34	64.80	7.63
BH/MW21-1	72.00	68.20	67.90	64.90	51.10	20.85

Note: Elevations were collected using a high precision GPS unit and a geodetic datum was established at the Phase Two Property.

mbgs – metres below ground surface

TOC - top of plastic well casing

When the monitoring wells are no longer required, they must be decommissioned in accordance with the procedure outlined in the Ontario Water Resources Act - R.R.O. 1990, Regulation 903 - Amended to O. Reg. 128/03.

Measures taken to minimize the potential for cross contamination or the introduction of contaminants during well construction included:

- The use of well pipe components (e.g. riser pipe and well screens) with factory machined threaded flush coupling joints;
- Construction of wells without the use of glues or adhesives;
- Removing the protective plastic wraps from well components at the time of borehole insertion to prevent contact with the ground and other surfaces;
- Cleaning of augers between sampling locations; and,
- The use of hollow stem augers to prevent loose and potentially contaminated material in overlying layers from sloughing into the boreholes and coming into contact with groundwater.

4.7 Groundwater: Field Measurement of Water Quality Parameters

The static water level was measured, the depth of each well was recorded and the well sampled. EXP used an interface probe to measure the possible presence of light non-aqueous phase liquid (LNAPL) in the monitoring well. The meter was calibrated by Pine Environmental Limited prior to the fieldwork using standard pH and conductivity solution.

4.8 Groundwater: Sampling

Groundwater samples were collected from the monitoring wells on December 8, 2021. The monitoring activities consisted of measuring the depth to groundwater in each monitoring well so that groundwater flow and direction below the Phase Two Property could be assessed. The water level measurements were recorded on water level log sheets. The water level meter probe was decontaminated between monitoring well locations with a spray bottle of water and alconox solution, paper towel, then potable water.

The well was then sampled using a "low flow" technique whereby the well was continuously purged using an electric pump (equipped with dedicated tubing) and parameters within the purged water were monitored using a groundwater chemistry multi-meter probe (YSI 550) at 3 minute intervals. These parameters include: pH, conductivity, temperature, and salinity. Once these parameters were found to deviate less than 10% over three testing events, equilibrium was deemed to have occurred and a sample of the groundwater was collected.

The purge water was also continuously monitored for visual and olfactory evidence of petroleum and solvent impact (sheen and odour). The groundwater sampling during the completion of this Phase Two ESA was undertaken in accordance with the Sampling and Analysis Plan presented in Appendix B.

The groundwater samples were collected in laboratory provided sample bottles and submitted to the analytical laboratory for analysis of VOC, PHC, and BTEX. The groundwater samples were placed in clean coolers containing ice prior to and during transportation to the subcontract laboratory.

4.9 Sediment: Sampling

As no water body was present at the Phase Two Property, sediment sampling was not part of the Phase Two ESA.

4.10 Analytical Testing

The contracted laboratory selected to perform chemical analysis on all soil and water samples was Bureau Veritas (BV). BV is an accredited laboratory under the Standards Council of Canada/Canadian Association for Laboratory Accreditation in accordance with ISO/IEC 17025:1999- *General Requirements for the Competence of Testing and Calibration Laboratories*.

4.11 Elevation Surveying

An elevation survey was conducted to obtain vertical control of the newly installed monitoring well locations. The top of casing and ground surface elevation of each monitoring well location was surveyed using a high precision GPS unit.

4.12 Residue Management

The drill cuttings were placed in steel drums at the Phase Two property.

Purge water was also stored in steel drums at the Phase Two property. This water will be disposed of by a licensed waste contractor. The fluids from equipment cleaning are handled by the driller at their facility.

4.13 Quality Assurance and Quality Control Measures

A QA/QC program was also implemented to ensure that the analytical results received are accurate and dependable. A QA/QC program is a system of documented checks that validate the reliability of the data collected regarding any given site. Quality Assurance is a system that ensures that quality control procedures are correctly performed and documented. Quality Control refers to the established procedures observed both in the field and in the laboratory, designed to ensure that the resulting end data meet intended quality objectives. The QA/QC program implemented by EXP incorporated the following components:

- Collection and analysis of blind duplicate soil and groundwater samples to ensure analytical precision;
- Using dedicated and/or disposal sampling equipment;
- Using a trip blank for BTEX during sampling;
- Following proper decontamination protocols to minimize cross-contamination;

- Maintaining field notes and completing field forms to document on-site activities; and,
- Using only laboratory supplied sample containers and following prescribed sample protocols, including proper preservation, meeting sample hold times, proper chain of custody documentation, to ensure integrity of the samples.

The laboratories' QA/QC program involved the systematic analysis of control standards for the purpose of optimizing the measuring system as well as establishing system precision and accuracy and included calibration standards, method blanks, reference standards, spiked samples, surrogates and duplicates.

5 Review and Evaluation

5.1 Geology

The detailed soil profiles encountered in the boreholes are provided on the borehole logs found in Appendix C. Boundaries of soils indicated on the logs are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change. A brief description of the soil stratigraphy at the Phase Two property, in order of depth, is summarized in the following sections.

5.1.1 Fill Material

Fill was contacted beneath the pavement structure in all of the boreholes. The fill consists of gravel with some silt and sand. The fill contains a trace of brick debris. The fill extended to depths ranging from 1.1 m to 1.8 m. No staining or petroleum odours were observed in the fill material.

5.1.2 Native Material

The fill in each borehole was underlain by a silty clay layer from 1.1 m to 6.1 m depths. Silty sand and gravel glacial till are present below the silty clay and extend to 7.6 m to 12.7 m depths. The glacial till contains shale fragments, cobbles and boulders. No staining or petroleum odours were observed in the native soil.

The grain size analyses showed that more than 50% of the soil had a grain size of silt or finer. This indicates that the native soil is fine grained. The results of the grain size analyses are found in Appendix A.

5.1.3 Bedrock

Dynamic cone and auger refusal was met in all boreholes from 7.6 m to 12.7 m depths. Conventional core drilling techniques were used to advance BH/MW21-1 and BH/MW21-4 beyond the auger refusal depths to termination depths of 20.35 m and 20.85 m confirming that auger refusal was met on shale bedrock.

5.2 Aquifers

In the Ottawa area, the regional aquifers consist of both bedrock and overburden sources, with the two key aquifers consisting of the highly weathered and fractured portion of the upper bedrock surface and overlying sand and gravel deposits (contact zone aquifer) and deeper bedrock aquifers.

In southeastern Ontario, there are four main bedrock aquifers (Singer et al., 2003):

- Nepean-March-Oxford Aquifer
- Rockcliffe Aquifer
- Ottawa Group Aquifer
- Billing-Carlsbad-Queenston Aquifer

In the vicinity of the Phase Two Property, the primary bedrock aquifer is the Ottawa Group. This aquifer is considered to have good water yielding capacity with generally fair to good water quality (RRCA and SNCA, 2008).

The contact zone aquifer, which generally includes the sand and gravel deposits and underlying fractured bedrock, is present across the Ottawa region, with more than 90% of the water extracted in eastern Ontario is extracted from the Contact Zone Aquifer (RRCA and SNCA, 2008). The contact zone aquifer varies in thickness across the region due to the large variation in the zone of upper bedrock fracturing.

Regional groundwater flow in both the contact zone and bedrock have been interpreted to be to the northeast towards the Ottawa River, generally following bedrock topography.

Recharge of aquifers regionally is limited due to the confining silty clay layer resulting from the former Champlain Sea. It has been estimated that only 10% of precipitation that falls in the Ottawa region infiltrates into the ground to recharge the aquifers, with the remainder of the precipitation being lost to evapotranspiration or runoff to rivers and lakes (City of Ottawa, 2011).

5.3 Groundwater: Elevations and Flow Direction

The monitoring well network advanced as part of this Phase Two ESA consists of four monitoring wells screened within the overburden at the Phase Two property.

Groundwater elevations and water levels were measured at the Phase Two property on December 8, 2021 and again on January 28, 2022. Groundwater was encountered at a depth of 2.80 m bgs in BH/MW21-2 and 5.80 m bgs in BH/MW21-4. No petroleum sheens were observed in the monitoring wells during either sampling event.

A summary of the elevation survey and groundwater levels for each well are shown on Table 5.1.

Table 5.1: Groundwater Elevations

Monitoring Well ID	Ground Elevation (MASL)	December 8, 2021		January 28, 2022	
		Water Level (mbg)	Water Level (MASL)	Water Level (mbg)	Water Level (MASL)
MW21-1	72.47	2.84	69.63	3.33	69.14
MW21-2	72.66	2.80	69.86	3.50	69.16
MW21-3	72.44	5.55	66.89	NA	NA
MW21-4	72.00	5.80	66.20	5.79	66.21

Note: Elevations were referenced using a high precision GPS unit and a geodetic datum was established at the Phase Two Property.
mbtoc – metres below top of plastic well casing
mASL – metres above sea level
NA – not applicable

Based on the groundwater elevations from December 8, 2021 and January 28, 2022, the groundwater flow direction is to the southeast as shown on Figure 5 in Appendix A. EXP notes that groundwater flow direction and level can be influenced by utility trenches and other subsurface structures and may migrate in the bedding stone of nearby subsurface utility trenches.

5.4 Groundwater: Hydraulic Gradients

The horizontal hydraulic gradients for the groundwater flow components identified in the overburden aquifer based on the December 2021 groundwater elevations and was 0.055. Vertical gradients were not measured.

5.5 Single Well Response Tests (SWRTs) Analysis

Single well response tests were conducted on BH/MW21-2 and BH/MW21-4 as a part of this Phase Two ESA. The calculated hydraulic conductivity of the silty clay ranged from 1.2×10^{-8} m/s to 4.0×10^{-7} m/s.

5.6 Soil Texture

Based on the grain size analysis of three soil samples, the soil texture at the water table at the Phase Two property was assessed to be fine textured (refer to the three grain-size/hydrometer analyses in Appendix A) consisting of silty clay. Therefore, the soil texture is fine grained.

5.7 Soil: Field Screening

Field screening involved using the combustible vapour meter to measure vapour concentrations, in parts per million volume (ppmv) hexane equivalent, in the collected soil samples in order to assess the presence of soil gases which would imply potential petroleum hydrocarbon impact. The vapour readings obtained during the drilling activities are presented on the borehole logs in Appendix C. As indicated, all boreholes have vapour readings ranging from 0 ppm to 45 ppmv.

Inspection of the soil cores retrieved from the boreholes did not indicate the presence of sheen, the presence of a separate organic phase, or other evidence of a non-aqueous phase liquid (NAPL) either in the surficial fill or overburden soil materials. No petroleum staining was observed in any of the soil samples.

5.8 Soil Quality

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes. The selection of representative “worst case” soil samples from each borehole was based on field visual or olfactory evidence of impacts and/or presence of potential water bearing zones. Summaries of the soil analytical results are found in Appendix D. Copies of the laboratory Certificates of Analysis for the tested soil samples are provided in Appendix E.

The MECP Table 3 SCS are applicable if soil pH is in the range of 5 to 11 for subsurface soil (greater than 1.5 m below soil surface). The Certificates of Analysis includes a pH measurement taken from the subsurface. Three soil samples were submitted for pH analysis with results of 6.06 to 7.73. The pH values were within the acceptable range for the application of MECP Table 3 SCS.

5.8.1 Petroleum Hydrocarbons

Four (4) soil samples and one blind duplicate were submitted for PHC and BTEX analyses. The concentrations of PHC and BTEX measured in the analysed soil samples were less than the MECP 2011 Table 3 SCS as shown in Table 1 in Appendix D. The PHC concentrations in soil are shown on Figure 6 and on cross-sections shown on Figure 10.

5.8.2 Volatile Organic Compounds

Four (4) soil samples and one blind duplicate were submitted for VOC analyses. The concentrations of VOC measured in the analysed soil samples were less than the MECP 2011 Table 3 SCS, as shown in Table 2 in Appendix D. The VOC concentrations in soil are shown on Figure 6 and on cross-sections shown on Figure 10.

5.8.3 Polycyclic Aromatic Hydrocarbons

Four (4) soil samples and one blind duplicate were submitted for PAH analyses. As shown in Table 3 in Appendix D, the concentrations of PAH measured in the analysed soil samples were less than the MECP 2011 Table 3 SCS, with the exception of several PAH parameters in the soil samples from BH/MW21-2 and BH/MW21-3, both collected at a depth of 0.8 m to 1.4 m. The PAH concentrations in soil are shown on Figure 8 and on cross-sections shown on Figure 11.

5.8.4 Metals

Four (4) soil samples and one blind duplicate were submitted for metals analyses. The concentrations of lead in BH/MW21-3 and barium, cobalt, vanadium and zinc in BH/MW21-4 exceeded the MECP Table 3 SCS. Both soil samples were collected from depths of 0.8 m to 1.4 m. The concentrations of metals measured in the remaining analysed soil samples were less than the MECP 2011 Table 3 SCS, as shown in Table 4 in Appendix D. The metals concentrations in soil are shown on Figure 7 and on cross-sections shown on Figure 12.

5.8.5 Chemical Transformation and Soil Contaminant Sources

There were two soil samples, located in the parking lot at a depth of 0.8 m to 1.4 m that had concentrations of metals and several PAH that exceeded the MECP Table 3 SCS. Chemical transformations are a concern at the Phase Two property. Since there is a separation of 1.4 m from the soil to the groundwater table, it is not expected that these parameters could be acting as a contaminant mass that could impact the Phase Two property 's groundwater. The maximum soil concentrations are presented in Table 5.

5.8.6 Evidence of Non-Aqueous Phase Liquid

Inspection of the soil cores retrieved from the boreholes did not indicate the presence of non-aqueous phase liquid (NAPL), staining or sheen. No petroleum odours were observed during soil sampling activities. NAPLs are not expected to be present at the Phase Two property.

5.9 Groundwater Quality

Representative groundwater samples were collected from the monitoring wells to assess groundwater quality at the Phase Two property. Evidence of free phase product (i.e. visible film or sheen), and odour was not noted during well development or purging.

The groundwater analytical results are summarized on Tables 6 and 7 in Appendix D and the Certificates of Analysis are enclosed in Appendix E.

5.9.1 Petroleum Hydrocarbons

Four (4) groundwater samples and one blind duplicate were submitted for the chemical analysis of PHC and BTEX. As shown in Table 6 in Appendix D, the concentrations of PHC and BTEX parameters in the groundwater samples were non-detect or below the MECP Table 3 SCS. The PHC concentrations in groundwater are shown on Figure 9 and on cross-sections shown on Figure 13.

5.9.2 Volatile Organic Compounds

Four (4) groundwater samples and one blind duplicate, a field blank and a trip blank were submitted for the chemical analysis of volatile organic compounds (VOC). As shown in Table 7 in Appendix D, the concentrations of VOC parameters in the groundwater samples were non-detect or below the MECP Table 3 SCS. The VOC concentrations in groundwater are shown on Figure 9 and on cross-sections shown on Figure 13.

5.9.3 Chemical Transformation and Contaminant Sources

There were no exceedances of the MECP Table 3 SCS. The maximum groundwater concentrations are presented in Table 8.

5.9.4 Evidence of Non-Aqueous Phase Liquid

Inspection of the groundwater monitoring wells did not indicate the presence of non-aqueous phase liquid (NAPL), staining or sheen. Odours were not observed during groundwater sampling activities. NAPLs are not expected to be present at the Phase Two property.

5.10 Sediment Quality

As there were no water bodies on the Phase Two property, surface water and sediment sampling were not required.

5.11 Quality Assurance and Quality Control Results

Quality assurance and quality control measures were taken during the field activities to meet the objectives of the sampling and quality assurance plan to collect unbiased and representative samples to characterize existing conditions in the fill/upper overburden materials and groundwater at the Phase Two property. QA/QC measures, as described in Section 4.13, included:

- Using dedicated and/or disposal sampling equipment;
- Following proper decontamination protocols to minimize cross-contamination;
- Maintaining field notes and completing field forms to document on-site activities; and,
- Using only laboratory supplied sample containers and following prescribed sample protocols, including proper preservation, meeting sample hold times, proper chain of custody documentation, to ensure integrity of the samples.

Review of field activity documentation indicated that recommended sample volumes were collected from groundwater for each analytical test group into appropriate containers and preserved with proper chemical reagents in accordance with the protocols set out in the *Protocol for Analytical Methods used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* (MOE, 2004). Samples were preserved at the required temperatures in insulated coolers and met applicable holding time requirements, when relinquished to the receiving laboratory. Where the concentrations of the analyzed representative soil sample and/or the duplicate were not greater than five times the laboratory MDL, RPDs could not be calculated. The results of the analyses where the concentrations were at least five times the laboratory MDL compared to the duplicate sample concentrations were within an acceptable degree of variance. The RPD results are found in Tables 9 to 14 in Appendix D. Since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, alert limits for field duplicates are two times the laboratory RPD.

Duplicate soil sample pairs BH/MW21-2 SS5 and its duplicate DUP 1, and BH/MW21-4 SS2 and its duplicate DUP 2 were submitted for chemical analysis of BTEX, PHC, VOC, PAH, and/or metals. For QA/QC purposes, the analytical sample results are quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. The concentrations of VOC and PHC were less than the laboratory reported detection limits for both the primary and duplicate samples. The RPD for PAH pair had RPDs that were less than the alert limits. However, several of the RPDs for metals in the duplicate pair exceeded the alert levels indicating heterogeneity of the samples.

The RPD for PHC and VOC in the groundwater sample pairs (BH/MW21-4 and its duplicate DUP-1) were less that the alert limits.

Certificates of Analysis were received from laboratory reporting the results of all the chemical analyses performed on the submitted soil and groundwater samples. Copies of the laboratory Certificates of Analysis are provided in Appendix E. A review of the Certificates of Analysis prepared by the laboratory indicates that they were in compliance with the requirements set out under subsection 47(3) of O.Reg. 153/04, as amended.

The analytical program conducted by laboratory included analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. The laboratory QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries (VOCs only) to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by the laboratory. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

Review of the laboratory QA/QC results reported by the laboratory indicated that they were within acceptable control limits or below applicable alert criteria for the sampled media and analytical test groups. Based on the assessment of the QA/QC, the analytical results reported by the laboratory are of acceptable quality and data qualifications are not required.

6 Phase Two Conceptual Site Model

This section presents a Conceptual Site Model (CSM) providing a narrative, graphical and tabulated description integrating information related to the Phase Two property's geologic and hydrogeological conditions, areas of potential environmental concern/potential contaminating activities, the presence and distribution of contaminants of concern, contaminant fate and transport, and potential exposure pathways.

For the purposes of this Phase Two CSM, the information relied upon was taken from all current and previous environmental reports conducted for the Phase Two property. However, the data relied upon was limited to the most recent information to convey the current Phase Two property conditions.

6.1 Site Identification Information

The Phase One property is located on the northeast corner of the intersection of Kent Street and James Street. The Phase Two property is irregular in shape and has an approximate area of 0.4 hectares (1.0 acres). The Phase Two property is occupied by a five-storey building containing various medical offices. A pharmacy and restaurant are present on the ground level. A Site Location Plan is provided as Figure 1 in Appendix A. The Phase Two property is located within a municipally serviced area of the City of Ottawa.

Refer to the following table for the Phase Two property identification information.

Civic Address	381 Kent Street, Ottawa, ON
Current Land Use	Commercial
Proposed Land Use	Residential
Legal Description	Lots 32, 33, 34 and 35, Plan 30671, N/S of James Street; Lots 32, 33 and 34, Plan 30671, S/S pf Gilmour Street; and Part Lot 35, Plan 30671, S/S of Gilmour Street, as in NS207100 City of Ottawa
Property Identification Number	041190081
UTM Coordinates	Zone 18, 445476 m E and 5029047 m N
Phase Two Property Area	0.40 ha
Property Owner	Katasa Groupe
Owner Contact	Ms. Chaxu Baria
Owner Address	69 rue Jean-Proulx unit 301. Gatineau, Quebec, J8Z 1W2

6.2 Physical Site Description

The Phase Two property is located in a mixed commercial and residential area of Ottawa where potable water is supplied by the City of Ottawa and therefore the MECP Table 3 Site Condition Standards (SCS) are applied to the Phase Two property. The City of Ottawa obtains its water from the Ottawa River, located approximately 1.2 km north of the Phase Two property.

In accordance with Section 41 of the Ontario Regulation 153/04 (as amended), the Phase Two property is not an environmentally sensitive area. The Phase Two property is not located within an area of natural significance and it does not include land that is within 30 metres of an area of natural significance.

Based on the Phase Two ESA investigation, the Phase Two property is not a shallow soil property as defined in Section 43.1 of the regulation. It does it include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

6.3 Geological and Hydrogeological Setting

Fill was contacted beneath the pavement structure in all of the boreholes. The fill consists of gravel with some silt and sand. The fill contains a trace of brick debris. The fill extended to depths ranging from 1.1 m to 1.8 m. The fill in each borehole was underlain by a silty clay layer from 1.1 m to 6.1 m depths. Silty sand and gravel glacial till is found below the silty clay and extends to 7.6 m to 12.7 m depths. The glacial till contains shale fragments, cobbles and boulders. No staining or petroleum odours were observed in the fill or native soil.

The grain size analyses showed that more than 50% of the soil had a grain size of silt or finer. This indicates that the native soil is fine grained. The results of the grain size analyses are found in Appendix A.

The Phase Two property stratigraphy characteristics are summarized in Table 6.1.

Table 6.1: Site Geological Characteristics

Stratigraphy	Details	Minimum Depth Observed (m bgs)	Maximum Depth Observed (m bgs)	Approximate Elevation Range (m ASL)
Surface	Asphalt / Concrete / Topsoil	0	0.05	72.00 to 72.66
	Fill Material – Gravel/Crushed Stone	0.05	1.8	71.90 to 70.90
Overburden	Silty Clay and Gravel Till	7.6	12.7	60.00 to 64.80
Bedrock	Shale	7.6	20.85	64.80 to 51.10

The geology of the Phase Two property is illustrated on the cross-sections (Figures 10 to 13).

Dynamic cone and auger refusal was met in all boreholes from 7.6 m to 12.7 m depths. Conventional core drilling techniques were used to advance BH/MW21-and BH/MW21-4 beyond the auger refusal depths to termination depths of 20.35 m and 20.85 m confirming that auger refusal was met on shale bedrock.

Groundwater elevations and water levels were measured at the Phase Two property on December 8, 2021. Groundwater was encountered at a depth of 2.80 m bgs in BH/MW21-2 and 5.80 m bgs in BH/MW21-4. No petroleum sheens were observed in the monitoring wells during either sampling event.

Topographically, the Phase Two property is relatively flat. The Ottawa River is approximately 1.2 km north from the Phase Two property. Regional groundwater flow direction is inferred to be in the northern direction towards the Ottawa River. Based on the groundwater elevations, the groundwater flow direction is to the southeast.

Refer to Table 6.2 for the Phase Two property hydrogeology characteristics based on groundwater monitoring observations.

Table 6.2: Site Hydrogeology Characteristics

Location	Observations
Depth to Groundwater	2.80 m to 5.80 m bgs
Groundwater Elevation	72.00 m AMSL to 72.66 m AMSL
Direction of Groundwater Flow	Southeast
Hydraulic Conductivity (1)	1.2×10^{-8} m/s to 4.0×10^{-7} m/s.
Horizontal Hydraulic Gradient	0.055 m/m

m bgs = meters below ground surface; m AMSL = meters above mean sea level

The hydrogeology of the Phase Two property is illustrated on the groundwater elevation plans (Figure 5) and are based on the most recent groundwater information collected from the Phase Two property.

Site Sensitivity

The Phase Two property sensitivity classification with respect to the conditions set out under Section 41 and 43.1 of O.Reg.153/04 were evaluated to determine if the Phase Two property is sensitive, as presented in Table 6.7.

Table 6.3: Site Sensitivity

Sensitivity	Classification	Does Sensitivity Apply to Phase Two Property?
Section 41 applies if	(i) property is within an area of natural significance	No
	(ii) property includes or is adjacent to an area of natural significance or part of such an area	No
	(iii) property includes land that is within 30 m of an area of natural significance or part of such an area	No
	(iv) soil at property has a pH value for surface soil less than 5 or greater than 9	No
	(v) soil at property has a pH value for sub-surface soil less than 5 or greater than 11	No
	(vi) a qualified person is of the opinion that, given the characteristics of the property and the certifications the qualified person would be required to make in a record of Phase Two Property condition in relation to the property as specified in Schedule A, it is appropriate to apply this section to the property	No
Section 43.1 applies if	(i) property is a shallow soil property	No
	(ii) property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 m of a water body	No

6.3.6 Land Use

Based on a review of historical aerial photographs, fire insurance plans and other records review, it appears the subject site was first developed with multiple residences prior to 1888. The residences were demolished, and the existing building was constructed circa 1965.

The intended future land use of the Phase Two property is residential.

6.4 Subsurface Structures and Utilities

The Phase Two property is municipally serviced by underground utilities such as bell, gas, water and sewer. The groundwater flow pattern in the overburden could be influenced by buried services.

6.5 Potentially Contaminating Activities

Ontario Regulation (O. Reg.) 153/04 defines a Potential Contaminating Activity (PCA) as one of fifty-nine (59) industrial operations set out in Table 2 of Schedule D that occurs or has occurred in the Phase Two study area. The following PCA were identified for the Phase Two property and the Phase One study area:

The following PCAs were identified:

- **PCA 1** – 301/303 Bank Street (190 m north) – Former automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 2** – 390 Bank Street (90 m east) – Former retail fuel outlet (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 3** – 428 Gladstone Avenue (130 m south) – Automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;
- **PCA 4** – 136 Florence Street (225 m southwest) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 5** – 431 Bank Street (200 m southeast) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 6** – 383 Bank Street (225 m southeast) – Storage garage with one 920-gallon fuel UST (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 7** – 282 Bank Street (220 m north) – Former Chinese laundry (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 8** – 429 Somerset Street W (190 m northwest) – Former retail fuel outlet with four fuel USTs (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 9** – 294 Bank Street (150 m west) – Former automotive service garage (PCA #10 – Commercial Autobody Shops). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 10** – 294 Bank Street (150 m west) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;

- **PCA 11** – 443 Somerset Street W (190 north) – Former retail fuel outlet (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks). Based on intervening distance and down gradient location, this does not result in an APEC;
- **PCA 12** – 3-9 Redstock Private (150 m north) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 13** – 498 Somerset Street W (210 m northwest) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 14** – 487 Gilmour Street (170 m east) – Former automotive service garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 15** – 390 Bank Street (90 m east) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 16** – 19 Florence Street (110 m east) – Former automotive service garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 17** – 19 Florence Street (110 m east) – Former fuel UST (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 18** – 450 Bank Street (240 m southeast) – Former retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 19** – 429 Kent Street (130 m south) – Retail fuel outlet (PCA#28 – Gasoline and Associated Products Stored in Fixed Tanks). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;
- **PCA 20** – 433 Lyon Street (200 m southwest) – Ottawa Hydro substation (PCA #55 – Transformer Manufacturing, Processing and Use). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 21** – 310 Bank Street (150 m northeast) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 22** – 290 Kent Street (240 m north) – Former Chinese laundry (PCA#37 – Operation of Dry-Cleaning Equipment). Based on intervening distance and being down-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;
- **PCA 23** – 410 Gladstone Avenue (180 m southwest) – ECA issued to Axle Automotive Inc. for a waste management system (PCA #58 – Waste Disposal and Waste Management, including thermal treatment, landfilling, and transfer of waste, other than use of biosoils as soil conditioners). As use of this waste management system is limited to the collection, handling and transportation of waste, and based on intervening distance and being cross-gradient in terms of the assumed direction of groundwater flow, this does not result in an APEC;

- **PCA 24** – 50 James Street (20 m south) – Former fuel oil spill (PCA# other – Fuel oil spill). This represents **APEC 2**;
- **PCA 25** – 410 Gladstone Avenue (180 m southwest) – Automotive service garage (PCA #10 – Commercial Autobody Shops). Based on the cross-gradient location and distance from the Site, this does not result in an APEC;
- **PCA 26** – Phase One property – Previous investigations identified fill material on the Phase One property (PCA #30 – Imported Fill Material of Unknown Quality). This represents **APEC 1**;
- **PCA 27** – 422 Gladstone Avenue (180 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance this does not result in an APEC;
- **PCA 28** – 426 Gladstone Avenue (180 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance this does not result in an APEC;
- **PCA 29** – 457 Gladstone Avenue (150 m south) – Automotive repair garage (PCA#10 – Commercial Autobody Shop). Based on intervening distance and low hydraulic conductivity of the native soil, this does not result in an APEC;

No other PCAs that took place within the vicinity of the Phase One property (approximately 250 m radius) were identified.

6.6 Areas of Potential Environmental Concern / Potential Contaminants of Concern

As per Ontario Regulation 153/04 (as amended), Potential Contaminating Activity (PCA) is defined as one of the 59 industrial operations set out in Table 2 of Schedule D that occurs or has occurred on the Phase Two property or within the Phase One ESA study area. Based on Phase One ESA, the identified areas of potential environmental concern (APEC) and potential contaminants of concern (PCOC) are summarized in the table below and are shown on Figure 2 in Appendix A.

Table 5.2: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase One property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	Metals, polycyclic aromatic hydrocarbons (PAH)	Soil
APEC #2	Phase One property, south property line	PCA #0ther – Former heating oil spill	Off-Site (20 m south)	PHC, BTEX	Groundwater

The above APECs were identified on the Phase Two property as shown on Figures 4 and 5 in Appendix A. It is noted that any significant uncertainty or absence of information has the ability to affect the Phase Two Conceptual Site Model. However, based on the information and findings presented within the Phase One ESA, it is EXP's opinion that any uncertainty would be minimal, and it would not alter the validity of the model presented above

6.7 Investigation and Remediation

The Phase Two ESA was conducted to assess the soil and groundwater quality at the Phase Two property. As indicated in the APEC and PCOC Table (above), the analytical program of the Phase Two ESA included testing of soil and groundwater for PHC, VOC, PAH, and/or metals from the boreholes and monitoring wells on the Phase Two property. The monitoring well locations are shown on Figure 4 in Appendix A.

6.8 Contaminants of Concern (COC)

Soil

Based on the results of the investigation, there were three boreholes (BH/MW21-2, BH/MW21-3, and BH/MW21-4) that had exceedances of the MECP Table 3 SCS for metals and/or several PAH parameters. Both soil samples were collected from depths of 0.8 m to 1.4 m.

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COCs in soil, the contribution of which is dependent on the soil conditions and the chemical/physical properties of the COCs. Relevant fate and transport mechanisms are natural attenuation mechanisms, including advection mixing, mechanical dispersion/molecular diffusion, phase partitions (i.e. sorption and volatilization), and possibly abiotic or biotic chemical reactions, which effectively reduce COC concentrations.

Concentrations of the COCs in soil will be reduced by the effects of molecular diffusion and the creation of concentration gradients. As non-volatile chemical constituents PAH and metals may undergo abiotic or biotic chemical reactions associated with the soil mineral particles and the micro-organisms present in the overburden material.

As a result of the various natural attenuation mechanisms in the soil environment, the concentrations of any COCs in soil will be reduced at the Phase Two property. The soil impacts are shown on the geologic cross sections (Figures 10 to 12).

The concentrations of lead in BH/MW21-3, and barium, cobalt, vanadium and zinc in BH/MW21-4, and several PAH parameters in BH/MW21-2 and BH/MW21-3 exceeded the MECP Table 3 SCS. The areas of impacted soil is shown on Figures 7, 8, 11 and 12 Additional boreholes should be drilled and soil samples collected for laboratory analysis in an attempt to delineate the impact to soil.

Groundwater

All groundwater samples had concentrations of the analyzed parameters that were less than the MECP Table 3 SCS. Therefore, no groundwater impact has been identified on the Phase Two property.

6.9 Contaminant Fate and Transport

Human Health Receptors and Exposure Pathways

The Phase Two property is used for commercial purposes and is occupied by one commercial medical building. The Phase Two property will be redeveloped to two high-rise residential towers in the future. The potential on-Site human receptors currently comprise residents, long-term workers, short-term workers, property visitors (adult, teen, child, toddler, and infant), and construction workers. The future potential residential land use on-Site human receptors comprise residents (adult, teen, child, toddler, and infant) and short-term visitors (adult, teen, child, toddler, and infant).

The potential on-site exposure pathways for the construction workers are inadvertent soil ingestion, soil particulate inhalation, soil dermal contact, and ambient vapour inhalation (sourced from soil, due to potential work conducted in a trench scenario).

The potential on-site exposure pathways for the short-term (outdoor) workers are soil particulate inhalation, soil dermal contact, and inadvertent soil ingestion.

The potential on-site exposure pathways for the long-term (indoor) workers, residents and property visitors indoor air inhalation (sourced from soil).

Ecological Receptors and Exposure Pathways

The Phase Two property is comprised of developed commercial lands with either a 5 storey building or asphalt covered parking. There is a small grassed area on the west edge of the property that is capable of supporting some terrestrial ecological receptors. Relevant terrestrial receptors are terrestrial vegetation, such as trees, grasses and weeds; soil invertebrates, such as earthworms, millipedes and beetles; terrestrial birds, such as pigeons, sparrows and robins; and small terrestrial mammals, such as moles, voles, and mice.

The potential on-site exposure pathways for terrestrial vegetation are root uptake (soil), and stem and foliar uptake of vapours (sourced from soil).

The potential on-site exposure pathways for soil invertebrates are soil particulate inhalation, soil dermal contact, soil ingestion, vapour inhalation (sourced from soil).

The potential on-site exposure pathways for mammals and birds are soil particulate inhalation, soil dermal contact, soil ingestion, vapour inhalation (sourced from soil), and animal tissue ingestion (as a result of biotransformation of soil).

7 Conclusions and Recommendations

Based on the Phase Two ESA results, the following summary is provided:

- From November 30 to December 2, 2021, a total of 4 boreholes BH/MW21-1 to BH/MW21-4) were advanced at the Phase Two property and each were instrumented with a monitoring well.
- Fill was contacted beneath the pavement structure in all of the boreholes. The fill consists of gravel with some silt and sand. The fill contains a trace of brick debris. The fill extended to depths ranging from 1.1 m to 1.8 m. The fill in each borehole was underlain by a silty clay layer from 1.1 m to 6.1 m depths. Silty sand and gravel glacial till are present below the silty clay and extends to 7.6 m to 12.7 m depths. The glacial till contains shale fragments, cobbles and boulders. No staining or petroleum odours were observed in the fill or native soil.
- Dynamic cone and auger refusal was met in all boreholes from 7.6 m to 12.7 m depths. Conventional core drilling techniques were used to advance BH/MW21-1 and BH/MW21-4 beyond the auger refusal depths to termination depths of 20.35 m and 20.85 m confirming that auger refusal was met on shale bedrock.
- Groundwater elevations and water levels were measured at the Phase Two property on December 8, 2021. Groundwater was encountered at a depth of 2.80 m bgs in BH/MW21-2 and 5.80 m bgs in BH/MW21-4. No petroleum sheens were observed in the monitoring wells during either sampling event. Based on the groundwater elevations, the groundwater flow direction is to the southeast.
- Based on the results of the investigation, the concentrations of lead in BH/MW21-3, and barium, cobalt, vanadium and zinc in BH/MW21-4, and several PAH parameters in BH/MW21-2 and BH/MW21-3 exceeded the MECP Table 3 SCS. Both soil samples were collected from depths of 0.8 m to 1.4 m.
- All groundwater samples had concentrations of PHC and VOC that were less than the MECP Table 3 SCS, therefore no impacted groundwater was identified on the Phase Two property.
- It is recommended that the extent of impacted soil on the Phase Two property be delineated prior to being removed from the Phase Two property.

8 General Limitations

The information presented in this report is based on a limited investigation designed to provide information to support an assessment of the current environmental conditions within the Phase Two property. The conclusions and recommendations presented in this report reflect Phase Two property conditions existing at the time of the investigation.

More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during any such excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent. Should this occur, EXP Services Inc. should be contacted to assess the situation, and the need for additional testing and reporting. EXP has qualified personnel to provide assistance in regards to any future geotechnical and environmental issues related to this property.

The environmental investigation was carried out to address the intent of applicable provincial Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Ministry of Environment. It should also be noted that current environmental Regulations, Guidelines, Policies, Standards, Protocols and Objectives are subject to change, and such changes, when put into effect, could alter the conclusions and recommendations noted throughout this report. Achieving the study objectives stated in this report has required us to arrive at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice we do not act as absolute insurers of the conclusions we reach, but we commit ourselves to care and competence in reaching those conclusions.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the engineering profession. It is intended that the outcome of this investigation assist in reducing the client's risk associated with environmental impairment. Our work should not be considered 'risk mitigation'. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of Katasa Groupe and may not be reproduced in whole or in part, without the prior written consent of EXP, or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

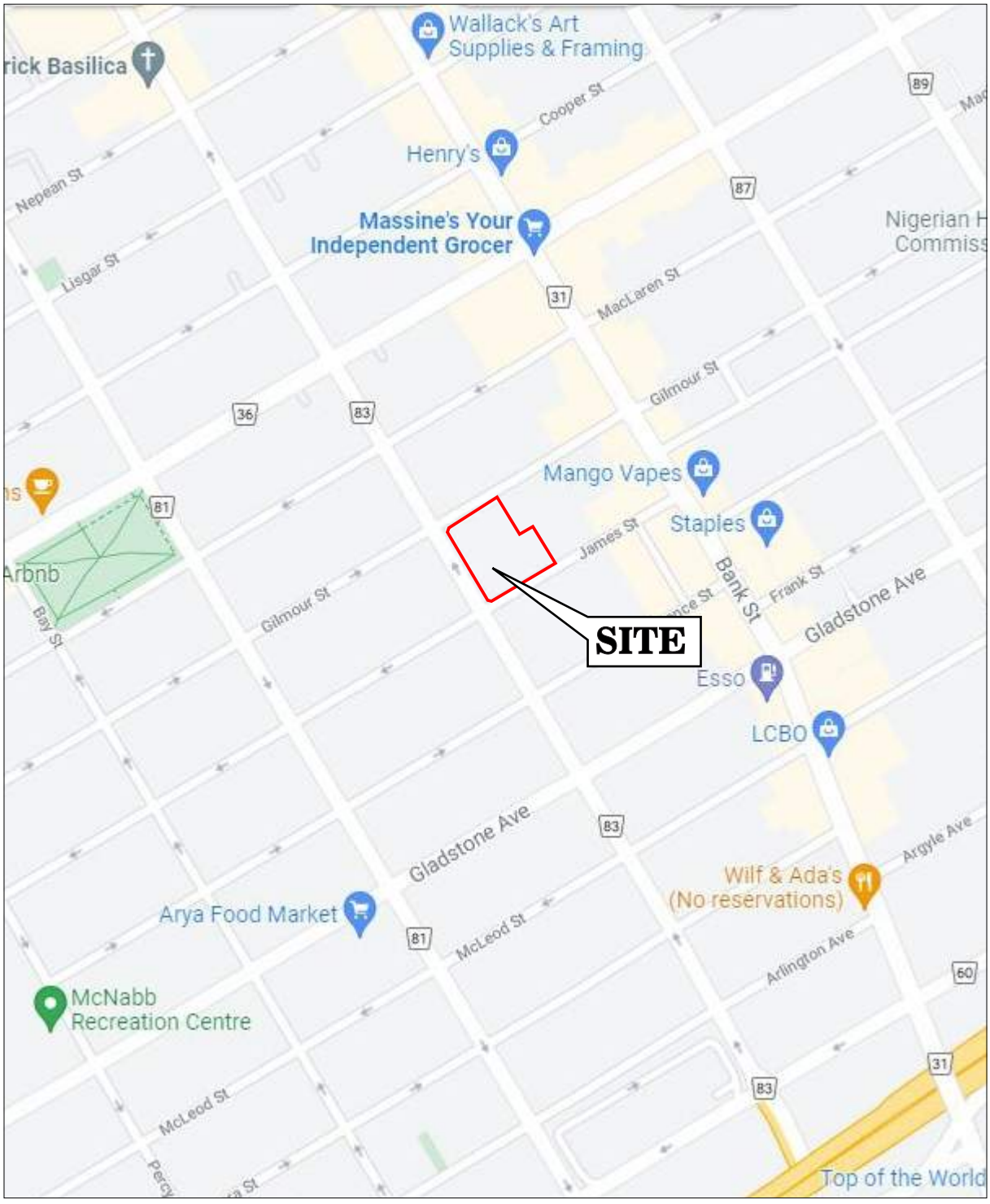
We trust this report satisfies your immediate requirements. If you have any questions regarding the information in this report, please do not hesitate to contact this office.

9 References

This study was conducted in general accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Ministry of the Environment. Specific reference is made to the following:

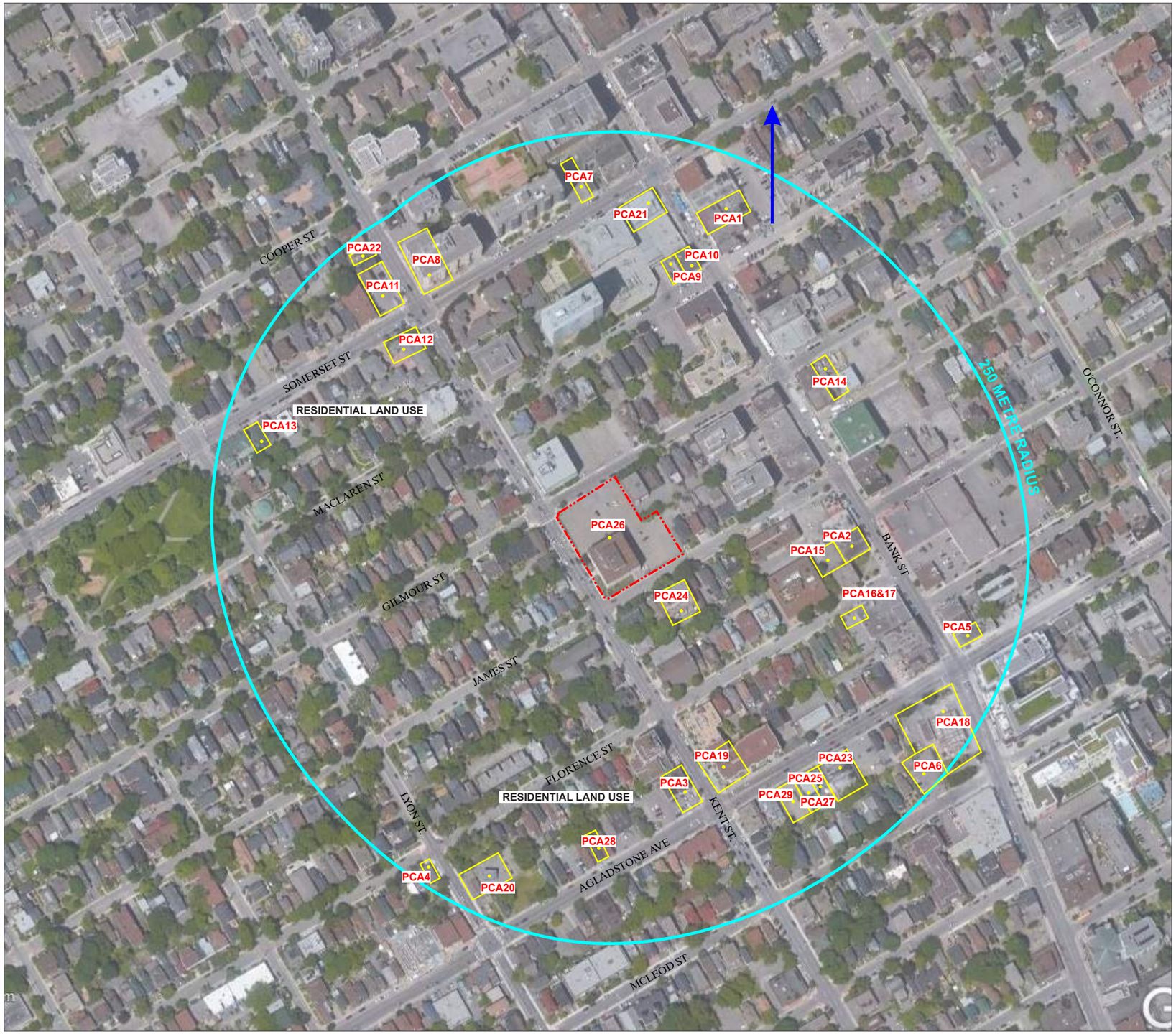
- City of Ottawa. 2011. Characterization of Ottawa's Watersheds: An Environmental Foundation Document with Supporting Information Base. March.
- Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended, September 2004.
- *EXP Services Inc. November 18*, 2021. *Phase One Environmental Site Assessment, 381 Kent Street*.
- Groundwater, Freeze and Cheery 1979. Prentice Hall.
- Ministry of the Environment [MOE] (1996) Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario. Ontario Ministry of the Environment, December 1996.
- MOE (2011) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. Ontario Ministry of the Environment, April 15, 2011.
- MOE (2011) Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04. Ontario Ministry of the Environment, June 2011.
- MOE (2011) Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Ontario Ministry of the Environment, March 2004, amended as of July 1, 2011.
- Ontario Regulation 153/04, made under the Environmental Protection Act, May 2004, last amended to O.Reg.333/13.
- Ontario Water Resources Act – R.R.O. 1990, Regulation 903, amended to O.Reg. 128/03, August 2003.
- Singer, S.N., C.K. Cheng, M.G. Scafe. 2003. Hydrogeology of Southern Ontario. Hydrogeology of Ontario Series – Report 1. Prepared for Ministry of Environment.
- WESA. 2006. Watershed Characterization: Geologic Model and Conceptual Hydrogeological Model, Raisin Region CA and South Nation Conservation, Source Protection Plan Partnership.

Appendix A – Figures and Grain-Size Analyses



SCALE: 0 100 200m	**SOURCE:** GOOGLE MAPS	LOCALITY PLAN	FIGURE 1
	LEGEND: SITE BOUNDARY	381 KENT STREET, OTTAWA, ONTARIO	
exp.	DRAWN BY: K.G. / CHECKED BY: M.M.		PROJECT NUMBER: 21019154

21019154-LOCALITY



N

LEGEND:

- SITE BOUNDARY
- 250 METRE STUDY AREA
- S1 — PCA RESULTING IN AN APEC
- S11 — PCA NOT RESULTING IN AN APEC
- INFERRED GROUNDWATER FLOW

PCA - POTENTIALLY CONTAMINATING ACTIVITY
APEC - AREA OF POTENTIAL ENVIRONMENTAL CONSERN
(52) INDICATES ITEM NUMBER OF O. REG. 153/04 SCHEDULE D, TABLE 2

SOURCE:
INTERACTIVE MAP - GOOGLE

SCALE:
0 50 100m

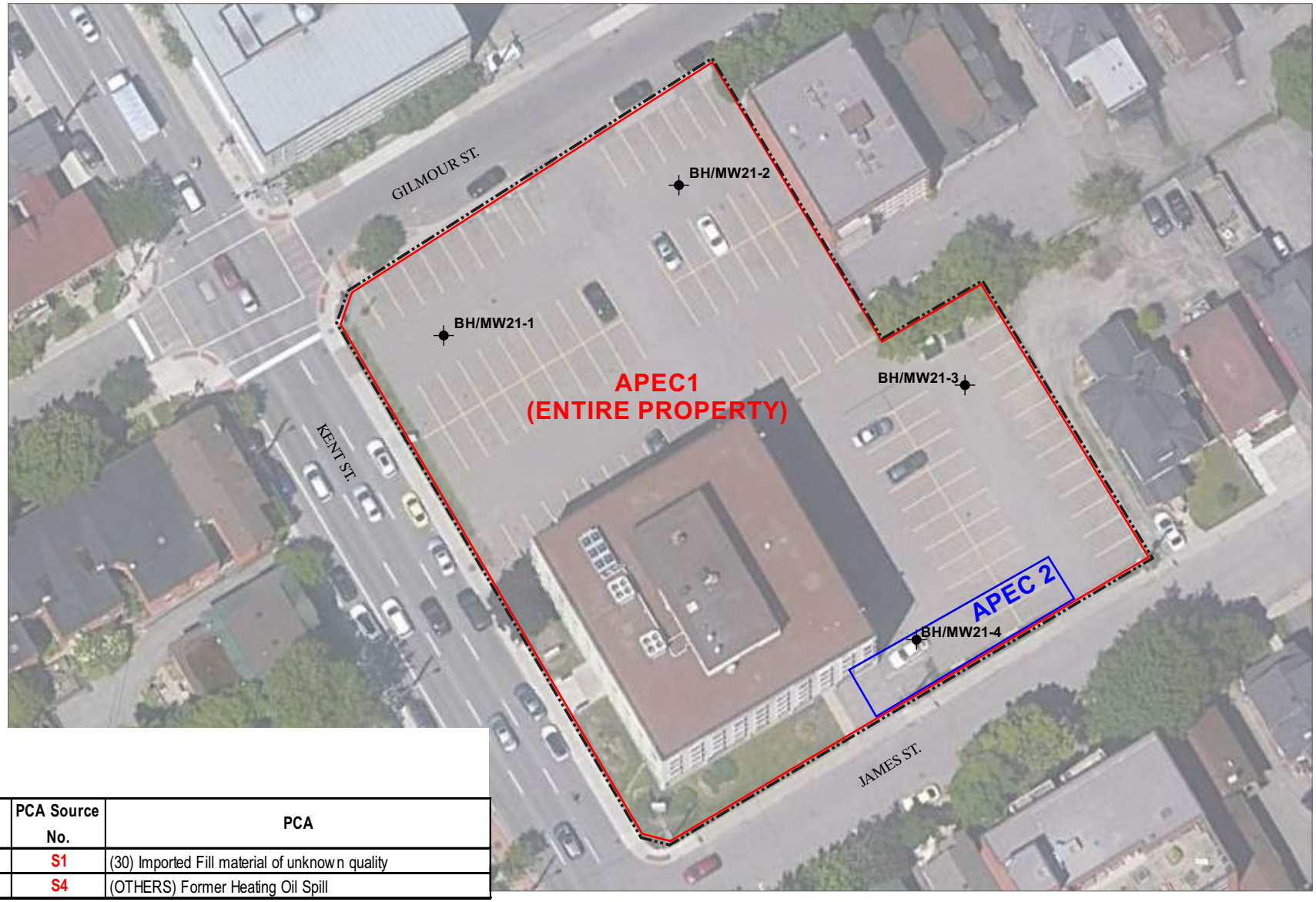
	DRAWN BY	CHECKED BY
exp.	K.G.	A.C.

SURROUNDING LAND USE PLAN AND PHASE ONE CONCEPTUAL SITE MODEL

FIGURE 2

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022



APEC	PCA Source No.	PCA
1	S1	(30) Imported Fill material of unknown quality
2	S4	(OTHERS) Former Heating Oil Spill

SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

SITE BOUNDARY

TEST HOLE WITH MONITOR (EXP, 2021)

PCA - POTENTIALLY CONTAMINATING ACTIVITY
APEC - AREA OF POTENTIAL ENVIRONMENTAL CONSERN
(28) INDICATES ITEM NUMBER OF O. REG. 153/04 SCHEDULE D, TABLE 2

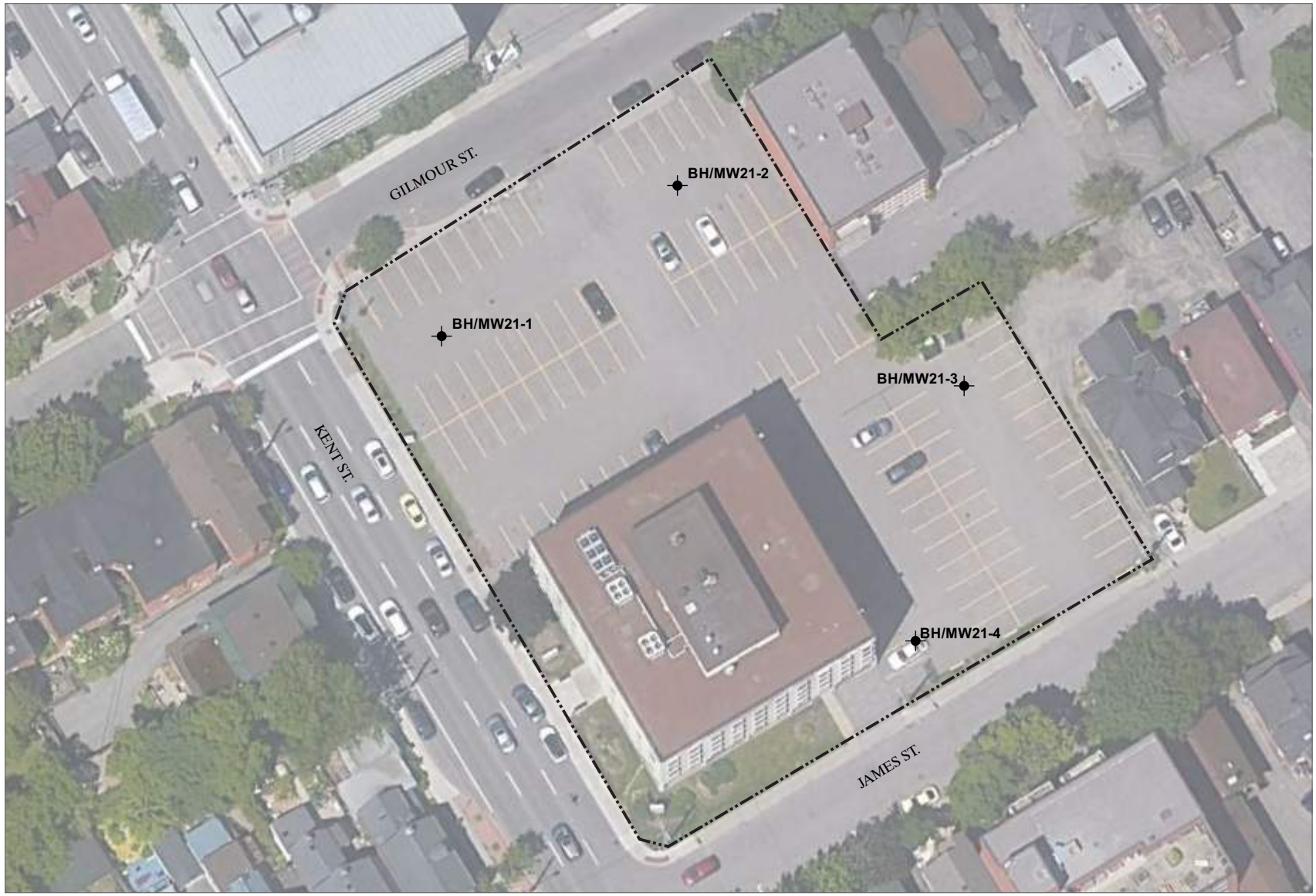
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

FIGURE 3

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

21018298-PH2 SITE PLAN-DEC21:APEC



SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

- SITE BOUNDARY
- TEST HOLE WITH MONITOR (EXP, 2021)

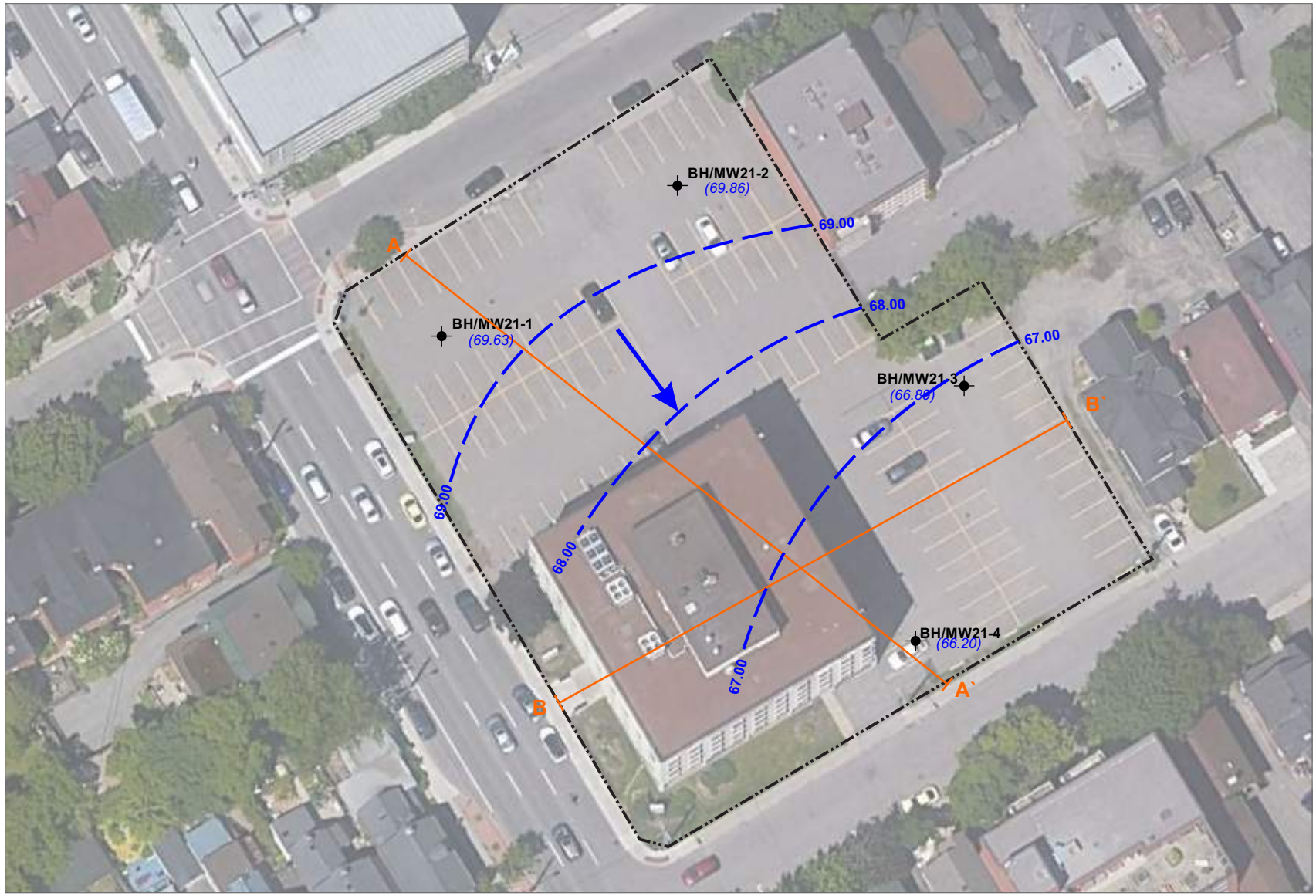
SITE PLAN

FIGURE 4

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

21019154-PH2 SITE PLAN-JAN22:SITE PLAN



SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

- SITE BOUNDARY
- TEST HOLE WITH MONITOR (EXP, 2021)
- CROSS SECTION LOCATION
- (100.00) GROUND WATER ELEVATION (m)
- 100.00 GROUND WATER ELEVATION CONTOUR (m)
- GROUND WATER FLOW DIRECTION

GROUND WATER CONTOUR PLAN (DECEMBER 8, 2021)

5

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

21019154-PH2 SITE PLAN-JAN22:GWC

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-2	12/01/21	3.8 - 4.4	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019
~	Duplicate of	3.8 - 4.4	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	0.17
Toluene	T	15
Ethylbenzene	E	6
Total Xylenes	X	25
F1 (C6-C10)	F1	65
F2 (C10-C16)	F2	150
F3 (C16-C34)	F3	1300
F4 (C34-C50)	F4	5600
F4 (C34-C50) G	F4G	5600
1,1-Dichloroethane	1,1-DCA	11
1,2-Dichlororethane	1,2-DCA	0.05
1,1-Dichloroethylene	1,1-DCE	0.05
Cis-1,2-Dichloroethylene	c-1,2-DCE	30
Trans-1,2,-Dichlorothylene	t-1,2-DCE	0.75
Tetrachloroethylene	PCE	2.3
Trichloroethylene	TCE	0.52
Vinyl Chloride	VC	0.022

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-1	12/02/21	3.0 - 3.6	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-4	29/11/2021	5.3 - 5.9	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-3	12/01/21	3.8 - 4.4	<0.0060	<0.010	<0.020	<0.020	<10	<10	<50	<50	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

SITE BOUNDARY

TEST HOLE WITH MONITOR (EXP, 2021)

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

SOIL ANALYTICAL RESULTS – PHCs AND VOCs

6

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	5
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	180
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	130
Selenium	Se	2.4
Silver	Ag	25
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340
Conductivity	Conductivity	0.7
SAR	SAR	5
Cyanide	Cyanide	0.051
Chromium VI	Cr VI	10
Mercury	Hg	1.8

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-2	12/01/21	0.8 - 1.4	<0.20	1.2	97	0.27	<5.0	<0.10	19	5.3	13	50	0.55	11	<0.50	<0.20	0.10	0.59	34	56

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-1	12/02/21	0.1 - 0.6	0.63	2.1	170	0.34	7.0	0.20	29	7.4	27	100	1.9	17	<0.50	<0.20	0.17	0.56	36	100

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-4	29/11/2021	0.8 - 1.4	<0.20	<1.0	430	0.88	<5.0	0.11	140	25	54	6.9	<0.50	73	<0.50	<0.20	0.54	0.96	**130**	**150**
~	29/11/2021	0.8 - 1.4	<0.20	3.7	**150**	0.41	7.2	0.15	13	**7.2**	20	8.0	3.6	24	<0.50	<0.20	0.23	1.7	21	30

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-3	12/01/21	0.8 - 1.4	0.43	3.0	100	0.32	5.0	0.31	21	4.8	14	**150**	1.4	11	<0.50	<0.20	0.11	0.66	29	120

SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:
- SITE BOUNDARY
- TEST HOLE WITH MONITOR (EXP, 2021)
- ESTIMATED AREA OF IMPACTED SOIL

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
LOCATION WHERE SAMPLE EXCEEDS TABLE 3 STANDARDS FOR AT LEAST ONE PARAMETER IS SHOWN IN RED
CONCENTRATION OF CONTAMINANT EXCEEDING TABLE 3 STANDARD SHOWN IN TEXT AS **RED BOLD**
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

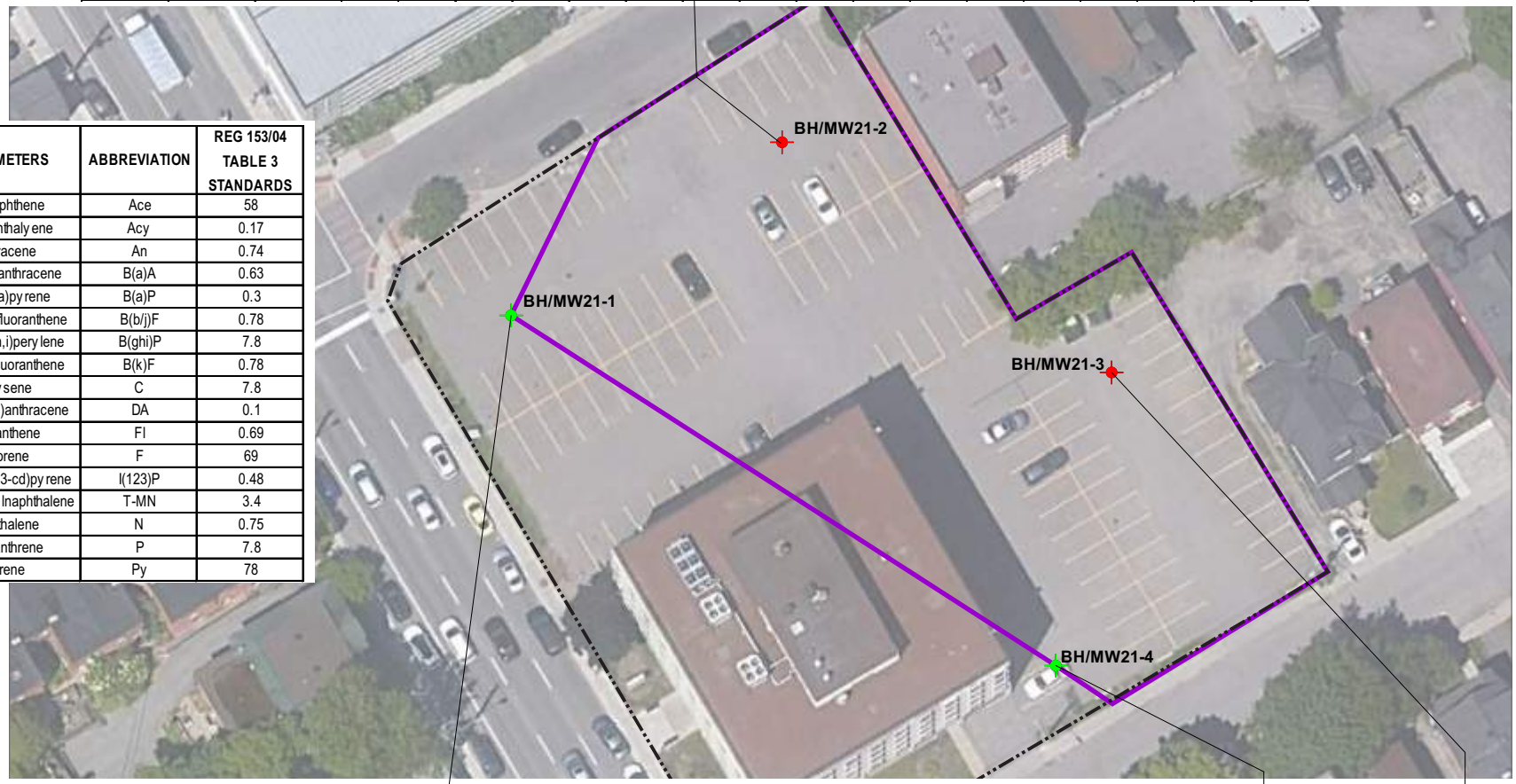
SOIL ANALYTICAL RESULTS – METALS

7

381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-2	12/01/21	0.8 - 1.4	1.2	0.083	3.9	4.9	3.5	4.2	1.7	1.6	4.0	0.47	15	1.2	2.0	0.69	0.83	15	12



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Acenaphthene	Ace	58
Acenaphthaly ene	Acy	0.17
Anthracene	An	0.74
Benzo(a)anthracene	B(a)A	0.63
Benzo(a)py rene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)pery lene	B(ghi)P	7.8
Benzo(k)fluoranthene	B(k)F	0.78
Chry sene	C	7.8
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	FI	0.69
Fluorene	F	69
Indeno(1,2,3-cd)py rene	I(123)P	0.48
Total Methy lnaphthalene	T-MN	3.4
Naphthalene	N	0.75
Phenanthrene	P	7.8
Py rene	Py	78

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-1	12/02/21	0.1 - 0.6	<0.050	<0.050	0.052	0.25	0.26	0.33	0.20	0.12	0.21	<0.050	0.50	<0.050	0.17	<0.071	<0.050	0.26	0.45

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-4	29/11/2021	0.8 - 1.4	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050
~	29/11/2021	0.8 - 1.4	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0058	0.016	<0.0050	<0.0050	<0.0050	0.0056	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	0.0092

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-3	12/01/21	0.8 - 1.4	0.51	<0.050	0.92	1.7	1.5	2.0	0.91	0.74	1.5	0.23	5.3	0.54	0.98	0.31	0.31	4.9	3.7

SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

SITE BOUNDARY

TEST HOLE WITH MONITOR (EXP, 2021)

ESTIMATED AREA OF IMPACTED SOIL

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.

LOCATION WHERE SAMPLE EXCEEDS TABLE 3 STANDARDS FOR AT LEAST ONE PARAMETER IS SHOWN IN RED

CONCENTRATION OF CONTAMINANT EXCEEDING TABLE 3 STANDARD SHOWN IN TEXT AS **RED BOLD**
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

SOIL ANALYTICAL RESULTS – PAHs

8

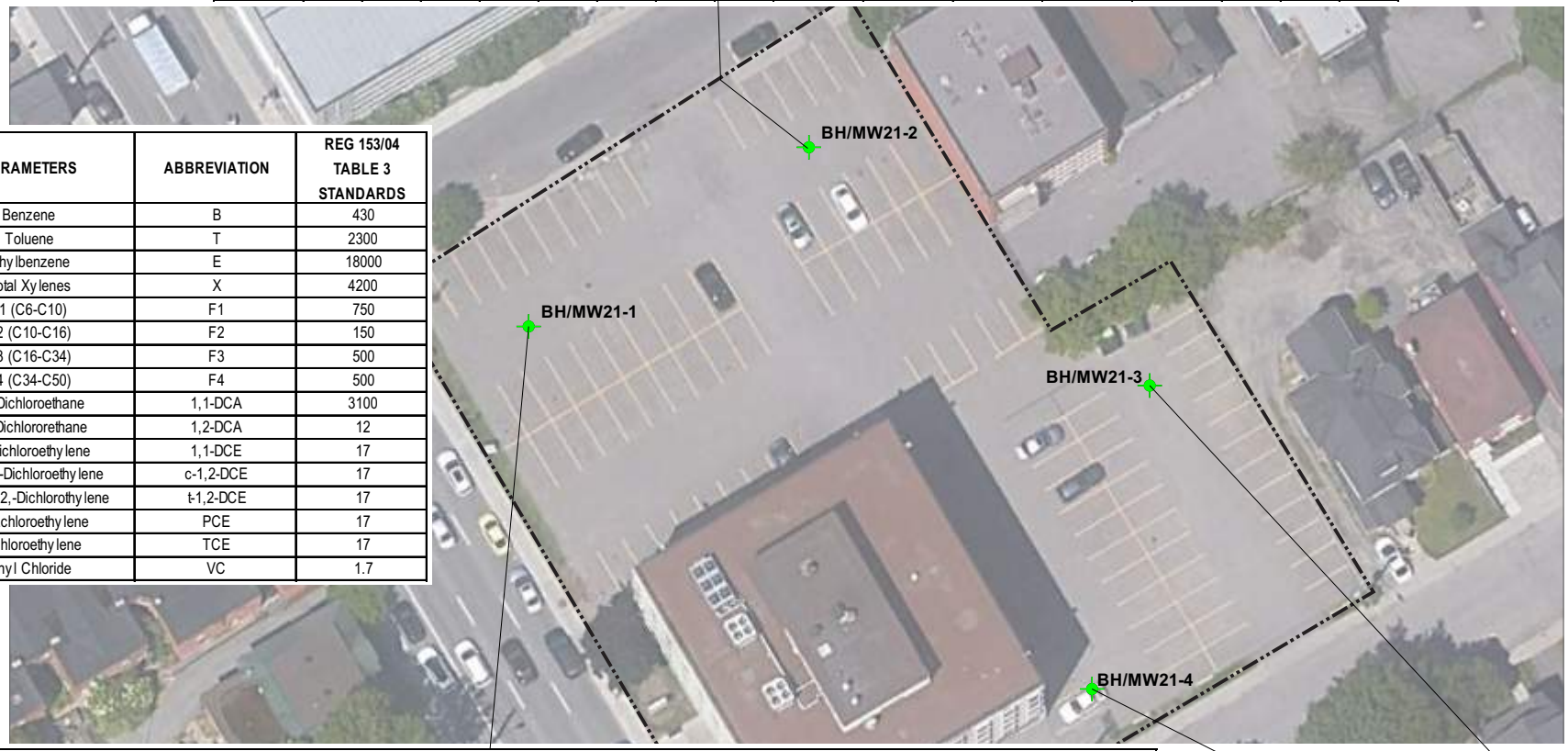
381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

21019154-PH2 SITE PLAN-JAN22:PAH

BH/MW21-2																Screen Interval: 3.0 - 6.1 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	430
Toluene	T	2300
Ethylbenzene	E	18000
Total Xylenes	X	4200
F1 (C6-C10)	F1	750
F2 (C10-C16)	F2	150
F3 (C16-C34)	F3	500
F4 (C34-C50)	F4	500
1,1-Dichloroethane	1,1-DCA	3100
1,2-Dichlororethane	1,2-DCA	12
1,1-Dichloroethylene	1,1-DCE	17
Cis-1,2-Dichloroethylene	c-1,2-DCE	17
Trans-1,2,-Dichlorothylene	t-1,2-DCE	17
Tetrachloroethylene	PCE	17
Trichloroethylene	TCE	17
Vinyl Chloride	VC	1.7



BH/MW21-1																Screen Interval: 3.0 - 6.1 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<100	<100	NA	NA	NA	NA	NA	NA	NA	NA

BH/MW21-4																Screen Interval: 3.9 - 7.0 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
~	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

BH/MW21-3																Screen Interval: 3.0 - 6.1 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

SCALE: 0 10 20m

SOURCE:
BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

SITE BOUNDARY

TEST HOLE WITH MONITOR (EXP, 2021)

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/L, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

GROUNDWATER ANALYTICAL RESULTS – PHCs AND VOCs

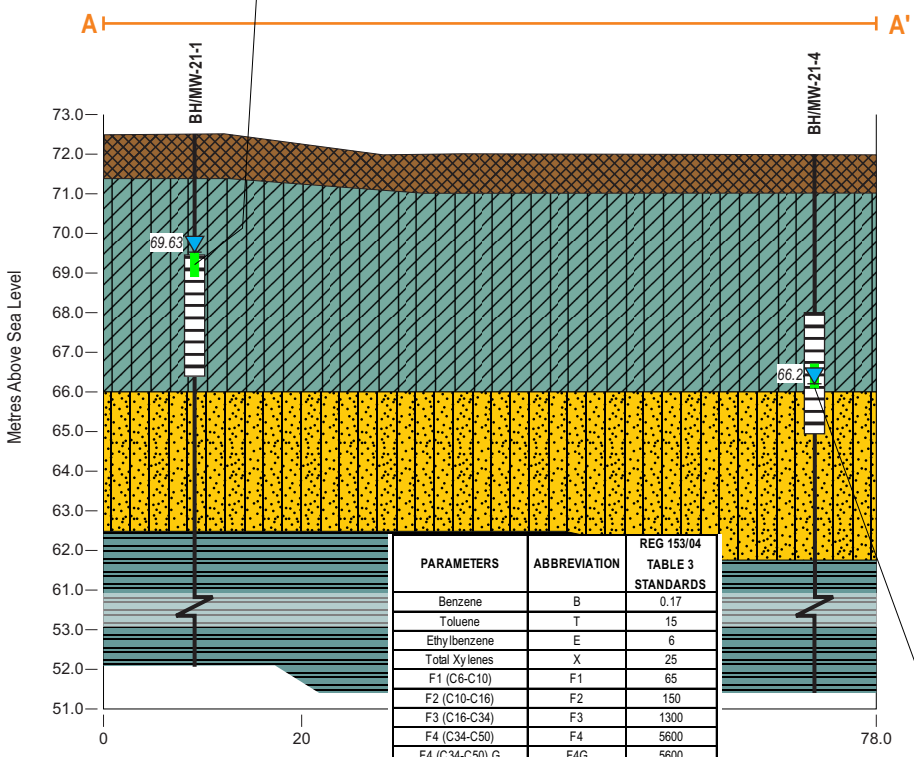
9

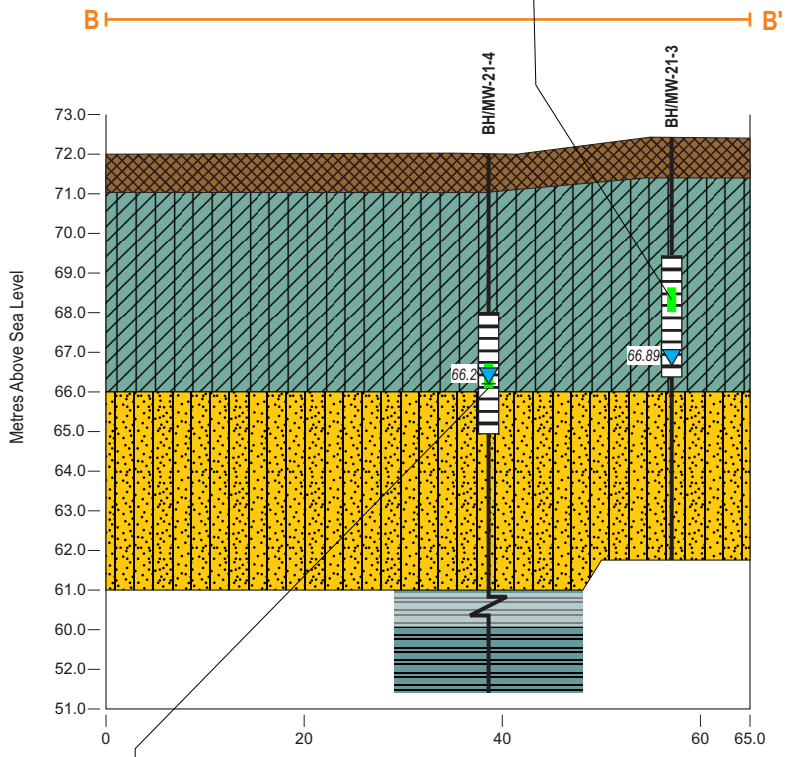
381 KENT STREET,
OTTAWA, ONTARIO

PROJECT NUMBER: 21019154 | DATE: JANUARY 2022

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-1	12/02/21	3.0 - 3.6	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-3	12/01/21	3.8 - 4.4	<0.0060	<0.010	<0.020	<0.020	<10	<10	<50	<50	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019





PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	0.17
Toluene	T	15
Ethylbenzene	E	6
Total Xylenes	X	25
F1 (C6-C10)	F1	65
F2 (C10-C16)	F2	150
F3 (C16-C34)	F3	1300
F4 (C34-C50)	F4	5600
F4 (C34-C50) G	F4G	5600
1,1-Dichloroethane	1,1-DCA	11
1,2-Dichlororethane	1,2-DCA	0.05
1,1-Dichloroethylene	1,1-DCE	0.05
Cis-1,2-Dichloroethylene	c-1,2-DCE	30
Trans-1,2,-Dichlorothylene	t-1,2-DCE	0.75
Tetrachloroethylene	PCE	2.3
Trichloroethylene	TCE	0.52
Vinyl Chloride	VC	0.022

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH/MW21-4	29/11/2021	5.3 - 5.9	<0.0060	<0.010	<0.020	<0.020	<10	<20	<100	<100	NA	<0.040	<0.049	<0.040	<0.040	<0.040	<0.040	<0.010	<0.019

SCALE:
4 X VERTICAL EXAGGERATION

SOURCE:
BASED ON FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

- TEST HOLE
- SCREEN INTERVAL
- GROUND WATER ELEVATION (DECEMBER 8, 2021)
- masl METRES ABOVE SEA LEVEL
- FILL
- GLACIAL TILL
- SILTY CLAY
- SHALE

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

CROSS SECTIONS A-A' AND B-B' SOIL ANALYTICAL RESULTS – PHCs AND VOCs

10

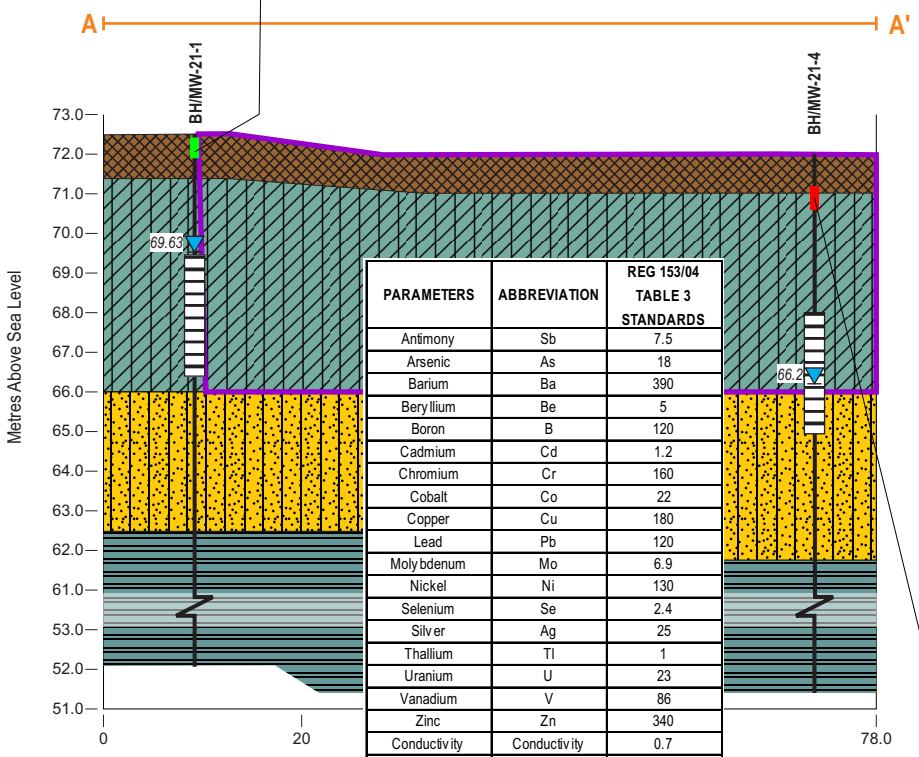
5329 BOUNDARY ROAD,
OTTAWA, ONTARIO

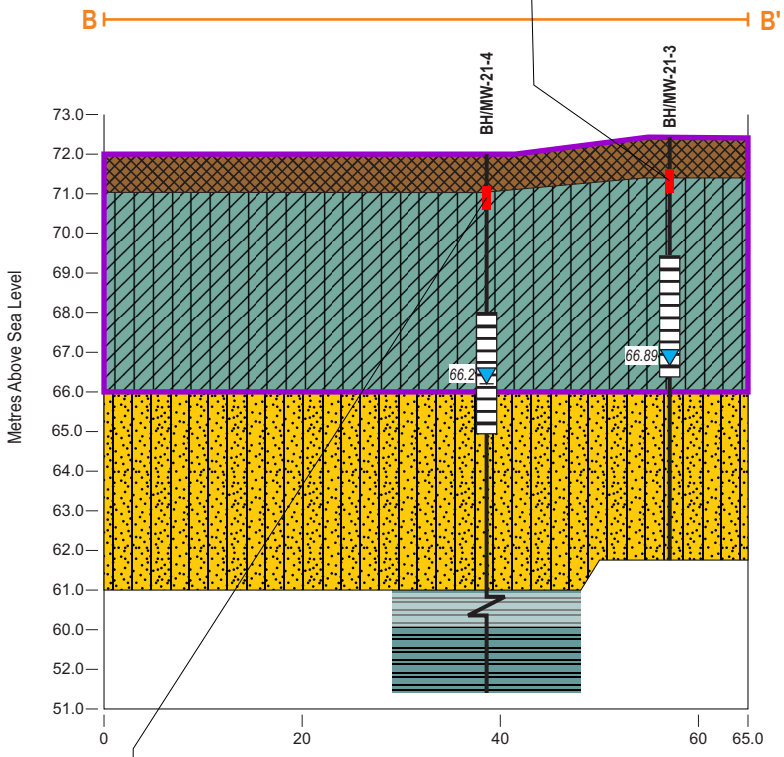
PROJECT NUMBER: 21018298 | DATE: JANUARY 2022

21019154-PH2 SEC-JAN22:PHC-VOC

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-1	12/02/21	0.1 - 0.6	0.63	2.1	170	0.34	7.0	0.20	29	7.4	27	100	1.9	17	<0.50	<0.20	0.17	0.56	36	100

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-3	12/01/21	0.8 - 1.4	0.43	3.0	100	0.32	5.0	0.31	21	4.8	14	**150**	1.4	11	<0.50	<0.20	0.11	0.66	29	120





PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	5
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	180
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	130
Selenium	Se	2.4
Silver	Ag	25
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340
Conductivity	Conductivity	0.7
SAR	SAR	5
Cyanide	Cyanide	0.051
Chromium VI	Cr VI	10
Mercury	Hg	1.8

ESTIMATED AREA OF IMPACTED SOIL

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH/MW21-4	29/11/2021	0.8 - 1.4	<0.20	<1.0	430	0.88	<5.0	0.11	140	25	54	6.9	<0.50	73	<0.50	<0.20	0.54	0.96	**130**	**150**
~	29/11/2021	0.8 - 1.4	<0.20	3.7	**150**	0.41	7.2	0.15	13	**7.2**	20	8.0	3.6	24	<0.50	<0.20	0.23	1.7	21	30

SCALE:
4 X VERTICAL EXAGGERATION

SOURCE:
BASED ON FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:
- TEST HOLE
- SCREEN INTERVAL
- GROUND WATER ELEVATION (DECEMBER 8, 2021)
- masl METRES ABOVE SEA LEVEL
- FILL
- GLACIAL TILL
- SILTY CLAY
- SHALE

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
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mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
LOCATION WHERE SAMPLE EXCEEDS TABLE 3 STANDARDS FOR AT LEAST ONE PARAMETER IS SHOWN IN RED
CONCENTRATION OF CONTAMINANT EXCEEDING TABLE 3 STANDARD SHOWN IN TEXT AS **RED BOLD**
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

CROSS SECTIONS A-A' AND B-B' SOIL ANALYTICAL RESULTS – METALS

11

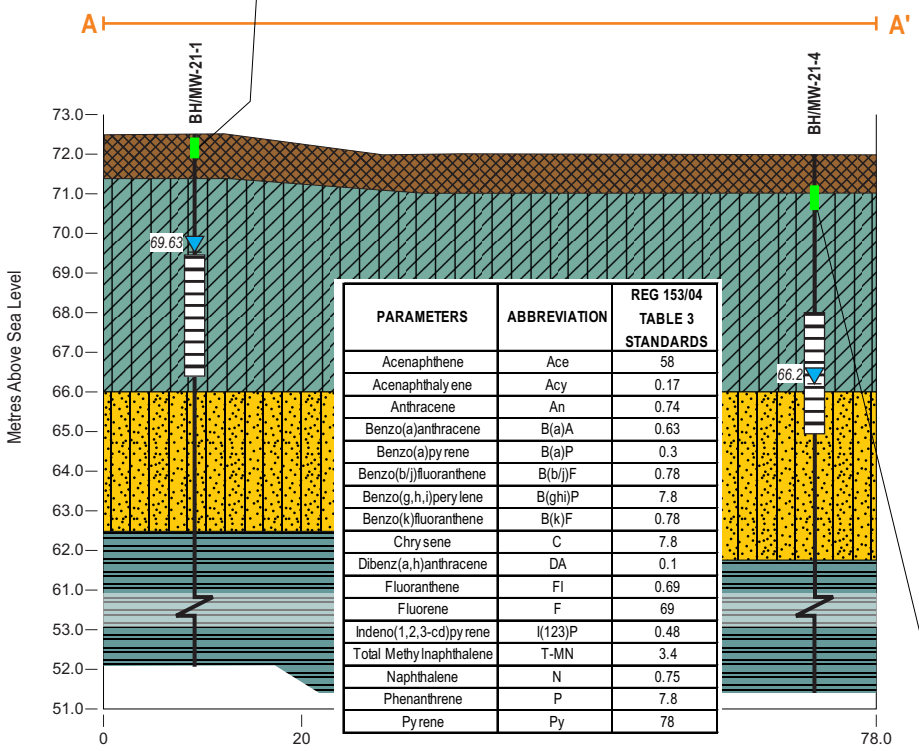
5329 BOUNDARY ROAD,
OTTAWA, ONTARIO

PROJECT NUMBER: 21018298 | DATE: JANUARY 2022

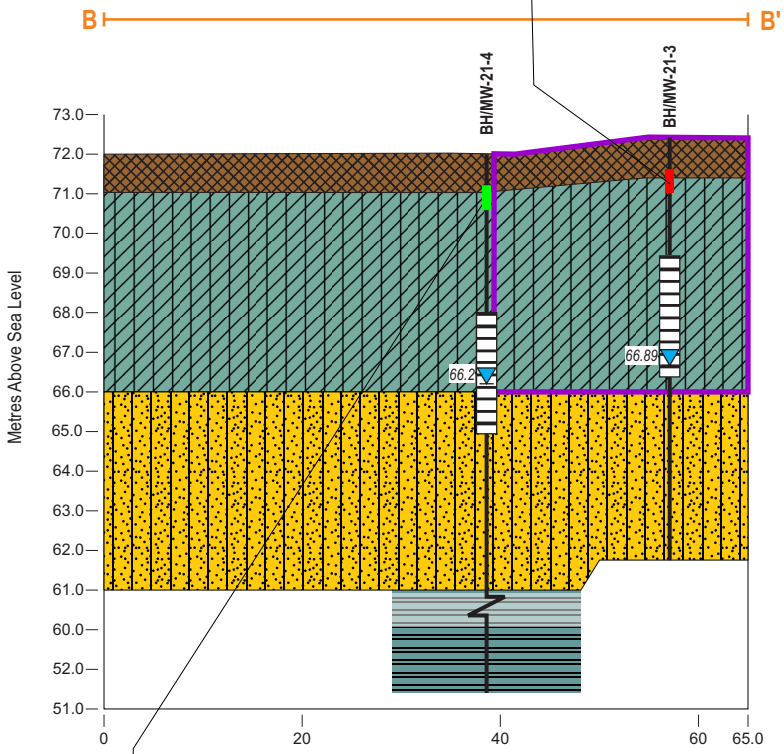
21019154-PH2 SEC-JAN22:MET

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-1	12/02/21	0.1 - 0.6	<0.050	<0.050	0.052	0.25	0.26	0.33	0.20	0.12	0.21	<0.050	0.50	<0.050	0.17	<0.071	<0.050	0.26	0.45

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-3	12/01/21	0.8 - 1.4	0.51	<0.050	0.92	1.7	1.5	2.0	0.91	0.74	1.5	0.23	5.3	0.54	0.98	0.31	0.31	4.9	3.7



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Acenaphthene	Ace	58
Acenaphthaly ene	Acy	0.17
Anthracene	An	0.74
Benzo(a)anthracene	B(a)A	0.63
Benzo(a)py rene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)pery lene	B(ghi)P	7.8
Benzo(k)fluoranthene	B(k)F	0.78
Chry sene	C	7.8
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	FI	0.69
Fluorene	F	69
Indeno(1,2,3-cd)py rene	I(123)P	0.48
Total Methy lnaphthalene	T-MN	3.4
Naphthalene	N	0.75
Phenanthrene	P	7.8
Py rene	Py	78



ESTIMATED AREA OF IMPACTED SOIL

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH/MW21-4	29/11/2021	0.8 - 1.4	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050
~	29/11/2021	0.8 - 1.4	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0058	0.016	<0.0050	<0.0050	<0.0050	0.0056	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	0.0092

SCALE:
4 X VERTICAL EXAGGERATION

SOURCE:
BASED ON FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:

- TEST HOLE
- SCREEN INTERVAL
- GROUND WATER ELEVATION (DECEMBER 8, 2021)
- masl METRES ABOVE SEA LEVEL
- FILL
- GLACIAL TILL
- SILTY CLAY
- SHALE

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
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ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
LOCATION WHERE SAMPLE EXCEEDS TABLE 3 STANDARDS FOR AT LEAST ONE PARAMETER IS SHOWN IN RED
CONCENTRATION OF CONTAMINANT EXCEEDING TABLE 3 STANDARD SHOWN IN TEXT AS **RED BOLD**
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

CROSS SECTIONS A-A' AND B-B' SOIL ANALYTICAL RESULTS – PAHs

12

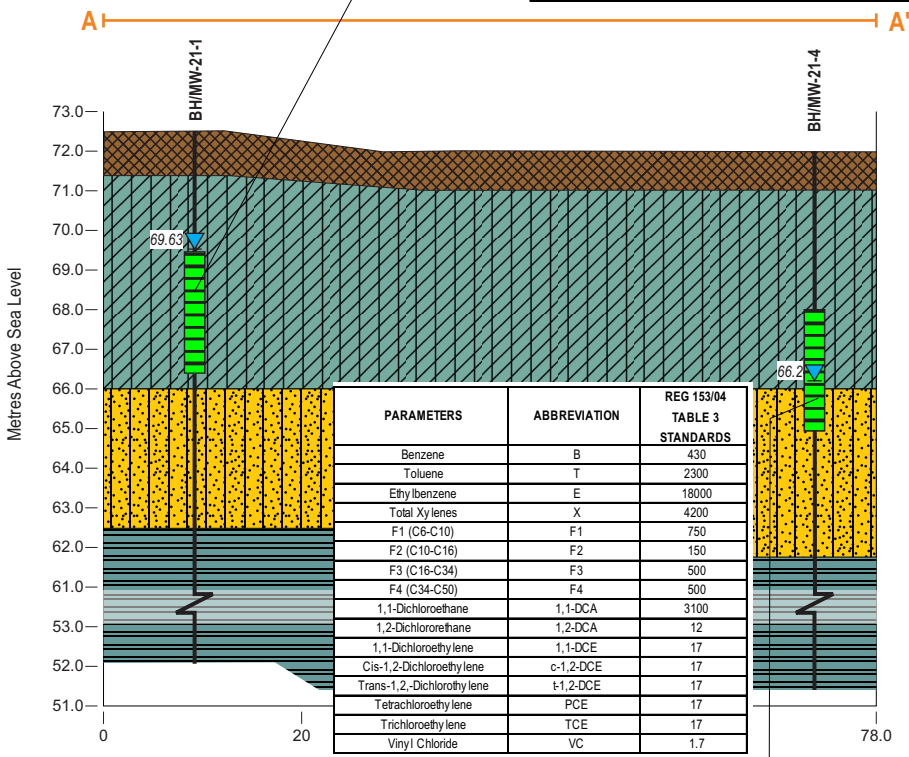
5329 BOUNDARY ROAD,
OTTAWA, ONTARIO

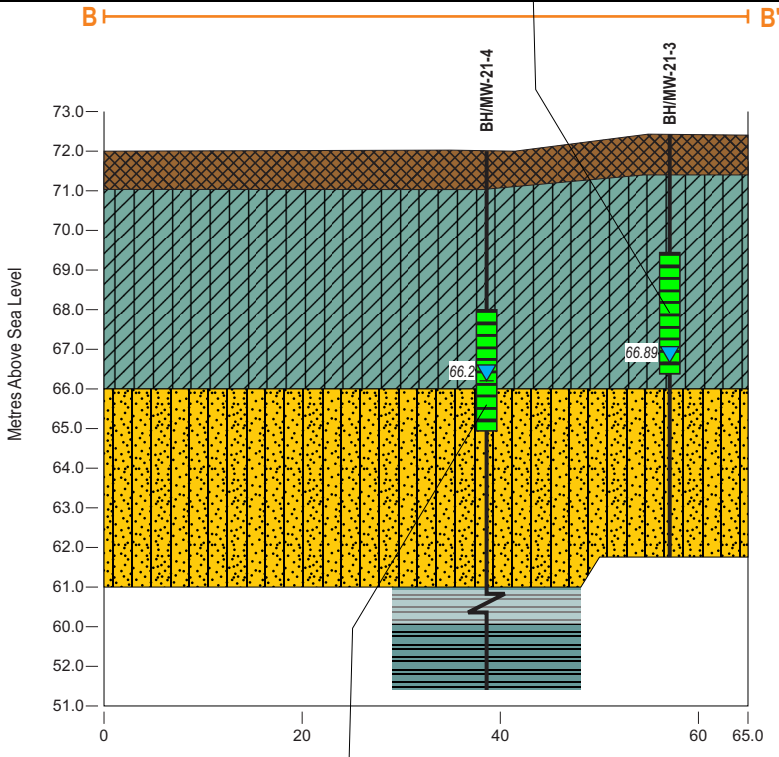
PROJECT NUMBER: 21018298 | DATE: JANUARY 2022

21019154-PH2 SEC-JAN22:PAH

BH/MW21-1																Screen Interval: 3.0 - 6.1 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<100	<100	NA	NA	NA	NA	NA	NA	NA	NA

BH/MW21-3																Screen Interval: 3.0 - 6.1 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20





PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	430
Toluene	T	2300
Ethy lbenzene	E	18000
Total Xy lenes	X	4200
F1 (C6-C10)	F1	750
F2 (C10-C16)	F2	150
F3 (C16-C34)	F3	500
F4 (C34-C50)	F4	500
1,1-Dichloroethane	1,1-DCA	3100
1,2-Dichlororethane	1,2-DCA	12
1,1-Dichloroethy lene	1,1-DCE	17
Cis-1,2-Dichloroethy lene	c-1,2-DCE	17
Trans-1,2,-Dichlorothy lene	t-1,2-DCE	17
Tetrachloroethy lene	PCE	17
Trichloroethy lene	TCE	17
Vinyl Chloride	VC	1.7

BH/MW21-4																Screen Interval: 3.9 - 7.0 mbgs
Date	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
12/8/21	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
~	<0.20	<0.20	<0.20	<0.40	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

SCALE:
4 X VERTICAL EXAGGERATION

SOURCE:
BASED ON FIELD MEASUREMENTS BY EXP STAFF

DRAWN BY	CHECKED BY
K.G.	M.M.

LEGEND:
- TEST HOLE
- SCREEN INTERVAL
- GROUND WATER ELEVATION (DECEMBER 8, 2021)
- masl METRES ABOVE SEA LEVEL
- FILL
- GLACIAL TILL
- SILTY CLAY
- SHALE

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH FINE TEXTURED SOILS.
~ INDICATES FIELD DUPLICATE SAMPLE.
ALL RESULTS IN UNITS OF µg/L, UNLESS OTHERWISE NOTED.
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

CROSS SECTIONS A-A' AND B-B' GROUNDWATER ANALYTICAL RESULTS – PHCs AND VOCs

13

5329 BOUNDARY ROAD,
OTTAWA, ONTARIO

PROJECT NUMBER: 21018298 | DATE: JANUARY 2022

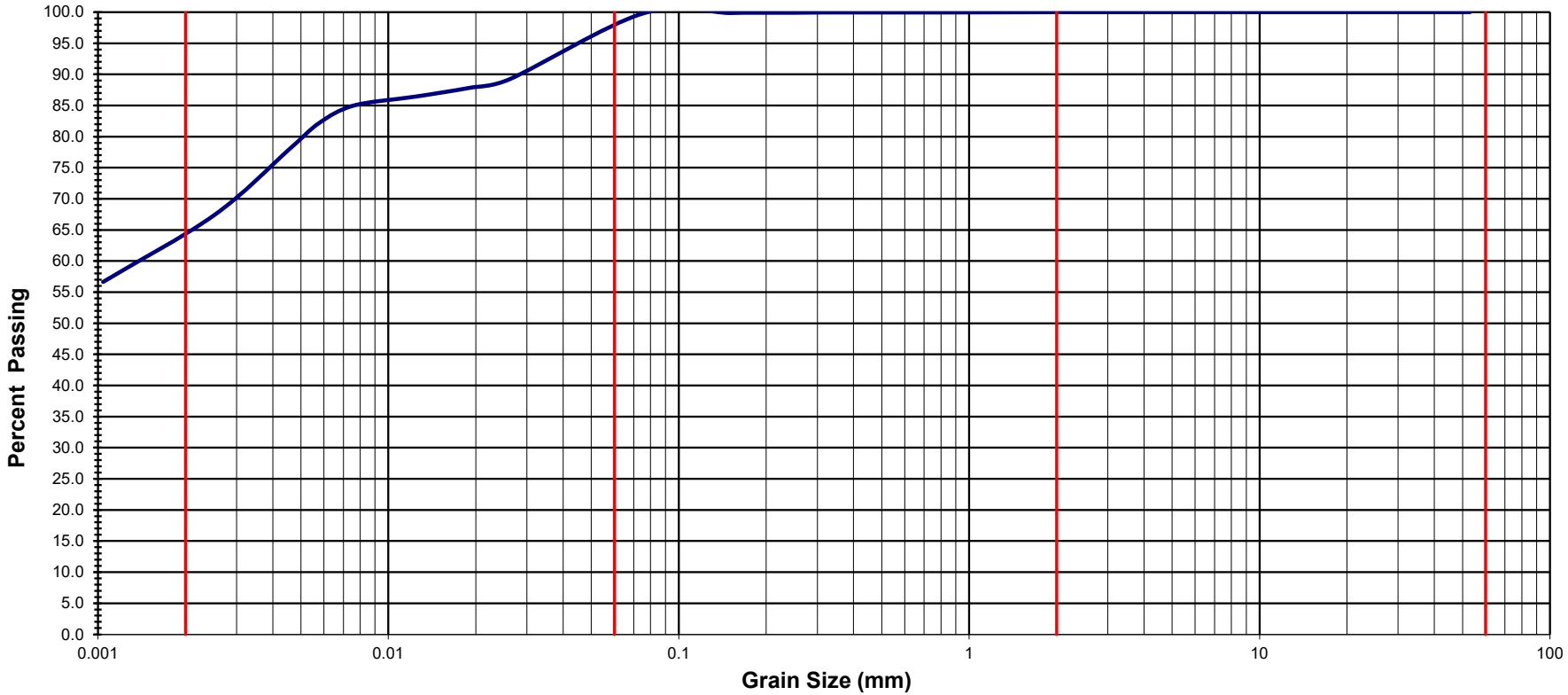
21019154-PH2 SEC-JAN22:GW PHC-VOC

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test for Particle Size Analysis of Soil
ASTM C-136/ASTM D-422

Modified M.I.T. Classification

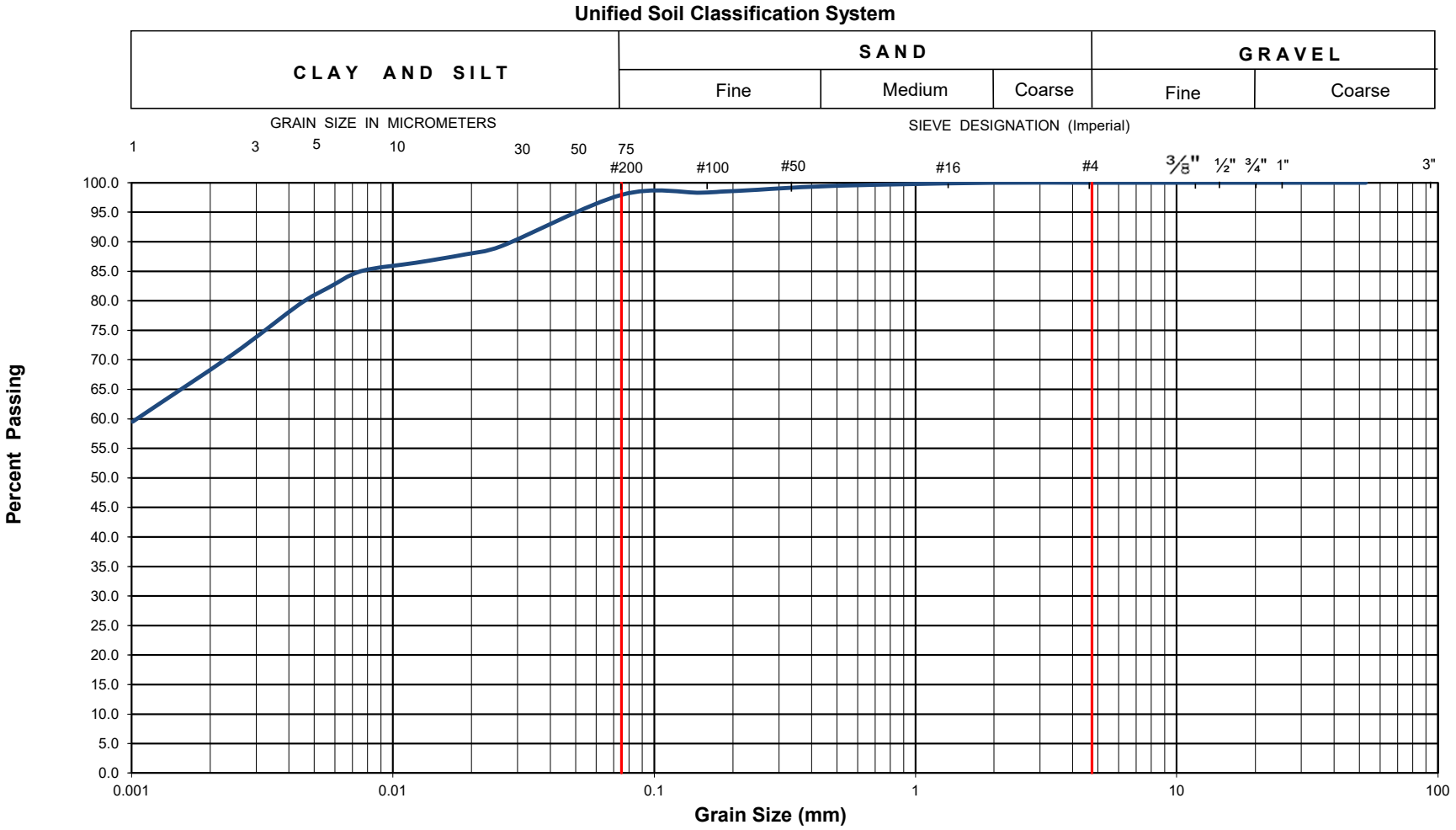
CLAY	SILT			SAND			GRAVEL			
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	



EXP Project No.:	**OTT-210195154-A0**		**Project Name :**	**Geotechnical Investigation - Proposed High Rise Development**					
Client :	**Katasa Groupe**		**Project Location :**	**381 Kent Street, Ottawa, Ontario**					
Date Sampled :	**December 2, 2021**		**Borehole No:**	**BH21-1**		**Sample No.:**	**SS4**	**Depth (m) :**	**4.6-5.2**
Sample Composition:	**% Clay:**	**64**	**% Silt:**	**34**	**% Sand:**	**2**	**% Gravel:**	**0**	**Figure :** **xxxx**
Sample Description :			**Silty Clay, trace Sand**						

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

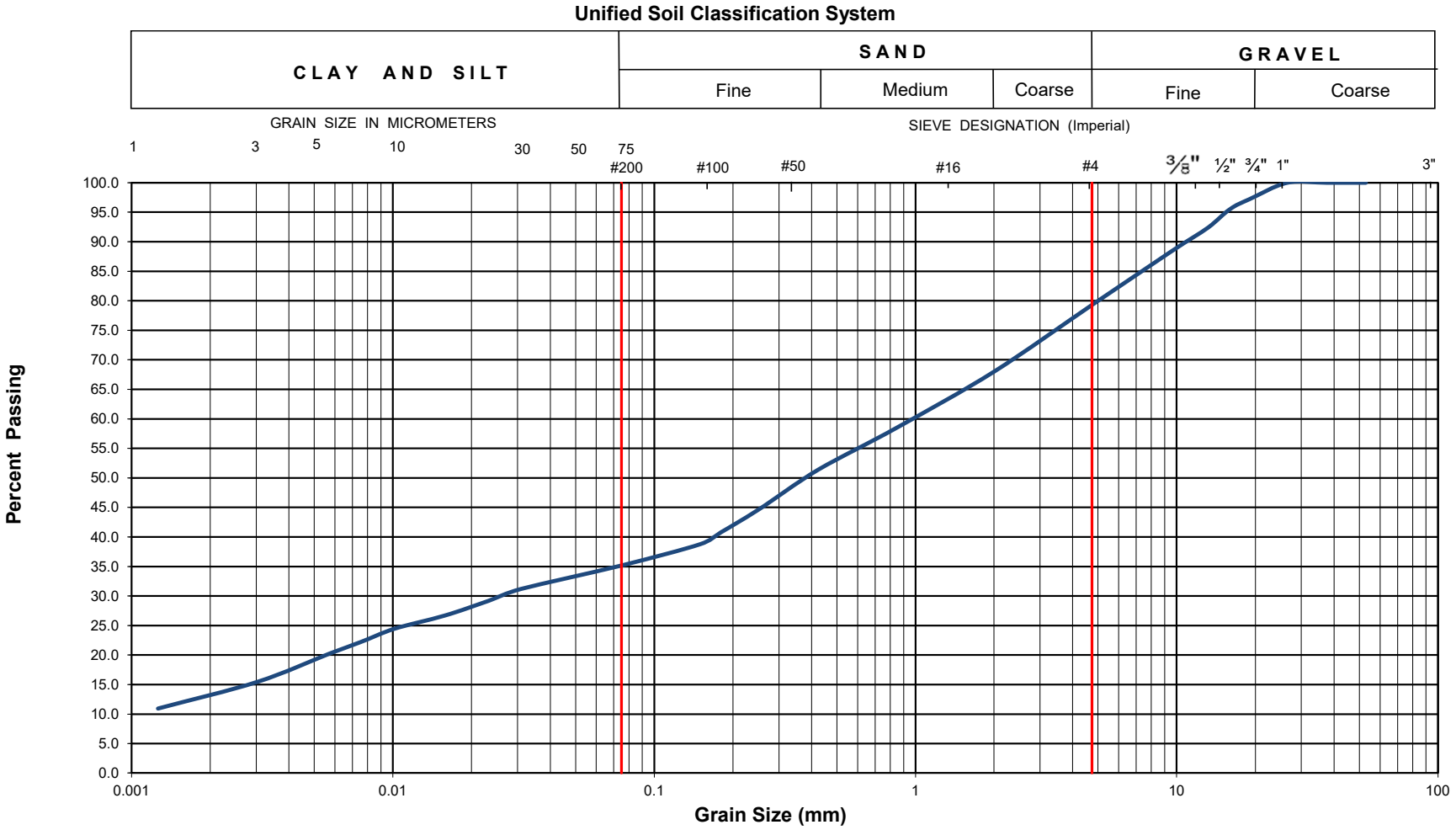
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-210195154-A0**	**Project Name :**	**Geotechnical Investigation - Proposed High Rise Development**						
Client :	**Katasa Groupe**	**Project Location :**	**381 Kent Street, Ottawa, Ontario**						
Date Sampled :	**December 1, 2021**	**Borehole No:**	**BH21-3**		**Sample No.:**	**SS4**		**Depth (m) :**	**2.3-2.9**
Sample Description :		**% Silt and Clay**	**98**	**% Sand**	**2**	**% Gravel**	**0**	**Figure :**	**xxxx**
Sample Description :		**High Plasticity Fat Clay (CH)**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-210195154-A0**	**Project Name :**	**Geotechnical Investigation - Proposed High Rise Development**						
Client :	**Katasa Groupe**	**Project Location :**	**381 Kent Street, Ottawa, Ontario**						
Date Sampled :	**December 2, 2021**	**Borehole No:**	**BH21-4**		**Sample No.:**	**SS11**		**Depth (m) :**	**7.6-8.2**
Sample Description :		**% Silt and Clay**	**35**	**% Sand**	**44**	**% Gravel**	**21**	**Figure :**	**xxxx**
Sample Description :	**Silty Sand with Gravel (SM) - Sandy Lean Clay with Gravel (CL)**								

Appendix B – Sampling and Analysis Plan

1 Introduction

This appendix presents the Sampling and Analysis Plan (SAAP) that was developed in support of the Phase Two Environmental Site Assessment (ESA) for the property located at 381 Kent Street in Ottawa, Ontario (hereinafter referred to as the 'site'). The SAAP presents the procedures and measures that will be undertaken during field investigative activities to characterize the site conditions and meet the data quality objectives of the Phase Two ESA.

The SAAP presents the sampling program proposed for the site, the recommended procedures and protocols for sampling and related field activities, the data quality objectives, and the quality assurance/ quality control measures that will be undertaken to provide for the collection of accurate, reproducible and representative data. These components are described in further detail below.

2 Field Sampling Program

The field sampling program was developed to provide for the collection of samples of the soil and groundwater for chemical analysis of petroleum hydrocarbons (PHC), benzene, toluene, ethylbenzene and xylenes (collectively known as 'BTEX'), polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOC), and/or metals. The soil sampling media is to consist of the overburden materials (depths up to 10 m of overburden beneath site). The soil sampling will be location-specific to assess for the potential presence of PHC, BTEX, PAH, VOC, and/or metals based on the identification of potential areas of potential environmental concern identified in a Phase One ESA completed by EXP in 2021. Vapour readings will also be taken in the field to determine samples to be submitted for laboratory analysis.

Each of the groundwater samples will be submitted for analysis of VOC and PHC. The monitoring well network is to comprise of four monitoring wells.

Vertical control of the boreholes and monitoring wells will be obtained through the completion of an elevation survey with reference to a geodetic benchmark. Groundwater flow and direction in the overburden aquifer will also be determined through groundwater level measurements and the elevations established in the site elevation survey.

3 Field Methods

To meet the requirements of the field sampling program, the following field investigative methods will be undertaken:

- Borehole Drilling;
- Soil Sampling;
- Monitoring Well Installation;
- Groundwater Level Measurements;
- Elevation Survey; and,
- Groundwater Sampling.

The field investigative methods will be performed following the procedures and protocols set out in EXP's standard operating procedures and are outlined below:

3.1 Borehole Drilling

Boreholes will be advanced at the site to facilitate the collection of soil samples for chemical analysis and geologic characterization; and, for the installation of groundwater monitoring wells. A total of four (4) boreholes are proposed to be advanced at the site, up to a maximum overburden depth of approximately 18 m below grade, to provide for the collection of samples of the surficial and overburden materials beneath the site. The borehole locations will be selected to delineate the extent and magnitude of PCOC related impacts to the soils and the groundwater.

Prior to borehole drilling, utility clearances will be obtained from public and private locators, as required. The borehole drilling program will be conducted by a licensed driller under the oversight of EXP field staff. All drilling equipment will be cleaned prior to the commencement of drilling at each borehole location.

3.2 Soil Sampling

Soil samples will be collected for chemical analysis and geologic property characterization. The soil samples will be collected using 5 cm diameter, 60 cm long, stainless steel split-spoon sampling devices advanced ahead of the direct push drilling equipment at continuous intervals. The split spoon sampling devices will be attached to drill rods and advanced into the soil by means of a standard penetrating hammer. Upon retrieval from the boreholes, the split-spoon samplers will be placed on a flat surface and disassembled by drilling personnel to provide access of the recovered cores. Geologic and sampling details of the recovered cores will be logged and the samples will be assessed for the potential presence of non-aqueous phase liquids. Samples for chemical analysis will be selected on the basis of visual and olfactory evidence of impacts and at specific intervals to define the lateral and vertical extent of known impacts.

Recommended volumes of soil samples selected for chemical analysis will be collected into pre-cleaned, laboratory supplied, analytical test group specific containers. The samples will be placed into clean insulated coolers chilled with ice for storage and transport. Samples intended for analysis of VOC, BTEX and PHC F1-F2 will be collected into 40 ml vials. The samples will be assigned unique identification numbers, and the date, time, location, and requested analyses for each sample will be documented in a bound field note book. The samples will be submitted to the contract laboratory within analytical test group holding times under Chain of Custody (COC) protocols. New disposable chemical resistant gloves will be used for each soil core to prevent sample cross-contamination.

3.3 Monitoring Well Installation

It is proposed that four boreholes will be instrumented as a groundwater monitoring well installed with slotted screens intercepting either the native overburden material or the shallow bedrock, where the water table aquifer is expected, extending to depths of approximately 6 m below grade. The monitoring wells will be constructed using 51 mm diameter, Schedule 40, PVC riser pipe and number 10 slot size (0.25 mm) well screens. The base of the well screens will be sealed with threaded flush PVC end caps. All well pipe connections will be factory machined threaded flush couplings. The annular space around the well screens will be backfilled with silica sand, to an average height of 0.3 m above the top of the screen. Granular bentonite will be placed in the borehole annulus from the top of the sand pack to approximately 0.3 m below grade. The monitoring wells will be completed with a flush-mounted protective steel casing cemented into place.

3.4 Monitoring Well Development

The newly installed monitoring wells will be developed to remove fine sediment particles potentially lodged in the sand pack and well screen to enhance hydraulic communication with the surrounding formation waters.

Standing water volumes will be determined by means of an electronic water level meter. Prior to collecting groundwater samples, the monitoring wells will be developed using low flow sampling techniques to reduce the amount of sediment in the samples. Well development details will be documented on a well development log sheet or in a bound hard cover notebook. All development waters will be collected and stored in labeled, sealed containers.

3.5 Groundwater Level Measurements

Groundwater level measurements will be recorded for the monitoring wells to determine groundwater flow and direction in the water table aquifer beneath the site. Water levels will be measured with respect to the top of the casing by means of an electronic water level meter. The water levels will be recorded on water level log sheets. The water level meter probe will be decontaminated between monitoring well locations.

3.6 Elevation Survey

An elevation survey will be conducted to obtain vertical control of all monitoring well locations. The top of casing and ground surface elevation of each monitoring well location will be surveyed against a known geodetic benchmark, or if unavailable, against a suitable arbitrary benchmark. Elevations measured against using a high precision GPS unit and a benchmark with an assigned elevation will be recorded as meters above mean sea level (m AMSL). The elevation survey will be accurate to within ± 0.5 cm.

3.7 Groundwater Sampling

Groundwater samples will be collected from the monitoring wells for chemical analysis. The wells will be sampled using a “low flow” technique whereby the wells are continuously purged using an electric pump (equipped with dedicated tubing) and parameters within the purged water are monitored using a groundwater chemistry multi-meter at 3 minute intervals. These parameters include: pH, conductivity, temperature, and salinity. Once these parameters are found to deviate less than 10% over three testing events, equilibrium is deemed to have occurred and a sample of the groundwater will be collected. The purge water will also be continuously monitored for visual and olfactory evidence of petroleum and solvent impact (sheen and odour).

Recommended groundwater sample volumes will be collected into pre-clean laboratory-supplied vials or bottles provided with analytical test group specific preservatives, as required. The samples will be placed in an insulated cooler chilled with ice for storage and transport. Each VOC vial will be inverted and inspected for gas bubbles prior to being placed in the cooler to ensure that no head-space is present. All groundwater samples will be assigned unique identification numbers, and the date, time, project number, company name, location and requested analyses for each sample will be documented in a bound hard cover notebook. The samples will be submitted to the contractual laboratory within analytical test group holding times under COC protocols. New disposable chemical resistant gloves will be used for each sampling location to prevent sample cross-contamination.

4 Field Quality Assurance/Quality Control Program

The objective of the field quality assurance/quality control (QA/QC) program is to obtain soil and groundwater samples and other field measurements that provide data of acceptable quality that meets the objectives of the Phase Two ESA. The objectives of the QA/QC program will be achieved through the implementation of procedures for the collection of unbiased (i.e. non-contaminated) samples, sample documentation and the collection of appropriate QC samples to provide a measure of sample reproducibility and accuracy. The field QA/QC measures will comprise:

- Decontamination Protocols;
- Equipment Calibration;
- Sample Preservation;
- Sample Documentation; and,
- Field Quality Control Samples.

Details on the field QA/QC measures are provided below.

4.1 Decontamination Protocols

Decontamination protocols will be followed during field sampling where non-dedicated sampling equipment is used to prevent sample cross contamination. The split spoon soil sampling device will be cleaned/decontaminated between sampling intervals in according with SOP requirements. For the monitoring well installation, well components are not to come into contact with the ground surface prior to insertion into boreholes. Electronic water level meters will be decontaminated between monitoring well locations during well development, and purging activities. For hydraulic conductivity tests, the electronic water level meters will be decontaminated between sampling locations. All decontamination fluids will be collected and stored in sealed, labeled containers.

4.2 Equipment Calibration

All equipment requiring calibration will be calibrated in the field according to manufacturer's requirements using analytical grade reagents, or by the supplier prior to conducting field activities, and subsequently checked in the field. The calibration of all pre-calibrated instruments will be checked in the field using analytical grade reagents and re-calibrated as required. For multiple day sampling events, equipment calibration will be checked prior to the beginning of sampling activities. All calibration data will be documented in a bound hard cover notebook.

4.3 Sample Preservation

All samples will be preserved using appropriate analytical test group specific reagents, as required, and upon collection placed in pre-chilled insulated coolers packed with ice for storage and transport.

4.4 Sample Documentation

All samples will be assigned a unique identification number, which is to be recorded along with the date, time, project number, company name, location and requested analysis in a bound field notebook. All samples will be handled and transported following COC protocols.

4.5 Field Quality Control

Field quality controls samples will be collected to evaluate the accuracy and reproducibility of the field sampling procedures. For soil and groundwater sampling, one (1) field duplicate is to be collected for every ten (10) samples submitted for chemical analysis. The field duplicate samples will be assessed by calculating the relative percent difference and comparing to the analytical test group specific acceptance criteria.

Appendix C: Borehole Logs

Explanation of Terms Used on Borehole Records

SOIL DESCRIPTION

Terminology describing common soil genesis:

Topsoil: mixture of soil and humus capable of supporting good vegetative growth.

Peat: fibrous fragments of visible and invisible decayed organic matter.

Fill: where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc.; none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

Till: the term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Terminology describing soil structure:

Desiccated: having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.

Stratified: alternating layers of varying material or color with the layers greater than 6 mm thick.

Laminated: alternating layers of varying material or color with the layers less than 6 mm thick.

Fissured: material breaks along plane of fracture.

Varved: composed of regular alternating layers of silt and clay.

Slickensided: fracture planes appear polished or glossy, sometimes striated.

Blocky: cohesive soil that can be broken down into small angular lumps which resist further breakdown.

Lensed: inclusion of small pockets of different soil, such as small lenses of sand scattered through a mass of clay; not thickness.

Seam: a thin, confined layer of soil having different particle size, texture, or color from materials above and below.

Homogeneous: same color and appearance throughout.

Well Graded: having wide range in grain sized and substantial amounts of all predominantly on grain size.

Uniformly Graded: predominantly on grain size.

All soil sample descriptions included in this report follow the ASTM D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. The system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification. The classification excludes particles larger than 76 mm. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually in accordance with ASTM D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems. Others may use different classification systems; one such system is the ISSMFE Soil Classification.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present and as described below in accordance with Note 16 in ASTM D2488-09a:

Table a: Percent or Proportion of Soil, Pp

	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5≤Pp≤10%
Little	15≤Pp≤25%
Some	30≤Pp≤45%
Mostly	50≤Pp≤100%

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test 'N' value:

Table b: Apparent Density of Cohesionless Soil

	'N' Value (blows/0.3 m)
Very Loose	N<5
Loose	5≤N<10
Compact	10≤N<30
Dense	30≤N<50
Very Dense	50≤N

The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis, Standard Penetration Test 'N' values can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils:

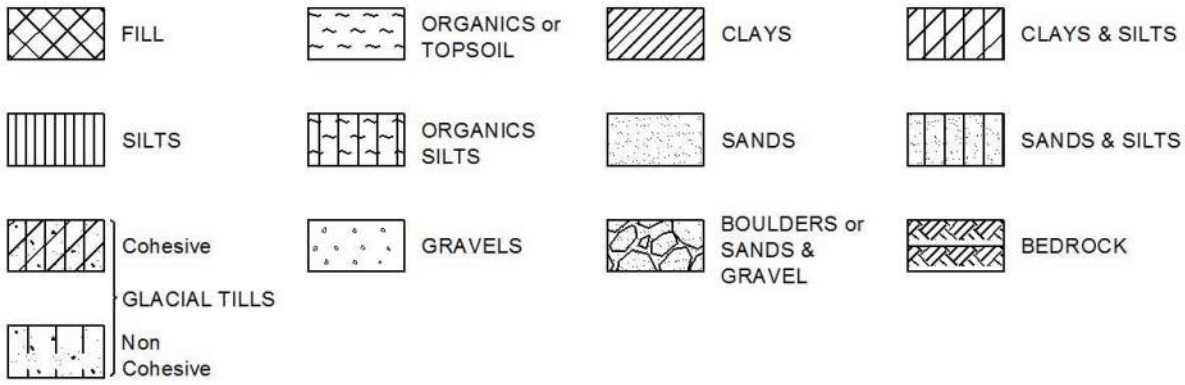
Table c: Consistency of Cohesive Soil

Consistency	Vane Shear Measurement (kPa)	'N' Value
Very Soft	<12.5	<2
Soft	12.5-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

Note: 'N' Value - The Standard Penetration Test records the number of blows of a 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler 1 foot (305mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in meters (e.g. 50/0.15).

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:



WATER LEVEL MEASUREMENT

Log of Borehole BH/MW21-1

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Location: 381 Kent Street, Ottawa, Ontario

Figure No. 3

Page. 1 of 2

Date Drilled: December 2nd, 2021

Drill Type: CME 55 Truck

Datum: Geodetic

Logged by: MAD Checked by: MGM/IT

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth
			72.47	0
		ASPHALT ~50 mm	72.4	
		GRAVEL WITH SOME SAND FILL Trace brick debris, brown, moist, no odour or staining, (compact).		
			71.3	1
		SILTY CLAY Grey, moist turning wet, no odour or staining.		2
			69.63	3
				4
				5
				6
			65.9	7
		SANDY GRAVELLY TILL WITH SHALE BOULDERS AND COBBLES Dark grey/brown, wet, no odour or staining (loose).		8
				9
				10

Standard Penetration Test N Value: 20 40 60 80
Shear Strength: 50 100 150 200 kPa
Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60
SAMPLES
Natural Unit Wt. kN/m³

27 — 25 / 0
21 — 45 / 0
6 — 40 / 0
HW — 5 / 0
2 — 0 / 0
85/410mm — 0 / 0

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A flushmount nested well comprised of 38 mm PVC pipe installed in the overburden and a 19 mm PCV pipe sealed into rock was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
6 days	2.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	9.86 - 11.48	100	14
2	11.48 - 13.08	100	30
3	13.08 - 14.61	100	28
4	14.61 - 16.1	100	35
5	16.1 - 17.65	100	47
6	17.65 - 19.22	95	85
7	19.22 - 20.35	95	93

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

Log of Borehole BH/MW21-1

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Figure No. 3

Page. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		Auger Refusal at 9.58 m Depth *(continued)*	62.47	10			RUN1	
		SHALE BEDROCK	62.4					
		Dark grey, poor to excellent quality.		11				
				12			RUN2	
				13				
				14			RUN3	
				15				
				16			RUN4	
				17				
				18			RUN5	
				19				
				20			RUN6	
			52.1				RUN7	
		Borehole Terminated at 20.35 m Depth						

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A flushmount nested well comprised of 38 mm PVC pipe installed in the overburden and a 19 mm PCV pipe sealed into rock was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
6 days	2.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	9.86 - 11.48	100	14
2	11.48 - 13.08	100	30
3	13.08 - 14.61	100	28
4	14.61 - 16.1	100	35
5	16.1 - 17.65	100	47
6	17.65 - 19.22	95	85
7	19.22 - 20.35	95	93

Log of Borehole BH/MW21-2

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Location: 381 Kent Street, Ottawa, Ontario

Figure No. 4

Date Drilled: December 1st, 2021

Drill Type: CME 55 Truck

Datum: Geodetic

Logged by: MAD Checked by: MGM/IT

Legend		Legend	
Split Spoon Sample	⊠	Combustible Vapour Reading	□
Auger Sample	◨	Natural Moisture Content	X
SPT (N) Value	○	Atterberg Limits	├─○
Dynamic Cone Test	───	Undrained Triaxial at % Strain at Failure	⊕
Shelby Tube	■	Shear Strength by Penetrometer Test	▲
Shear Strength by Vane Test	+ S		

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth
			72.66	0
		ASPHALT ~50 mm	72.6	
		SAND FILL WITH SOME GRAVEL AND COBBLES Some brick debris, brown, moist, no odour or staining, (loose to compact).		
		SILTY CLAY Grey, moist turning wet, no odour or staining.	70.9	
			69.86	
		SANDY GRAVELLY TILL WITH SHALE BOULDERS AND COBBLES Dark grey/brown, wet, no odour or staining (compact).	66.6	
				10

Standard Penetration Test N Value (20, 40, 60, 80); Shear Strength kPa (50, 100, 150, 200)

Combustible Vapour Reading (ppm) (250, 500, 750); Natural Moisture Content %; Atterberg Limits (% Dry Weight) (20, 40, 60)

SAMPLES; Natural Unit Wt. kN/m^3

Approx. Depth (m)	SPT N Value	Combustible Vapour Reading
0.3	9	
1.1	7	25 / 0
1.8	10	20 / 0
2.6	15	35 / 0
3.4	8	25 / 0
4.1	0	25 / 0
7.9	13	25 / 0

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A flushmount monitoring well with a 38 mm slotted pipe was installed in the borehole upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
7 days	2.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH/MW21-2

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Figure No. 4

Page. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		SANDY GRAVELLY TILL WITH SHALE BOULDERS AND COBBLES Dark grey/brown, wet, no odour or staining (compact). *(continued)*	62.66	10	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
				11				
				12				
			60.0					
		Auger Refusal at 12.66 m Depth, Borehole Terminated						

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A flushmount monitoring well with a 38 mm slotted pipe was installed in the borehole upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
7 days	2.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH/MW21-3

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Location: 381 Kent Street, Ottawa, Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: December 1st, 2021

Drill Type: CME 55 Truck

Datum: Geodetic

Logged by: MAD Checked by: MGM/IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)
Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth	Standard Penetration Test N Value / Shear Strength (kPa)	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~50 mm	72.44	0				
		GRAVEL FILL WITH SOME SAND AND COBBLES Some brick debris, brown, moist, no odour or staining, (dense to compact).	72.3		37	0 / 2		
				1	22	0 / 0		
		SILTY CLAY Grey, moist turning wet, no odour or staining, (hard to stiff).	70.9		13	0 / 0		
				2		>250		
					15	0 / 1		
				3	7	0 / 0		
					HW	0 / 0		
					77 s = 5.5			
				5	HW	0 / 0		
			66.89		HW	0 / 0		
		Dynamic Cone Test	66.1	6	67 s = 3.5			
				7				
			64.8					
		Cone Refusal at 7.63 m Depth, Borehole Terminated						

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A flushmount monitoring well with a 38 mm slotted pipe was installed in the borehole upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
7 days	5.6	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH/MW21-4

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Location: 381 Kent Street, Ottawa, Ontario

Figure No. 6

Page. 1 of 2

Date Drilled: November 29th to 30th, 2021

Drill Type: CME 55 Truck

Datum: Geodetic

Logged by: MAD Checked by: MGM/IT

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test + S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~60 mm	72 / 71.9	0				
		SAND AND GRAVEL FILL Crushed stone, grey, moist, no odour or staining, (dense).	71.7					
		SAND FILL WITH SOME GRAVEL BOULDERS AND COBBLES Trace brick debris, brown, moist, no odour or staining, (dense to loose).	70.8	1	45	0 / 0		
					6	0 / 0		
		SILTY CLAY Grey, moist turning wet, no odour or staining (hard to stiff).		2	15 / 144	>250 / 0 / 1		
					13 / 144	5 / 1		
				3	5 / 48	10 / 0		
					60 s = 3.0			
				4	HW	0 / 0		
				5	HW	0 / 0		
			66.2		1	5 / 0		
				6	96 s = 2.9			
		SANDY GRAVELLY TILL WITH SHALE BOULDERS AND COBBLES Dark grey/brown, wet, no odour or staining (compact to very dense).	65.4	7	15	15 / 0		
				8	11	25 / 0		
					23	25 / 0		
				9	77	30 / 0		
				10				

Continued Next Page

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A nested well comprised of 38 mm PVC pipe installed in the overburden and a 19 mm PCV pipe sealed into rock was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
8 days	5.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	10.07 - 11.71	57	8
2	11.71 - 13.23	100	49
3	13.23 - 14.76	97	29
4	14.76 - 16.28	100	73
5	16.28 - 17.81	100	99
6	17.81 - 19.33	100	91
7	19.33 - 20.85	97	95

Log of Borehole BH/MW21-4

Project No: OTT-21019154-A0

Project: Phase II Environmental Site Assessment / Geotechnical Investigation

Figure No. 6

Page. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic m	Depth
		SANDY GRAVELLY TILL WITH SHALE BOULDERS AND COBBLES	62	10
		Dark grey/brown, wet, no odour or staining (compact to very dense). *(continued)*		
		SHALE BEDROCK	61.1	
		Dark grey, poor to excellent quality.		11
				12
				13
				14
				15
				16
				17
				18
				19
				20
			51.1	
		Borehole Terminated at 20.85 m Depth		

Standard Penetration Test N Value

Shear Strength kPa: 20 40 60 80 | 50 100 150 200

63/280mm

Combustible Vapour Reading (ppm): 250 500 750

Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60

45 / 0

SAMPLES: RUN1 RUN2 RUN3 RUN4 RUN5 RUN6 RUN7

Natural Unit Wt. kN/m³

LOG OF BOREHOLE LOGS OF BOREHOLES - 381 KENT STREET.GPJ TROW OTTAWA.GDT 12/9/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A nested well comprised of 38 mm PVC pipe installed in the overburden and a 19 mm PCV pipe sealed into rock was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019154-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
8 days	5.8	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	10.07 - 11.71	57	8
2	11.71 - 13.23	100	49
3	13.23 - 14.76	97	29
4	14.76 - 16.28	100	73
5	16.28 - 17.81	100	99
6	17.81 - 19.33	100	91
7	19.33 - 20.85	97	95

Appendix D - Analytical Summary Tables

TABLE 1 SOIL ANALYTICAL RESULTS *(µg/g)*
PETROLEUM HYDROCARBONS
381 Kent Street, Ottawa, Ontario

Parameter	MECP Table 3[1]	BH/MW21-1 SS3	BH/MW21-2 SS5	DUP 1	BH/MW21-3 SS6	BH/MW21-4 SS8	Field Blank	Trip Blank
Sample Date (d/m/y)	Residential	12/02/21	12/01/21	Duplicate of	12/01/21	29/11/2021	NA	NA
Sample Depth (mbsg)		3.0 - 3.6	3.8 - 4.4	BH/MW21-2 SS5	3.8 - 4.4	5.3 - 5.9	NA	NA
Laboratory ID		RIO155	RIO157	RIO160	RIO159	RI0182	M1203-198-01-A	M1203-198-01-B
Date of Analysis		24/12/21	24/12/21	24/12/21	24/12/21	22/12/21	na	na
Certificate of Analysis		C1Y8891	C1Y8891	C1Y8891	C1Y8891	C1Y8897	M1203-198	M1203-198
Benzene	0.17	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.02	<0.02
Ethylbenzene	15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.02	<0.02
Toluene	6	<0.020	<0.020	<0.020	<0.020	<0.020	<0.02	<0.02
Xylenes	25	<0.020	<0.020	<0.020	<0.020	<0.020	<0.04	<0.04
PHC F_1 (>C_6-C_{10})	65	<10	<10	<10	<10	<10	NA	NA
PHC F_2 (>C_{10}-C_{16})	150	<20	<20	<20	<10	<20	NA	NA
PHC F_3 (>C_{16}-C_{34})	1300	<100	<100	<100	<50	<100	NA	NA
PHC F_4 (>C_{34}-C_{50})	5600	<100	<100	<100	<50	<100	NA	NA

NOTES:

1 MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards, fine grained soil.*

Shaded/Bold Concentration exceeds MECP Table 3 soil quality standard.

TABLE 2 **SOIL ANALYTICAL RESULTS *(µg/g)***
VOLATILE ORGANIC COMPOUNDS
381 Kent Street, Ottawa, Ontario

Parameter	MECP Table 3[1]	BH/MW21-1 SS3	BH/MW21-2 SS5	DUP 1	BH/MW21-3 SS6	BH/MW21-4 SS8
Sample Date (d/m/y)	Residential	12/02/21	12/01/21	Duplicate of	12/01/21	29/11/2021
Sample Depth (mbgs)		3.0 - 3.6	3.8 - 4.4	BH/MW21-2 SS5	3.8 - 4.4	5.3 - 5.9
Maxxam ID		RIO155	RIO157	RIO160	RIO159	RI0182
Date of Analysis		24/12/21	24/12/21	24/12/21	24/12/21	22/12/21
Maxxam Certificate of Analysis		C1Y8891	C1Y8891	C1Y8891	C1Y8891	C1Y8897
Acetone	28	<0.49	<0.49	<0.49	<0.49	<0.49
Benzene	0.17	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Bromodichloromethane	13	<0.040	<0.040	<0.040	<0.040	<0.040
Bromoform	0.26	<0.040	<0.040	<0.040	<0.040	<0.040
Bromomethane	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Carbon Tetrachloride	0.12	<0.040	<0.040	<0.040	<0.040	<0.040
Chlorobenzene	2.7	<0.040	<0.040	<0.040	<0.040	<0.040
Chloroform	0.18	<0.040	<0.040	<0.040	<0.040	<0.040
Dibromochloromethane	9.4	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichlorobenzene	4.3	<0.040	<0.040	<0.040	<0.040	<0.040
1,3-Dichlorobenzene	6	<0.040	<0.040	<0.040	<0.040	<0.040
1,4-Dichlorobenzene	0.097	<0.040	<0.040	<0.040	<0.040	<0.040
Difluorodifluoromethane	25	<0.040	<0.040	<0.040	<0.040	<0.040
1,1-Dichloroethane	11	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichloroethane	0.05	<0.049	<0.049	<0.049	<0.049	<0.049
1,1-Dichloroethylene	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Cis-1,2-Dichloroethylene	30	<0.040	<0.040	<0.040	<0.040	<0.040
Trans-1,2-Dichloroethylene	0.75	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichloropropane	0.085	<0.040	<0.040	<0.040	<0.040	<0.040
1,3-Dichloropropene (cis+trans)	0.083	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	15	<0.010	<0.010	<0.010	<0.010	<0.010
Ethylene Dibromide	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Hexane	34	<0.040	<0.040	<0.040	<0.040	<0.040
Methylene Chloride	0.96	<0.049	<0.049	<0.049	<0.049	<0.049
Methyl Ethyl Ketone	44	<0.40	<0.40	<0.40	<0.40	<0.40
Methyl Isobutyl Ketone	4.3	<0.40	<0.40	<0.40	<0.40	<0.40
Methyl-t-Butyl Ether	1.4	<0.040	<0.040	<0.040	<0.040	<0.040
Styrene	2.2	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,1,2-Tetrachloroethane	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,2,2-Tetrachloroethane	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Tetrachloroethylene	2.3	<0.040	<0.040	<0.040	<0.040	<0.040
Toluene	6	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,1-Trichloroethane	3.4	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,2-Trichloroethane	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Trichloroethylene	0.52	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorofluoromethane	5.8	<0.040	<0.040	<0.040	<0.040	<0.040
Vinyl Chloride	0.022	<0.019	<0.019	<0.019	<0.019	<0.019
Total Xylenes	25	<0.020	<0.020	<0.020	<0.020	<0.020

NOTES:

1 MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards, fine grained soil.*

Shaded/ Bold Concentration exceeds MECP Table 3 soil quality standard.

TABLE 3 SOIL ANALYTICAL RESULTS *(µg/g)*
POLYCYCLIC AROMATIC HYDROCARBONS
381 Kent Street, Ottawa, Ontario

Parameter	MECP Table 3[1]	BH/MW21-1 SS1	BH/MW21-2 SS1	BH/MW21-3 SS2	BH/MW21-4 SS2	DUP 2
Sample Date (d/m/y)	Residential	12/02/21	12/01/21	12/01/21	29/11/2021	Duplicate of
Sample Depth (mbsg)		0.1 - 0.6	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	BH/MW21-4 SS2
Laboratory ID		RIO155	RIO156	RIO158	RIO181	RIO184
Date of Analysis		08/12/21	08/12/21	08/12/21	08/12/21	08/12/21
Certificate of Analysis		C1Y8891	C1Y8891	C1Y8891	C1Y8891	C1Y8891
Acenaphthene	58	<0.050	1.2	0.51	<0.0050	<0.0050
Acenaphthylene	0.17	<0.050	0.083	<0.050	<0.0050	<0.0050
Anthracene	0.74	0.052	**3.9**	**0.92**	<0.0050	<0.0050
Benzo[a]anthracene	0.63	0.25	**4.9**	**1.7**	<0.0050	<0.0050
Benzo[a]pyrene	0.3	0.26	**3.5**	**1.5**	<0.0050	<0.0050
Benzo[b]fluoranthene	0.78	0.33	**4.2**	**2.0**	<0.0050	0.0058
Benzo[g,h,i]perylene	7.8	0.20	1.7	0.91	<0.0050	0.016
Benzo[k]fluoranthene	0.78	0.12	**1.6**	0.74	<0.0050	<0.0050
Chrysene	7.8	0.21	4.0	1.5	<0.0050	<0.0050
Dibenz[a,h]anthracene	0.1	<0.050	**0.47**	**0.23**	<0.0050	<0.0050
Fluoranthene	0.69	0.50	**15**	**5.3**	<0.0050	0.0056
Fluorene	69	<0.050	1.2	0.54	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	0.48	0.17	**2.0**	**0.98**	<0.0050	<0.0050
Methylnaphthalene, 2-(1-)	3.4	<0.071	0.69	0.31	<0.0071	<0.0071
Naphthalene	0.75	<0.050	**0.83**	0.31	<0.0050	<0.0050
Phenanthrene	7.8	0.26	**15**	4.9	<0.0050	<0.0050
Pyrene	78	0.45	12	3.7	<0.0050	0.0092

NOTES:

1 MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards, fine grained soil.*

Shaded/ Bold Concentration exceeds MECP Table 3 soil quality standard.

TABLE 4 SOIL ANALYTICAL RESULTS *(µg/g)*
METALS
381 Kent Street, Ottawa, Ontario

Parameter	MECP Table 3[1]	BH/MW21-1 SS1	BH/MW21-2 SS1	BH/MW21-3 SS2	BH/MW21-4 SS2	DUP 2
Sample Date (d/m/y)	Residential	12/02/21	12/01/21	12/01/21	29/11/2021	Duplicate of
Sample Depth (mbgs)		0.1 - 0.6	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	BH/MW21-4 SS2
Laboratory ID		RIO155	RIO156	RIO158	RIO181	RIO184
Date of Analysis		08/12/21	08/12/21	08/12/21	08/12/21	08/12/21
Certificate of Analysis		C1Y8891	C1Y8891	C1Y8891	C1Y8891	C1Y8891
Antimony	7.5	0.63	<0.20	0.43	<0.20	<0.20
Arsenic	18	2.1	1.2	3.0	<1.0	3.7
Barium	390	170	97	100	**430**	150
Beryllium	5	0.34	0.27	0.32	0.88	0.41
Boron	120	7.0	<5.0	5.0	<5.0	7.2
Cadmium	1.2	0.20	<0.10	0.31	0.11	0.15
Chromium	160	29	19	21	140	13
Cobalt	22	7.4	5.3	4.8	**25**	7.2
Copper	180	27	13	14	54	20
Lead	120	100	50	**150**	6.9	8.0
Molybdenum	6.9	1.9	0.55	1.4	<0.50	3.6
Nickel	130	17	11	11	73	24
Selenium	2.4	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	25	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.17	0.10	0.11	0.54	0.23
Uranium	23	0.56	0.59	0.66	0.96	1.7
Vanadium	86	36	34	29	**130**	21
Zinc	340	100	56	120	**150**	30

NOTES:

1	MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards, fine grained soil.*
Shaded/ Bold	Concentration exceeds MECP Table 3 soil quality standard.
NA	Not analyzed

Table 5 - Maximum Concentrations in Soil
381 Kent Street, Ottawa, Ontario

Parameter	Sample Location	Sample Depth (mbgs)	Sampling Date	Maximum Concentration	MECP Table 2
Petroleum Hydrocarbons					
F1 PHC (C6 - C10) - BTEX	All Locations	NA	1-Dec-21	<10	65
F2 PHC (C10-C16)	All Locations	NA	1-Dec-21	<20	150
F3 PHC (C16-C34)	All Locations	NA	1-Dec-21	<100	1300
F4 PHC (C34-C50)	All Locations	NA	1-Dec-21	<100	5600
Volatiles					
Acetone	All Locations	NA	1-Dec-21	<0.49	28
Benzene	All Locations	NA	1-Dec-21	<0.0060	0.17
Bromodichloromethane	All Locations	NA	1-Dec-21	<0.040	13
Bromoform	All Locations	NA	1-Dec-21	<0.040	0.26
Bromomethane	All Locations	NA	1-Dec-21	<0.040	0.05
Carbon Tetrachloride	All Locations	NA	1-Dec-21	<0.040	0.12
Chlorobenzene	All Locations	NA	1-Dec-21	<0.040	2.7
Chloroform	All Locations	NA	1-Dec-21	<0.040	0.18
Dibromochloromethane	All Locations	NA	1-Dec-21	<0.040	9.4
1,2-Dichlorobenzene	All Locations	NA	1-Dec-21	<0.040	4.3
1,3-Dichlorobenzene	All Locations	NA	1-Dec-21	<0.040	6
1,4-Dichlorobenzene	All Locations	NA	1-Dec-21	<0.040	0.097
Dichlorodifluoromethane	All Locations	NA	1-Dec-21	<0.040	25
1,1-Dichloroethane	All Locations	NA	1-Dec-21	<0.040	11
1,2-Dichloroethane	All Locations	NA	1-Dec-21	<0.049	0.05
1,1-Dichloroethylene	All Locations	NA	1-Dec-21	<0.040	0.05
Cis-1,2-Dichloroethylene	All Locations	NA	1-Dec-21	<0.040	30
Trans-1,2-Dichloroethylene	All Locations	NA	1-Dec-21	<0.040	0.75
1,2-Dichloropropane	All Locations	NA	1-Dec-21	<0.040	0.085
Cis-1,3-Dichloropropylene	All Locations	NA	1-Dec-21	<0.050	
Trans-1,3-Dichloropropylene	All Locations	NA	1-Dec-21	<0.050	0.083
Ethylbenzene	All Locations	NA	1-Dec-21	<0.010	15
Ethylene Dibromide	All Locations	NA	1-Dec-21	<0.040	0.05
Hexane	All Locations	NA	1-Dec-21	<0.040	34
Methylene Chloride	All Locations	NA	1-Dec-21	<0.049	0.96
Methyl Ethyl Ketone	All Locations	NA	1-Dec-21	<0.40	44
Methyl Isobutyl Ketone	All Locations	NA	1-Dec-21	<0.40	4.3
Methyl-t-Butyl Ether	All Locations	NA	1-Dec-21	<0.040	1.4
Styrene	All Locations	NA	1-Dec-21	<0.040	2.2
1,1,1,2-Tetrachloroethane	All Locations	NA	1-Dec-21	<0.040	0.05
1,1,2,2-Tetrachloroethane	All Locations	NA	1-Dec-21	<0.040	0.05
Tetrachloroethylene	All Locations	NA	1-Dec-21	<0.040	2.3
Toluene	All Locations	NA	1-Dec-21	<0.020	6
1,1,1-Trichloroethane	All Locations	NA	1-Dec-21	<0.040	3.4
1,1,2-Trichloroethane	All Locations	NA	1-Dec-21	<0.040	0.05
Trichloroethylene	All Locations	NA	1-Dec-21	<0.010	0.52
Trichlorofluoromethane	All Locations	NA	1-Dec-21	<0.040	5.8
Vinyl Chloride	All Locations	NA	1-Dec-21	<0.019	0.022
Total Xylenes	All Locations	NA	1-Dec-21	<0.020	25

NOTES:

Analysis by BVL

All results are in ppm on dry weight basis

Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 2 Full Depth Generic Site Condition Standards (SCS) in a Potable Ground Water Condition for Commercial property use and fine textured soils.

Table 5 - Maximum Concentrations in Soil
381 Kent Street, Ottawa, Ontario

Parameter	Sample Location	Sample Depth (mbgs)	Sampling Date	Maximum Concentration	MECP Table 2
Polycylic Aromatic Hydrocarbons					
Acenaphthene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	1.2	58
Acenaphthylene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	0.083	0.17
Anthracene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	3.9	0.74
Benzo(a)anthracene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	4.9	0.63
Benzo(a)pyrene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	3.5	0.3
Benzo(b/j)fluoranthene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	4.2	0.78
Benzo(g,h,i)perylene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	1.7	7.8
Benzo(k)fluoranthene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	1.6	0.78
Chrysene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	4.0	7.8
Dibenz(a,h)anthracene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	0.47	0.1
Fluoranthene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	15	0.69
Fluorene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	1.2	69
Indeno(1,2,3-cd)pyrene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	2.0	0.48
Methylnaphthalene, 2-(1-)	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	0.69	3.4
Naphthalene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	0.83	0.75
Phenanthrene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	15	7.8
Pyrene	BH/MW21-2 SS1	0.8 - 1.4	1-Dec-21	12	78
Inorganic Parameters					
Antimony	BH/MW21-1 SS1	0.1 - 0.6	1-Dec-21	0.63	7.5
Arsenic	DUP 2	0.8 - 1.4	29-Nov-21	3.7	18
Barium	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	430	390
Beryllium	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	0.88	5
Boron	DUP 2	0.8 - 1.4	29-Nov-21	7.2	120
Cadmium	BH/MW21-3 SS2	0.8 - 1.4	1-Dec-21	0.31	1.2
Chromium	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	140	160
Cobalt	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	25	22
Copper	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	54	180
Lead	BH/MW21-3 SS2	0.8 - 1.4	1-Dec-21	150	120
Molybdenum	BH/MW21-1 SS1	0.8 - 1.4	1-Dec-21	1.9	6.9
Nickel	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	73.0	130
Selenium	All Locations	NA	1-Dec-21	<0.50	2.4
Silver	All Locations	NA	1-Dec-21	<0.20	25
Thallium	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	0.54	1
Uranium	DUP 2	0.8 - 1.4	29-Nov-21	1.7	23
Vanadium	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	130	86
Zinc	BH/MW21-4 SS2	0.8 - 1.4	29-Nov-21	150	340

NOTES:

Analysis by BVL
All results are in ppm on dry weight basis
Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 2 Full Depth Generic Site Condition Standards (SCS) in a Potable Ground Water Condition for Commercial property use and fine textured soils.

TABLE 6 GROUNDWATER ANALYTICAL RESULTS *(µg/L)*
PHC and BTEX
381 Kent Street, Ottawa, Ontario

Parameter	**MECP Table 3[1]**	**BH/MW21-1**	**BH/MW21-2**	**BH/MW21-3**	**BH/MW21-4**	**DUP1**	**Field Blank**	**Trip Blank**
Sample Date (d/m/y)		12/8/21	12/8/21	12/8/21	12/8/21	Duplicate of	12/08/21	12/08/21
Screened Interval		3.0 - 6.1	3.0 - 6.1	3.0 - 6.1	3.9 - 7.0	BH/MW21-4	NA	NA
Laboratory ID		RHL901	RHL902	RHL903	RHL904	RHL905	RHL907	RHL906
Date of Analysis		14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021
Lab Certificate of Analysis		C1Y3898	C1Y3898	C1Y3898	C1Y3898	C1Y3898	C1Y3898	C1Y3898
Benzene	430	<0.17	<0.17	<0.17	<0.17	<0.17	<0.20	<0.20
Ethylbenzene	2300	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	18000	<0.20	<0.20	<0.20	0.58	0.58	<0.20	<0.20
Xylenes	4200	<0.20	<0.20	<0.20	<0.20	<0.20	<0.40	<0.40
PHC F_1 (C_6-C_{10})	750	<25	<25	<25	<25	<25	<25	<25
PHC F_2 (>C_{10}-C_{16})	150	<100	<100	<100	<100	<100	NA	NA
PHC F_3 (>C_{16}-C_{34})	500	<200	<200	<200	<200	<200	NA	NA
PHC F_4 (>C_{34}-C_{50})	500	<200	<200	<200	<200	<200	NA	NA

NOTES:

1 MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable standards.*

Shaded Concentration exceeds MECP Table 3 groundwater quality standard.

TABLE 7 GROUNDWATER ANALYTICAL RESULTS *(µg/L)*
VOLATILE ORGANIC COMPOUNDS
381 Kent Street, Ottawa, Ontario

Parameter	MECP Table 3[1]	BH/MW21-1	BH/MW21-2	BH/MW21-3	BH/MW21-4	DUP1
Sample Date		12/8/21	12/8/21	12/8/21	12/8/21	Duplicate of
Screened Interval		3.0 - 6.1	3.0 - 6.1	3.0 - 6.1	3.9 - 7.0	BH/MW21-4
Laboratory ID		RHL901	RHL902	RHL903	RHL904	RHL905
Date of Analysis		14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021
Lab Certificate of Analysis		C1Y3898	C1Y3898	C1Y3898	C1Y3898	C1Y3898
Acetone	130000	<10	<10	<10	<10	<10
Benzene	430	<0.17	<0.17	<0.17	<0.17	<0.17
Bromodichloromethane	85000	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	770	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	56	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	8.4	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	630	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	22	1.8	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	82000	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	4400	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	9600	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	9600	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	67	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	3100	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	12	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	17	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	17	<0.50	<0.50	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	17	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	140	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichloropropylene	45	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2300	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	0.83	<0.20	<0.20	<0.20	<0.20	<0.20
Hexane	520	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	5500	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone	1500000	<10	<10	<10	<10	<10
Methyl Isobutyl Ketone	580000	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	1400	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	9100	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	28	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	15	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	17	<0.20	0.36	<0.20	<0.20	<0.20
Toluene	18000	<0.20	<0.20	<0.20	0.58	0.58
1,1,1-Trichloroethane	6700	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	30	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	17	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	2500	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	1.7	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylenes	4200	<0.20	<0.20	<0.20	<0.20	<0.20

NOTES:

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable standards.

Shaded Concentration exceeds MECP Table 3 groundwater quality standard.

TABLE 8 MAXIMUM CONCENTRATIONS IN GROUNDWATER
381 Kent Street, Ottawa, Ontario

Parameter	Sample Location	Screen Interval (mbgs)	Sampling Date	Maximum Concentration	MECP Table 3
Petroleum Hydrocarbons					
F1 PHC (C6 - C10) - BTEX	All Locations	NA	8-Dec-21	<25	750
F2 PHC (C10-C16)	All Locations	NA	8-Dec-21	<100	150
F3 PHC (C16-C34)	All Locations	NA	8-Dec-21	<200	500
F4 PHC (C34-C50)	All Locations	NA	8-Dec-21	<200	500
Volatile Organic Compounds					
Acetone	All Locations	NA	8-Dec-21	<10	130000
Benzene	All Locations	NA	8-Dec-21	0.64	44
Bromodichloromethane	All Locations	NA	8-Dec-21	<0.50	85000
Bromoform	All Locations	NA	8-Dec-21	<1.0	380
Bromomethane	All Locations	NA	8-Dec-21	<0.50	5.6
Carbon Tetrachloride	All Locations	NA	8-Dec-21	<0.20	0.79
Chlorobenzene	All Locations	NA	8-Dec-21	<0.20	630
Chloroform	MW21-1	3.0 - 6.1	8-Dec-21	1.80	2.4
Dibromochloromethane	All Locations	NA	8-Dec-21	<0.50	82000
Dichlorodifluoromethane	All Locations	NA	8-Dec-21	<0.50	4400
1,2-Dichlorobenzene	All Locations	NA	8-Dec-21	<0.50	4600
1,3-Dichlorobenzene	All Locations	NA	8-Dec-21	<0.50	9600
1,4-Dichlorobenzene	All Locations	NA	8-Dec-21	<1.0	8
1,1-Dichloroethane	All Locations	NA	8-Dec-21	<0.20	320
1,2-Dichloroethane	All Locations	NA	8-Dec-21	2.0	1.6
1,1-Dichloroethylene	All Locations	NA	8-Dec-21	<0.20	1.6
Cis-1,2-Dichloroethylene	All Locations	NA	8-Dec-21	<0.50	1.6
Trans-1,2-Dichloroethylene	All Locations	NA	8-Dec-21	<0.50	1.6
1,2-Dichloropropane	All Locations	NA	8-Dec-21	<0.20	16
1,3-Dichloropropylene	All Locations	NA	8-Dec-21	<0.30	5.2
Ethylbenzene	All Locations	NA	8-Dec-21	2.0	2300
Ethylene Dibromide	All Locations	NA	8-Dec-21	<0.20	0.25
Hexane	All Locations	NA	8-Dec-21	<1.0	51
Methylene Chloride	All Locations	NA	8-Dec-21	<2.0	610
Methyl Ethyl Ketone	All Locations	NA	8-Dec-21	<10	470000
Methyl Isobutyl Ketone	All Locations	NA	8-Dec-21	<5.0	140000
Methyl-t-Butyl Ether	All Locations	NA	8-Dec-21	4.6	190
Styrene	All Locations	NA	8-Dec-21	<0.50	1300
1,1,1,2-Tetrachloroethane	All Locations	NA	8-Dec-21	<0.50	3.3
1,1,2,2-Tetrachloroethane	All Locations	NA	8-Dec-21	<0.50	3.2
Tetrachloroethylene	MW21-2	3.0 - 6.1	8-Dec-21	0.36	1.6
Toluene	MW21-4	3.9 - 7.0	8-Dec-21	0.58	18000
1,1,1-Trichloroethane	All Locations	NA	8-Dec-21	<0.20	640
1,1,2-Trichloroethane	All Locations	NA	8-Dec-21	<0.50	4.7
Trichloroethylene	All Locations	NA	8-Dec-21	<0.20	1.6
Trichlorofluoromethane	All Locations	NA	8-Dec-21	<0.50	2500
Vinyl Chloride	All Locations	NA	8-Dec-21	<0.20	0.5
Total Xylenes	All Locations	NA	8-Dec-21	<0.20	4200

NOTES:

Analysis by BVL Analytics

All results are in ppb

Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 3 Full Depth Generic Site Condition Standards (SCS) in a Non- Potable Ground Water Condition for all types of property use and fine textured soils.

TABLE 9 RELATIVE PERCENT DIFFERENCES
PETROLEUM HYDROCARBONS - SOIL
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-2 SS5	DUP 1	RPD (%)	Alert Limit (%)
			12-Jan-21	12-Jan-21		
Petroleum Hydrocarbons						
PHC F_1 (>C_6-C10)	ug/g	10	<10	<10	nc	60
PHC F_2 (>C_{10}-C_{16})	ug/g	10	<20	<20	nc	60
PHC F_3 (>C_{16}-C_{34})	ug/g	50	<100	<100	nc	60
PHC F_4 (>C_{34}-C_{50})	ug/g	50	<100	<100	nc	60
Volatiles						
Benzene	ug/g	0.020	<0.0060	<0.0060	nc	100
Ethylbenzene	ug/g	0.020	<0.010	<0.010	nc	100
Toluene	ug/g	0.020	<0.020	<0.020	nc	100
Total Xylenes	ug/g	0.020	<0.020	<0.020	nc	100

NOTES:

Analysis by BVL
All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)
- means "not analysed"
nc means "not calculable" - one (or both) of the results are <5x RDL
Exceedances of alert limits are shown in **bold**
Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 10 RELATIVE PERCENT DIFFERENCES
VOLATILE ORGANIC COMPOUNDS - SOIL
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-2 SS5	DUP 1	RPD (%)	Alert Limit (%)
			12-Jan-21	12-Jan-21		
Volatiles						
Acetone	ug/g	0.50	<0.49	<0.49	nc	100
Benzene	ug/g	0.020	<0.0060	<0.0060	nc	100
Bromodichloromethane	ug/g	0.050	<0.040	<0.040	nc	100
Bromoform	ug/g	0.050	<0.040	<0.040	nc	100
Bromomethane	ug/g	0.050	<0.040	<0.040	nc	100
Carbon Tetrachloride	ug/g	0.050	<0.040	<0.040	nc	100
Chlorobenzene	ug/g	0.050	<0.040	<0.040	nc	100
Chloroform	ug/g	0.050	<0.040	<0.040	nc	100
Dibromochloromethane	ug/g	0.050	<0.040	<0.040	nc	100
1,2-Dichlorobenzene	ug/g	0.050	<0.040	<0.040	nc	100
1,3-Dichlorobenzene	ug/g	0.050	<0.040	<0.040	nc	100
1,4-Dichlorobenzene	ug/g	0.050	<0.040	<0.040	nc	100
Difluorodifluoromethane	ug/g	0.050	<0.040	<0.040	nc	100
1,1-Dichloroethane	ug/g	0.050	<0.040	<0.040	nc	100
1,2-Dichloroethane	ug/g	0.050	<0.049	<0.049	nc	100
1,1-Dichloroethylene	ug/g	0.050	<0.040	<0.040	nc	100
Cis-1,2-Dichloroethylene	ug/g	0.050	<0.040	<0.040	nc	100
Trans-1,2-Dichloroethylene	ug/g	0.050	<0.040	<0.040	nc	100
1,2-Dichloropropane	ug/g	0.050	<0.040	<0.040	nc	100
1,3-Dichloropropene (cis+trans)	ug/g	0.030	<0.050	<0.050	nc	100
Ethylbenzene	ug/g	0.050	<0.010	<0.010	nc	100
Ethylene Dibromide	ug/g	0.050	<0.040	<0.040	nc	100
Hexane	ug/g	0.050	<0.040	<0.040	nc	100
Methylene Chloride	ug/g	0.050	<0.049	<0.049	nc	100
Methyl Ethyl Ketone	ug/g	0.50	<0.40	<0.40	nc	100
Methyl Isobutyl Ketone	ug/g	0.50	<0.40	<0.40	nc	100
Methyl-t-Butyl Ether	ug/g	0.050	<0.040	<0.040	nc	100
Styrene	ug/g	0.05	<0.040	<0.040	nc	100
1,1,1,2-Tetrachloroethane	ug/g	0.050	<0.040	<0.040	nc	100
1,1,2,2-Tetrachloroethane	ug/g	0.050	<0.040	<0.040	nc	100
Tetrachloroethylene	ug/g	0.050	<0.040	<0.040	nc	100
Toluene	ug/g	0.050	<0.020	<0.020	nc	100
1,1,1-Trichloroethane	ug/g	0.050	<0.040	<0.040	nc	100
1,1,2-Trichloroethane	ug/g	0.050	<0.040	<0.040	nc	100
Trichloroethylene	ug/g	0.050	<0.010	<0.010	nc	100
Trichlorofluoromethane	ug/g	0.050	<0.040	<0.040	nc	100
Vinyl Chloride	ug/g	0.020	<0.019	<0.019	nc	100
Total Xylenes	ug/g	0.050	<0.020	<0.020	nc	100

NOTES:

Analysis by BVL

<RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 11 RELATIVE PERCENT DIFFERENCES
POLYCYCLIC AROMATIC HYDROCARBONS - SOIL
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-4 SS2	DUP 2	RPD (%)	Alert Limit (%)
			29/11/2021	29/11/2021		
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Acenaphthylene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(a)anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(a)pyrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Benzo(b/j)fluoranthene	ug/g	0.0050	<0.0050	0.0058	nc	80
Benzo(ghi)perylene	ug/g	0.0050	<0.0050	0.016	nc	80
Benzo(k)fluoranthene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Chrysene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Dibenz(a,h)anthracene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Fluoranthene	ug/g	0.0050	<0.0050	0.0056	nc	80
Fluorene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Indeno(1,2,3-cd)pyrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Methylnaphthalene, 2-(1-)	ug/g	0.0050	<0.0071	<0.0071	nc	80
Naphthalene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Phenanthrene	ug/g	0.0050	<0.0050	<0.0050	nc	80
Pyrene	ug/g	0.0050	<0.0050	0.0092	nc	80

NOTES:

Analysis by BVL

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 12 RELATIVE PERCENT DIFFERENCES
METALS - SOIL
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-4 SS2	DUP 2	RPD (%)	Alert Limit (%)
			29/11/2021	29/11/2021		
Inorganic Parameters						
Antimony	ug/g	0.20	<0.20	<0.20	nc	60
Arsenic	ug/g	1.0	<1.0	3.7	nc	60
Barium	ug/g	0.50	**430**	150	**97**	60
Beryllium	ug/g	0.20	0.88	0.41	**73**	60
Boron	ug/g	5.0	<5.0	7.2	nc	60
Cadmium	ug/g	0.10	0.11	0.15	nc	60
Chromium	ug/g	1.0	140	13	**166**	60
Cobalt	ug/g	0.10	**25**	7.2	**111**	60
Copper	ug/g	0.50	54	20	**92**	60
Lead	ug/g	1.0	6.9	8.0	15	60
Molybdenum	ug/g	0.50	<0.50	3.6	nc	60
Nickel	ug/g	0.50	73	24	**101**	60
Selenium	ug/g	0.50	<0.50	<0.50	nc	60
Silver	ug/g	0.20	<0.20	<0.20	nc	60
Thallium	ug/g	0.050	0.54	0.23	**81**	60
Uranium	ug/g	0.050	0.96	1.7	56	60
Vanadium	ug/g	5.0	**130**	21	**144**	60
Zinc	ug/g	5.0	**150**	30	**133**	60

NOTES:

Analysis by BVL

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 13 RELATIVE PERCENT DIFFERENCES
PETROLEUM HYDROCARBONS - GROUNDWATER
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-4	DUP1	RPD (%)	Alert Limit (%)
			12-Aug-21	12-Aug-21		
Petroleum Hydrocarbons						
PHC F_1 (>C_6-C10)	ug/L	25	<25	<25	nc	60
PHC F_2 (>C_{10}-C_{16})	ug/L	100	<100	<100	nc	60
PHC F_3 (>C_{16}-C_{34})	ug/L	100	<200	<200	nc	60
PHC F_4 (>C_{34}-C_{50})	ug/L	100	<200	<200	nc	60
Volatiles						
Benzene	ug/L	0.20	<0.17	<0.17	nc	60
Ethylbenzene	ug/L	0.20	<0.20	<0.20	nc	60
Toluene	ug/L	0.20	0.58	0.58	nc	60
Total Xylenes	ug/L	0.20	<0.20	<0.20	nc	60

NOTES:

Analysis by BVL

<RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 14 RELATIVE PERCENT DIFFERENCES
VOLATILE ORGANIC COMPOUNDS - GROUNDWATER
381 Kent Street, Ottawa, Ontario

Parameter	Units	RDL	BH/MW21-4	DUP1	RPD (%)	Alert Limit (%)
			12-Aug-21	12-Aug-21		
Volatiles						
Acetone	ug/L	10	<10	<10	nc	60
Benzene	ug/L	0.20	<0.17	<0.17	nc	60
Bromodichloromethane	ug/L	0.50	<0.50	<0.50	nc	60
Bromoform	ug/L	1.0	<1.0	<1.0	nc	60
Bromomethane	ug/L	0.50	<0.50	<0.50	nc	60
Carbon Tetrachloride	ug/L	0.20	<0.20	<0.20	nc	60
Chlorobenzene	ug/L	0.20	<0.20	<0.20	nc	60
Chloroform	ug/L	0.20	<0.20	<0.20	nc	60
Dibromochloromethane	ug/L	0.50	<0.50	<0.50	nc	60
Dichlorodifluoromethane	ug/L	1.0	<1.0	<1.0	nc	60
1,2-Dichlorobenzene	ug/L	0.50	<0.50	<0.50	nc	60
1,3-Dichlorobenzene	ug/L	0.50	<0.50	<0.50	nc	60
1,4-Dichlorobenzene	ug/L	0.50	<0.50	<0.50	nc	60
1,1-Dichloroethane	ug/L	0.20	<0.20	<0.20	nc	60
1,2-Dichloroethane	ug/L	0.50	<0.50	<0.50	nc	60
1,1-Dichloroethylene	ug/L	0.20	<0.20	<0.20	nc	60
Cis-1,2-Dichloroethylene	ug/L	0.50	<0.50	<0.50	nc	60
Trans-1,2-Dichloroethylene	ug/L	0.50	<0.50	<0.50	nc	60
1,2-Dichloropropane	ug/L	0.20	<0.20	<0.20	nc	60
1,3-Dichloropropylene	ug/L	0.30	<0.50	<0.50	nc	60
Ethylbenzene	ug/L	0.20	<0.20	<0.20	nc	60
Ethylene Dibromide	ug/L	0.20	<0.20	<0.20	nc	60
Hexane(n)	ug/L	1.0	<1.0	<1.0	nc	60
Methylene Chloride	ug/L	2.0	<2.0	<2.0	nc	60
Methyl Ethyl Ketone	ug/L	10	<10	<10	nc	60
Methyl Isobutyl Ketone	ug/L	5.0	<5.0	<5.0	nc	60
Methyl-t-Butyl Ether	ug/L	0.50	<0.50	<0.50	nc	60
Styrene	ug/L	0.50	<0.50	<0.50	nc	60
1,1,1,2-Tetrachloroethane	ug/L	0.50	<0.50	<0.50	nc	60
1,1,2,2-Tetrachloroethane	ug/L	0.20	<0.50	<0.50	nc	60
Tetrachloroethylene	ug/L	0.20	<0.20	<0.20	nc	60
Toluene	ug/L	0.20	0.58	0.58	nc	60
1,1,1-Trichloroethane	ug/L	0.20	<0.20	<0.20	nc	60
1,1,2-Trichloroethane	ug/L	0.50	<0.50	<0.50	nc	60
Trichloroethylene	ug/L	0.20	<0.20	<0.20	nc	60
Trichlorofluoromethane	ug/L	0.50	<0.50	<0.50	nc	60
Vinyl Chloride	ug/L	0.20	<0.20	<0.20	nc	60
Total Xylenes	ug/L	0.20	<0.20	<0.20	nc	60

NOTES:

Analysis by Maxxam Analytics

<RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

Appendix E – Laboratory Certificates of Analysis

Your Project #: OTT-21019154
Your C.O.C. #: 857272-01-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2022/01/14
Report #: R6961983
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8897
Received: 2021/12/03, 08:30

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	2	N/A	2021/12/27	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	1	N/A	2021/12/22		EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Soil (1, 2)	1	2021/12/06	2021/12/07	CAM SOP-00316	CCME CWS m
Acid Extractable Metals by ICPMS (1)	1	2022/01/13	2022/01/13	CAM SOP-00447	EPA 6020B m
Acid Extractable Metals by ICPMS (1)	1	2021/12/08	2021/12/08	CAM SOP-00447	EPA 6020B m
Moisture (1)	3	N/A	2021/12/18	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	2	2021/12/07	2021/12/08	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	2	2021/12/13	2021/12/08	CAM SOP-00413	EPA 9045 D m
Sieve, 75um (1)	2	N/A	2021/12/14	CAM SOP-00467	ASTM D1140 -17 m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2021/12/07	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8

Your Project #: OTT-21019154
Your C.O.C. #: 857272-01-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2022/01/14
Report #: R6961983
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8897

Received: 2021/12/03, 08:30

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633

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This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RIO181		RIO184	RIO184		
Sampling Date		2021/11/29 10:00		2021/11/29 10:15	2021/11/29 10:15		
COC Number		857272-01-01		857272-01-01	857272-01-01		
	UNITS	**BH/MW21-4-SS2**	**QC Batch**	**DUP2**	**DUP2 Lab-Dup**	**RDL**	**QC Batch**
Metals							
Acid Extractable Antimony (Sb)	ug/g	<0.20	7763704	<0.20	0.24	0.20	7779944
Acid Extractable Arsenic (As)	ug/g	<1.0	7763704	3.7	3.6	1.0	7779944
Acid Extractable Barium (Ba)	ug/g	430	7763704	150	150	0.50	7779944
Acid Extractable Beryllium (Be)	ug/g	0.88	7763704	0.41	0.39	0.20	7779944
Acid Extractable Boron (B)	ug/g	<5.0	7763704	7.2	7.2	5.0	7779944
Acid Extractable Cadmium (Cd)	ug/g	0.11	7763704	0.15	0.15	0.10	7779944
Acid Extractable Chromium (Cr)	ug/g	140	7763704	13	13	1.0	7779944
Acid Extractable Cobalt (Co)	ug/g	25	7763704	7.2	7.3	0.10	7779944
Acid Extractable Copper (Cu)	ug/g	54	7763704	20	18	0.50	7779944
Acid Extractable Lead (Pb)	ug/g	6.9	7763704	8.0	8.0	1.0	7779944
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	7763704	3.6	3.4	0.50	7779944
Acid Extractable Nickel (Ni)	ug/g	73	7763704	24	24	0.50	7779944
Acid Extractable Selenium (Se)	ug/g	<0.50	7763704	<0.50	<0.50	0.50	7779944
Acid Extractable Silver (Ag)	ug/g	<0.20	7763704	<0.20	<0.20	0.20	7779944
Acid Extractable Thallium (Tl)	ug/g	0.54	7763704	0.23	0.22	0.050	7779944
Acid Extractable Uranium (U)	ug/g	0.96	7763704	1.7	1.8	0.050	7779944
Acid Extractable Vanadium (V)	ug/g	130	7763704	21	21	5.0	7779944
Acid Extractable Zinc (Zn)	ug/g	150	7763704	30	30	5.0	7779944

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RIO181	RIO184		
Sampling Date		2021/11/29 10:00	2021/11/29 10:15		
COC Number		857272-01-01	857272-01-01		
	UNITS	**BH/MW21-4-SS2**	**DUP2**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	29	13	1.0	7739092
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	0.0071	7732760
Polyaromatic Hydrocarbons					
Acenaphthene	ug/g	<0.0050	<0.0050	0.0050	7755413
Acenaphthylene	ug/g	<0.0050	<0.0050	0.0050	7755413
Anthracene	ug/g	<0.0050	<0.0050	0.0050	7755413
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	0.0050	7755413
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	0.0050	7755413
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.0058	0.0050	7755413
Benzo(g,h,i)perylene	ug/g	<0.0050	0.016	0.0050	7755413
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	0.0050	7755413
Chrysene	ug/g	<0.0050	<0.0050	0.0050	7755413
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	0.0050	7755413
Fluoranthene	ug/g	<0.0050	0.0056	0.0050	7755413
Fluorene	ug/g	<0.0050	<0.0050	0.0050	7755413
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	0.0050	7755413
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	7755413
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	7755413
Naphthalene	ug/g	<0.0050	<0.0050	0.0050	7755413
Phenanthrene	ug/g	<0.0050	<0.0050	0.0050	7755413
Pyrene	ug/g	<0.0050	0.0092	0.0050	7755413
Surrogate Recovery (%)					
D10-Anthracene	%	85	85		7755413
D14-Terphenyl (FS)	%	97	98		7755413
D8-Acenaphthylene	%	83	85		7755413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO182		
Sampling Date		2021/11/29 13:00		
COC Number		857272-01-01		
	UNITS	**BH/MW21-4-SS8**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	38	1.0	7739092
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	7731176
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.49	0.49	7729041
Benzene	ug/g	<0.0060	0.0060	7729041
Bromodichloromethane	ug/g	<0.040	0.040	7729041
Bromoform	ug/g	<0.040	0.040	7729041
Bromomethane	ug/g	<0.040	0.040	7729041
Carbon Tetrachloride	ug/g	<0.040	0.040	7729041
Chlorobenzene	ug/g	<0.040	0.040	7729041
Chloroform	ug/g	<0.040	0.040	7729041
Dibromochloromethane	ug/g	<0.040	0.040	7729041
1,2-Dichlorobenzene	ug/g	<0.040	0.040	7729041
1,3-Dichlorobenzene	ug/g	<0.040	0.040	7729041
1,4-Dichlorobenzene	ug/g	<0.040	0.040	7729041
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	0.040	7729041
1,1-Dichloroethane	ug/g	<0.040	0.040	7729041
1,2-Dichloroethane	ug/g	<0.049	0.049	7729041
1,1-Dichloroethylene	ug/g	<0.040	0.040	7729041
cis-1,2-Dichloroethylene	ug/g	<0.040	0.040	7729041
trans-1,2-Dichloroethylene	ug/g	<0.040	0.040	7729041
1,2-Dichloropropane	ug/g	<0.040	0.040	7729041
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	7729041
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	7729041
Ethylbenzene	ug/g	<0.010	0.010	7729041
Ethylene Dibromide	ug/g	<0.040	0.040	7729041
Hexane	ug/g	<0.040	0.040	7729041
Methylene Chloride(Dichloromethane)	ug/g	<0.049	0.049	7729041
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	0.40	7729041
Methyl Isobutyl Ketone	ug/g	<0.40	0.40	7729041
Methyl t-butyl ether (MTBE)	ug/g	<0.040	0.040	7729041
Styrene	ug/g	<0.040	0.040	7729041
1,1,1,2-Tetrachloroethane	ug/g	<0.040	0.040	7729041
1,1,2,2-Tetrachloroethane	ug/g	<0.040	0.040	7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO182		
Sampling Date		2021/11/29 13:00		
COC Number		857272-01-01		
	UNITS	**BH/MW21-4-SS8**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/g	<0.040	0.040	7729041
Toluene	ug/g	<0.020	0.020	7729041
1,1,1-Trichloroethane	ug/g	<0.040	0.040	7729041
1,1,2-Trichloroethane	ug/g	<0.040	0.040	7729041
Trichloroethylene	ug/g	<0.010	0.010	7729041
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	0.040	7729041
Vinyl Chloride	ug/g	<0.019	0.019	7729041
p+m-Xylene	ug/g	<0.020	0.020	7729041
o-Xylene	ug/g	<0.020	0.020	7729041
Total Xylenes	ug/g	<0.020	0.020	7729041
F1 (C6-C10)	ug/g	<10	10	7729041
F1 (C6-C10) - BTEX	ug/g	<10	10	7729041
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<20	20	7741637
F3 (C16-C34 Hydrocarbons)	ug/g	<100	100	7741637
F4 (C34-C50 Hydrocarbons)	ug/g	<100	100	7741637
Reached Baseline at C50	ug/g	Yes		7741637
Surrogate Recovery (%)				
o-Terphenyl	%	107		7741637
4-Bromofluorobenzene	%	93		7729041
D10-o-Xylene	%	93		7729041
D4-1,2-Dichloroethane	%	105		7729041
D8-Toluene	%	94		7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		RIO181		RIO181		RIO183		
Sampling Date		2021/11/29 10:00		2021/11/29 10:00		2021/11/29 14:00		
COC Number		857272-01-01		857272-01-01		857272-01-01		
	UNITS	**BH/MW21-4-SS2**	**QC Batch**	**BH/MW21-4-SS2 Lab-Dup**	**QC Batch**	**BH/MW21-4-SS10**	**RDL**	**QC Batch**
Inorganics								
Available (CaCl2) pH	pH	7.55	7722815			8.03		7722815
Miscellaneous Parameters								
Grain Size	%	COARSE	7738578	COARSE	7738578	FINE	N/A	7738578
Sieve - #200 (<0.075mm)	%	16	7738578	15	7738578	51	1	7738578
Sieve - #200 (>0.075mm)	%	84	7738578	85	7738578	49	1	7738578

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

TEST SUMMARY

Bureau Veritas ID: RIO181 **Collected:** 2021/11/29
Sample ID: BH/MW21-4-SS2 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7732760	N/A	2021/12/27	Automated Statchk
Acid Extractable Metals by ICPMS	ICP/MS	7763704	2021/12/08	2021/12/08	Daniel Teclu
Moisture	BAL	7739092	N/A	2021/12/18	Gurpreet Kaur (ONT)
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7755413	2021/12/07	2021/12/08	Jonghan Yoon
pH CaCl2 EXTRACT	AT	7722815	2021/12/08	2021/12/08	Taslima Aktar
Sieve, 75um	SIEV	7738578	N/A	2021/12/14	Gurpreet Kaur (ONT)

Bureau Veritas ID: RIO181 Dup **Collected:** 2021/11/29
Sample ID: BH/MW21-4-SS2 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sieve, 75um	SIEV	7738578	N/A	2021/12/14	Gurpreet Kaur (ONT)

Bureau Veritas ID: RIO182 **Collected:** 2021/11/29
Sample ID: BH/MW21-4-SS8 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7731176	N/A	2021/12/22	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7741637	2021/12/06	2021/12/07	Dennis Ngondu
Moisture	BAL	7739092	N/A	2021/12/18	Gurpreet Kaur (ONT)
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7729041	N/A	2021/12/07	Anna Gabrielyan

Bureau Veritas ID: RIO183 **Collected:** 2021/11/29
Sample ID: BH/MW21-4-SS10 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	7722815	2021/12/08	2021/12/08	Taslima Aktar
Sieve, 75um	SIEV	7738578	N/A	2021/12/14	Gurpreet Kaur (ONT)

Bureau Veritas ID: RIO184 **Collected:** 2021/11/29
Sample ID: DUP2 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7732760	N/A	2021/12/27	Automated Statchk
Acid Extractable Metals by ICPMS	ICP/MS	7779944	2022/01/13	2022/01/13	Viviana Canzonieri
Moisture	BAL	7739092	N/A	2021/12/18	Gurpreet Kaur (ONT)
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7755413	2021/12/07	2021/12/08	Jonghan Yoon

Bureau Veritas Job #: C1Y8897
Report Date: 2022/01/14

exp Services Inc
Client Project #: OTT-21019154
Sampler Initials: MAD

TEST SUMMARY

Bureau Veritas ID: RIO184 Dup
Sample ID: DUP2
Matrix: Soil

Collected: 2021/11/29
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Acid Extractable Metals by ICPMS	ICP/MS	7779944	2022/01/13	2022/01/13	Viviana Canzonieri

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.3°C
Package 2	3.3°C

Sample RIO182 [BH/MW21-4-SS8] : F2-F4 Analysis: Detection limits were adjusted for high moisture content

Results relate only to the items tested.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvna.com

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7729041	4-Bromofluorobenzene	2021/12/06	102	60 - 140	103	60 - 140	92	%				
7729041	D10-o-Xylene	2021/12/06	109	60 - 130	110	60 - 130	93	%				
7729041	D4-1,2-Dichloroethane	2021/12/06	103	60 - 140	106	60 - 140	106	%				
7729041	D8-Toluene	2021/12/06	103	60 - 140	101	60 - 140	98	%				
7741637	o-Terphenyl	2021/12/07	97	60 - 130	88	60 - 130	106	%				
7755413	D10-Anthracene	2021/12/07	89	50 - 130	94	50 - 130	90	%				
7755413	D14-Terphenyl (FS)	2021/12/07	98	50 - 130	104	50 - 130	97	%				
7755413	D8-Acenaphthylene	2021/12/07	87	50 - 130	93	50 - 130	90	%				
7722815	Available (CaCl2) pH	2021/12/08			100	N/A			0	N/A		
7729041	1,1,1,2-Tetrachloroethane	2021/12/06	105	60 - 140	103	60 - 130	<0.040	ug/g				
7729041	1,1,1-Trichloroethane	2021/12/06	105	60 - 140	106	60 - 130	<0.040	ug/g				
7729041	1,1,2,2-Tetrachloroethane	2021/12/06	101	60 - 140	104	60 - 130	<0.040	ug/g				
7729041	1,1,2-Trichloroethane	2021/12/06	105	60 - 140	105	60 - 130	<0.040	ug/g				
7729041	1,1-Dichloroethane	2021/12/06	98	60 - 140	96	60 - 130	<0.040	ug/g				
7729041	1,1-Dichloroethylene	2021/12/06	103	60 - 140	101	60 - 130	<0.040	ug/g				
7729041	1,2-Dichlorobenzene	2021/12/06	99	60 - 140	97	60 - 130	<0.040	ug/g				
7729041	1,2-Dichloroethane	2021/12/06	98	60 - 140	100	60 - 130	<0.049	ug/g				
7729041	1,2-Dichloropropane	2021/12/06	103	60 - 140	102	60 - 130	<0.040	ug/g				
7729041	1,3-Dichlorobenzene	2021/12/06	102	60 - 140	100	60 - 130	<0.040	ug/g				
7729041	1,4-Dichlorobenzene	2021/12/06	109	60 - 140	104	60 - 130	<0.040	ug/g				
7729041	Acetone (2-Propanone)	2021/12/06	107	60 - 140	109	60 - 140	<0.49	ug/g				
7729041	Benzene	2021/12/06	93	60 - 140	92	60 - 130	<0.0060	ug/g	NC	50		
7729041	Bromodichloromethane	2021/12/06	105	60 - 140	106	60 - 130	<0.040	ug/g				
7729041	Bromoform	2021/12/06	101	60 - 140	101	60 - 130	<0.040	ug/g				
7729041	Bromomethane	2021/12/06	97	60 - 140	105	60 - 140	<0.040	ug/g				
7729041	Carbon Tetrachloride	2021/12/06	103	60 - 140	104	60 - 130	<0.040	ug/g				
7729041	Chlorobenzene	2021/12/06	101	60 - 140	99	60 - 130	<0.040	ug/g				
7729041	Chloroform	2021/12/06	101	60 - 140	101	60 - 130	<0.040	ug/g				
7729041	cis-1,2-Dichloroethylene	2021/12/06	101	60 - 140	102	60 - 130	<0.040	ug/g				
7729041	cis-1,3-Dichloropropene	2021/12/06	93	60 - 140	102	60 - 130	<0.030	ug/g				
7729041	Dibromochloromethane	2021/12/06	102	60 - 140	101	60 - 130	<0.040	ug/g				
7729041	Dichlorodifluoromethane (FREON 12)	2021/12/06	98	60 - 140	99	60 - 140	<0.040	ug/g				

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7729041	Ethylbenzene	2021/12/06	95	60 - 140	92	60 - 130	<0.010	ug/g	NC	50		
7729041	Ethylene Dibromide	2021/12/06	98	60 - 140	99	60 - 130	<0.040	ug/g				
7729041	F1 (C6-C10) - BTEX	2021/12/06					<10	ug/g	NC	30		
7729041	F1 (C6-C10)	2021/12/06	85	60 - 140	87	80 - 120	<10	ug/g	NC	30		
7729041	Hexane	2021/12/06	103	60 - 140	99	60 - 130	<0.040	ug/g				
7729041	Methyl Ethyl Ketone (2-Butanone)	2021/12/06	98	60 - 140	101	60 - 140	<0.40	ug/g				
7729041	Methyl Isobutyl Ketone	2021/12/06	111	60 - 140	114	60 - 130	<0.40	ug/g				
7729041	Methyl t-butyl ether (MTBE)	2021/12/06	96	60 - 140	94	60 - 130	<0.040	ug/g				
7729041	Methylene Chloride(Dichloromethane)	2021/12/06	97	60 - 140	96	60 - 130	<0.049	ug/g				
7729041	o-Xylene	2021/12/06	95	60 - 140	93	60 - 130	<0.020	ug/g	NC	50		
7729041	p+m-Xylene	2021/12/06	99	60 - 140	96	60 - 130	<0.020	ug/g	NC	50		
7729041	Styrene	2021/12/06	110	60 - 140	107	60 - 130	<0.040	ug/g				
7729041	Tetrachloroethylene	2021/12/06	94	60 - 140	90	60 - 130	<0.040	ug/g				
7729041	Toluene	2021/12/06	104	60 - 140	99	60 - 130	<0.020	ug/g	NC	50		
7729041	Total Xylenes	2021/12/06					<0.020	ug/g	NC	50		
7729041	trans-1,2-Dichloroethylene	2021/12/06	101	60 - 140	99	60 - 130	<0.040	ug/g				
7729041	trans-1,3-Dichloropropene	2021/12/06	94	60 - 140	107	60 - 130	<0.040	ug/g				
7729041	Trichloroethylene	2021/12/06	105	60 - 140	105	60 - 130	<0.010	ug/g				
7729041	Trichlorofluoromethane (FREON 11)	2021/12/06	104	60 - 140	103	60 - 130	<0.040	ug/g				
7729041	Vinyl Chloride	2021/12/06	104	60 - 140	103	60 - 130	<0.019	ug/g				
7738578	Sieve - #200 (<0.075mm)	2021/12/14							2.7	20	56	53 - 58
7738578	Sieve - #200 (>0.075mm)	2021/12/14							0.48	20	44	42 - 47
7741637	F2 (C10-C16 Hydrocarbons)	2021/12/07	97	50 - 130	88	80 - 120	<10	ug/g	NC	30		
7741637	F3 (C16-C34 Hydrocarbons)	2021/12/07	98	50 - 130	89	80 - 120	<50	ug/g	NC	30		
7741637	F4 (C34-C50 Hydrocarbons)	2021/12/07	98	50 - 130	89	80 - 120	<50	ug/g	NC	30		
7755413	1-Methylnaphthalene	2021/12/07	99	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40		
7755413	2-Methylnaphthalene	2021/12/07	100	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40		
7755413	Acenaphthene	2021/12/07	97	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40		
7755413	Acenaphthylene	2021/12/07	91	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40		
7755413	Anthracene	2021/12/07	94	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40		
7755413	Benzo(a)anthracene	2021/12/07	103	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40		
7755413	Benzo(a)pyrene	2021/12/07	97	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7755413	Benzo(b/j)fluoranthene	2021/12/07	103	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40		
7755413	Benzo(g,h,i)perylene	2021/12/07	89	50 - 130	106	50 - 130	<0.0050	ug/g	NC	40		
7755413	Benzo(k)fluoranthene	2021/12/07	94	50 - 130	106	50 - 130	<0.0050	ug/g	NC	40		
7755413	Chrysene	2021/12/07	106	50 - 130	115	50 - 130	<0.0050	ug/g	NC	40		
7755413	Dibenzo(a,h)anthracene	2021/12/07	99	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40		
7755413	Fluoranthene	2021/12/07	110	50 - 130	118	50 - 130	<0.0050	ug/g	NC	40		
7755413	Fluorene	2021/12/07	105	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40		
7755413	Indeno(1,2,3-cd)pyrene	2021/12/07	98	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40		
7755413	Naphthalene	2021/12/07	82	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
7755413	Phenanthrene	2021/12/07	103	50 - 130	109	50 - 130	<0.0050	ug/g	NC	40		
7755413	Pyrene	2021/12/07	110	50 - 130	116	50 - 130	<0.0050	ug/g	NC	40		
7763704	Acid Extractable Antimony (Sb)	2021/12/08	105	75 - 125	100	80 - 120	<0.20	ug/g	21	30		
7763704	Acid Extractable Arsenic (As)	2021/12/08	109	75 - 125	101	80 - 120	<1.0	ug/g	7.0	30		
7763704	Acid Extractable Barium (Ba)	2021/12/08	NC	75 - 125	104	80 - 120	<0.50	ug/g	9.1	30		
7763704	Acid Extractable Beryllium (Be)	2021/12/08	111	75 - 125	101	80 - 120	<0.20	ug/g	2.6	30		
7763704	Acid Extractable Boron (B)	2021/12/08	105	75 - 125	98	80 - 120	<5.0	ug/g	0.63	30		
7763704	Acid Extractable Cadmium (Cd)	2021/12/08	111	75 - 125	98	80 - 120	<0.10	ug/g	22	30		
7763704	Acid Extractable Chromium (Cr)	2021/12/08	113	75 - 125	103	80 - 120	<1.0	ug/g	12	30		
7763704	Acid Extractable Cobalt (Co)	2021/12/08	110	75 - 125	104	80 - 120	<0.10	ug/g	6.2	30		
7763704	Acid Extractable Copper (Cu)	2021/12/08	108	75 - 125	100	80 - 120	<0.50	ug/g	7.9	30		
7763704	Acid Extractable Lead (Pb)	2021/12/08	NC	75 - 125	105	80 - 120	<1.0	ug/g	6.9	30		
7763704	Acid Extractable Molybdenum (Mo)	2021/12/08	112	75 - 125	100	80 - 120	<0.50	ug/g	17	30		
7763704	Acid Extractable Nickel (Ni)	2021/12/08	112	75 - 125	104	80 - 120	<0.50	ug/g	6.3	30		
7763704	Acid Extractable Selenium (Se)	2021/12/08	111	75 - 125	103	80 - 120	<0.50	ug/g	NC	30		
7763704	Acid Extractable Silver (Ag)	2021/12/08	116	75 - 125	105	80 - 120	<0.20	ug/g	NC	30		
7763704	Acid Extractable Thallium (Tl)	2021/12/08	114	75 - 125	105	80 - 120	<0.050	ug/g	2.6	30		
7763704	Acid Extractable Uranium (U)	2021/12/08	116	75 - 125	108	80 - 120	<0.050	ug/g	5.0	30		
7763704	Acid Extractable Vanadium (V)	2021/12/08	NC	75 - 125	104	80 - 120	<5.0	ug/g	8.2	30		
7763704	Acid Extractable Zinc (Zn)	2021/12/08	NC	75 - 125	102	80 - 120	<5.0	ug/g	9.8	30		
7779944	Acid Extractable Antimony (Sb)	2022/01/13	93	75 - 125	102	80 - 120	<0.20	ug/g	16	30		
7779944	Acid Extractable Arsenic (As)	2022/01/13	94	75 - 125	99	80 - 120	<1.0	ug/g	2.7	30		
7779944	Acid Extractable Barium (Ba)	2022/01/13	NC	75 - 125	100	80 - 120	<0.50	ug/g	1.1	30		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7779944	Acid Extractable Beryllium (Be)	2022/01/13	93	75 - 125	98	80 - 120	<0.20	ug/g	6.3	30		
7779944	Acid Extractable Boron (B)	2022/01/13	88	75 - 125	93	80 - 120	<5.0	ug/g	0.19	30		
7779944	Acid Extractable Cadmium (Cd)	2022/01/13	97	75 - 125	99	80 - 120	<0.10	ug/g	2.9	30		
7779944	Acid Extractable Chromium (Cr)	2022/01/13	98	75 - 125	98	80 - 120	<1.0	ug/g	2.1	30		
7779944	Acid Extractable Cobalt (Co)	2022/01/13	91	75 - 125	100	80 - 120	<0.10	ug/g	0.39	30		
7779944	Acid Extractable Copper (Cu)	2022/01/13	90	75 - 125	98	80 - 120	<0.50	ug/g	6.0	30		
7779944	Acid Extractable Lead (Pb)	2022/01/13	94	75 - 125	98	80 - 120	<1.0	ug/g	0.20	30		
7779944	Acid Extractable Molybdenum (Mo)	2022/01/13	97	75 - 125	101	80 - 120	<0.50	ug/g	4.9	30		
7779944	Acid Extractable Nickel (Ni)	2022/01/13	91	75 - 125	98	80 - 120	<0.50	ug/g	0.19	30		
7779944	Acid Extractable Selenium (Se)	2022/01/13	96	75 - 125	104	80 - 120	<0.50	ug/g	NC	30		
7779944	Acid Extractable Silver (Ag)	2022/01/13	95	75 - 125	99	80 - 120	<0.20	ug/g	NC	30		
7779944	Acid Extractable Thallium (Tl)	2022/01/13	83	75 - 125	98	80 - 120	<0.050	ug/g	4.3	30		
7779944	Acid Extractable Uranium (U)	2022/01/13	95	75 - 125	97	80 - 120	<0.050	ug/g	1.2	30		
7779944	Acid Extractable Vanadium (V)	2022/01/13	100	75 - 125	98	80 - 120	<5.0	ug/g	0.61	30		
7779944	Acid Extractable Zinc (Zn)	2022/01/13	NC	75 - 125	98	80 - 120	<5.0	ug/g	0.30	30		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

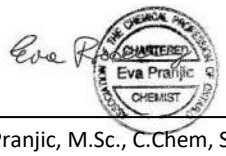
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvna.com

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvlab.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17498 exp Services Inc	Company Name:		Quotation #:	B91718	Bureau Veritas Job #:	Bottle Order #: 857272
Attention:	Accounts Payable	Attention:	Mark McCalla	P.O. #:			
Address:	100-2650 Queensview Drive, Ottawa ON K2B 8H6	Address:		Project:	OTT-21019154	COC #: C#857272-01-01	Project Manager: Katherine Szozda
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:			
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	mark.mccalla@exp.com	Site #:			
				Sampled By:	MAD/JE		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☒ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Reg-04 Table ☐ Other

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)?

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ (call lab for #)

	Sample Barcode Label	Sample Identification	Date Sampled	Time Sampled	Matrix	Volatile Organic Compounds and F1 (PHCs)	Petroleum Hydrocarbons F2-F4 in Soil	O.Reg 153 PAHs (Soil)	O.Reg 153 ICP/MS Metals (Soil)	pH / Texture (Coarse/Fine)	# of Bottles	Comments
1		BH/MW21-4-SS2	NOV 29 2021	10:00am	Soil			X	X	X	3 JE JE	#2 Bottles, 1 bag limited sample
2		BH/MW21-4-SS8	NOV 29 2021	1:00PM	Soil	X	X				4	
3		BH/MW21-4-SS10	NOV 29 2021	2:00PM	Soil					X	1	1 bag
4		DUP 2	NOV 29 2021	1015am	Soil			X	X		1	limited sample
5												
6		M1203-197										
7		env-654										
8		CH 8897 AM										
9												RECEIVED IN OTTAWA
10												

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jeremy Eckert	21/12/02	1700	G. Santiago ABT	21/12/03	8:30	
			DIPIKA SINGH	21/12/04	08:20	

Laboratory Use Only: Time Sensitive; Temperature (°C) on Recei: 0, 0, 1 (ice); Custody Seal: Present ✓, Intact ✓; Yes; No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

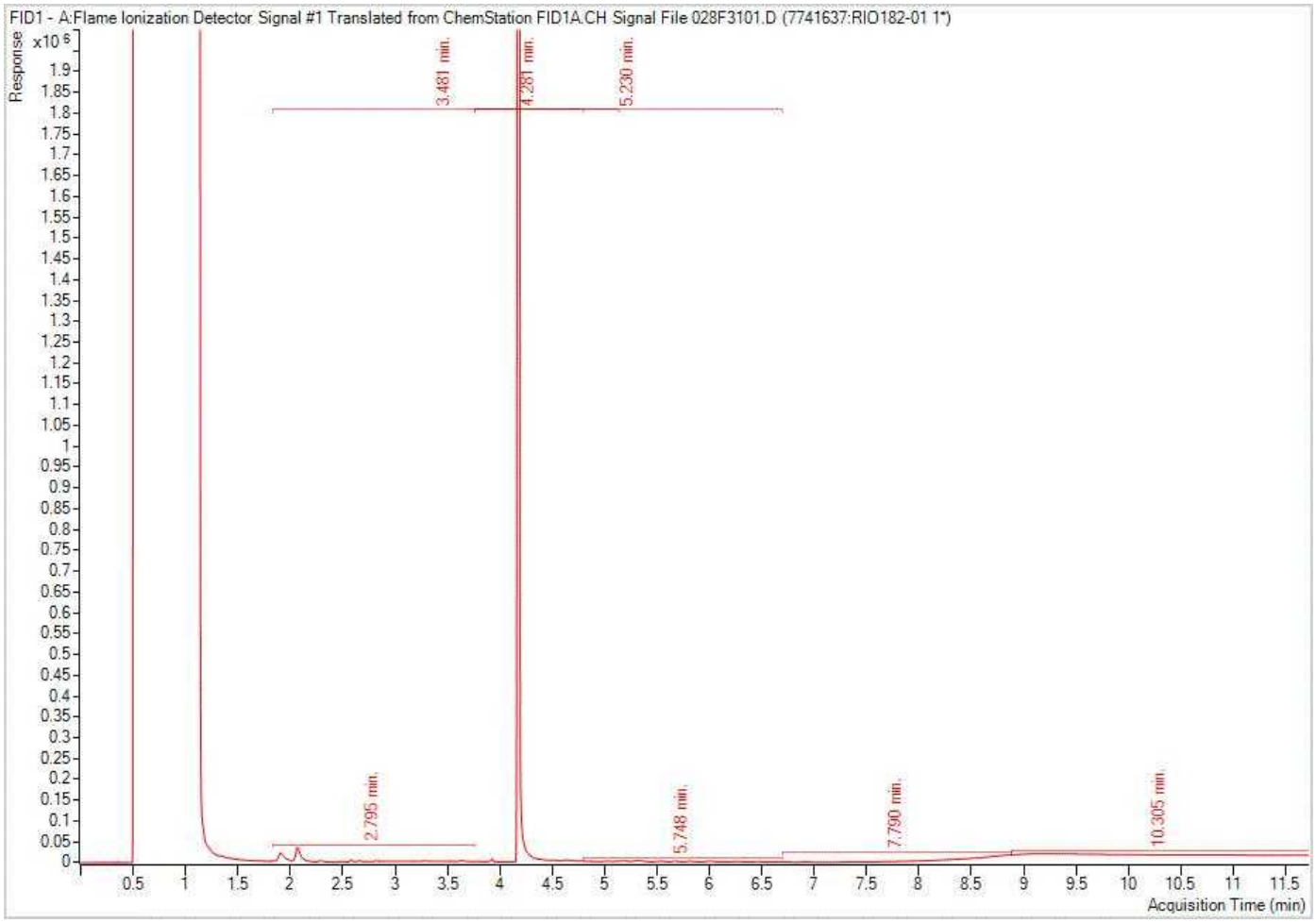
Bureau Veritas Canada (2019) Inc.

3/6/1

Bureau Veritas Job #: C1Y8897
Report Date: 2022/01/14
Bureau Veritas Sample: RIO182

exp Services Inc
Client Project #: OTT-21019154
Client ID: BH/MW21-4-SS8

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: OTT-21019154
Your C.O.C. #: 857272-02-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2022/01/04
Report #: R6948806
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8891
Received: 2021/12/03, 08:30

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	3	N/A	2021/12/27	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	4	N/A	2021/12/24		EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Soil (1, 2)	4	2021/12/06	2021/12/07	CAM SOP-00316	CCME CWS m
Acid Extractable Metals by ICPMS (1)	3	2021/12/08	2021/12/08	CAM SOP-00447	EPA 6020B m
Moisture (1)	7	N/A	2021/12/17	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	3	2021/12/07	2021/12/08	CAM SOP-00318	EPA 8270D m
Volatile Organic Compounds and F1 PHCs (1)	4	N/A	2021/12/07	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1

Your Project #: OTT-21019154
Your C.O.C. #: 857272-02-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2022/01/04
Report #: R6948806
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8891
Received: 2021/12/03, 08:30
Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RIO154	RIO156	RIO158	RIO158		
Sampling Date		2021/12/02 10:00	2021/12/01 16:00	2021/12/01 10:00	2021/12/01 10:00		
COC Number		857272-02-01	857272-02-01	857272-02-01	857272-02-01		
	UNITS	**BH/MW21-1-SS1**	**BH/MW21-2-SS1**	**BH/MW21-3-SS2**	**BH/MW21-3-SS2 Lab-Dup**	**RDL**	**QC Batch**
Metals							
Acid Extractable Antimony (Sb)	ug/g	0.63	<0.20	0.43	0.35	0.20	7763704
Acid Extractable Arsenic (As)	ug/g	2.1	1.2	3.0	2.8	1.0	7763704
Acid Extractable Barium (Ba)	ug/g	170	97	100	96	0.50	7763704
Acid Extractable Beryllium (Be)	ug/g	0.34	0.27	0.32	0.31	0.20	7763704
Acid Extractable Boron (B)	ug/g	7.0	<5.0	5.0	<5.0	5.0	7763704
Acid Extractable Cadmium (Cd)	ug/g	0.20	<0.10	0.31	0.25	0.10	7763704
Acid Extractable Chromium (Cr)	ug/g	29	19	21	19	1.0	7763704
Acid Extractable Cobalt (Co)	ug/g	7.4	5.3	4.8	4.5	0.10	7763704
Acid Extractable Copper (Cu)	ug/g	27	13	14	13	0.50	7763704
Acid Extractable Lead (Pb)	ug/g	100	50	150	140	1.0	7763704
Acid Extractable Molybdenum (Mo)	ug/g	1.9	0.55	1.4	1.2	0.50	7763704
Acid Extractable Nickel (Ni)	ug/g	17	11	11	10	0.50	7763704
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	0.50	7763704
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	0.20	7763704
Acid Extractable Thallium (Tl)	ug/g	0.17	0.10	0.11	0.11	0.050	7763704
Acid Extractable Uranium (U)	ug/g	0.56	0.59	0.66	0.70	0.050	7763704
Acid Extractable Vanadium (V)	ug/g	36	34	29	27	5.0	7763704
Acid Extractable Zinc (Zn)	ug/g	100	56	120	110	5.0	7763704

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RIO154	RIO156	RIO158		
Sampling Date		2021/12/02 10:00	2021/12/01 16:00	2021/12/01 10:00		
COC Number		857272-02-01	857272-02-01	857272-02-01		
	UNITS	**BH/MW21-1-SS1**	**BH/MW21-2-SS1**	**BH/MW21-3-SS2**	**RDL**	**QC Batch**
Inorganics						
Moisture	%	15	20	14	1.0	7734993
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	<0.071	0.69	0.31	0.071	7732760
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	<0.050	1.2	0.51	0.050	7755413
Acenaphthylene	ug/g	<0.050	0.083	<0.050	0.050	7755413
Anthracene	ug/g	0.052	3.9	0.92	0.050	7755413
Benzo(a)anthracene	ug/g	0.25	4.9	1.7	0.050	7755413
Benzo(a)pyrene	ug/g	0.26	3.5	1.5	0.050	7755413
Benzo(b/j)fluoranthene	ug/g	0.33	4.2	2.0	0.050	7755413
Benzo(g,h,i)perylene	ug/g	0.20	1.7	0.91	0.050	7755413
Benzo(k)fluoranthene	ug/g	0.12	1.6	0.74	0.050	7755413
Chrysene	ug/g	0.21	4.0	1.5	0.050	7755413
Dibenzo(a,h)anthracene	ug/g	<0.050	0.47	0.23	0.050	7755413
Fluoranthene	ug/g	0.50	15	5.3	0.050	7755413
Fluorene	ug/g	<0.050	1.2	0.54	0.050	7755413
Indeno(1,2,3-cd)pyrene	ug/g	0.17	2.0	0.98	0.050	7755413
1-Methylnaphthalene	ug/g	<0.050	0.27	0.15	0.050	7755413
2-Methylnaphthalene	ug/g	<0.050	0.42	0.17	0.050	7755413
Naphthalene	ug/g	<0.050	0.83	0.31	0.050	7755413
Phenanthrene	ug/g	0.26	15	4.9	0.050	7755413
Pyrene	ug/g	0.45	12	3.7	0.050	7755413
Surrogate Recovery (%)						
D10-Anthracene	%	106	100	100		7755413
D14-Terphenyl (FS)	%	95	100	98		7755413
D8-Acenaphthylene	%	92	89	91		7755413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO155	RIO157		RIO159		
Sampling Date		2021/12/02 10:15	2021/12/01 16:15		2021/12/01 10:30		
COC Number		857272-02-01	857272-02-01		857272-02-01		
	UNITS	**BH/MW21-1-SS3**	**BH/MW21-2-SS5**	**RDL**	**BH/MW21-3-SS6**	**RDL**	**QC Batch**
Inorganics							
Moisture	%	38	40	1.0	39	1.0	7734993
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	0.050	<0.050	0.050	7750878
Volatile Organics							
Acetone (2-Propanone)	ug/g	<0.49	<0.49	0.49	<0.49	0.49	7729041
Benzene	ug/g	<0.0060	<0.0060	0.0060	<0.0060	0.0060	7729041
Bromodichloromethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Bromoform	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Bromomethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Carbon Tetrachloride	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Chlorobenzene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Chloroform	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Dibromochloromethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,2-Dichlorobenzene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,3-Dichlorobenzene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,4-Dichlorobenzene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,1-Dichloroethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,2-Dichloroethane	ug/g	<0.049	<0.049	0.049	<0.049	0.049	7729041
1,1-Dichloroethylene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
cis-1,2-Dichloroethylene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
trans-1,2-Dichloroethylene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,2-Dichloropropane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	0.030	<0.030	0.030	7729041
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Ethylbenzene	ug/g	<0.010	<0.010	0.010	<0.010	0.010	7729041
Ethylene Dibromide	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Hexane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Methylene Chloride(Dichloromethane)	ug/g	<0.049	<0.049	0.049	<0.049	0.049	7729041
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	<0.40	0.40	<0.40	0.40	7729041
Methyl Isobutyl Ketone	ug/g	<0.40	<0.40	0.40	<0.40	0.40	7729041
Methyl t-butyl ether (MTBE)	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Styrene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,1,1,2-Tetrachloroethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,1,2,2-Tetrachloroethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO155	RIO157		RIO159		
Sampling Date		2021/12/02 10:15	2021/12/01 16:15		2021/12/01 10:30		
COC Number		857272-02-01	857272-02-01		857272-02-01		
	UNITS	**BH/MW21-1-SS3**	**BH/MW21-2-SS5**	**RDL**	**BH/MW21-3-SS6**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Toluene	ug/g	<0.020	<0.020	0.020	<0.020	0.020	7729041
1,1,1-Trichloroethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
1,1,2-Trichloroethane	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Trichloroethylene	ug/g	<0.010	<0.010	0.010	<0.010	0.010	7729041
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	<0.040	0.040	<0.040	0.040	7729041
Vinyl Chloride	ug/g	<0.019	<0.019	0.019	<0.019	0.019	7729041
p+m-Xylene	ug/g	<0.020	<0.020	0.020	<0.020	0.020	7729041
o-Xylene	ug/g	<0.020	<0.020	0.020	<0.020	0.020	7729041
Total Xylenes	ug/g	<0.020	<0.020	0.020	<0.020	0.020	7729041
F1 (C6-C10)	ug/g	<10	<10	10	<10	10	7729041
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	<10	10	7729041
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	<20	<20	20	<10	10	7741637
F3 (C16-C34 Hydrocarbons)	ug/g	<100	<100	100	<50	50	7741637
F4 (C34-C50 Hydrocarbons)	ug/g	<100	<100	100	<50	50	7741637
Reached Baseline at C50	ug/g	Yes	Yes		Yes		7741637
Surrogate Recovery (%)							
o-Terphenyl	%	103	108		112		7741637
4-Bromofluorobenzene	%	91	90		93		7729041
D10-o-Xylene	%	106	93		95		7729041
D4-1,2-Dichloroethane	%	105	107		106		7729041
D8-Toluene	%	98	98		97		7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO160		
Sampling Date		2021/12/01 16:30		
COC Number		857272-02-01		
	UNITS	**DUP1**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	40	1.0	7734993
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	7750878
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.49	0.49	7729041
Benzene	ug/g	<0.0060	0.0060	7729041
Bromodichloromethane	ug/g	<0.040	0.040	7729041
Bromoform	ug/g	<0.040	0.040	7729041
Bromomethane	ug/g	<0.040	0.040	7729041
Carbon Tetrachloride	ug/g	<0.040	0.040	7729041
Chlorobenzene	ug/g	<0.040	0.040	7729041
Chloroform	ug/g	<0.040	0.040	7729041
Dibromochloromethane	ug/g	<0.040	0.040	7729041
1,2-Dichlorobenzene	ug/g	<0.040	0.040	7729041
1,3-Dichlorobenzene	ug/g	<0.040	0.040	7729041
1,4-Dichlorobenzene	ug/g	<0.040	0.040	7729041
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	0.040	7729041
1,1-Dichloroethane	ug/g	<0.040	0.040	7729041
1,2-Dichloroethane	ug/g	<0.049	0.049	7729041
1,1-Dichloroethylene	ug/g	<0.040	0.040	7729041
cis-1,2-Dichloroethylene	ug/g	<0.040	0.040	7729041
trans-1,2-Dichloroethylene	ug/g	<0.040	0.040	7729041
1,2-Dichloropropane	ug/g	<0.040	0.040	7729041
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	7729041
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	7729041
Ethylbenzene	ug/g	<0.010	0.010	7729041
Ethylene Dibromide	ug/g	<0.040	0.040	7729041
Hexane	ug/g	<0.040	0.040	7729041
Methylene Chloride(Dichloromethane)	ug/g	<0.049	0.049	7729041
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	0.40	7729041
Methyl Isobutyl Ketone	ug/g	<0.40	0.40	7729041
Methyl t-butyl ether (MTBE)	ug/g	<0.040	0.040	7729041
Styrene	ug/g	<0.040	0.040	7729041
1,1,1,2-Tetrachloroethane	ug/g	<0.040	0.040	7729041
1,1,2,2-Tetrachloroethane	ug/g	<0.040	0.040	7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RIO160		
Sampling Date		2021/12/01 16:30		
COC Number		857272-02-01		
	UNITS	**DUP1**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/g	<0.040	0.040	7729041
Toluene	ug/g	<0.020	0.020	7729041
1,1,1-Trichloroethane	ug/g	<0.040	0.040	7729041
1,1,2-Trichloroethane	ug/g	<0.040	0.040	7729041
Trichloroethylene	ug/g	<0.010	0.010	7729041
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	0.040	7729041
Vinyl Chloride	ug/g	<0.019	0.019	7729041
p+m-Xylene	ug/g	<0.020	0.020	7729041
o-Xylene	ug/g	<0.020	0.020	7729041
Total Xylenes	ug/g	<0.020	0.020	7729041
F1 (C6-C10)	ug/g	<10	10	7729041
F1 (C6-C10) - BTEX	ug/g	<10	10	7729041
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<20	20	7741637
F3 (C16-C34 Hydrocarbons)	ug/g	<100	100	7741637
F4 (C34-C50 Hydrocarbons)	ug/g	<100	100	7741637
Reached Baseline at C50	ug/g	Yes		7741637
Surrogate Recovery (%)				
o-Terphenyl	%	110		7741637
4-Bromofluorobenzene	%	90		7729041
D10-o-Xylene	%	99		7729041
D4-1,2-Dichloroethane	%	106		7729041
D8-Toluene	%	98		7729041

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

TEST SUMMARY

Bureau Veritas ID: RIO154 **Collected:** 2021/12/02
Sample ID: BH/MW21-1-SS1 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7732760	N/A	2021/12/27	Automated Statchk
Acid Extractable Metals by ICPMS	ICP/MS	7763704	2021/12/08	2021/12/08	Daniel Teclu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7755413	2021/12/07	2021/12/08	Jonghan Yoon

Bureau Veritas ID: RIO155 **Collected:** 2021/12/02
Sample ID: BH/MW21-1-SS3 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7750878	N/A	2021/12/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7741637	2021/12/06	2021/12/07	Dennis Ngondu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7729041	N/A	2021/12/07	Anna Gabrielyan

Bureau Veritas ID: RIO156 **Collected:** 2021/12/01
Sample ID: BH/MW21-2-SS1 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7732760	N/A	2021/12/27	Automated Statchk
Acid Extractable Metals by ICPMS	ICP/MS	7763704	2021/12/08	2021/12/08	Daniel Teclu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7755413	2021/12/07	2021/12/08	Jonghan Yoon

Bureau Veritas ID: RIO157 **Collected:** 2021/12/01
Sample ID: BH/MW21-2-SS5 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7750878	N/A	2021/12/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7741637	2021/12/06	2021/12/07	Dennis Ngondu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7729041	N/A	2021/12/07	Anna Gabrielyan

Bureau Veritas ID: RIO158 **Collected:** 2021/12/01
Sample ID: BH/MW21-3-SS2 **Shipped:**
Matrix: Soil **Received:** 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7732760	N/A	2021/12/27	Automated Statchk
Acid Extractable Metals by ICPMS	ICP/MS	7763704	2021/12/08	2021/12/08	Daniel Teclu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7755413	2021/12/07	2021/12/08	Jonghan Yoon

TEST SUMMARY

Bureau Veritas ID: RIO158 Dup
Sample ID: BH/MW21-3-SS2
Matrix: Soil

Collected: 2021/12/01
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Acid Extractable Metals by ICPMS	ICP/MS	7763704	2021/12/08	2021/12/08	Daniel Teclu

Bureau Veritas ID: RIO159
Sample ID: BH/MW21-3-SS6
Matrix: Soil

Collected: 2021/12/01
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7750878	N/A	2021/12/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7741637	2021/12/06	2021/12/07	Dennis Ngondu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7729041	N/A	2021/12/07	Anna Gabrielyan

Bureau Veritas ID: RIO160
Sample ID: DUP1
Matrix: Soil

Collected: 2021/12/01
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7750878	N/A	2021/12/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7741637	2021/12/06	2021/12/07	Dennis Ngondu
Moisture	BAL	7734993	N/A	2021/12/17	Gurpreet Kaur (ONT)
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7729041	N/A	2021/12/07	Anna Gabrielyan

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.3°C
Package 2	3.3°C

Sample RIO154 [BH/MW21-1-SS1] : PAH ANALYSIS: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample RIO155 [BH/MW21-1-SS3] : F2-F4 Analysis: Detection limits were adjusted for high moisture content

Sample RIO156 [BH/MW21-2-SS1] : PAH ANALYSIS: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample RIO157 [BH/MW21-2-SS5] : F2-F4 Analysis: Detection limits were adjusted for high moisture content

Sample RIO158 [BH/MW21-3-SS2] : PAH ANALYSIS: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample RIO160 [DUP1] : F2-F4 Analysis: Detection limits were adjusted for high moisture content

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7729041	4-Bromofluorobenzene	2021/12/06	102	60 - 140	103	60 - 140	92	%		
7729041	D10-o-Xylene	2021/12/06	109	60 - 130	110	60 - 130	93	%		
7729041	D4-1,2-Dichloroethane	2021/12/06	103	60 - 140	106	60 - 140	106	%		
7729041	D8-Toluene	2021/12/06	103	60 - 140	101	60 - 140	98	%		
7741637	o-Terphenyl	2021/12/07	97	60 - 130	88	60 - 130	106	%		
7755413	D10-Anthracene	2021/12/07	89	50 - 130	94	50 - 130	90	%		
7755413	D14-Terphenyl (FS)	2021/12/07	98	50 - 130	104	50 - 130	97	%		
7755413	D8-Acenaphthylene	2021/12/07	87	50 - 130	93	50 - 130	90	%		
7729041	1,1,1,2-Tetrachloroethane	2021/12/06	105	60 - 140	103	60 - 130	<0.040	ug/g		
7729041	1,1,1-Trichloroethane	2021/12/06	105	60 - 140	106	60 - 130	<0.040	ug/g		
7729041	1,1,2,2-Tetrachloroethane	2021/12/06	101	60 - 140	104	60 - 130	<0.040	ug/g		
7729041	1,1,2-Trichloroethane	2021/12/06	105	60 - 140	105	60 - 130	<0.040	ug/g		
7729041	1,1-Dichloroethane	2021/12/06	98	60 - 140	96	60 - 130	<0.040	ug/g		
7729041	1,1-Dichloroethylene	2021/12/06	103	60 - 140	101	60 - 130	<0.040	ug/g		
7729041	1,2-Dichlorobenzene	2021/12/06	99	60 - 140	97	60 - 130	<0.040	ug/g		
7729041	1,2-Dichloroethane	2021/12/06	98	60 - 140	100	60 - 130	<0.049	ug/g		
7729041	1,2-Dichloropropane	2021/12/06	103	60 - 140	102	60 - 130	<0.040	ug/g		
7729041	1,3-Dichlorobenzene	2021/12/06	102	60 - 140	100	60 - 130	<0.040	ug/g		
7729041	1,4-Dichlorobenzene	2021/12/06	109	60 - 140	104	60 - 130	<0.040	ug/g		
7729041	Acetone (2-Propanone)	2021/12/06	107	60 - 140	109	60 - 140	<0.49	ug/g		
7729041	Benzene	2021/12/06	93	60 - 140	92	60 - 130	<0.0060	ug/g	NC	50
7729041	Bromodichloromethane	2021/12/06	105	60 - 140	106	60 - 130	<0.040	ug/g		
7729041	Bromoform	2021/12/06	101	60 - 140	101	60 - 130	<0.040	ug/g		
7729041	Bromomethane	2021/12/06	97	60 - 140	105	60 - 140	<0.040	ug/g		
7729041	Carbon Tetrachloride	2021/12/06	103	60 - 140	104	60 - 130	<0.040	ug/g		
7729041	Chlorobenzene	2021/12/06	101	60 - 140	99	60 - 130	<0.040	ug/g		
7729041	Chloroform	2021/12/06	101	60 - 140	101	60 - 130	<0.040	ug/g		
7729041	cis-1,2-Dichloroethylene	2021/12/06	101	60 - 140	102	60 - 130	<0.040	ug/g		
7729041	cis-1,3-Dichloropropene	2021/12/06	93	60 - 140	102	60 - 130	<0.030	ug/g		
7729041	Dibromochloromethane	2021/12/06	102	60 - 140	101	60 - 130	<0.040	ug/g		
7729041	Dichlorodifluoromethane (FREON 12)	2021/12/06	98	60 - 140	99	60 - 140	<0.040	ug/g		
7729041	Ethylbenzene	2021/12/06	95	60 - 140	92	60 - 130	<0.010	ug/g	NC	50

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7729041	Ethylene Dibromide	2021/12/06	98	60 - 140	99	60 - 130	<0.040	ug/g		
7729041	F1 (C6-C10) - BTEX	2021/12/06					<10	ug/g	NC	30
7729041	F1 (C6-C10)	2021/12/06	85	60 - 140	87	80 - 120	<10	ug/g	NC	30
7729041	Hexane	2021/12/06	103	60 - 140	99	60 - 130	<0.040	ug/g		
7729041	Methyl Ethyl Ketone (2-Butanone)	2021/12/06	98	60 - 140	101	60 - 140	<0.40	ug/g		
7729041	Methyl Isobutyl Ketone	2021/12/06	111	60 - 140	114	60 - 130	<0.40	ug/g		
7729041	Methyl t-butyl ether (MTBE)	2021/12/06	96	60 - 140	94	60 - 130	<0.040	ug/g		
7729041	Methylene Chloride(Dichloromethane)	2021/12/06	97	60 - 140	96	60 - 130	<0.049	ug/g		
7729041	o-Xylene	2021/12/06	95	60 - 140	93	60 - 130	<0.020	ug/g	NC	50
7729041	p+m-Xylene	2021/12/06	99	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
7729041	Styrene	2021/12/06	110	60 - 140	107	60 - 130	<0.040	ug/g		
7729041	Tetrachloroethylene	2021/12/06	94	60 - 140	90	60 - 130	<0.040	ug/g		
7729041	Toluene	2021/12/06	104	60 - 140	99	60 - 130	<0.020	ug/g	NC	50
7729041	Total Xylenes	2021/12/06					<0.020	ug/g	NC	50
7729041	trans-1,2-Dichloroethylene	2021/12/06	101	60 - 140	99	60 - 130	<0.040	ug/g		
7729041	trans-1,3-Dichloropropene	2021/12/06	94	60 - 140	107	60 - 130	<0.040	ug/g		
7729041	Trichloroethylene	2021/12/06	105	60 - 140	105	60 - 130	<0.010	ug/g		
7729041	Trichlorofluoromethane (FREON 11)	2021/12/06	104	60 - 140	103	60 - 130	<0.040	ug/g		
7729041	Vinyl Chloride	2021/12/06	104	60 - 140	103	60 - 130	<0.019	ug/g		
7741637	F2 (C10-C16 Hydrocarbons)	2021/12/07	97	50 - 130	88	80 - 120	<10	ug/g	NC	30
7741637	F3 (C16-C34 Hydrocarbons)	2021/12/07	98	50 - 130	89	80 - 120	<50	ug/g	NC	30
7741637	F4 (C34-C50 Hydrocarbons)	2021/12/07	98	50 - 130	89	80 - 120	<50	ug/g	NC	30
7755413	1-Methylnaphthalene	2021/12/07	99	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40
7755413	2-Methylnaphthalene	2021/12/07	100	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40
7755413	Acenaphthene	2021/12/07	97	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
7755413	Acenaphthylene	2021/12/07	91	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40
7755413	Anthracene	2021/12/07	94	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
7755413	Benzo(a)anthracene	2021/12/07	103	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40
7755413	Benzo(a)pyrene	2021/12/07	97	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
7755413	Benzo(b/j)fluoranthene	2021/12/07	103	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7755413	Benzo(g,h,i)perylene	2021/12/07	89	50 - 130	106	50 - 130	<0.0050	ug/g	NC	40
7755413	Benzo(k)fluoranthene	2021/12/07	94	50 - 130	106	50 - 130	<0.0050	ug/g	NC	40

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7755413	Chrysene	2021/12/07	106	50 - 130	115	50 - 130	<0.0050	ug/g	NC	40
7755413	Dibenzo(a,h)anthracene	2021/12/07	99	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
7755413	Fluoranthene	2021/12/07	110	50 - 130	118	50 - 130	<0.0050	ug/g	NC	40
7755413	Fluorene	2021/12/07	105	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40
7755413	Indeno(1,2,3-cd)pyrene	2021/12/07	98	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7755413	Naphthalene	2021/12/07	82	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40
7755413	Phenanthrene	2021/12/07	103	50 - 130	109	50 - 130	<0.0050	ug/g	NC	40
7755413	Pyrene	2021/12/07	110	50 - 130	116	50 - 130	<0.0050	ug/g	NC	40
7763704	Acid Extractable Antimony (Sb)	2021/12/08	105	75 - 125	100	80 - 120	<0.20	ug/g	21	30
7763704	Acid Extractable Arsenic (As)	2021/12/08	109	75 - 125	101	80 - 120	<1.0	ug/g	7.0	30
7763704	Acid Extractable Barium (Ba)	2021/12/08	NC	75 - 125	104	80 - 120	<0.50	ug/g	9.1	30
7763704	Acid Extractable Beryllium (Be)	2021/12/08	111	75 - 125	101	80 - 120	<0.20	ug/g	2.6	30
7763704	Acid Extractable Boron (B)	2021/12/08	105	75 - 125	98	80 - 120	<5.0	ug/g	0.63	30
7763704	Acid Extractable Cadmium (Cd)	2021/12/08	111	75 - 125	98	80 - 120	<0.10	ug/g	22	30
7763704	Acid Extractable Chromium (Cr)	2021/12/08	113	75 - 125	103	80 - 120	<1.0	ug/g	12	30
7763704	Acid Extractable Cobalt (Co)	2021/12/08	110	75 - 125	104	80 - 120	<0.10	ug/g	6.2	30
7763704	Acid Extractable Copper (Cu)	2021/12/08	108	75 - 125	100	80 - 120	<0.50	ug/g	7.9	30
7763704	Acid Extractable Lead (Pb)	2021/12/08	NC	75 - 125	105	80 - 120	<1.0	ug/g	6.9	30
7763704	Acid Extractable Molybdenum (Mo)	2021/12/08	112	75 - 125	100	80 - 120	<0.50	ug/g	17	30
7763704	Acid Extractable Nickel (Ni)	2021/12/08	112	75 - 125	104	80 - 120	<0.50	ug/g	6.3	30
7763704	Acid Extractable Selenium (Se)	2021/12/08	111	75 - 125	103	80 - 120	<0.50	ug/g	NC	30
7763704	Acid Extractable Silver (Ag)	2021/12/08	116	75 - 125	105	80 - 120	<0.20	ug/g	NC	30
7763704	Acid Extractable Thallium (Tl)	2021/12/08	114	75 - 125	105	80 - 120	<0.050	ug/g	2.6	30
7763704	Acid Extractable Uranium (U)	2021/12/08	116	75 - 125	108	80 - 120	<0.050	ug/g	5.0	30
7763704	Acid Extractable Vanadium (V)	2021/12/08	NC	75 - 125	104	80 - 120	<5.0	ug/g	8.2	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7763704	Acid Extractable Zinc (Zn)	2021/12/08	NC	75 - 125	102	80 - 120	<5.0	ug/g	9.8	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

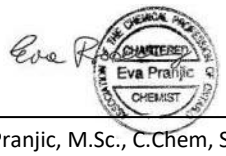
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

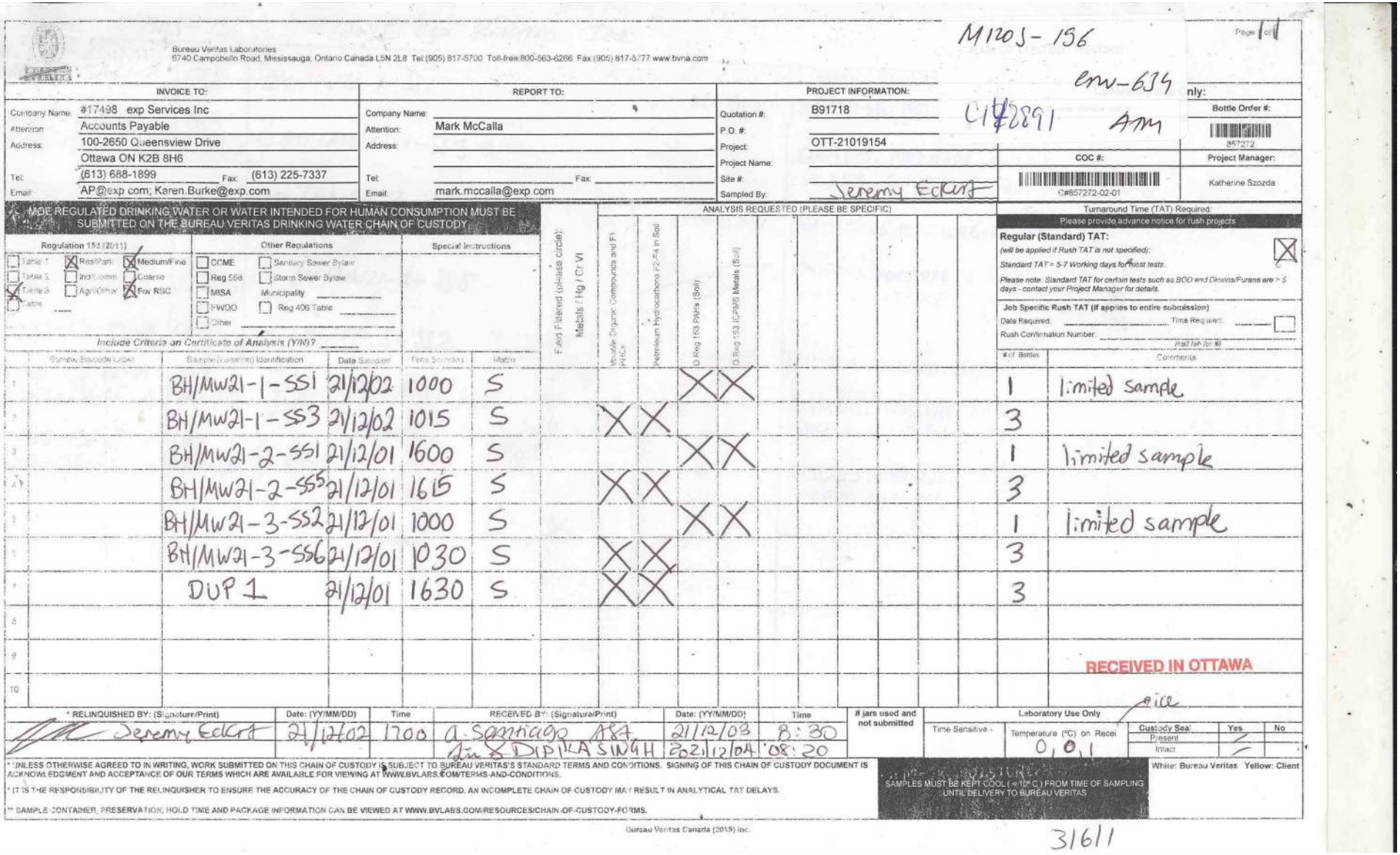
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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env-634
C#857272 AM

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INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Bureau Veritas Only:
Company Name:	#17498 exp Services Inc	Company Name:		Quotation #:	B91718	Bottle Order #:
Attention:	Accounts Payable	Attention:	Mark McCalla	P.O. #:		857272
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-21019154	
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:		COC #: C#857272-02-01
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	mark.mccalla@exp.com	Site #:		Project Manager: Katherine Szozda
				Sampled By:	Jeremy Eckert	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153/2011: ☐ Table 1 ☒ Res/Park ☒ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ____

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Reg 406 Table ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ (call lab for #)

	Bureau Sample Code Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Volatile Organic Compounds and F1 PHCs	Petroleum Hydrocarbons F2-F4 in Soil	O.Reg 153 PAHs (Soil)	O.Reg 153 ICPMS Metals (Soil)	# of Bottles	Comments
1		BH/MW21-1-SS1	21/12/02	1000	S				X	X	1	limited sample
2		BH/MW21-1-SS3	21/12/02	1015	S		X	X			3	
3		BH/MW21-2-SS1	21/12/01	1600	S				X	X	1	limited sample
4		BH/MW21-2-SS5	21/12/01	1615	S		X	X			3	
5		BH/MW21-3-SS2	21/12/01	1000	S				X	X	1	limited sample
6		BH/MW21-3-SS6	21/12/01	1030	S		X	X			3	
7		DUP 1	21/12/01	1630	S		X	X			3	
8												
9												
10												

RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only			
Jeremy Eckert	21/12/02	1700	A. Samnaga AST	21/12/03	8:30		Time Sensitive -	Temperature (°C) on Recei: 0, 0, 1	Custody Seal Present / Intact	Yes / —
			Jin & DIPIKA SINGH	2021/12/04	08:20					No

ice

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

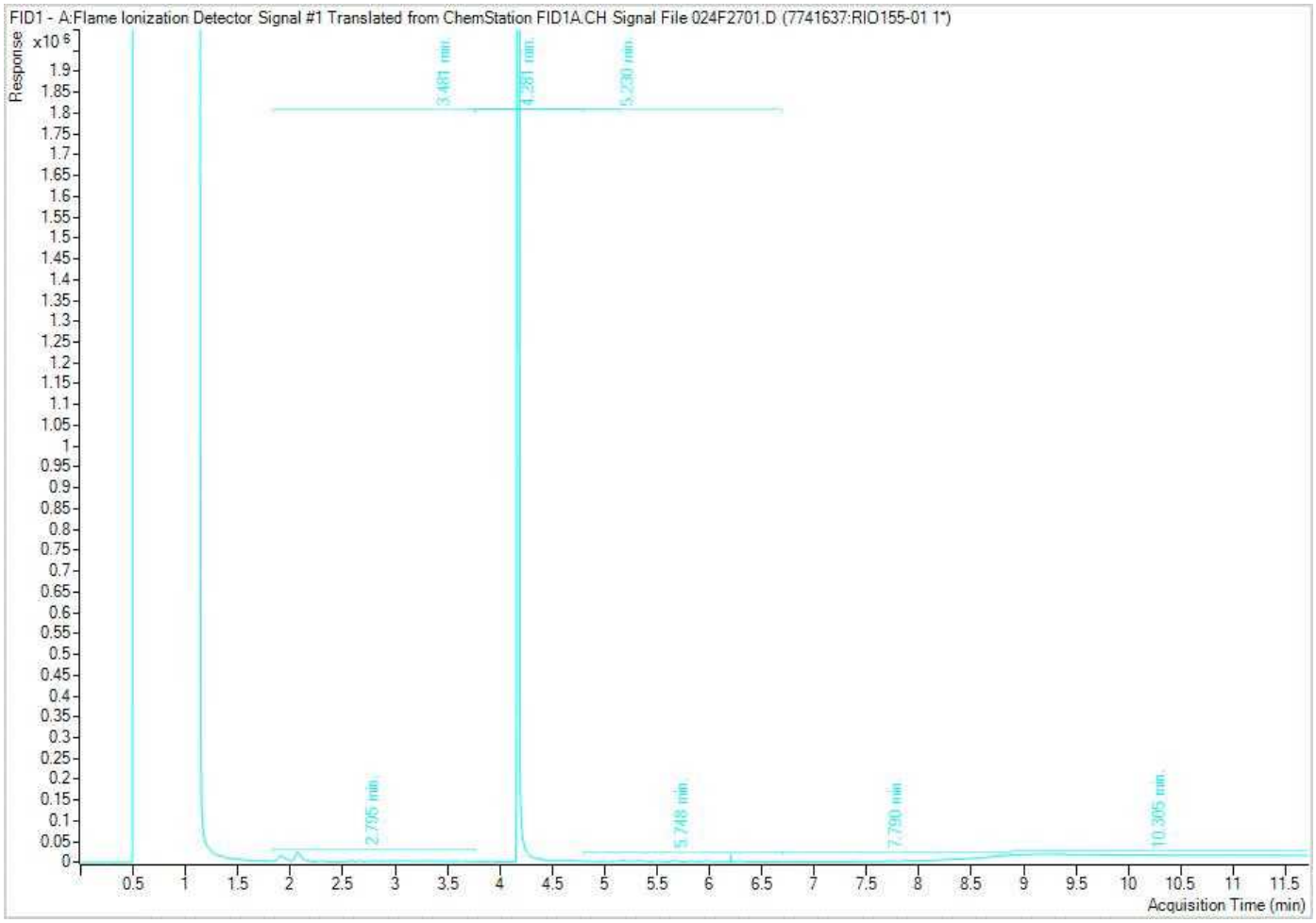
Bureau Veritas Canada (2019) Inc.

3 | 6 | 1 | 1

Bureau Veritas Job #: C1Y8891
Report Date: 2022/01/04
Bureau Veritas Sample: RIO155

exp Services Inc
Client Project #: OTT-21019154
Client ID: BH/MW21-1-SS3

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

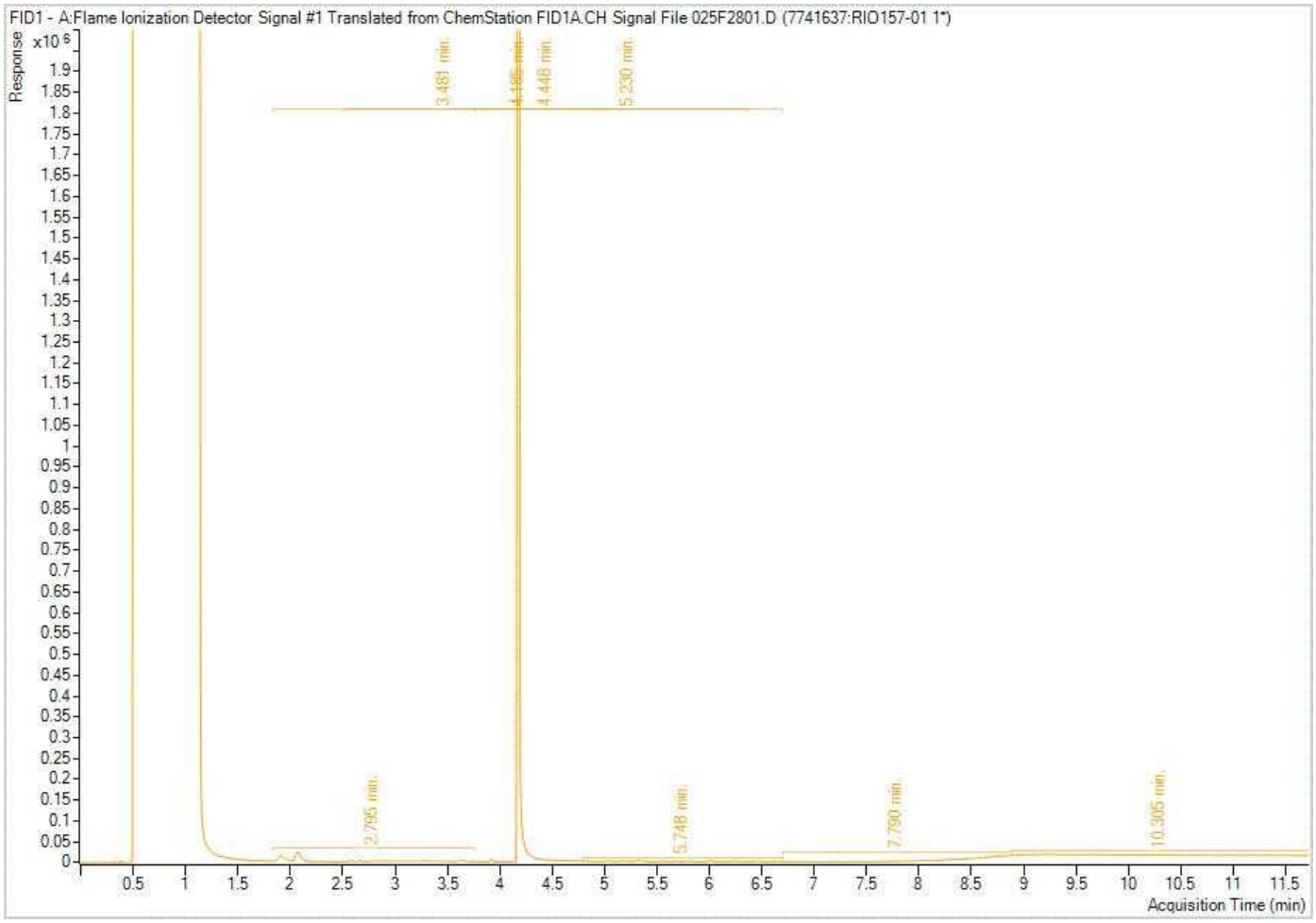


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y8891
Report Date: 2022/01/04
Bureau Veritas Sample: RIO157

exp Services Inc
Client Project #: OTT-21019154
Client ID: BH/MW21-2-SS5

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

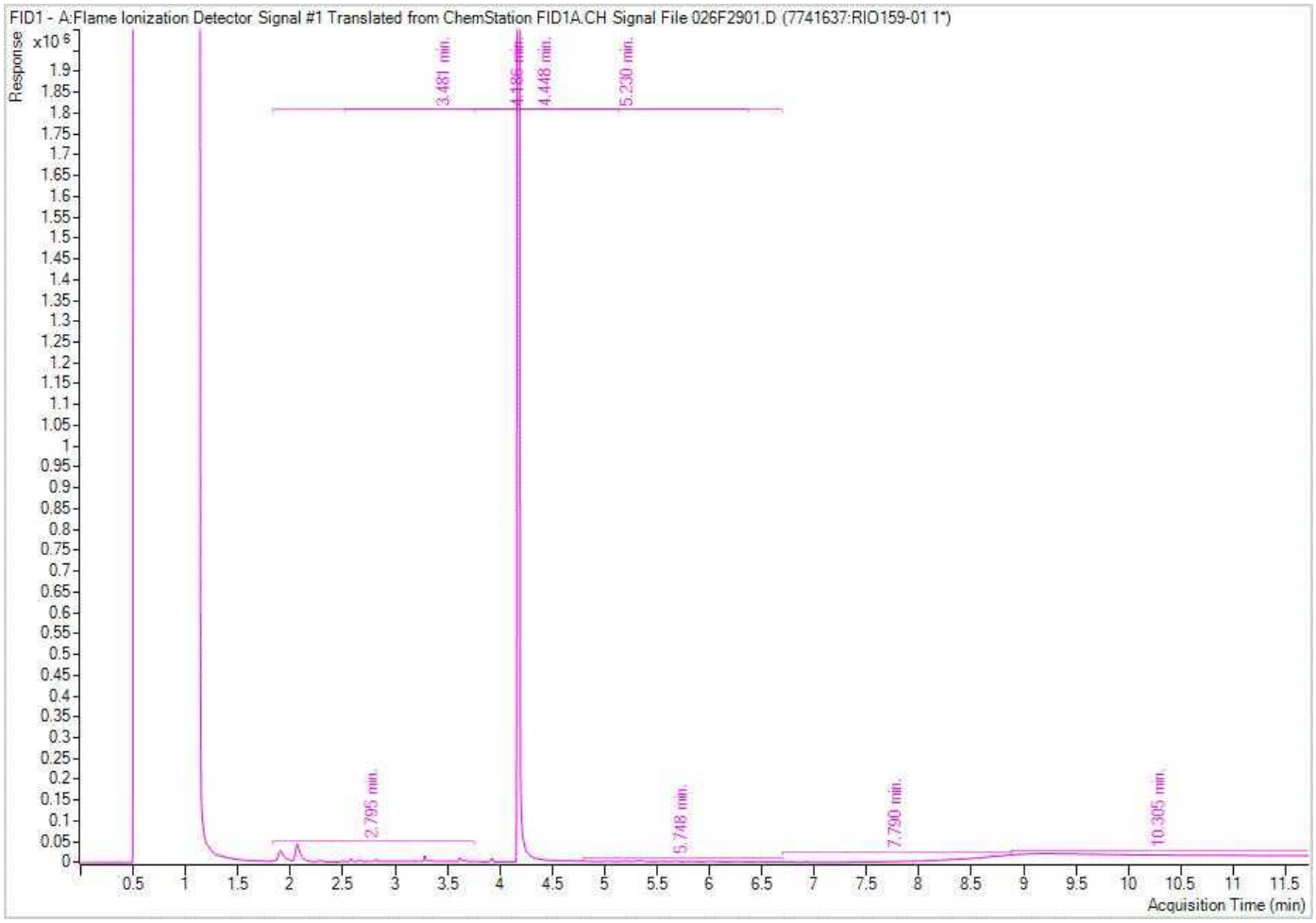


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y8891
Report Date: 2022/01/04
Bureau Veritas Sample: RIO159

exp Services Inc
Client Project #: OTT-21019154
Client ID: BH/MW21-3-SS6

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

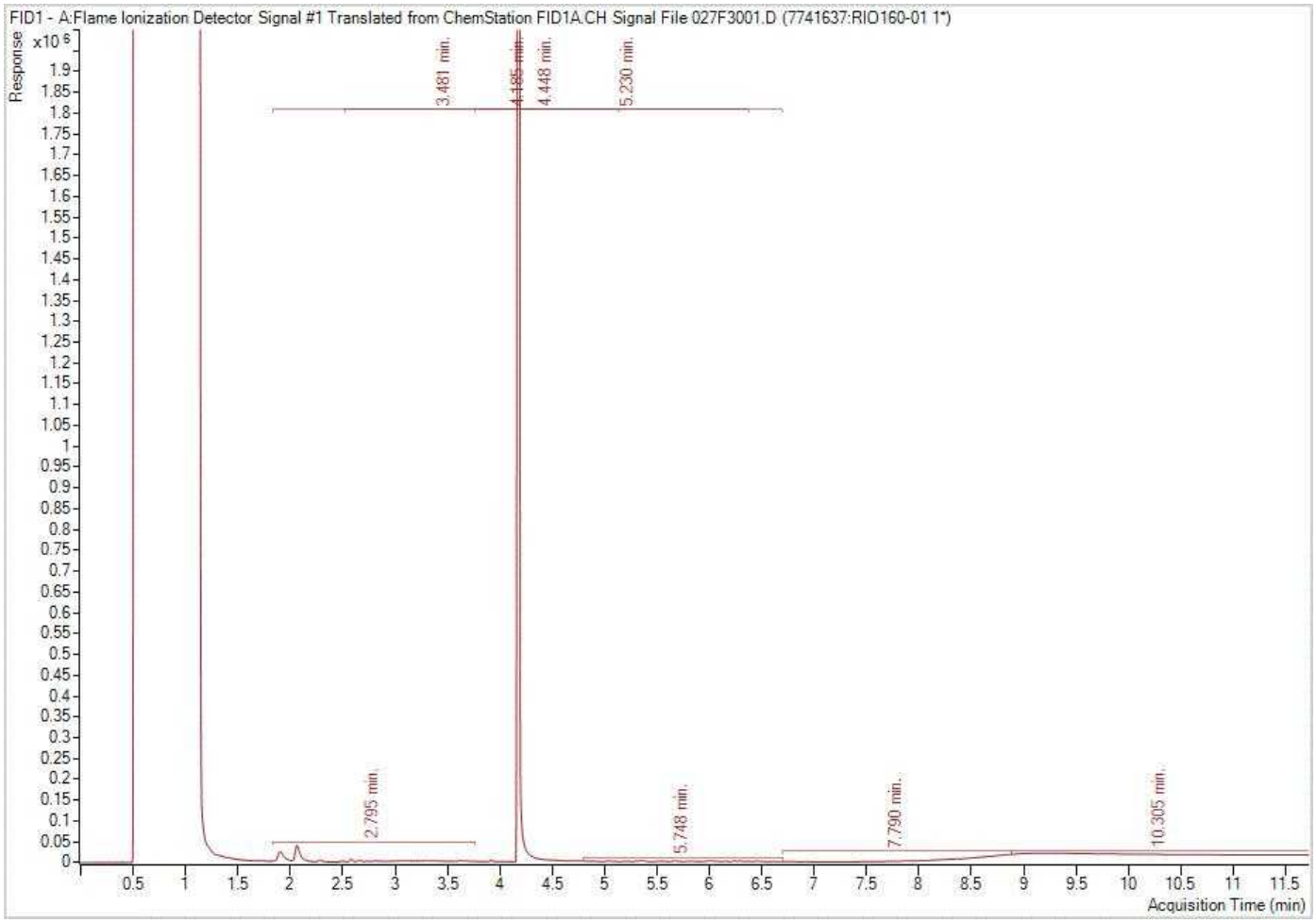


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y8891
Report Date: 2022/01/04
Bureau Veritas Sample: RIO160

exp Services Inc
Client Project #: OTT-21019154
Client ID: DUP1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17498 exp Services Inc	Company Name:		Quotation #:	B91718	Bureau Veritas Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Mark McCalla	P.O. #:			857272
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-21019154	COC #:	Project Manager:
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:		C#857272-03-01	Katherine Szozda
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	mark.mccalla@exp.com	Site #:			
				Sampled By:	Jeremy Eckert		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☒ Res/Park ☒ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☒ Table 3 ☐ Agri/Other ☒ For RSC	☐ MISA Municipality	
☐ Table	☐ PWQO ☐ Reg 406 Table	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)?

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): BTEX	Petroleum Hydrocarbons F2-F4 in Soil	O.Reg 153 PAHs (Soil)	O.Reg 153 ICPMS Metals (Soil)	# of Bottles	Comments
1		Field Blank	21/12/02	1600	O		X				2	
2		Trip Blank	21/12/02	1630	O		X				2	
3												
4												
5		M1203-158										
6												
7		EW-634										
8		ATM										
9												
10												

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒

(will be applied if Rush TAT is not specified):

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____ ☐

Rush Confirmation Number: _____ *(call lab for #)*

RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jeremy Eckert	21/12/02	1700	G. Santiago ART DIPIKA SINGH	21/12/03 2021/12/04	8:30 08:20	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	0,0,1	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

3611

M1203-188 # 17488 exp services Inc

M1203-188-01-A	2xMVIA	Field Blank	FIBTEXHS-S (only BTEX)
M1203-188-02-A	2xMVIA	TRIP Blank	FIBTEXHS-S "

#B6.

BKR.

Your Project #: OTT-21019154
Your C.O.C. #: 857272-03-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2021/12/29
Report #: R6943357
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8903
Received: 2021/12/03, 08:30

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	2	N/A	2021/12/07	CAM SOP-00315	CCME PHC-CWS m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.

Your Project #: OTT-21019154
Your C.O.C. #: 857272-03-01

Attention: Mark McCalla

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2021/12/29
Report #: R6943357
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y8903
Received: 2021/12/03, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

PETROLEUM HYDROCARBONS (CCME)

Bureau Veritas ID		RIO204	RIO205		
Sampling Date		2021/12/02 16:00	2021/12/02 16:30		
COC Number		857272-03-01	857272-03-01		
	UNITS	**FIELD BLANK**	**TRIP BLANK**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
Benzene	ug/g	<0.020	<0.020	0.020	7713976
Toluene	ug/g	<0.020	<0.020	0.020	7713976
Ethylbenzene	ug/g	<0.020	<0.020	0.020	7713976
o-Xylene	ug/g	<0.020	<0.020	0.020	7713976
p+m-Xylene	ug/g	<0.040	<0.040	0.040	7713976
Total Xylenes	ug/g	<0.040	<0.040	0.040	7713976
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	104	103		7713976
4-Bromofluorobenzene	%	93	91		7713976
D10-o-Xylene	%	101	90		7713976
D4-1,2-Dichloroethane	%	111	109		7713976

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C1Y8903
Report Date: 2021/12/29

exp Services Inc
Client Project #: OTT-21019154
Sampler Initials: JE

TEST SUMMARY

Bureau Veritas ID: RIO204
Sample ID: FIELD BLANK
Matrix: Soil

Collected: 2021/12/02
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7713976	N/A	2021/12/07	Joe Paino

Bureau Veritas ID: RIO205
Sample ID: TRIP BLANK
Matrix: Soil

Collected: 2021/12/02
Shipped:
Received: 2021/12/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7713976	N/A	2021/12/07	Joe Paino

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.3°C
Package 2	3.3°C

Results relate only to the items tested.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvna.com

Bureau Veritas Job #: C1Y8903
Report Date: 2021/12/29

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: OTT-21019154
Sampler Initials: JE

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7713976	1,4-Difluorobenzene	2021/12/07	97	60 - 140	95	60 - 140	103	%		
7713976	4-Bromofluorobenzene	2021/12/07	104	60 - 140	103	60 - 140	94	%		
7713976	D10-o-Xylene	2021/12/07	104	60 - 140	101	60 - 140	102	%		
7713976	D4-1,2-Dichloroethane	2021/12/07	97	60 - 140	100	60 - 140	108	%		
7713976	Benzene	2021/12/07	99	50 - 140	100	50 - 140	<0.020	ug/g	NC	50
7713976	Ethylbenzene	2021/12/07	116	50 - 140	112	50 - 140	<0.020	ug/g	0.16	50
7713976	o-Xylene	2021/12/07	110	50 - 140	110	50 - 140	<0.020	ug/g	NC	50
7713976	p+m-Xylene	2021/12/07	112	50 - 140	109	50 - 140	<0.040	ug/g	3.2	50
7713976	Toluene	2021/12/07	98	50 - 140	98	50 - 140	<0.020	ug/g	NC	50
7713976	Total Xylenes	2021/12/07					<0.040	ug/g	3.2	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Job #: C1Y8903
Report Date: 2021/12/29

exp Services Inc
Client Project #: OTT-21019154
Sampler Initials: JE

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvna.com

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17498 exp Services Inc	Company Name:		Quotation #:	B91718	Bureau Veritas Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Mark McCalla	P.O. #:			857272
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-21019154	COC #:	Project Manager:
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:		C#857272-03-01	Katherine Szozda
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	mark.mccalla@exp.com	Site #:			
				Sampled By:	Jeremy Eckert		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☒ Res/Park ☒ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☒ Table 3 ☐ Agri/Other ☒ For RSC	☐ MISA Municipality	
☐ Table	☐ PWQO ☐ Reg 406 Table	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)?

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): BTEX	Petroleum Hydrocarbons F2-F4 in Soil	O.Reg 153 PAHs (Soil)	O.Reg 153 ICPMS Metals (Soil)	# of Bottles	Comments
1		Field Blank	21/12/02	1600	O		X				2	
2		Trip Blank	21/12/02	1630	O		X				2	
3												
4												
5		M1203-158										
6												
7		EW-634										
8		ATM										
9												
10												

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒

(will be applied if Rush TAT is not specified):

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____ ☐

Rush Confirmation Number: _____ *(call lab for #)*

RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jeremy Eckert	21/12/02	1700	G. Santiago ART DIPIKA SINGH	21/12/03 2021/12/04	8:30 08:20	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	0,0,1	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

3611

M1203-188 # 17488 exp services Inc

M1203-188-01-A	2xMVIA	Field Blank	FIBTEXHS-S (only BTEX)
M1203-188-02-A	2xMVIA	TRIP Blank	FIBTEXHS-S "

#B6.

BKR.

Your Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Your C.O.C. #: na

Attention: Mark McCalla

exp Services Inc
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2021/12/15
Report #: R6921588
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y3898
Received: 2021/12/08, 14:45

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
1,3-Dichloropropene Sum (1)	5	N/A	2021/12/14		EPA 8260C m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	2	N/A	2021/12/12	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	5	2021/12/10	2021/12/11	CAM SOP-00316	CCME PHC-CWS m
Volatile Organic Compounds and F1 PHCs (1)	5	N/A	2021/12/14	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Your Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Your C.O.C. #: na

Attention: Mark McCalla

exp Services Inc
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Report Date: 2021/12/15
Report #: R6921588
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y3898
Received: 2021/12/08, 14:45

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15

exp Services Inc
Client Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Sampler Initials: MAD

PETROLEUM HYDROCARBONS (CCME)

Bureau Veritas ID		RHL906	RHL907		
Sampling Date		2021/12/08	2021/12/08		
COC Number		na	na		
	UNITS	**TRIP BLANK**	**FB**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
Benzene	ug/L	<0.20	<0.20	0.20	7719752
Toluene	ug/L	<0.20	<0.20	0.20	7719752
Ethylbenzene	ug/L	<0.20	<0.20	0.20	7719752
o-Xylene	ug/L	<0.20	<0.20	0.20	7719752
p+m-Xylene	ug/L	<0.40	<0.40	0.40	7719752
Total Xylenes	ug/L	<0.40	<0.40	0.40	7719752
F1 (C6-C10)	ug/L	<25	<25	25	7719752
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	7719752
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	102	103		7719752
4-Bromofluorobenzene	%	96	94		7719752
D10-o-Xylene	%	103	106		7719752
D4-1,2-Dichloroethane	%	102	103		7719752

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Bureau Veritas ID		RHL901	RHL902	RHL903	RHL904	RHL905		
Sampling Date		2021/12/08 12:00	2021/12/08 11:00	2021/12/08 01:00	2021/12/08 10:00	2021/12/08		
COC Number		na	na	na	na	na		
	UNITS	**BH/MW21-1**	**BH/MW21-2**	**BH/MW21-3**	**BH/MW21-4**	**DUP1**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7716316
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	<10	10	7717548
Benzene	ug/L	<0.17	<0.17	<0.17	<0.17	<0.17	0.17	7717548
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7717548
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Chloroform	ug/L	1.8	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7717548
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	7717548
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7717548
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7717548
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7717548
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	<10	10	7717548
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7717548
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Bureau Veritas ID		RHL901	RHL902	RHL903	RHL904	RHL905		
Sampling Date		2021/12/08 12:00	2021/12/08 11:00	2021/12/08 01:00	2021/12/08 10:00	2021/12/08		
COC Number		na	na	na	na	na		
	UNITS	**BH/MW21-1**	**BH/MW21-2**	**BH/MW21-3**	**BH/MW21-4**	**DUP1**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/L	<0.20	0.36	<0.20	<0.20	<0.20	0.20	7717548
Toluene	ug/L	<0.20	<0.20	<0.20	0.58	0.58	0.20	7717548
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7717548
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
Total Xylenes	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7717548
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	7717548
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	7717548
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	7718192
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	7718192
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	7718192
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		7718192
Surrogate Recovery (%)								
o-Terphenyl	%	116	114	110	112	117		7718192
4-Bromofluorobenzene	%	108	109	109	109	109		7717548
D4-1,2-Dichloroethane	%	100	100	101	102	99		7717548
D8-Toluene	%	93	93	93	92	93		7717548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15

exp Services Inc
Client Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Sampler Initials: MAD

TEST SUMMARY

Bureau Veritas ID: RHL901 **Collected:** 2021/12/08
Sample ID: BH/MW21-1 **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7716316	N/A	2021/12/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7718192	2021/12/10	2021/12/11	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7717548	N/A	2021/12/14	Juan Pangilinan

Bureau Veritas ID: RHL902 **Collected:** 2021/12/08
Sample ID: BH/MW21-2 **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7716316	N/A	2021/12/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7718192	2021/12/10	2021/12/11	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7717548	N/A	2021/12/14	Juan Pangilinan

Bureau Veritas ID: RHL903 **Collected:** 2021/12/08
Sample ID: BH/MW21-3 **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7716316	N/A	2021/12/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7718192	2021/12/10	2021/12/11	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7717548	N/A	2021/12/14	Juan Pangilinan

Bureau Veritas ID: RHL904 **Collected:** 2021/12/08
Sample ID: BH/MW21-4 **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7716316	N/A	2021/12/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7718192	2021/12/10	2021/12/11	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7717548	N/A	2021/12/14	Juan Pangilinan

Bureau Veritas ID: RHL905 **Collected:** 2021/12/08
Sample ID: DUP1 **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7716316	N/A	2021/12/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7718192	2021/12/10	2021/12/11	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7717548	N/A	2021/12/14	Juan Pangilinan

Bureau Veritas ID: RHL906 **Collected:** 2021/12/08
Sample ID: TRIP BLANK **Shipped:**
Matrix: Water **Received:** 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7719752	N/A	2021/12/12	Domnica Andronescu

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15

exp Services Inc
Client Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Sampler Initials: MAD

TEST SUMMARY

Bureau Veritas ID: RHL907
Sample ID: FB
Matrix: Water

Collected: 2021/12/08
Shipped:
Received: 2021/12/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7719752	N/A	2021/12/12	Domnica Andronescu

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.7°C

Results relate only to the items tested.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: OTT-21019154-A0
Site Location: KENT ST, OTTAWA
Sampler Initials: MAD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7717548	4-Bromofluorobenzene	2021/12/14	112	70 - 130	114	70 - 130	109	%		
7717548	D4-1,2-Dichloroethane	2021/12/14	100	70 - 130	98	70 - 130	97	%		
7717548	D8-Toluene	2021/12/14	96	70 - 130	96	70 - 130	93	%		
7718192	o-Terphenyl	2021/12/11	112	60 - 130	111	60 - 130	109	%		
7719752	1,4-Difluorobenzene	2021/12/12			104	70 - 130	102	%		
7719752	4-Bromofluorobenzene	2021/12/12			102	70 - 130	96	%		
7719752	D10-o-Xylene	2021/12/12			96	70 - 130	105	%		
7719752	D4-1,2-Dichloroethane	2021/12/12			100	70 - 130	100	%		
7717548	1,1,1,2-Tetrachloroethane	2021/12/14	96	70 - 130	102	70 - 130	<0.50	ug/L		
7717548	1,1,1-Trichloroethane	2021/12/14	93	70 - 130	99	70 - 130	<0.20	ug/L		
7717548	1,1,2,2-Tetrachloroethane	2021/12/14	89	70 - 130	93	70 - 130	<0.50	ug/L		
7717548	1,1,2-Trichloroethane	2021/12/14	92	70 - 130	94	70 - 130	<0.50	ug/L		
7717548	1,1-Dichloroethane	2021/12/14	84	70 - 130	88	70 - 130	<0.20	ug/L		
7717548	1,1-Dichloroethylene	2021/12/14	86	70 - 130	92	70 - 130	<0.20	ug/L		
7717548	1,2-Dichlorobenzene	2021/12/14	92	70 - 130	98	70 - 130	<0.50	ug/L		
7717548	1,2-Dichloroethane	2021/12/14	91	70 - 130	94	70 - 130	<0.50	ug/L		
7717548	1,2-Dichloropropane	2021/12/14	83	70 - 130	87	70 - 130	<0.20	ug/L		
7717548	1,3-Dichlorobenzene	2021/12/14	89	70 - 130	97	70 - 130	<0.50	ug/L		
7717548	1,4-Dichlorobenzene	2021/12/14	105	70 - 130	114	70 - 130	<0.50	ug/L		
7717548	Acetone (2-Propanone)	2021/12/14	87	60 - 140	102	60 - 140	<10	ug/L		
7717548	Benzene	2021/12/14	85	70 - 130	91	70 - 130	<0.17	ug/L	0.33	30
7717548	Bromodichloromethane	2021/12/14	89	70 - 130	93	70 - 130	<0.50	ug/L		
7717548	Bromoform	2021/12/14	106	70 - 130	109	70 - 130	<1.0	ug/L		
7717548	Bromomethane	2021/12/14	105	60 - 140	110	60 - 140	<0.50	ug/L		
7717548	Carbon Tetrachloride	2021/12/14	94	70 - 130	101	70 - 130	<0.20	ug/L		
7717548	Chlorobenzene	2021/12/14	91	70 - 130	98	70 - 130	<0.20	ug/L		
7717548	Chloroform	2021/12/14	94	70 - 130	99	70 - 130	<0.20	ug/L		
7717548	cis-1,2-Dichloroethylene	2021/12/14	99	70 - 130	104	70 - 130	<0.50	ug/L		
7717548	cis-1,3-Dichloropropene	2021/12/14	91	70 - 130	93	70 - 130	<0.30	ug/L		
7717548	Dibromochloromethane	2021/12/14	96	70 - 130	97	70 - 130	<0.50	ug/L		
7717548	Dichlorodifluoromethane (FREON 12)	2021/12/14	91	60 - 140	98	60 - 140	<1.0	ug/L		
7717548	Ethylbenzene	2021/12/14	79	70 - 130	85	70 - 130	<0.20	ug/L	0.41	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7717548	Ethylene Dibromide	2021/12/14	93	70 - 130	96	70 - 130	<0.20	ug/L		
7717548	F1 (C6-C10) - BTEX	2021/12/14					<25	ug/L	NC	30
7717548	F1 (C6-C10)	2021/12/14	78	60 - 140	87	60 - 140	<25	ug/L	NC	30
7717548	Hexane	2021/12/14	80	70 - 130	86	70 - 130	<1.0	ug/L		
7717548	Methyl Ethyl Ketone (2-Butanone)	2021/12/14	91	60 - 140	102	60 - 140	<10	ug/L		
7717548	Methyl Isobutyl Ketone	2021/12/14	86	70 - 130	92	70 - 130	<5.0	ug/L		
7717548	Methyl t-butyl ether (MTBE)	2021/12/14	85	70 - 130	89	70 - 130	<0.50	ug/L		
7717548	Methylene Chloride(Dichloromethane)	2021/12/14	99	70 - 130	102	70 - 130	<2.0	ug/L		
7717548	o-Xylene	2021/12/14	79	70 - 130	85	70 - 130	<0.20	ug/L	NC	30
7717548	p+m-Xylene	2021/12/14	81	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
7717548	Styrene	2021/12/14	90	70 - 130	96	70 - 130	<0.50	ug/L		
7717548	Tetrachloroethylene	2021/12/14	96	70 - 130	105	70 - 130	<0.20	ug/L		
7717548	Toluene	2021/12/14	90	70 - 130	96	70 - 130	<0.20	ug/L	2.8	30
7717548	Total Xylenes	2021/12/14					<0.20	ug/L	NC	30
7717548	trans-1,2-Dichloroethylene	2021/12/14	92	70 - 130	99	70 - 130	<0.50	ug/L		
7717548	trans-1,3-Dichloropropene	2021/12/14	93	70 - 130	92	70 - 130	<0.40	ug/L		
7717548	Trichloroethylene	2021/12/14	106	70 - 130	113	70 - 130	<0.20	ug/L		
7717548	Trichlorofluoromethane (FREON 11)	2021/12/14	96	70 - 130	104	70 - 130	<0.50	ug/L		
7717548	Vinyl Chloride	2021/12/14	88	70 - 130	93	70 - 130	<0.20	ug/L		
7718192	F2 (C10-C16 Hydrocarbons)	2021/12/11	NC	60 - 130	96	60 - 130	<100	ug/L	NC	30
7718192	F3 (C16-C34 Hydrocarbons)	2021/12/11	NC	60 - 130	106	60 - 130	<200	ug/L	NC	30
7718192	F4 (C34-C50 Hydrocarbons)	2021/12/11	NC	60 - 130	103	60 - 130	<200	ug/L	NC	30
7719752	Benzene	2021/12/12			114	50 - 140	<0.20	ug/L	NC	30
7719752	Ethylbenzene	2021/12/12			113	50 - 140	<0.20	ug/L	NC	30
7719752	F1 (C6-C10) - BTEX	2021/12/12					<25	ug/L	NC	30
7719752	F1 (C6-C10)	2021/12/12			92	60 - 140	<25	ug/L	NC	30
7719752	o-Xylene	2021/12/12			111	50 - 140	<0.20	ug/L	NC	30
7719752	p+m-Xylene	2021/12/12			106	50 - 140	<0.40	ug/L	NC	30
7719752	Toluene	2021/12/12			99	50 - 140	<0.20	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7719752	Total Xylenes	2021/12/12					<0.40	ug/L	NC	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

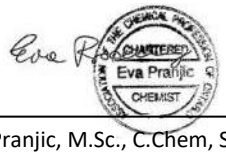
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



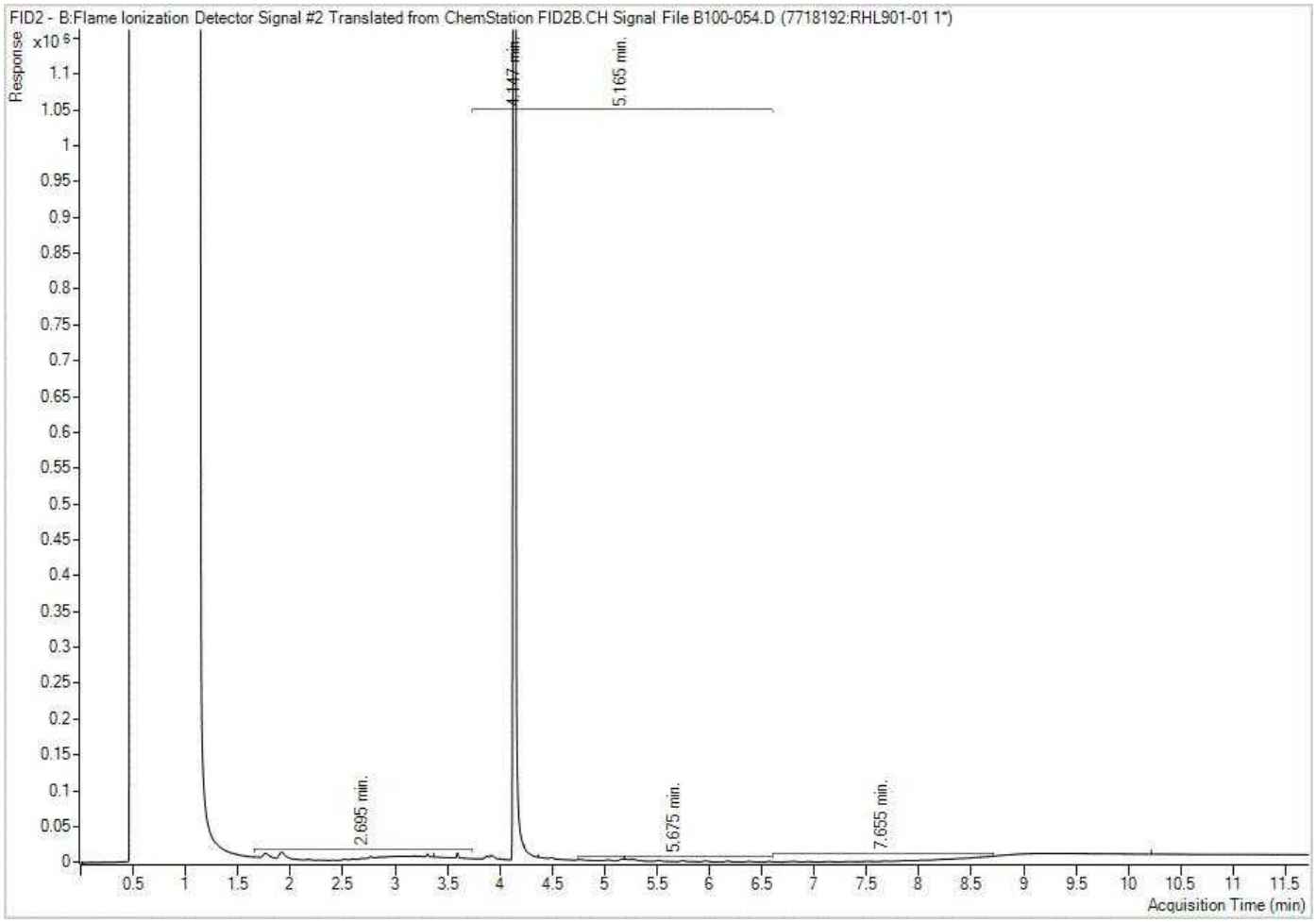
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15
Bureau Veritas Sample: RHL901

exp Services Inc
Client Project #: OTT-21019154-A0
Project name: KENT ST, OTTAWA
Client ID: BH/MW21-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

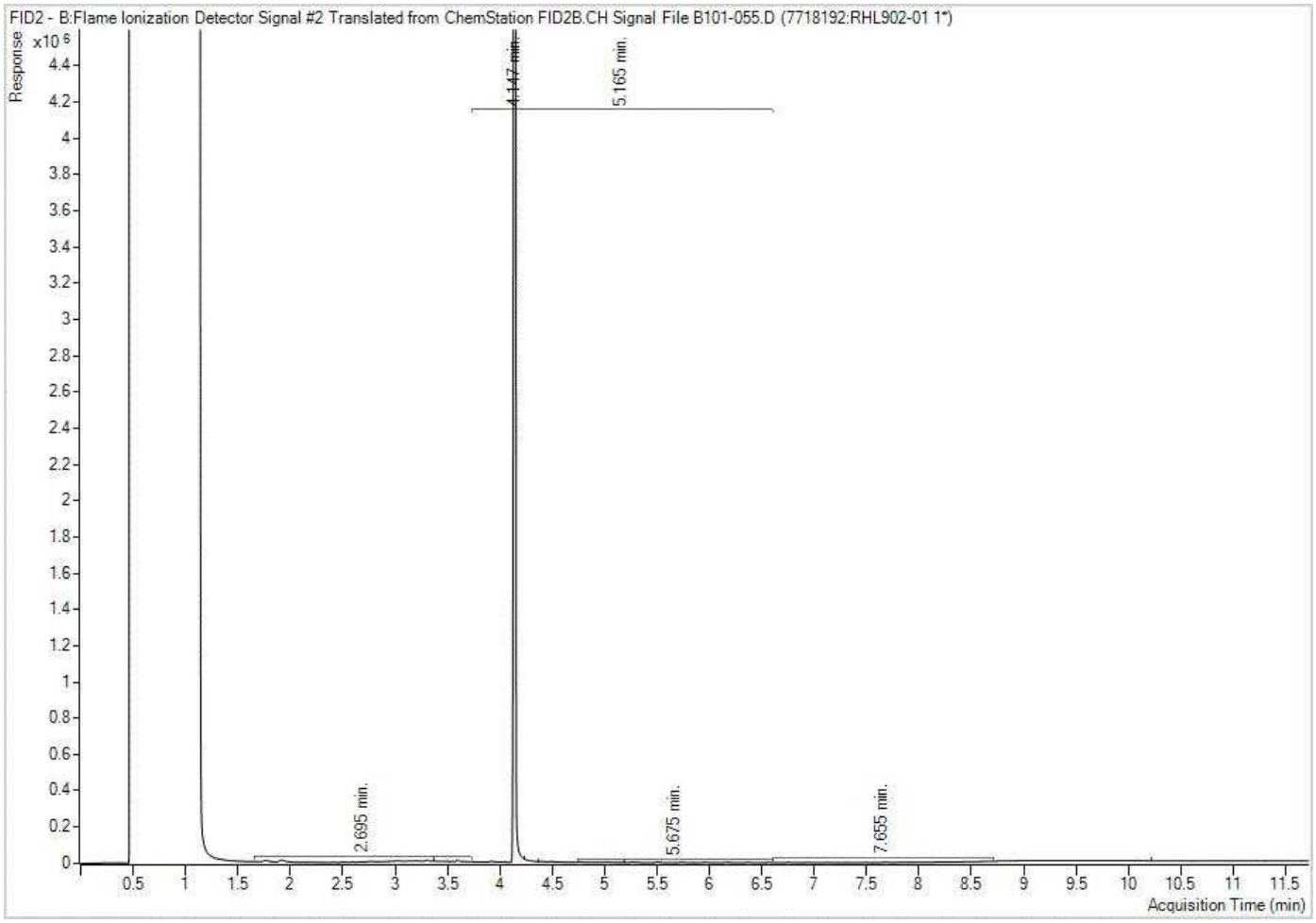


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15
Bureau Veritas Sample: RHL902

exp Services Inc
Client Project #: OTT-21019154-A0
Project name: KENT ST, OTTAWA
Client ID: BH/MW21-2

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

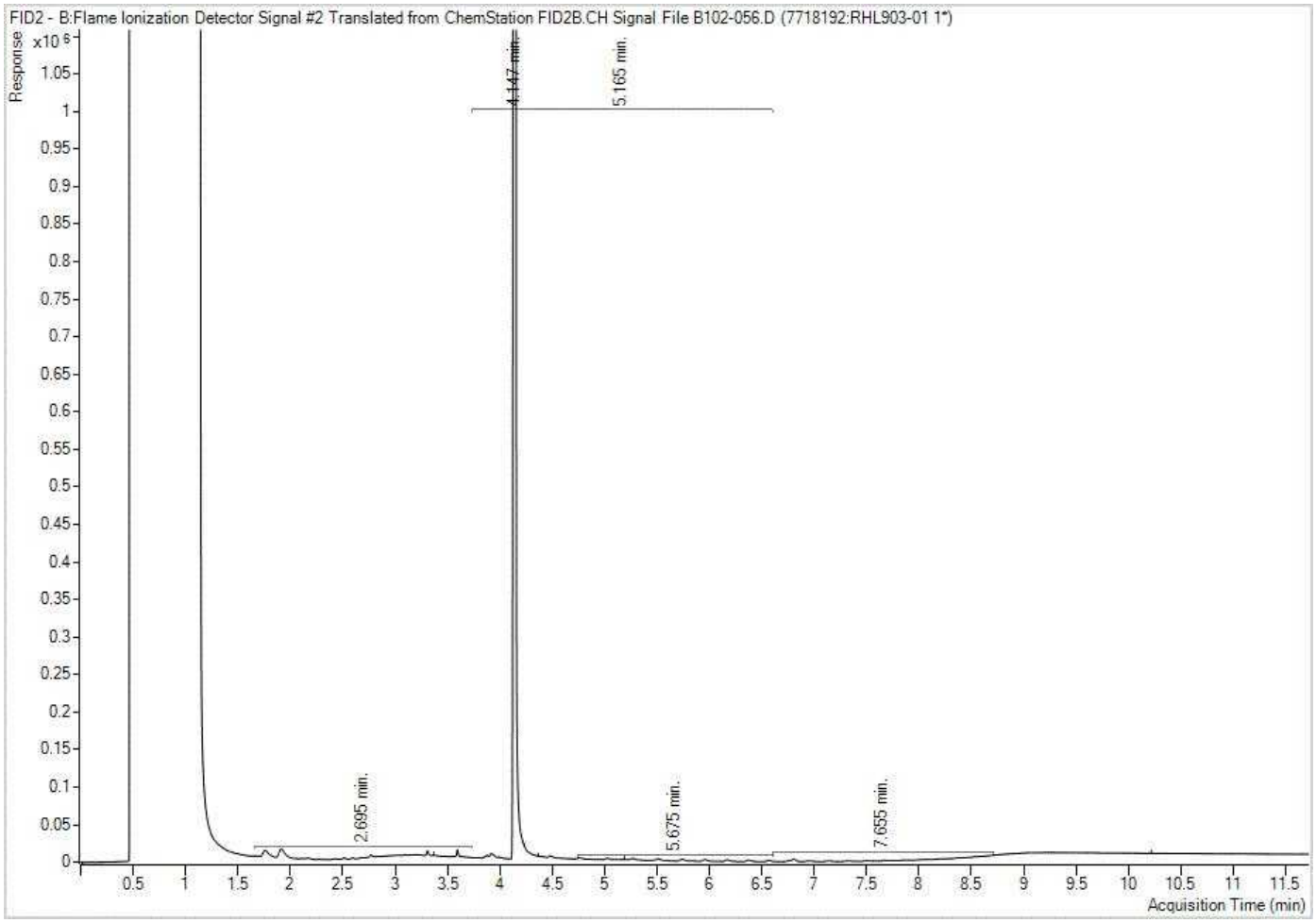


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15
Bureau Veritas Sample: RHL903

exp Services Inc
Client Project #: OTT-21019154-A0
Project name: KENT ST, OTTAWA
Client ID: BH/MW21-3

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

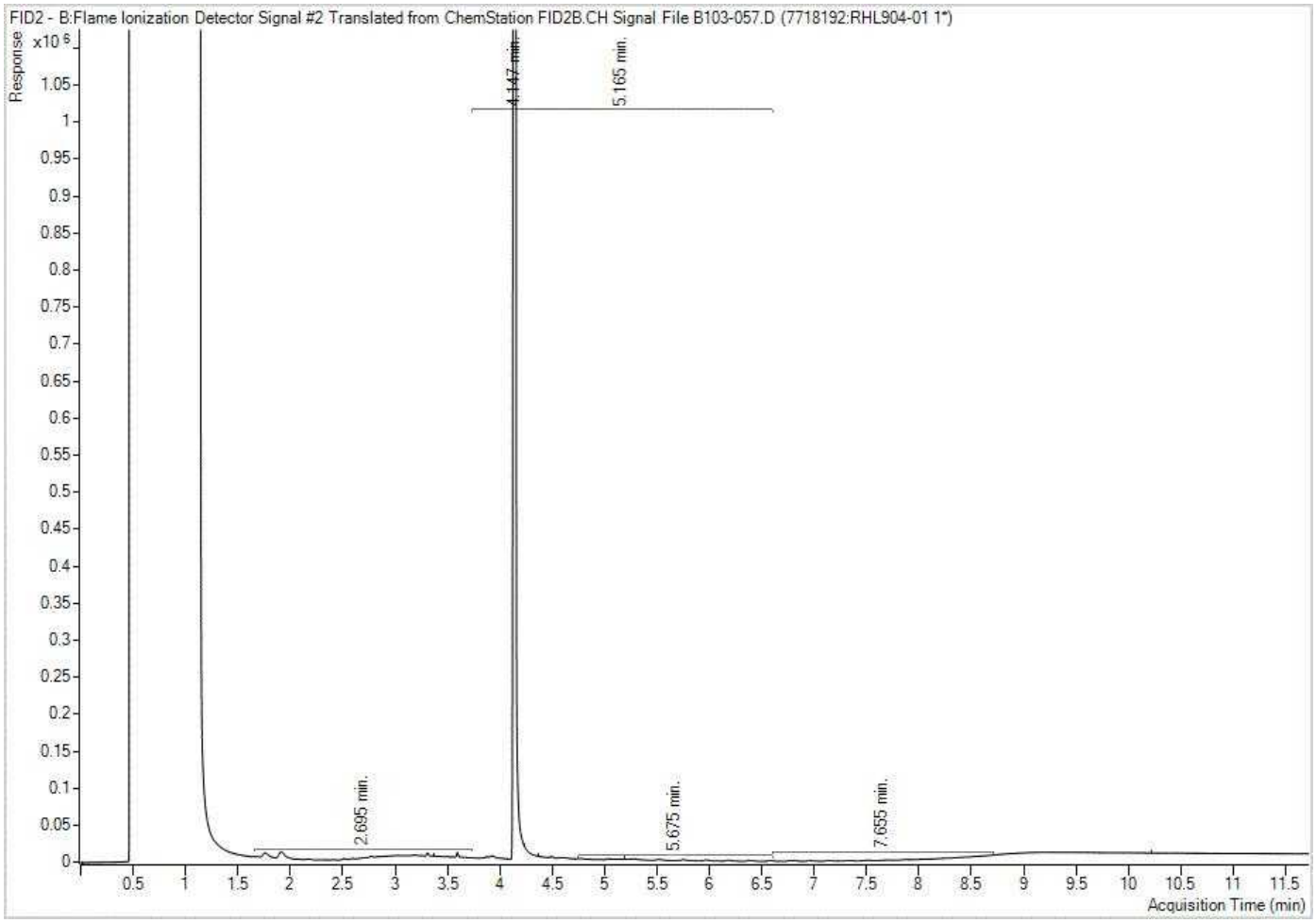


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15
Bureau Veritas Sample: RHL904

exp Services Inc
Client Project #: OTT-21019154-A0
Project name: KENT ST, OTTAWA
Client ID: BH/MW21-4

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

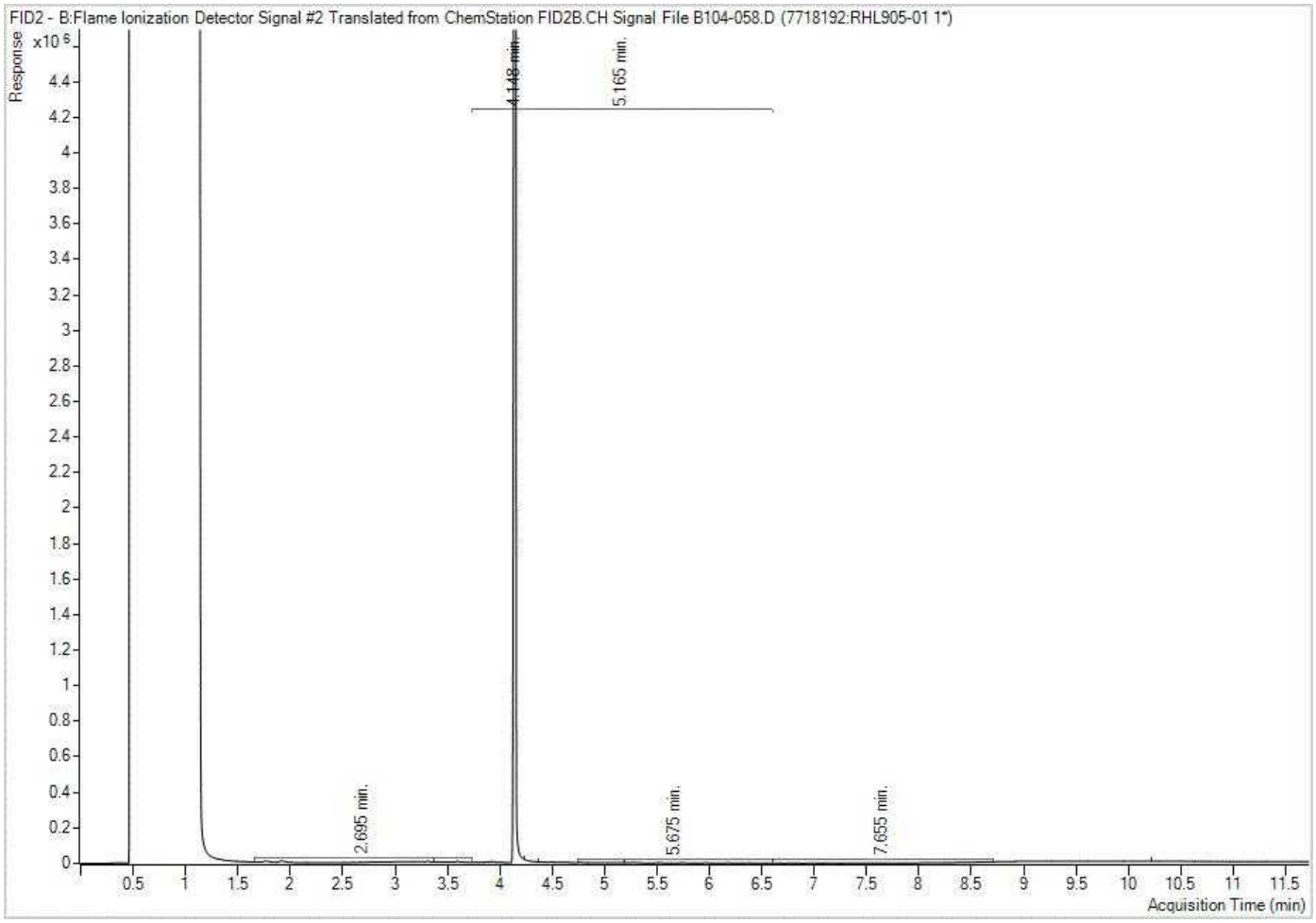


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C1Y3898
Report Date: 2021/12/15
Bureau Veritas Sample: RHL905

exp Services Inc
Client Project #: OTT-21019154-A0
Project name: KENT ST, OTTAWA
Client ID: DUP1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.