Phase Two Environmental Site Assessment
2663 Innes Road, Ottawa, Ontario

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Phase Two Environmental Site Assessment

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Executive Summary

EXP Services Inc. (EXP) was retained by 8743169 Canada Inc. to conduct a Phase Two Environmental Site Assessment (ESA) for the property located 2663 Innes Road in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by a 1½ story commercial building (former residence) and parking lot.

The objective of the Phase Two ESA investigation was to assess the quality of the soil and groundwater conditions within the areas of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP. The most recent use of the property was commercial (law office). It is proposed that a mixed commercial and residential building be constructed on the phase One property. As the proposed land use is more sensitive than the previous land use, a Record of Site Condition (RSC) is required.

The Phase Two property is located on the north side of Innes Road, at 2663 Innes Road. The Phase Two property is rectangular in shape with an area of 0.16 hectares (0.40 acres). The Phase Two property is legally described as Part Lot 13, Concession 2, Gloucester, Part 8, 5R1738, City of Ottawa, and the property identification number (PIN) is 043980045.

A 1½ storey commercial building is present on the Phase Two property. A partial basement is present at the rear of the building which contains the furnace and a sump. A crawl space is present under the remainder of the building footprint. The building was used initially as a residence until it was converted to offices in the 1990s. The building has a footprint of approximately 95 m^2. A gravel parking lot is present on the east side of the site. The rear part of the property is tree-covered.

The local groundwater flow direction is anticipated to be west/southwest towards Mud Creek and Green's Creek.

EXP completed a Phase One ESA for the property in February 2023 and the following potentially contaminating activities (PCAs) were identified:

- PCA #Other – Historic furnace oil spill
- PCA # 30 – Fill Material of Unknown Quality

Although the spill was partially addressed in 1997 (section 3.5), impacted soil remained under the building footing and no groundwater samples were collected. Therefore, this PCA is considered to result in an APEC.

The following PCAs were identified in the study area:

- PCA #28 – Gasoline and associated products storage in fixed tanks (gas station at 2630 Innes Road)
- PCA #37 – Operation of dry-cleaning equipment (where chemicals are used) (dry cleaner at 110 Bearbrook Road, and 2636 Innes Road)

Due to the distance and cross gradient location from the Phase Two property, the off-site PCAs were determined not to result in APECs. The following APEC were identified on the Phase Two property, as shown in Table EX-1:

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	Northwest part of the building where the former AST was located	PCA #Other – Historic furnace oil spill	On-site	Benzene, toluene, ethylbenzene, xylene (BTEX), and petroleum hydrocarbons (PHC)	Soil and groundwater

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 #2	South part of the Site	PCA #30 – Fill Material of Unknown Quality	On-Site	PHC, BTEX, polycyclic aromatic hydrocarbons (PAH), metals	Soil

A geotechnical investigation was completed on the Phase Two property in December 2022 by EXP. Two boreholes (BH1 and BH2) were advanced on the Phase Two property as part of this investigation. On February 14, 2023, three additional boreholes (BH1A, BH3, and BH4) were advanced at the Phase Two property for environmental purposes by Strata Drilling (Strata). One of the boreholes (BH4) was advanced in the basement of the building. The boreholes were advanced in the overburden to termination depths ranging from 1.5 m (BH4) to 4.5 m below existing grade. The geotechnical boreholes were drilled to a maximum depth of 31.7 m when inferred bedrock was encountered. A 19 mm diameter standpipe with slotted section was previously installed in one of the geotechnical boreholes (BH2) and a 51 mm diameter monitoring well with screen section was installed in two of the environmental boreholes (BH1A and BH3).

Three soil samples and one duplicate were collected and submitted for analysis of PHC and BTEX; one soil sample was submitted for analysis of PAH and metals. Three groundwater samples, one field duplicate, one field blank, and one trip blank were submitted for chemical analysis of BTEX and PHC.

Results were compared to MECP Regulation 153/04 Table 3 site condition standards (SCS) for residential/parkland/institutional property use and fine textured soils in a non-potable groundwater condition.

All soil samples met the applicable MECP Table 3 residential SCS for all parameters that were analyzed with the exception of the soil sample collected from BH-1A, which exceeded the MECP Table 3 residential SCS for cobalt and vanadium. However, the measured concentrations of cobalt and vanadium in the native silty clay at the Phase Two property are within the typical range of concentrations in the Ottawa area and are not indicative of anthropogenic impact. No additional soil quality investigation is recommended.

There were no exceedances of the MECP 3 SCS for any of the parameters analysed in the groundwater samples.

It is EXP's opinion that none of the PCA that were identified in the Phase One ESA have adversely affected the property. No further environmental investigations are deemed to be warranted.

This executive summary is a brief synopsis of the report and should not be read in lieu of reading the report in its entirety.

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1.0 Introduction

EXP Services Inc. (EXP) was retained by 8743169 Canada Inc. to conduct a Phase Two Environmental Site Assessment (ESA) for the property located 2663 Innes Road in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by a 1½ story commercial building (former residence) and parking lot.

The objective of the Phase Two ESA investigation was to assess the quality of the soil and groundwater conditions within the areas of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP. The most recent use of the property was commercial (law office). It is proposed that a mixed commercial and residential building be constructed on the phase One property. As the proposed land use is more sensitive than the previous land use, a Record of Site Condition (RSC) is required.

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 8 of this report.

1.1 Site Description

The Phase Two property is located on the north side of Innes Road, at 2663 Innes Road, as shown on Figure 1 in Appendix A. The Phase Two property is rectangular in shape with an area of 0.16 hectares (0.40 acres). A survey plan is provided in Appendix B. The Phase Two property is legally described as Part Lot 13, Concession 2, Gloucester, Part 8, 5R1738, City of Ottawa, and the property identification number (PIN) is 043980045.

A 1½ storey commercial building is present on the Phase Two property. A partial basement is present at the rear of the building which contains the furnace and a sump. A crawl space is present under the remainder of the building footprint. The building was used initially as a residence until it was converted to offices in the 1990s. The building has a footprint of approximately 95 m^2. A gravel parking lot is present on the east side of the site. The rear part of the property is tree-covered.

The site layout is shown on Figure 2 in Appendix A.

The local groundwater flow direction is anticipated to be west/southwest towards Mud Creek and Green's Creek.

Refer to Table 1.1 for the Site identification information.

Table 1.1: Site Identification Details

Civic Address	2663 Innes Road, Ottawa, Ontario
Current Land Use	Commercial
Proposed Future Land Use	Residential and Commercial
Property Identification Number	043980045
UTM Coordinates	Zone 18, 455953 m E and 5031154 m N
Site Area	0.16 hectares
Property Owner	8743169 Canada Inc.

A survey plan of the Phase Two property was completed by J. D. Barnes Limited in 2022. A copy of the survey plan is provided in Appendix B.

1.2 Property Ownership

The registered owner of the Phase One property is 8743169 Canada Inc. Authorization to proceed with this investigation was provided by Ms. Michelle LaPierre on behalf of 8743169 Canada Inc. Contact information for Ms. LaPierre is 2663 Innes Road, Ottawa, Ontario K1B 3J7.

1.3 Current and Proposed Future Use

The most recent use of the property was commercial. The proposed future use of the property is mixed commercial and residential. Since the past use of the property was commercial land use, an RSC must be filed, per Ontario Regulation 153/04.

1.4 Applicable Site Condition Standards

Analytical results obtained for soil and groundwater samples were compared to Site Condition Standards (SCS) established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document entitled *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, 2011. This document provides 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. 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).

Table 1 to 9 SCS are summarized as follows:

- Table 1 – applicable to sites where background concentrations must be met (full depth), such as sensitive sites where site-specific criteria have not been derived
- Table 2 – applicable to sites with potable groundwater and full depth restoration
- Table 3 – applicable to sites with non-potable groundwater and full depth restoration
- Table 4 – applicable to sites with potable groundwater and stratified restoration
- Table 5 – applicable to sites with non-potable groundwater and stratified restoration
- Table 6 – applicable to sites with potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 7 – applicable to sites with non-potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 8 – applicable to sites with potable groundwater and that are within 30 m of a water body
- Table 9 – applicable to sites with non-potable groundwater and that are within 30 m of a water body

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH, thickness and extent of overburden material, and proximity to an area of environmental sensitivity or of natural significance. For some chemical parameters, 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 2011 Table 3 SCS for a non-potable groundwater condition and residential/parkland/ institutional property use.

The selection of these categories was based on the following factors:

- Bedrock is greater than 2 metres below grade across the subject property;
- The Phase Two property is not located within 30 metres of a waterbody;
- Based on laboratory testing conducted during the current investigation, more than 50 per cent of soil particles by mass were less than 75 micrometres in mean diameter, therefore the soil at the site is medium-fine textured;
- The Phase Two property is not located within an area of natural significance, does not include nor is adjacent to an area of natural significance, and does not include land that is within 30 metres of an area of natural significance;
- The Phase Two study area is serviced with potable water by the City of Ottawa through its water distribution system. The subject site is the only property within the Phase Two study area currently serviced by a potable water well. This well will be decommissioned during site development and the future development on the site will be serviced by the City of Ottawa.
- The Phase Two property is not located in an area designated in a municipal official plan as a well-head protection area;
- The proposed building is planned for residential use; and
- It is the opinion of the Qualified Person who oversaw this work that the Phase Two property is not a sensitive site.

2.0 Background Information

2.1 Physical Setting

The Phase Two property is located on the north side of Innes Road, at 2663 Innes Road, as shown on Figure 1 in Appendix A. The Phase Two property is rectangular in shape with an area of 0.16 hectares (0.40 acres). A site plan showing the Phase Two property is presented as Figure 2 in Appendix A.

The Phase Two study area is serviced with potable water by the City of Ottawa through its water distribution system. The subject site is the only property within the Phase Two study area currently serviced by a potable water well. This well will be decommissioned during site development and the future development on the Phase Two property will be serviced by the City of Ottawa.

In accordance with Section 41 of Ontario Regulation 153/04, the Phase Two property is not an environmentally sensitive area. In addition, 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.

The Phase Two property is not a shallow soil property as defined in Section 43.1 of the regulation. It does not 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.

Bedrock geology underlying the Phase One property consists of limestone of the Ottawa Formation. Surficial geology consists of fine grained glaciomarine deposits of silt and clay. Local MOE well records indicate local geology consists of sand overlying silty clay overlying limestone bedrock. Depth to bedrock is approximately 32 metres below grade.

The closest body of water to the Phase Two property is an unnamed tributary to Mud Creek, approximately 480 m southeast of the site. Mud Creek is present approximately 1 km south of the Phase Two property and flows west to Green's Creek. The inferred groundwater flow direction is to the west/southwest.

2.2 Past Investigations

EXP prepared a report entitled *Phase One Environmental Site Assessment, 2663 Innes Road, Ottawa, Ontario,* dated February 24, 2023. The Phase One study area included the entire Phase Two property as well as properties within 250 m of the Phase Two property. Based on the results of the Phase One ESA, EXP identified two APECs on the Phase One property. A summary is provided in Table 2.1.

Table 2.1: Findings of Phase One ESA

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	Northwest part of the building where the former AST was located	PCA #Other – Historic furnace oil spill	On-site	Benzene, toluene, ethylbenzene, xylene (BTEX), and petroleum hydrocarbons (PHC)	Soil and groundwater
APEC #2	South part of the Site	PCA #30 – Fill Material of Unknown Quality	On-Site	PHC, BTEX, polycyclic aromatic hydrocarbons (PAH), metals	Soil

The Phase One ESA was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices. A copy of the Phase One conceptual site model, including APECs, is provided as Figure 3 in Appendix A.

3.0 Scope of the Investigation

3.1 Overview of Site Investigation

The objective of the Phase Two ESA was to assess the quality of soil and groundwater quality on the Phase Two property.

The most recent use of the property was commercial. The proposed future use of the property is mixed commercial and residential. As the most proposed land use is more sensitive than the most recent land use, a Record of Site Condition (RSC) must be filed, per Ontario Regulation 153/04.

3.2 Scope of Work

The Phase ESA was conducted in conjunction with a geotechnical investigation. The scope of work for the Phase Two ESA was as follows:

- Drilling three boreholes (MW1A, MW3 and BH4) on the subject property and completing two of them as monitoring wells (MW1A and MW3);
- Submitting select soil samples for laboratory analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), petroleum hydrocarbon (PHC) fractions F1 to F4, polycyclic aromatic hydrocarbons (PAH), and/or metals;
- Collecting groundwater samples from the two monitoring wells and an existing piezometer (BH2) northeast of the residence and submitting them for analysis of BTEX and PHC;
- Comparing the results of the soil and groundwater chemical analyses to applicable criteria, as set out by the Ontario Ministry of the Environment, Conservation and Parks (MECP);
- Conducting an elevation survey of the boreholes and monitoring wells;
- Monitoring groundwater levels in the monitoring wells and piezometer to determine groundwater elevations; and,
- Preparing a report summarizing the results of the assessment activities.

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 8 of this report.

3.3 Media Investigated

The Phase Two ESA included the investigation of soil and groundwater on the Phase Two property. There are no waterbodies on the Phase Two property, therefore sediment sampling was not required.

The contaminants of potential concern (COPC) identified in the Phase One ESA were identified as target parameters for this Phase Two ESA. The APEC and COPC identified in the Phase One ESA are outlined in Section 2.2.

3.4 Phase One Conceptual Site Model

The Phase One conceptual site model (CSM) was developed by considering the following physical characteristics and pathways. The CSM showing the topography of the site, inferred groundwater flow, general site features, APEC, and PCA is shown in Figure 3 in Appendix A.

3.4.1 Buildings and Structures

A 1½ storey commercial building is present on the Phase Two property. A partial basement is present at the rear of the building which contains the furnace and a sump. The remainder of the building has a crawl space.

3.4.2 Water Bodies and Groundwater Flow Direction

There are no water bodies on the Phase Two property. The closest body of water is and unnamed tributary to Mud Creek, approximately 480 m southeast of the site. Mud Creek is present approximately 1 km south of the Phase Two property and flows west to Green's Creek.

3.4.3 Areas of Natural Significance

There are no ANSI within the Phase Two study area.

3.4.4 Water Wells

Twenty-two well records were identified in the study area. Three of the well records were for water supply wells for schools installed in 1953. It is unlikely that any of these wells are still in use. The remainder of the records were for monitoring wells. A shallow dug well is present on the site, approximately 8 m north of the building. No well record was available for the on-site well.

3.4.5 Potentially Contaminating Activity

EXP completed a Phase One ESA for the property in February 2023 and the following potentially contaminating activities (PCAs) were identified.

The following PCAs were identified on the Phase Two property:

- PCA #Other – Historic furnace oil spill
- PCA # 30 – Fill Material of Unknown Quality

Although the spill was partially addressed in 1997 (section 3.5), impacted soil remained under the building footing and no groundwater samples were collected. Therefore, this PCA is considered to result in an APEC.

The following PCAs were identified in the study area:

- PCA #28 – Gasoline and associated products storage in fixed tanks (gas station at 2630 Innes Road)
- PCA #37 – Operation of dry-cleaning equipment (where chemicals are used) (dry cleaner at 110 Bearbrook Road, and 2636 Innes Road)

Due to the distance and cross gradient location from the Phase Two property, the off-site PCAs were determined not to result in APECs.

3.4.6 Areas of Potential Environmental Concern

The APEC identified are summarized in Table 3.1.

Table 3.1: 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	Northwest part of the building where the former AST was located	PCA #Other – Historic furnace oil spill	On-site	Benzene, toluene, ethylbenzene, xylene (BTEX), and petroleum hydrocarbons (PHC)	Soil and groundwater
APEC #2	South part of the Site	PCA #30 – Fill Material of Unknown Quality	On-Site	PHC, BTEX, polycyclic aromatic hydrocarbons (PAH), metals	Soil

3.4.7 Underground Utilities

The office on the Phase Two property is currently serviced by a well, sanitary sewer, overhead hydro and natural gas. All other properties in the Phase One study area, and the proposed new developed on the Phase Two property will be serviced by municipal water and sewer, and underground hydro.

3.4.8 Subsurface Stratigraphy

Bedrock geology underlying the Phase One property consists of limestone of the Ottawa Formation. Surficial geology consists of fine grained glaciomarine deposits of silt and clay. Local MOE well records indicate local geology consists of sand overlying silty clay overlying limestone bedrock. Depth to bedrock is approximately 35 metres below grade. Based on the geotechnical investigation conducted by EXP in 2022, the inferred depth to bedrock on the site was 31.7 m.

3.4.9 Uncertainty Analysis

The CSM is a simplification of reality, which aims to provide a description and assessment of any areas where potentially contaminating activity that occurred within the Phase Two study area may have adversely affected the Phase Two property. All information collected during this investigation, including records, interviews, and site reconnaissance, has contributed to the formulation of the CSM.

Information was assessed for consistency, however EXP has confirmed neither the completeness nor the accuracy of any of the records that were obtained or of any of the statements made by others. All reasonable inquiries to obtain accessible information were made, as required by Schedule D, Table 1, Mandatory Requirements for Phase Two Environmental Site Assessment Reports. The CSM reflects our best interpretation of the information that was available during this investigation.

3.5 Deviations from Sampling and Analysis Plan

The field investigative and sampling program was carried out following the requirements of the Phase Two property, as described in Section 4.

No significant deviations from the SAAP, as provided in Appendix C, were reported that affected the sampling and data quality objectives for the Phase Two property.

3.6 Impediments

No impediments were encountered during this investigation.

4.0 Investigation Method

4.1 General

The current investigation was performed following requirements given under Ontario Regulation 153/04 and in accordance with generally accepted professional practices.

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

4.2 Drilling Program

A geotechnical investigation was completed on the Phase Two property in December 2022 by EXP. Two boreholes (BH1 and BH2) were advanced on the Phase Two property as part of the geotechnical investigation. On February 14, 2023, three additional boreholes (BH1A, BH3, and BH4) were advanced at the Phase Two property for environmental purposes by Strata Drilling (Strata). One of the boreholes (BH4) was advanced in the basement of the building. The boreholes were advanced in the overburden to termination depths ranging from 1.5 m (BH4) to 4.5 m below existing grade. The previous boreholes were drilled to a maximum depth of 31.7 m where inferred bedrock was encountered.

The exterior environmental boreholes were drilled with a Geoprobe drill rig with direct push tube samplers. All soil samples were visually examined in the field for textural classification, logged, preserved in plastic bags and identified. The interior borehole (BH4) was drilled using manual equipment.

The locations of the boreholes are shown in Figure 2 in Appendix A.

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 C.

Soil samples were selected for laboratory analysis based on combustible vapour measurements and visual and olfactory evidence of impacts, where observed. Soil samples identified for possible laboratory analysis were placed directly into pre-cleaned, laboratory-supplied glass sample jars/vials. Samples to be analysed for 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 headspace 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 Laboratories (BV Labs) of Ottawa, Ontario. The samples were transported/submitted within 24 hours of collection to the laboratory following chain of custody protocols for chemical analysis. Soil samples were submitted for laboratory analysis of PHC, PAH, and/or metals.

Soil samples for geologic characterization were collected on a continuous basis in the overburden materials using direct push tube samplers advanced into the subsurface using the drill rig. 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/excavation, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix D.

4.4 Field Screening Measurements

Soil samples were placed in a sealed Ziploc plastic bag and allowed to reach ambient temperature prior to field screening with a combustible and organic vapour meter calibrated to hexane gas prior to use. The field screening 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 'headspace' 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 potential impacts and the selection of soil samples for analysis.

Readings of combustible and organic vapour concentrations in the soil samples collected during the drilling investigation were recorded using an RKI Eagle 2, where there was sufficient recovery. 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.

The field screening measurements, in parts per million by volume (ppmv), are presented in the borehole logs provided in Appendix D.

4.5 Groundwater: Monitoring Well Installation

A 19 mm diameter standpipe with slotted section was installed during the geotechnical investigation in BH2, and a 51 mm diameter monitoring well with screen section was installed in two of the environmental boreholes (BH1A and BH3).

The standpipes and monitoring wells were installed in accordance with EXP standard practice, and the installation configuration is documented on the respective borehole log. All boreholes were backfilled upon completion of drilling and the installation of the standpipes and monitoring wells.

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 19 mm or 52 mm diameter Schedule 40 PVC screen that was no more than 3.0 m long and a 51 mm diameter Schedule 40 PVC riser pipe that was at least 0.8 m long. The annular space around the wells 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 flushmount casings. Details of the monitoring well installations are shown on the borehole logs provided in Appendix D.

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; and,
- Cleaning or disposal of drilling equipment between sampling locations.

4.6 Groundwater: Field Measurement and Water Quality Parameters

Field measurement of water quality parameters is described in Section 4.7.

All measurements of petroleum vapours in the monitor riser were made with an RKI Eagle 2 in methane elimination mode. Immediately after removing the well cap, the collection tube of the Eagle was inserted into the riser and the peak instrument reading was recorded. EXP used a Heron water level tape to measure the static water level in each monitoring well. The measuring tape was cleaned with phosphate-free soap and tap water, rinsed with distilled water after each measurement.

4.7 Groundwater: Sampling

All groundwater samples were collected via a low flow sampling technique using a Horiba U-52 multi probe water quality meter. The U-52 probe was calibrated using in-house reference standards. Prior to collecting the groundwater samples, water quality field parameters (turbidity, dissolved oxygen, conductivity, temperature, pH, and oxidation reduction potential) were monitored until stable readings were achieved to ensure that the samples collected were representative of actual groundwater conditions. These parameters are considered to be stable when three consecutive readings meet the following conditions:

- Turbidity: within 10% for values greater than 5 nephelometric turbidity units (NTU), or three values less than 5 NTU;
- Dissolved oxygen: within 10% for values greater than 0.5 mg/L, or three values less than 0.5 mg/L;
- Conductivity: within 3%;
- Temperature: ± 1°C;
- pH: ± 0.1 unit; and,
- Oxidation reduction potential: ±10 millivolts.

When stabilization occurs, equilibrium between groundwater within a monitor and the surrounding formation water is attained. As such, samples collected when stabilization occurs are considered to be representative of formation water.

The groundwater sampling during the completion of this Phase Two ESA was undertaken in general accordance with the SAAP presented in Appendix C. The groundwater samples were placed in clean coolers containing ice packs prior to and during transportation to the laboratory. The samples were transported to the laboratory within 24 hours of collection with a chain of custody.

On February 22, 2023, groundwater samples were collected from the three monitoring wells (BH2, MW1A, and MW3) using the low flow sampling method described above. Three groundwater samples, one field duplicate, one field blank, and one trip blank were submitted for chemical analysis of BTEX and PHC.

4.8 Sediment: Sampling

There are no waterbodies present on the Phase Two property, therefore sediment sampling was not required.

4.9 Analytical Testing

The contracted laboratory selected to perform chemical analysis on all soil samples was BV Labs. BV Labs 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.

4.10 Residue Management

The minor amount of drill cuttings from drilling activities and purged water from groundwater development and sampling were disposed of on-site. Fluids from cleaning drilling equipment were disposed of by the driller at their facility.

4.11 Elevation Surveying

An elevation survey was conducted by EXP. The top of casing and ground surface elevation of each monitoring well location was surveyed relative to a geodetic reference. The Universal Transverse Mercator (UTM) coordinates of each monitoring well were also recorded so that their locations could be plotted accurately.

4.12 Quality Assurance and Quality Control Measures

All soil and groundwater samples were placed in coolers containing ice packs prior to and during transportation to the contract laboratory, BV Labs. BV Labs is accredited to the ISO/IEC 17025:2005 standard - *General Requirements for the Competence of Testing and Calibration Laboratories*.

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. 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:

- Collecting and analysing field duplicate samples to ensure analytical precision;
- Using dedicated and/or disposable sampling equipment;
- Following proper decontamination protocols to minimize cross-contamination;
- Maintaining field notes and completing field forms to document field activities; and,
- Using only laboratory-supplied sample containers and following prescribed sample protocols, including using proper preservation techniques, meeting sample hold times, and documenting sample transmission on chains of custody, to ensure the integrity of the samples is maintained.

BV Labs' 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.

5.0 Review and Evaluation

5.1 Geology

A surficial topsoil layer was contacted in BH1A and BH2. The topsoil ranged in thickness from 100 mm to 300 mm. A buried topsoil layer was encountered in BH1A at a depth of 0.8 m. Fill material was observed in BH1A and BH2 to a maximum depth of 0.8 m.

Native silty clay was encountered below the topsoil and fill materials in all boreholes. All of the boreholes were terminated within the silty clay at between 1.5 m to 31.7 m depths.

A plan view showing cross-sections is provided as Figure 5 in Appendix A, while the Phase Two property geology is depicted in cross-sections on Figure 6 in Appendix A.

5.2 Groundwater: Elevations and Flow Direction

On February 22, 2023, the monitoring wells were inspected for general physical condition, groundwater depth, the presence of light non-aqueous phase liquid (LNAPL).

Overburden groundwater monitoring and elevation data are provided below.

Table 5.1: Monitoring and Elevation Data

Monitoring Well ID	Grade Elevation (masl)	Top of Casing Elevation (masl)	Screen Depth (mbgs)	Depth to LNAPL (mbgs)	February 22, 2023	
					Depth to Groundwater (mbTOC)	Groundwater Elevation (masl)
BH/MW 1A	74.42	75.48	1.5 – 4.5	N/A	3.71	71.77
BH-2	74.44	75.09	4.5 - 6.2	N/A	2.84	72.25
MW3	74.32	75.13	1.5 – 4.5	N/A	3.09	72.04

Notes: Elevations were measured to a geodetic datum
mbgs – metres below ground surface
masl – metres above sea level
mbTOC – metres below top of monitor casing
N/A – not applicable

Based on the groundwater elevations, a groundwater contour plan was prepared. The overburden groundwater flow direction was determined to be to the south. The groundwater contour plan is provided as Figure 4 in Appendix A.

5.3 Groundwater: Hydraulic Gradients

Horizontal hydraulic gradients were estimated for the groundwater flow components identified in the overburden aquifer based on the February 2023 groundwater elevations.

The horizontal hydraulic gradient is calculated across the using the following equation:

$$i = \Delta h / \Delta s$$

Where,

i = horizontal hydraulic gradient;
Δh (m) = groundwater elevation difference; and,
Δs (m) = separation distance.

The horizontal hydraulic gradient was calculated to be 0.022 m/m.

5.4 Fine-Medium Soil Texture

Based on field observations and laboratory analysis of three samples for grain size from the geotechnical investigation, the soil texture was determined to be fine-medium. The Grain size results are shown below. The grain-size distribution curves are included in Appendix E.

Table 5.2: Grain Size Analysis Results

Sample	Depth (m bgs)	Soil Type	Particles Smaller than 75 microns by Mean Diameter	Ontario Regulation 153/04 Classification
BH2-SS3	1.5 to 2.1	Clay	99%	Fine-Medium
BH2-SS5	3.8 to 4.4	Clay	99%	Fine-Medium
BH2-SS8	10.7 to 11.3	Clay	100%	Fine-Medium

The clay unit is the dominant type of soil on the Phase Two property. Since more than 1/3 of the soil on the Phase Two property consisted of medium and fine textured soil, soil and groundwater results were compared to medium and fine textured SCS.

5.5 Soil: Field Screening

The methodology for the collection of soil vapour concentration measurements is described in Section 4.4.

Petroleum vapours ranged from non-detectable to 30 ppm in samples collected from the test pits. Field screening data is presented in the test pit logs in Appendix D.

5.6 Soil: Quality

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes and from the north wall of the utility trench excavation. 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.

Three soil samples and one duplicate were collected and submitted for analysis of PHC and BTEX; and one soil sample was submitted for analysis of PAH and metals. All of the soil samples had concentrations that were less the MECP Table 3 SCS for all parameters that were analysed, with the exception of cobalt and vanadium.

It is probable that the elevated concentrations of cobalt and vanadium observed in the soil samples from the Phase Two property are due to naturally elevated concentrations in the native silty clays in the Ottawa area and are not due to anthropogenic impact. A technical paper entitled "*Elevated Background Metals Concentrations in Champlain Sea Clay – Ottawa Region*" was written by two engineering firms and the City of Ottawa was presented at GEO Ottawa in 2017. The paper presented results from several studies in the Ottawa area that showed that the concentrations of several metals, including cobalt and vanadium, in the native silty clay are naturally elevated above the MECP background SCS. New background concentrations that are higher than the MECP Table 3 SCS were proposed for five metals for eastern Ontario. Based on the above technical paper, the range of concentrations of cobalt in 271 native soil samples in the Ottawa area ranged from 3.0 to 30.5 ug/g with a 98th percentile of 27.9 ug/g. The measured concentrations of cobalt in the silty clay at the Phase Two property was 23 ug/g. Similarly, the range of concentrations of vanadium in 267 native soil samples in the Ottawa area ranged from 10.0 to 136 ug/g with a 98th percentile of 123 ug/g. The measured concentrations of vanadium in the silty clay at the subject site was 110 ug/g. This indicates that the measured concentrations of cobalt and vanadium in the

native silty clay at the Phase Two property are within the typical range of concentrations cited in the above technical paper and are not indicative of anthropogenic impact.

The soil results are provided in Tables 1 to 3 in Appendix F. They are shown in plan view on Figures 7 to 9 and on cross-sections on Figures 10 to 12 in Appendix A.

Copies of the laboratory Certificates of Analysis are provided in Appendix G.

5.7 Groundwater: Quality

All groundwater samples were collected via a low flow sampling technique. EXP monitored several water quality parameters (such as water level, temperature, dissolved oxygen, conductivity, salinity, pH, oxygen reduction potential and turbidity) in order to ensure that the samples collected were representative of actual groundwater conditions.

Following their installation, the monitoring wells were developed by purging water with an inertial pump and foot valve until it became clear.

Three groundwater samples, one field duplicate, one field blank, and one trip blank were submitted for chemical analysis of BTEX and PHC. There were no exceedances of the MECP Table 3 SCS for any of the parameters analyzed.

The analytical results are included in Table 4 in Appendix E and are shown in plan view on Figures 13 and on cross-sections on Figure 14 in Appendix A.

Copies of the laboratory Certificates of Analysis are provided in Appendix G.

5.7.1 Chemical Transformation and Contaminant Sources

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COC in soil and groundwater, the contribution of which is dependent on the soil and groundwater conditions at the Phase Two property, as well as the chemical/physical properties of the COC. 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.

All soil samples met the applicable Table 3 residential SCS for all parameters that were analyzed with the exception of cobalt and vanadium. However, the measured concentrations of cobalt and vanadium in the native silty clay at the Phase Two property are within the typical range of concentrations in the Ottawa area and are not indicative of anthropogenic impact. No additional soil quality investigation is recommended. Chemical transformations of contaminants in soil are not a significant concern at the Phase Two property.

There were no groundwater exceedances of the Table 3 SCS for any of the parameters analyzed.

Cross-sections that depict the geological, hydrogeological, and groundwater chemical data for the Phase Two property are provided as Figure 6 in Appendix A.

5.7.2 Evidence of Non-Aqueous Phase Liquid

Inspection of the groundwater monitoring wells did not indicate the presence of non-aqueous phase liquid (NAPL).

5.7.3 Maximum Concentrations

Contaminants that exceeded the applicable MECP Table 3 residential standards included:

Soil: Cobalt and vanadium.

Groundwater: none.

Maximum soil and groundwater concentrations are provided in Tables 7 and 8 in Appendix E.

5.8 Sediment: Quality

There are no water bodies on the Phase Two property, therefore sediment sampling was not required.

5.9 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 materials and groundwater at the site. QA/QC measures, included:

- Collection and analysis of blind duplicate soil and groundwater samples to ensure sample collection precision;
- Analysis of a groundwater field blank for all parameters that were analysed to assess potential impact during sampling;
- Using dedicated and/or disposable 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.

BV Labs' 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 to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificates of Analysis prepared by Caduceon. The QA/QC results are reported as percent recoveries for matrix spikes, spiked blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

Review of the laboratory QA/QC results reported indicated that they were mostly within acceptable control limits or below applicable alert criteria for the sampled media and analytical test groups. For QA/QC purposes, the analytical sample results are quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. To accurately calculate a statistically valid RPD, the concentration of the analytes found in both the original and duplicate sample must be greater than five times the reporting detection limit (RDL).

The results of the RPD calculations are provided in Appendix E in Tables 7 and 8. All of the RPD for soil and groundwater were either not calculable or within the applicable alert limits.

A field blank and trip blanks were prepared and submitted for laboratory analysis of BTEX and PHC. The results of the trip blank and field blank analyses are provided in Table 4 in Appendix F. The trip blank and field blank were below the detection limits for all parameters analysed

5.10 Phase Two Conceptual Site Model

A Conceptual Site Model (CSM) provides 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.

5.10.1 Introduction

EXP Services Inc. (EXP) was retained by 8743169 Canada Inc. to conduct a Phase Two Environmental Site Assessment (ESA) for the property located 2663 Innes Road in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by a 1½ story commercial building (former residence) and parking lot.

The objective of the Phase Two ESA investigation was to assess the quality of the soil and groundwater conditions within the areas of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP. The most recent use of the property was commercial (law office). It is proposed that a mixed commercial and residential building be constructed on the phase One property. As the proposed land use is more sensitive than the previous land use, a Record of Site Condition (RSC) is required.

5.10.2 Physical Site Description

The Phase Two property is located on the north side of Innes Road, at 2663 Innes Road, as shown on Figure 1 in Appendix A. The Phase Two property is rectangular in shape with an area of 0.16 hectares (0.40 acres). A survey plan is provided in Appendix B. The Phase Two property is legally described as Part Lot 13, Concession 2, Gloucester, Part 8, 5R1738, City of Ottawa, and the property identification number (PIN) is 043980045.

A 1½ storey commercial building is present on the Phase Two property. A partial basement is present at the rear of the building which contains the furnace and a sump. A crawl space is present under the remainder of the building footprint. The building was used initially as a residence until it was converted to offices in the 1990s. The building has a footprint of approximately 95 m^2. A gravel parking lot is present on the east side of the site. The rear part of the property is tree-covered.

The local groundwater flow direction is anticipated to be west/southwest towards Mud Creek and Green's Creek.

Refer to Table 5.3 for the Site identification information.

Table 5.3: Site Identification Details

Civic Address	2663 Innes Road, Ottawa, Ontario
Current Land Use	Commercial
Proposed Future Land Use	Residential and Commercial
Property Identification Number	043980045
UTM Coordinates	Zone 18, 455953 m E and 5031154 m N
Site Area	0.16 hectares
Property Owner	8743169 Canada Inc.

The Phase One Conceptual Site Model is provided as Figure 3.

The Phase Two study area is serviced with potable water by the City of Ottawa through its water distribution system. The subject site is the only property within the Phase Two study area is currently serviced by a potable water well. This well will be decommissioned during site development and the proposed development at the Phase Two property will be serviced by the City of Ottawa.

In accordance with Section 41 of Ontario Regulation 153/04, the Phase Two property is not an environmentally sensitive area. In addition, 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.

The Phase Two property is not a shallow soil property as defined in Section 43.1 of the regulation. It does not 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.

5.10.3 Geological and Hydrogeological

Bedrock geology underlying the Phase One property consists of limestone of the Ottawa Formation. Surficial geology consists of fine grained glaciomarine deposits of silt and clay. Local MOE well records indicate local geology consists of sand overlying silty clay overlying limestone bedrock. Depth to bedrock is approximately 35 metres below grade.

The closest body of water to the Phase Two property is an unnamed tributary to Mud Creek, approximately 480 m southeast of the site. Mud Creek is present approximately 1 km south of the Phase Two property and flows west to Green's Creek. The inferred groundwater flow direction is to the west/southwest.

A plan view showing cross-sections is provided as Figure 5, while the Phase Two property geology is depicted in cross-sections on Figure 6.

A summary of factors that apply to the Phase Two property is provided in Table 5.4.

Table 5.4: Site Characteristics

Characteristic	Description
Minimum Depth to Bedrock	42.7 masl (31.7 m bgs)
Minimum Depth to Groundwater	2.3 m bgs
Shallow Soil Property	No, bedrock is greater than 2.0 mbgs
Proximity to water body or ANSI	480 m southeast – Mud Creek

Soil Texture	Fine-Medium
Current Property Use	Commercial
Future Property Use	Residential and Commercial
Areas Containing Suspected Fill	South Part of Phase Two property

5.10.4 Utilities and Impediments

The office on the Phase Two property is currently serviced by a well, sanitary sewer, overhead hydro and natural gas. All other properties in the Phase One study area, and the proposed new developed on the Phase Two property will be serviced by municipal water and sewer, and underground hydro.

5.10.5 Potentially Contaminating Activities

EXP completed a Phase One ESA for the property in February 2023 and the following potentially contaminating activities (PCAs) were identified.

The following PCAs were identified on the Phase Two property:

- PCA #Other – Historic furnace oil spill
- PCA # 30 – Fill Material of Unknown Quality

Although the spill was partially addressed in 1997 (section 3.5), impacted soil remained under the building footing and no groundwater samples were collected. Therefore, this PCA is considered to result in an APEC.

The following PCAs were identified in the study area:

- PCA #28 – Gasoline and associated products storage in fixed tanks (gas station at 2630 Innes Road)
- PCA #37 – Operation of dry-cleaning equipment (where chemicals are used) (dry cleaner at 110 Bearbrook Road, and 2636 Innes Road)
- Due to the distance and cross gradient location from the Phase Two property, the off-site PCAs were determined not to result in APECs

5.10.6 Areas of Potential Environmental Concern/Potential Contaminates of Concern

Ontario Regulation 153/04 defines an APEC as an area on a property where one or more contaminants are potentially present. The following APEC were identified on the Phase Two property, as shown on Figure 2 and Table 5.5 below:

Table 5.5: 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	Northwest part of the building where the former AST was located	PCA #Other – Historic furnace oil spill	On-site	Benzene, toluene, ethylbenzene, xylene (BTEX), and petroleum hydrocarbons (PHC)	Soil and groundwater

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 #2	South part of the Site	PCA #30 – Fill Material of Unknown Quality	On-Site	PHC, BTEX, polycyclic aromatic hydrocarbons (PAH), metals	Soil

5.10.7 Investigation

The site investigative activities consisted of drilling boreholes to facilitate the collection of soil samples for visual inspection and chemical analysis. The boreholes were instrumented with monitoring wells to facilitate the collection of groundwater samples.

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

A geotechnical investigation was completed on the Phase Two property in December 2022 by EXP. Two boreholes (BH1 and BH2) were advanced on the Phase Two property as part of the geotechnical investigation. On February 14, 2023, three additional boreholes (BH1A, BH3, and BH4) were advanced at the Phase Two property for environmental purposes by Strata Drilling (Strata). One of the boreholes (BH4) was advanced in the basement of the building. The boreholes were advanced in the overburden to termination depths ranging from 1.5 m (BH4) to 4.5 m below existing grade. The geotechnical boreholes were drilled to a maximum depth of 31.7 m when inferred bedrock was encountered.

The exterior environmental boreholes were drilled with a Geoprobe drill rig with direct push tube samplers. All soil samples were visually examined in the field for textural classification, logged, preserved in plastic bags and identified. The interior borehole (BH4) was drilled using manual equipment.

5.10.8 Soil Sampling

Soil samples were selected for laboratory analysis based on combustible vapour measurements and visual and olfactory evidence of impacts, where observed. Soil samples identified for possible laboratory analysis were placed directly into pre-cleaned, laboratory-supplied glass sample jars/vials. Samples to be analysed for 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 headspace 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 Laboratories (BV Labs) of Ottawa, Ontario. The samples were transported/submitted within 24 hours of collection to the laboratory following chain of custody protocols for chemical analysis. Soil samples were submitted for laboratory analysis of PHC, PAH, and/or metals.

Soil samples for geologic characterization were collected on a continuous basis in the overburden materials using direct push tube samplers advanced into the subsurface using the drill rig. 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/excavation, and to record visual or olfactory observations of potential impacts.

Three soil samples and one duplicate were collected and submitted for analysis of PHC and BTEX; one soil sample was submitted for analysis of PAH and metals. All of the soil samples had concentrations that were less the MECP Table 3 SCS for all parameters that were analysed, with the exception of cobalt and vanadium.

It is probable that the elevated concentrations of cobalt and vanadium observed in the soil samples from the Phase Two property are due to naturally elevated concentrations in the native silty clays in the Ottawa area and are not due to anthropogenic impact. A technical paper entitled "*Elevated Background Metals Concentrations in Champlain Sea Clay – Ottawa Region*" was written by two engineering firms and the City of Ottawa was presented at GEO Ottawa in 2017. The paper presented results from several studies in the Ottawa area that showed that the concentrations of several metals, including cobalt and vanadium, in the native silty clay are naturally elevated above the MECP Table SCS. New background concentrations that are higher than the MECP Table 3 SCS were proposed for five metals for eastern Ontario. Based on the above technical paper, the range of concentrations of cobalt in 271 native soil samples in the Ottawa area ranged from 3.0 to 30.5 ug/g with a 98th percentile of 27.9 ug/g. The measured concentrations of cobalt in the silty clay at the Phase Two property was 23 ug/g. Similarly, the range of concentrations of vanadium in 267 native soil samples in the Ottawa area ranged from 10.0 to 136 ug/g with a 98th percentile of 123 ug/g. The measured concentrations of vanadium in the silty clay at the subject site was 110 ug/g. This indicates that the measured concentrations of cobalt and vanadium in the native silty clay at the Phase Two property are within the typical range of concentrations cited in the above technical paper and are not indicative of anthropogenic impact.

The soil results are provided in Tables 1 to 3 in Appendix F. They are shown in plan view on Figures 7 to 9 and on cross-sections on Figures 10 to 12 in Appendix A.

5.10.9 Groundwater Sampling

A 19 mm diameter standpipe with slotted section was installed during the geotechnical investigation in BH2 and a 51 mm diameter monitoring well with screen section was installed in two environmental boreholes (BH1A and BH3). All groundwater samples were collected via a low flow sampling technique using a U-52 Horiba multi probe water quality meter. The U-52 probe was calibrated using in-house reference standards. Prior to collecting the groundwater samples, water quality field parameters (turbidity, dissolved oxygen, conductivity, temperature, pH, and oxidation reduction potential) were monitored until stable readings were achieved to ensure that the samples collected were representative of actual groundwater conditions.

The groundwater samples were placed in clean coolers containing ice packs prior to and during transportation to the laboratory. The samples were transported to the laboratory within 24 hours of collection with a chain of custody.

Three groundwater samples, one field duplicate, one field blank, and one trip blank were submitted for chemical analysis of BTEX and PHC. There were no exceedances of the MECP Table 3 SCS for any of the parameters analyzed.

The analytical results are included in Table 4 in Appendix F and are shown in plan view on Figure 13 and on cross-sections on Figure 14 in Appendix A.

5.10.10 Contaminants of Concern

Contaminants that exceeded the Table 2 residential standards included:

Soil: Cobalt and vanadium

Groundwater: none

5.10.11 Contaminant Fate and Transport

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COC in soil and groundwater, the contribution of which is dependent on the soil and groundwater conditions at the Phase Two property, as well as the chemical/physical properties of the COC. 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.

All soil samples met the applicable MECP Table 3 residential SCS for all parameters that were analyzed with the exception of the sample from BH-1A, which exceeded the MECP Table 3 residential SCS for cobalt and vanadium. However, the measured concentrations of cobalt and vanadium in the native silty clay at the Phase Two property are within the typical range of concentrations in the Ottawa area and are not indicative of anthropogenic impact. No additional soil quality investigation is recommended. Chemical transformations of contaminants in soil are not a significant concern at the Phase Two property.

There were no groundwater exceedances of the MECP Table 3 SCS for any of the parameters analyzed.

Cross-sections that depict the geological, hydrogeological, and groundwater chemical data for the Phase Two property are provided as Figure 6 in Appendix A.

6.0 Conclusion

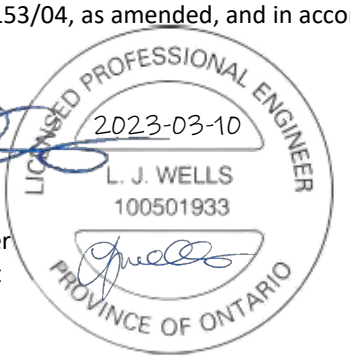
During the current investigation, the soil and groundwater quality at the Phase Two property were investigated. Results were compared to MECP Regulation 153/04 Table 3 SCS for residential/parkland/institutional property use and fine textured soils in a non-potable groundwater condition.

All soil samples met the applicable MECP Table 3 residential SCS for all parameters that were analyzed with the exception of the soil sample from BH1A, which exceeded the MECP Table 3 residential SCS for cobalt and vanadium. However, the measured concentrations of cobalt and vanadium in the native silty clay at the Phase Two property are within the typical range of concentrations in the Ottawa area and are not indicative of anthropogenic impact. No additional soil quality investigation is recommended.

There were no exceedances of the MECP 3 SCS for any of the parameters analysed in the groundwater samples.

It is EXP's opinion that none of the PCA that were identified in the Phase One ESA have adversely affected the property. No further environmental investigations are deemed to be warranted.

The Qualified Person can confirm that the Phase Two Environmental Site Assessment was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.



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7.0 References

This study was conducted in accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives. Specific reference is made to the following documents.

- EXP Services Inc., *Phase One Environmental Site Assessment, 2663 Innes Road, Ottawa, Ontario*, February 24 , 2023.
- Ontario Ministry of the Environment, Conservation and Parks, *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*, December 1996.
- Ontario Ministry of the Environment, Conservation and Parks, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, April 15, 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04,* June 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* July 1, 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Management of Excess Soil – A Guide for Best Management Practices,* January 2014.
- Ontario Regulation 153/04, made under the *Environmental Protection Act*, as amended.
- Ontario R.R.O. 1990, Regulation 347, made under the *Environmental Protection Act*, as amended.
- Ontario R.R.O. 1990, Regulation 903, made under the *Water Resources Act*, as amended.

8.0 General Limitations

Basis of Report

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation. Where special concerns exist, or 8743169 Canada Inc. ("the Client") has special considerations or requirements, these should be disclosed to EXP to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

Reliance on Information Provided

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to exp. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

Standard of Care

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

Complete Report

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by the Client, communications between EXP and the Client, other reports, proposals or documents prepared by EXP for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

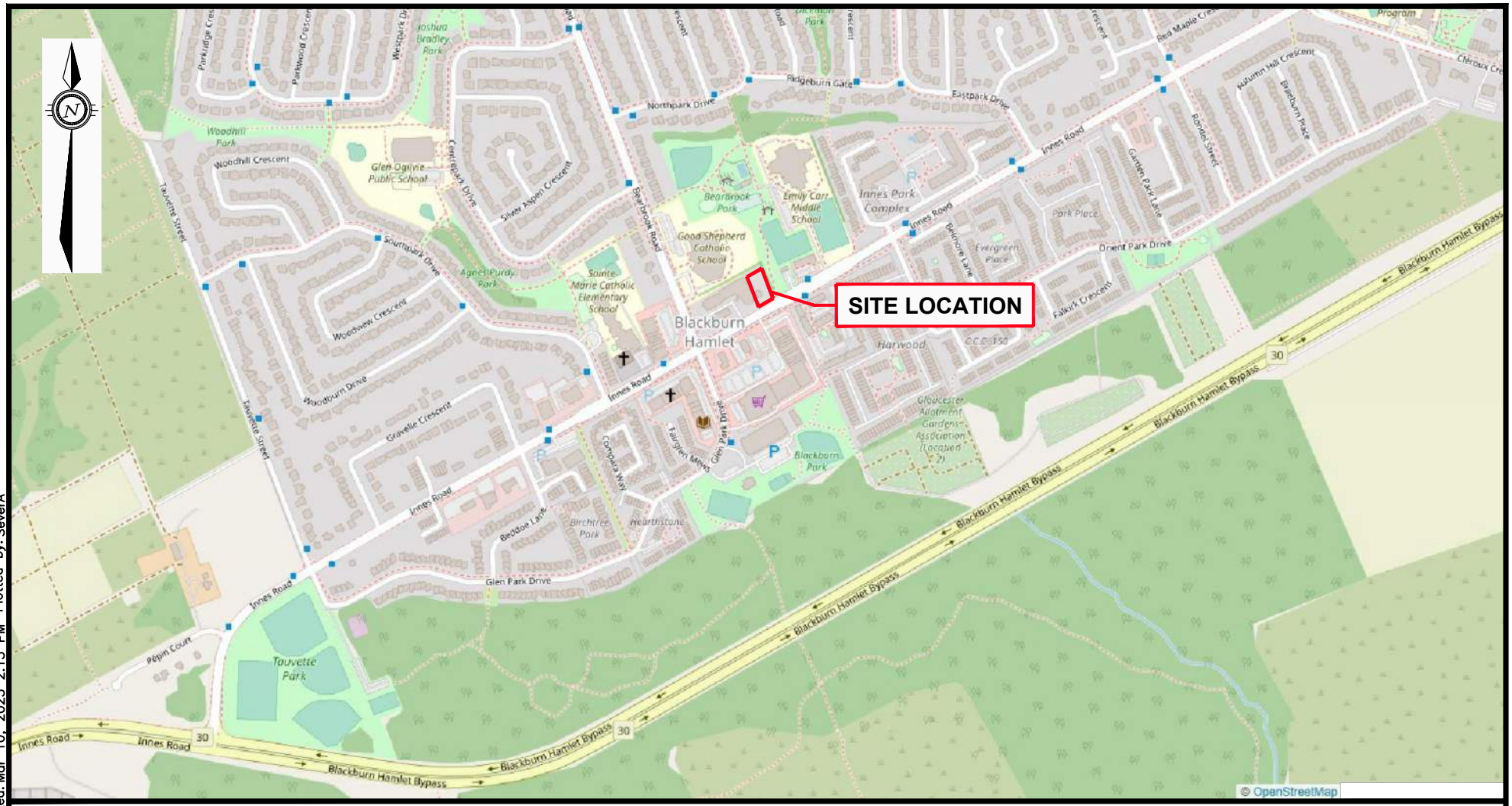
Use of Report

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

Report Format

Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

Appendix A: Figures



0 100m 200m 400m

HORIZONTAL 1:10,000

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DESIGN: LW / CHECKED: MM			scale 1:10,000
DRAWN BY: AS	TITLE: SITE LOCATION PLAN		FIG 1

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
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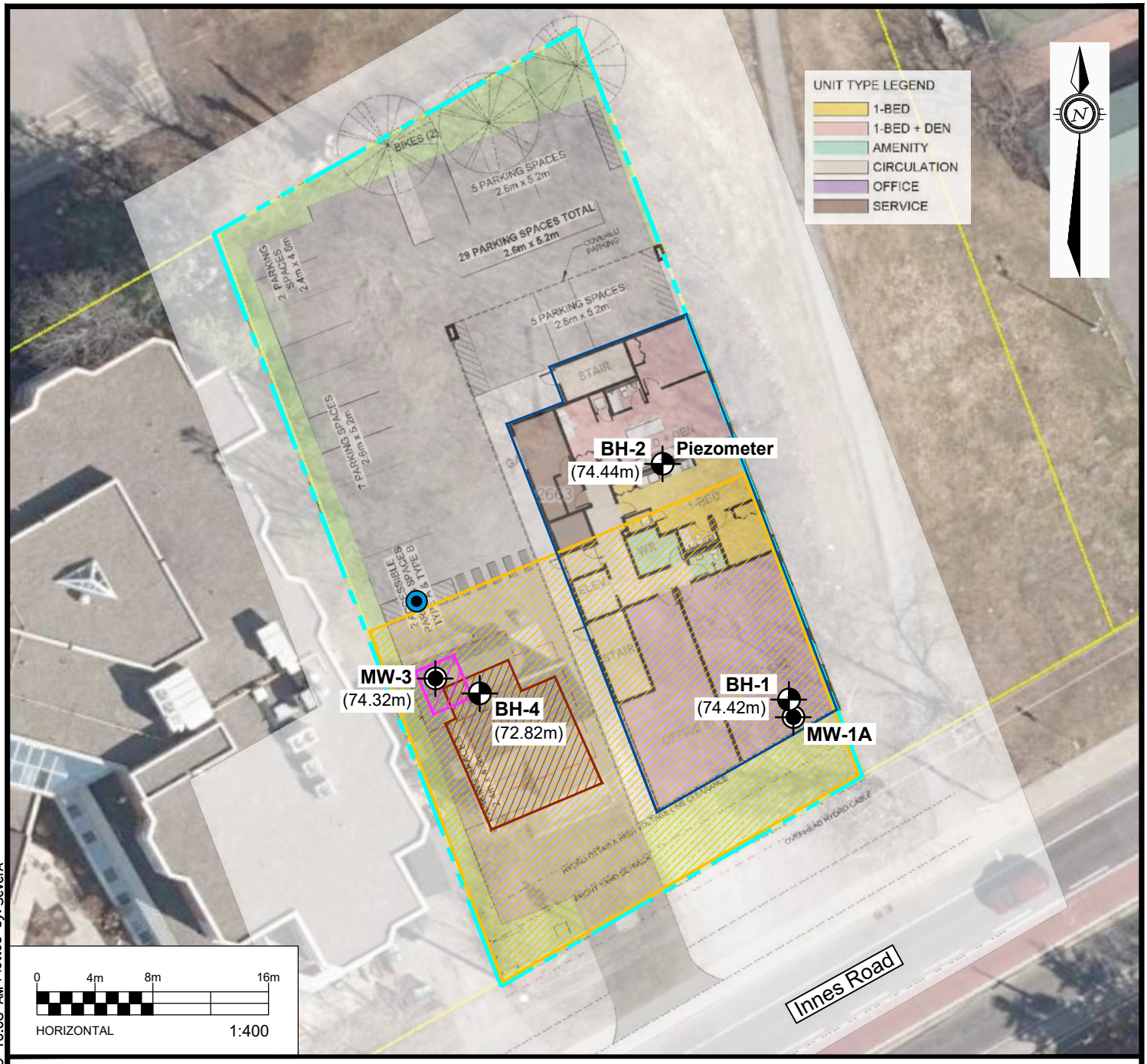

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- **BH-1** (74.42m) — BOREHOLE NO. & LOCATION GROUND SURFACE ELEVATION
- NEW PROPOSED BUILDING
- EXISTING BUILDING
- **MW-1A** — MONITORING WELL NO. & LOCATION

AREA OF POTENTIAL ENVIRONMENTAL CONCERN

- APEC 1 – PCA **#Other** - HISTORIC FURNACE OIL SPILL
- APEC 2 – PCA **#30** - FILL MATERIAL OF UNKNOWN QUALITY

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DESIGN: LW / CHECKED: MM		scale: 1:400
DRAWN BY: AS	TITLE: BOREHOLE / MONITORING WELL LOCATION PLAN	FIG 2

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
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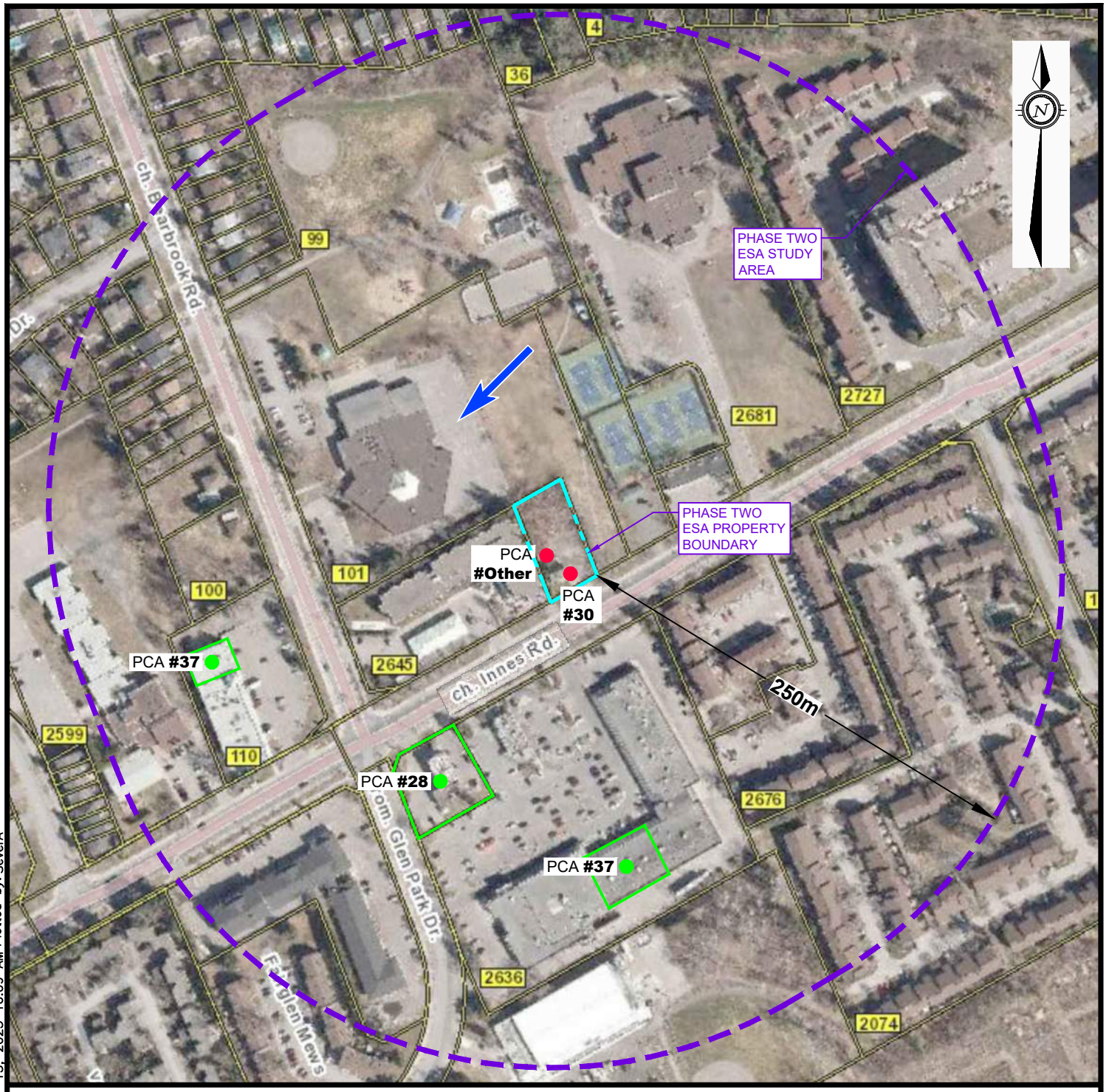

LEGEND

- PROPERTY BOUNDARY
- PHASE ONE STUDY AREA (250m)
- INFERRED GROUNDWATER FLOW DIRECTION
- 1 — POTENTIALLY CONTAMINATING ACTIVITY (PCA) RESULTING IN APECS
- 2 — POTENTIALLY CONTAMINATING ACTIVITY (PCA) NOT RESULTING IN APECS

0 30m 60m 120m

HORIZONTAL 1:3,000

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DESIGN: LW / CHECKED: MM		scale: 1:3,000
DRAWN BY: AS	TITLE: PHASE TWO ESA STUDY AREA	FIG 3

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
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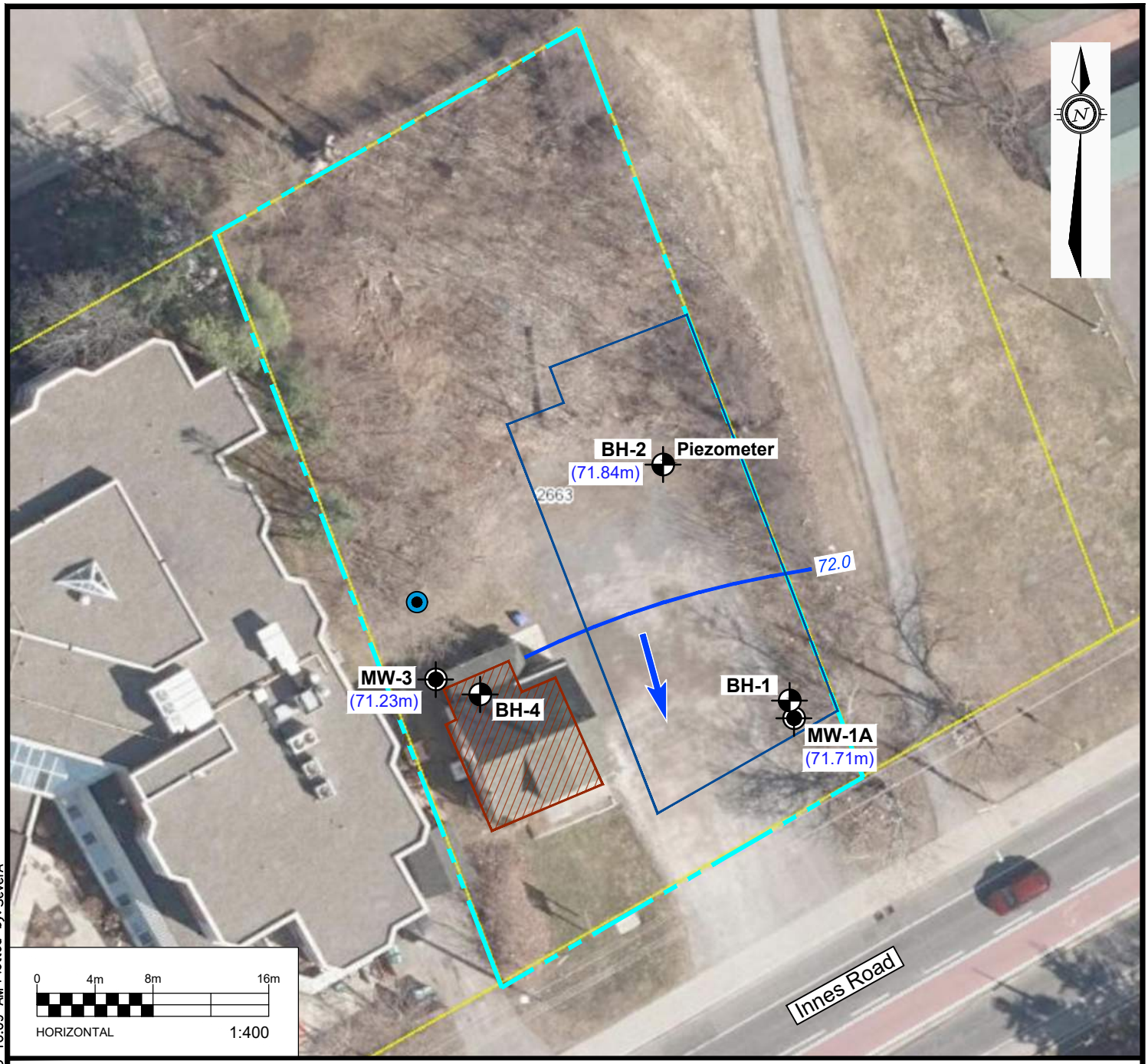

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 (71.71m) — BOREHOLE NO. & LOCATION GROUNDWATER ELEVATION
- NEW PROPOSED BUILDING
- EXISTING BUILDING
- MW-1A — MONITORING WELL NO. & LOCATION
- 72.0 — GROUNDWATER CONTOUR

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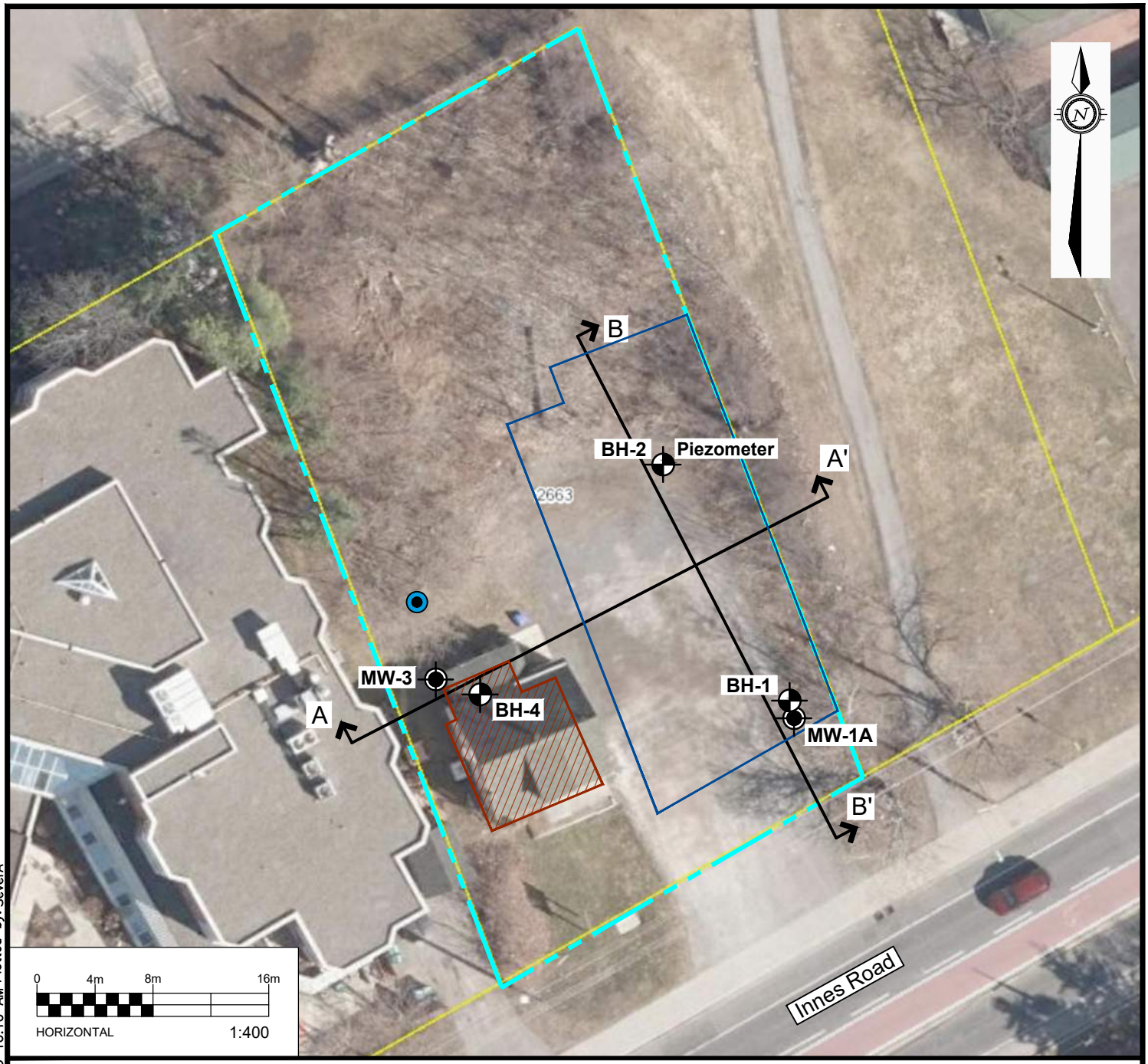
DESIGN: LW / CHECKED: MM		scale: 1:400
DRAWN BY: AS	TITLE: GROUNDWATER CONTOUR PLAN	FIG 4

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
Last Saved: Mar 13, 2023 10:06 AM Last Plotted: Mar 13, 2023 10:09 AM Plotted by: SeverA



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 — BOREHOLE NO. & LOCATION
- NEW PROPOSED BUILDING
- EXISTING BUILDING
- MW-1A — MONITORING WELL NO. & LOCATION
- A — A' SECTION MARK

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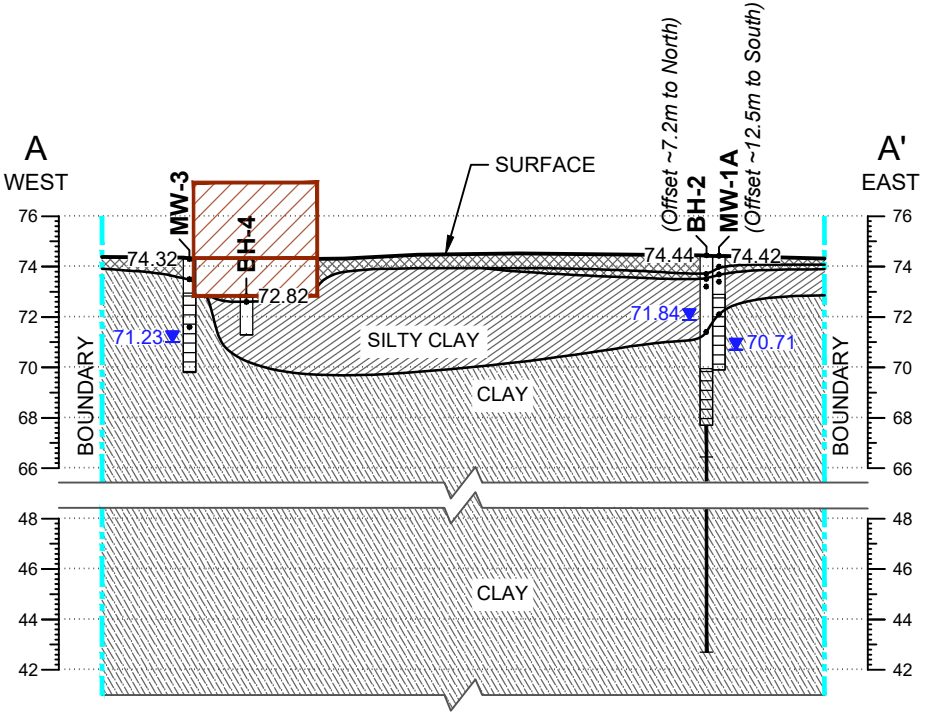
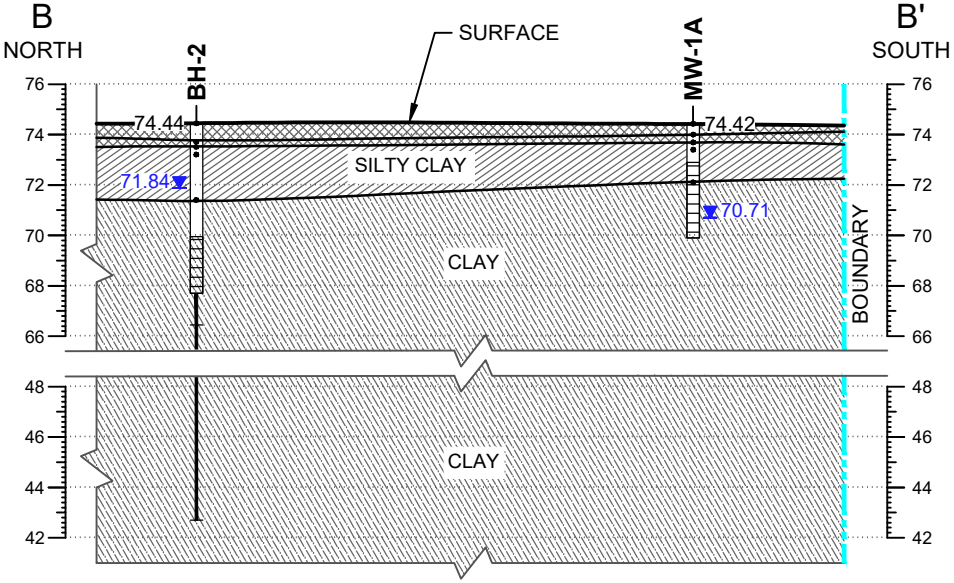
DESIGN: LW / CHECKED: MM		scale: 1:400
DRAWN BY: AS	TITLE: CROSS SECTION PLAN	FIG 5



CROSS SECTION A-A'



CROSS SECTION B-B'

PROPERTY BOUNDARY

EXISTING BUILDING

0 3m 6m 12m

HORIZONTAL 1:300

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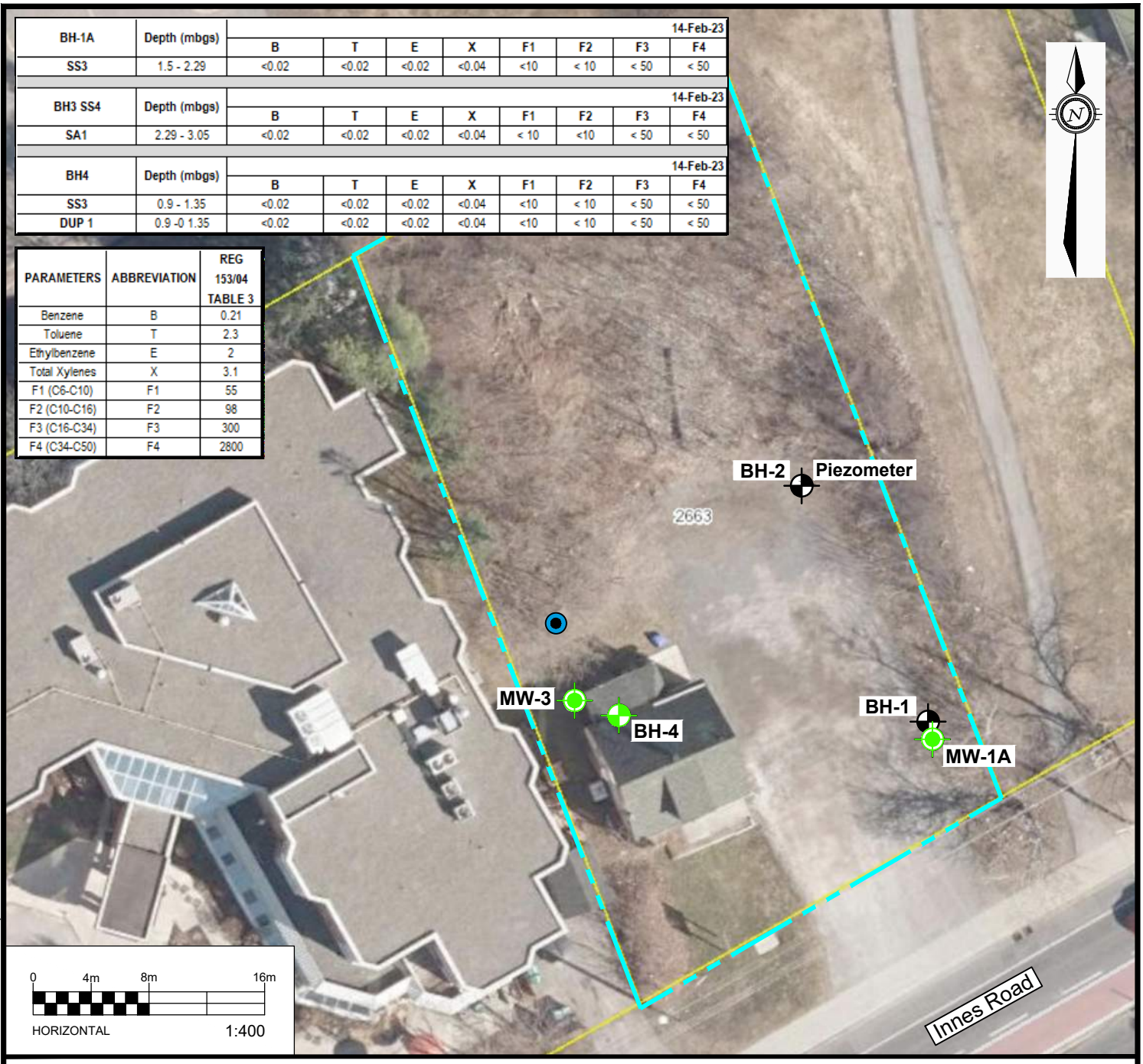
DESIGN: LW / CHECKED: MM		scale 1:300
DRAWN BY: AS	TITLE: CROSS SECTIONS A-A', B-B'	FIG 6

BH-1A	Depth (mbgs)	14-Feb-23							
		B	T	E	X	F1	F2	F3	F4
SS3	1.5 - 2.29	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50

BH3 SS4	Depth (mbgs)	14-Feb-23							
		B	T	E	X	F1	F2	F3	F4
SA1	2.29 - 3.05	<0.02	<0.02	<0.02	<0.04	< 10	<10	< 50	< 50

BH4	Depth (mbgs)	14-Feb-23							
		B	T	E	X	F1	F2	F3	F4
SS3	0.9 - 1.35	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50
DUP 1	0.9 -0 1.35	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1 (C6-C10)	F1	55
F2 (C10-C16)	F2	98
F3 (C16-C34)	F3	300
F4 (C34-C50)	F4	2800



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 — BOREHOLE NO. & LOCATION
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- MW-1A — MONITORING WELL NO. & LOCATION

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DESIGN: LW / CHECKED: MM	TITLE:	scale: 1:400
DRAWN BY: AS	SOIL ANALYTICAL RESULTS - PHC & BTEX	FIG 7

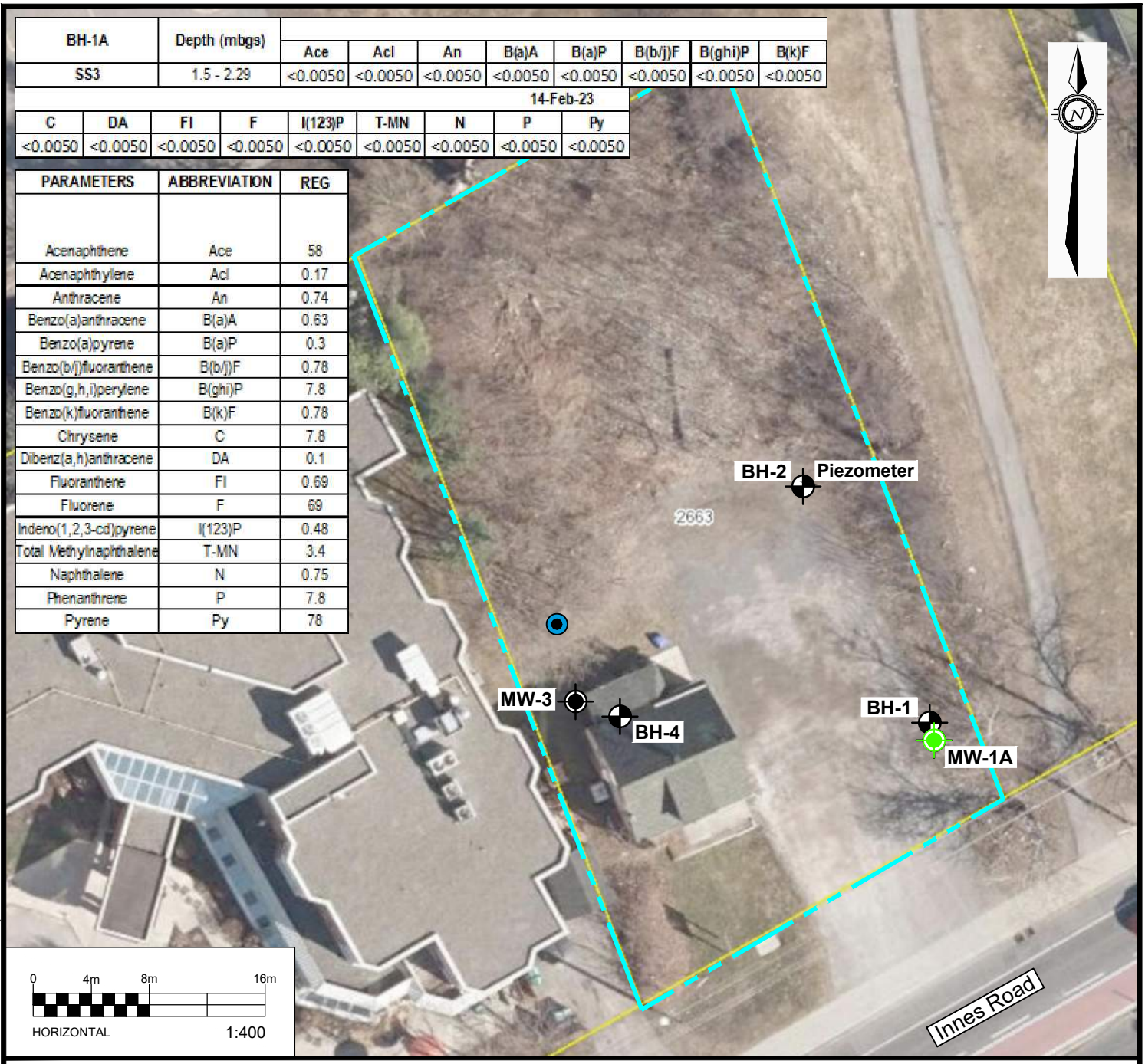
Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
Last Saved: Mar 13, 2023 10:11 AM Last Plotted: Mar 13, 2023 10:12 AM Plotted by: SeverA

BH-1A	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F
SS3	1.5 - 2.29	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

14-Feb-23

C	DA	FI	F	I(123)P	T-MN	N	P	Py
<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

PARAMETERS	ABBREVIATION	REG
Acenaphthene	Ace	58
Acenaphthylene	Acl	0.17
Anthracene	An	0.74
Benzo(a)anthracene	B(a)A	0.63
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)perylene	B(ghi)P	7.8
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7.8
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	FI	0.69
Fluorene	F	69
Indeno(1,2,3-cd)pyrene	I(123)P	0.48
Total Methylnaphthalene	T-MN	3.4
Naphthalene	N	0.75
Phenanthrene	P	7.8
Pyrene	Py	78



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 — BOREHOLE NO. & LOCATION
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- MW-1A — MONITORING WELL NO. & LOCATION

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2663 INNES ROAD, OTTAWA, ONTARIO

TITLE: SOIL ANALYTICAL RESULTS - PAH

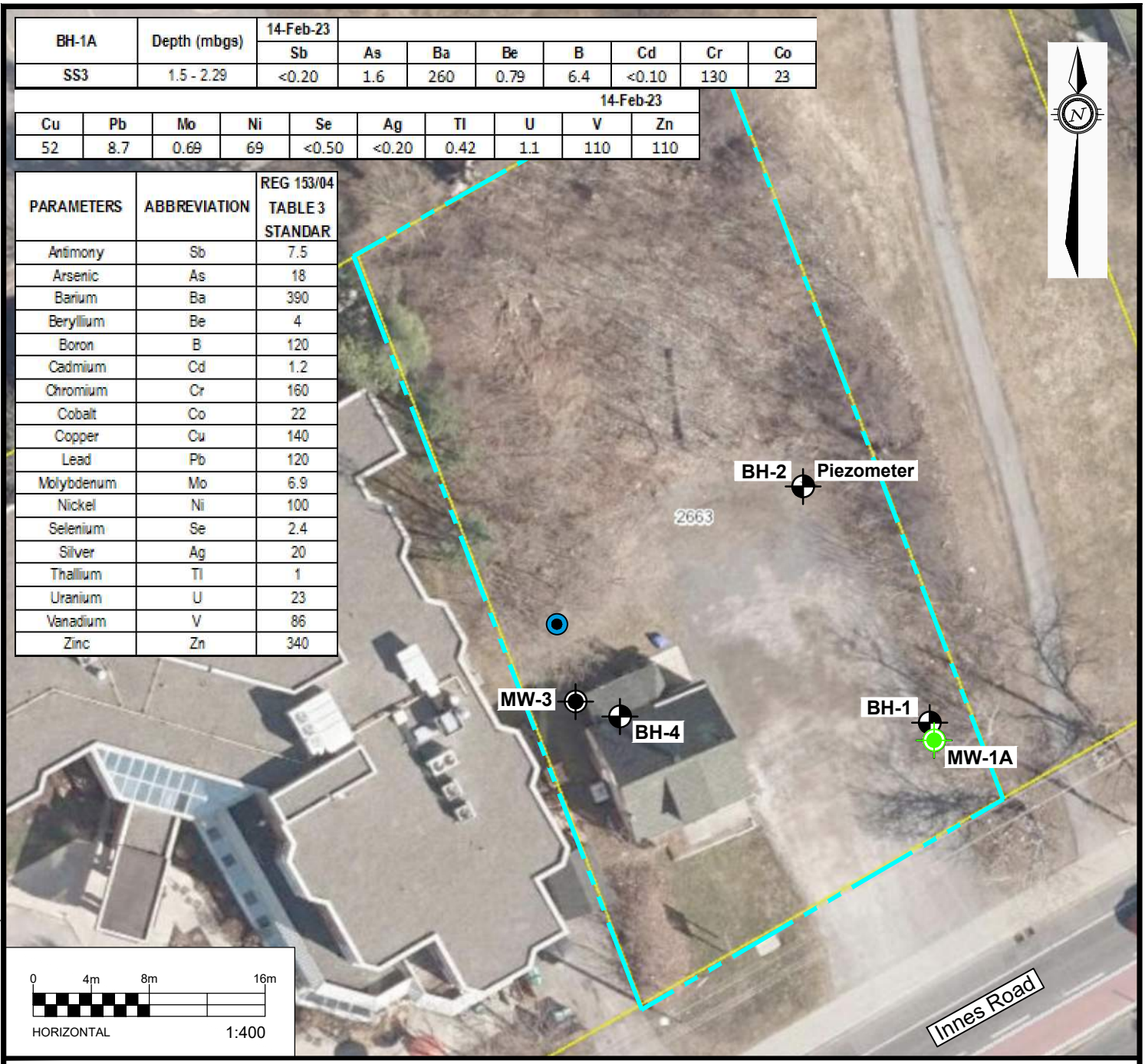
project no. OTT-22015620-B0
scale 1:400
FIG 8

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
Last Saved: Mar 13, 2023 10:40 AM Last Plotted: Mar 13, 2023 10:40 AM Plotted by: SeverA

BH-1A	Depth (mbgs)	14-Feb-23							
		Sb	As	Ba	Be	B	Cd	Cr	Co
SS3	1.5 - 2.29	<0.20	1.6	260	0.79	6.4	<0.10	130	23

14-Feb-23									
Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
52	8.7	0.69	69	<0.50	<0.20	0.42	1.1	110	110

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDAR
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 — BOREHOLE NO. & LOCATION
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- MW-1A — MONITORING WELL NO. & LOCATION

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DESIGN: LW / CHECKED: MM	TITLE:	scale: 1:400
DRAWN BY: AS	SOIL ANALYTICAL RESULTS - METALS & INORGANICS	FIG 9

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
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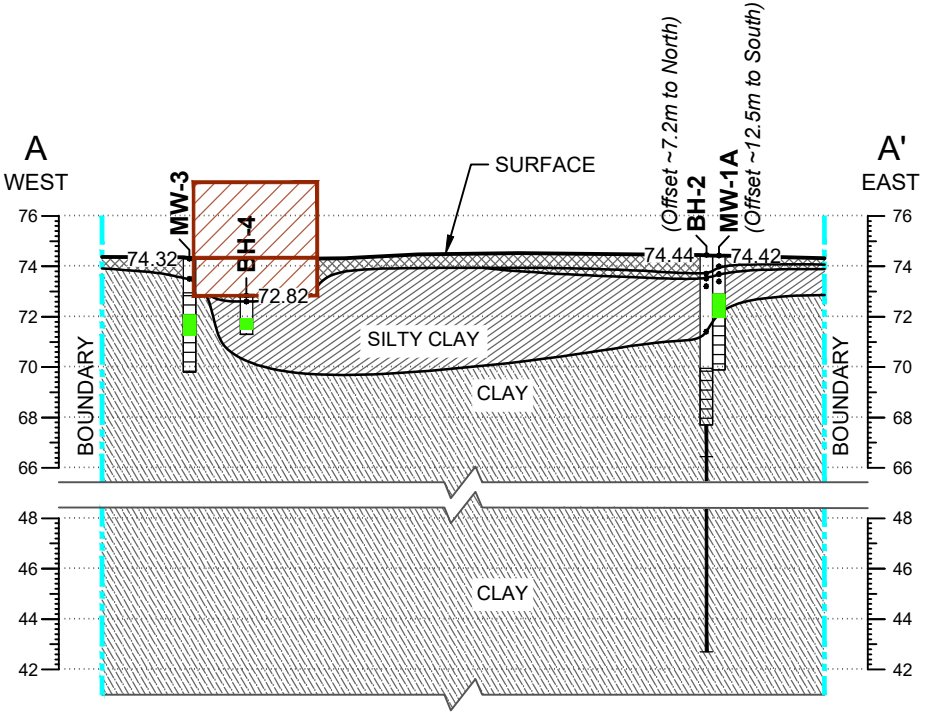
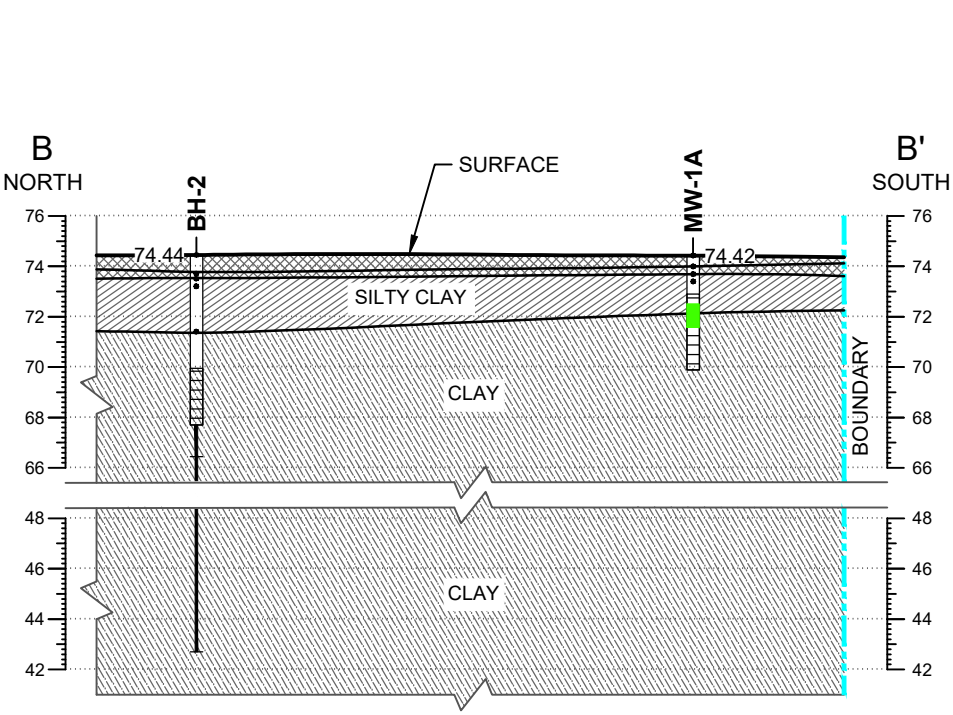


CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- TOPSOIL, SAND, & GRAVEL FILL
- SILTY CLAY
- CLAY
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- PROPERTY BOUNDARY
- EXISTING BUILDING

0 3m 6m 12m

HORIZONTAL 1:300

BH-1A	Depth (mbgs)	14-Feb-23							
		B	T	E	X	F1	F2	F3	F4
SS3	1.5 - 2.29	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50
BH3 SS4	**Depth (mbgs)**	**14-Feb-23**							
		B	T	E	X	F1	F2	F3	F4
SA1	2.29 - 3.05	<0.02	<0.02	<0.02	<0.04	< 10	<10	< 50	< 50
BH4	**Depth (mbgs)**	**14-Feb-23**							
		B	T	E	X	F1	F2	F3	F4
SS3	0.9 - 1.35	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50
DUP 1	0.9 -0 1.35	<0.02	<0.02	<0.02	<0.04	<10	< 10	< 50	< 50

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1 (C6-C10)	F1	55
F2 (C10-C16)	F2	98
F3 (C16-C34)	F3	300
F4 (C34-C50)	F4	2800

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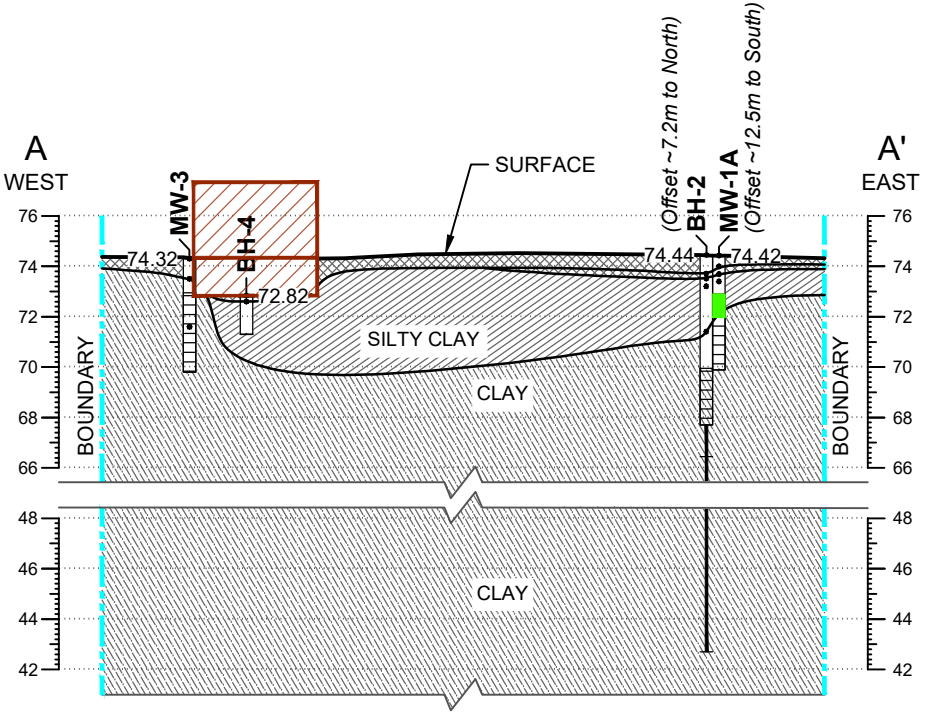
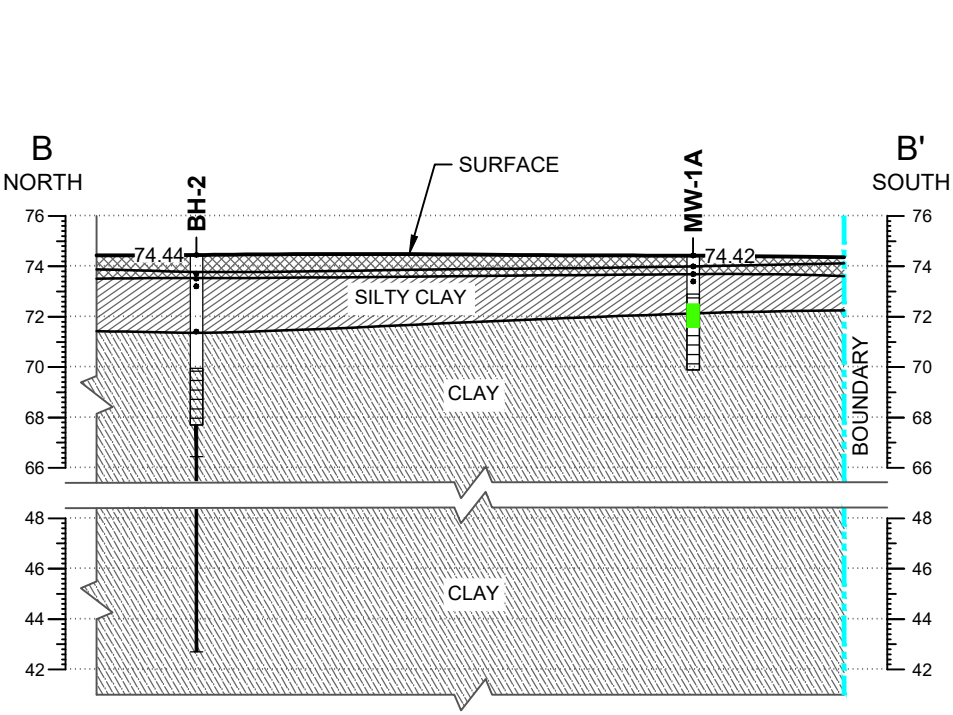
2663 INNES ROAD, OTTAWA, ONTARIO

TITLE: CROSS SECTIONS A-A', B-B'
SOIL ANALYTICAL RESULTS - PHC & BTEX

project no. OTT-22015620-B0
scale 1:300
FIG 10



CROSS SECTION A-A'



CROSS SECTION B-B'

PARAMETERS	ABBREVIATION	REG
Acenaphthene	Ace	58
Acenaphthylene	Acl	0.17
Anthracene	An	0.74
Benzo(a)anthracene	B(a)A	0.63
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)perylene	B(ghi)P	7.8
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7.8
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	Fl	0.69
Fluorene	F	69
Indeno(1,2,3-cd)pyrene	I(123)P	0.48
Total Methylnaphthalene	T-MN	3.4
Naphthalene	N	0.75
Phenanthrene	P	7.8
Pyrene	Py	78

BH-1A	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F
SS3	1.5 - 2.29	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

							14-Feb-23	
C	DA	Fl	F	I(123)P	T-MN	N	P	Py
<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

LEGEND

- TOPSOIL, SAND, & GRAVEL FILL
- SILTY CLAY
- CLAY
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS

0 3m 6m 12m

HORIZONTAL 1:300

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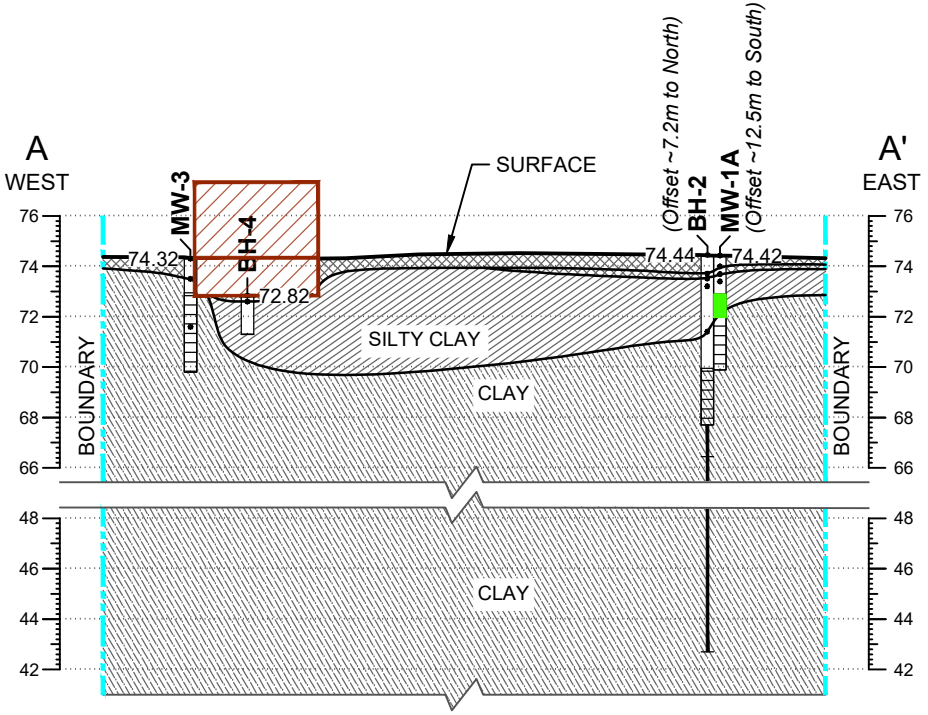
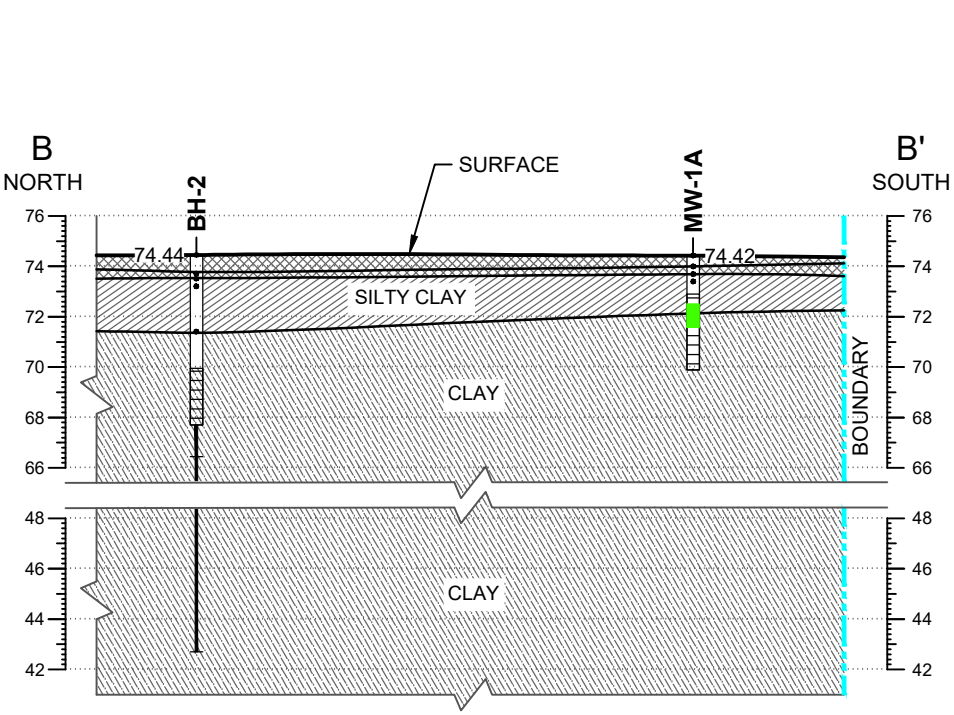
DESIGN: LW / CHECKED: MM			scale 1:300
DRAWN BY: AS	TITLE: CROSS SECTIONS A-A', B-B' SOIL ANALYTICAL RESULTS - PAH		FIG 11



CROSS SECTION A-A'



CROSS SECTION B-B'

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDAR
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340

BH-1A	Depth (mbgs)	14-Feb-23							
		Sb	As	Ba	Be	B	Cd	Cr	Co
SS3	1.5 - 2.29	<0.20	1.6	260	0.79	6.4	<0.10	130	23

14-Feb-23									
Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
52	8.7	0.69	69	<0.50	<0.20	0.42	1.1	110	110

LEGEND

- TOPSOIL, SAND, & GRAVEL FILL
- SILTY CLAY
- CLAY
- SOIL CONCENTRATION MEETS MECP TABLE 3 SCS
- SOIL CONCENTRATION EXCEEDS MECP TABLE 3 SCS

0 3m 6m 12m

HORIZONTAL 1:300

EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

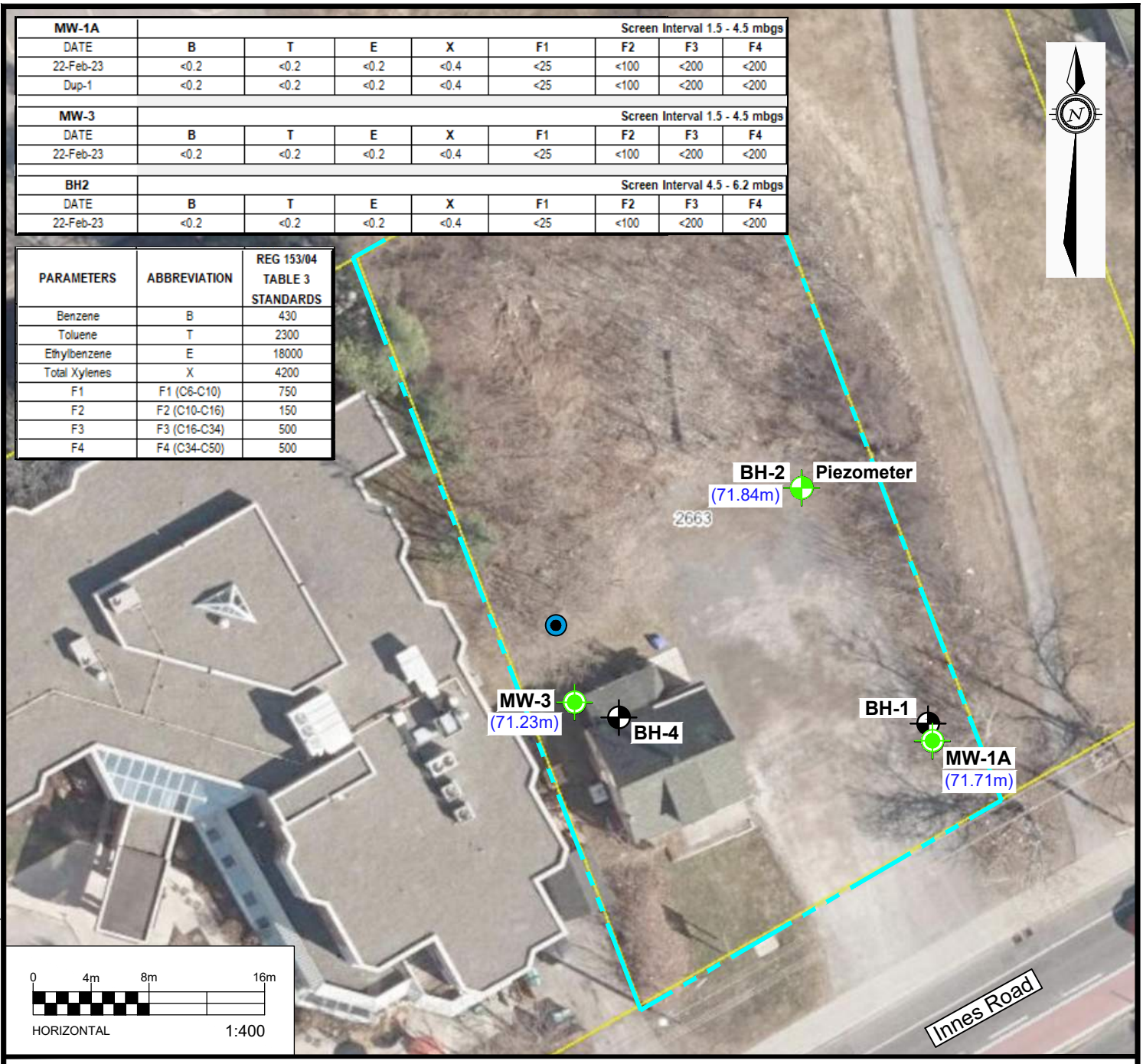
DATE: MARCH 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 2663 INNES ROAD, OTTAWA, ONTARIO	project no. OTT-22015620-B0
DESIGN: LW / CHECKED: MM		scale 1:300
DRAWN BY: AS	TITLE: CROSS SECTIONS A-A', B-B' SOIL ANALYTICAL RESULTS - METALS & INORGANICS	FIG 12

MW-1A								Screen Interval 1.5 - 4.5 mbgs
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200
Dup-1	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200

MW-3								Screen Interval 1.5 - 4.5 mbgs
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200

BH2								Screen Interval 4.5 - 6.2 mbgs
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	430
Toluene	T	2300
Ethylbenzene	E	18000
Total Xylenes	X	4200
F1	F1 (C6-C10)	750
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF WATER SUPPLY WELL
- BH-1 (71.71m) — BOREHOLE NO. & LOCATION GROUNDWATER ELEVATION
- GROUNDWATER CONCENTRATION MEETS MECP TABLE 3 SCS
- GROUNDWATER CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- MW-1A — MONITORING WELL NO. & LOCATION

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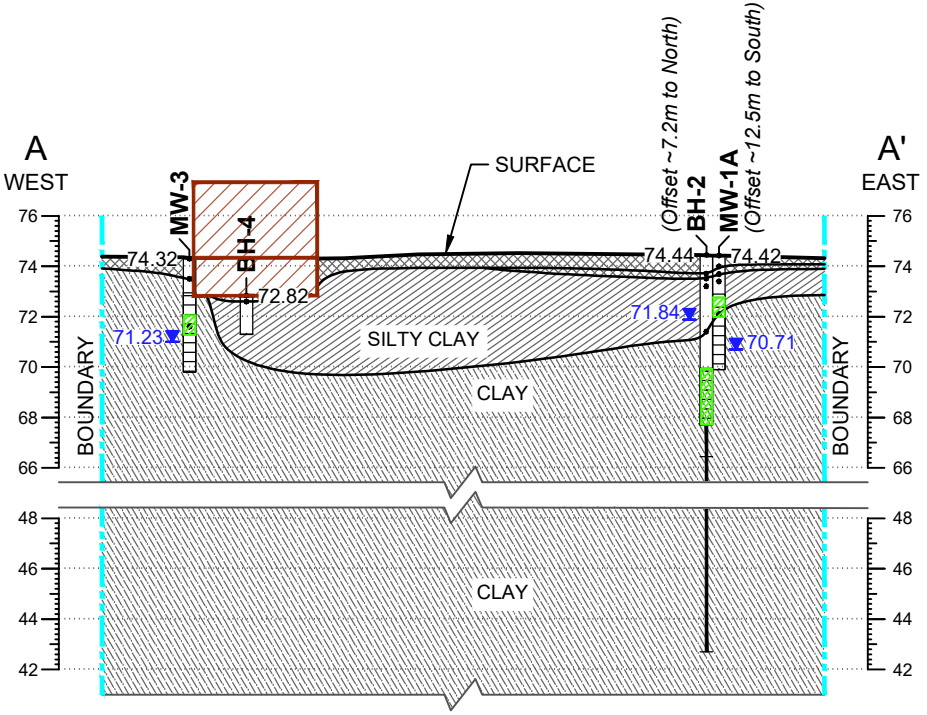
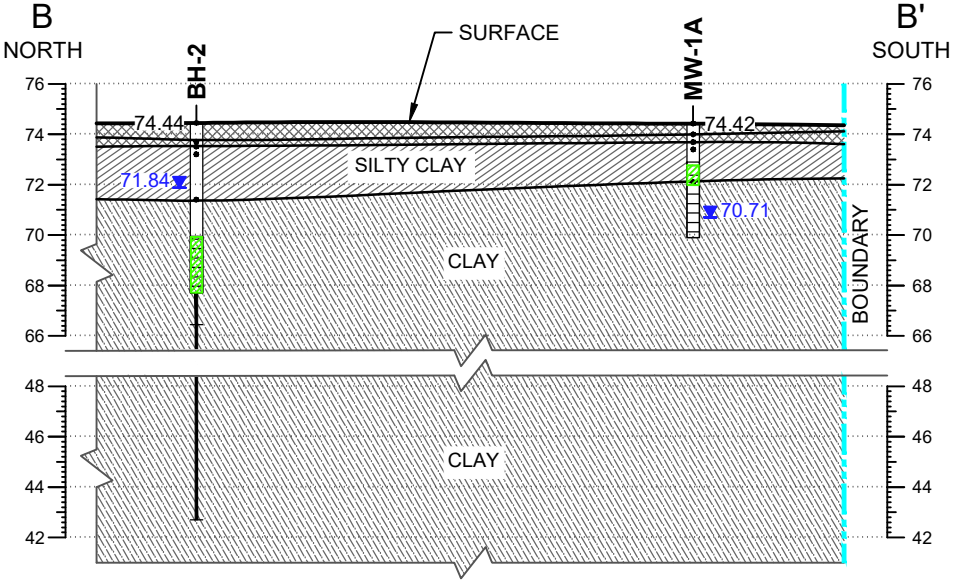
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE	PROJECT:	project no.
MARCH 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 2663 INNES ROAD, OTTAWA, ONTARIO	OTT-22015620-B0
DESIGN: LW / CHECKED: MM	TITLE: GROUNDWATER ANALYTICAL RESULTS PHC & BTEX	scale: 1:400
DRAWN BY: AS		FIG 13

Filename: \\exp\data\OTT\OTT-22015620-B0\60 Execution\65 Drawings\22015620-B0_ph2.dwg
Last Saved: Mar 13, 2023 10:50 AM Last Plotted: Mar 13, 2023 10:50 AM Plotted by: SeverA



CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- TOPSOIL, SAND, & GRAVEL FILL
- SILTY CLAY
- CLAY
- GROUNDWATER LEVEL
- GROUNDWATER CONCENTRATION MEETS MECP TABLE 3 SCS
- GROUNDWATER CONCENTRATION EXCEEDS MECP TABLE 3 SCS
- PROPERTY BOUNDARY
- EXISTING BUILDING

HORIZONTAL 0 3m 6m 12m 1:300

MW-1A							Screen Interval 1.5 - 4.5 mbgs	
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200
Dup-1	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200
MW-3							**Screen Interval 1.5 - 4.5 mbgs**	
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200
BH2							**Screen Interval 4.5 - 6.2 mbgs**	
DATE	B	T	E	X	F1	F2	F3	F4
22-Feb-23	<0.2	<0.2	<0.2	<0.4	<25	<100	<200	<200

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 STANDARDS
Benzene	B	430
Toluene	T	2300
Ethylbenzene	E	18000
Total Xylenes	X	4200
F1	F1 (C6-C10)	750
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500

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t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE: MARCH 2023
DESIGN: LW
CHECKED: MM
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
2663 INNES ROAD, OTTAWA, ONTARIO

TITLE: CROSS SECTIONS A-A', B-B'
GROUNDWATER ANALYTICAL RESULTS - PHC & BTEX

project no. OTT-22015620-B0
scale 1:300
FIG 14

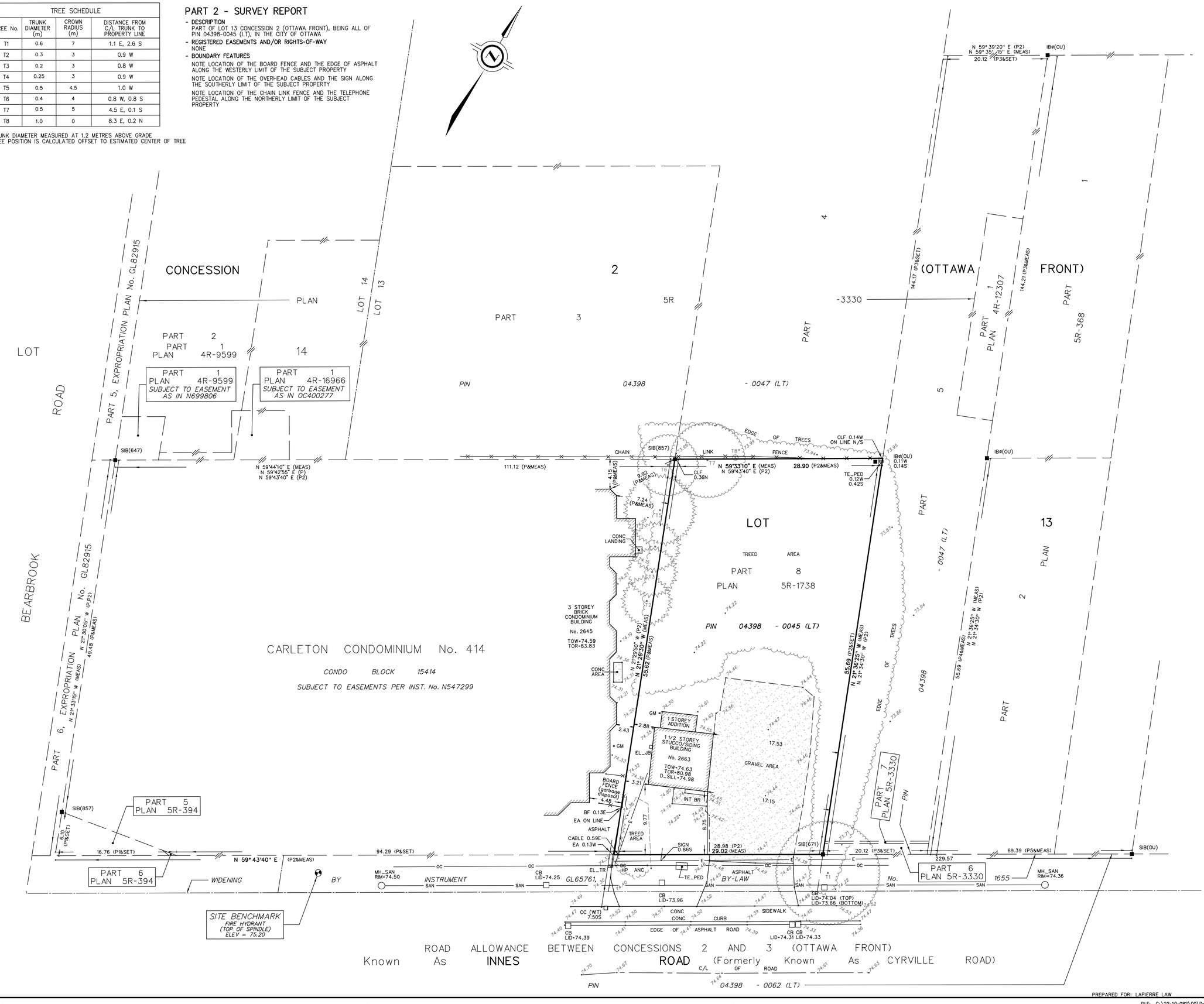
Appendix B: Survey Plan

TREE SCHEDULE			
TREE No.	TRUNK DIAMETER (m)	CROWN RADIUS (m)	DISTANCE FROM C/L TRUNK TO PROPERTY LINE
T1	0.6	7	1.1 E, 2.6 S
T2	0.3	3	0.9 W
T3	0.2	3	0.8 W
T4	0.25	3	0.9 W
T5	0.5	4.5	1.0 W
T6	0.4	4	0.8 W, 0.8 S
T7	0.5	5	4.5 E, 0.1 S
T8	1.0	0	8.3 E, 0.2 N

TRUNK DIAMETER MEASURED AT 1.2 METRES ABOVE GRADE
TREE POSITION IS CALCULATED OFFSET TO ESTIMATED CENTER OF TREE

PART 2 - SURVEY REPORT

- **DESCRIPTION**
  PART OF LOT 13 CONCESSION 2 (OTTAWA FRONT), BEING ALL OF PIN 04398-0045 (LT), IN THE CITY OF OTTAWA
- **REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY**
  NONE
- **BOUNDARY FEATURES**
  NOTE LOCATION OF THE BOARD FENCE AND THE EDGE OF ASPHALT ALONG THE WESTERLY LIMIT OF THE SUBJECT PROPERTY
  NOTE LOCATION OF THE OVERHEAD CABLES AND THE SIGN ALONG THE SOUTHERLY LIMIT OF THE SUBJECT PROPERTY
  NOTE LOCATION OF THE CHAIN LINK FENCE AND THE TELEPHONE PEDESTAL ALONG THE NORTHERLY LIMIT OF THE SUBJECT PROPERTY



SURVEYOR'S REAL PROPERTY REPORT
WITH TOPOGRAPHIC DETAILS
PART 1 - PLAN SHOWING

PART OF LOT 13
CONCESSION 2 (OTTAWA FRONT)

GEOGRAPHIC TOWNSHIP OF GLOUCESTER
NOW IN THE
CITY OF OTTAWA

J.D. BARNES LIMITED

SCALE 1 : 250

5 0 5 10 15 metres

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE MTM GRID, AND DERIVED FROM GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) BY REAL TIME NETWORK (RTN) OBSERVATIONS, MTM ZONE 9, NAD 83, (CSRS) (2010.0).

DISTANCES ARE GROUND.

ALL BUILDING TIES ARE TAKEN TO CONCRETE FOUNDATION UNLESS OTHERWISE NOTED.

COMPLIANCE WITH ONTARIO BUILDING CODE SETBACK REQUIREMENTS ARE NOT VERIFIED BY THIS SURVEY.

FOR BEARING COMPARISONS, A COUNTER-CLOCKWISE ROTATION OF 0°39'40" WAS APPLIED TO P.

FOR BEARING COMPARISONS, A COUNTER-CLOCKWISE ROTATION OF 0°38'35" WAS APPLIED TO P2.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
IBØ	DENOTES	ROUND IRON BAR
CC	DENOTES	CUT CROSS
MEAS	DENOTES	MEASURED
OU	DENOTES	ORIGIN UNKNOWN
WIT	DENOTES	WITNESS
No.	DENOTES	NUMBER
P	DENOTES	CARLETON CONDOMINIUM PLAN No. 414
P1	DENOTES	PLAN 4R-5898
P2	DENOTES	PLAN 5R-1738
P3	DENOTES	PLAN 5R-3330
P4	DENOTES	PLAN 5R-368
P5	DENOTES	INSTRUMENT No. GL65761
647	DENOTES	H.R. FARLEY, O.L.S.
671	DENOTES	F.H. GOOCH, O.L.S.
857	DENOTES	FAIRHALL, MOFFATT & WOODLAND LIMITED
———	DENOTES	PROPERTY LINE

N=NORTH / S=SOUTH / E=EAST / W=WEST

TOPOGRAPHIC LEGEND

CONC	DENOTES CONCRETE
C/L	DENOTES CENTERLINE
TOW	DENOTES TOP OF WALL
TOR	DENOTES TOP OF ROOF
D_SILL	DENOTES DOOR SILL
EA	DENOTES EDGE OF ASPHALT
INT BR	DENOTES INTERLOCK BRICK
CLF	DENOTES CHAIN LINK FENCE
BF	DENOTES BOARD FENCE
• HP	DENOTES HYDRO POLE
• ANC	DENOTES ANCHOR
• GM	DENOTES GAS METER
□ CB	DENOTES CATCH BASIN
□ E_JB	DENOTES HYDRO JUNCTION BOX
⊠ E_TRANS	DENOTES HYDRO TRANSFORMER
⊟ TE_PED	DENOTES TELEPHONE PEDESTAL
◯ MH_SAN	DENOTES SANITARY MANHOLE
—— E ——	DENOTES OVERHEAD HYDRO CABLE
—— OC ——	DENOTES OVERHEAD CABLE
—— SAN ——	DENOTES UNDERGROUND SANITARY SEWER
⊙	DENOTES TREE (UNKNOWN TYPE)
	DENOTES DECIDUOUS TREE
	DENOTES CONIFEROUS TREE

ELEVATION NOTE:

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE SITE BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.

2. ELEVATIONS ARE GEODETIC AND ARE REFERRED TO CITY OF OTTAWA CONTROL POINT 001965302I6 HAVING A PUBLISHED ELEVATION OF 74.56 METRES (CGVD-1928 DATUM).

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.

2. THE SURVEY WAS COMPLETED ON JULY 27, 2022.

AUGUST 10, 2022
DATE

GEORGE ZERVOS
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER 2160895

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
62 STEACIE DRIVE, SUITE 103, KANATA, ON K2K 2A9
T: (613) 731-7244 F: (613) 254-8659 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
RP	GZ	22-10-082-00
PLOTTED: 12/21/2022		DATED: 08/10/22

PREPARED FOR: LAPIERRE LAW

FILE: G:\22-10-082\00\Drawing\SRPR-TOPO\22-10-082-00-TOPO.dgn

Appendix C: 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 2663 Innes Road 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), and/or metals. The soil sampling media is to consist of the overburden materials (depths up to 1.5 m of overburden beneath site). The soil sampling will be location-specific to assess for the potential presence of PHC, BTEX, and/or metals based on the identification of potential areas of potential environmental concern identified in a Phase One ESA completed by EXP in 2023. 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 PHC and BTEX. The monitoring well network is to comprise of two monitoring wells and one existing peizometer.

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 three (3) boreholes are proposed to be advanced at the site, up to a maximum overburden depth of approximately 4.5 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. One interior borehole will be drilled in the basement of the building using manual methods.

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 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 two 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 either a flush-mounted protective steel casing or above ground protective casings 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 D: 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:

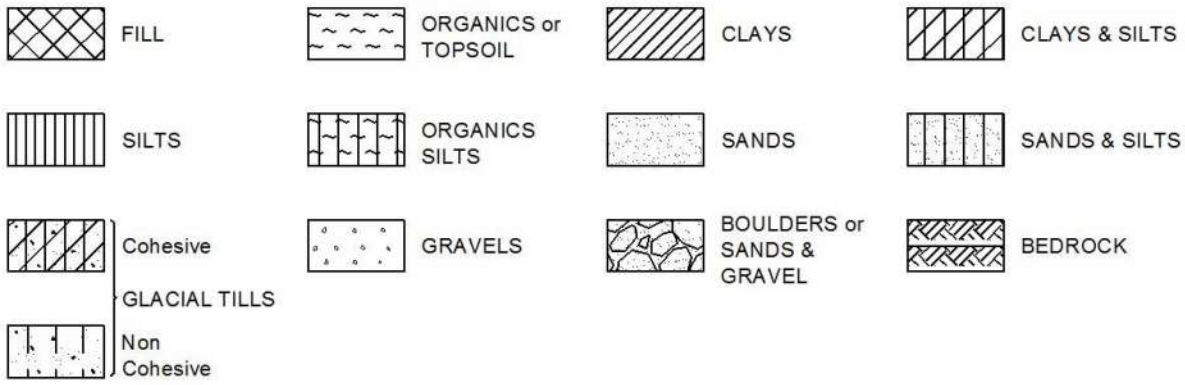
Table c: Consistency of Cohesive Soil

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-02

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Location: 2663 Innes Road, Ottawa, Ontario

Date Drilled: 'December 2, 2022

Drill Type: CME-45 Track-Mounted Drill RIg

Datum: Approximate Elevation

Logged by: M.Z. Checked by: D.W.

Figure No. 4

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	Approximate Elevation 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
		FILL Silty sand to sand with gravel and topsoil inclusions, brown, moist, (compact)	74.44	0	11		SS1	
			73.7					
		TOPSOIL ~125 mm thick	73.5					
		FILL Silty sand, brown, moist, (compact)	73.2	1	10; 216 kPa		SS2	
		CLAY High plasticity, brown, moist, (very stiff)		2	14; 168 Kpa		SS3	19.4
▼			71.84		6		SS4	18.0
		CLAY High plasticity, grey, wet (firm to stiff)	71.4	3	80 kPa s=8			
				4	3		SS5	
				5	53 kPa s=11			
					Hammer Weight		SS6	
				6	38 kPa s=32			
				7				
					Hammer Weight		SS7	
				8				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	Dry	13.1
'Dec 14, 2022	2.6	
Feb 22, 2023	2.2	

CORE DRILLING RECORD

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

Log of Borehole BH-02

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Figure No. 4

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation 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
		CLAY High plasticity, grey, wet (firm to stiff) *(continued)*	66.44	8	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
				9	48 kPa			
				10				
				11	Hammer Weight		SS8	
				12	53 kPa s=15			
				13				
				14	Hammer Weight		SS9	
				15	96 kPa s=5			
				16				
				17				
		Dynamic Cone Penetration Dynamic Cone penetration (DCPT) conducted from 15.8 m to termination depth at 31.7 m	58.6					

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	Dry	13.1
'Dec 14, 2022	2.6	
Feb 22, 2023	2.2	

CORE DRILLING RECORD

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

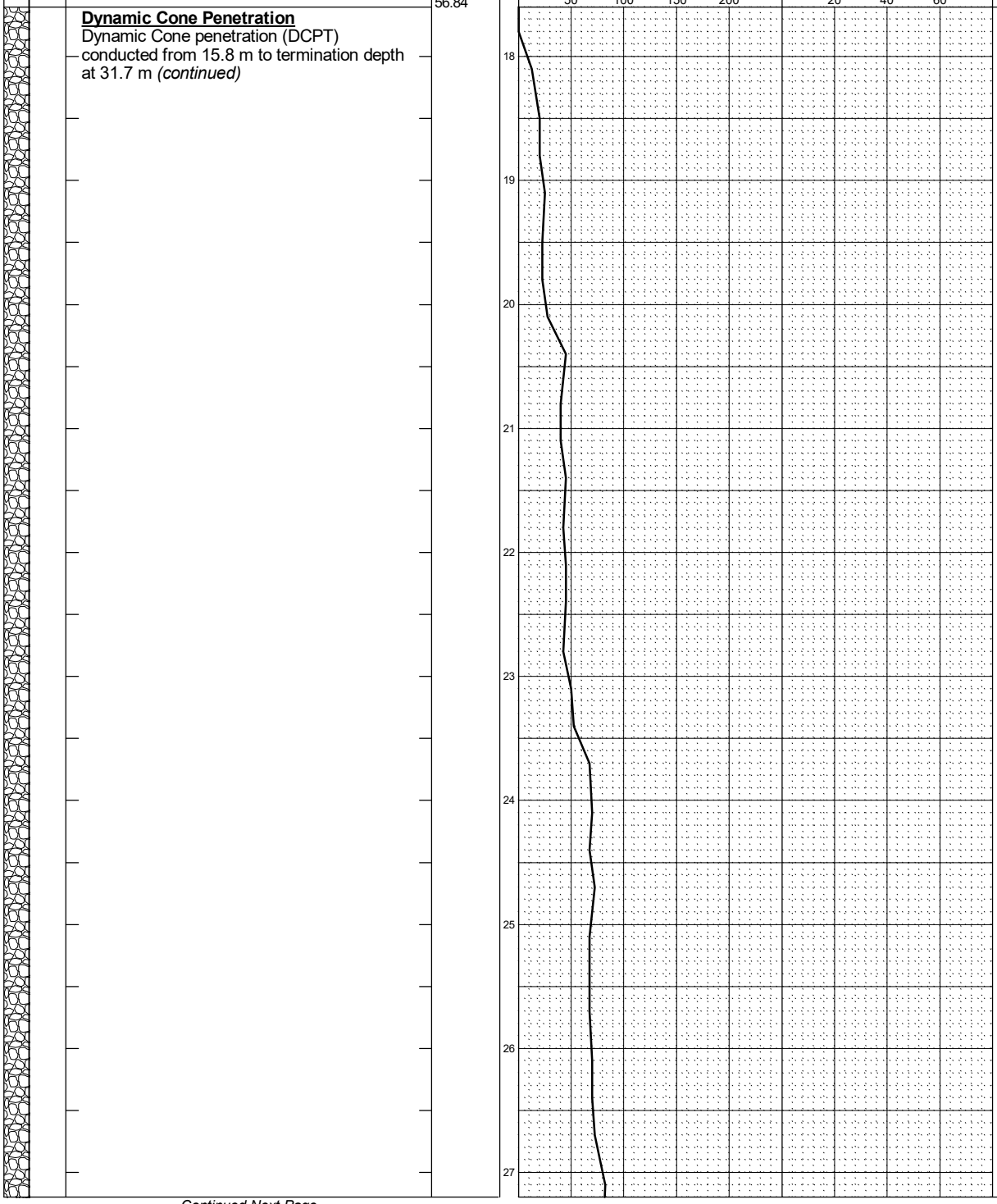
Log of Borehole BH-02

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Figure No. 4

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation 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
		Dynamic Cone Penetration Dynamic Cone penetration (DCPT) conducted from 15.8 m to termination depth at 31.7 m *(continued)*	56.84		20 40 60 80 Shear Strength kPa 50 100 150 200	250 500 750 Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60		



Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	Dry	13.1
'Dec 14, 2022	2.6	
Feb 22, 2023	2.2	

CORE DRILLING RECORD

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

Log of Borehole BH-02

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Figure No. 4

Page. 4 of 4

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation 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
		Dynamic Cone Penetration Dynamic Cone penetration (DCPT) conducted from 15.8 m to termination depth at 31.7 m *(continued)*	47.24	28				
				29				
				30				
				31				
		Borehole Terminated at 31.7 m Depth	42.7					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Completion	Dry	13.1
'Dec 14, 2022	2.6	
Feb 22, 2023	2.2	

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-22024457-A0 2663 INNES.GPJ TROW OTTAWA.GDT 3/9/23

Log of Borehole BH-04

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Location: 2663 Innes Road, Ottawa, Ontario

Figure No. _____

Page. 1 of 1

Date Drilled: 2/14/23

Drill Type: Hilty Jack Hammer

Datum: Approximate Elevation

Logged by: M.R. Checked by: L.W.

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	Approximate Elevation 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
			72.82	0	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
		FILL Topsoil with trace medium gravel	72.6					
		CLAY Brown, moist to wet (at 1.2 m)			10		S1	
				1	10		S2	
			71.3		10		S3	
		Borehole Terminated at 1.5 m Depth			5		S4	

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled with soil cuttings 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-22024457-A0 2663 INNES.GPJ TROW OTTAWA.GDT 3/9/23

Log of Borehole BH-1A

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Location: 2663 Innes Road, Ottawa, Ontario

Figure No. _____

Page. 1 of 1

Date Drilled: 2/14/23

Drill Type: Geoprobe 7822T

Datum: Approximate Elevation

Logged by: M.R. Checked by: L.W.

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	Approximate Elevation 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
		TOPSOIL	74.42	0				
		FILL Silt and clay mix, light brown, moist	74.0			10	S1	
		FINE SAND Light brown, moist	73.7					
		SILTY CLAY Light brown to brown, moist	73.4	1		10	S2	
				2		30	S3	
		CLAY Grey, moist to wet at 2.7 m	72.1			10	S4	
				3		20	S5	
			70.71					
				4		10	S6	
		Borehole Terminated at 4.5 m Depth	69.9					

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 50 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Feb 22, 2023	2.7	

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-22024457-A0 2663 INNES.GPJ TROW OTTAWA.GDT 3/9/23

Log of Borehole BH-3

Project No: OTT-22024457-A0

Project: Proposed Mixed Use Building

Location: 2663 Innes Road, Ottawa, Ontario

Date Drilled: 2/14/23

Drill Type: Geoprobe 7822T

Datum: Approximate Elevation

Logged by: M.R. Checked by: L.W.

Figure No. _____

Page. 1 of 1

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	Approximate Elevation 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
		SAND Fine, brown, moist	74.32	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60	S1	
			73.5					
		SILTY CLAY Light brown, moist		1			S2	
				2			S3	
			71.6				S4	
▼		**CLAY** Grey, wet	71.23	3			S5	
				4			S6	
			69.8					
		Borehole Terminated at 4.5 m Depth						

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 50 mm diameter slotted standpipe 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 No. OTT-22024457-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Feb 22, 2023	2.3	

CORE DRILLING RECORD

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

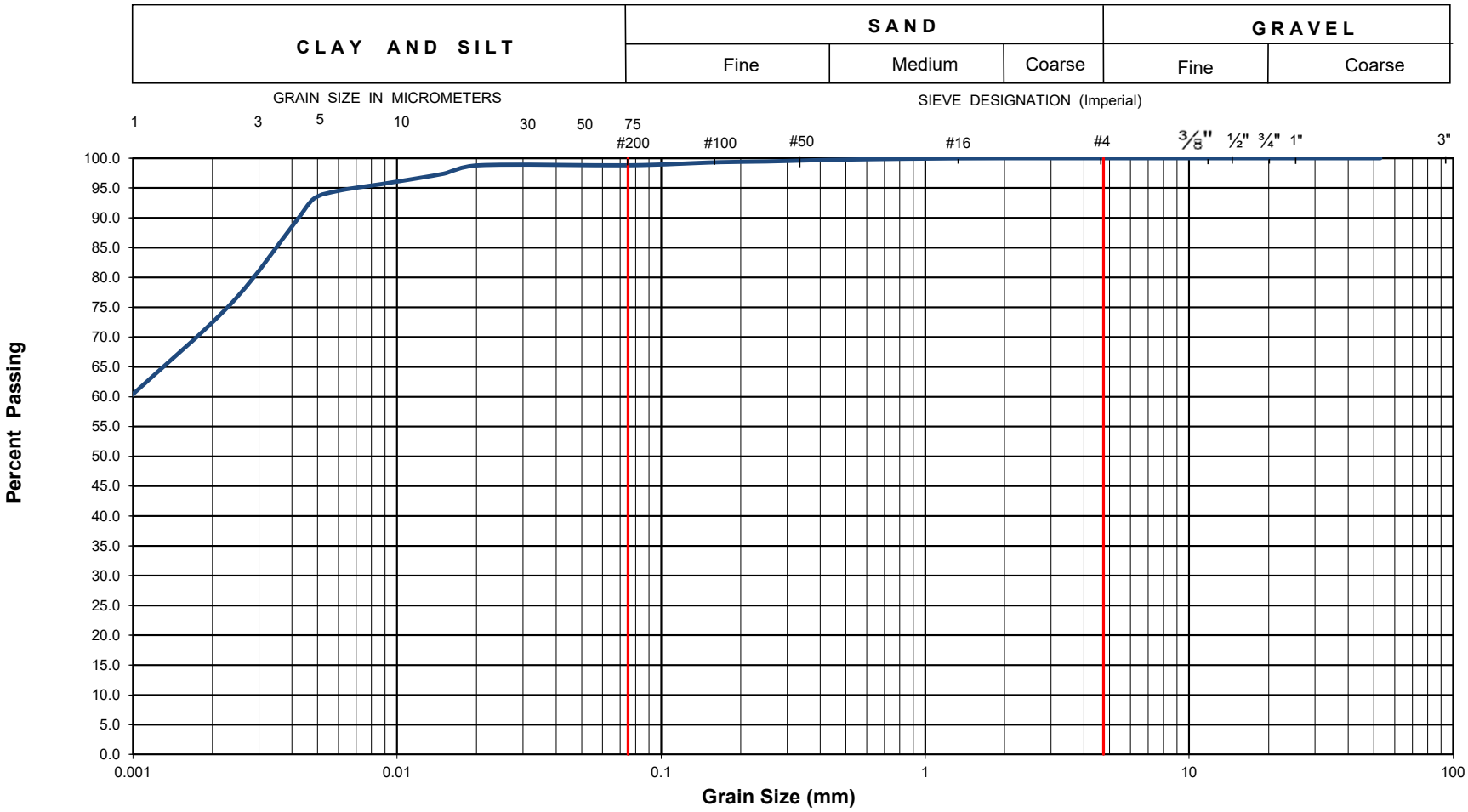
LOG OF BOREHOLE OTT-22024457-A0 2663 INNES.GPJ TROW OTTAWA.GDT 3/9/23

Appendix E: Grain Size Analysis

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

Unified Soil Classification System

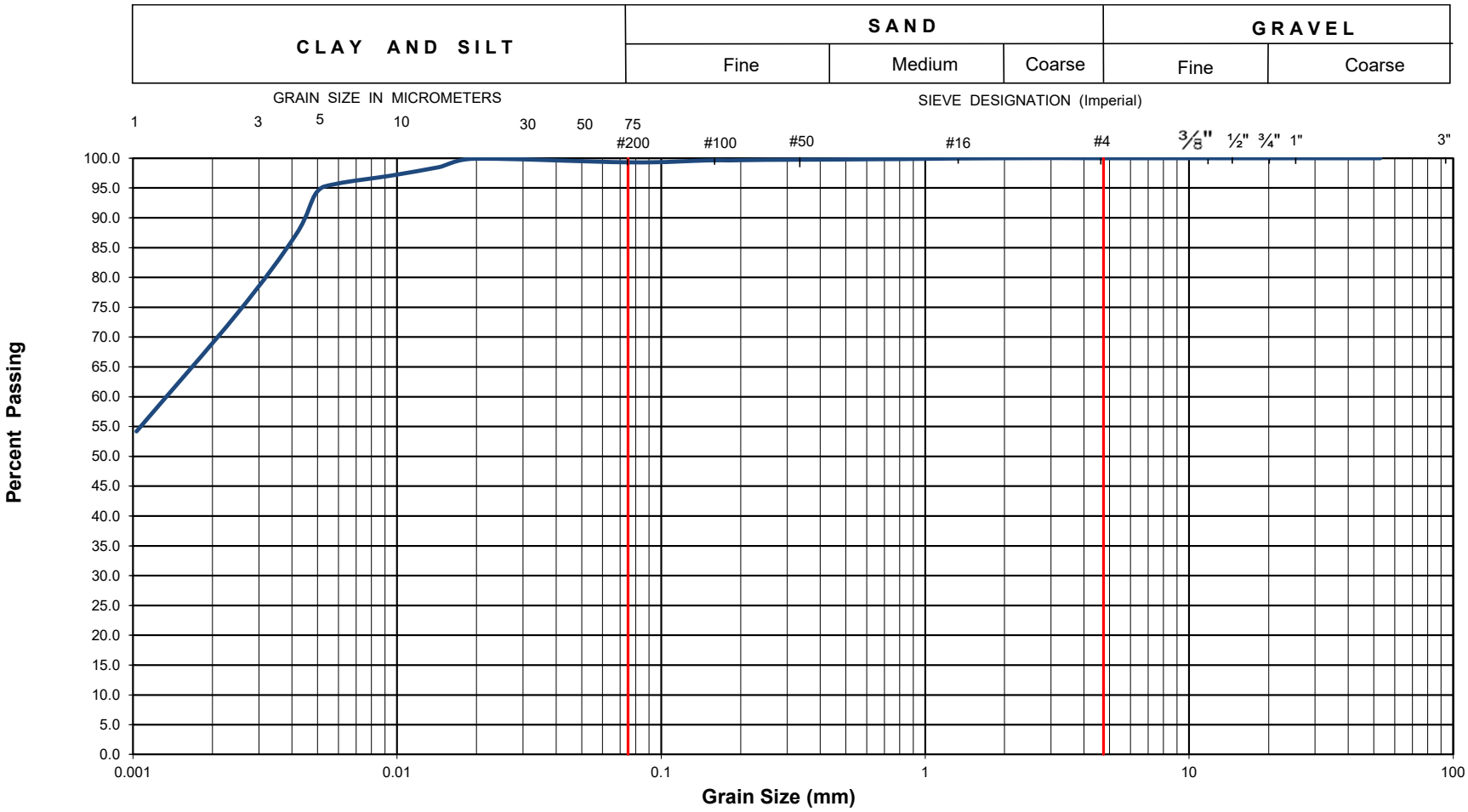


EXP Project No.:	**OTT-22024457-A0**	**Project Name :**	**Geotechnical Investigation - Proposed Multi Use Building**						
Client :	**Caber Group of Companies**	**Project Location :**	**2663 Innes road, Ottawa**						
Date Sampled :	**December 2, 2022**	**Borehole No:**	**BH2**	**Sample No.:**	**SS3**	**Depth (m) :**	**1.5-2.1**		
Sample Description :		**% Silt and Clay**	**99**	**% Sand**	**1**	**% Gravel**	**0**	**Figure :**	**xxxx**
Sample Description :		**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

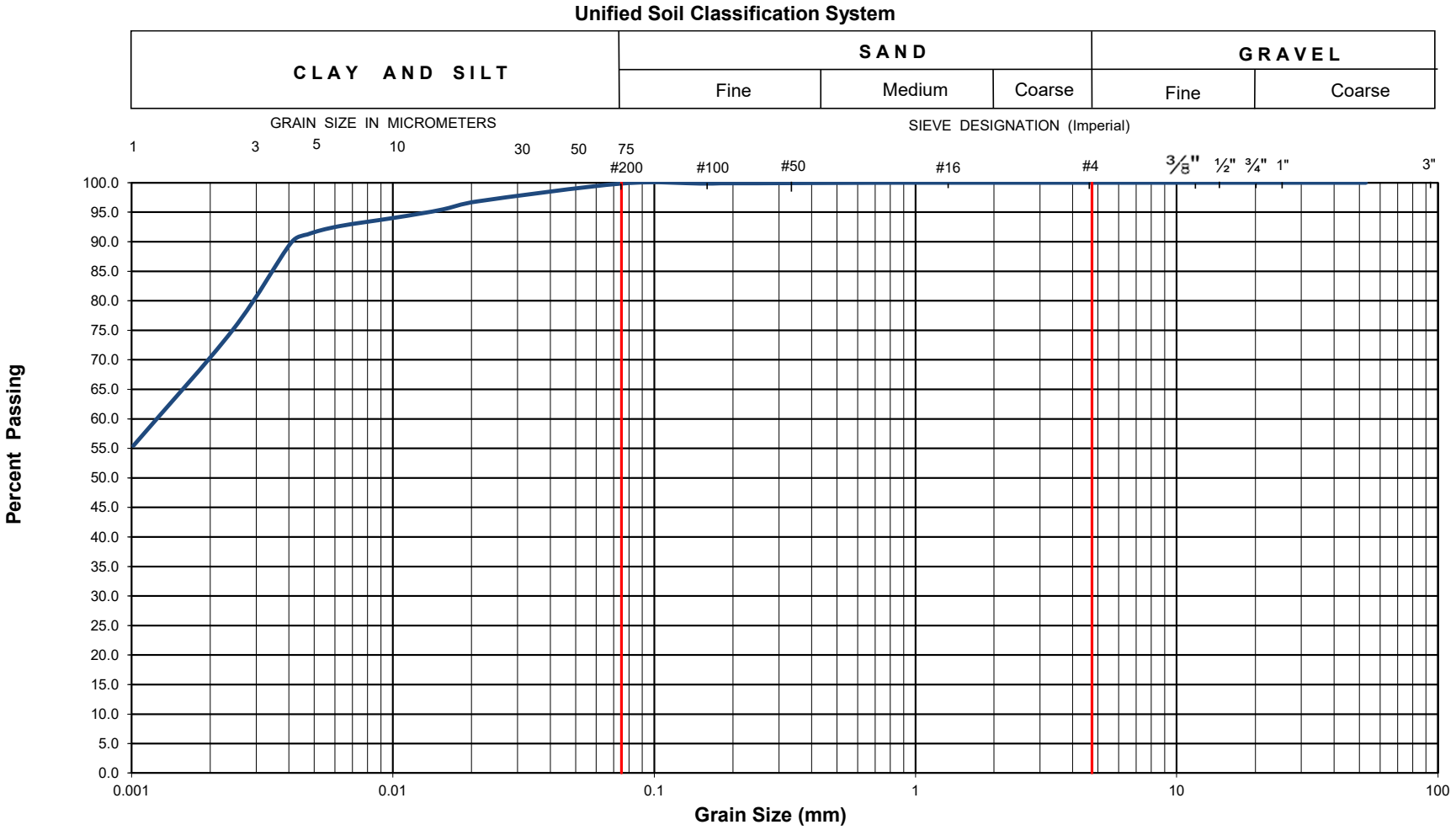
Unified Soil Classification System



EXP Project No.:	**OTT-22024457-A0**	**Project Name :**	**Geotechnical Investigation - Proposed Multi Use Building**						
Client :	**Caber Group of Companies**	**Project Location :**	**2663 Innes road, Ottawa**						
Date Sampled :	**December 2, 2022**	**Borehole No:**	**BH2**	**Sample No.:**	**SS5**			**Depth (m) :**	**3.8-4.4**
Sample Description :		**% Silt and Clay**	**99**	**% Sand**	**1**	**% Gravel**	**0**	**Figure :**	**xxxx**
Sample Description :		**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-22024457-A0**	**Project Name :**	**Geotechnical Investigation - Proposed Multi Use Building**						
Client :	**Caber Group of Companies**	**Project Location :**	**2663 Innes road, Ottawa**						
Date Sampled :	**December 2, 2022**	**Borehole No:**	**BH2**	**Sample No.:**	**SS8**	**Depth (m) :**	**10.7-11.3**		
Sample Description :		**% Silt and Clay**	**100**	**% Sand**	**0**	**% Gravel**	**0**	**Figure :**	**xxxx**
Sample Description :		**Fat Clay (CH)**							

Appendix F: Analytical Summary Tables

Table 1 - Analytical Results in Soil - PHC and VOC
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Sample ID	UNITS	Provincial MECP Table 3 Residential [1]	Samples			
			BH4 SS3	DUP 1	BH3 SS4	BH1A SS3
Sampling Date			**14-Feb-23**	**Duplicate of**	**14-Feb-23**	**14-Feb-23**
Sample Depth (mbgs)			0.9 - 1.35	BH4 SS3	2.29 - 3.05	1.5 - 2.29
Petroleum Hydrocarbons						
F1 PHC (C6-C10)	µg/g	55	<10	<10	<10	<10
F2 PHC (C10-C16)	µg/g	98	<10	<10	<10	<10
F3 PHC (C16-C34)	µg/g	300	<50	<50	<50	<50
F4 PHC (C34-C50)	µg/g	2800	<50	<50	<50	<50
Volatile Organic Compounds						
Benzene	µg/g	0.21	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	µg/g	2.3	<0.020	<0.020	<0.020	<0.020
Toluene	µg/g	2	<0.020	<0.020	<0.020	<0.020
Total Xylenes	µg/g	3.1	<0.040	<0.040	<0.040	<0.040

NOTES:

1	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 Residential/Parkland/Institutional Use (fine-medium textured soils)
<RDL	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
-	Parameter not analyzed
	Indicates soil exceedance of MECP Table 3 SCS

Table 2 - Analytical Results in Soil - PAH
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Sample ID	UNITS	Provincial MECP Table 3 Residential [1]	Samples BH1A
Sampling Date			**14-Feb-23**
Sample Depth (mbgs)			1.5 - 2.29
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	µg/g	58	<0.0050
Acenaphthylene	µg/g	0.17	<0.0050
Anthracene	µg/g	0.74	<0.0050
Benzo[a]anthracene	µg/g	0.63	<0.0050
Benzo[a]pyrene	µg/g	0.3	<0.0050
Benzo[b/j]fluoranthene	µg/g	0.78	<0.0050
Benzo[g,h,i]perylene	µg/g	7.8	<0.0050
Benzo[k]fluoranthene	µg/g	0.78	<0.0050
Chrysene	µg/g	7.8	<0.0050
Dibenzo[a,h]anthracene	µg/g	0.1	<0.0050
Fluoranthene	µg/g	0.69	<0.0050
Fluorene	µg/g	69	<0.0050
Indeno[1,2,3-cd]pyrene	µg/g	0.48	<0.0050
1-Methylnaphthalene	µg/g	3.4	<0.0050
2-Methylnaphthalene	µg/g	3.4	<0.0050
Naphthalene	µg/g	0.75	<0.0050
Phenanthrene	µg/g	7.8	<0.0050
Pyrene	µg/g	78	<0.0050

NOTES:

1	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 Residential/Parkland/Institutional Property Use (fine-medium textured soils)
<RDL	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
-	Parameter not analyzed
	Indicates soil exceedance of MECP Table 3 SCS

Table 3 - Analytical Results in Soil - Inorganic Parameters
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Sample ID	UNITS	Provincial	Sample
		MECP Table 3 Residential [1]	BH1A SS3
Sampling Date			14-Feb-23
Sample Depth (mbgs)			1.5 - 2.29
Metals			
Antimony	µg/g	7.5	<0.20
Arsenic	µg/g	18	1.6
Barium	µg/g	390	260
Beryllium	µg/g	4	0.79
Boron (Total)	µg/g	120	6.4
Cadmium	µg/g	1.2	<0.10
Chromium (Total)	µg/g	160	130
Cobalt	µg/g	22	23
Copper	µg/g	140	52
Lead	µg/g	120	8.7
Molybdenum	µg/g	6.9	0.69
Nickel	µg/g	100	69
Selenium	µg/g	2.4	<0.50
Silver	µg/g	20	<0.20
Thallium	µg/g	1	0.42
Uranium	µg/g	23	1.1
Vanadium	µg/g	86	110
Zinc	µg/g	340	110

NOTES:

1	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 Residential/Parkland/Institutional Property Use (fine-medium textured soils)
<RDL	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
-	Parameter not analyzed
	Indicates soil exceedance of MECP Table 3 SCS

Table 4 - Analytical Results in Groundwater - PHC and VOC
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Sample ID	UNITS	Provincial	Samples					
		MECP Table 3 Residential[1]	BH/MW 1A	DUP-1 (Duplicate BH/MW 1A)	MW3	BH-2	FIELD BLANK	TRIP BLANK
Sampling Date			**22-Feb-2023**	**22-Feb-2023**	**22-Feb-2023**	**22-Feb-2023**	**22-Feb-2023**	**22-Feb-2023**
Sceen Depth			1.5 to 4.5	1.5 to 4.5	1.5 to 4.5	4.5 to 6.2	N/A	N/A
Petroleum Hydrocarbons								
F1 PHC (C6-C10)*	µg/L	750	<25	<25	<25	<25	<25	<25
F2 PHC (C10-C16)	µg/L	150	<100	<100	<100	<100	<100	<100
F3 PHC (C16-C34)	µg/L	500	<200	<200	<200	<200	<200	<200
F4 PHC (C34-C50)	µg/L	500	<200	<200	<200	<200	<200	<200
Volatile Organic Compounds								
Benzene	µg/L	430	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2300	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylenes	µg/L	4200	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40

NOTES:

1	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 Residenital/Parkland/Institutional Property Use (fine-medium textured soils)
*	F1 fraction does not include BTEX; however, the proponent has the choice as to whether or not to subtract BTEX from the analytical result
<RDL	Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.
NV	No Value
-	Parameter not analyzed
	Indicates groundwater exceedance of MECP Table 3 SCS

Table 5 - Maximum Concentrations in Soil
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Parameter	Sample Location	Sample Depth (m bgs)	Sampling Date	Maximum Concentration	MECP Table 3 Residential
Petroleum Hydrocarbons					
F1 PHC (C6-C10)	All sample locations	0.9 - 1.35	14-Feb-23	<10	55
F2 PHC (C10-C16)	All sample locations	0.9 - 1.35	14-Feb-23	<10	98
F3 PHC (C16-C34)	All sample locations	0.9 - 1.35	14-Feb-23	<50	300
F4 PHC (C34-C50)	All sample locations	0.9 - 1.35	14-Feb-23	<50	2800
Volatile Organic Compounds					
Benzene	All sample locations	0.9 - 1.35	14-Feb-23	<0.020	0.21
Ethylbenzene	All sample locations	0.9 - 1.35	14-Feb-23	<0.020	2.3
Toluene	All sample locations	0.9 - 1.35	14-Feb-23	<0.020	2
Total Xylenes	All sample locations	0.9 - 1.35	14-Feb-23	<0.040	3.1
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	58
Acenaphthylene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.17
Anthracene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.74
Benzo[a]anthracene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.63
Benzo[a]pyrene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.3
Benzo[b/j]fluoranthene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.78
Benzo[g,h,i]perylene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	7.8
Benzo[k]fluoranthene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.78
Chrysene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	7.8
Dibenzo[a,h]anthracene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.1
Fluoranthene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.69
Fluorene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	69
Indeno[1,2,3-cd]pyrene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.48
1-Methylnaphthalene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	3.4
2-Methylnaphthalene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	3.4
Naphthalene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	0.75
Phenanthrene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	7.8
Pyrene	All sample locations	0.9 - 1.35	14-Feb-23	<0.0050	78
Metals					
Antimony	BH1A SS3	1.5 - 2.29	14-Feb-23	<0.20	7.5
Arsenic	BH1A SS3	1.5 - 2.29	14-Feb-23	1.6	18
Barium	BH1A SS3	1.5 - 2.29	14-Feb-23	260	390
Beryllium	BH1A SS3	1.5 - 2.29	14-Feb-23	0.79	4
Boron (Total)	BH1A SS3	1.5 - 2.29	14-Feb-23	6.4	120
Cadmium	BH1A SS3	1.5 - 2.29	14-Feb-23	<0.10	1.2
Chromium (Total)	BH1A SS3	1.5 - 2.29	14-Feb-23	130	160
Cobalt	BH1A SS3	1.5 - 2.29	14-Feb-23	23	22
Copper	BH1A SS3	1.5 - 2.29	14-Feb-23	52	140
Lead	BH1A SS3	1.5 - 2.29	14-Feb-23	8.7	120
Molybdenum	BH1A SS3	1.5 - 2.29	14-Feb-23	0.69	6.9
Nickel	BH1A SS3	1.5 - 2.29	14-Feb-23	69	100
Selenium	BH1A SS3	1.5 - 2.29	14-Feb-23	<0.50	2.4
Silver	BH1A SS3	1.5 - 2.29	14-Feb-23	<0.20	20
Thallium	BH1A SS3	1.5 - 2.29	14-Feb-23	0.42	1
Uranium	BH1A SS3	1.5 - 2.29	14-Feb-23	1.1	23
Vanadium	BH1A SS3	1.5 - 2.29	14-Feb-23	110	86
Zinc	BH1A SS3	1.5 - 2.29	14-Feb-23	110	340

NOTES:

1	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 Residential/Parkland/Institutional Property Use (fine-medium textured soils)
NV	No Value
-	Parameter not analyzed
m bgs	Metres below ground surface

Table 6 - Maximum Concentrations in Groundwater
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Parameter	Sample Location	Sample Depth (m bgs)	Sampling Date	Maximum Concentration	MECP Table 3 Residential
Petroleum Hydrocarbons					
F1 PHC (C6-C10)	All sample locations	4.5 to 7.6	22-Feb-23	<25	750
F2 PHC (C10-C16)	All sample locations	4.5 to 7.6	22-Feb-23	<100	150
F3 PHC (C16-C34)	All sample locations	4.5 to 7.6	22-Feb-23	<200	500
F4 PHC (C34-C50)	All sample locations	4.5 to 7.6	22-Feb-23	<200	500
Volatile Organic Compounds					
Benzene	All sample locations	4.5 to 7.6	22-Feb-23	<0.20	430.000
Ethylbenzene	All sample locations	4.5 o 7.6	22-Feb-23	<0.20	2300
Toluene	All sample locations	4.5 to 7.6	22-Feb-23	<0.20	18000
p+m-Xylene	All sample locations	4.5 to 7.6	22-Feb-23	<0.20	NV
o-Xylene	All sample locations	4.5 to 7.6	22-Feb-23	<0.40	NV
Total Xylenes	All sample locations	4.5 to 7.6	22-Feb-23	<0.40	4200

NOTES:

1	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 Residential/Parkland/Institutional Property Use (fine-medium textured soils)
NV	No Value
-	Parameter not analyzed
m bgs	Metres below ground surface

Table 7 - Relative Percent Differences - PHC and BTEX in Soil
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Parameter	Units	RDL	BH4 SS3	DUP 1	RPD (%)	Alert Limit (%)
Petroleum Hydrocarbons						
F1 PHC (C6 - C10) - BTEX	ug/g dry	10	<10	<10	nc	60
F2 PHC (C10-C16)	ug/g dry	10	<10	<10	nc	60
F3 PHC (C16-C34)	ug/g dry	50	<50	<50	nc	60
F4 PHC (C34-C50)	ug/g dry	50	<50	<50	nc	60
Volatiles						
Benzene	ug/g dry	0.0060	<0.020	<0.020	nc	100
Ethylbenzene	ug/g dry	0.010	<0.020	<0.020	nc	100
Toluene	ug/g dry	0.020	<0.020	<0.020	nc	100
Xylenes, total	ug/g dry	0.020	<0.040	<0.040	nc	100

NOTES:

Analysis by Bureau Veritas Labratories

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

- means "not analysed"

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

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

Table 8 - Relative Percent Differences - PHC and BTEX in Groundwater
2663 Innes Road, Ottawa, Ontario
OTT-22015620-B0

Parameter	Units	RDL	BH/MW 1A	DUP 1	RPD (%)	Alert Limit (%)
			22-Feb-2023	22-Feb-2023		
Petroleum Hydrocarbons						
F1 PHC (C6 - C10) - BTEX	ug/L	25	<25	<25	nc	60
F2 PHC (C10-C16)	ug/L	100	<100	<100	nc	60
F3 PHC (C16-C34)	ug/L	100	<200	<200	nc	60
F4 PHC (C34-C50)	ug/L	100	<200	<200	nc	60
Volatiles						
Benzene	ug/L	0.5	<0.20	<0.20	nc	60
Ethylbenzene	ug/L	0.5	<0.20	<0.20	nc	60
Toluene	ug/L	0.5	<0.20	<0.20	nc	60
m/p-Xylene	ug/L	0.5	<0.20	<0.20	nc	60
o-Xylene	ug/L	0.5	<0.40	<0.40	nc	60
Xylenes, total	ug/L	0.5	<0.40	<0.40	nc	60

NOTES:

Analysis by Bureau Veritas Labratories

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

- means "not analysed"

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

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

Appendix G: Laboratory Certificates of Analysis

Your Project #: OTT-22015620-A0
Your C.O.C. #: 921104-01-01

Attention: Mark McCalla

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

Report Date: 2023/02/17
Report #: R7514312
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344136
Received: 2023/02/14, 16:01

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	1	N/A	2023/02/17	CAM SOP-00301	EPA 8270D m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	4	N/A	2023/02/16	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	4	2023/02/16	2023/02/17	CAM SOP-00316	CCME CWS m
Acid Extractable Metals by ICPMS (1)	1	2023/02/16	2023/02/16	CAM SOP-00447	EPA 6020B m
Moisture (1)	4	N/A	2023/02/16	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	1	2023/02/16	2023/02/17	CAM SOP-00318	EPA 8270E

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.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas 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

Your Project #: OTT-22015620-A0
Your C.O.C. #: 921104-01-01

Attention: Mark McCalla

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

Report Date: 2023/02/17
Report #: R7514312
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C344136
Received: 2023/02/14, 16:01
reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
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.
Bureau Veritas 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 Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		VBI115		
Sampling Date		2023/02/14 14:15		
COC Number		921104-01-01		
	UNITS	**BH1A**	**RDL**	**QC Batch**
Metals				
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	8508690
Acid Extractable Arsenic (As)	ug/g	1.6	1.0	8508690
Acid Extractable Barium (Ba)	ug/g	260	0.50	8508690
Acid Extractable Beryllium (Be)	ug/g	0.79	0.20	8508690
Acid Extractable Boron (B)	ug/g	6.4	5.0	8508690
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.10	8508690
Acid Extractable Chromium (Cr)	ug/g	130	1.0	8508690
Acid Extractable Cobalt (Co)	ug/g	23	0.10	8508690
Acid Extractable Copper (Cu)	ug/g	52	0.50	8508690
Acid Extractable Lead (Pb)	ug/g	8.7	1.0	8508690
Acid Extractable Molybdenum (Mo)	ug/g	0.69	0.50	8508690
Acid Extractable Nickel (Ni)	ug/g	69	0.50	8508690
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	8508690
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	8508690
Acid Extractable Thallium (Tl)	ug/g	0.42	0.050	8508690
Acid Extractable Uranium (U)	ug/g	1.1	0.050	8508690
Acid Extractable Vanadium (V)	ug/g	110	5.0	8508690
Acid Extractable Zinc (Zn)	ug/g	110	5.0	8508690

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		VBI115		
Sampling Date		2023/02/14 14:15		
COC Number		921104-01-01		
	UNITS	**BH1A**	**RDL**	**QC Batch**
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.0071	8505301
Polyaromatic Hydrocarbons				
Acenaphthene	ug/g	<0.0050	0.0050	8508568
Acenaphthylene	ug/g	<0.0050	0.0050	8508568
Anthracene	ug/g	<0.0050	0.0050	8508568
Benzo(a)anthracene	ug/g	<0.0050	0.0050	8508568
Benzo(a)pyrene	ug/g	<0.0050	0.0050	8508568
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.0050	8508568
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	8508568
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	8508568
Chrysene	ug/g	<0.0050	0.0050	8508568
Dibenzo(a,h)anthracene	ug/g	<0.0050	0.0050	8508568
Fluoranthene	ug/g	<0.0050	0.0050	8508568
Fluorene	ug/g	<0.0050	0.0050	8508568
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	8508568
1-Methylnaphthalene	ug/g	<0.0050	0.0050	8508568
2-Methylnaphthalene	ug/g	<0.0050	0.0050	8508568
Naphthalene	ug/g	<0.0050	0.0050	8508568
Phenanthrene	ug/g	<0.0050	0.0050	8508568
Pyrene	ug/g	<0.0050	0.0050	8508568
Surrogate Recovery (%)				
D10-Anthracene	%	120		8508568
D14-Terphenyl (FS)	%	96		8508568
D8-Acenaphthylene	%	84		8508568

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PHCS, BTEX/F1-F4 (SOIL)

Bureau Veritas ID		VBI112	VBI113	VBI114	VBI115		
Sampling Date		2023/02/14 11:00	2023/02/14 13:30	2023/02/14 12:00	2023/02/14 14:15		
COC Number		921104-01-01	921104-01-01	921104-01-01	921104-01-01		
	UNITS	**BH4**	**BH3**	**DUP1**	**BH1A**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons							
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	8509012
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	8509012
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	8509012
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	8509012
p+m-Xylene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	8509012
Total Xylenes	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	8509012
F1 (C6-C10)	ug/g	<10	<10	<10	<10	10	8509012
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	10	8509012
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	10	8508266
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	50	8508266
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	50	8508266
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		8508266
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	100	99	100	100		8509012
4-Bromofluorobenzene	%	102	98	100	103		8509012
D10-o-Xylene	%	97	101	94	96		8509012
D4-1,2-Dichloroethane	%	105	102	104	103		8509012
o-Terphenyl	%	97	97	99	90		8508266

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C344136
Report Date: 2023/02/17

exp Services Inc
Client Project #: OTT-22015620-A0
Sampler Initials: PO

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		VBI112	VBI113	VBI114	VBI114	VBI115		
Sampling Date		2023/02/14 11:00	2023/02/14 13:30	2023/02/14 12:00	2023/02/14 12:00	2023/02/14 14:15		
COC Number		921104-01-01	921104-01-01	921104-01-01	921104-01-01	921104-01-01		
	UNITS	**BH4**	**BH3**	**DUP1**	**DUP1 Lab-Dup**	**BH1A**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	33	33	33	33	28	1.0	8507888

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

TEST SUMMARY

Bureau Veritas ID: VBI112 **Collected:** 2023/02/14
Sample ID: BH4 **Shipped:**
Matrix: Soil **Received:** 2023/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	8509012	N/A	2023/02/16	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	8508266	2023/02/16	2023/02/17	Suleeqa Nurr
Moisture	BAL	8507888	N/A	2023/02/16	Simrat Bhathal

Bureau Veritas ID: VBI113 **Collected:** 2023/02/14
Sample ID: BH3 **Shipped:**
Matrix: Soil **Received:** 2023/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	8509012	N/A	2023/02/16	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	8508266	2023/02/16	2023/02/17	Suleeqa Nurr
Moisture	BAL	8507888	N/A	2023/02/16	Simrat Bhathal

Bureau Veritas ID: VBI114 **Collected:** 2023/02/14
Sample ID: DUP1 **Shipped:**
Matrix: Soil **Received:** 2023/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	8509012	N/A	2023/02/16	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	8508266	2023/02/16	2023/02/17	Suleeqa Nurr
Moisture	BAL	8507888	N/A	2023/02/16	Simrat Bhathal

Bureau Veritas ID: VBI114 Dup **Collected:** 2023/02/14
Sample ID: DUP1 **Shipped:**
Matrix: Soil **Received:** 2023/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	8507888	N/A	2023/02/16	Simrat Bhathal

Bureau Veritas ID: VBI115 **Collected:** 2023/02/14
Sample ID: BH1A **Shipped:**
Matrix: Soil **Received:** 2023/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	8505301	N/A	2023/02/17	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	8509012	N/A	2023/02/16	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	8508266	2023/02/16	2023/02/17	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	8508690	2023/02/16	2023/02/16	Daniel Teclu
Moisture	BAL	8507888	N/A	2023/02/16	Simrat Bhathal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	8508568	2023/02/16	2023/02/17	Mitesh Raj

GENERAL COMMENTS

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

Package 1	12.3°C

F1/BTEX Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency.

Results relate only to the items tested.

Bureau Veritas 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 Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8508266	o-Terphenyl	2023/02/16	92	60 - 130	91	60 - 130	91	%		
8508568	D10-Anthracene	2023/02/16	108	50 - 130	115	50 - 130	117	%		
8508568	D14-Terphenyl (FS)	2023/02/16	93	50 - 130	101	50 - 130	95	%		
8508568	D8-Acenaphthylene	2023/02/16	86	50 - 130	96	50 - 130	89	%		
8509012	1,4-Difluorobenzene	2023/02/16	97	60 - 140	100	60 - 140	103	%		
8509012	4-Bromofluorobenzene	2023/02/16	105	60 - 140	103	60 - 140	98	%		
8509012	D10-o-Xylene	2023/02/16	87	60 - 140	88	60 - 140	90	%		
8509012	D4-1,2-Dichloroethane	2023/02/16	102	60 - 140	101	60 - 140	105	%		
8507888	Moisture	2023/02/16							0.30	20
8508266	F2 (C10-C16 Hydrocarbons)	2023/02/17	96	60 - 130	94	80 - 120	<10	ug/g	NC	30
8508266	F3 (C16-C34 Hydrocarbons)	2023/02/17	98	60 - 130	96	80 - 120	<50	ug/g	NC	30
8508266	F4 (C34-C50 Hydrocarbons)	2023/02/17	100	60 - 130	98	80 - 120	<50	ug/g	NC	30
8508568	1-Methylnaphthalene	2023/02/16	79	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40
8508568	2-Methylnaphthalene	2023/02/16	85	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
8508568	Acenaphthene	2023/02/16	98	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
8508568	Acenaphthylene	2023/02/16	98	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
8508568	Anthracene	2023/02/16	110	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
8508568	Benzo(a)anthracene	2023/02/16	107	50 - 130	110	50 - 130	<0.0050	ug/g	NC	40
8508568	Benzo(a)pyrene	2023/02/16	99	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40
8508568	Benzo(b/j)fluoranthene	2023/02/16	97	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40
8508568	Benzo(g,h,i)perylene	2023/02/16	104	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
8508568	Benzo(k)fluoranthene	2023/02/16	100	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40
8508568	Chrysene	2023/02/16	107	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
8508568	Dibenzo(a,h)anthracene	2023/02/16	103	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
8508568	Fluoranthene	2023/02/16	101	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
8508568	Fluorene	2023/02/16	98	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
8508568	Indeno(1,2,3-cd)pyrene	2023/02/16	111	50 - 130	114	50 - 130	<0.0050	ug/g	NC	40
8508568	Naphthalene	2023/02/16	109	50 - 130	103	50 - 130	<0.0050	ug/g	NC	40
8508568	Phenanthrene	2023/02/16	102	50 - 130	109	50 - 130	<0.0050	ug/g	NC	40
8508568	Pyrene	2023/02/16	103	50 - 130	108	50 - 130	<0.0050	ug/g	NC	40
8508690	Acid Extractable Antimony (Sb)	2023/02/16	100	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
8508690	Acid Extractable Arsenic (As)	2023/02/16	95	75 - 125	97	80 - 120	<1.0	ug/g	3.5	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
8508690	Acid Extractable Barium (Ba)	2023/02/16	101	75 - 125	101	80 - 120	<0.50	ug/g	5.6	30
8508690	Acid Extractable Beryllium (Be)	2023/02/16	96	75 - 125	94	80 - 120	<0.20	ug/g	NC	30
8508690	Acid Extractable Boron (B)	2023/02/16	91	75 - 125	97	80 - 120	<5.0	ug/g	NC	30
8508690	Acid Extractable Cadmium (Cd)	2023/02/16	96	75 - 125	95	80 - 120	<0.10	ug/g	6.9	30
8508690	Acid Extractable Chromium (Cr)	2023/02/16	100	75 - 125	100	80 - 120	<1.0	ug/g	5.9	30
8508690	Acid Extractable Cobalt (Co)	2023/02/16	97	75 - 125	99	80 - 120	<0.10	ug/g	2.1	30
8508690	Acid Extractable Copper (Cu)	2023/02/16	97	75 - 125	100	80 - 120	<0.50	ug/g	5.0	30
8508690	Acid Extractable Lead (Pb)	2023/02/16	102	75 - 125	99	80 - 120	<1.0	ug/g	2.5	30
8508690	Acid Extractable Molybdenum (Mo)	2023/02/16	101	75 - 125	98	80 - 120	<0.50	ug/g	NC	30
8508690	Acid Extractable Nickel (Ni)	2023/02/16	97	75 - 125	101	80 - 120	<0.50	ug/g	2.1	30
8508690	Acid Extractable Selenium (Se)	2023/02/16	99	75 - 125	99	80 - 120	<0.50	ug/g	NC	30
8508690	Acid Extractable Silver (Ag)	2023/02/16	100	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
8508690	Acid Extractable Thallium (Tl)	2023/02/16	102	75 - 125	100	80 - 120	<0.050	ug/g	NC	30
8508690	Acid Extractable Uranium (U)	2023/02/16	101	75 - 125	98	80 - 120	<0.050	ug/g	9.5	30
8508690	Acid Extractable Vanadium (V)	2023/02/16	97	75 - 125	99	80 - 120	<5.0	ug/g	2.0	30
8508690	Acid Extractable Zinc (Zn)	2023/02/16	NC	75 - 125	95	80 - 120	<5.0	ug/g	0.62	30
8509012	Benzene	2023/02/16	79	50 - 140	95	50 - 140	<0.020	ug/g	NC	50
8509012	Ethylbenzene	2023/02/16	91	50 - 140	101	50 - 140	<0.020	ug/g	NC	50
8509012	F1 (C6-C10) - BTEX	2023/02/16					<10	ug/g	NC	30
8509012	F1 (C6-C10)	2023/02/16	74	60 - 140	93	80 - 120	<10	ug/g	NC	30
8509012	o-Xylene	2023/02/16	88	50 - 140	103	50 - 140	<0.020	ug/g	NC	50
8509012	p+m-Xylene	2023/02/16	87	50 - 140	103	50 - 140	<0.040	ug/g	NC	50
8509012	Toluene	2023/02/16	77	50 - 140	92	50 - 140	<0.020	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
8509012	Total Xylenes	2023/02/16					<0.040	ug/g	NC	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.

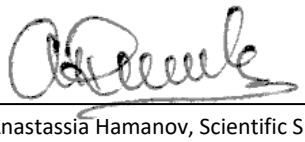
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (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:



Anastassia Hamanov, Scientific Specialist

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

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

14-Feb-23 16:01
Katherine Szozda
C344136

Page 1 of 1

Received in Ottawa

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		
Company Name:	#17498 exp Services Inc	Company Name:		Quotation #:	C20328 - STREAM 3	Bottle Order #:
Attention:	Accounts Payable	Attention:	Mark McCalla	P.O. #:		921104
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-22015620-A0	COC #:
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:		Project Manager:
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	mark.mccalla@exp.com	Site #:		C#921104-01-01
				Sampled By:	Philip Oliveira	Katherine Szozda

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)? ___

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 PHCs, BTEX/F1-F4 (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 ICPMS Metals (Soil)	# of Bottles	Comments
1		BH4	2023-02-14	11h00	Soil		X			3	
2		BH3		13h30			X			3	
3		Dup 1		12h00			X			3	
4		BH1A		14h15			X	X	X	5	
5											
6											
7											
8											
9											
10											

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 #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Philip Oliveira	2023-02-14	16h00	Lawrence Lawson / Lawrence Museau	2023/02/14 2023/02/15	1601 0830	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	12,11,14 ICEPACK	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.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-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.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

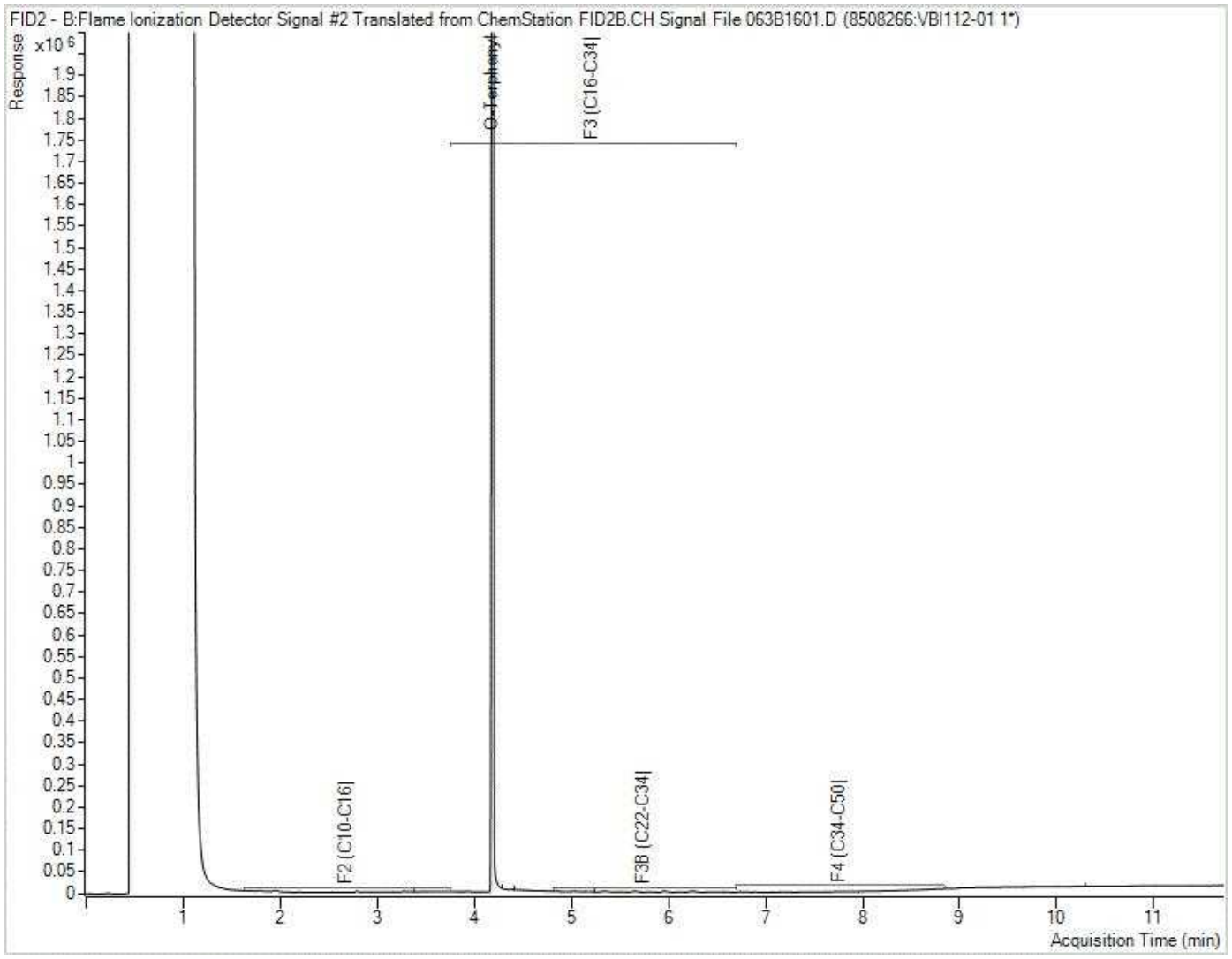
6/6/6

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.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

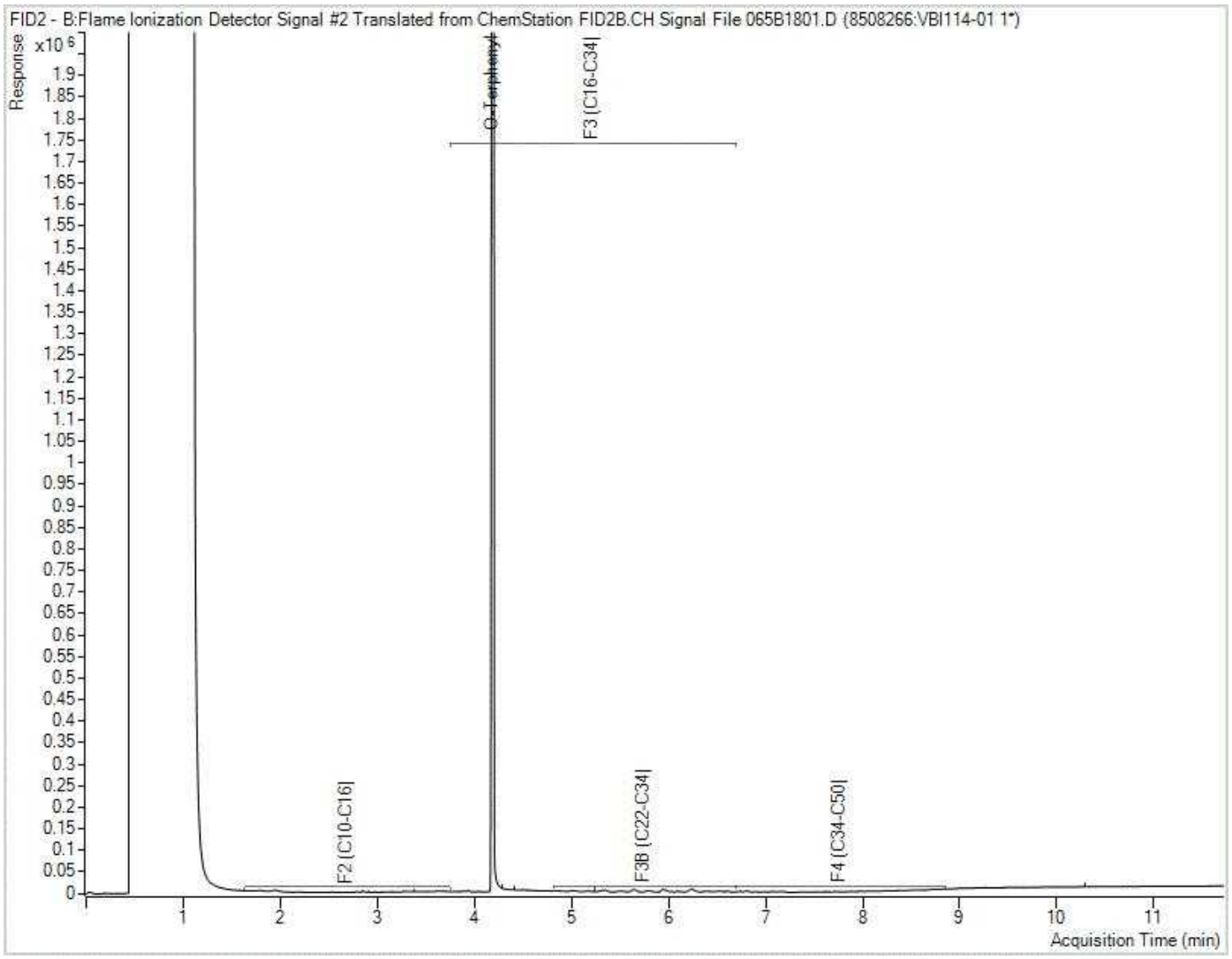


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C344136
Report Date: 2023/02/17
Bureau Veritas Sample: VBI114

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: DUP1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

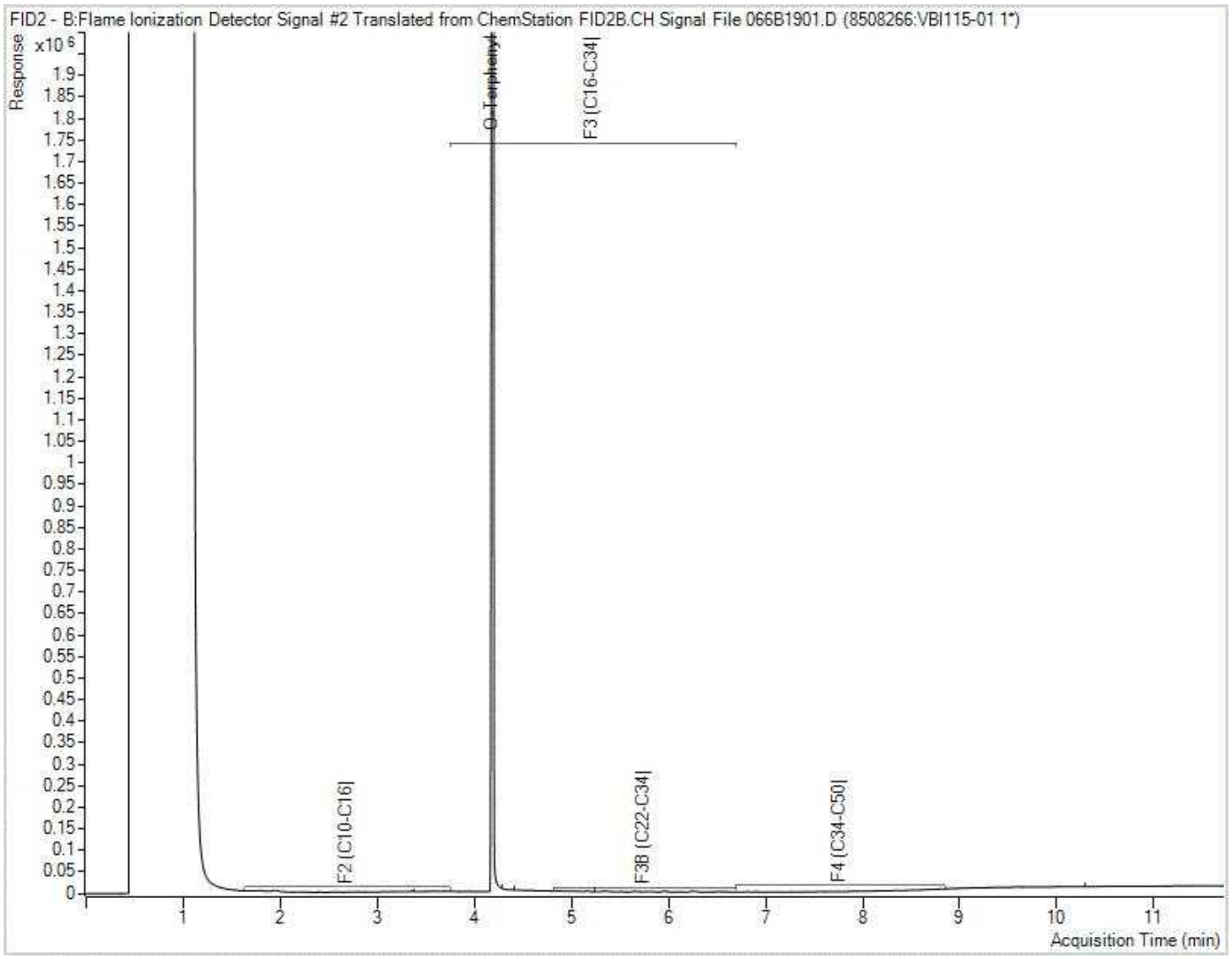


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C344136
Report Date: 2023/02/17
Bureau Veritas Sample: VBI115

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: BH1A

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-22015620-A0
Your C.O.C. #: N/A

Attention: Mark McCalla

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

Report Date: 2023/02/28
Report #: R7526022
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C354020
Received: 2023/02/23, 09:51

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Petroleum Hydro. CCME F1 & BTEX in Water (1)	6	N/A	2023/02/26	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	6	2023/02/27	2023/02/27	CAM SOP-00316	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) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas 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-22015620-A0
Your C.O.C. #: N/A

Attention: Mark McCalla

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

Report Date: 2023/02/28
Report #: R7526022
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C354020
Received: 2023/02/23, 09:51

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
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.
Bureau Veritas 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 Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

O.REG 153 PHCS, BTEX/F1-F4 (WATER)

Bureau Veritas ID		VDH855	VDH856	VDH857	VDH858	VDH859	VDH860		
Sampling Date		2023/02/22 14:40	2023/02/22 15:45	2023/02/22 16:25	2023/02/22 15:15	2023/02/22 14:40	2023/02/22 14:40		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	**BH/MW 1A**	**MW3**	**BH-2**	**DUP-1**	**FIELD BLANK**	**TRIP BLAMK**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	8523182
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	8523182
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	8523182
o-Xylene	ug/L	<0.20	0.40	<0.20	<0.20	<0.20	<0.20	0.20	8523182
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8523182
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8523182
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	<25	25	8523182
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	<25	25	8523182
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	<100	100	8523405
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	8523405
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	8523405
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes	Yes		8523405
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	97	98	98	97	98	99		8523182
4-Bromofluorobenzene	%	101	102	100	101	100	100		8523182
D10-o-Xylene	%	89	88	91	89	89	89		8523182
D4-1,2-Dichloroethane	%	104	102	104	104	101	100		8523182
o-Terphenyl	%	93	86	95	94	95	94		8523405

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

TEST SUMMARY

Bureau Veritas ID: VDH855 **Collected:** 2023/02/22
Sample ID: BH/MW 1A **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

Bureau Veritas ID: VDH856 **Collected:** 2023/02/22
Sample ID: MW3 **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

Bureau Veritas ID: VDH857 **Collected:** 2023/02/22
Sample ID: BH-2 **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

Bureau Veritas ID: VDH858 **Collected:** 2023/02/22
Sample ID: DUP-1 **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

Bureau Veritas ID: VDH859 **Collected:** 2023/02/22
Sample ID: FIELD BLANK **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

Bureau Veritas ID: VDH860 **Collected:** 2023/02/22
Sample ID: TRIP BLAMK **Shipped:**
Matrix: Water **Received:** 2023/02/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	8523182	N/A	2023/02/26	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	8523405	2023/02/27	2023/02/27	Anna Stuglik-Rolland

GENERAL COMMENTS

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

Package 1	3.0°C

Results relate only to the items tested.

Bureau Veritas 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 Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8523182	1,4-Difluorobenzene	2023/02/26	97	70 - 130	99	70 - 130	100	%		
8523182	4-Bromofluorobenzene	2023/02/26	100	70 - 130	101	70 - 130	100	%		
8523182	D10-o-Xylene	2023/02/26	91	70 - 130	91	70 - 130	93	%		
8523182	D4-1,2-Dichloroethane	2023/02/26	101	70 - 130	98	70 - 130	98	%		
8523405	o-Terphenyl	2023/02/27	99	60 - 130	99	60 - 130	97	%		
8523182	Benzene	2023/02/26	92	50 - 140	93	50 - 140	<0.20	ug/L	NC	30
8523182	Ethylbenzene	2023/02/26	98	50 - 140	100	50 - 140	<0.20	ug/L	NC	30
8523182	F1 (C6-C10) - BTEX	2023/02/26					<25	ug/L	NC	30
8523182	F1 (C6-C10)	2023/02/26	102	60 - 140	102	60 - 140	<25	ug/L	NC	30
8523182	o-Xylene	2023/02/26	96	50 - 140	96	50 - 140	<0.20	ug/L	NC	30
8523182	p+m-Xylene	2023/02/26	92	50 - 140	93	50 - 140	<0.40	ug/L	NC	30
8523182	Toluene	2023/02/26	87	50 - 140	89	50 - 140	<0.20	ug/L	NC	30
8523182	Total Xylenes	2023/02/26					<0.40	ug/L	NC	30
8523405	F2 (C10-C16 Hydrocarbons)	2023/02/27	102	60 - 130	95	60 - 130	<100	ug/L	6.4	30
8523405	F3 (C16-C34 Hydrocarbons)	2023/02/27	94	60 - 130	99	60 - 130	<200	ug/L	3.1	30
8523405	F4 (C34-C50 Hydrocarbons)	2023/02/27	95	60 - 130	99	60 - 130	<200	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 (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:

Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

Bureau Veritas 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 Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

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

BUREAU VERITAS

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CAM FCD-01191/5

Received in Ottawa

CHAIN OF CUSTODY RECORD

137826

Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: EXP Services Inc.	Company Name: EXP Services Inc	Quotation #: Stream 3	[X] Regular TAT (5-7 days) Most analyses
Contact Name: Accounts Payable	Contact Name: Mark McCalla	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 2650 Queensview Dr. Ottawa	Address: 2650 Queensview Dr Ottawa	Project #: OTT-22015620-A0	Rush TAT (Surcharges will be applied)
Phone: 613-688-1899 Fax:	Phone: 613-688-1899 Fax:	Site Location:	[ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Email:	Email: Mark.McCalla@exp.com	Site #:	Date Required:
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS LABORATORIES' DRINKING WATER CHAIN OF CUSTODY		Site Location Province:	Rush Confirmation #:
		Sampled By: Philip Oliveira	

Regulation 153

[ ] Table 1 [ ] Res/Park [ ] Med/ Fine
[ ] Table 2 [ ] Ind/Comm [ ] Coarse
[ ] Table 3 [ ] Agri/ Other
[ ] Table ____
FOR RSC (PLEASE CIRCLE) Y / N

Other Regulations

[ ] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Region
[ ] Other (Specify)
[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

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

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	HOLD- DO NOT ANALYZE
1	BH/MW1A	2023-02-22	14h40	GW	4		X	X					
2	MW3		15h45		4								
3	BH-2		16h25		4								
4	Dup 1		15h15		4								
5													
6	FIELD BLANK		14h40		3								
7	Trip Blanks		14h40		3								
8													
9													
10													

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
4	4	3,3,3
4	4	1112

COOLING MEDIA PRESENT: (Y) / N Ice pack

COMMENTS

23-Feb-23 09:51
Katherine Szozda
C354020
AVI ENV-1679

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Philip Oliveira	2023-02-22	18h00	Alexandre Jaxson Lamarche	2023/02/23	0951
Philip Oliveira					

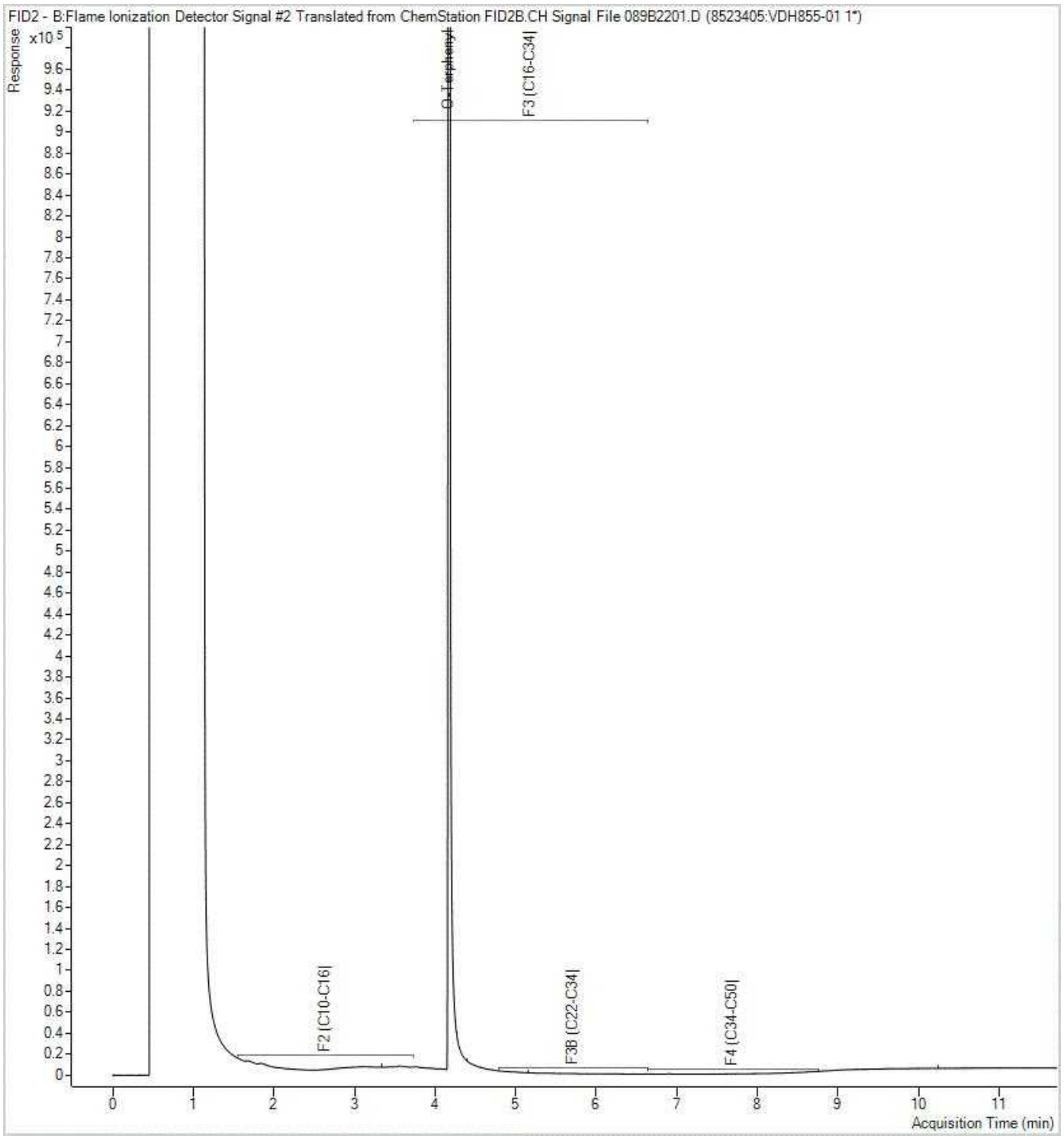
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms available at http://www.bvlabs.com/terms-and-conditions

COC-1004 (06/19)

Bureau Veritas Job #: C354020
Report Date: 2023/02/28
Bureau Veritas Sample: VDH855

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: BH/MW 1A

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

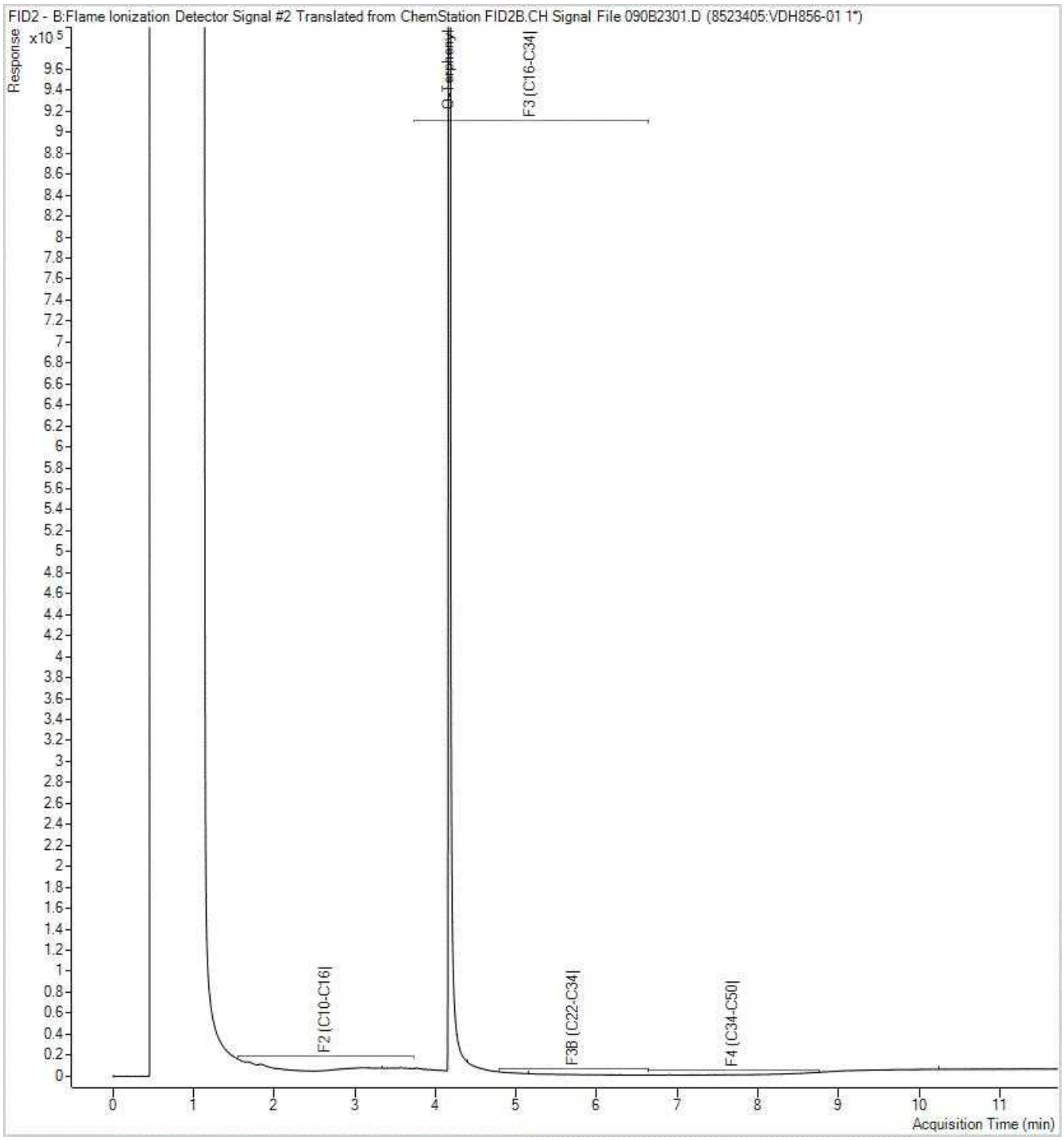


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C354020
Report Date: 2023/02/28
Bureau Veritas Sample: VDH856

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: MW3

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

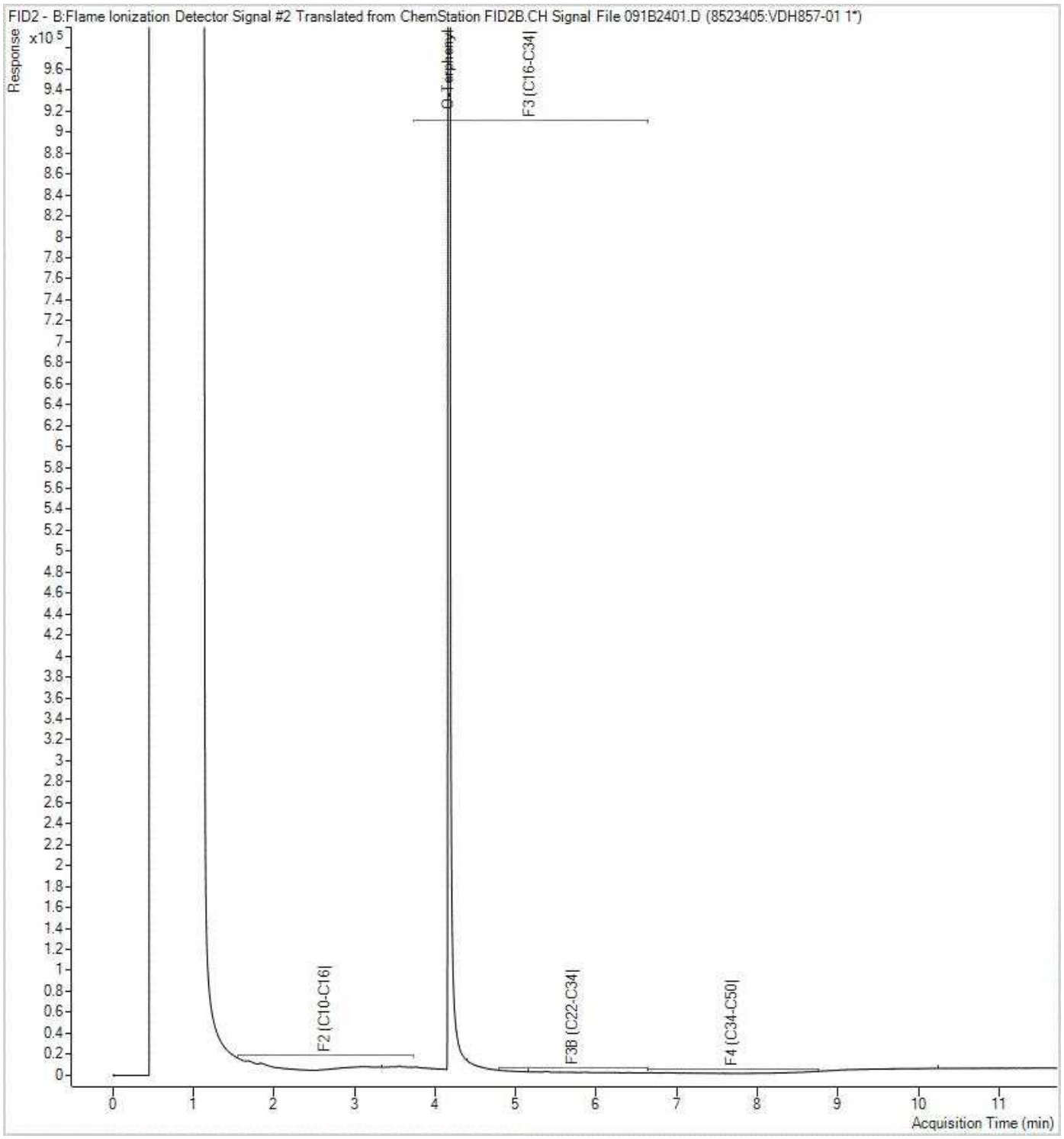


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C354020
Report Date: 2023/02/28
Bureau Veritas Sample: VDH857

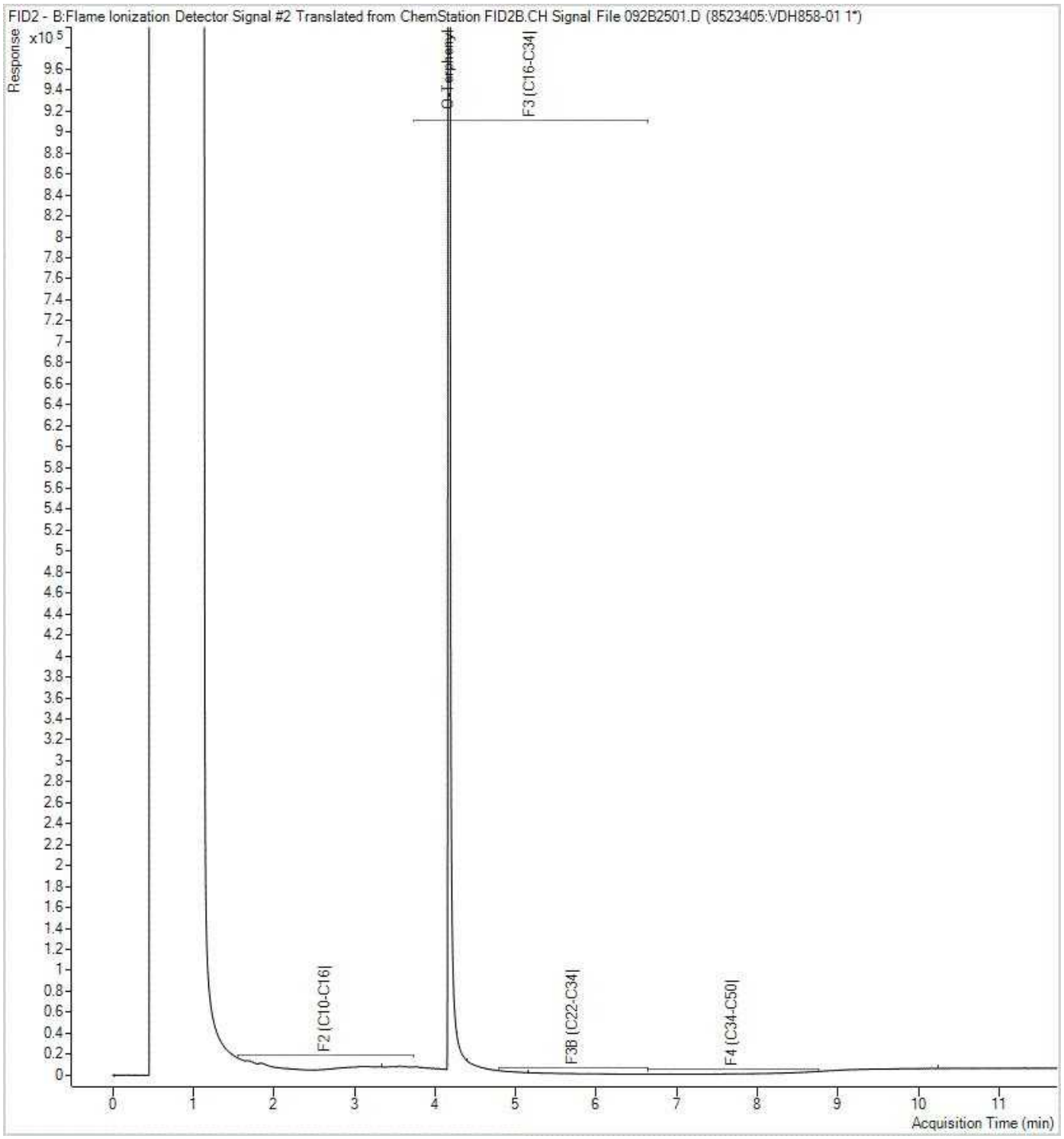
exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: BH-2

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.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

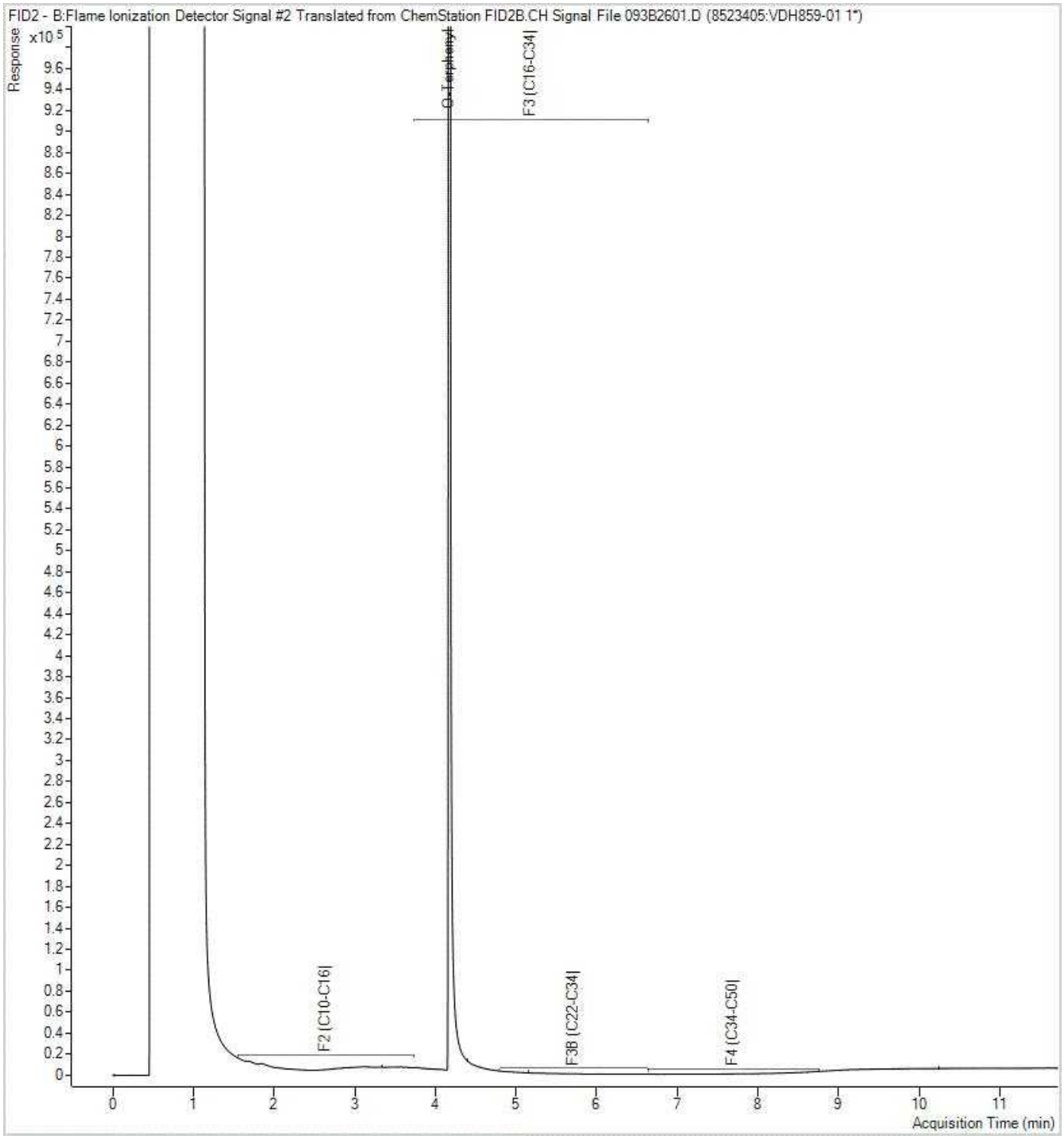


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C354020
Report Date: 2023/02/28
Bureau Veritas Sample: VDH859

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: FIELD BLANK

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

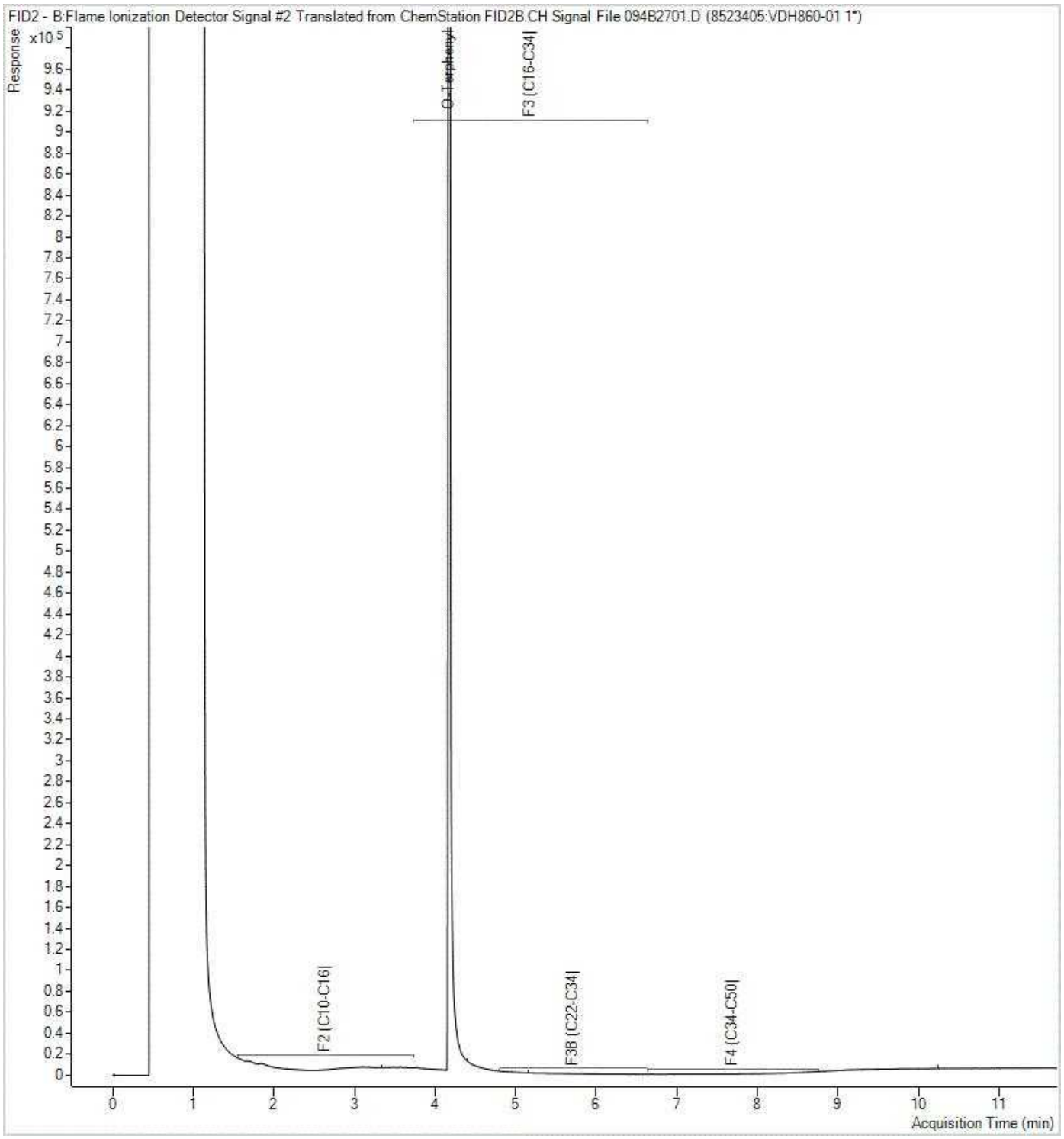


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C354020
Report Date: 2023/02/28
Bureau Veritas Sample: VDH860

exp Services Inc
Client Project #: OTT-22015620-A0
Client ID: TRIP BLAMK

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.