Phase Two Environmental Site Assessment
1640-1660 Carling Avenue, Ottawa, Ontario

Client:
RioCan Real Estate Investment Trust

Type of Document:
Final

Project Name:
Phase Two Environmental Site Assessment

Project Number:
OTT-22015769-A0

Prepared By: Leah Wells, P.Eng.

Reviewed By: Chris Kimmerly, P.Geo.

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, Ontario K2B 8H6
t: +1.613.688.1899
f: +1.613.225.7337

Date Submitted:
2023-07-06

Legal Notification

This report was prepared by EXP Services Inc. for the account of **RioCan Real Estate Investment Trust.**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Executive Summary

EXP Services Inc. (EXP) was retained by RioCan Real Estate Investment Trust to conduct a Phase Two Environmental Site Assessment (ESA) for the property located at 1640 and 1660 Carling Avenue in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by four commercial buildings and an associated 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. EXP understands that the most recent use of the Phase One property is commercial and that the proposed future use is residential and commercial. Consequently, since the proposed future use of the property is more sensitive than its previous use, a Record of Site Condition (RSC) is required.

The Phase Two property has the municipal addresses of 1640-1660 Carling Avenue in Ottawa, Ontario, and is located on the southeast corner of the intersection of Carling Avenue and Clyde Avenue. The Phase Two property is roughly rectangular in shape with an approximate area of 2.3 hectares. The Phase Two property is occupied by four commercial buildings. The main floor of the commercial building fronting Carling Avenue is approximately 20,500 square feet and has a smaller footprint than the second floor. The second floor is approximately 85,000 square feet and extends to the south, over top of a surface parking lot, to connect to the garden centre and repair garage buildings on the south side of the Phase Two property. A separate commercial building occupied by Boston Pizza was located on the northeast corner of the site. Outside of the building footprints, the site property consists of asphalt parking and driving lanes.

Multiple previous investigations have been conducted at the Phase Two property. Historically, the Phase Two property was developed in the 1960s with a Turpin Pontiac Buick (1666 Carling Avenue), and a Saturn car dealership (1650 Carling Avenue). Dealership operations included the operation of a service garage with six in-ground hydraulic hoists. A bulk oil UST formerly present on the site and was removed in the 1970s/1980s. Underground storage tanks (USTs) installed in the 1960s and 1980s respectively were also historically present on the Phase Two property.

Between 2005 and 20007, a total of 1,613 tonnes of PHC impacted soil was removed from the site. Approximately 16,000 L of petroleum impacted groundwater was pumped from the excavation on the west side of the building, the recovery well, and various sewers on the site. Based on the analytical results obtained, soil and groundwater on site met the applicable provincial standards. A RSC for commercial property use was obtained in 2007 following the site remediation (RSC #14102). Approximately 800 m^3 of imported fill material was bought to site to replace to impacted soil removed during remediation. The existing commercial site building was constructed in 2007-2008, after obtaining the RSC.

An additional site investigation was conducted by Englobe in 2022. The work was completed to fulfill Canadian Tire Real Estate Limited's (CTREL) lease agreement. Six boreholes were advanced at the site, all of which were completed as bedrock monitoring wells (MW22-1 to MW22-6). Soil and groundwater samples were submitted for analysis of volatile organic compounds (VOC), petroleum hydrocarbons (PHC), polycyclic aromatic hydrocarbons (PAH), metals, glycols, pH and/or grain size.

As part of the store closure, CTREL has decommissioned the service centre on the Phase One property. The decommissioning process included the removal of all underground infrastructure, including drain lines, sumps, and oil/water separators. The waste oil AST, and any other waste associated with service center operations will be removed from the site.

EXP completed a Phase One ESA for the property in December 2022. The following potentially contaminating activities (PCAs) and areas of potential environmental concern (APECs) were identified:

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
#1. Former Canadian Tire auto repair garage	Footprint of the garage building	PCA #10 – Commercial autobody shops (**PCA 9**)	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), metals	Soil and groundwater
#2. Historic interior 1,000 L AST	Southwest corner of the garage building	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 28**)	On-Site	Benzene, toluene, ethylbenzene, xylenes (BTEX), PHC, metals	Soil and groundwater
#3. Existing waste oil AST	South of the repair garage, in waste storage area	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 29**)	On-site	BTEX, PHC, metals	Soil and groundwater
#4. Fill material of unknown quality	Entire Phase One property	PCA #30 – Importation of fill material of unknown quality (**PCA 41**)	On-site	PHC, VOC, metals	Soil
#5. Former repair garage at the dairy south adjacent	Area along the south property line	PCA #10 – Commercial autobody shops (**PCA 4**)	Off-site	PHC, VOC, metals	Groundwater
#6. Former USTs at the dairy south adjacent	Area along the south property line	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 4**)	Off-site	BTEX, PHC	Groundwater
#7. Garage at 1690 Doheny Street	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 11**)	Off-site	PHC, VOC, metals	Groundwater
#8. Garage at 841 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 14**)	Off-site	PHC, VOC, metals	Groundwater
#9. Garage at 849 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 15**)	Off-site	PHC, VOC, metals	Groundwater

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

- Advancing fifteen boreholes (ten geotechnical and five environmental) on the subject property, and completing eight of them as monitoring wells (four overburden and four bedrock);
- Submitting select soil samples for laboratory analysis of PHC fractions F1 to F4, VOC, and/or metals;
- Collecting groundwater samples from the monitoring wells and submitting them for analysis of PHC, VOC, and/or metals;
- 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;
- Preparing a report summarizing the results of the assessment activities.

Five soil samples and one duplicate sample were submitted for analysis of PHC, VOC, and metals. All of the soil samples were within the Table 3 SCS for all parameters that were analysed, with the exception of two soil samples which exceeded the Table 3 SCS for electrical conductivity and sodium adsorption ratio.

In accordance with Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. Therefore, for the purpose of this investigation, the elevated EC and SAR in the soil samples collected from ENV-1 and ENV-2 are deemed not to exceed the Table 3 SCS.

As part of the 2022 Englobe investigation six soil samples and one duplicate sample were submitted for analysis of VOC, PAH, and metals; two soil samples and one duplicate sample were submitted for analysis of glycols; four soil samples were submitted for analysis of BTEX; and ten soil samples and one duplicate sample were submitted for analysis of PHC. All of the soil samples were within the Table 3 SCS for all parameters that were analysed.

Three groundwater samples and a duplicate sample were submitted for chemical analysis of PHC, VOC, and metals. None of the groundwater samples exceeded the Table 3 SCS for any of the parameters analyzed, with the exception of sodium in MW22-02 and ENV-4.

As part of the 2022 Englobe investigation, six groundwater samples and one duplicate sample were submitted for analysis of PHC, VOC, PAH, and metals; two groundwater samples and one duplicate sample were submitted for analysis of glycols. All of the groundwater samples were within the Table 3 SCS with the exception of chloroform in MW22-04, sodium in MW22-01, MW22-02, MW22-05, and MW22-06, and cobalt in MW22-04.

An additional sample was collected from MW22-04 in 2023 to verify the cobalt exceedance. The sample collected by EXP also exceeded the Table 3 SCS. The 2022 Englobe report concluded that the cobalt exceedance was anomalous, and no known source was identified. Although the sample collected by EXP also exceeded the Table 3 SCS, the cobalt concentration was lower than in the 2022 sample.

In accordance with Section 49.1.2 of O.Reg. 153/04, standards are deemed to be met if there has been a discharge of drinking water within the meaning of the Safe Drinking Water Act, 2002. As a municipal water source was used for bedrock coring, it is inferred that the municipal water is the source of the chloroform in the groundwater samples from MW22-04, and the applicable SCS are deemed not to be exceeded.

In accordance with Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. As all of the monitoring wells were located in the parking lot or service garage, for the purpose of this investigation, the elevated sodium levels in the groundwater samples collected from MW22-01, MW22-02, MW22-05, MW22-06, and ENV-4 are deemed not to exceed the Table 3 SCS.

During the current investigation, the soil and groundwater quality at the Phase Two property were investigated. Results were compared to Regulation 153/04 Table 3 SCS for residential/parkland/institutional use and coarse textured soils.

No soil exceedances of the Table 3 SCS were present on the Phase Two property.

Groundwater samples collected from MW22-04 in 2022 and 2023 both exceeded the Table 3 SCS for cobalt. Although it is noted that the cobalt concentration in the sample collected by EXP in 2023 was lower than in the 2022 Englobe sample. None of the other monitoring wells had cobalt concentrations exceeding the Table 3 SCS. It recommended that MW22-04 be purged, and the cobalt concentration be monitored to assess for any trends.

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

Table of Contents

List of Figures

List of Appendices

1.0 Introduction

EXP Services Inc. (EXP) was retained by RioCan Real Estate Investment Trust to conduct a Phase Two Environmental Site Assessment (ESA) for the property located at 1640 and 1660 Carling Avenue in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by four commercial buildings and an associated 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. EXP understands that the most recent use of the Phase One property is commercial and that the proposed future use is residential and commercial. Consequently, since the proposed future use of the property is more sensitive than its previous 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 has the municipal addresses of 1640-1660 Carling Avenue in Ottawa, Ontario, and is located on the southeast corner of the intersection of Carling Avenue and Clyde Avenue. The Phase Two property is roughly rectangular in shape with an approximate area of 2.3 hectares. The Phase Two property site location and site layout are shown on Figure 1 and 2 in Appendix A.

The Phase Two property is occupied by four commercial buildings. The main floor of the commercial building fronting Carling Avenue is approximately 20,500 square feet and has a smaller footprint than the second floor. The second floor is approximately 85,000 square feet and extends to the south, over top of a surface parking lot, to connect to the garden centre and repair garage buildings on the south side of the Phase Two property. A separate commercial building occupied by Boston Pizza was located on the northeast corner of the site. Outside of the building footprints, the site property consists of asphalt parking and driving lanes.

The legal description of 1660 Carling Avenue is Part Lot 1, Concession ARF, as in CR480960, Except Part 1 on Plan 4R21540, Ottawa; subject to an easement over Part 1 on Plan 4R22558 as in OC831533. The property identification number (PIN) is 040030110. The legal description of 1640 Carling Avenue is Part Lot 1, Concession ARF, as in NS271298, except Part 2 on Plan 4R21540, Ottawa; subject to an easement over Part 1 on Plan 4R22337 as in OC792612. The PIN is 040030112.

Refer to Table 1.1 for the Site identification information.

Table 1.1: Site Identification Details

Civic Address	1640-1660 Carling Avenue, Ottawa, Ontario
Current Land Use	Commercial
Proposed Future Land Use	Residential
Property Identification Number	040030110, 040030112
UTM Coordinates	Zone 18, 441352 m E and 5025322 m N
Site Area	2.3 hectares
Property Owner	RioCan Real Estate Investment Trust

A survey plan of the Phase Two property was completed by Stantec in October 2022. A copy of the survey plan is provided in Appendix B.

1.2 Property Ownership

The registered owner of the Phase Two property is RioCan Real Estate Investment Trust. Authorization to proceed with this investigation was provided by Ms. Vanessa Leon on behalf of RioCan Real Estate Investment Trust. Contact information for Ms. Leon is 700 Lawrence Avenue, Suite 365B, Toronto, Ontario M6A 3B4.

1.3 Current and Proposed Future Use

The most recent use of the Phase One property is commercial and that the proposed future use is residential and commercial. Consequently, since the proposed future use of the property is more sensitive than its previous use an RSC is required.

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 Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition for Residential/Parkland/Institutional properties, Coarse Textured Soil. The selection of this category was based on the following factors:

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;
- 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 stratigraphy of the Site predominantly consists of coarse textured soil, as per the grain size analysis. Results included in Appendix D;
- The Phase Two property is located in an area serviced with potable water by the City of Ottawa through its water distribution system;
- The proposed future use of the Phase Two property is residential; 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 has the municipal addresses of 1640-1660 Carling Avenue in Ottawa, Ontario, and is located on the southeast corner of the intersection of Carling Avenue and Clyde Avenue. The Phase Two property is roughly rectangular in shape with an approximate area of 2.3 hectares. The Phase Two property site location and site layout are shown on Figure 1 and 2 in Appendix A.

The Phase Two property, and all other properties located, in whole or in part, within 250 metres of the boundaries of the Phase Two property, are supplied by a municipal drinking water system provided by the City of Ottawa. Further, the Phase Two property is not located in an area designated in the municipal official plan as a well-head protection area and no properties within the Phase Two study area have a well that is being used or is intended for use as a source of potable water. Thus, in accordance with Section 35 of Ontario Regulation 153/04, non-potable water standards apply to the Phase Two property.

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

Based on the Phase Two ESA investigation, the property is not considered a shallow soil property as defined in Section 43.1 of the regulation as more than 1/3 of the Phase Two property has greater than 2 metres of soil.

Beneath any fill, the surficial geology of the subject site is characterised by Champlain Sea deposits of plain till. The bedrock geology underlying the site consists of limestone with some shaley partings of the Ottawa Formation. The depth to rock in the area is typically 5 m below surface grade or less. Ground surface is approximately 76 metres above sea level.

Based on previous investigation in the vicinity of the Phase Two property, the regional groundwater flow direction in the Phase Two study area is to the northeast towards the Ottawa River.

2.2 Past Investigations

Multiple previous investigations have been conducted at the Phase Two property. Historically, the Phase Two property was developed in the 1960s with a Turpin Pontiac Buick (1666 Carling Avenue), and a Saturn car dealership (1650 Carling Avenue). Dealership operations included the operation of a service garage with six in-ground hydraulic hoists. A bulk oil UST formerly present on the site and was removed in the 1970s/1980s. USTs installed in the 1960s and 1980s respectively were also historically present on the Phase Two property.

In September 2005, Trow Associates Inc. (now EXP Services Inc.) conducted a Phase II investigation which involved advancing seven interior and ten exterior boreholes on the Phase Two property, six of the which were completed as monitoring wells. PHC impacted soil was identified in the vicinity of all three UST locations. Free phase petroleum product was observed in the monitoring well near the waste oil UST at 1666 Carling Avenue.

In October 2005, supplemental investigation was conducted to delineate the PHC impacted soil and groundwater. Four exterior boreholes and seven interior boreholes were advanced at the site. One of the interior and two of the exterior boreholes were complected as monitoring wells. Soil and groundwater samples were submitted for analysis of PHC.

As part of the site remediation, multiple remedial excavations were conducted at the Phase Two property as summarized in the following paragraphs.

- Main Excavation – Former Waste Oil Underground Storage Tank, 1666 Carling Avenue

In October 2006, the waste oil UST was removed from the Phase One property. Remedial excavation was conducted in conjunction with the UST removal. A total of 651 tonnes of petroleum impacted soil was removed from the Phase One property.

A recovery well was installed in the bedrock where free product had historically been observed to collect groundwater for pumping/remediation. Minimal flow was observed to enter the newly excavated bedrock from fractures in the bedrock. A slight petroleum sheen was noted on the water migrating from the fractures.

In February 2007, four additional excavations were completed at the site. The site buildings were demolished in conjunction with remediation activities.

- Excavation 1 – Former Waste Oil Underground Storage Tank, 1666 Carling Avenue

This excavation consisted of the removal of PHC impacted soil formerly present under the garage associated with the waste oil UST on the west side of the 1666 Carling Avenue building. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 666 tonnes of PHC impacted soil was removed from Excavation 1.

- Excavation 2 – Former Bulk Oil Underground Storage Tank, 1660 Carling Avenue

This excavation consisted of the removal of PHC impacted soil in the vicinity of the former bulk UST located at 1666 Carling Avenue beneath the building addition. The excavation was bounded to the south by a concrete block foundation wall. Confirmatory samples were collected from the north, east, and west excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 201 tonnes of PHC impacted soil was removed from Excavation 2.

- Excavation 3 – Former Waste Oil Underground Storage Tank, 1650 Carling Avenue

This excavation consisted of the removal of PHC impacted soil in the are of the former car-wash bay. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 23 tonnes of PHC impacted soil was removed from Excavation 3.

- Excavation 4 – Former Car Wash Bay, 1666 Carling Ave

This excavation consisted of the removal of PHC impacted soil following the removal of the waste oil UST on the southwest side of the 1650 Carling Avenue building. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 120 tonnes of PHC impacted soil was removed from Excavation 3.

A total of 1,613 tonnes of PHC impacted soil was removed from the site. One soil sample was collected from the non-impacted soil to confirm the non-impacted soil met the requirements for use as back-fill on the Phase Two property. The soil sample met the applicable standards.

Approximately 16,000 L of petroleum impacted groundwater was pumped from the excavation on the west side of the building, the recovery well, and various sewers on the site. At the time of this investigation, there were no provincial standards for PHC in a non-potable groundwater condition. Groundwater samples were compared to the Atlantic Partner in Risk-Based Corrective Action Implementation (PIRI) standards. The groundwater analytical results indicated that the concentrations of BTEX and PHC measured in the groundwater sample collected from the recovery well met the provincial non-potable standards (Table 2) and the PIRI groundwater quality criteria.

Based on the analytical results obtained, soil and groundwater on site met the applicable provincial standards. A record of site condition (RSC) for commercial property use was obtained in 2007 following the site remediation (RSC #14102). Approximately 800 m^3 of imported fill material was bought to site to replace to impacted soil removed during remediation. The existing commercial site building was constructed in 2007-2008, after obtaining the RSC.

The locations of boreholes/monitoring wells from previous investigations, and the previously completed remedial excavations are shown on Figures 3 and 4 in Appendix A respectively.

Additional site investigation was conducted by Englobe in 2022. The work was completed to fulfill Canadian Tire Real Estate Limited's (CTREL) lease agreement. Six boreholes were advanced at the site, all of which were completed as bedrock monitoring wells (MW22-1 to MW22-6). Soil and groundwater samples were submitted for analysis of VOC, PHC, PAH, metals, glycols, pH and/or grain size. Grain size analysis confirmed that soil on the site was coarse grained. All of the soil samples were within the Table 3 SCS for all parameters analysed.

Four of the groundwater samples exceeded the Table 3 SCS for sodium, and one sample exceeded the Table 3 SCS for chloroform and cobalt. As all of the monitoring wells were installed in the parking lot, elevated sodium concentrations were inferred to be associated with the application of road salt during the winter. The groundwater sample that exceeded the SCS for chloroform came from a bedrock monitoring. To facilitate bedrock drilling, municipal water was used to cool the drill bits. Chloroform is generated at municipal water treatment plants when chlorine is used to kill bacteria in the water. Its is likely that the source of the chloroform was the municipal water used for drilling. The source of the cobalt in MW22-04 was unknown but was considered by Englobe to have been anomalous.

As part of the store closure, CTREL has decommissioned the service centre on the Phase One property. The decommissioning process included the removal of all underground infrastructure, including drain lines, sumps, and oil/water separators. The waste oil AST, and any other waste associated with service center operations will be removed from the site.

Previous investigations at the Phase Two property have determined that the stratigraphy generally consisted of granular and silty sand fill overlying silty sand till. Bedrock was encountered in all of the boreholes between 1.9 and 3.6 m bgs. Groundwater in the bedrock was present between 2.2 and 4.4 m bgs. Minimal perched water was present at the overburden bedrock interface. Bedrock was encountered in all of the monitoring wells between 2.0 to 3.5 m bgs. The groundwater flow direction in the shallow bedrock aquifer was to the north, towards the Ottawa River.

Most recently, EXP prepared a report entitled *Phase One Environmental Site Assessment, 1640-1660 Carling Avenue, Ottawa, Ontario,* dated December 13, 2022. 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 nine 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)
#1. Former Canadian Tire auto repair garage	Footprint of the garage building	PCA #10 – Commercial autobody shops (**PCA 9**)	On-Site	PHC, VOC, metals	Soil and groundwater
#2. Historic interior 1,000 L AST	Southwest corner of the garage building	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 28**)	On-Site	BTEX, PHC, metals	Soil and groundwater
#3. Existing waste oil AST	South of the repair garage, in waste storage area	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 29**)	On-site	BTEX, PHC, metals	Soil and groundwater
#4. Fill material of unknown quality	Entire Phase One property	PCA #30 – Importation of fill material of unknown quality (**PCA 41**)	On-site	PHC, VOC, metals	Soil
#5. Former repair garage at the dairy south adjacent	Area along the south property line	PCA #10 – Commercial autobody shops (**PCA 4**)	Off-site	PHC, VOC, metals	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)
#6. Former USTs at the dairy south adjacent	Area along the south property line	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 4**)	Off-site	BTEX, PHC	Groundwater
#7. Garage at 1690 Doheny Street	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 11**)	Off-site	PHC, VOC, metals	Groundwater
#8. Garage at 841 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 14**)	Off-site	PHC, VOC, metals	Groundwater
#9. Garage at 849 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 15**)	Off-site	PHC, VOC, metals	Groundwater

The locations of the APEC are shown on Figure 5 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 field program was conducted in conjunction with geotechnical and hydrogeological investigations.

The most recent use of the was commercial, and it is proposed that residential and commercial buildings be constructed on the Phase Two property. As the proposed land use is more sensitive than the previous land use, an RSC is required as per O. Reg. 153/04.

3.2 Scope of Work

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

- Advancing fifteen boreholes (ten geotechnical and five environmental) on the subject property, and completing eight of them as monitoring wells (four overburden and four bedrock);
- Submitting select soil samples for laboratory analysis of PHC fractions F1 to F4, VOC, and/or metals;
- Collecting groundwater samples from the monitoring wells and submitting them for analysis of PHC, VOC, and/or metals;
- Comparing the results of the soil and groundwater chemical analyses to applicable criteria, as set out by the Ontario MECP;
- Conducting an elevation survey of the boreholes;
- 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 2 in Appendix A.

3.4.1 Buildings and Structures

The Phase Two property is occupied by four commercial buildings. The main floor of the commercial building fronting Carling Avenue is approximately 20,500 square feet and has a smaller footprint than the second floor. The second floor is

approximately 85,000 square feet and extends to the south, over top of a surface parking lot, to connect to the garden centre and repair garage buildings on the south side of the Phase Two property.

A separate commercial building occupied by Boston Pizza was located on the northeast corner of the Phase Two property. Outside of the building footprints, the Phase One property consists of asphalt parking and driving lanes.

3.4.2 Water Bodies and Groundwater Flow Direction

There are no water bodies on the subject site. The closest body of water is the Ottawa River located approximately 1.7 km north of the Phase Two property. The inferred groundwater flow direction is to the north towards the Ottawa River.

3.4.3 Areas of Natural Significance

There are no ANSI within the Phase Two study area.

3.4.4 Water Wells

There were 349 well records identified in the study area. None of the well records appear to be for the Phase Two property, although the monitoring wells installed in 2022 are still present on the site.

There were 184 records for the property at 861 Clyde Avenue. One of the records was for a water supply well installed in 1954. The remaining wells records were for monitoring wells installed between 2007 and 2020 and monitoring well abandonment records. The number of wells suggests contamination is present on the property.

There were 98 well records for the property at 1599 Carling Avenue. All of the records were for monitoring wells installed between 2012 and 2019, and well abandonment records. Monitoring wells were likely installed to address the former gas station and repair garage on the property. Due to the distance and down-gradient location from the Phase Two property impacted soil or groundwater does not represent a concern to the Phase Two property.

Two of the records were for water supply wells installed between 1951 and 1956. As the study area is now municipally serviced, it is assumed these wells are no longer in use.

The remaining wells records in the study area were for monitoring wells installed at properties along Boyd Avenue, Campbell Avenue, Clyde Avenue, and Carling Avenue.

3.4.5 Potentially Contaminating Activity

The following on-site PCAs were identified:

- PCA 7 – 1596 (now 1600) Carling Avenue – former gas station (PCA #28);
- PCA 8 – 1666 (now 1660) Carling Avenue – former repair garage and dealership (PCA #10);
- PCA 9 – 1660 Carling Avenue – Auto repair garage (PCA #10);
- PCA 25 – 1666 (now 1660) Carling Avenue – former bulk oil UST (PCA #28);
- PCA 26 – 1666 (now 1660) Carling Avenue – former waste oil UST (PCA #28);
- PCA 27 – 1650 (now 1640) Carling Avenue – former waste oil UST (PCA #28);
- PCA 28 – 1660 Carling Avenue – Former motor oil AST (PCA #28);
- PCA 29 – 1660 Carling Avenue – Waste oil AST (PCA #28); and,
- PCA 41 – 1660 and 1640 Carling Avenue – Fill material of unknown quality (PCA #30).

The Phase Two property operated as a dealership and repair garage between the late 1960s and the early 2000s. PCAs associated with these operations on the Phase Two property have been addressed by previous investigations and an RSC was filed in 2007 (Section 3.5). Historic site operations prior to 2007 are considered to have been adequately assessed and do not contribute to APECs.

An auto repair garage has operated as part of the Canadian Tire on the Phase Two property since 2007. Although previous investigations conducted in 2022 in the vicinity of the garage did not identify any impacts attributed to the garage (Section 3.5), soil and groundwater conditions within the footprint of the garage, and near the ASTs were not investigated.

Granular fill material is likely present across the site as a base for the buildings and parking lot. Previous investigations identified sandy gravel fill at the property. It is likely that the majority of the fill material was removed from the site when it was redeveloped in 2007, however it is possible that fill material is still present on the Phase Two property (**PCA 41**).

The following off-site PCAs were identified:

- PCA 1 – 1621 (now 1607) Carling Avenue – gas station (PCA #28);
- PCA 2 – 1593 (now 1599) Carling Avenue – gas station (PCA #28);
- PCA 3 – 850 Campbell Avenue – laundry (PCA #28, PCA #37);
- PCA 4 – 861 (now 839 Clyde Avenue) – former repair garage at dairy (PCA #10, PCA #28);
- PCA 5 – 885 Churchill Avenue – repair garage, private fuel outlet (PCA #10, PCA #28);
- PCA 6 – 896 Churchill Avenue (891 Bellevue Avenue) – auto repair garage (PCA #10);
- PCA 10 – 1638 Carling Avenue – dealership and garage (PCA #10, PCA #28);
- PCA 11 – 842 Clyde Avenue/1690 Doheny Street – auto repair garage (PCA #10, PCA #28);
- PCA 12 – 1688 Carling Avenue – auto repair garage (PCA #10);
- PCA 13 – 1622 Carling Avenue – auto repair garage (PCA #10);
- PCA 14 – 851 Campbell Avenue/1700 Doheny Street – auto repair garage (PCA #10, PCA #28);
- PCA 15 – 849 Campbell Avenue – auto repair garage (PCA #10);
- PCA 16 – 870 Clyde Avenue – auto repair garage (PCA #10);
- PCA 17 – 856 Campbell Avenue – auto repair garage (PCA #10);
- PCA 18 – 873 Campbell Avenue – auto repair garage (PCA #10);
- PCA 19 – 843-849 (now 850) Campbell Avenue – auto repair garage (PCA #10);
- PCA 20 – 857 Boyd Avenue – auto repair garage, private fuel outlet (PCA #10, PCA #28);
- PCA 21 – 10 Dobbie Street – auto repair garage (PCA #10);
- PCA 22 – 1605-1615 Lapierre Avenue – auto repair garage (PCA #10);
- PCA 23 – 814 Boyd Avenue – auto repair garage (PCA #10);
- PCA 24 – 900 (now 891) Churchill Avenue – auto repair garage (PCA #10);
- PCA 30 – 1675-1677 Carling Avenue – former gas station (PCA #28);
- PCA 31 – 819-825 Campbell Avenue – auto repair garage (PCA #10);

- PCA 32 – 1619 Carling Avenue – fuel oil UST (PCA #28);
- PCA 33 – 818 Campbell Avenue – private fuel outlet (PCA #28);
- PCA 34 – 1704 Carling Avenue – fuel oil UST (PCA #28);
- PCA 35 – 1740 Carling Avenue – former fuel oil UST (PCA #28);
- PCA 36 – 878 Campbell Avenue/20 Dobbie Street – Hydro Ottawa Substation (PCA #55);
- PCA 37 – 895 Churchill Avenue – former auto repair garage (PCA #10);
- PCA 38 – 877 Boyd Avenue – former auto repair garage (PCA #28);
- PCA 39 – 1564 Carling Avenue – private fuel outlet (PCA #28); and,
- PCA 40 – 1745 Carling Avenue – private fuel outlet (PCA #28).

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

Although previous investigations did not identify any impacts from the former dairy south of the site (**PCA 4**), there are areas of known impacted groundwater on the dairy property. In addition, the former dairy is south adjacent and up-gradient location form the Phase Two property. Therefore, the former repair garage and USTs are the dairy contribute to APECs on the Phase Two property.

Due to the proximity and the down-gradient location from the Phase Two property, the garage at 1690 Doheny Street (**PCA 11**), the garage at 841 Campbell Avenue (**PCA 14**), the garage at 849 Campbell Avenue (**PCA 15**) result in APECs.

The remaining PCAs identified in the Phase One study area were located at least 100 m from the Phase Two property and/or down/cross-gradient to the Phase One property and were not considered to contribute to APECs on the Phase Two property

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)
#1. Former Canadian Tire auto repair garage	Footprint of the garage building	PCA #10 – Commercial autobody shops (**PCA 9**)	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), metals	Soil and groundwater
#2. Historic interior 1,000 L AST	Southwest corner of the garage building	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 28**)	On-Site	Benzene, toluene, ethylbenzene, xylenes (BTEX), PHC, metals	Soil and groundwater
#3. Existing waste oil AST	South of the repair garage, in waste storage area	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 29**)	On-site	BTEX, PHC, metals	Soil and groundwater
#4. Fill material of unknown quality	Entire Phase One property	PCA #30 – Importation of fill material of unknown quality (**PCA 41**)	On-site	PHC, VOC, metals	Sol

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)
#5. Former repair garage at the dairy south adjacent	Area along the south property line	PCA #10 – Commercial autobody shops (**PCA 4**)	Off-site	PHC, VOC, metals	Groundwater
#6. Former USTs at the dairy south adjacent	Area along the south property line	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 4**)	Off-site	BTEX, PHC	Groundwater
#7. Garage at 1690 Doheny Street	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 11**)	Off-site	PHC, VOC, metals	Groundwater
#8. Garage at 841 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 14**)	Off-site	PHC, VOC, metals	Groundwater
#9. Garage at 849 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 15**)	Off-site	PHC, VOC, metals	Groundwater

3.4.7 Underground Utilities

The Site is serviced with municipal sewer and water, hydro and natural gas. Sanitary and storm sewer lines are present throughout the Phase One property.

The locations of the utilities on the Phase Two property are shown on Figure 7.

3.4.8 Subsurface Stratigraphy

Beneath any fill, the surficial geology of the subject site is characterised by Champlain Sea deposits of plain till. The bedrock geology underlying the site consists of limestone with some shaley partings of the Ottawa Formation. The depth to rock in the area is typically 5 m below surface grade or less.

Previous investigations have determined that the site geology generally consists of sandy gravel fill overlying silty sand till. Limestone bedrock is present between 2 m and 3.5 metres below ground surface across the Phase Two property.

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.

The SAAP indicated that eighteen boreholes would be advanced at the site. Due to conflict with existing utilities, three of the geotechnical boreholes (BH-1, BH-3, and BH-6) were not completed. Due to insufficient volume, no groundwater samples were collected from ENV-1, ENV-2, or ENV-3.

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.

The site investigative activities were conducted in conjunction with a hydrogeological investigation and geotechnical investigation and consisted of the advancement of boreholes on the site to facilitate the collection of soil and groundwater samples for visual inspection and chemical analyses.

Prior to the commencement of excavating, 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 Borehole Drilling

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

The borehole locations were selected to address the APECs identified in the Phase One ESA, and to provide site coverage for geotechnical purposes. The exterior drilling program was completed between May 4 to May 8, 2023, by George Downing Estate Drilling Ltd. (Downing), a licensed well contractor. Downing advanced ten geotechnical boreholes (BH-2, BH-4, BH-5, BH-7 to BH-13) and three environmental boreholes (ENV-1, ENV-2, and ENV-5) across the Phase Two property, using a CME-75 truck mounted drill. On May 12, 2023, CCC Geotechnical & Environmental Drilling Ltd. (CCC) completed two interior environmental boreholes (ENV-3 and ENV-4) inside the former service garage.

Four of the geotechnical boreholes (BH-2, BH-4, BH-9, and BH-11) were completed as bedrock monitoring wells. These boreholes were augured to refusal, then cored to depth. Four environmental boreholes (ENV-1 to ENV-4) were completed as overburden monitoring wells. All of the environmental boreholes were terminated at refusal on inferred bedrock.

Boreholes BH-2, BH-4, BH-5, BH-7, BH-9, and BH-11 were cored and terminated in bedrock between 11.9 and 12.4 metres below ground surface (mbgs). Boreholes BH-8, BH-10, BH-12, BH-13, and ENV-1 to ENV-5 were terminated at auger refusal on inferred bedrock between 2.2 and 3.8 m bgs.

EXP staff continuously monitored the drilling activities to log the stratigraphy observed, to record the depth of soil sample collection, to record total depths of excavation, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix E. Nitrile gloves (i.e., one pair per sample) were used during sample handling. No petroleum-based greases or solvents were used during drilling activities.

The locations and geodetic elevations of the boreholes were established by a survey crew from EXP and are shown in Figure 5.

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 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, Caduceon Environmental Laboratories (Caduceon) 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, VOC, and/or metals.

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 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 petroleum 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 are presented in the borehole logs provided in Appendix E.

4.5 Groundwater: Monitoring Well Installation

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 52 mm diameter Schedule 40 PVC screen that was no more than 3.0 m long and a 52 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 flush mount casings.

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

- The use of well pipe components (e.g. riser pipe and well screens) with factory machined threaded flush coupling joints
- Construction of wells without the use of glues or adhesives
- Removing the protective plastic wraps from well components at the time of borehole insertion to prevent contact with the ground and other surfaces
- Cleaning or disposal of drilling equipment between sampling locations

Details of the monitoring well installations are shown on the borehole logs provided in Appendix E. It is noted that six monitoring wells (MW22-1 to MW22-6) installed as part of the 2022 Englobe investigation were still present on the Phase Two property.

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 industry standards. 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.

A total of four overburden monitoring wells were installed on the Phase Two property. Three of the overburden monitoring wells were dry, and no groundwater samples were collected. A grab sample was collected from ENV-4 due to limited samples volume. Groundwater samples were also collected from bedrock wells BH-9, MW22-02, and MW22-04.

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 and groundwater samples was Caduceon Environmental Laboratories (Caduceon). Caduceon is accredited laboratories 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

Boreholes were backfilled with soil cuttings upon completion. The soil cuttings from monitoring well installations and purged water from groundwater development and sampling are being stored on site drums until work is completed. 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 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. Caduceon 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:

- 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.

Caduceon's 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

With the exception of the interior boreholes (ENV-3 and ENV-4) all of the remaining exterior boreholes are located in a paved area. The pavement structure consists of 65 mm to 180 mm thick asphaltic concrete underlain by 200 mm to 660 mm granular fill base. The pavement structure extends to depths of 0.3 m to 0.8 m. ENV-3 and ENV-4 are located inside the former service garage and the thickness of the concrete floor slab is 230 mm and 255 mm. The concrete floor slab in ENV-3 is underlain by a 230 mm thick silty sand and crushed gravel fill layer that is further underlain by a 255 mm thick buried concrete layer.

The exterior pavement structure and the interior concrete floor slab are underlain by fill in all of the boreholes that extends to depths of 1.4 m to 2.6 m. The fill consists of silty sand with gravel. The fill in BH-4, BH-10, and BH-11 contains brick and concrete pieces.

The fill was underlain by glacial till contacted at 1.4 m to 3.0 m depths The glacial till extends to depths ranging from 2.5 m to 3.4 m. The glacial till consists of silty sand with gravel and possible cobbles and boulders.

Auger and casing refusal was met on inferred cobbles, boulders or bedrock in BH-8, BH-10, BH-12, BH-13 and ENV-1 to ENV - 5 at 2.2 m to 3.8 m depths. The presence of the bedrock was proven by coring the bedrock in BH-2, BH-4, BH-5, BH-7, BH-9 and BH-11 and found to be at depths ranging from 2.5 m to 3.4 m (Elevation 76.4 m to Elevation 75.2 m).

A plan view showing cross-sections is provided as Figure 7 in Appendix A, while the Phase Two property geology is depicted in cross-sections on Figure 8 in Appendix A. The borehole logs are included in Appendix E.

5.2 Groundwater: Elevations and Flow Direction

On May 31, 2023, the monitoring wells were inspected for general physical condition, groundwater depth, the presence of light non-aqueous phase liquid (LNAPL).

Overburden and bedrock 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)	Petroleum Vapour (ppm)	Depth to LNAPL (mbgs)	Depth to Groundwater (mbTOC)	Groundwater Elevation (masl)
Bedrock							
BH-2	78.80	78.70	9.4 to 12.4	N/A	N/A	6.63	72.07
BH-4	78.87	78.77	9.2 to 12.2	N/A	N/A	5.98	72.79
BH-9	78.87	78.78	9.4 to 12.4	N/A	N/A	4.16	74.62
BH-11	78.90	78.80	9.4 to 12.4	N/A	N/A	4.41	74.39
BH/MW22-01	78.53	78.47	3.1 to 6.1	N/A	N/A	2.90	75.57
BH/MW22-02	78.91	78.83	3.1 to 4.6	ND	N/A	2.83	76.00
BH/MW22-03	78.98	78.88	3.6 to 6.1	N/A	N/A	2.99	75.89
BH/MW22-04	79.02	78.93	3.1 to 6.1	N/A	N/A	3.68	75.25
BH/MW22-05	78.95	78.82	3.1 to 6.1	N/A	N/A	3.81	75.01
BH/MW22-06	78.93	78.82	6.2 to 9.2	N/A	N/A	3.59	75.23
Overburden							

Monitoring Well ID	Grade Elevation (masl)	Top of Casing Elevation (masl)	Screen Depth (mbgs)	Petroleum Vapour (ppm)	Depth to LNAPL (mbgs)	Depth to Groundwater (mbTOC)	Groundwater Elevation (masl)
ENV-1	78.62	78.53	1.0 to 2.2	ND	N/A	2.06	76.47
ENV-2	78.96	78.86	1.2 to 2.7	ND	N/A	2.57	76.29
ENV-3	79.08	79.00	2.0 to 3.5	ND	N/A	2.94	76.06
ENV-4	79.08	78.98	2.3 to 3.8	ND	N/A	3.03	75.95

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/O – not observed

The depth to groundwater was measured to range from 2.91 m to 6.63 m below ground surface in monitoring wells where equilibrium had been attained. Minimal perched water was present at the overburden bedrock interface. Based on the groundwater level measurements, groundwater contours in the bedrock were plotted, as shown on Figure 6. The overburden groundwater elevations were not considered to be representative of the groundwater table. The groundwater flow direction in the shallow bedrock aquifer was to the northwest, towards the Ottawa River.

5.3 Groundwater: Hydraulic Gradients

Horizontal hydraulic gradients were estimated for the groundwater flow components identified in the bedrock aquifer based on the May 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 0.0375 m/m.

On May 31, 2023, rising head tests were conducted four bedrock monitoring wells (BH-2, BH-4, BH-9, and BH-11). The rising head test requires that the static water level be measured in each monitoring well prior to the removal of groundwater. Groundwater is removed from the monitoring well using a bailer. After the water level has been sufficiently lowered, an interface probe is lowered into the monitor as quickly as possible to measure the new water level. The time at which the new water level is measured is noted as time equal zero. Water level readings are subsequently taken at frequent intervals. Both the water levels and the time they were taken are recorded.

The frequency of the time measurement is determined by the rate the water level recovers to the static water level. Measurements are taken until at least 70% recovery has been achieved or, in cases where recovery is extremely slow, until it is deemed that a sufficient amount of time has elapsed. Using the Hvorslev model, the hydraulic conductivity for the monitoring well was calculated.

All water level measurements were made with a Heron oil/water interface probe. Both the probe and the measuring tape that come into contact with liquids within a monitor are cleaned with phosphate-free soap and tap water, rinsed with distilled water and then finally rinsed with methanol after each hydraulic conductivity test is concluded.

Table 5.2: Rising Head Tests

Monitoring Well ID/ Installation ID	Horizon	Screen Depth (mbgs)	Initial Static Water Level (mbToC)	Water Level after Purging (mbToC)	% Recovery to Static after Elapsed time	Hydraulic Conductivity (m/s)
BH-2	Bedrock	9.4 to 12.4	5.47	8.28	100	7.56×10^{-6}
BH-4	Bedrock	9.2 to 12.2	5.95	7.58	93	2.23×10^{-8}
BH-9	Bedrock	9.4 to 12.4	4.23	5.72	85	1.75×10^{-6}
BH-11	Bedrock	9.4 to 12.4	4.41	5.46	88	3.29×10^{-6}

Notes: mbTOC – metres below top of monitor casing

The hydraulic conductivity geometric mean calculated for the bedrock was 9.93×10^{-7}.

The data and the calculations for the hydraulic conductivity testing are provided in Appendix H.

5.4 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 environmental boreholes. Field screening data is presented in the borehole logs in Appendix E.

5.5 Soil: Quality

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes.

Five soil samples and one duplicate sample were submitted for analysis of PHC, VOC, and metals. All of the soil samples were within the Table 3 SCS for all parameters that were analysed, with the exception of two soil samples which exceeded the Table 3 SCS for electrical conductivity and sodium adsorption ratio.

In accordance with Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. Therefore, for the purpose of this investigation, the elevated EC and SAR in the soil samples collected from ENV-1 and ENV-2 are deemed not to exceed the Table 3 SCS.

As part of the 2022 Englobe investigation, six soil samples and one duplicate sample were submitted for analysis of VOC, PAH, and metals; two soil samples and one duplicate sample were submitted for analysis of glycols; four soil samples were submitted for analysis of BTEX; and ten soil samples and one duplicate sample were submitted for analysis of PHC. All of the soil samples were within the Table 3 SCS for all parameters that were analysed.

The soil results are provided in Tables 1 and 2 in Appendix F and shown on Figures 9 to 14 in Appendix A. Copies of the laboratory Certificates of Analysis are provided in Appendix G.

5.6 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.

Three groundwater samples and a duplicate sample were submitted for chemical analysis of PHC, VOC, and metals. None of the groundwater samples exceeded the Table 3 SCS for any of the parameters analyzed, with the exception of sodium in MW22-02 and ENV-4.

As part of the 2022 Englobe investigation, six groundwater samples and one duplicate sample were submitted for analysis of PHC, VOC, PAH, and metals; two groundwater samples and one duplicate sample were submitted for analysis of glycols. All of the groundwater samples were within the Table 3 SCS with the exception of chloroform in MW22-04, sodium in MW22-01, MW22-02, MW22-05, and MW22-06, and cobalt in MW22-04.

An additional sample was collected from MW22-04 in 2023 to verify the cobalt exceedance. The sample collected by EXP also exceeded the Table 3 SCS. The 2022 Englobe report concluded that the cobalt exceedance was anomalous, and no known source was identified. Although the sample collected by EXP also exceeded the Table 3 SCS, the cobalt concentration was lower than in the 2022 sample.

In accordance with Section 49.1.2 of O.Reg. 153/04, standards are deemed to be met if there has been a discharge of drinking water within the meaning of the Safe Drinking Water Act, 2002. As a municipal water source was used for bedrock coring, it is inferred that the municipal water is the source of the chloroform in the groundwater sample from MW22-04, and the applicable SCS are deemed not to be exceeded.

According to Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. As all of the monitoring wells were located in the parking lot or service garage, for the purpose of this investigation, the elevated sodium levels in the groundwater samples collected from MW22-01, MW22-02, MW22-05, MW22-06, and ENV-4 are deemed not to exceed the Table 3 SCS.

The groundwater results are provided in Tables 3 and 4 in Appendix F and shown on Figures 15 to 20 in Appendix A. Copies of the laboratory Certificates of Analysis are provided in Appendix G.

5.6.1 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.

No impacts in soil or groundwater resulting from PCA on the Phase Two property were identified. Therefore, chemical transformations of contaminants in soil or groundwater are not a significant concern at the Phase Two property.

5.6.2 Evidence of Non-Aqueous Phase Liquid

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

5.6.3 Maximum Concentrations

There were no soil exceedances of the Table 3 SCS, with the exception of electrical conductivity and sodium adsorption ratio. There were no groundwater exceedances of the Table 3 SCS with the exception of sodium. In accordance with Section 49.1 of O.Reg. 153/04 the source of the sodium, sodium adsorption ratio, and electrical conductivity soil/groundwater exceedances was inferred to be the application of road salt to the driving and parking surfaces on the Phase Two property. Therefore, for the purpose of this investigation, there were not considered to be any soil or groundwater exceedances of the Table 3 SCS.

Maximum soil and groundwater concentrations are shown on Tables 5 and 6 respectively in Appendix F.

5.7 Sediment: Quality

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

5.8 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.

Caduceons's 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 Paracel and 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 F in Tables 7 to 10. All of the RPD for soil and groundwater were either not calculable or within the applicable alert limits, with the exception of the groundwater duplicate which was outside of the acceptable RPD limits for silver. As both the sample and the duplicate were within the applicable SCS for silver, the exceedance of the acceptable RPD does not affect the conclusions of this report.

5.9 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. The P2CSM was completed in accordance with Ontario Regulation 153/04, as amended (O.Reg.153/04), as defined by the Ontario Ministry of the Environment, Conservation and Parks (MECP).

5.9.1 Introduction

EXP Services Inc. (EXP) was retained by RioCan Real Estate Investment Trust to conduct a Phase Two Environmental Site Assessment (ESA) for the property located at 1640 and 1660 Carling Avenue in Ottawa, Ontario (hereinafter referred to as the 'Phase Two property'). At the time of the investigation, the Phase Two property was occupied by four commercial buildings and associated 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.

5.9.2 Current and Proposed Future Uses

The most recent use of the Phase One property is commercial and that the proposed future use is residential and commercial. Consequently, since the proposed future use of the property is more sensitive than its previous use a Record of Site Condition (RSC) is required.

5.9.3 Site Description

The Phase Two property has the municipal addresses of 1640-1660 Carling Avenue in Ottawa, Ontario, and is located on the southeast corner of the intersection of Carling Avenue and Clyde Avenue. The Phase Two property is roughly rectangular in shape with an approximate area of 2.3 hectares. The Phase Two property site location and site layout are shown on Figure 1 and 2 in Appendix A.

The legal description of 1660 Carling Avenue is Part Lot 1, Concession ARF, as in CR480960, Except Part 1 on Plan 4R21540, Ottawa; subject to an easement over Part 1 on Plan 4R22558 as in OC831533. The property identification number (PIN) is 040030110. The legal description of 1640 Carling Avenue is Part Lot 1, Concession ARF, as in NS271298, except Part 2 on Plan 4R21540, Ottawa; subject to an easement over Part 1 on Plan 4R22337 as in OC792612. The PIN is 040030112.

Refer to Table 5.3 for the Site identification information.

Table 5.3: Site Identification Details

Civic Address	1640-1660 Carling Avenue, Ottawa, Ontario
Current Land Use	Commercial
Proposed Future Land Use	Residential
Property Identification Number	040030110, 040030112
UTM Coordinates	Zone 18, 441352 m E and 5025322 m N
Site Area	2.3 hectares
Property Owner	RioCan Real Estate Investment Trust

5.9.4 Buildings and Structures

The Phase Two property is occupied by four commercial buildings. The main floor of the commercial building fronting Carling Avenue is approximately 20,500 square feet and has a smaller footprint than the second floor. The second floor is approximately 85,000 square feet and extends to the south, over top of a surface parking lot, to connect to the garden centre and repair garage buildings on the south side of the Phase Two property. A separate commercial building occupied by Boston Pizza was located on the northeast corner of the site. Outside of the building footprints, the site property consists of asphalt parking and driving lanes.

It is proposed that the Phase Two property will be re-developed with six 40-storey high-rise residential towers with a shared three-level underground parking garage. The proposed building locations are shown on Figure 7.

5.9.5 Utilities

Historical buildings were demolished as part of the re-development of the Phase Two property in 2008. The locations of the former buildings and underground structures (in-ground hoists, USTs) are shown on Figure 4. The in-ground hoists and USTs were removed in conjunction with site remediation.

The existing buildings on the Phase Two property are slab on-grade and are serviced with municipal sewer and water, underground hydro and natural gas. Sanitary and storm sewer lines are present throughout the Phase One property. The locations of the utilities on the Phase Two property are shown on Figure 7.

5.9.6 Geological and Hydrogeological Setting

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

Table 5.4: Site Characteristics

Minimum Depth to Bedrock	2.2 metres below ground surface
Minimum Depth to Groundwater	Overburden – 2.16 (May 31, 2023) – assumed perched at overburden-bedrock interface Bedrock – 2.91 (May 31, 2023)
Shallow Soil Property	No, bedrock is greater than 2.0 mbgs
Proximity to water body or ANSI	Approximately 1.7 km north – Ottawa River
Soil pH	Surface and sub-surface pH was within applicable ranges
Soil Texture	Coarse
Current Property Use	Commercial
Future Property Use	Residential
Proposed Future Building	Six 40-storey residential towers with one shared three level underground parking garage
Areas Containing Suspected Fill	Entire Phase Two property

5.9.7 Site Stratigraphy

Beneath any fill, the surficial geology of the subject site is characterised by Champlain Sea deposits of plain till. The bedrock geology underlying the site consists of limestone with some shaley partings of the Ottawa Formation. The depth to rock in the area is typically 5 m below surface grade or less. Ground surface is approximately 76 metres above sea level.

With the exception of the interior boreholes (ENV-3 and ENV-4) all of the remaining exterior boreholes are located in a paved area. The pavement structure consists of 65 mm to 180 mm thick asphaltic concrete underlain by 200 mm to 660 mm granular fill base. The pavement structure extends to depths of 0.3 m to 0.8 m. ENV-3 and ENV-4 are located inside the former service garage and the thickness of the concrete floor slab is 230 mm and 255 mm. The concrete floor slab in ENV-3 is underlain by a 230 mm thick silty sand and crushed gravel fill layer that is further underlain by a 255 mm thick buried concrete layer.

The exterior pavement structure and the interior concrete floor slab are underlain by fill in all of the boreholes that extends to depths of 1.4 m to 2.6 m. The fill consists of silty sand with gravel. The fill in BH-4, BH-10, and BH-11 contains brick and concrete pieces.

The fill was underlain by glacial till contacted at 1.4 m to 3.0 m depths The glacial till extends to depths ranging from 2.5 m to 3.4 m. The glacial till consists of silty sand with gravel and possible cobbles and boulders.

Auger and casing refusal was met on inferred cobbles, boulders or bedrock in BH-8, BH-10, BH-12, BH-13 and ENV-1 to ENV - 5 at 2.2 m to 3.8 m depths. The presence of the bedrock was proven by coring the bedrock in BH-2, BH-4, BH-5, BH-7, BH-9 and BH-11 and found to be at depths ranging from 2.5 m to 3.4 m (Elevation 76.4 m to Elevation 75.2 m).

A plan view showing cross-sections is provided as Figure 7 in Appendix A, while the Phase Two property geology is depicted in cross-sections on Figure 8 in Appendix A.

5.9.8 Approximate Depth to Water Table

The depth to groundwater was measured to range from 2.91 m to 6.63 m below ground surface in monitoring wells where equilibrium had been attained. Minimal perched water was present at the overburden bedrock interface. Based on the groundwater level measurements, groundwater contours in the bedrock were plotted, as shown on Figure 6. The overburden groundwater elevations were not considered to be representative of the groundwater table. The groundwater flow direction in the shallow bedrock aquifer was to the northwest, towards the Ottawa River.

EXP notes that groundwater levels can be influenced by seasonal changes, the presence of subsurface structures, or fill, however based on the depth of the water table (within the bedrock), it is unlikely that any of these factors will affect the groundwater flow direction at the Phase Two property.

5.9.9 Hydrogeological Conditions

There are no water bodies on the subject site. The closest bodies of water are the Ottawa River located approximately 1.7 km north of the Phase Two property. The inferred groundwater flow direction is to the northwest towards the Ottawa River.

The hydraulic conductivity was calculated to be range between 2.23×10^{-8} and 7.56×10^{-6} in the bedrock. The hydraulic conductivity geometric mean calculated for the bedrock was 9.93×10^{-7}.

Vertical hydraulic gradients were not calculated as overburden groundwater consisted of minimal perched water at the bedrock-overburden interface.

5.9.10 Approximate Depth to Bedrock

Investigations at the Phase Two property have determined that the stratigraphy generally consisted of granular and silty sand fill overlying silty sand till. Bedrock was encountered between 2.0 to 3.5 m bgs.

5.9.11 Site Sensitivity

The Phase Two property, and all other properties located, in whole or in part, within 250 metres of the boundaries of the Phase Two property, are supplied by a municipal drinking water system provided by the City of Ottawa. Further, the Phase Two property is not located in an area designated in the municipal official plan as a well-head protection area and no properties within the Phase Two property study area has a well that is being used or is intended for use as a source of potable water. Thus, in accordance with Section 35 of Ontario Regulation 153/04, non-potable water standards apply to the Phase Two property.

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 located greater than 30 metres from a water body. In the opinion of the Qualified Person who oversaw the entire investigation, the Phase Two property is not a sensitive site.

Based on the Phase Two ESA investigation, the property is not considered a shallow soil property as defined in Section 43.1 of the regulation, as the depth to bedrock is greater than 2 metres across 2/3 of the Phase Two property.

5.9.12 Potentially Contaminating Activities

The following on-site PCAs were identified:

- PCA 7 – 1596 (now 1600) Carling Avenue – former gas station (PCA #28);
- PCA 8 – 1666 (now 1660) Carling Avenue – former repair garage and dealership (PCA #10);
- PCA 9 – 1660 Carling Avenue – Auto repair garage (PCA #10);
- PCA 25 – 1666 (now 1660) Carling Avenue – former bulk oil UST (PCA #28);
- PCA 26 – 1666 (now 1660) Carling Avenue – former waste oil UST (PCA #28);
- PCA 27 – 1650 (now 1640) Carling Avenue – former waste oil UST (PCA #28);
- PCA 28 – 1660 Carling Avenue – Former motor oil AST (PCA #28);
- PCA 29 – 1660 Carling Avenue – Waste oil AST (PCA #28); and,
- PCA 41 – 1660 and 1640 Carling Avenue – Fill material of unknown quality (PCA #30).

The Phase Two property operated as a dealership and repair garage between the late 1960s and the early 2000s. PCAs associated with these operations on the Phase Two property have been addressed by previous investigations and an RSC was filed in 2007 (Section 3.5). Historic site operations prior to 2007 are considered to have been adequately assessed and do not contribute to APECs.

An auto repair garage has operated as part of the Canadian Tire on the Phase Two property since 2007. Although previous investigations conducted in 2022 in the vicinity of the garage did not identify any impacts attributed to the garage (Section 3.5), soil and groundwater conditions within the footprint of the garage, and near the ASTs were not investigated.

Granular fill material is likely present across the site as a base for the buildings and parking lot. Previous investigations identified sandy gravel fill at the property. It is likely that the majority of the fill material was removed from the site when it was redeveloped in 2007, however it is possible that fill material is still present on the Phase Two property (**PCA 41**).

The following off-site PCAs were identified:

- PCA 1 – 1621 (now 1607) Carling Avenue – gas station (PCA #28);
- PCA 2 – 1593 (now 1599) Carling Avenue – gas station (PCA #28);
- PCA 3 – 850 Campbell Avenue – laundry (PCA #28, PCA #37);
- PCA 4 – 861 (now 839 Clyde Avenue) – former repair garage at dairy (PCA #10, PCA #28);
- PCA 5 – 885 Churchill Avenue – repair garage, private fuel outlet (PCA #10, PCA #28);
- PCA 6 – 896 Churchill Avenue (891 Bellevue Avenue) – auto repair garage (PCA #10);
- PCA 10 – 1638 Carling Avenue – dealership and garage (PCA #10, PCA #28);
- PCA 11 – 842 Clyde Avenue/1690 Doheny Street – auto repair garage (PCA #10, PCA #28);

- PCA 12 – 1688 Carling Avenue – auto repair garage (PCA #10);
- PCA 13 – 1622 Carling Avenue – auto repair garage (PCA #10);
- PCA 14 – 851 Campbell Avenue/1700 Doheny Street – auto repair garage (PCA #10, PCA #28);
- PCA 15 – 849 Campbell Avenue – auto repair garage (PCA #10);
- PCA 16 – 870 Clyde Avenue – auto repair garage (PCA #10);
- PCA 17 – 856 Campbell Avenue – auto repair garage (PCA #10);
- PCA 18 – 873 Campbell Avenue – auto repair garage (PCA #10);
- PCA 19 – 843-849 (now 850) Campbell Avenue – auto repair garage (PCA #10);
- PCA 20 – 857 Boyd Avenue – auto repair garage, private fuel outlet (PCA #10, PCA #28);
- PCA 21 – 10 Dobbie Street – auto repair garage (PCA #10);
- PCA 22 – 1605-1615 Lapierre Avenue – auto repair garage (PCA #10);
- PCA 23 – 814 Boyd Avenue – auto repair garage (PCA #10);
- PCA 24 – 900 (now 891) Churchill Avenue – auto repair garage (PCA #10);
- PCA 30 – 1675-1677 Carling Avenue – former gas station (PCA #28);
- PCA 31 – 819-825 Campbell Avenue – auto repair garage (PCA #10);
- PCA 32 – 1619 Carling Avenue – fuel oil UST (PCA #28);
- PCA 33 – 818 Campbell Avenue – private fuel outlet (PCA #28);
- PCA 34 – 1704 Carling Avenue – fuel oil UST (PCA #28);
- PCA 35 – 1740 Carling Avenue – former fuel oil UST (PCA #28);
- PCA 36 – 878 Campbell Avenue/20 Dobbie Street – Hydro Ottawa Substation (PCA #55);
- PCA 37 – 895 Churchill Avenue – former auto repair garage (PCA #10);
- PCA 38 – 877 Boyd Avenue – former auto repair garage (PCA #28);
- PCA 39 – 1564 Carling Avenue – private fuel outlet (PCA #28); and,
- PCA 40 – 1745 Carling Avenue – private fuel outlet (PCA #28).

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

Although previous investigations did not identify any impacts from the former dairy south of the site (**PCA 4**), there are areas of known impacted groundwater on the dairy property. In addition, the former dairy is south adjacent and up-gradient location form the Phase Two property. Therefore, the former repair garage and USTs are the dairy contribute to APECs on the Phase Two property.

Due to the proximity and the down-gradient location from the Phase Two property, the garage at 1690 Doheny Street (**PCA 11**), the garage at 841 Campbell Avenue (**PCA 14**), the garage at 849 Campbell Avenue (**PCA 15**) result in APECs.

The remaining PCAs identified in the Phase One study area were located at least 100 m from the Phase Two property and/or down/cross-gradient to the Phase One property and were not considered to contribute to APECs on the Phase Two property

5.9.13 Areas of Potential Environmental Concern

The APEC identified are summarized in Table 5.5.

Table 5.5: 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)
#1. Former Canadian Tire auto repair garage	Footprint of the garage building	PCA #10 – Commercial autobody shops (**PCA 9**)	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), metals	Soil and groundwater
#2. Historic interior 1,000 L AST	Southwest corner of the garage building	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 28**)	On-Site	Benzene, toluene, ethylbenzene, xylenes (BTEX), PHC, metals	Soil and groundwater
#3. Existing waste oil AST	South of the repair garage, in waste storage area	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 29**)	On-site	BTEX, PHC, metals	Soil and groundwater
#4. Fill material of unknown quality	Entire Phase One property	PCA #30 – Importation of fill material of unknown quality (**PCA 41**)	On-site	PHC, VOC, metals	Soil
#5. Former repair garage at the dairy south adjacent	Area along the south property line	PCA #10 – Commercial autobody shops (**PCA 4**)	Off-site	PHC, VOC, metals	Groundwater
#6. Former USTs at the dairy south adjacent	Area along the south property line	PCA #28 – Gasoline and associated products storage in fixed tanks (**PCA 4**)	Off-site	BTEX, PHC	Groundwater
#7. Garage at 1690 Doheny Street	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 11**)	Off-site	PHC, VOC, metals	Groundwater
#8. Garage at 841 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 14**)	Off-site	PHC, VOC, metals	Groundwater
#9. Garage at 849 Campbell Avenue	Area along the west property line	PCA #10 – Commercial autobody shops (**PCA 15**)	Off-site	PHC, VOC, metals	Groundwater

The locations of the APEC are shown on Figure 5 in Appendix A.

5.9.14 Previous Investigations

Multiple previous investigations have been conducted at the Phase Two property. Historically, the Phase Two property was developed in the 1960s with a Turpin Pontiac Buick (1666 Carling Avenue), and a Saturn car dealership (1650 Carling Avenue). Dealership operations included the operation of a service garage with six in-ground hydraulic hoists. A bulk oil UST formerly present on the site and was removed in the 1970s/1980s. USTs installed in the 1960s and 1980s respectively were also historically present on the Phase Two property.

In September 2005, Trow Associates Inc. (now EXP Services Inc.) conducted a Phase II investigation which involved advancing seven interior and ten exterior boreholes on the Phase Two property, six of the which were completed as monitoring wells.

PHC impacted soil was identified in the vicinity of all three UST locations. Free phase petroleum product was observed in the monitoring well near the waste oil UST at 1666 Carling Avenue.

In October 2005, supplemental investigation was conducted to delineate the PHC impacted soil and groundwater. Four exterior boreholes and seven interior boreholes were advanced at the site. One of the interior and two of the exterior boreholes were complected as monitoring wells. Soil and groundwater samples were submitted for analysis of PHC.

As part of the site remediation, multiple remedial excavations were conducted at the Phase Two property as summarized in the following paragraphs.

- Main Excavation – Former Waste Oil Underground Storage Tank, 1666 Carling Avenue

In October 2006, the waste oil UST was removed from the Phase One property. Remedial excavation was conducted in conjunction with the UST removal. A total of 651 tonnes of petroleum impacted soil was removed from the Phase One property.

A recovery well was installed in the bedrock where free product had historically been observed to collect groundwater for pumping/remediation. Minimal flow was observed to enter the newly excavated bedrock from fractures in the bedrock. A slight petroleum sheen was noted on the water migrating from the fractures.

In February 2007, four additional excavations were completed at the site. The site buildings were demolished in conjunction with remediation activities.

- Excavation 1 – Former Waste Oil Underground Storage Tank, 1666 Carling Avenue

This excavation consisted of the removal of PHC impacted soil formerly present under the garage associated with the waste oil UST on the west side of the 1666 Carling Avenue building. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 666 tonnes of PHC impacted soil was removed from Excavation 1.

- Excavation 2 – Former Bulk Oil Underground Storage Tank, 1660 Carling Avenue

This excavation consisted of the removal of PHC impacted soil in the vicinity of the former bulk UST located at 1666 Carling Avenue beneath the building addition. The excavation was bounded to the south by a concrete block foundation wall. Confirmatory samples were collected from the north, east, and west excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 201 tonnes of PHC impacted soil was removed from Excavation 2.

- Excavation 3 – Former Waste Oil Underground Storage Tank, 1650 Carling Avenue

This excavation consisted of the removal of PHC impacted soil in the are of the former car-wash bay. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 23 tonnes of PHC impacted soil was removed from Excavation 3.

- Excavation 4 – Former Car Wash Bay, 1666 Carling Ave

This excavation consisted of the removal of PHC impacted soil following the removal of the waste oil UST on the southwest side of the 1650 Carling Avenue building. Confirmatory samples were collected from the excavation walls. As the excavation extended to bedrock surface, no floor samples were collected. A total of 120 tonnes of PHC impacted soil was removed from Excavation 3.

A total of 1,613 tonnes of PHC impacted soil was removed from the site. One soil sample was collected from the non-impacted soil to confirm the non-impacted soil met the requirements for use as back-fill on the Phase Two property. The soil sample met the applicable standards.

Approximately 16,000 L of petroleum impacted groundwater was pumped from the excavation on the west side of the building, the recovery well, and various sewers on the site. At the time of this investigation, there were no provincial standards

for PHC in a non-potable groundwater condition. Groundwater samples were compared to the Atlantic Partner in Risk-Based Corrective Action Implementation (PIRI) standards. The groundwater analytical results indicated that the concentrations of BTEX and PHC measured in the groundwater sample collected from the recovery well met the provincial non-potable standards (Table 2) and the PIRI groundwater quality criteria.

Based on the analytical results obtained, soil and groundwater on site met the applicable provincial standards. A record of site condition (RSC) for commercial property use was obtained in 2007 following the site remediation (RSC #14102). Approximately 800 m^3 of imported fill material was bought to site to replace to impacted soil removed during remediation. The existing commercial site building was constructed in 2007-2008, after obtaining the RSC.

The locations of boreholes/monitoring wells from previous investigations, and the previously completed remedial excavations are shown on Figures 3 and 4 in Appendix A respectively.

Additional site investigation was conducted by Englobe in 2022. The work was completed to fulfill Canadian Tire Real Estate Limited's (CTREL) lease agreement. Six boreholes were advanced at the site, all of which were completed as bedrock monitoring wells (MW22-1 to MW22-6). Soil and groundwater samples were submitted for analysis of VOC, PHC, PAH, metals, glycols, pH and/or grain size. Grain size analysis confirmed that soil on the site was coarse grained. All of the soil samples were within the Table 3 SCS for all parameters analysed.

Four of the groundwater samples exceeded the Table 3 SCS for sodium, and one sample exceeded the Table 3 SCS for chloroform and cobalt. As all of the monitoring wells were installed in the parking lot, elevated sodium concentrations were inferred to be associated with the application of road salt during the winter. The groundwater sample that exceeded the SCS for chloroform came from a bedrock monitoring. To facilitate bedrock drilling, municipal water was used to cool the drill bits. Chloroform is generated at municipal water treatment plants when chlorine is used to kill bacteria in the water. Its is likely that the source of the chloroform was the municipal water used for drilling. The source of the cobalt in MW22-04 was unknown but was considered by Englobe to have been anomalous.

As part of the store closure, CTREL has decommissioned the service centre on the Phase One property. The decommissioning process included the removal of all underground infrastructure, including drain lines, sumps, and oil/water separators. The waste oil AST, and any other waste associated with service center operations will be removed from the site.

5.9.15 Scope of the Investigation

The objective of the Phase Two ESA was to assess the quality of soil and groundwater quality on the Phase Two property. The field program was conducted in conjunction with geotechnical and hydrogeological investigations.

The following table summarizes the soil and groundwater locations on the Phase Two property, and the APECs each sample location addresses.

Table 5.6: Summary of Investigation

Area of Potential Environmental Concern (APEC)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)	Addressed by BH/MW/sample #
#1. Former Canadian Tire auto repair garage	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), metals	Soil and groundwater	ENV-3, ENV-4 (DUP A) BH/MW22-04, BHMW/22-05
#2. Historic interior 1,000 L AST	Benzene, toluene, ethylbenzene, xylenes (BTEX), PHC, metals	Soil and groundwater	ENV-3
#3. Existing waste oil AST	BTEX, PHC, metals	Soil and groundwater	BH/MW22-03

#4. Fill material of unknown quality	PHC, VOC, metals	Soil	ENV-2, ENV-3, ENV-4 BH/MW22-01 to BH/MW22-06
#5. Former repair garage at the dairy south adjacent	PHC, VOC, metals	Groundwater	ENV-1, ENV-2, ENV-5 BH-9, BH/MW22-03, BH/MW22-02
#6. Former USTs at the dairy south adjacent	BTEX, PHC	Groundwater	ENV-1, ENV-2, ENV-5 BH-9, BH/MW22-03, BH/MW22-02
#7. Garage at 1690 Doheny Street	PHC, VOC, metals	Groundwater	ENV-1, BH-9
#8. Garage at 841 Campbell Avenue	PHC, VOC, metals	Groundwater	ENV-1, BH-9
#9. Garage at 849 Campbell Avenue	PHC, VOC, metals	Groundwater	ENV-1, BH-9

It is noted that, with the exception of ENV-4, all of the overburden wells were dry. It is considered likely that the groundwater present at ENV-04 is perched at the bedrock overburden interface and not representative of the groundwater table.

5.9.16 Investigation

The site investigative activities were conducted in conjunction with a hydrogeological investigation and geotechnical investigation and consisted of the advancement of boreholes on the site to facilitate the collection of soil and groundwater samples for visual inspection and chemical analyses.

Prior to the commencement of excavating, 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.

The borehole locations were selected to address APECs identified in the Phase One ESA, and to provide site coverage for geotechnical purposes. The exterior drilling program was completed May 4 to May 8, 2023, by George Downing Estate Drilling Ltd. (Downing), a licensed well contractor. Downing advanced ten geotechnical boreholes (BH-2, BH-4, BH-5, BH-7 to BH-13) and three environmental boreholes (ENV-1, ENV-2, and ENV-5) across the Phase Two property, using a CME-75 truck mounted drill. On May 12, 2023, CCC Geotechnical & Environmental Drilling Ltd. (CCC) completed two interior environmental boreholes (ENV-3 and ENV-4) inside the service garage.

Four of the geotechnical boreholes (BH-2, BH-4, BH-9, and BH-11) were completed as bedrock monitoring wells. These boreholes were augured to refusal, then cored to depth. Four environmental boreholes (ENV-1 to ENV-4) were completed as overburden monitoring wells. All of the environmental boreholes were terminated at refusal on inferred bedrock.

Boreholes BH-2, BH-4, BH-5, BH-7, BH-9, and BH-11 were cored, and terminated in bedrock between 11.9 and 12.4 metres below ground surface (mbgs). Boreholes BH-8, BH-10, BH-12, BH-13, and ENV-1 to ENV-5 were terminated at auger refusal on inferred bedrock between 2.2 and 3.8 m bgs.

EXP staff continuously monitored the test pitting activities to log the stratigraphy observed, to record the depth of soil sample collection, to record total depths of excavation, and to record visual or olfactory observations of potential impacts. Field observations are summarized on the borehole logs provided in Appendix E. Nitrile gloves (i.e., one pair per sample) were used during sample handling. No petroleum-based greases or solvents were used during drilling activities.

5.9.17 Soil Sampling

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes.

Five soil samples and one duplicate sample were submitted for analysis of PHC, VOC, and metals. All of the soil samples were within the Table 3 SCS for all parameters that were analysed, with the exception of two soil samples which exceeded the Table 3 SCS for electrical conductivity and sodium adsorption ratio.

In accordance with Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. Therefore, for the purpose of this investigation, the elevated EC and SAR in the soil samples collected from ENV-1 and ENV-2 are deemed not to exceed the Table 3 SCS.

As part of the 2022 Englobe investigation six soil samples and one duplicate sample were submitted for analysis of VOC, PAH, and metals; two soil samples and one duplicate sample were submitted for analysis of glycols; four soil samples were submitted for analysis of BTEX; and ten soil samples and one duplicate sample were submitted for analysis of PHC. All of the soil samples were within the Table 3 SCS for all parameters that were analysed.

5.9.18 Groundwater Sampling

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.

Three groundwater samples and a duplicate sample were submitted for chemical analysis of PHC, VOC, and metals. None of the groundwater samples exceeded the Table 3 SCS for any of the parameters analyzed, with the exception of sodium in MW22-02 and ENV-4.

As part of the 2022 Englobe investigation, six groundwater samples and one duplicate sample were submitted for analysis of PHC, VOC, PAH, and metals; two groundwater samples and one duplicate sample were submitted for analysis of glycols. All of the groundwater samples were within the Table 3 SCS with the exception of chloroform in MW22-04, sodium in MW22-01, MW22-02, MW22-05, and MW22-06, and cobalt in MW22-04.

An additional sample was collected from MW22-04 in 2023 to verify the cobalt exceedance. The sample collected by EXP also exceeded the Table 3 SCS. The 2022 Englobe report concluded that the cobalt exceedance was anomalous, and no known source was identified. Although the sample collected by EXP also exceeded the Table 3 SCS, the cobalt concentration was lower than in the 2022 sample.

In accordance with Section 49.1.2 of O.Reg. 153/04, standards are deemed to be met if there has been a discharge of drinking water within the meaning of the Safe Drinking Water Act, 2002. As a municipal water source was used for bedrock coring, it is inferred that the municipal water is the source of the chloroform in the groundwater samples from MW22-04, and the applicable SCS are deemed not to be exceeded.

In accordance with Section 49.1 of O.Reg. 153/04 if, in the opinion of the Qualified Person, the applicable SCS at the Phase Two property are exceeded solely due to the application of a substance to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, the applicable SCS is deemed not to be exceeded. Road salt is considered to have been applied to the driving and parking surfaces on the Phase Two property. As all of the monitoring wells were located in the parking lot or service garage, for the purpose of this investigation, the elevated sodium levels in the groundwater samples collected from MW22-01, MW22-02, MW22-05, MW22-06, and ENV-4 are deemed not to exceed the Table 3 SCS.

5.9.19 Contaminants of Concern

There were no soil exceedances of the Table 3 SCS, with the exception of electrical conductivity and sodium adsorption ratio. There were no groundwater exceedances of the Table 3 SCS, with the exception of sodium. In accordance with Section 49.1 of O.Reg. 153/04 the source of the sodium, sodium adsorption ratio, and electrical conductivity soil/groundwater exceedances was inferred to be the application of road salt to the driving and parking surfaces on the Phase Two property. Therefore, for the purpose of this investigation, there were not considered to be any soil or groundwater exceedances of the Table 3 SCS.

5.9.20 Contaminant Fate and Transport

No impacts in soil or groundwater resulting from a PCA on the Phase Two property were identified. Therefore, chemical transformations of contaminants in soil or groundwater are not a significant concern at the Phase Two property.

5.9.21 Preferential Pathways

The preferential pathways for contaminants present in soil and groundwater include underground utilities and surface features. Storm and sanitary sewers are present across the property, as shown on Figure 7.

As no groundwater impacts were identified on the site, migration of impacted groundwater is not considered a concern at the Phase Two property.

5.9.22 Climactic Conditions

It is noted that climatic or meteorological conditions may influence the distribution and migration of COCs at the Phase Two property. Seasonal fluctuations in groundwater due to cyclical increases and decreases in precipitation can affect groundwater recharge and hence flow direction. Groundwater levels may be elevated in the spring and fall due to snow melt and/or increases in precipitation; and groundwater levels may be lowered in the winter and summer due to snow storage and/or increased evaporation. Such fluctuations have the potential to increase the vertical distribution of COCs in the capillary zone, as well as alter the direction of groundwater flow paths based on changes in infiltration rates.

As no soil or groundwater contaminants were identified on the Phase Two property, climatic or meteorological changes are not considered a concern to the phase Two property with regards to contaminant distribution.

5.9.23 Human Health Receptors and Exposure Pathways

Residential apartments with underground parking are currently proposed for the Phase Two property. The potential on-site human receptors are identified as property residents (adult, teen, child, toddler and infant), property visitors (adult, teen, child, toddler and infant), indoor and outdoor long-term workers, indoor and outdoor short-term workers, and construction workers.

Possible routes of exposure for human receptors include the following: incidental soil ingestion, soil particulate inhalation, soil dermal contact.

As there were no contaminants of concern identified on the Phase Two property, none of the identified exposure pathways are considered to potentially pose a concern to human receptors.

5.9.24 Ecological Receptors and Exposure Pathways

While the footprint of the building and parking lot will occupy most of the property, there will be some landscaped areas on the Phase Two property. Therefore, the Phase Two property is capable of supporting some ecological receptors. Relevant

ecological receptors include terrestrial vegetation (bushes, grasses and weeds); soil invertebrates (earthworms, millipedes and beetles); birds (seagulls, pigeons, sparrows and robins); and small terrestrial mammals (moles, voles, and mice).

Possible routes of exposure for ecological receptors are root uptake of soil (terrestrial vegetation), and soil particulate inhalation, soil dermal contact, and soil ingestion (soil invertebrates, mammals, and birds).

As there were no contaminants of concern identified on the Phase Two property, none of the identified exposure pathways are considered to potentially pose a concern to ecological receptors.

6.0 Conclusion

During the current investigation, the soil and groundwater quality at the Phase Two property were investigated. Results were compared to Regulation 153/04 Table 3 SCS for residential/parkland/institutional use and coarse textured soils.

No soil exceedances of the Table 3 SCS were present on the Phase Two property.

Groundwater samples collected from MW22-04 in 2022 and 2023 both exceeded the Table 3 SCS for cobalt. Although it is noted that the cobalt concentration in the sample collected by EXP in 2023 was lower than in the 2022 Englobe sample. None of the other monitoring wells had cobalt concentrations exceeding the Table 3 SCS. It recommended that MW22-04 be purged, and the cobalt concentration be monitored to assess for any trends.

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.

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.

- Englobe Corp (Englobe), *Phase II Environmental Site Assessment, Canadian Tire Retail Store #290, 1660 Carling Avenue, Ottawa, Ontario,* June 2022.
- EXP Services Inc., *Phase One Environmental Site Assessment, Phase One Environmental Site Assessment, 1640-1660 Carling Avenue, Ottawa, Ontario,* December 13, 2022.
- 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.
- Trow Associates Inc. (now EXP Services Inc.), *Phase I Environmental Site Assessment, 1650 and 1666 Carling Avenue, Ottawa, Ontario,* September 2005.
- Trow Associates Inc. (now EXP Services Inc.), *Phase II Environmental Site Assessment, 1650 and 1666 Carling Avenue, Ottawa, Ontario*, September 2005.
- Trow Associates Inc., *Supplemental Phase II Environmental Site Assessment, 1666 Carling Avenue, Ottawa, Ontario*, October 2005.
- Trow Associates Inc., *Interim Report – Underground Storage Tank and Contaminated Soil Removal, 1666 Carling Avenue, Ottawa*, November 2006.
- Trow Associates Inc., *Site Remediation, 1650 & 1666 Carling Avenue, Ottawa, Ontario, Final Report*, March 2007.
- Trow Associates Inc., *Phase I Environmental Site Assessment, 1650 Carling Avenue, Ottawa, ON*, April 2009.

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 RioCan Real Estate Investment Trust ("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.

9.0 Signatures

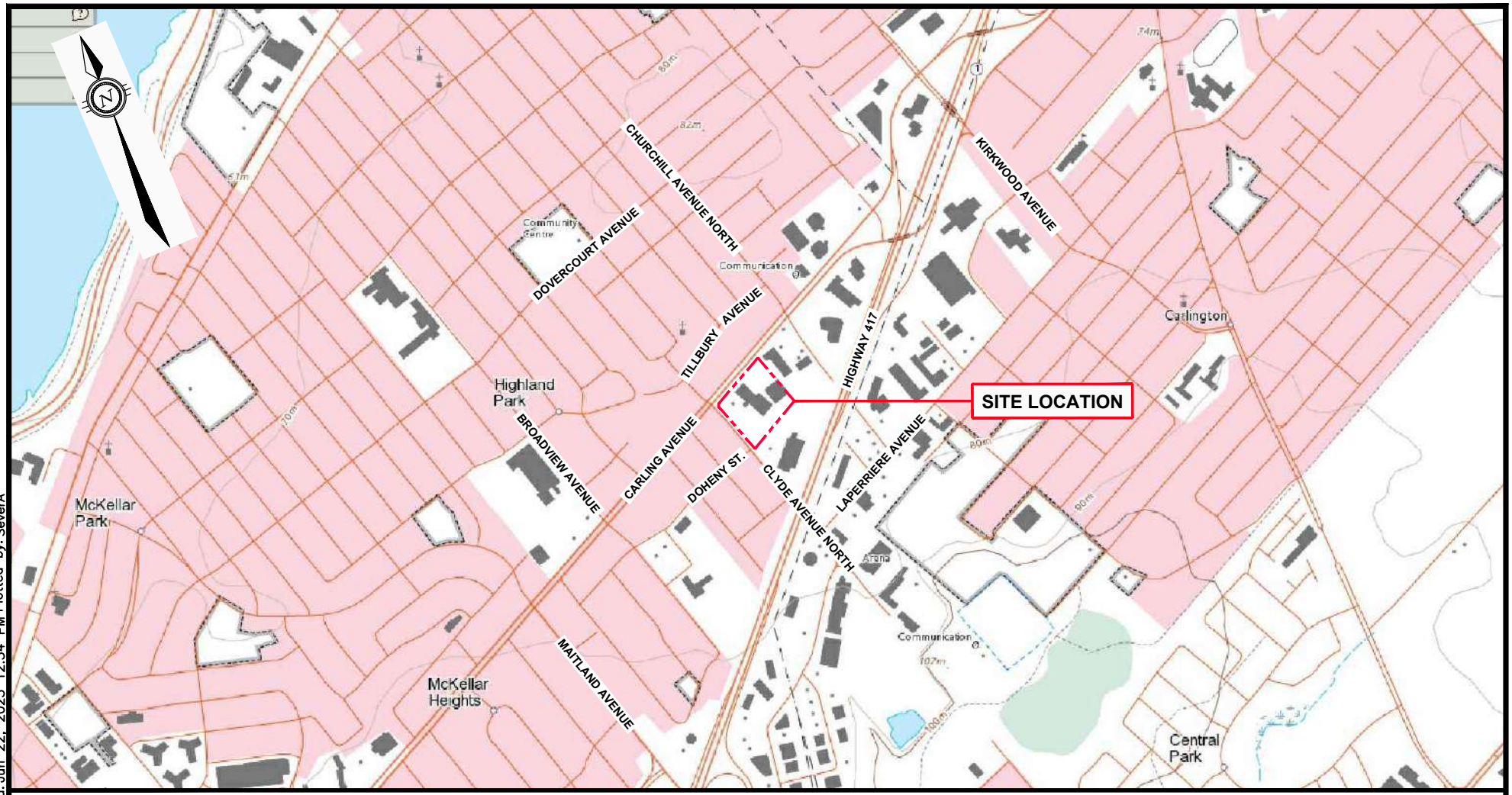
We trust this report meets your current needs. If you have any questions pertaining to the investigation undertaken by EXP, please do not hesitate to contact the undersigned.

The Qualified Person confirms 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.

Leah Wells, P.Eng.
Environmental Engineer
Earth and Environment

Chris Kimmerly, P.Geo.
Senior Project Manager
Earth and Environment

Appendix A: Figures



LEGEND

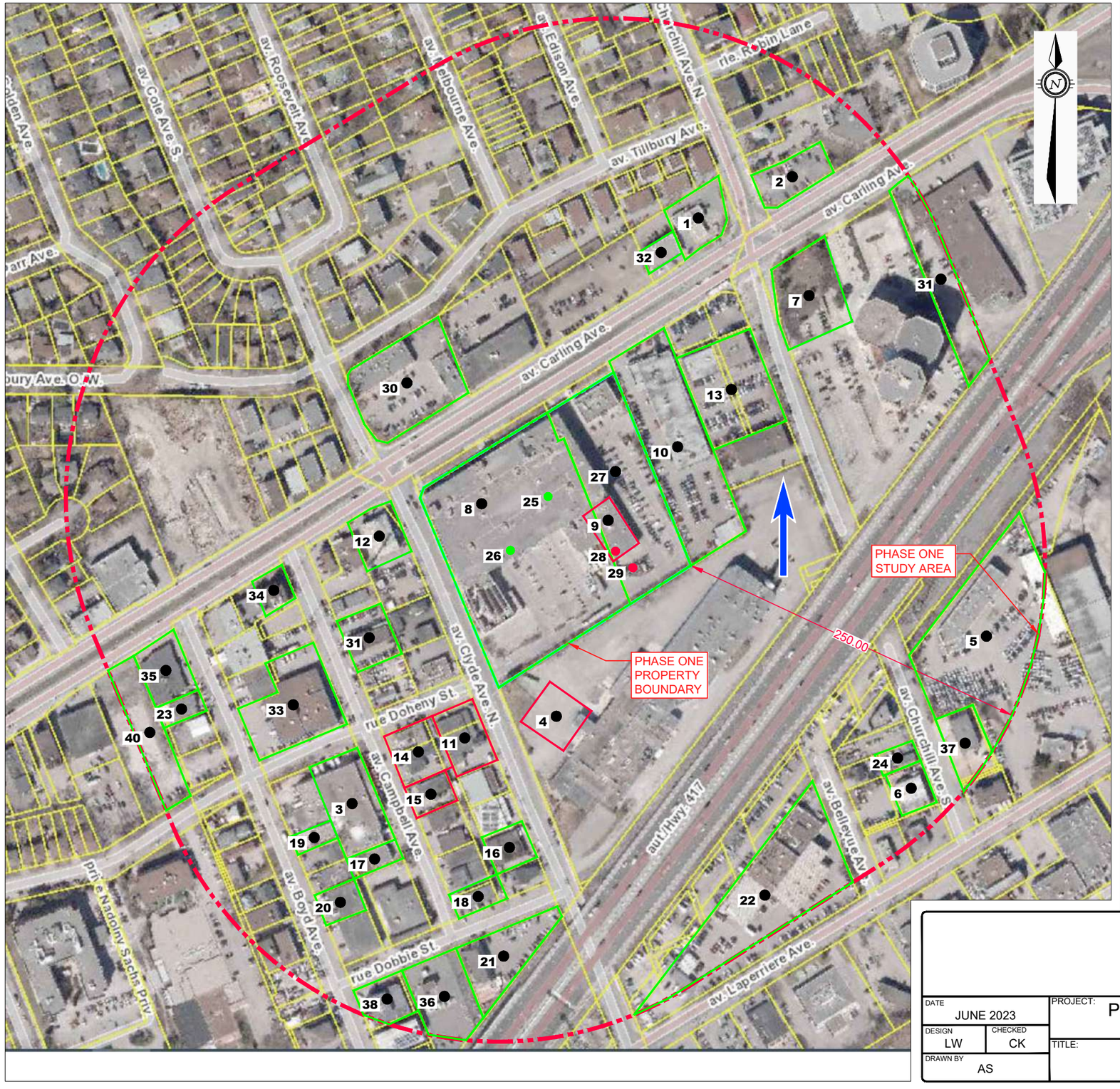
PROPERTY BOUNDARY

0 150m 300m 600m

HORIZONTAL 1:15,000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK		scale 1:15,000
DRAWN BY: AS	TITLE: SITE LOCATION PLAN	FIG 1



PCA 1 - 1621 (NOW 1607) CARLING AVENUE - GAS STATION (PCA #28)
PCA 2 - 1593 (NOW 1599) CARLING AVENUE - GAS STATION (PCA #28)
PCA 3 - 850 CAMPBELL AVENUE - LAUNDRY (PCA #28, PCA #37)
PCA 4 - 861 (NOW 839 CLYDE AVENUE) - FORMER REPAIR GARAGE AT DAIRY (PCA #10, PCA #28)
PCA 5 - 885 CHURCHILL AVENUE - REPAIR GARAGE, PRIVATE FUEL OUTLET (PCA #10, PCA #28)
PCA 6 - 896 CHURCHILL AVENUE (891 BELLEVUE AVENUE) - AUTO REPAIR GARAGE (PCA #10)
PCA 7 - 1596 (NOW 1600) CARLING AVENUE - FORMER GAS STATION (PCA #28)
PCA 8 - 1666 (NOW 1660) CARLING AVENUE - FORMER REPAIR GARAGE AND DEALERSHIP (PCA #10)
PCA 9 - 1660 CARLING AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 10 - 1638 CARLING AVENUE - DEALERSHIP AND GARAGE (PCA #10, PCA #28)
PCA 11 - 842 CLYDE AVENUE/1690 DOHENY STREET - AUTO REPAIR GARAGE (PCA #10, PCA #28)
PCA 12 - 1688 CARLING AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 13 - 1622 CARLING AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 14 - 851 CAMPBELL AVENUE/1700 DOHENY STREET - AUTO REPAIR GARAGE (PCA #10, PCA #28)
PCA 15 - 849 CAMPBELL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 16 - 870 CLYDE AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 17 - 856 CAMPBELL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 18 - 873 CAMPBELL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 19 - 843-849 (NOW 850) CAMPBELL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 20 - 857 BOYD AVENUE - AUTO REPAIR GARAGE, PRIVATE FUEL OUTLET (PCA #10, PCA #28)
PCA 21 - 10 DOBBIE STREET - AUTO REPAIR GARAGE (PCA #10)
PCA 22 - 1605-1615 LAPIERRE AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 23 - 814 BOYD AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 24 - 900 (NOW 891) CHURCHILL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 25 - 1666 (NOW 1660) CARLING AVENUE - FORMER BULK OIL UNDERGROUND STORAGE TANK (UST) (PCA #28)
PCA 26 - 1666 (NOW 1660) CARLING AVENUE - FORMER WASTE OIL UST (PCA #28)
PCA 27 - 1650 (NOW 1640) CARLING AVENUE - FORMER WASTE OIL UST (PCA #28)
PCA 28 - 1660 CARLING AVENUE - FORMER MOTOR OIL ABOVE GROUND STORAGE TANK (AST) (PCA #28)
PCA 29 - 1660 CARLING AVENUE - WASTE OIL AST (PCA #28)
PCA 30 - 1675-1677 CARLING AVENUE - FORMER GAS STATION (PCA #28)
PCA 31 - 819-825 CAMPBELL AVENUE - AUTO REPAIR GARAGE (PCA #10)
PCA 32 - 1619 CARLING AVENUE - FUEL OIL UST (PCA #28)
PCA 33 - 818 CAMPBELL AVENUE - PRIVATE FUEL OUTLET (PCA #28)
PCA 34 - 1704 CARLING AVENUE - FUEL OIL UST (PCA #28)
PCA 35 - 1740 CARLING AVENUE - FORMER FUEL OIL UST (PCA #28)
PCA 36 - 878 CAMPBELL AVENUE/20 DOBBIE STREET - HYDRO OTTAWA SUBSTATION (PCA #55)
PCA 37 - 895 CHURCHILL AVENUE - FORMER AUTO REPAIR GARAGE (PCA #10)
PCA 38 - 877 BOYD AVENUE - FORMER AUTO REPAIR GARAGE (PCA #28)
PCA 39 - 1564 CARLING AVENUE - PRIVATE FUEL OUTLET (PCA #28)
PCA 40 - 1745 CARLING AVENUE - PRIVATE FUEL OUTLET (PCA #28)
PCA 41 - 1660 AND 1640 CARLING AVENUE - FILL MATERIAL OF UNKNOWN QUALITY (PCA #30)

LEGEND

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

0 30m 60m 120m
HORIZONTAL 1:3,000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:3,000
DRAWN BY: AS	TITLE: PHASE ONE CONSEPTUAL SITE MODEL		FIG 2

av. Carling Ave.

av. Carling Ave.

av. Cole Ave. S.

av. Churchill Ave. N.

av. Clyde Ave. N.

PHASE ONE PROPERTY BOUNDARY

1666 CARLING AVENUE (TURPIN PONTIAC BUICK)

1650 CARLING AVENUE (SATURN)

MW G4 (96.20)

MW E15 (96.51)

MW E14 (97.05)

MW E11 (96.78)

BH E1

BH E19

BH G8

BH E12

HISTORICAL BULK OIL UST

HISTORICAL TRUCK HOIST No.1 (STALL 49)

BH E18

BH E2

MW E16 (97.44)

MW E17 (97.40)

HISTORICAL CAR HOIST No.1

HISTORICAL WASTE OIL UST

BH E3

BH E23

PETROLEUM PRODUCT IN GROUNDWATER

MW E8 (96.60)

BH E4

BH E5

HISTORICAL WASTE OIL UST

BH E9

BH E21

BH E22

BH E24

BH E6

BH E7

HISTORICAL OIL SEPARATOR

HISTORICAL HYDRAULIC HOISTS AREAS

HISTORICAL FORMER AUTO BODY SHOP

HISTORICAL AUTO SERVICE AREA

WASTE COMPOUND

MW E13 (97.03)

MW G12 (97.30)

LEGEND

- PROPERTY BOUNDARY
- MW E11 — ENVIRONMENTAL MONITORING WELL LOCATION AND NUMBER (AUG-SEP 2005)
- MW G4 — GEOTECHNICAL / ENVIRONMENTAL MONITORING WELL LOCATION AND NUMBER (AUG 2005)
- BH E7 — ENVIRONMENTAL BOREHOLE LOCATION AND NUMBER (AUG-SEP 2005)
- BH G9 — ENVIRONMENTAL BOREHOLE LOCATION AND NUMBER (AUG 2005)
- (96.50) — BEDROCK GROUNDWATER ELEVATION (2005)
- FRACTION 3 PHC SOIL EXCEEDANCE
- INFERRED GROUNDWATER FLOW DIRECTION
- HISTORICAL BUILDINGS FOOTPRINT / OUTLINE

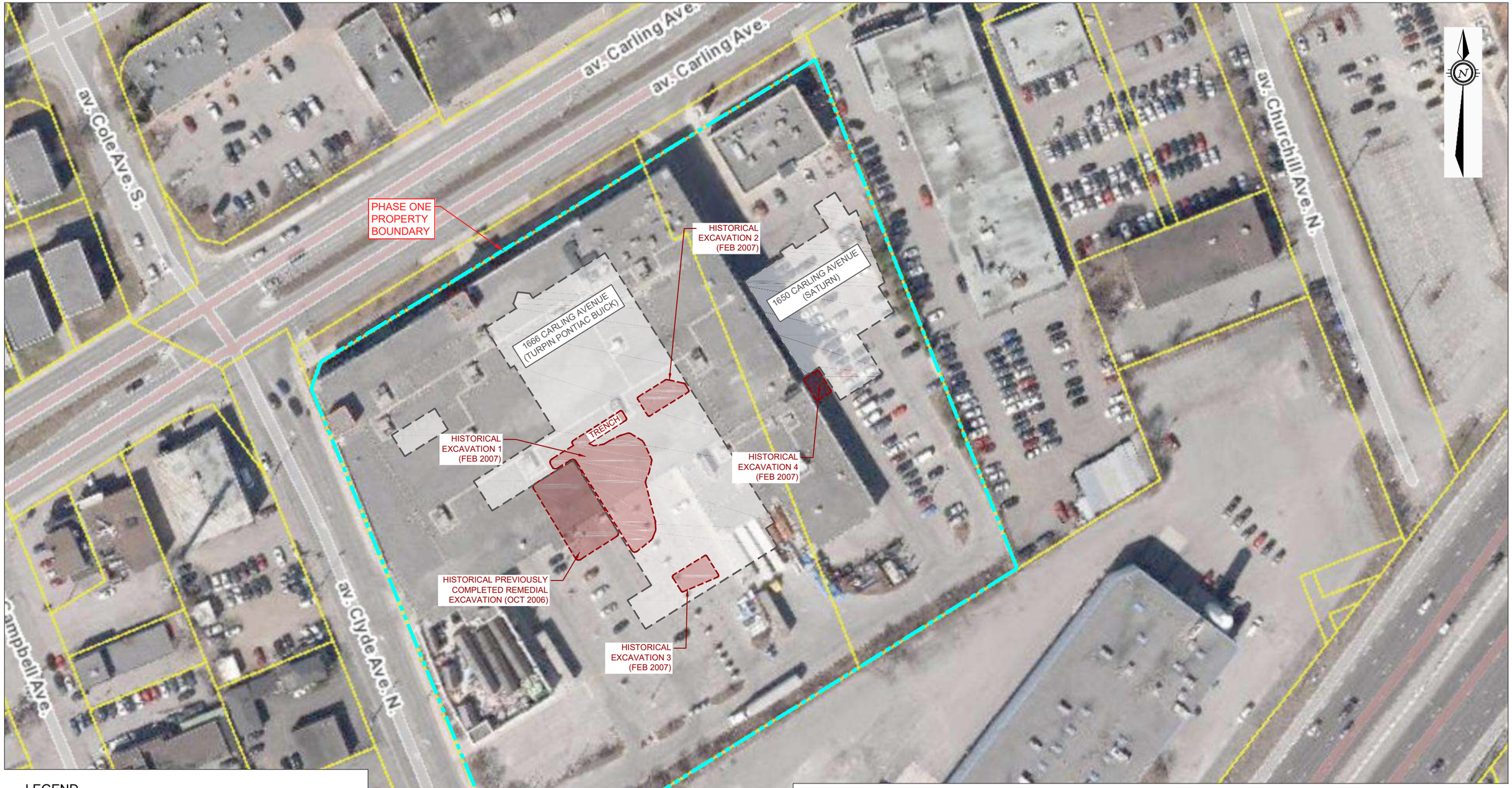
0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:1,000
DRAWN BY: AS	TITLE: SITE PLAN (HISTORICAL BOREHOLE / MONITORING WELL)		FIG 3

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:36 PM Last Plotted: Jun 22, 2023 12:37 PM Plotted by: SeverA



LEGEND

- PROPERTY BOUNDARY
- HISTORICAL BUILDINGS FOOTPRINT / OUTLINE
- HISTORICAL REMEDIAL EXCAVATION

0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:1,000
DRAWN BY: AS	TITLE: SITE PLAN (HISTORICAL REMEDIAL EXCAVATIONS)		FIG 4

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:37 PM Last Plotted: Jun 22, 2023 12:37 PM Plotted by: SeverA

LEGEND

- PROPERTY BOUNDARY
- **ENV-1** — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- **BH-1** — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- **BH/MW22-01** — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- (76.46) OVERBURDEN GROUNDWATER ELEVATION (2023)
- (72.07) BEDROCK GROUNDWATER ELEVATION (2023)

AREA OF POTENTIAL ENVIRONMENTAL CONCERN

- **APEC 1: PCA #10** - COMMERCIAL AUTOBODY SHOPS (PCA 9)
- **APEC 2: PCA #28** - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS (PCA 28)
- **APEC 3: PCA #28** - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS (PCA 29)
- **APEC 4: PCA #30** - IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY (PCA 41)
- **APEC 5: PCA #10** - COMMERCIAL AUTOBODY SHOPS (PCA 4)
- **APEC 6: PCA #28** - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS (PCA 4)
- **APEC 7: PCA #10** - COMMERCIAL AUTOBODY SHOPS (PCA 11)
- **APEC 8: PCA #10** - COMMERCIAL AUTOBODY SHOPS (PCA 14)
- **APEC 9: PCA #10** - COMMERCIAL AUTOBODY SHOPS (PCA 15)

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:1,000
DRAWN BY: AS	TITLE: PHASE TWO CONCEPTUAL SITE MODEL		FIG 5

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:37 PM Last Plotted: Jun 22, 2023 12:38 PM Plotted by: SeverA

av. Carling Ave.
av. Cole Ave. S.
av. Churchill Ave. N.
av. Clyde Ave. N.
Doheny St.

BH-1
BH-2
BR (72.07)
BH-3
BH-4
BR (72.79)
BH-5
BH-6
BH-7
BH-8
BH-9
BR (74.62)
BH-10
BH-11
BR (74.39)
BH-12
BH-13
BH/MW22-01
BR (75.57)
BH/MW22-02
BR (76.00)
BH/MW22-03
BR (75.89)
BH/MW22-04
BR (74.25)
BH/MW22-05
BR (75.01)
BH/MW22-06
BR (75.05)
ENV-1
OB (76.46)
ENV-2
OB (76.29)
ENV-3
OB (76.04)
ENV-4
OB (75.95)
ENV-5

73.0
74.0
75.0
76.0

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)
- (72.07) — GROUNDWATER ELEVATION (2023)
- OB — OVERBURDEN WELL
- BR — BEDROCK WELL
- INFERRED GROUNDWATER FLOW DIRECTION
- 75.0 — GROUNDWATER CONTOUR (m)

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:1,000
DRAWN BY: AS	TITLE: BEDROCK GROUNDWATER CONTOUR PLAN		FIG 6

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:37 PM Last Plotted: Jun 22, 2023 12:38 PM Plotted by: SeverA

av. Carling Ave.

av. Carling Ave.

av. Cole Ave S.

av. Churchill Ave. N.

Doheny St.

WASTEWATER - STORM

WASTEWATER - SANITARY

WATER - 203mm (PVC)

B

A

A'

B'

BH-1
GS = 79.74m

BH-2
GS = 78.80m
BR (72.07)

BH-3
GS = 79.11m

BH-4
GS = 78.87m
BR (72.79)

BH-5
APPROX. GS = 78.63m

BH-6
GS = 78.85m

BH-7
GS = 78.92m

BH-8
GS = 79.10m

BH-9
GS = 78.87m
BR (74.62)

BH-10
GS = 78.86

BH-11
GS = 78.90m
BR (74.39)

BH-12
GS = 78.73m

BH-13
GS = 78.96m

BH/MW22-01
BR (75.57)

BH/MW22-02
BR (76.00)

BH/MW22-03
BR (75.89)

BH/MW22-04
BR (74.25)

BH/MW22-05
BR (75.01)

BH/MW22-06
BR (75.05)

ENV-1
GS = 78.62m
OB (76.46)

ENV-2
GS = 78.96m
OB (76.29)

ENV-3
APPROX. GS = 79.08m
OB (76.04)

ENV-4
APPROX. GS = 79.08m
OB (75.95)

ENV-5
GS = 78.85m

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- GS — GROUND SURFACE ELEVATION (m)
- (72.07) — GROUNDWATER ELEVATION (2023)
- OB — OVERBURDEN WELL
- BR — BEDROCK WELL
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- A — CROSS SECTION MARK
- BUILDING FOOTPRINT OF SIX (6) PROPOSED NEW 40 STOREY HIGH-RISE RESIDENTIAL TOWERS

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

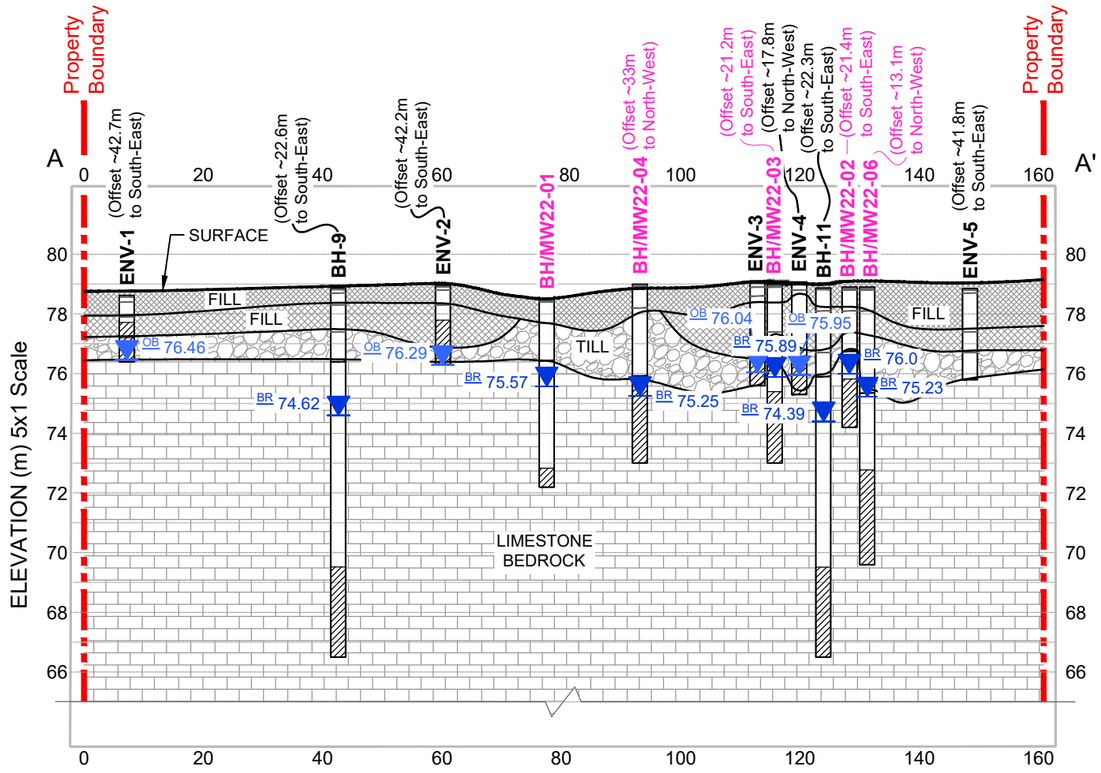
UTILITIES LEGEND:

- WASTEWATER - STORM
- WASTEWATER - SANITARY
- WATER

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

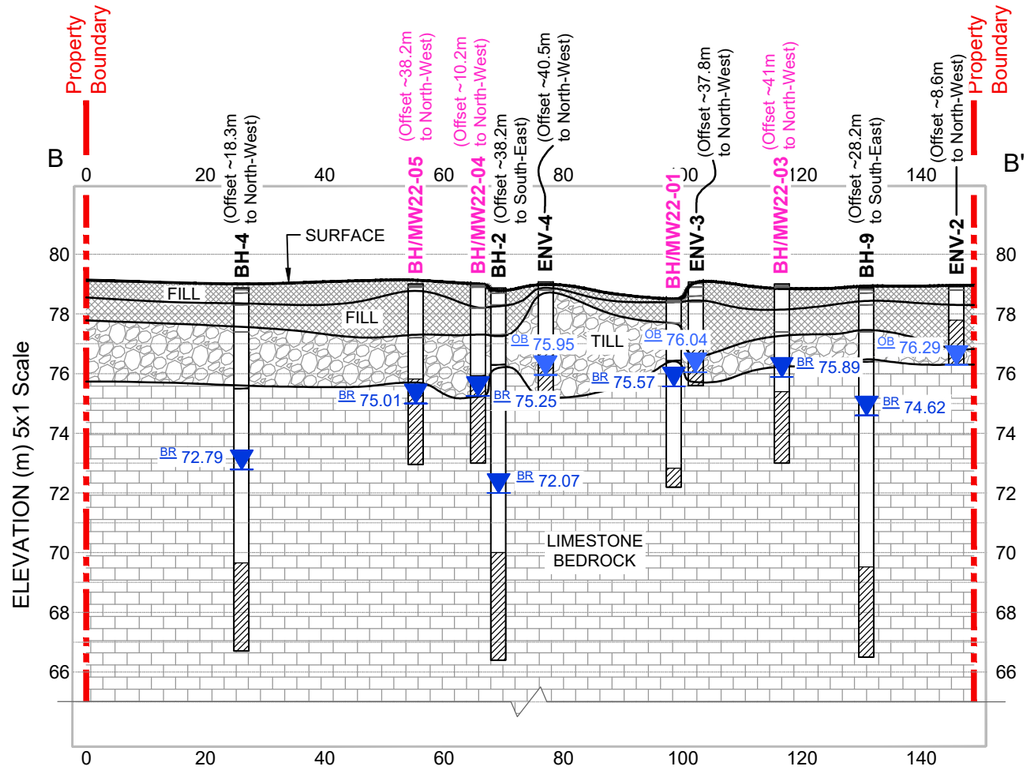
DATE: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK			scale 1:1,000
DRAWN BY: AS	TITLE: CROSS SECTION PLAN		FIG 7

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:37 PM Last Plotted: Jun 22, 2023 12:38 PM Plotted by: SeverA



HORIZONTAL DISTANCE (m) Scale as indicated

CROSS SECTION A-A'



HORIZONTAL DISTANCE (m) Scale as indicated

CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN
- OB 76.46 — OVERBURDEN GROUNDWATER ELEVATION (MAY 31, 2023)
- BR 74.61 — BEDROCK GROUNDWATER ELEVATION (MAY 31, 2023)

ORIGINAL SHEET SIZE = 11" x 17"

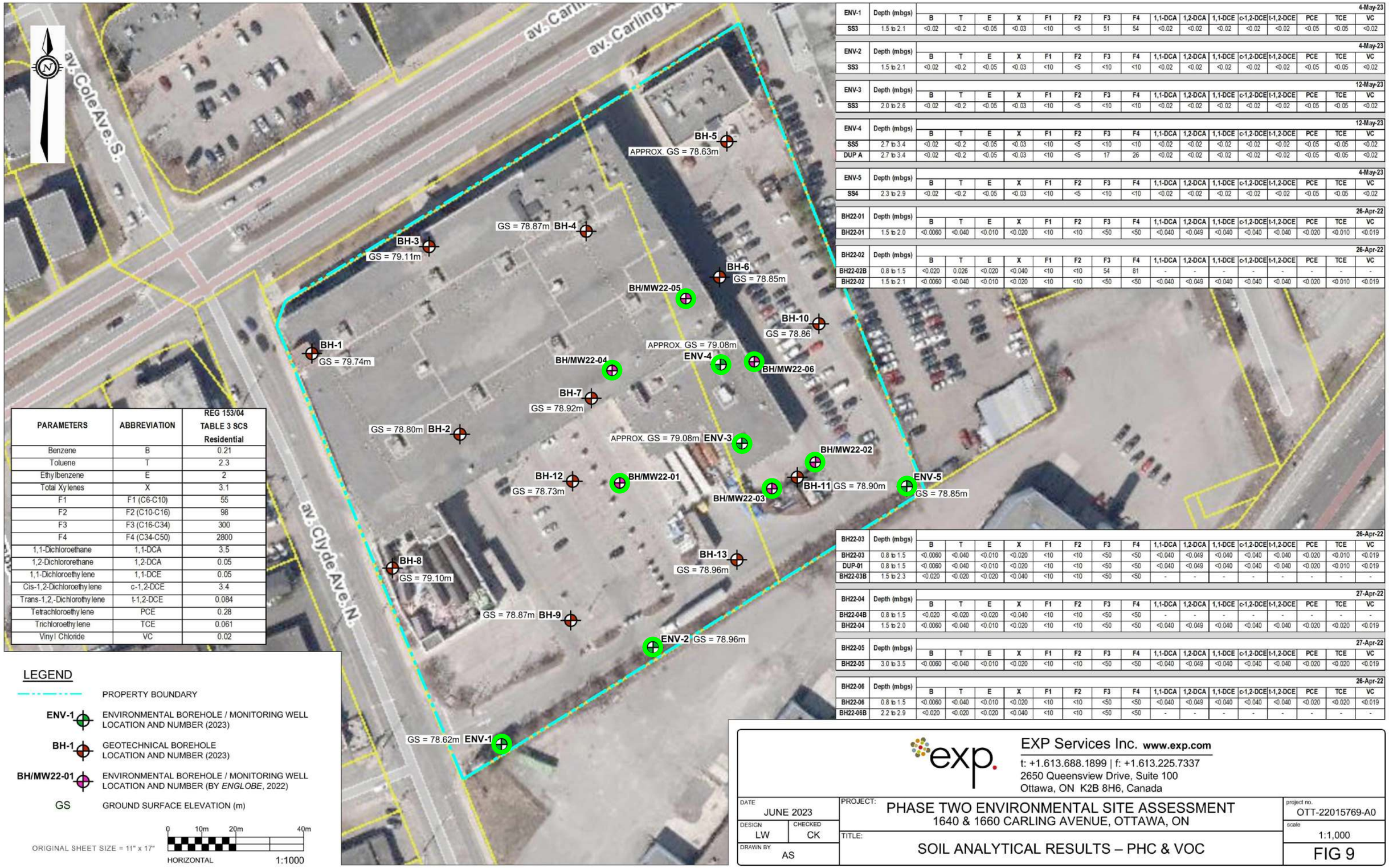
0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK		scale: 1:1,000
DRAWN BY: AS	TITLE: CROSS SECTION A-A' AND B-B'	FIG 8

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:39 PM Plotted by: SeverA



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1	F1 (C6-C10)	55
F2	F2 (C10-C16)	98
F3	F3 (C16-C34)	300
F4	F4 (C34-C50)	2800
1,1-Dichloroethane	1,1-DCA	3.5
1,2-Dichlororethane	1,2-DCA	0.05
1,1-Dichloroethylene	1,1-DCE	0.05
Cis-1,2-Dichloroethylene	c-1,2-DCE	3.4
Trans-1,2,-Dichlorothylene	t-1,2-DCE	0.084
Tetrachloroethylene	PCE	0.28
Trichloroethylene	TCE	0.061
Vinyl Chloride	VC	0.02

ENV-1	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		4-May-23															
SS3	1.5 to 2.1	<0.02	<0.2	<0.05	<0.03	<10	<5	51	54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-2	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		4-May-23															
SS3	1.5 to 2.1	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-3	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		12-May-23															
SS3	2.0 to 2.6	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-4	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		12-May-23															
SS5	2.7 to 3.4	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02
DUP A	2.7 to 3.4	<0.02	<0.2	<0.05	<0.03	<10	<5	17	26	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-5	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		4-May-23															
SS4	2.3 to 2.9	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

BH22-01	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		26-Apr-22															
BH22-01	1.5 to 2.0	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019

BH22-02	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		26-Apr-22															
BH22-02B	0.8 to 1.5	<0.020	0.026	<0.020	<0.040	<10	<10	54	81	-	-	-	-	-	-	-	-
BH22-02	1.5 to 2.1	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019

BH22-03	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		26-Apr-22															
BH22-03	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019
DUP-01	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019
BH22-03B	1.5 to 2.3	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-

BH22-04	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		27-Apr-22															
BH22-04B	0.8 to 1.5	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-
BH22-04	1.5 to 2.0	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019

BH22-05	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		27-Apr-22															
BH22-05	3.0 to 3.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019

BH22-06	Depth (mbgs)	B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		26-Apr-22															
BH22-06	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019
BH22-06B	2.2 to 2.9	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

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: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

TITLE: SOIL ANALYTICAL RESULTS – PHC & VOC

project no. OTT-22015769-A0
scale 1:1,000
FIG 9

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:39 PM Plotted by: SeverA

BH22-01	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				26-Apr-22
BH22-01	1.5 to 2.0	<0.0050	<0.0050	0.0055	0.024	0.026	0.038	0.015	0.013	0.023	<0.0050	0.052	<0.0050	0.016	0.0084	0.0095	0.018	0.0061	0.027	0.044

BH22-02	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				26-Apr-22
BH22-02	1.5 to 2.1	<0.0050	<0.0050	<0.0050	<0.0050	0.0057	0.011	0.0050	<0.0050	0.0065	<0.0050	0.012	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	0.0061	0.011

BH22-03	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				26-Apr-22
BH22-03	0.8 to 1.5	<0.0050	<0.0050	0.0054	0.025	0.025	0.038	0.019	0.013	0.023	<0.0050	0.053	<0.0050	0.017	0.0090	0.011	0.020	0.0071	0.025	0.048
DUP-01	0.8 to 1.5	<0.0050	<0.0050	0.0081	0.027	0.028	0.041	0.019	0.014	0.026	<0.0050	0.059	<0.0050	0.018	0.0054	0.0068	0.012	<0.0050	0.030	0.050

BH22-04	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				27-Apr-22
BH22-04	1.5 to 2.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050

BH22-05	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				27-Apr-22
BH22-05	3.0 to 3.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050

BH22-06	Depth (mbgs)	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
																				26-Apr-22
BH22-06	0.8 to 1.5	<0.0050	<0.0050	0.0053	0.025	0.027	0.041	0.018	0.014	0.026	<0.0050	0.054	<0.0050	0.019	<0.0050	<0.0050	<0.0071	<0.0050	0.025	0.047

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Acenaphthene	Ace	7.9
Acenaphthylene	Acl	0.15
Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b)F	0.78
Benzo(ghi)perylene	B(ghi)P	6.6
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7
Dibenzo(a,h)anthracene	DA	0.1
Fluoranthene	FI	0.69
Fluorene	F	62
Indeno(1,2,3-cd)pyrene	I(123)P	0.38
1-Methylnaphthalene	1-MN	0.99
2-Methylnaphthalene	2-MN	0.99
Methylnaphthalene, 2-(1-)	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78

av. Cole Ave. S.
av. Carling Ave.
av. Clyde Ave. N.
BH-5
APPROX. GS = 78.63m
GS = 78.87m BH-4
BH-3
GS = 79.11m
BH-6
GS = 78.85m
BH/MW22-05
BH-10
GS = 78.86
APPROX. GS = 79.08m
ENV-4
BH-1
GS = 79.74m
BH/MW22-04
BH/MW22-06
BH-7
GS = 78.92m
GS = 78.80m BH-2
APPROX. GS = 79.08m ENV-3
BH/MW22-02
BH-12
GS = 78.73m
BH/MW22-01
BH-11 GS = 78.90m
BH/MW22-03
ENV-5
GS = 78.85m
BH-13
GS = 78.96m
BH-8
GS = 79.10m
GS = 78.87m BH-9
ENV-2 GS = 78.96m
GS = 78.62m ENV-1

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)

ORIGINAL SHEET SIZE = 11" x 17"

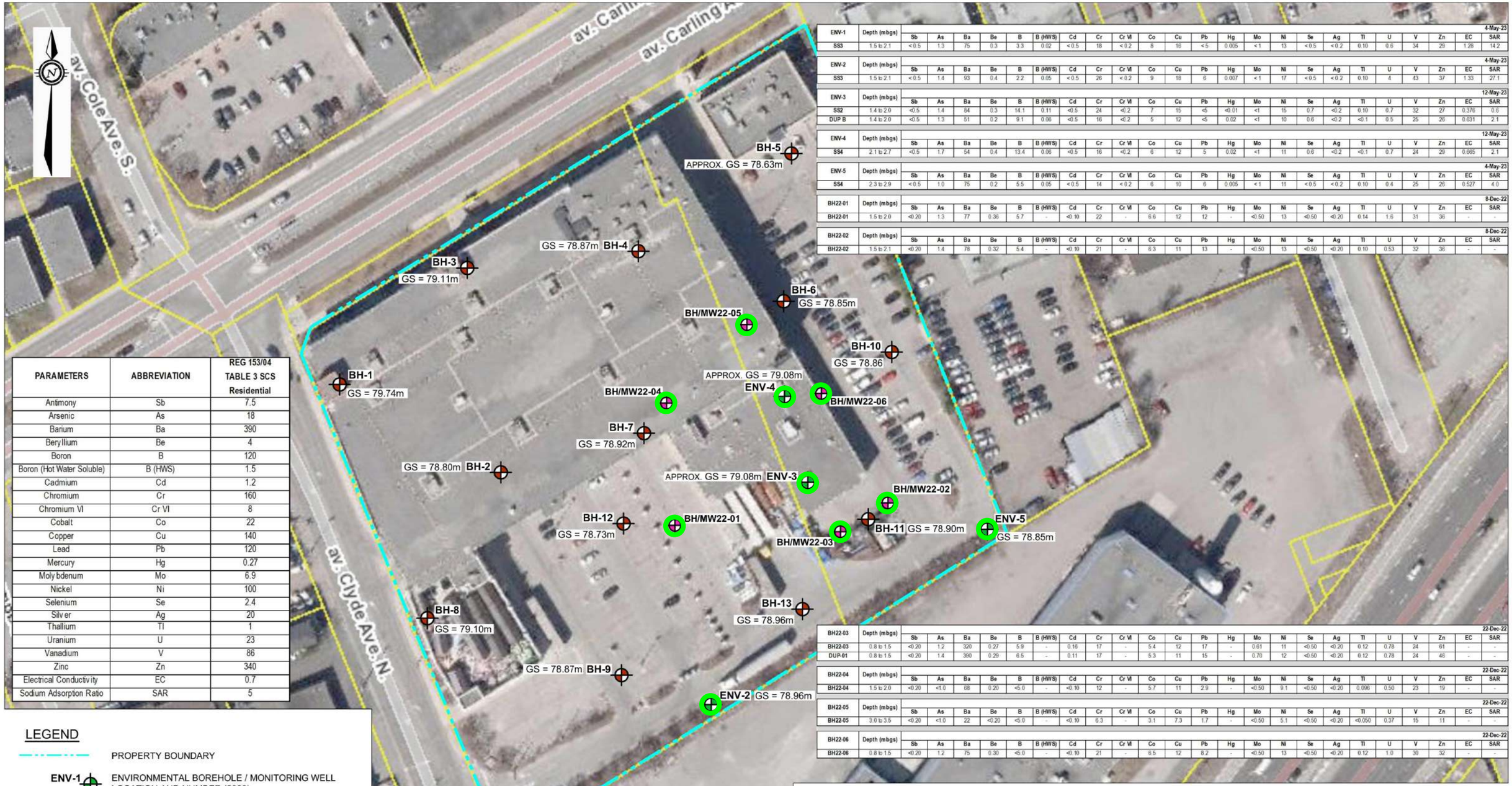
0 10m 20m 40m

HORIZONTAL 1:1000

exp.
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	PROJECT:	project no.
JUNE 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	OTT-22015769-A0
DESIGN: LW / CHECKED: CK	TITLE:	scale: 1:1,000
DRAWN BY: AS	SOIL ANALYTICAL RESULTS – PAH	FIG 10

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:40 PM Plotted by: SeverA



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Boron (Hot Water Soluble)	B (HWS)	1.5
Cadmium	Cd	1.2
Chromium	Cr	160
Chromium VI	Cr VI	8
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Mercury	Hg	0.27
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
Electrical Conductivity	EC	0.7
Sodium Adsorption Ratio	SAR	5

ENV-1	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS3	1.5 to 2.1	<0.5	1.3	75	0.3	3.3	0.02	<0.5	18	<0.2	8	16	<5	0.005	<1	13	<0.5	<0.2	0.10	0.6	34	29	1.28	14.2

ENV-2	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS3	1.5 to 2.1	<0.5	1.4	93	0.4	2.2	0.05	<0.5	26	<0.2	9	18	6	0.007	<1	17	<0.5	<0.2	0.10	4	43	37	1.33	27.1

ENV-3	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								12-May-23
SS2	1.4 to 2.0	<0.5	1.4	84	0.3	14.1	0.11	<0.5	24	<0.2	7	15	<5	<0.01	<1	15	0.7	<0.2	0.10	0.7	32	27	0.376	0.6
DUP B	1.4 to 2.0	<0.5	1.3	51	0.2	9.1	0.06	<0.5	16	<0.2	5	12	<5	0.02	<1	10	0.6	<0.2	<0.1	0.5	25	26	0.631	2.1

ENV-4	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								12-May-23
SS4	2.1 to 2.7	<0.5	1.7	54	0.4	13.4	0.06	<0.5	16	<0.2	6	12	5	0.02	<1	11	0.6	<0.2	<0.1	0.7	24	29	0.665	2.1

ENV-5	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS4	2.3 to 2.9	<0.5	1.0	75	0.2	5.5	0.05	<0.5	14	<0.2	6	10	6	0.005	<1	11	<0.5	<0.2	0.10	0.4	25	26	0.527	4.0

BH22-01	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								8-Dec-22
BH22-01	1.5 to 2.0	<0.20	1.3	77	0.36	5.7	-	<0.10	22	-	6.6	12	12	-	<0.50	13	<0.50	<0.20	0.14	1.6	31	36	-	-

BH22-02	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								8-Dec-22
BH22-02	1.5 to 2.1	<0.20	1.4	78	0.32	5.4	-	<0.10	21	-	6.3	11	13	-	<0.50	13	<0.50	<0.20	0.10	0.53	32	36	-	-

BH22-03	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-03	0.8 to 1.5	<0.20	1.2	320	0.27	5.9	-	0.16	17	-	5.4	12	17	-	0.61	11	<0.50	<0.20	0.12	0.78	24	61	-	-
DUP-01	0.8 to 1.5	<0.20	1.4	390	0.29	6.5	-	0.11	17	-	5.3	11	15	-	0.70	12	<0.50	<0.20	0.12	0.78	24	46	-	-

BH22-04	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-04	1.5 to 2.0	<0.20	<1.0	68	0.20	<5.0	-	<0.10	12	-	5.7	11	2.9	-	<0.50	9.1	<0.50	<0.20	0.096	0.50	23	19	-	-

BH22-05	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-05	3.0 to 3.5	<0.20	<1.0	22	<0.20	<5.0	-	<0.10	6.3	-	3.1	7.3	1.7	-	<0.50	5.1	<0.50	<0.20	<0.050	0.37	15	11	-	-

BH22-06	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-06	0.8 to 1.5	<0.20	1.2	75	0.30	<5.0	-	<0.10	21	-	6.6	12	8.2	-	<0.50	13	<0.50	<0.20	0.12	1.0	30	32	-	-

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)

ORIGINAL SHEET SIZE = 11" x 17"

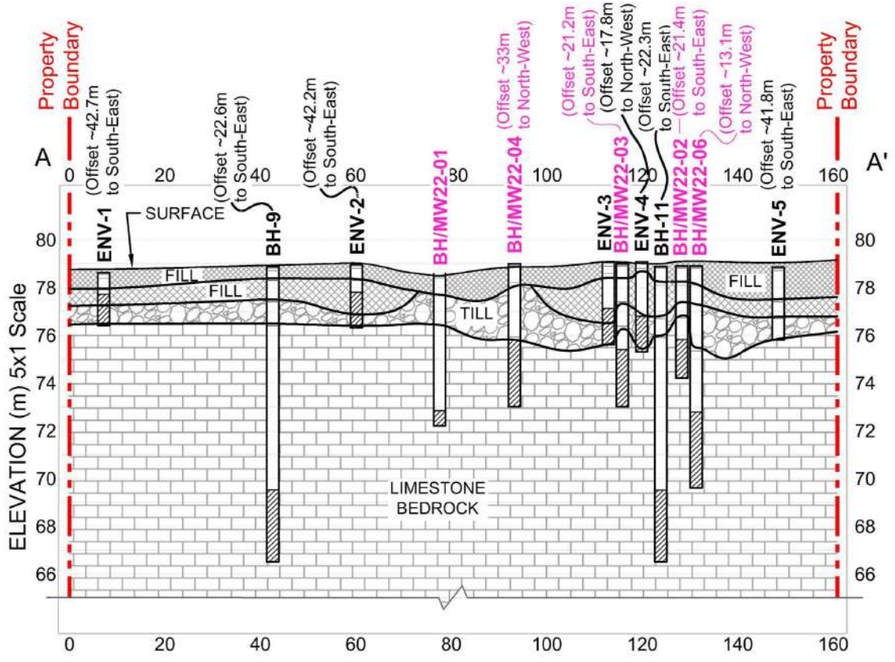
0 10m 20m 40m

HORIZONTAL 1:1000

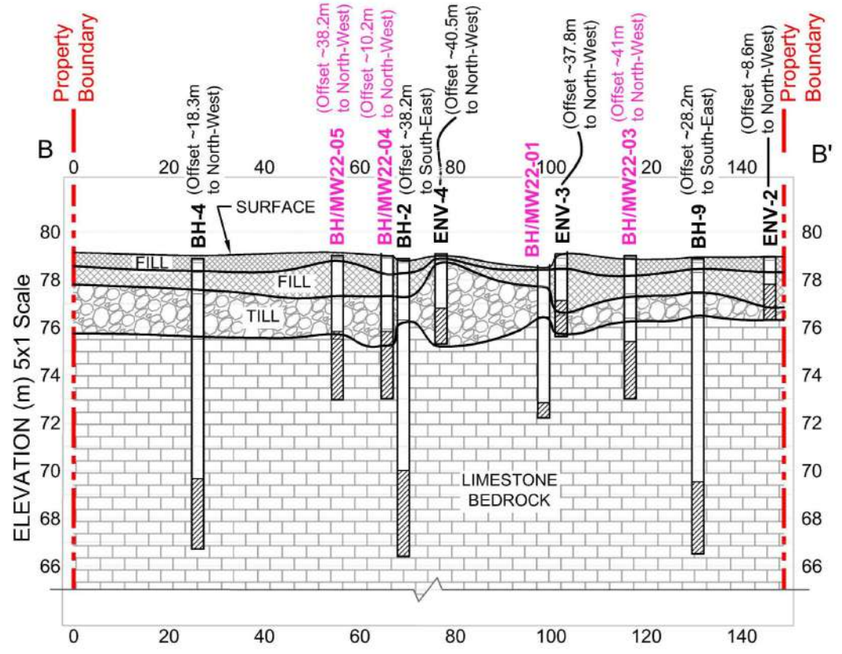
EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE: JUNE 2023	PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON		project no. OTT-22015769-A0
DESIGN: LW / CHECKED: CK	TITLE: SOIL ANALYTICAL RESULTS – METALS		scale 1:1,000
DRAWN BY: AS			FIG 11

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:41 PM Plotted by: SeverA



CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN

ENV-1	Depth (mbgs)	4-May-23															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
SS3	1.5 to 2.1	<0.02	<0.2	<0.05	<0.03	<10	<5	51	54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-2	Depth (mbgs)	4-May-23															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
SS3	1.5 to 2.1	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-3	Depth (mbgs)	12-May-23															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
SS3	2.0 to 2.6	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-4	Depth (mbgs)	12-May-23															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
SS5	2.7 to 3.4	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02
DUP A	2.7 to 3.4	<0.02	<0.2	<0.05	<0.03	<10	<5	17	26	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

ENV-5	Depth (mbgs)	4-May-23															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
SS4	2.3 to 2.9	<0.02	<0.2	<0.05	<0.03	<10	<5	<10	<10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02

BH22-01	Depth (mbgs)	26-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-01	1.5 to 2.0	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019

BH22-02	Depth (mbgs)	26-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-02B	0.8 to 1.5	<0.020	0.026	<0.020	<0.040	<10	<10	54	81	-	-	-	-	-	-	-	-
BH22-02	1.5 to 2.1	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019

BH22-03	Depth (mbgs)	26-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-03	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019
DUP-01	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.010	<0.019
BH22-03B	1.5 to 2.3	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-

BH22-04	Depth (mbgs)	27-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-04B	0.8 to 1.5	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-
BH22-04	1.5 to 2.0	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019

BH22-05	Depth (mbgs)	27-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-05	3.0 to 3.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019

BH22-06	Depth (mbgs)	26-Apr-22															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
BH22-06	0.8 to 1.5	<0.0060	<0.040	<0.010	<0.020	<10	<10	<50	<50	<0.040	<0.049	<0.040	<0.040	<0.040	<0.020	<0.020	<0.019
BH22-06B	2.2 to 2.9	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50	-	-	-	-	-	-	-	-

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1	F1 (C6-C10)	55
F2	F2 (C10-C16)	98
F3	F3 (C16-C34)	300
F4	F4 (C34-C50)	2800
1,1-Dichloroethane	1,1-DCA	3.5
1,2-Dichlororethane	1,2-DCA	0.05
1,1-Dichloroethylene	1,1-DCE	0.05
Cis-1,2-Dichloroethylene	c-1,2-DCE	3.4
Trans-1,2,-Dichlorothylene	t-1,2-DCE	0.084
Tetrachloroethylene	PCE	0.28
Trichloroethylene	TCE	0.061
Vinyl Chloride	VC	0.02

ORIGINAL SHEET SIZE = 11" x 17"

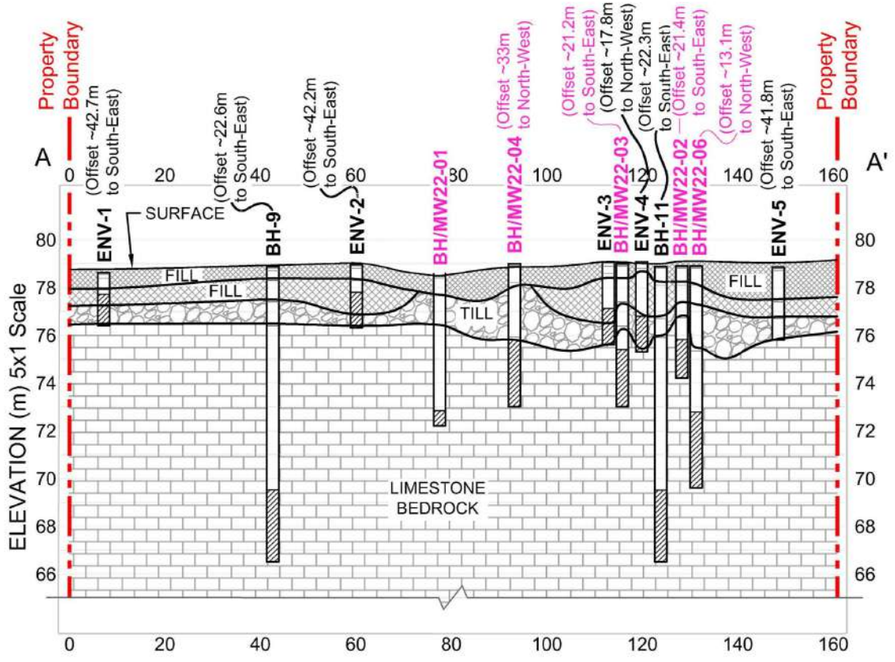
0 10m 20m 50m

HORIZONTAL 1:1250

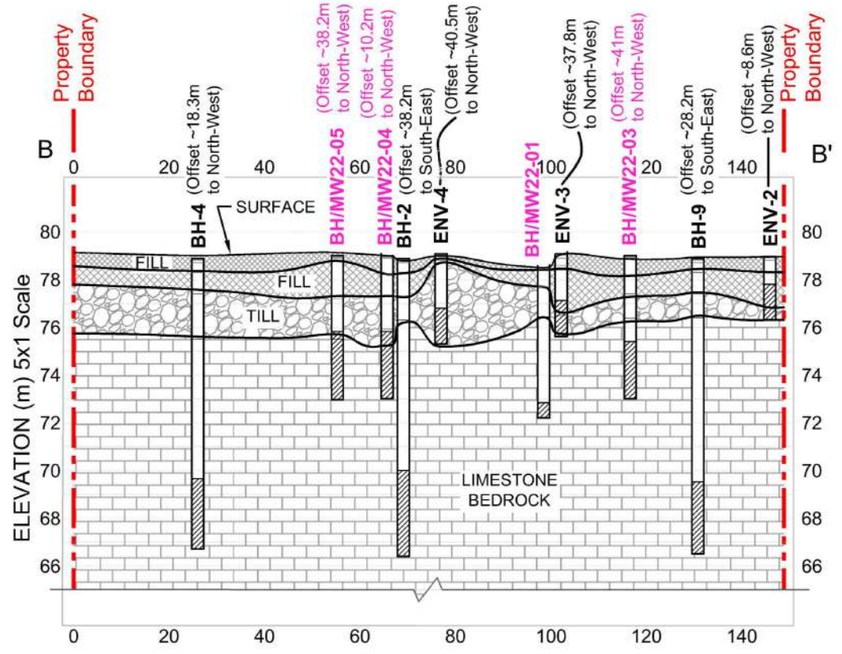
EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE	PROJECT:	project no.
JUNE 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	OTT-22015769-A0
DESIGN: LW / CHECKED: CK		scale: 1:1,250
DRAWN BY: AS	TITLE: SOIL CROSS SECTION A-A' AND B-B' – PHC & VOC	FIG 12

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:42 PM Plotted by: SeverA



CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN

BH22-01	Depth (mbgs)	26-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-01	1.5 to 2.0	<0.0050	<0.0050	0.0055	0.024	0.026	0.038	0.015	0.013	0.023	<0.0050	0.052	<0.0050	0.016	0.0084	0.0095	0.018	0.0061	0.027	0.044

BH22-02	Depth (mbgs)	26-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-02	1.5 to 2.1	<0.0050	<0.0050	<0.0050	<0.0050	0.0057	0.011	0.0050	<0.0050	0.0065	<0.0050	0.012	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	0.0061	0.011

BH22-03	Depth (mbgs)	26-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-03	0.8 to 1.5	<0.0050	<0.0050	0.0054	0.025	0.025	0.038	0.019	0.013	0.023	<0.0050	0.053	<0.0050	0.017	0.0090	0.011	0.020	0.0071	0.025	0.048
DUP-01	0.8 to 1.5	<0.0050	<0.0050	0.0081	0.027	0.028	0.041	0.019	0.014	0.026	<0.0050	0.059	<0.0050	0.018	0.0054	0.0068	0.012	<0.0050	0.030	0.050

BH22-04	Depth (mbgs)	27-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-04	1.5 to 2.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050

BH22-05	Depth (mbgs)	27-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-05	3.0 to 3.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050

BH22-06	Depth (mbgs)	26-Apr-22																		
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
BH22-06	0.8 to 1.5	<0.0050	<0.0050	0.0053	0.025	0.027	0.041	0.018	0.014	0.026	<0.0050	0.054	<0.0050	0.019	<0.0050	<0.0050	<0.0071	<0.0050	0.025	0.047

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Acenaphthene	Ace	7.9
Acenaphthylene	Acl	0.15
Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b)F	0.78
Benzo(ghi)perylene	B(ghi)P	6.6
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7
Dibenzo(a,h)anthracene	DA	0.1
Fluoranthene	Fl	0.69
Fluorene	F	62
Indeno(1,2,3-cd)pyrene	I(123)P	0.38
1-Methylnaphthalene	1-MN	0.99
2-Methylnaphthalene	2-MN	0.99
Methylnaphthalene, 2-(1-)	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78

ORIGINAL SHEET SIZE = 11" x 17"

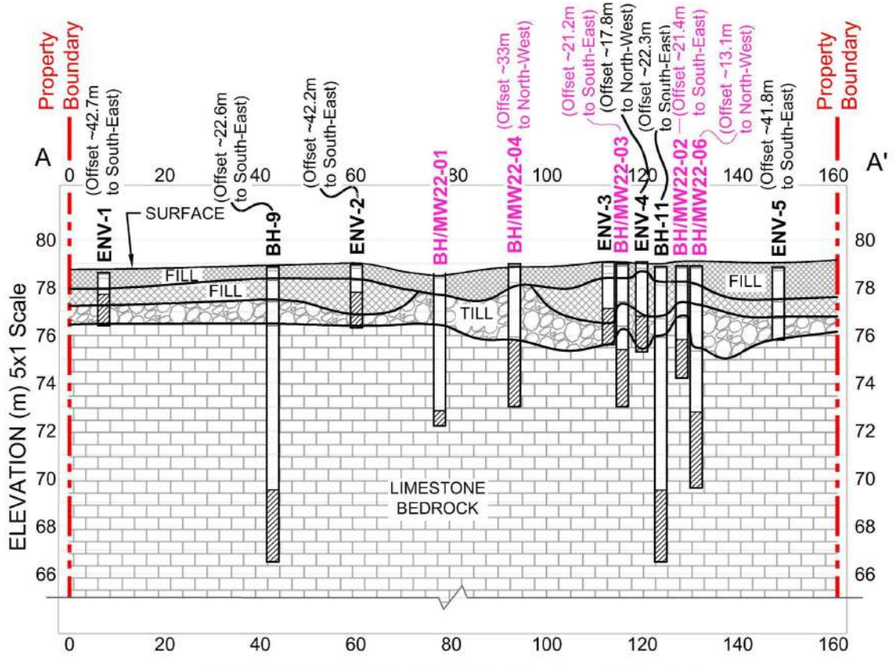
0 10m 20m 50m

HORIZONTAL 1:1250

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

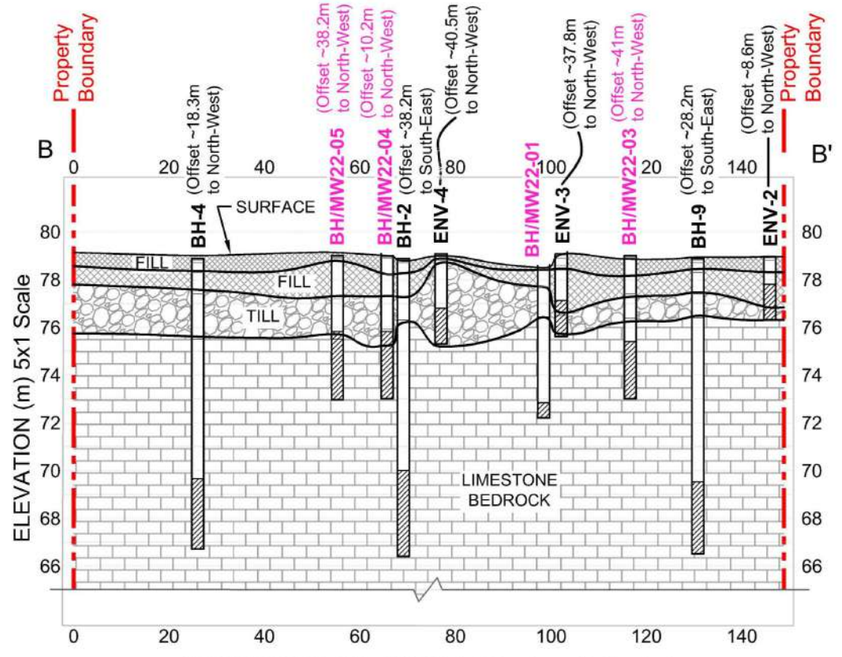
DATE	PROJECT:	project no.
JUNE 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	OTT-22015769-A0
DESIGN: LW / CHECKED: CK		scale: 1:1,250
DRAWN BY: AS	TITLE: SOIL CROSS SECTION A-A' AND B-B' – PAH	FIG 13

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:43 PM Plotted by: SeverA



HORIZONTAL DISTANCE (m) Scale as indicated

CROSS SECTION A-A'



HORIZONTAL DISTANCE (m) Scale as indicated

CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN

ENV-1	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS3	1.5 to 2.1	< 0.5	1.3	75	0.3	3.3	0.02	< 0.5	18	< 0.2	8	16	< 5	0.005	< 1	13	< 0.5	< 0.2	0.10	0.6	34	29	1.28	14.2

ENV-2	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS3	1.5 to 2.1	< 0.5	1.4	93	0.4	2.2	0.05	< 0.5	26	< 0.2	9	18	6	0.007	< 1	17	< 0.5	< 0.2	0.10	4	43	37	1.33	27.1

ENV-3	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								12-May-23
SS2	1.4 to 2.0	<0.5	1.4	84	0.3	14.1	0.11	<0.5	24	<0.2	7	15	<5	<0.01	<1	15	0.7	<0.2	0.10	0.7	32	27	0.376	0.6
DUP B	1.4 to 2.0	<0.5	1.3	51	0.2	9.1	0.06	<0.5	16	<0.2	5	12	<5	0.02	<1	10	0.6	<0.2	<0.1	0.5	25	26	0.631	2.1

ENV-4	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								12-May-23
SS4	2.1 to 2.7	<0.5	1.7	54	0.4	13.4	0.06	<0.5	16	<0.2	6	12	5	0.02	<1	11	0.6	<0.2	<0.1	0.7	24	29	0.665	2.1

ENV-5	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								4-May-23
SS4	2.3 to 2.9	< 0.5	1.0	75	0.2	5.5	0.05	< 0.5	14	< 0.2	6	10	6	0.005	< 1	11	< 0.5	< 0.2	0.10	0.4	25	26	0.527	4.0

BH22-01	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								8-Dec-22
BH22-01	1.5 to 2.0	<0.20	1.3	77	0.36	5.7	-	<0.10	22	-	6.6	12	12	-	<0.50	13	<0.50	<0.20	0.14	1.6	31	36	-	-

BH22-02	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								8-Dec-22
BH22-02	1.5 to 2.1	<0.20	1.4	78	0.32	5.4	-	<0.10	21	-	6.3	11	13	-	<0.50	13	<0.50	<0.20	0.10	0.53	32	36	-	-

BH22-03	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-03	0.8 to 1.5	<0.20	1.2	320	0.27	5.9	-	0.16	17	-	5.4	12	17	-	0.61	11	<0.50	<0.20	0.12	0.78	24	61	-	-
DUP-01	0.8 to 1.5	<0.20	1.4	390	0.29	6.5	-	0.11	17	-	5.3	11	15	-	0.70	12	<0.50	<0.20	0.12	0.78	24	46	-	-

BH22-04	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-04	1.5 to 2.0	<0.20	<1.0	68	0.20	<5.0	-	<0.10	12	-	5.7	11	2.9	-	<0.50	9.1	<0.50	<0.20	0.096	0.50	23	19	-	-

BH22-05	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-05	3.0 to 3.5	<0.20	<1.0	22	<0.20	<5.0	-	<0.10	6.3	-	3.1	7.3	1.7	-	<0.50	5.1	<0.50	<0.20	<0.050	0.37	15	11	-	-

BH22-06	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	EC	SAR
																								22-Dec-22
BH22-06	0.8 to 1.5	<0.20	1.2	75	0.30	<5.0	-	<0.10	21	-	6.5	12	8.2	-	<0.50	13	<0.50	<0.20	0.12	1.0	30	32	-	-

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Boron (Hot Water Soluble)	B (HWS)	1.5
Cadmium	Cd	1.2
Chromium	Cr	160
Chromium VI	Cr VI	8
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Mercury	Hg	0.27
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
Electrical Conductivity	EC	0.7
Sodium Adsorption Ratio	SAR	5

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 50m

HORIZONTAL 1:1250

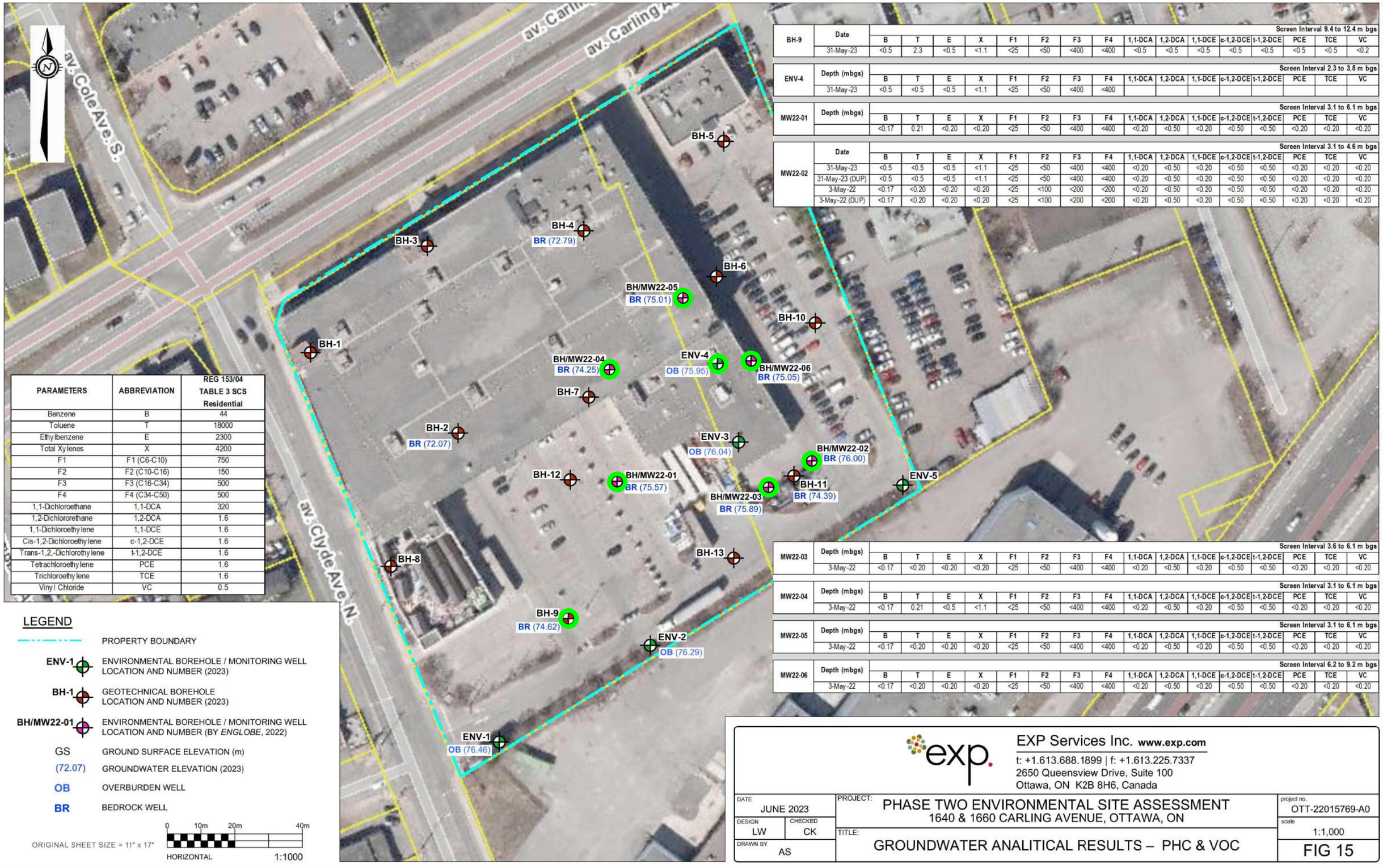
EXP Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6, Canada

DATE: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

TITLE: SOIL CROSS SECTION A-A' AND B-B' – METALS

project no. OTT-22015769-A0
scale 1:1,250
FIG 14



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Benzene	B	44
Toluene	T	18000
Ethylbenzene	E	2300
Total Xylenes	X	4200
F1	F1 (C6-C10)	750
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500
1,1-Dichloroethane	1,1-DCA	320
1,2-Dichlororethane	1,2-DCA	1.6
1,1-Dichloroethylene	1,1-DCE	1.6
Cis-1,2-Dichloroethylene	c-1,2-DCE	1.6
Trans-1,2,-Dichlorothylene	t-1,2-DCE	1.6
Tetrachloroethylene	PCE	1.6
Trichloroethylene	TCE	1.6
Vinyl Chloride	VC	0.5

BH-9	Date	Screen Interval 9.4 to 12.4 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	2.3	<0.5	<1.1	<25	<50	<400	<400	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2

ENV-4	Depth (mbgs)	Screen Interval 2.3 to 3.8 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400								

MW22-01	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		<0.17	0.21	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-02	Date	Screen Interval 3.1 to 4.6 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	31-May-23 (DUP)	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	3-May-22 (DUP)	<0.17	<0.20	<0.20	<0.20	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-03	Depth (mbgs)	Screen Interval 3.6 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-04	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	0.21	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-05	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-06	Depth (mbgs)	Screen Interval 6.2 to 9.2 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)
- (72.07) — GROUNDWATER ELEVATION (2023)
- OB — OVERBURDEN WELL
- BR — BEDROCK WELL

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

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

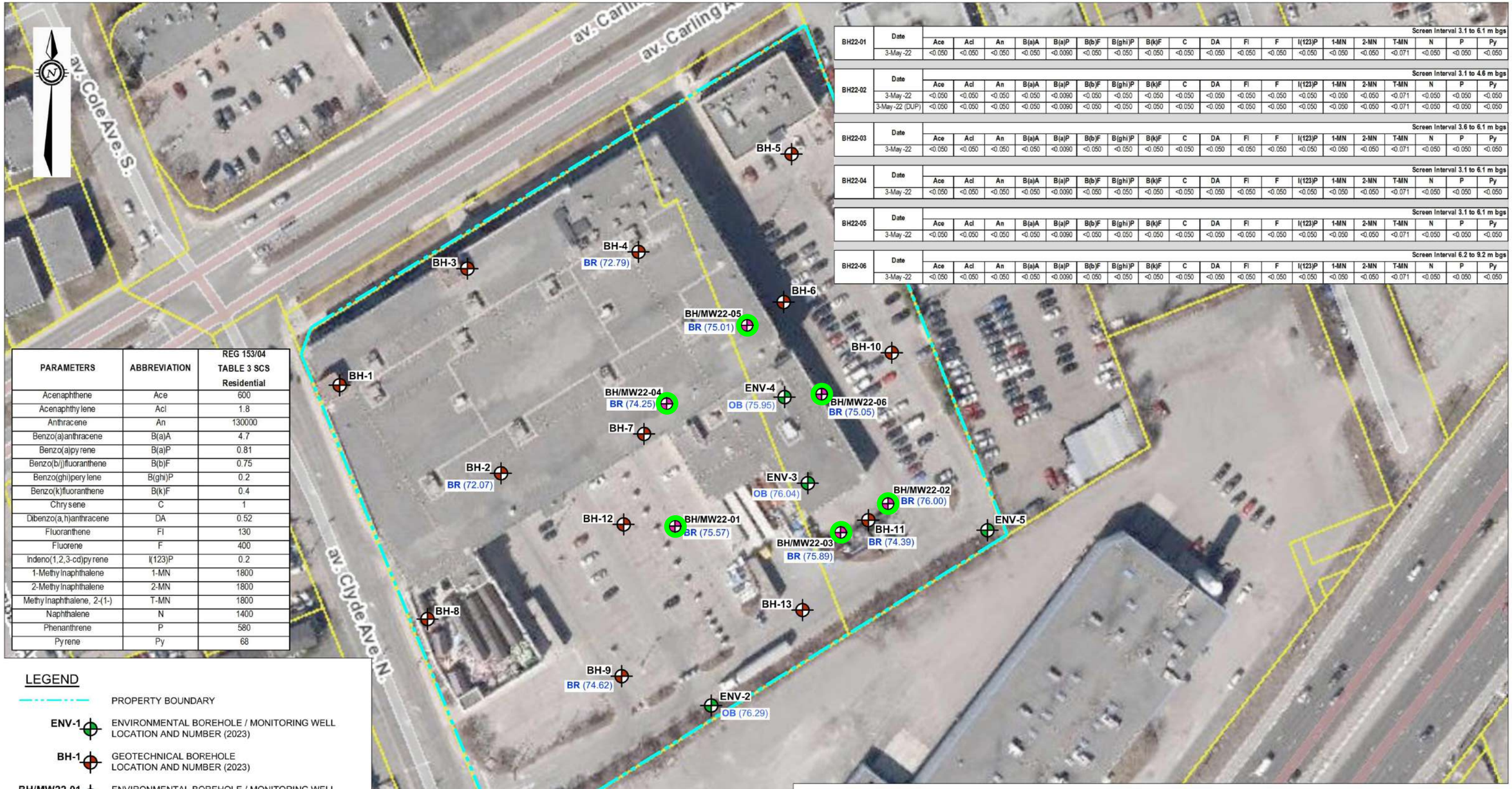
DATE: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

TITLE: GROUNDWATER ANALITICAL RESULTS – PHC & VOC

project no. OTT-22015769-A0
scale 1:1,000
FIG 15

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:38 PM Last Plotted: Jun 22, 2023 12:45 PM Plotted by: SeverA



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Acenaphthene	Ace	600
Acenaphthylene	Acl	1.8
Anthracene	An	130000
Benzo(a)anthracene	B(a)A	4.7
Benzo(a)pyrene	B(a)P	0.81
Benzo(b/j)fluoranthene	B(b)F	0.75
Benzo(ghi)perylene	B(ghi)P	0.2
Benzo(k)fluoranthene	B(k)F	0.4
Chrysene	C	1
Dibenzo(a,h)anthracene	DA	0.52
Fluoranthene	Fl	130
Fluorene	F	400
Indeno(1,2,3-cd)pyrene	I(123)P	0.2
1-Methylnaphthalene	1-MN	1800
2-Methylnaphthalene	2-MN	1800
Methylnaphthalene, 2-(1-)	T-MN	1800
Naphthalene	N	1400
Phenanthrene	P	580
Pyrene	Py	68

BH22-01	Date	Screen Interval 3.1 to 6.1 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-02	Date	Screen Interval 3.1 to 4.6 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050
	3-May -22 (DUP)	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-03	Date	Screen Interval 3.6 to 6.1 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-04	Date	Screen Interval 3.1 to 6.1 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-05	Date	Screen Interval 3.1 to 6.1 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-06	Date	Screen Interval 6.2 to 9.2 m bgs																	
		Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
	3-May -22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

LEGEND

- PROPERTY BOUNDARY
- ENV-1 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- BH-1 — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- BH/MW22-01 — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)
- (72.07) — GROUNDWATER ELEVATION (2023)
- OB — OVERBURDEN WELL
- BR — BEDROCK WELL

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

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

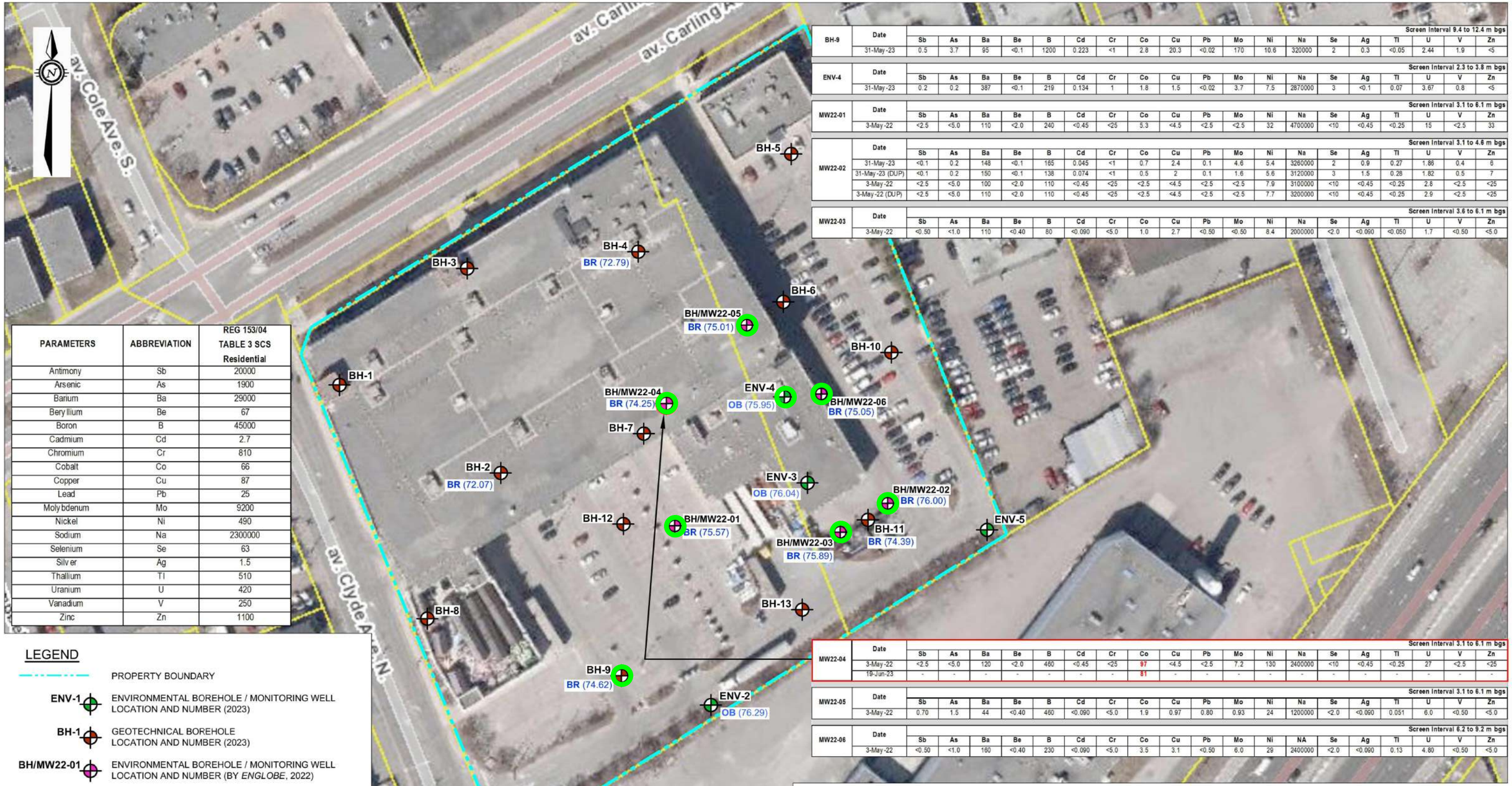
DATE: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

TITLE: GROUNDWATER ANALITICAL RESULTS – PAH

project no. OTT-22015769-A0
scale 1:1,000
FIG 16

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:45 PM Last Plotted: Jun 22, 2023 12:46 PM Plotted by: SeverA



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Antimony	Sb	20000
Arsenic	As	1900
Barium	Ba	29000
Beryllium	Be	67
Boron	B	45000
Cadmium	Cd	2.7
Chromium	Cr	810
Cobalt	Co	66
Copper	Cu	87
Lead	Pb	25
Molybdenum	Mo	9200
Nickel	Ni	490
Sodium	Na	2300000
Selenium	Se	63
Silver	Ag	1.5
Thallium	Tl	510
Uranium	U	420
Vanadium	V	250
Zinc	Zn	1100

LEGEND

- PROPERTY BOUNDARY
- **ENV-1** — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (2023)
- **BH-1** — GEOTECHNICAL BOREHOLE LOCATION AND NUMBER (2023)
- **BH/MW22-01** — ENVIRONMENTAL BOREHOLE / MONITORING WELL LOCATION AND NUMBER (BY *ENGLOBE*, 2022)
- GS — GROUND SURFACE ELEVATION (m)
- (72.07) — GROUNDWATER ELEVATION (2023)
- **OB** — OVERBURDEN WELL
- **BR** — BEDROCK WELL
- SAMPLE EXCEEDS TABLE 3 SCS REGULATIONS

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 40m

HORIZONTAL 1:1000

BH-9	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 9.4 to 12.4 m bgs	31-May-23	0.5	3.7	95	<0.1	1200	0.223	<1	2.8	20.3	<0.02	170	10.6	320000	2	0.3	<0.05	2.44	1.9	<5

ENV-4	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 2.3 to 3.8 m bgs	31-May-23	0.2	0.2	387	<0.1	219	0.134	1	1.8	1.5	<0.02	3.7	7.5	2870000	3	<0.1	0.07	3.67	0.8	<5

MW22-01	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 3.1 to 6.1 m bgs	3-May-22	<2.5	<5.0	110	<2.0	240	<0.45	<25	5.3	<4.5	<2.5	<2.5	32	4700000	<10	<0.45	<0.25	15	<2.5	33

MW22-02	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 3.1 to 4.6 m bgs	31-May-23	<0.1	0.2	148	<0.1	165	0.045	<1	0.7	2.4	0.1	4.6	5.4	3260000	2	0.9	0.27	1.86	0.4	6
	31-May-23 (DUP)	<0.1	0.2	150	<0.1	138	0.074	<1	0.5	2	0.1	1.6	5.6	3120000	3	1.5	0.28	1.82	0.5	7
	3-May-22	<2.5	<5.0	100	<2.0	110	<0.45	<25	<2.5	<4.5	<2.5	<2.5	7.9	3100000	<10	<0.45	<0.25	2.8	<2.5	<25
	3-May-22 (DUP)	<2.5	<5.0	110	<2.0	110	<0.45	<25	<2.5	<4.5	<2.5	<2.5	7.7	3200000	<10	<0.45	<0.25	2.9	<2.5	<25

MW22-03	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 3.6 to 6.1 m bgs	3-May-22	<0.50	<1.0	110	<0.40	80	<0.090	<5.0	1.0	2.7	<0.50	<0.50	8.4	2000000	<2.0	<0.090	<0.050	1.7	<0.50	<5.0

MW22-04	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 3.1 to 6.1 m bgs	3-May-22	<2.5	<5.0	120	<2.0	460	<0.45	<25	97	<4.5	<2.5	7.2	130	2400000	<10	<0.45	<0.25	27	<2.5	<25
	19-Jun-23	-	-	-	-	-	-	-	81	-	-	-	-	-	-	-	-	-	-	-

MW22-05	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
Screen Interval 3.1 to 6.1 m bgs	3-May-22	0.70	1.5	44	<0.40	480	<0.090	<5.0	1.9	0.97	0.80	0.93	24	1200000	<2.0	<0.090	0.051	6.0	<0.50	<5.0

MW22-06	Date	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	NA	Se	Ag	Tl	U	V	Zn
Screen Interval 6.2 to 9.2 m bgs	3-May-22	<0.50	<1.0	160	<0.40	230	<0.090	<5.0	3.5	3.1	<0.50	6.0	29	2400000	<2.0	<0.090	0.13	4.80	<0.50	<5.0

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

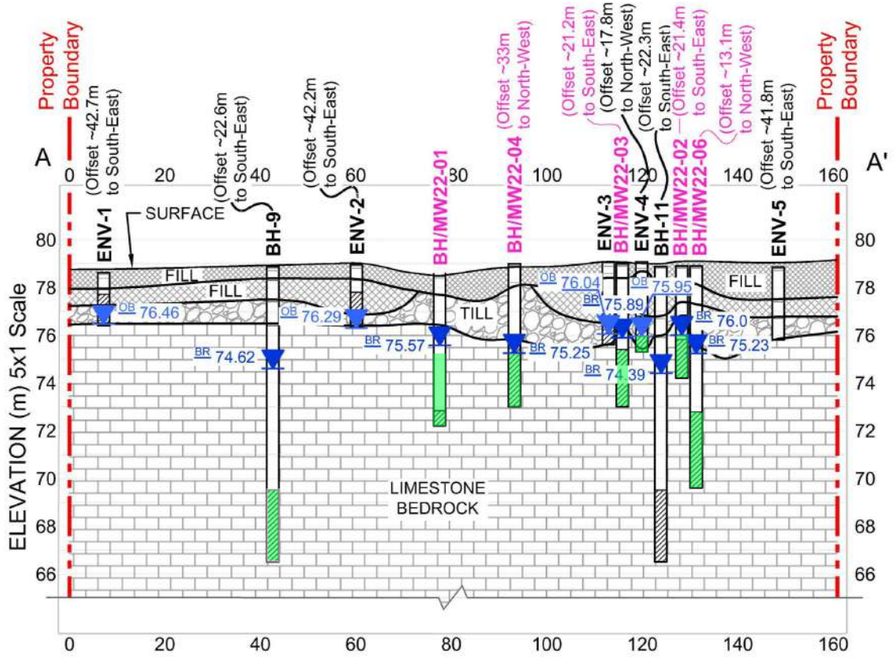
DATE: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

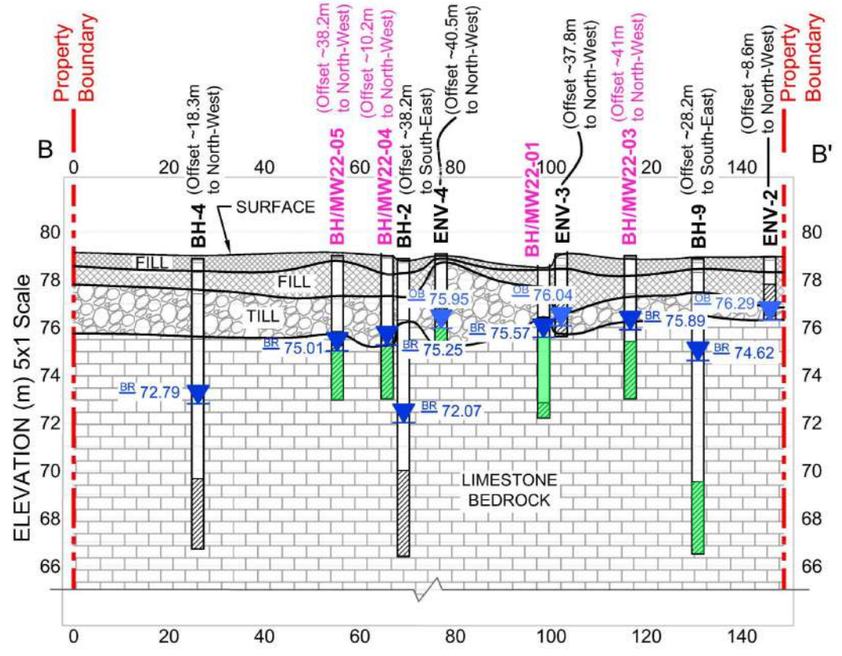
TITLE: GROUNDWATER ANALITICAL RESULTS – METALS

project no. OTT-22015769-A0
scale 1:1,000
FIG 17

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:49 PM Last Plotted: Jun 22, 2023 12:49 PM Plotted by: SeverA



CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN
- OB 76.46 — OVERBURDEN GROUNDWATER ELEVATION (MAY 31, 2023)
- BR 74.61 — BEDROCK GROUNDWATER ELEVATION (MAY 31, 2023)

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Benzene	B	44
Toluene	T	18000
Ethylbenzene	E	2300
Total Xylenes	X	4200
F1	F1 (C6-C10)	750
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500
1,1-Dichloroethane	1,1-DCA	320
1,2-Dichlororethane	1,2-DCA	1.6
1,1-Dichloroethylene	1,1-DCE	1.6
Cis-1,2-Dichloroethylene	c-1,2-DCE	1.6
Trans-1,2,-Dichlorothylene	t-1,2-DCE	1.6
Tetrachloroethylene	PCE	1.6
Trichloroethylene	TCE	1.6
Vinyl Chloride	VC	0.5

BH-9	Date	Screen Interval 9.4 to 12.4 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	2.3	<0.5	<1.1	<25	<50	<400	<400	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2

ENV-4	Depth (mbgs)	Screen Interval 2.3 to 3.8 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400								

MW22-01	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
		<0.17	0.21	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-02	Date	Screen Interval 3.1 to 4.6 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	31-May-23	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	31-May-23 (DUP)	<0.5	<0.5	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20
	3-May-22 (DUP)	<0.17	<0.20	<0.20	<0.20	<25	<100	<200	<200	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-03	Depth (mbgs)	Screen Interval 3.6 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-04	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	0.21	<0.5	<1.1	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-05	Depth (mbgs)	Screen Interval 3.1 to 6.1 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

MW22-06	Depth (mbgs)	Screen Interval 6.2 to 9.2 m bgs															
		B	T	E	X	F1	F2	F3	F4	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	PCE	TCE	VC
	3-May-22	<0.17	<0.20	<0.20	<0.20	<25	<50	<400	<400	<0.20	<0.50	<0.20	<0.50	<0.50	<0.20	<0.20	<0.20

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 50m

HORIZONTAL 1:1250

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

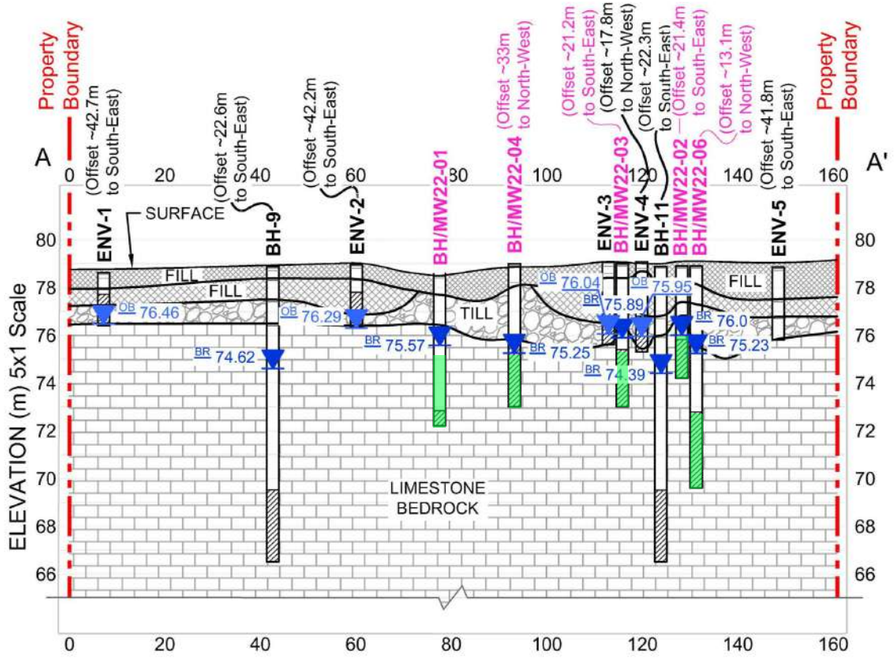
DATE: JUNE 2023
DESIGN: LW
CHECKED: CK
DRAWN BY: AS

PROJECT: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1640 & 1660 CARLING AVENUE, OTTAWA, ON

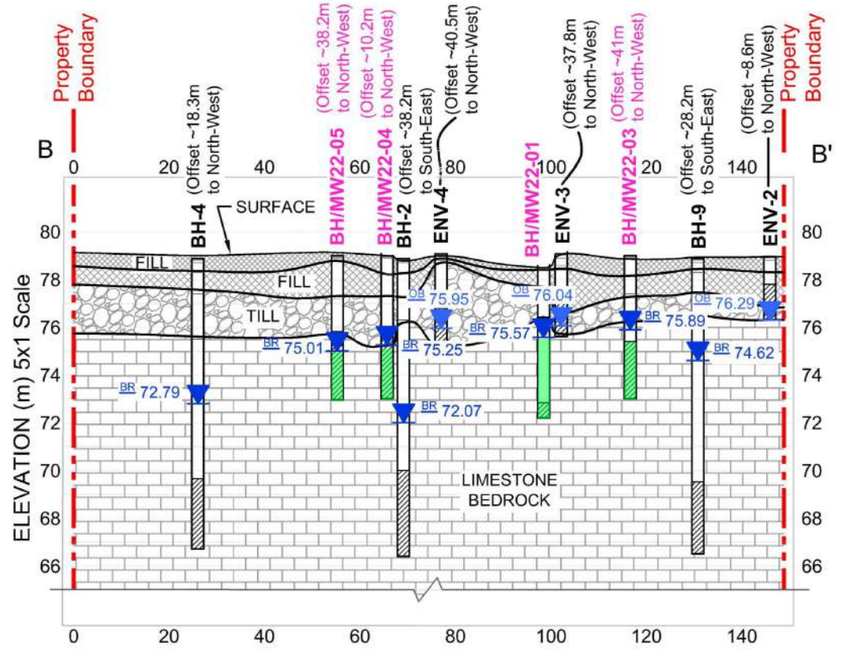
TITLE: GROUNDWATER CROSS SECTION A-A' AND B-B' – PHC & VOC

project no. OTT-22015769-A0
scale 1:1,250
FIG 18

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:51 PM Last Plotted: Jun 22, 2023 12:53 PM Plotted by: SeverA



CROSS SECTION A-A'



CROSS SECTION B-B'

LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN
- OB 76.46 OVERBURDEN GROUNDWATER ELEVATION (MAY 31, 2023)
- BR 74.61 BEDROCK GROUNDWATER ELEVATION (MAY 31, 2023)

BH22-01	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 3.1 to 6.1 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-02	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 3.1 to 4.6 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050
	3-May-22 (DUP)	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-03	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 3.6 to 6.1 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-04	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 3.1 to 6.1 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-05	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 3.1 to 6.1 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

BH22-06	Date	Ace	Acl	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	1-MN	2-MN	T-MN	N	P	Py
		Screen Interval 6.2 to 9.2 m bgs																		
	3-May-22	<0.050	<0.050	<0.050	<0.050	<0.0090	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.071	<0.050	<0.050	<0.050

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Acenaphthene	Ace	600
Acenaphthylene	Acl	1.8
Anthracene	An	130000
Benzo(a)anthracene	B(a)A	4.7
Benzo(a)pyrene	B(a)P	0.81
Benzo(b/j)fluoranthene	B(b)F	0.75
Benzo(ghi)perylene	B(ghi)P	0.2
Benzo(k)fluoranthene	B(k)F	0.4
Chrysene	C	1
Dibenzo(a,h)anthracene	DA	0.52
Fluoranthene	FI	130
Fluorene	F	400
Indeno(1,2,3-cd)pyrene	I(123)P	0.2
1-Methylnaphthalene	1-MN	1800
2-Methylnaphthalene	2-MN	1800
Methylnaphthalene, 2-(1-)	T-MN	1800
Naphthalene	N	1400
Phenanthrene	P	580
Pyrene	Py	68

ORIGINAL SHEET SIZE = 11" x 17"

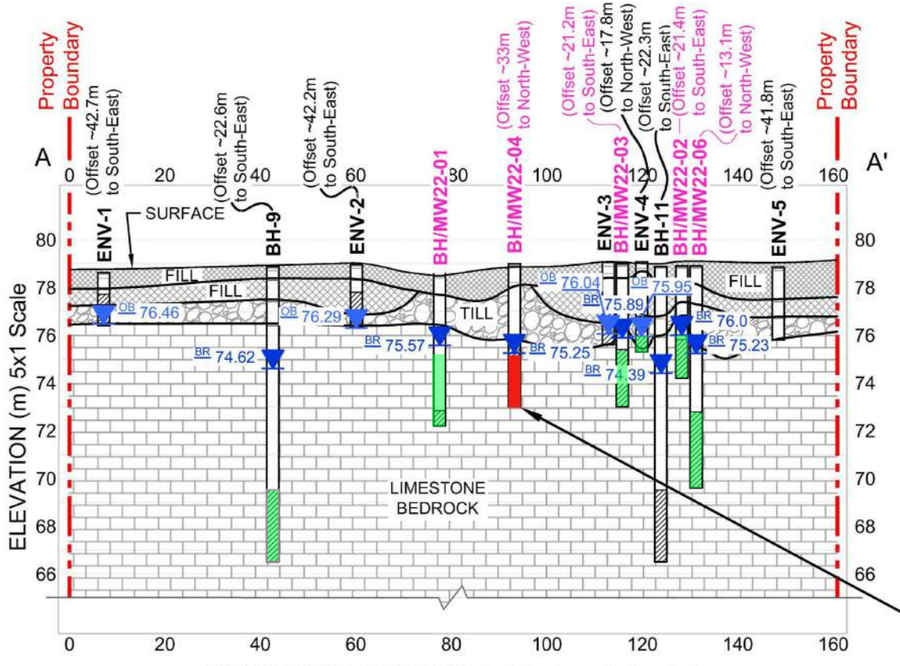
0 10m 20m 50m

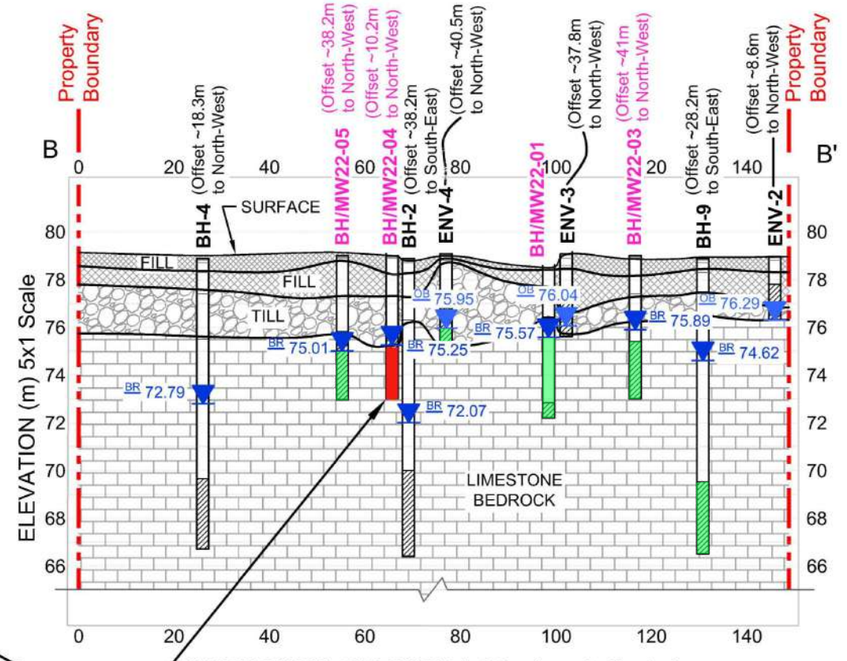
HORIZONTAL 1:1250

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	PROJECT:	project no.
JUNE 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	OTT-22015769-A0
DESIGN: LW / CHECKED: CK	TITLE:	scale: 1:1,250
DRAWN BY: AS	GROUNDWATER CROSS SECTION A-A' AND B-B' – PAH	FIG 19

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:51 PM Last Plotted: Jun 22, 2023 12:53 PM Plotted by: SeverA





LEGEND

- FILL
- TILL
- BEDROCK
- SCREEN
- OB 76.46 — OVERBURDEN GROUNDWATER ELEVATION (MAY 31, 2023)
- BR 74.61 — BEDROCK GROUNDWATER ELEVATION (MAY 31, 2023)
- SAMPLE EXCEEDS TABLE 3 SCS REGULATIONS

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 3 SCS Residential
Antimony	Sb	20000
Arsenic	As	1900
Barium	Ba	29000
Beryllium	Be	67
Boron	B	45000
Cadmium	Cd	2.7
Chromium	Cr	810
Cobalt	Co	66
Copper	Cu	87
Lead	Pb	25
Molybdenum	Mo	9200
Nickel	Ni	490
Sodium	Na	2300000
Selenium	Se	63
Silver	Ag	1.5
Thallium	Tl	510
Uranium	U	420
Vanadium	V	250
Zinc	Zn	1100

BH-9	Date	Screen Interval 9.4 to 12.4 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	31-May-23	0.5	3.7	95	<0.1	1200	0.223	<1	2.8	20.3	<0.02	170	10.6	320000	2	0.3	<0.05	2.44	1.9	<5

ENV-4	Date	Screen Interval 2.3 to 3.8 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	31-May-23	0.2	0.2	387	<0.1	219	0.134	1	1.8	1.5	<0.02	3.7	7.5	2870000	3	<0.1	0.07	3.67	0.8	<5

MW22-01	Date	Screen Interval 3.1 to 6.1 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	3-May-22	<2.5	<5.0	110	<2.0	240	<0.45	<25	5.3	<4.5	<2.5	<2.5	32	4700000	<10	<0.45	<0.25	15	<2.5	33

MW22-02	Date	Screen Interval 3.1 to 4.6 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	31-May-23	<0.1	0.2	148	<0.1	165	0.045	<1	0.7	2.4	0.1	4.6	5.4	3260000	2	0.9	0.27	1.86	0.4	6
	31-May-23 (DUP)	<0.1	0.2	150	<0.1	138	0.074	<1	0.5	2	0.1	1.6	5.6	3120000	3	1.5	0.28	1.82	0.5	7
	3-May-22	<2.5	<5.0	100	<2.0	110	<0.45	<25	<2.5	<4.5	<2.5	<2.5	7.9	3100000	<10	<0.45	<0.25	2.8	<2.5	<25
	3-May-22 (DUP)	<2.5	<5.0	110	<2.0	110	<0.45	<25	<2.5	<4.5	<2.5	<2.5	7.7	3200000	<10	<0.45	<0.25	2.9	<2.5	<25

MW22-03	Date	Screen Interval 3.6 to 6.1 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	3-May-22	<0.50	<1.0	110	<0.40	80	<0.090	<5.0	1.0	2.7	<0.50	<0.50	8.4	2000000	<2.0	<0.090	<0.050	1.7	<0.50	<5.0

MW22-04	Date	Screen Interval 3.1 to 6.1 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	3-May-22	<2.5	<5.0	120	<2.0	460	<0.45	<25	97	<4.5	<2.5	7.2	130	2400000	<10	<0.45	<0.25	27	<2.5	<25
	19-Jun-23	-	-	-	-	-	-	-	81	-	-	-	-	-	-	-	-	-	-	-

MW22-05	Date	Screen Interval 3.1 to 6.1 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Na	Se	Ag	Tl	U	V	Zn
	3-May-22	0.70	1.5	44	<0.40	460	<0.090	<5.0	1.9	0.97	0.80	0.93	24	1200000	<2.0	<0.090	0.051	6.0	<0.50	<5.0

MW22-06	Date	Screen Interval 6.2 to 9.2 m bgs																		
		Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	NA	Se	Ag	Tl	U	V	Zn
	3-May-22	<0.50	<1.0	160	<0.40	230	<0.090	<5.0	3.5	3.1	<0.50	6.0	29	2400000	<2.0	<0.090	0.13	4.80	<0.50	<5.0

ORIGINAL SHEET SIZE = 11" x 17"

0 10m 20m 50m

HORIZONTAL 1:1250

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	PROJECT:	project no.
JUNE 2023	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 1640 & 1660 CARLING AVENUE, OTTAWA, ON	OTT-22015769-A0
DESIGN: LW / CHECKED: CK		scale: 1:1,250
DRAWN BY: AS	TITLE: GROUNDWATER CROSS SECTION A-A' AND B-B' – METALS	FIG 20

Filename: E:\OTT\OTT-22015769-A0\60 Execution\65 Drawings\22015769-A0_Ph-2.dwg
Last Saved: Jun 22, 2023 12:51 PM Last Plotted: Jun 22, 2023 12:54 PM Plotted by: SeverA

Appendix B: Survey Plan

CARLING AVENUE

WIDENING PER BY-LAW 57-58, INST. NO. CR356791

DEDICATED AS PUBLIC HIGHWAY BY-LAW 2007-130 INST. OC707809

PART 1 AR-21540

PART 2 AR-21540

PIN 04003-0109

PIN 04003-0111

PART 1 AR-23039

PART 2 AR-23039

PART 1 AR-10843

PART 2 AR-10843

PIN 04003 - 0110

PIN 04003 - 0112

PIN 04003-0106

PART 1 AR-16885

PART 1 AR-10858

SUBJECT TO EASEMENT INST. OC851533

PART 1 5R-6884

PIN 04003-0005

LOT 20
R.P. 367

CLYDE AVENUE

ROAD ALLOWANCE BETWEEN CONCESSION A (R.F.) AND CONCESSION 'A' (O.F.)

PIN 04003-0098

CONCESSION 'A' (RIDEAU FRONT)

LOT 'I'

1 STOREY COMMERCIAL BUILDING #1640

3 STOREY COMMERCIAL BUILDING #1660

2 STOREY COMMERCIAL BUILDING ABOVE

ASPHALT PARKING LOT AT GROUND LEVEL

ASPHALT PARKING LOT

AREA NOT ACCESSIBLE DUE TO LOCKED SECURITY FENCE

N57°49'20"E (P1&M) 155.51 (M) 155.43 (P1)

N57°23'00"E 158.73 (P1&M)

N22°23'50"W (M) 92.82 (P1&M)

49.46 (M) 49.50 (P1)

142.53 (P1&M)

10.83 (P1&M) 10.86 (M)

4.12 (P1&M) 4.43 (M)

N17°22'10"E 6.60 (P1&M)

STAIRWELL

METAL STEPS & LANDING

CONCRETE STEPS & LANDING

RAMP

CONCRETE RAMP

CONCRETE WALL

STONE WALL

STEEL GUARD WALL

RETAINING WALL

COVERED PATIO

BOARD FENCE

CHAIN LINK FENCE

METAL SECURITY FENCE

WOOD GUARD RAIL

BUS SHELTER

SIGN & CONCRETE BASE

ENTRANCE

CANOPY

SHRUBS

TREES

GRASS

CONCRETE

ASPHALT

EDGE/ASPHALT

CONCRETE CURB

CONCRETE SIDEWALK

ROW OF SMALL TREES

BUSH

MH TRAFFIC

MH BELL

MH HYDRO

MH STORM

MH SANITARY

MH MUNICIPAL

MH STREET LIGHTING

CB

CBMH

SCV

SV

HYD

MW

SIGN

SIB (123M)

SIB (OU)

SIB (857)

CP (857)

CP (1236)

LS

PART 1 AR-16885

PART 1 AR-10858

PART 1 AR-23039

PART 2 AR-23039

PART 2 AR-10843

PART 1 AR-10843

PART 1 AR-21540

PART 2 AR-21540

PART 1 5R-6884

PART (AR-29579)

W:\active\161614648\topographical\drawing\161614648-111_d1.dwg

November 3, 2022

Stantec

Stantec Geomatics Ltd.
300-1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

TOPOGRAPHIC PLAN OF SURVEY

PART OF LOT 'I' CONCESSION 'A' (RIDEAU FRONT)

(GEOGRAPHIC TOWNSHIP OF NEPEAN)

CITY OF OTTAWA

Scale 1:250

5 0 5 10 15 METRES

METRIC CONVERSION

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

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT No. 019680397 ELEVATION=76.544m.

LEGEND

	DENOTES	
■	-	FOUND MONUMENTS
□	-	SET MONUMENTS
IB	-	IRON BAR
IRØ	-	ROUND IRON BAR
SIB	-	STANDARD IRON BAR
SSIB	-	SHORT STANDARD IRON BAR
CC	-	CUT CROSS
CP	-	CONCRETE PIN
WIT	-	WITNESS
PIN	-	IDENTIFICATION NUMBER
M/MEAS	-	MEASURED
INST	-	INSTRUMENT
PROP	-	PROPORTIONED
OU	-	ORIGIN UNKNOWN
SG	-	STANTEC GEOMATICS LTD.
P1	-	PLAN 4R-21540
P2	-	PLAN 4R-16885
P3	-	PLAN 4R-23081
P4	-	PLAN 4R-22337
857	-	FAIRHALL, MOFFATT & WOODLAND LTD.
1236	-	P.A. RIDDELL O.L.S
ACU	-	AIR CONDITIONING UNIT
AN	-	ANCHOR
AP	-	AIR PUMP
ANT	-	ANTENNA
BH	-	BOREHOLE
BIB	-	HOSE BIB
BKR	-	BIKE RACK
BENCH	-	BENCH
BOL	-	BOLLARD
BOUL	-	BOULDER
CB	-	CATCH BASIN
DICB	-	DOUBLE CB
CBMH	-	CB MANHOLE
DCBMH	-	DOUBLE CB MANHOLE
SICB	-	SIDE INLET CB
CHM	-	CHIMNEY
CO	-	CONCRETE COLUMN
CSV	-	CURB STOP VALVE
DRN	-	DRAIN
EPOST	-	ELECTRICAL OUTLET
FP	-	FLAG POLE
FL	-	FLOOD LIGHT
FTF	-	FUEL TANK FILLER CAP
GC	-	GARBAGE CAN
GFL	-	PIPE FLANGE (GAS)
GFP	-	GAS FUEL PUMP
GP	-	POLE GUYWIRE
GSR	-	GAS SERVICE REGULATOR
GV	-	GAS VALVE
HIC	-	HICKENBOTTOM
HDS	-	HEADSTONE
HLS	-	HYDRO LIGHT STANDARD
HM	-	HYDRO METER
HTN	-	HYDRO TRANSFORMER
HW	-	HAND WELL
HYD	-	FIRE HYDRANT
JBX	-	JUNCTION BOX
LS	-	LIGHT STANDARD
MB	-	MAILBOX
MP	-	MONITORING PIN
MH	-	MAINTENANCE HOLE UNIDENTIFIED
MHB	-	MAINTENANCE HOLE BELL
MHF	-	MAINTENANCE HOLE FIBRE OPTIC
MHH	-	MAINTENANCE HOLE HYDRO
MHSA	-	MAINTENANCE HOLE SANITARY
MHST	-	MAINTENANCE HOLE STORM
MHT	-	MAINTENANCE HOLE TRAFFIC
MW	-	MONITORING WELL
NPB	-	NEWS PAPER BOX
OLS	-	LIGHT STANDARD ORNAMENTAL
OW	-	OBSERVATION WELL
PKM	-	PARKING METER
PLBX	-	PULL BOX
PLQ	-	PLAQUE
PLR	-	PILLAR
PZ	-	PIEZOMETER
RLC	-	RED LIGHT CAMERA
RWSG	-	RAILWAY SIGNAL LIGHT
RWSS	-	RAILWAY SWITCH STAND
SAT	-	SATELLITE DISH
SCLP	-	SCULPTURE
SCP	-	SUMP/CATCH PIT
SCV	-	SPRINKLER CONTROL VALVE
SH	-	SPRINKLER HEAD
SIA	-	SIAMESE CONNECTION
SIGN	-	SIGN
SPAN	-	SOLAR PANEL
SPIT	-	SEPTIC TANK LID
TBL	-	TABLE
TB BELL	-	TERMINAL BOX - BELL
TB CATV	-	TERMINAL BOX - CABLE
TCB	-	TRAFFIC CONTROL BOX
TH	-	TEST PIT
TSL	-	TRAFFIC SIGNAL LIGHT
UMB	-	MARKER BELL UNDERGROUND
UMC	-	MARKER CABLE UNDERGROUND
UMG	-	MARKER GAS UNDERGROUND
UMO	-	MARKER OIL UNDERGROUND
UP	-	UTILITY POLE
VB	-	VALVE BOX
VC	-	VALVE CHAMBER
WV	-	WATER VALVE
	-	TREE STUMP
	-	TREE CONIFEROUS (D.B.H. SHOWN)
	-	TREE DECIDUOUS (D.B.H. SHOWN)

T T T UNDERGROUND TELEPHONE

WTM WTM WTM WATERMAIN

G G G GASMAIN

STM STM STM STORM SEWER

SAN SAN SAN SANITARY SEWER

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THE SURVEY WAS COMPLETED ON THE 24th DAY OF OCTOBER , 2022.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

DRAWN: ME CHECKED: - PM: BW FIELD: CA/ES PROJECT No.: 161614648-111

Appendix C: Sampling and Analysis Plan

1 Introduction

This Sampling and Analysis Plan (SAAP) was developed in support of a Phase Two Environmental Site Assessment (ESA), hydrogeological and geotechnical investigation for the property located at 1640-1660 Carling Avenue 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 investigations.

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

2 Field Sampling Program

The field sampling program was developed to provide for the collection of samples of the soil and groundwater for chemical analysis of petroleum hydrocarbons (PHC), benzene, toluene, ethylbenzene and xylenes (collectively known as 'BTEX'), polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOC) and/or metals. The soil sampling media is to consist of the overburden materials. The soil sampling will be location-specific to assess for the potential contaminants of concern (PCOC) based on the identification of potential areas of potential environmental concern identified in a Phase One ESA completed by EXP in 2023.

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 bedrock aquifer will also be determined through groundwater level measurements and the elevations established in the site elevation survey.

A proposed site plan is attached. Note that the parameters of boreholes and/or monitoring wells (exact location, depth etc.) may be subject to change based on site conditions encountered during the field work program.

3 Field Methods

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

- Private and public utility clearances – subcontracted to USL-1 Underground Service Locators Inc.
- Borehole Drilling – subcontracted to OGS Drilling Inc.;
- Soil Sampling – completed by EXP;
- Monitoring Well Installation – completed by OGS Drilling Inc.;
- Groundwater Level Measurements; - completed by EXP
- Hydraulic Conductivity Testing – completed by EXP;
- Elevation Survey – completed by EXP,
- Groundwater Sampling – completed by EXP.

The field investigative methods will be performed following the procedures outlined below.

3.1 Borehole Drilling

Boreholes will be advanced at the site in conjunction with a geotechnical investigation to facilitate the collection of soil samples for chemical analysis and geologic characterization, and for the installation of groundwater monitoring wells. A total of eighteen (18) boreholes are proposed to be advanced at the site, to provide for the collection of samples of the surficial and overburden materials beneath the site. (see attached figure). The borehole locations were selected to assess the areas of potential environmental concern and PCOC related impacts to the soils and the groundwater, and to provide geotechnical information based on the layout of the proposed site building. Soil samples will be collected from the boreholes and submitted for analysis of BTEX, PHC, PAH and/or metals.

Boreholes will be advanced by OGS Inc., a licensed drilling contractor, using a truck or track mounted drill rig equipped with augering and core drilling capabilities. All boreholes will be initially drilled to refusal to an anticipated depth of 2 to 3.5 metres below grade. Six (6) of the boreholes will be cased and further advanced using washboring and core drilling techniques to a maximum depth of 10 metres below grade.

Upon completion, monitoring wells will be installed in eight (8) of the boreholes. Boreholes will be backfilled using a mixture of soil cuttings, sand, and bentonite chips. Cold-patch asphalt will be used at surface of the boreholes located in the parking lot.

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 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.

3.3 Monitoring Well Installation

It is proposed that eight (8) of the boreholes will be instrumented as a groundwater monitoring well installed with slotted screens, installed in the bedrock. 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.

Monitoring wells will be installed by OGS Inc., a licensed well contractor. When the monitoring wells are no longer required monitoring wells must be decommissioned by a licensed well driller in accordance with O.Reg. 903. Monitoring well decommissioning and maintenance is the responsibility of the site owner.

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 Residue Management

All drill cuttings not used for backfilling, and purge water from monitoring well development and groundwater sampling will be stored on-site in labelled drums. The drums will be disposed off-site by a licensed contractor following waste management regulations.

3.6 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.

3.7 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.

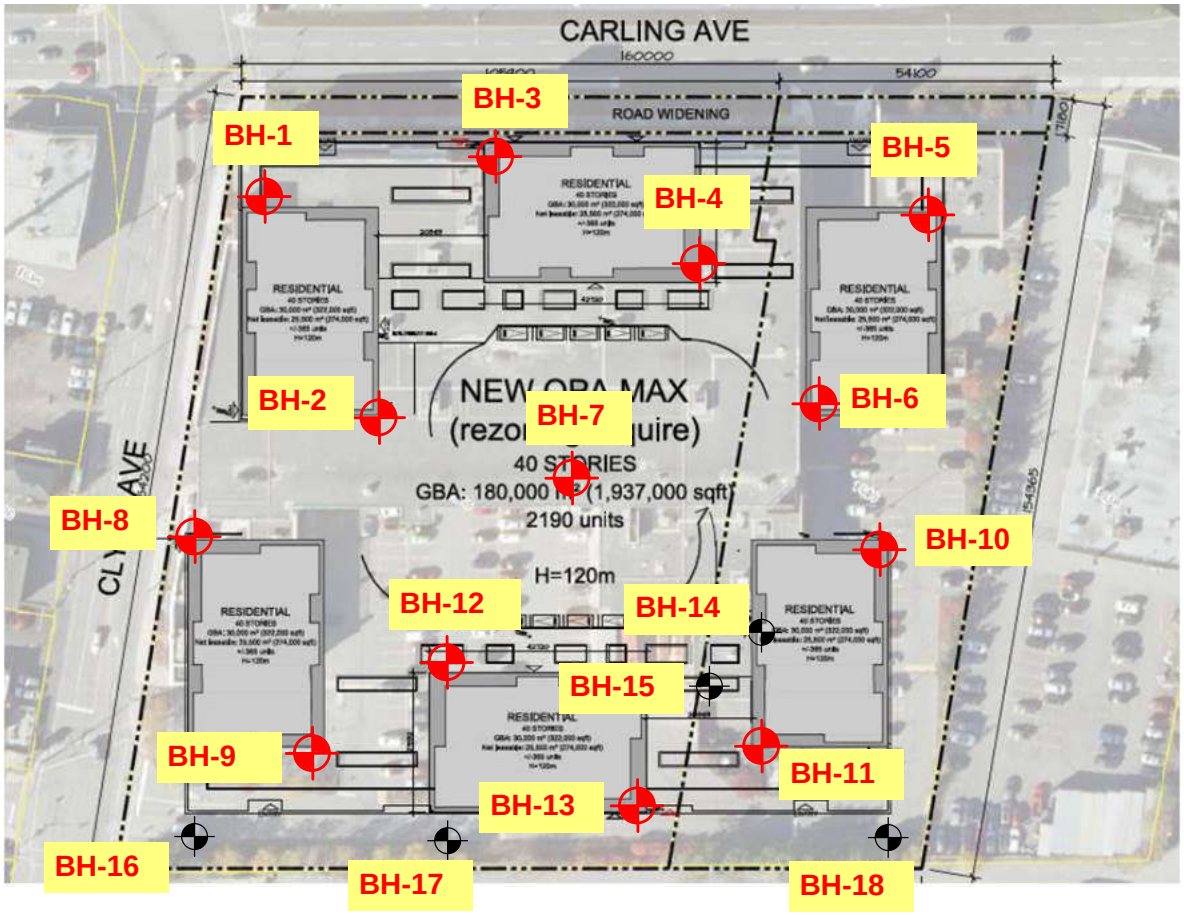
3.8 Hydraulic Conductivity Testing

Single well response tests will be conducted on the monitoring wells to evaluate the hydraulic properties of the saturated stratigraphic units at the site.

3.9 Groundwater Sampling

Groundwater samples will be collected from the newly installed monitoring wells and/or existing monitoring wells and submitted 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).

Fig 1: Proposed Locations of Boreholes



Proposed Location of Boreholes

Proposed Location of Boreholes - ENV only

Appendix D: Grain Size Analyses

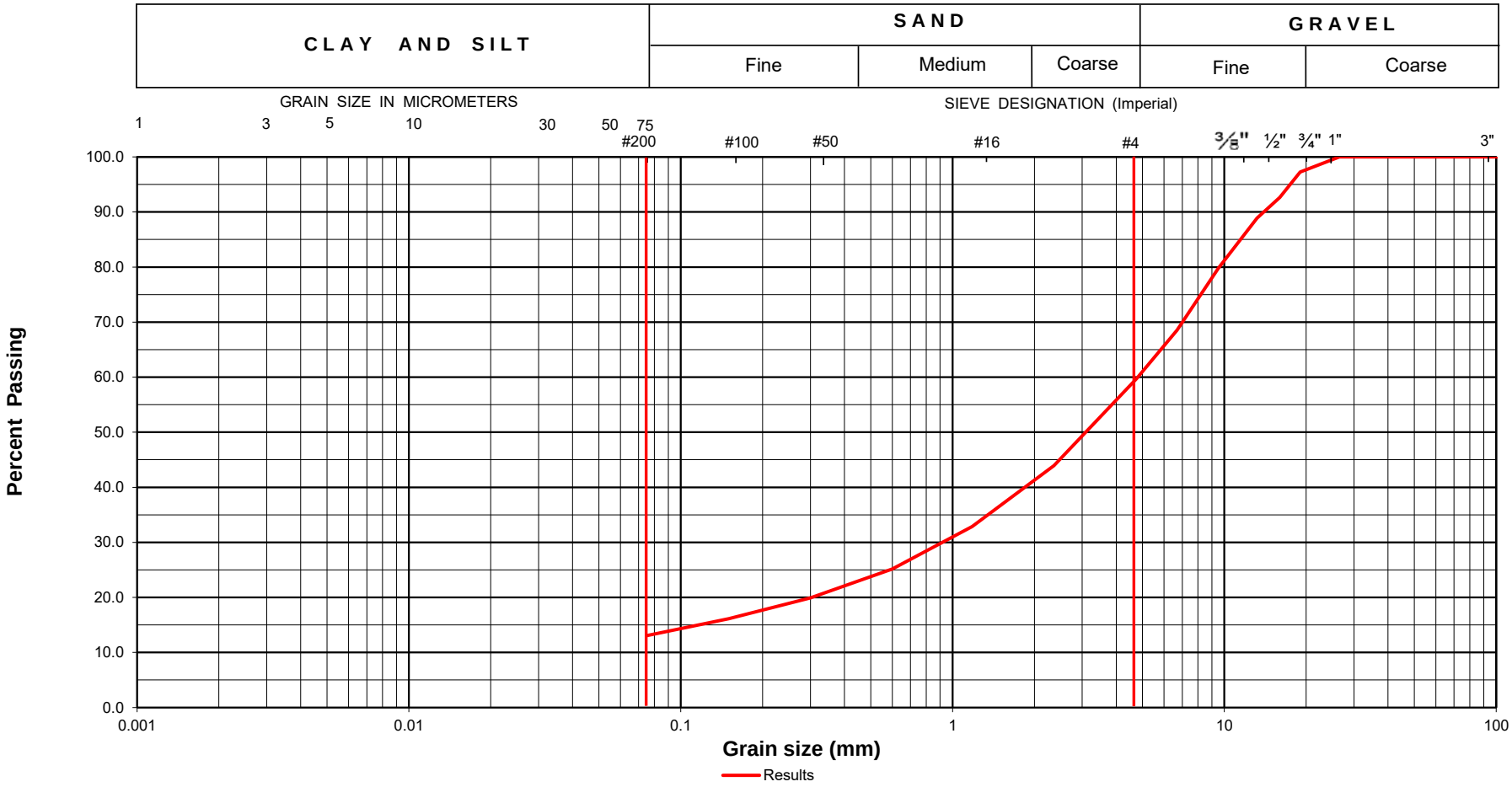
exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve

Method of Test for Sieve Analysis of Aggregate

ASTM C-136 (LS-602)

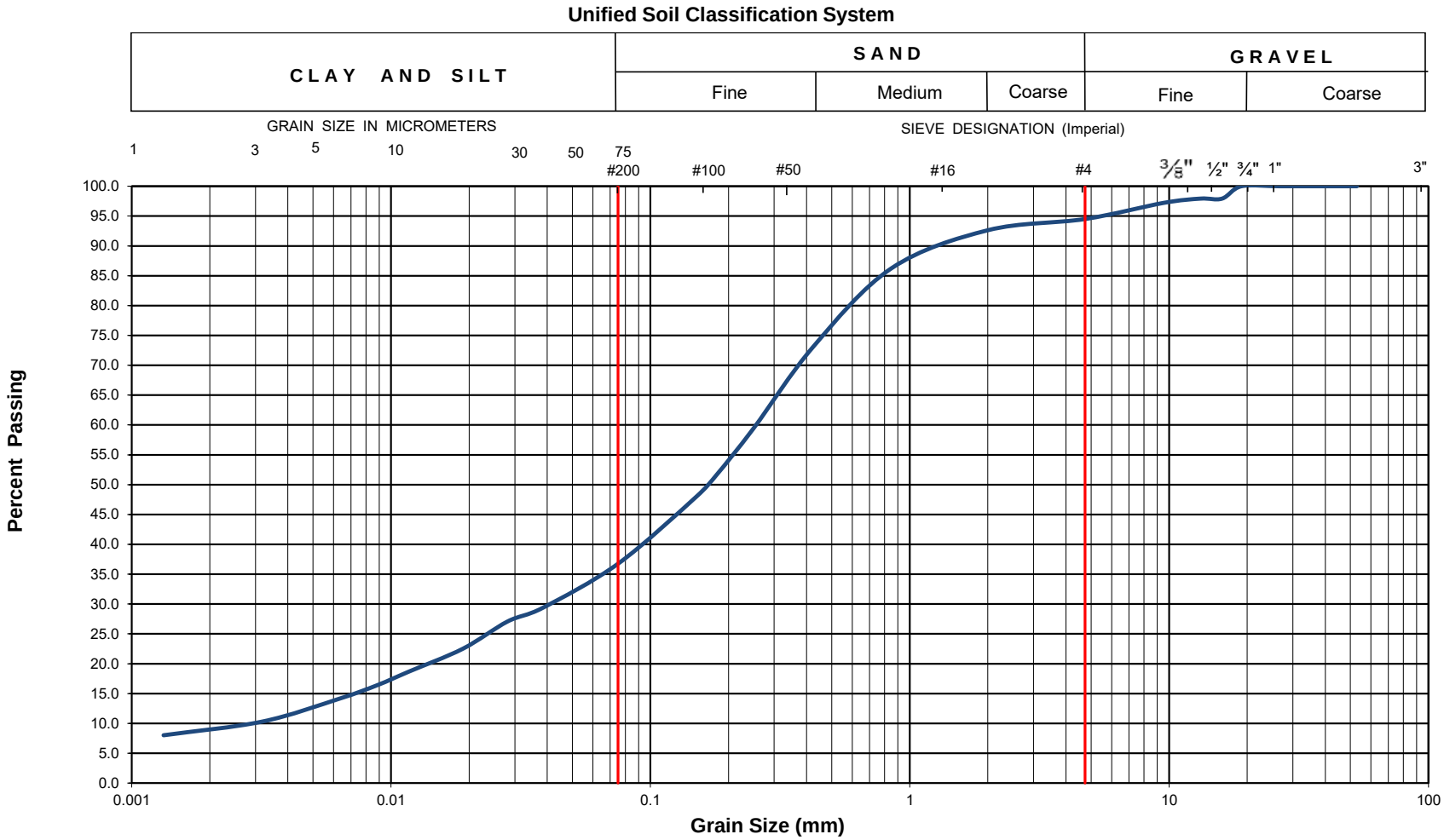
Unified Soil Classification System



Exp Project No.:	**OTT-22015769-A0**	**Project Name :**	**Proposed Residential High-Rise Towers**				
Client :	**RioCan Real Estate Investment Trust**	**Project Location :**	**1640 - 1660 Carling Avenue, Ottawa, ON**				
Date Sampled :	**May 9, 2023**	**Borehole:**	**BH11**	**Sample:**	**SS1**	**Depth (m) :**	**0.1 - 0.6**
Sample Description :		**% Silt & Clay**	**13**	**% Sand**	**47**	**% Gravel**	**40**
Sample Description :	**GRANULAR FILL: Sand and Gravel (SM) - Some Silt**					**Figure :**	**18**

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

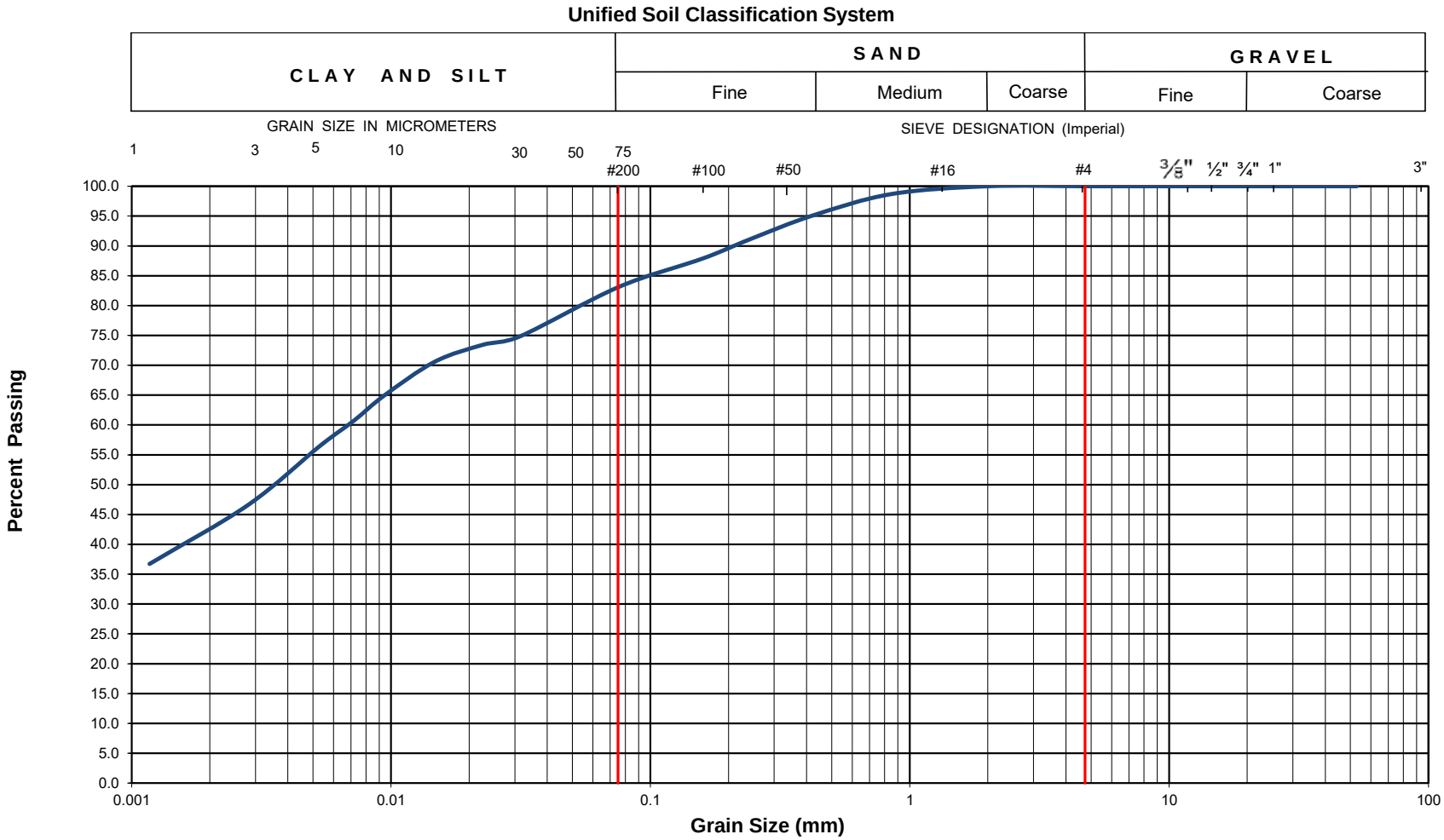
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-22015769-A0**		**Project Name :**	**Proposed Residential High-Rise Towers**					
Client :	**RioCan Real Estate Investment Trust**		**Project Location :**	**1640-1660 Carling Avenue, Ottawa, ON**					
Date Sampled :	**May 8, 2023**		**Borehole No:**	**BH7**		**Sample No.:**	**SS3**	**Depth (m) :**	**1.5-2.1**
Sample Description :			**% Silt and Clay**	**37**	**% Sand**	**57**	**% Gravel**	**6**	**Figure :** **19**
Sample Description :			**FILL: Silty Sand (SM) - Trace Gravel and Clay**						

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

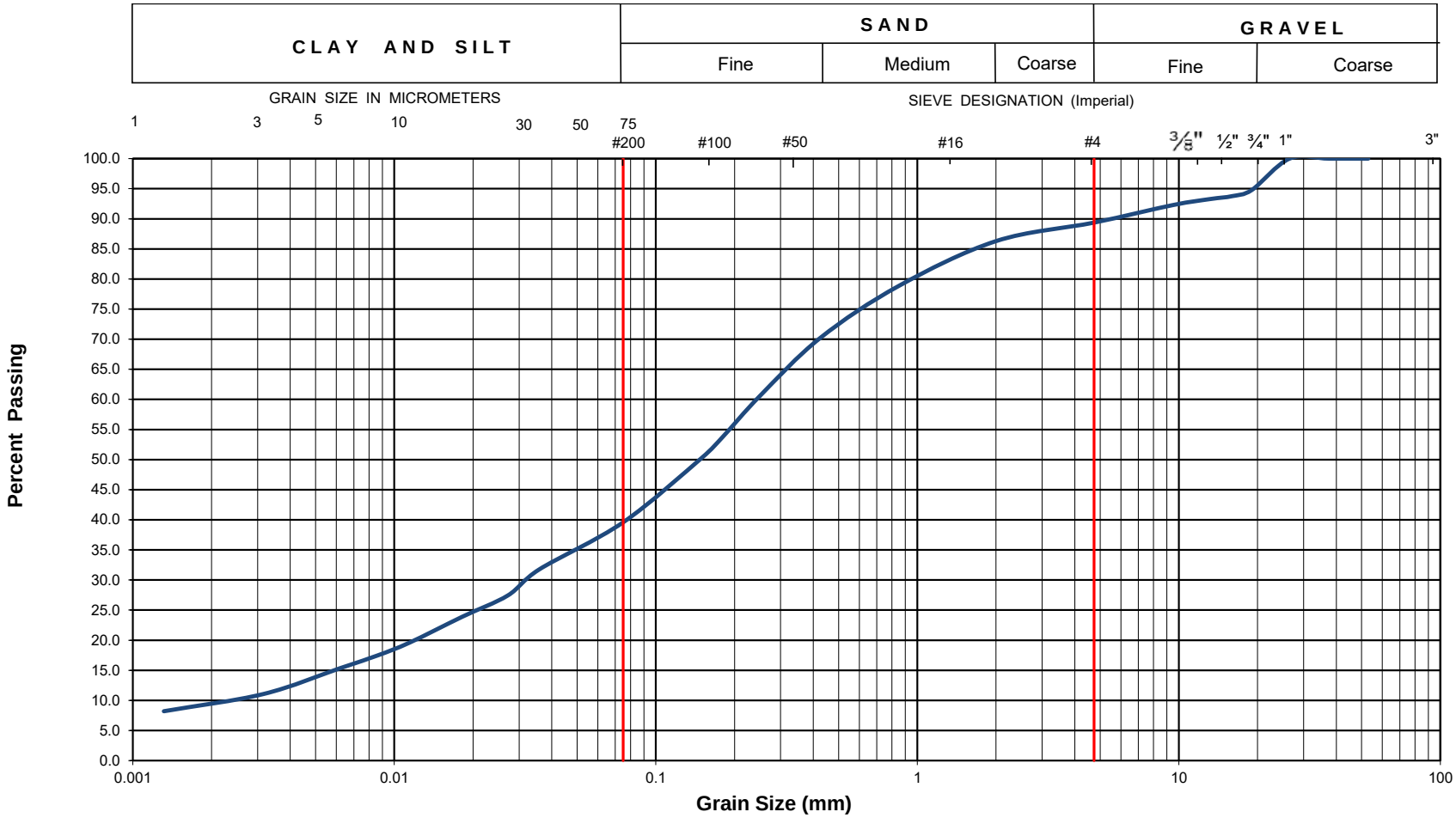


EXP Project No.:	**OTT-22015769-A0**	**Project Name :**	**Proposed Residential High-Rise Towers**						
Client :	**RioCan Real Estate Investment Trust**	**Project Location :**	**1640-1660 Carling Avenue, Ottawa, ON**						
Date Sampled :	**May 9, 2023**	**Borehole No:**	**BH5**		**Sample No.:**	**SS4**		**Depth (m) :**	**2.3-2.9**
Sample Description :		**% Silt and Clay**	**83**	**% Sand**	**17**	**% Gravel**	**0**	**Figure :**	**20**
Sample Description :	**SILTY CLAY of Medium Plasticity (CL) - Some Sand**								

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

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

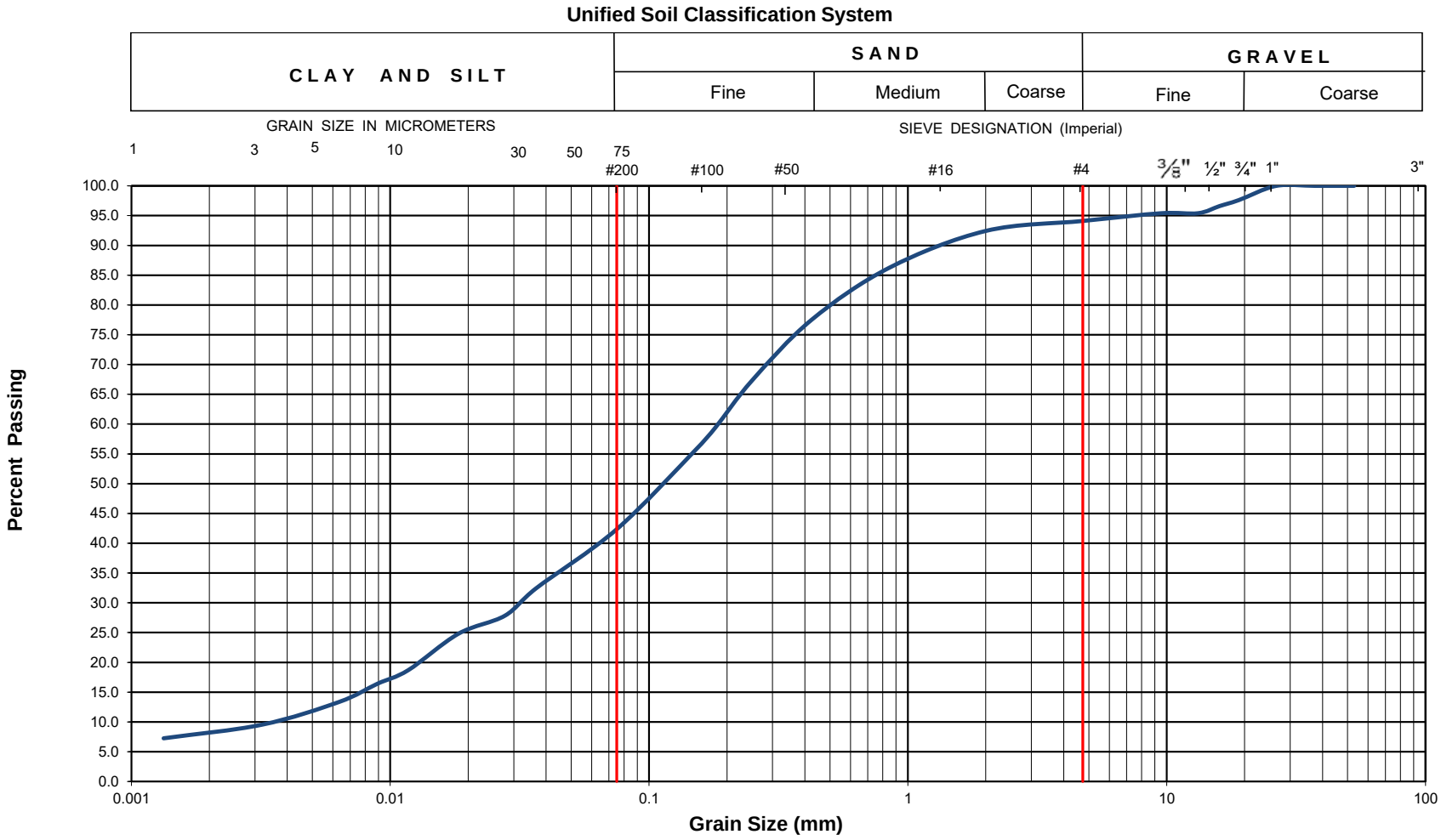
Unified Soil Classification System



EXP Project No.:	**OTT-22015769-A0**	**Project Name :**	**Proposed Residential High-Rise Towers**						
Client :	**RioCan Real Estate Investment Trust**	**Project Location :**	**1640-1660 Carling Avenue, Ottawa, ON**						
Date Sampled :	**May 5, 2023**	**Borehole No:**	**BH4**	**Sample No.:**	**SS4**	**Depth (m) :**	**2.3-2.9**		
Sample Description :		**% Silt and Clay**	**40**	**% Sand**	**49**	**% Gravel**	**11**	**Figure :**	**21**
Sample Description :	**GLACIAL TILL: Silty Sand (SM) - Some Gravel and Clay**								

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

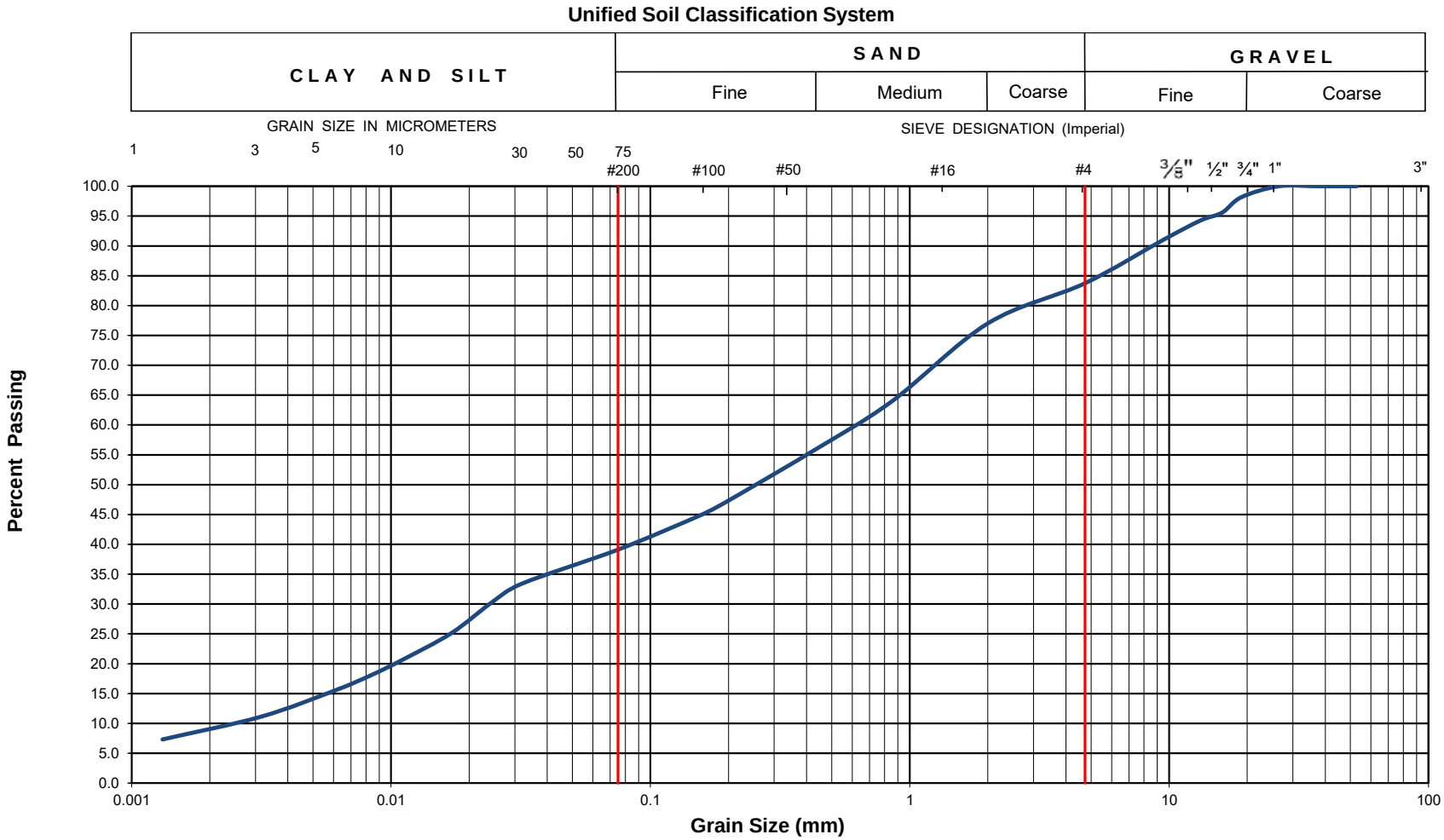
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-22015769-A0**	**Project Name :**	**Proposed Residential High-Rise Towers**						
Client :	**RioCan Real Estate Investment Trust**	**Project Location :**	**1640-1660 Carling Avenue, Ottawa, ON**						
Date Sampled :	**May 5, 2023**	**Borehole No:**	**BH8**		**Sample No.:**	**SS3**		**Depth (m) :**	**1.5-2.1**
Sample Description :		**% Silt and Clay**	**42**	**% Sand**	**52**	**% Gravel**	**6**	**Figure :**	**22**
Sample Description :	**GLACIAL TILL: Silty Sand (SM) - Trace Gravel and Clay**								

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-22015769-A0**		**Project Name :**	**Proposed Residential High-Rise Towers**					
Client :	**RioCan Real Estate Investment Trust**		**Project Location :**	**1640-1660 Carling Avenue, Ottawa, ON**					
Date Sampled :	**May 4, 2023**		**Borehole No:**	**ENV-5**	**Sample No.:**	**SS4**	**Depth (m) :**	**2.3-2.9**	
Sample Description :			**% Silt and Clay**	**39**	**% Sand**	**45**	**% Gravel**	**16**	**Figure :** **23**
Sample Description :	**GLACIAL TILL: Silty Sand (SM) - Some Gravel and Trace Clay**								

Appendix E: Borehole Logs

Log of Borehole BH-02

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 3

Page. 1 of 2

Date Drilled: 'May 8, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
			78.8	0
		ASPHALT ~75 mm thick	78.7	
		GRANULAR FILL (BASE) ~200 mm thick Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (dense)	78.3	
		FILL Silty sand, trace gravel, brown, moist, no odours, no stains (loose)	77.3	1
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders,grey, moist, no odours no stains (dense)	76.3	2
		LIMESTONE BEDROCK With shale seams, occasional granite seams, grey to dark grey (fair to excellent quality)		3
		- Slightly weathered in upper 150 mm		4
				5
				6
				7
				8
				9
				10

Standard Penetration Test N Value: 36 (SS1); 6 (SS2); 40 (SS3); 7, then 50 for 50mm (SS4)

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

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

Natural Unit Wt. kN/m³: SS2 22.4; SS3 23.9

SAMPLES: SS1, SS2, SS3, SS4, RUN 1, RUN 2, RUN 3, RUN 4, RUN 5

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	2.5 - 3.3	100	83
2	3.3 - 4.9	100	98
3	4.9 - 6.4	100	100
4	6.4 - 7.9	100	66
5	7.9 - 9.4	100	100
6	9.4 - 10.9	100	100
7	10.9 - 12.4	100	93

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-02

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 3

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, occasional granite seams, grey to dark grey (fair to excellent quality)	68.8	10	20 40 60 80 50 100 150 200 kPa	250 500 750 20 40 60		RUN 6
		- Slightly weathered in upper 150 mm *(continued)*		11				RUN 7
				12				
		Borehole Terminated at 12.4 m Depth	66.4					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	2.5 - 3.3	100	83
2	3.3 - 4.9	100	98
3	4.9 - 6.4	100	100
4	6.4 - 7.9	100	66
5	7.9 - 9.4	100	100
6	9.4 - 10.9	100	100
7	10.9 - 12.4	100	93

Log of Borehole BH-04

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 4

Page. 1 of 2

Date Drilled: 'May 5, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		ASPHALT ~125 mm thick	78.87	0	41	×	SS1	
		GRANULAR FILL (BASE) ~300 mm thick	78.7					
		Silty sand and crushed gravel, concrete pieces, dark brown and grey, damp, no odours, no stains (dense)	78.3	1	11	×	SS2	
		FILL Silty sand, some gravel, brick and concrete pieces, brown, damp, no odours, no stains (compact)	77.4	2	13	×	SS3	
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, moist to wet, no odours, no stains (very loose to compact)		3	20	×	SS4	23.6
					3, then 50 for 75 mm	×	SS5	
		LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality) - slightly weathered in upper 150 mm	75.5	4			RUN 1	
				5			RUN 2	
				6				
				7			RUN 3	
				8			RUN 4	
				9				
				10			RUN 5	

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.4 - 4.3	97	82
2	4.3 - 6.4	96	71
3	6.4 - 7.4	100	95
4	7.4 - 9	100	100
5	9 - 10.6	100	100
6	10.6 - 12.2	100	90

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-04

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 4

Page. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality) - slightly weathered in upper 150 mm *(continued)*	68.87	10 11				RUN 6
			66.7	12				
		Borehole Terminated at 12.2 m Depth						

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.4 - 4.3	97	82
2	4.3 - 6.4	96	71
3	6.4 - 7.4	100	95
4	7.4 - 9	100	100
5	9 - 10.6	100	100
6	10.6 - 12.2	100	90

Log of Borehole BH-05

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 5

Page. 1 of 2

Date Drilled: 'May 9, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		ASPHALT ~75 mm thick	78.63	0
		GRANULAR FILL (BASE) ~485 mm thick Silty sand and crushed gravel, concrete pieces, dark brown and grey, damp, no odours, no stains (dense)	78.6	
			77.1	1
		FILL Silty sand, some gravel, with 25 mm thick topsoil seam, rootlets, brown to grey, moist, no odours, no stains (compact)	76.4	2
		SILTY CLAY Grey, moist, no odours, no stains (firm)	75.6	3
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, moist, no odours, no stains (compact)	75.2	
		LIMESTONE BEDROCK With shale seams, occasional granite seams, grey to dark grey (fair to excellent quality)		4
				5
				6
				7
				8
				9
				10

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

44
18
13
6
13, then 50 for 125 mm

SAMPLES	Natural Unit Wt. kN/m³
SS1	
SS2	
SS3	21.0
SS4	19.4
SS5	
RUN 1	
RUN 2	
RUN 3	
RUN 4	
RUN 5	

Continued Next Page

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.4 - 4.3	86	71
2	4.3 - 5.9	100	90
3	5.9 - 7.4	100	90
4	7.4 - 8.9	98	92
5	8.9 - 10.4	100	98
6	10.4 - 11.9	100	97

Log of Borehole BH-05

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 5

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, occasional granite seams, grey to dark grey (fair to excellent quality) *(continued)*	68.63	10	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
				11			RUN 6	
		Borehole Terminated at 11.9 m Depth	66.7					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.4 - 4.3	86	71
2	4.3 - 5.9	100	90
3	5.9 - 7.4	100	90
4	7.4 - 8.9	98	92
5	8.9 - 10.4	100	98
6	10.4 - 11.9	100	97

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-07

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 6

Page. 1 of 2

Date Drilled: 'May 8, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
			78.92					
		ASPHALT ~75 mm thick	78.8					
		GRANULAR FILL (BASE) ~460 mm thick Silty sand and crushed gravel, dark brown and dark grey, damp, no odours, no stains (dense)	78.3					
		FILL Silty sand, some gravel, brown, moist, no odours, no stains (loose to compact)		0	35	×	SS1	
				1	25	×	SS2	
				2	10	×	SS3	
				3	5	×	SS4	
					50 for 75 mm	×	SS5	
		LIMESTONE BEDROCK With shale seams, grey to dark grey (good to excellent quality)	75.8	4			RUN 1	
				5			RUN 2	
				6				
				7			RUN 3	
				8			RUN 4	
				9				
				10			RUN 5	

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.1 - 4.6	92	95
2	4.6 - 6.1	100	90
3	6.1 - 7.7	100	80
4	7.7 - 9.1	100	98
5	9.1 - 10.7	100	95
6	10.7 - 12.2	100	94

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-07

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 6

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, grey to dark grey (good to excellent quality) *(continued)*	68.92	10				
				11				RUN 6
			66.7	12				
		Borehole Terminated at 12.2 m Depth						

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.1 - 4.6	92	95
2	4.6 - 6.1	100	90
3	6.1 - 7.7	100	80
4	7.7 - 9.1	100	98
5	9.1 - 10.7	100	95
6	10.7 - 12.2	100	94

Log of Borehole BH-08

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 7

Page. 1 of 1

Date Drilled: 'May 5, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		ASPHALT ~75 mm thick	79.1 79.0	0	6		SS1	
		GRANULAR FILL (BASE) ~460 mm thick Silty sand and crushed gravel, concrete pieces, dark brown and dark grey, damp, no odours, no stains (loose)	78.6	1	5		SS2	
		FILL Silty sand, some gravel, brown, damp to moist, no odours, no stains (loose)	77.6		8, then 50 for 125 mm		SS3	
		GLACIAL TILL Silty sand, some gravel and clay, possible cobbles and boulders, grey, moist, no odours, no stains (loose to dense)	76.6	2	44, then 50 for 0 mm		SS4	
		Auger Refusal at 2.5 m Depth						

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH-09

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 8

Page. 1 of 2

Date Drilled: 'May 10, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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 ▲

SOIL DESCRIPTION	Geodetic Elevation m	Depth
ASPHALT ~75 mm thick	78.87	0
GRANULAR FILL (BASE) ~535 mm thick	78.7	
Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (very dense)	78.3	
FILL Silty sand, silt and clay pockets, organic soil pockets, brown to dark brown, moist, no odours, no stains (loose)	77.4	1
GLACIAL TILL Silty sand, some gravel and rock chips, possible cobbles and boulders, grey, wet, no odours, no stains (loose to dense)	76.4	2
LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality)		3
- slightly weathered from 2.7 m to 3.3 m depth		4
		5
		6
		7
		8
		9
		10

Standard Penetration Test N Value: 64 (0 m), 7 (1 m), 5 (2 m), 39 (2.5 m)

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
SS1	
SS2	20.7
SS3	22.1
SS4	22.7
RUN 1	
RUN 2	
RUN 3	
RUN 4	
RUN 5	

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	2.5 - 3.3	100	61
2	3.3 - 4.9	98	89
3	4.9 - 6.4	100	90
4	6.4 - 7.9	100	90
5	7.9 - 9.3	100	98
6	9.3 - 11	100	100
7	11 - 12.4	100	95

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-09

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 8

Page. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality) - slightly weathered from 2.7 m to 3.3 m depth *(continued)*	68.87	10 11 12			RUN 6 RUN 7	
		Borehole Terminated at 12.4 m Depth	66.5					

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	2.5 - 3.3	100	61
2	3.3 - 4.9	98	89
3	4.9 - 6.4	100	90
4	6.4 - 7.9	100	90
5	7.9 - 9.3	100	98
6	9.3 - 11	100	100
7	11 - 12.4	100	95

Log of Borehole BH-10

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 9

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
			78.86	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		ASPHALT ~ 65 mm thick	78.8					
		GRANULAR FILL (BASE) ~595 mm thick Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (dense)	78.2		31		SS1	
		FILL Silty sand, some gravel, concrete pieces, brown, damp to moist, no odours, no stains (compact to dense)		1	40		SS2	
					13		SS3	
			76.7	2				
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, wet, no odours, no stains (compact to very dense)			12		SS4	23.5
				3	50		SS5	
			75.4					
		Auger Refusal at 3.5 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-11

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 10

Page. 1 of 2

Date Drilled: 'May 9, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		ASPHALT ~100 mm thick	78.9	0
		GRANULAR FILL (BASE) ~660 mm thick Silty sand and crushed gravel, dark brown and dark grey, damp, no odours, no stains (dense)	78.8	
		FILL Silty sand, some gravel, brick and concrete pieces, brown, moist, no odours, no stains (compact to dense)	78.1	1
				2
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, moist, no odours, no stains (compact)	76.7	
		LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality)	75.9	3
		- With 25 mm thick clay seam at 4.3 m depth		4
				5
				6
				7
				8
				9
				10

Standard Penetration Test N Value: 38 (SS1); 44 (SS2); 30, then 50 for 125 mm (SS3); 22, then 50 for 75 mm (SS4)

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
SS1	
SS2	
SS3	
SS4	
RUN 1	
RUN 2	
RUN 3	
RUN 4	
RUN 5	

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3 - 3.3	100	50
2	3.3 - 4.9	100	77
3	4.9 - 6.4	100	86
4	6.4 - 7.9	100	95
5	7.9 - 9.4	100	93
6	9.4 - 11	100	100
7	11 - 12.4	100	96

Log of Borehole BH-11

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Figure No. 10

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		LIMESTONE BEDROCK With shale seams, grey to dark grey (fair to excellent quality) *(continued)*	68.9	10			RUN 6	
				11			RUN 7	
			66.5	12				
		Borehole Terminated at 12.4 m Depth						

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3 - 3.3	100	50
2	3.3 - 4.9	100	77
3	4.9 - 6.4	100	86
4	6.4 - 7.9	100	95
5	7.9 - 9.4	100	93
6	9.4 - 11	100	100
7	11 - 12.4	100	96

Log of Borehole BH-12

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 11

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
			78.73	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		ASPHALT ~ 75 mm thick	78.7					
		GRANULAR FILL (BASE) ~380 mm thick Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (compact)	78.2		21	×	SS1	
		FILL Silty sand, some gravel, organic black silty sand, dark grey, moist, no odours, no stains (loose)	77.2	1	6	×	SS2	
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, moist, no odours, no stains (dense)			34	×	SS3	
				2	10, then 50 for 75 mm	×	SS4	
			76.0					
		Auger Refusal at 2.7 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole BH-13

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 12

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		ASPHALT ~ 125 mm thick	78.96	0
		GRANULAR FILL (BASE) ~535 mm thick	78.8	
		Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (very dense)	78.3	
		FILL Silty sand, some gravel, brown, moist, no odours, no stains (loose to compact)		1
			76.8	2
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, moist, no odours, no stains (dense)	76.0	
		Auger Refusal at 3.0 m Depth		3

Standard Penetration Test N Value: 20 40 60 80
Shear Strength: 50 100 150 200 kPa

57
11
5
47, then 50 for 75 mm

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

SAMPLES	Natural Unit Wt. kN/m³
SS1	
SS2	20.2
SS3	
SS4	21.9

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

Log of Borehole ENV-1

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 13

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
			78.62	0
		ASPHALT ~180 mm thick	78.4	
		GRANULAR FILL (BASE) ~505 mm thick Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (compact)	77.9	
		FILL Silty sand, some gravel, brown, wet, no odours, no stains (loose)	77.2	1
		GLACIAL TILL Silty sand, some gravel and clay, possible cobbles and boulders, grey, wet, no odours, no stains (compact)	76.4	2
		Auger Refusal at 2.2 m Depth		

Standard Penetration Test N Value: 20 40 60 80

Shear Strength: 50 100 150 200 kPa

Combustible Vapour Reading (ppm): 250 500 750

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

SAMPLES	Natural Unit Wt. kN/m³
SS1	
SS2	
SS3	

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole ENV-2

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 14

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		ASPHALT ~125 mm thick	78.96	0				
		GRANULAR FILL (BASE) ~575 mm thick	78.8					
		Silty sand and crushed gravel, brown and grey, damp, no odours, no stains (compact)	78.3					
		FILL Silty sand, some gravel and clay, brown, moist to wet, no odours, no stains (loose to compact)		1	17	0	SS1	
					17	0	SS2	
				2	6	0	SS3	
			76.8					
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, wet, no odours, no stains (dense)	76.3		42, then 50 for 150 mm	20	SS4	
		Auger Refusal at 2.7 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole ENV-3

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 15

Page. 1 of 1

Date Drilled: 'May 12, 2023

Drill Type: Portable Drilling Equipment

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		CONCRETE ~ 230 mm	79.08 78.9	0
		GRANULAR FILL ~230 mm thick Brown, dry, no odours, no stains	78.6	
		CONCRETE ~255 mm thick	78.4	
		FILL Silty sand, some gravel, brown, damp to moist, no odours, no stains		1
				2
			76.5	
		GLACIAL TILL Silty sand, some gravel, possible cobbles and boulders, grey, wet, no odours, no stains		3
			75.6	
		Casing Refusal at 3.5 m Depth		

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

SAMPLES	Natural Unit Wt. kN/m³	N
SS1		20
SS2		10
SS3		10
SS4		5
SS5		15

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole ENV-4

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 16

Page. 1 of 1

Date Drilled: 'May 12, 2023

Drill Type: Portable Drilling Equipment

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		CONCRETE ~255 mm thick	79.08	0				
		FILL Silty sand and gravel, brown, damp to wet, no odours, no stains	78.8					
				1		10	SS1	
						15	SS2	
				2		10	SS3	
						10	SS4	
				3		5	SS5	
			75.3			25	SS6	
		Casing Refusal at 3.8 m Depth						

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

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. A 50mm PVC monitoring well was installed upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

Log of Borehole ENV-5

Project No: OTT-22015769-A0

Project: Proposed Residential Hi-Rise Towers

Location: 1640 - 1660 Carling Avenue, Ottawa, ON

Figure No. 17

Page. 1 of 1

Date Drilled: 'May 4, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: JE Checked by: SP

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic 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
		ASPHALT ~125 mm thick	78.85	0				
		GRANULAR FILL (BASE) ~1.3 m thick Silty sand and gravel, brown and grey, damp, no odours, no stains (dense to very dense).	78.7		35	0	SS1	
				1	50	0	SS2	
		FILL Silty sand, some gravel, brown, moist, no odours, no stains (compact)	77.4		17	25	SS3	
		GLACIAL TILL Silty sand, some gravel, rock chips, grey, damp, no odours, no stains (dense)	76.7	2	39	30	SS4	23.7
			75.8	3	50 / 25 mm		SS5	
		Auger Refusal at 3.1 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. The borehole was backfilled upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22015769-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS 1660 CARLING AVE.GPJ TROW OTTAWA.GDT 5/23/23

BH/MW22-01

DST Project No.	02202032	Date	April 26, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Air Hammer
Project	Phase II Environmental Site Assessment	Diameter	ID 7.6 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025276 m N, 441389 m E
		Surface Elevation	78.04 m

Depth (m)	Elevation (m)	Water level (m)	Well construction	Depth (m) / Elevation (m)	Symbol	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
0	78			0 / 78.04		**ASPHALT**											
				0.1 / 77.94		**FILL - gravel, some sand, light grey, dry, loose**	SS1		100	NM	NM						
0.5																	
1.0	77			0.75 / 77.29		**SAND & SILT - trace gravel, brown, damp, loose**	SS2		100	NM	NM						
1.5							BH22-01		100	<5 ppm	<1 ppm	✓	✓	✓	✓	✓	
2.0	76			2 / 76.04		**BEDROCK - limestone, fractured**											
2.5		75.56															Groundwater level measured on May 3, 2022.
3.0	75																
3.5																	
4.0	74																
4.5																	
5.0	73																
5.5																	
6.0	72					**End of Borehole at 6.1 m.**											

BH/MW22-02

DST Project No.	02202032	Date	April 26, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Air Hammer
Project	Phase II Environmental Site Assessment	Diameter	ID 7.6 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025280 m N, 441447 m E
		Surface Elevation	78.15 m

Depth (m)	Elevation (m)	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
0	78.15	**ASPHALT**											
0.1	78.05	**FILL - gravel, dry, loose, light brown**	SS1		100	NM	NM						
0.75	77.4	**SAND - trace gravel, damp, soft**	BH22-02B		100	<5 ppm	<1 ppm		✓				
1.2	76.95	**SAND & GRAVEL - dry**											
1.7	76.45	**- black, seam**	BH22-02		100	<5 ppm	<1 ppm	✓	✓	✓	✓	✓	Other: Glycols
1.8	76.35	**SAND & SILT - damp, firm, some organics**											
2.1	76.05	**BEDROCK - limestone**											
		End of Borehole at 4.6 m.											

Water level (m): 75.50 — Groundwater level measured on May 3, 2022.

Well construction

Symbol

BH/MW22-03

DST Project No.	02202032	Date	April 26, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Air Hammer
Project	Phase II Environmental Site Assessment	Diameter	ID 7.6 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025273 m N, 441434 m E
		Surface Elevation	78.19 m

Depth (m)	Elevation (m)	Water level (m)	Well construction	Depth (m) / Elevation (m)	Symbol	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
0	78			0 / 78.19		**ASPHALT**											
				0.1 / 78.09		**FILL - sandy gravel, dry, loose, light brown**	SS1		100	NM	NM						
0.5																	
1.0	77					**- Silty**	BH22-03		100	15 ppm	<1 ppm	✓	✓	✓	✓	✓	Other: Glycols, pH, Grain Size Duplicate: Dup-01
1.5				1.6 / 76.59		**SANDY SILT - trace gravel, damp, grey. firm**											
2.0	76						BH22-03B		100	10 ppm	<1 ppm		✓				
2.5							SS4		100	NM	NM						
		75.48		2.7 / 75.49		**BEDROCK - limestone**											Groundwater level measured on May 3, 2022.
3.0	75																
3.5																	
4.0	74																
4.5																	
5.0	73																
5.5																	
6.0																	
	72					**End of Borehole at 6.1 m.**											

BH/MW22-04

DST Project No.	02202032	Date	April 27, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Water Rotary Coring
Project	Phase II Environmental Site Assessment	Diameter	ID 5.4 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025308 m N, 441388 m E
		Surface Elevation	78.22 m

Depth (m)	Elevation (m)	Water level (m)	Well construction	Depth (m) Elevation (m)	Symbol	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
0	78.22			0		ASPHALT											
				0.1		FILL - sandy gravel, grey, dry, loose	SS1		100	NM	NM						
0.5	78			78.12													
				0.75		SAND - trace gravel, brown, damp	BH22-04B		80	<5 ppm	<1 ppm		✓				
1.0	77			77.47													
1.5				1.4		- firm	BH22-04		95	<5 ppm	<1 ppm	✓	✓	✓	✓		
				76.82													
2.0	76			2		BEDROCK - limestone											
				76.22													
2.5																	
3.0	75																
		74.88															Groundwater level measured on May 3, 2022.
3.5																	
4.0	74																
4.5																	
5.0	73																
5.5																	
6.0						End of Borehole at 6.1 m.											
	72																

BH/MW22-05

DST Project No.	02202032	Date	April 27, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Water Rotary Coring
Project	Phase II Environmental Site Assessment	Diameter	ID 5.4 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025329 m N, 441410 m E
		Surface Elevation	78.14 m

Depth (m)	Elevation (m)	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis: PAHs	Analysis: PHC/BTEX	Analysis: Metals	Analysis: VOCs	Analysis: Others	Remarks
0	78.14	ASPHALT											
0.1	78.04	FILL - gravel, some sand, grey, dry, loose	SS1		100	NM	NM						
			SS2		100	<5 ppm	<1 ppm						
1.8	76.34	SAND - trace gravel, damp, brown, loose/soft	SS3		100	<5 ppm	<1 ppm						
			SS4		100	NM	NM						
3.1	75.04	- saturated, some silt	BH22-05		100	<5 ppm	<1 ppm	✓	✓	✓	✓	✓	Other: pH, Grain Size
3.5	74.64	BEDROCK - limestone											Groundwater level measured on May 3, 2022.
6.1	72	End of Borehole at 6.1 m.											

Water level (m): 74.70

Well construction: Flush mount protective casing; Bentonite seal; Sand pack; Slotted screen

BH/MW22-06

DST Project No.	02202032	Date	April 26, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Air Hammer
Project	Phase II Environmental Site Assessment	Diameter	ID 7.6 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025310 m N, 441429 m E
		Surface Elevation	78.15 m

Depth (m)	Elevation (m)	Water level (m)	Well construction	Depth (m) / Elevation (m)	Symbol	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
0	78			0 / 78.15		**ASPHALT**											
				0.1 / 78.05		**FILL - sandy gravel, grey/brown, damp, firm**	SS1		100	NM	NM						
0.5																	
1.0	77						BH22-06		100	5 ppm	<1 ppm	✓	✓	✓	✓	✓	
1.5				1.5 / 76.65		**Sand - trace gravel, light brown, damp, soft**	SS2		100	NM	NM						
2.0	76																
2.5				2.3 / 75.85		**- saturated**	BH22-06B		100	<5 ppm	<1 ppm		✓				
3.0	75	75.05		2.9 / 75.25		**- wet, grey**	SS3		100	NM	NM						Groundwater level measured on May 3, 2022.
3.5				3.5 / 74.65		**BEDROCK - limestone**											
4.0	74																
4.5																	
5.0	73																
5.5																	
6.0	72																

BH/MW22-06

DST Project No.	02202032	Date	April 26, 2022
Client	Canadian Tire Real Estate Limited	Method	Hollow Stem Auger with Direct Push/Air Hammer
Project	Phase II Environmental Site Assessment	Diameter	ID 7.6 cm
Address	CTR 290 - 1660 Carling Avenue, Ottawa	Coordinates	5025310 m N, 441429 m E
		Surface Elevation	78.15 m

Depth (m)	Elevation (m)	Water level (m)	Well construction	Depth (m) Elevation (m)	Symbol	Material Description	Sample #	Sample Type	% Sample Recov.	CCGD / PID: CCGD	CCGD / PID: PID	Analysis (Submitted for laboratory analysis): PAHs	PHC/BTEX	Metals	VOCs	Others	Remarks
6.5						BEDROCK - limestone											
7.0	71																
7.5																	
8.0	70																
8.5																	
9.0	69					End of Borehole at 9.2 m.											
9.5																	
10.0	68																
10.5																	
11.0	67																
11.5																	
12.0	66																

Appendix F: Analytical Summary Tables

Table 1 - Analytical Results in Soil - PHC and VOC
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Sample ID	UNITS	Provincial	Samples					
		MECP Table 3 Residential[1]	ENV-1-SS3	ENV-2-SS3	ENV-3-SS3	ENV-4-SS5	DUP A (ENV-4-SS5)	ENV-5-SS4
Sampling Date			**4-May-23**	**4-May-23**	**12-May-23**	**12-May-23**	**12-May-23**	**4-May-23**
Sample Depth (mbgs)			1.5 to 2.1	1.5 to 2.1	2.0 to 2.6	2.7 to 3.4	2.7 to 3.4	2.3 to 2.9
Petroleum Hydrocarbons								
F1 PHC (C6-C10)	µg/g	55	< 10	< 10	< 10	< 10	< 10	< 10
F2 PHC (C10-C16)	µg/g	98	< 5	< 5	< 5	< 5	< 5	< 5
F3 PHC (C16-C34)	µg/g	300	51	< 10	< 10	< 10	17	< 10
F4 PHC (C34-C50)	µg/g	2800	54	< 10	< 10	< 10	26	< 10
Volatile Organic Compounds								
Acetone	µg/g	16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	µg/g	0.21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Bromodichloromethane	µg/g	13	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Bromoform	µg/g	0.27	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlorobenzene	µg/g	2.4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chloroform	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	µg/g	9.4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichlorobenzene	µg/g	3.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/g	4.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.083	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethane	µg/g	3.5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichloroethane	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-Dichloroethylene	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Cis-1,2-Dichloroethylene	µg/g	3.4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Trans-1,2-Dichloroethylene	µg/g	0.084	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichloropropane	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Cis-1,3-Dichloropropylene	µg/g	NV	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Trans-1,3-Dichloropropylene	µg/g	NV	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,3-Dichloropropylene, Total	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylene Dibromide	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Hexane(n)	µg/g	2.8	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Methylene Chloride	µg/g	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Ethyl Ketone	µg/g	16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/g	1.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl-t-Butyl Ether	µg/g	0.75	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	µg/g	0.7	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.058	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1,2,2-Tetrachloroethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.28	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	2.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	µg/g	0.38	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1,2-Trichloroethane	µg/g	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethylene	µg/g	0.061	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Trichlorofluoromethane	µg/g	4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Total Xylenes	µg/g	3.1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

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 (coarse 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 - Inorganic Parameters
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Sample ID	UNITS	Provincial	Samples					
		MECP Table 3 Residential [1]	ENV-1-SS3	ENV-2-SS3	ENV-3-SS2	DUP B (ENV-3-SS2)	ENV-4-SS4	ENV-5-SS4
Sampling Date			**4-May-23**	**4-May-23**	**12-May-23**	**12-May-23**	**12-May-23**	**4-May-23**
Sample Depth (mbgs)			1.5 to 2.1	1.5 to 2.1	1.4 to 2.0	1.4 to 2.0	2.1 to 2.7	2.3 to 2.9
Metals								
Antimony	µg/g	7.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5
Arsenic	µg/g	18	1.3	1.4	1.4	1.3	1.7	1.0
Barium	µg/g	390	75	93	84	51	54	75
Beryllium	µg/g	4	0.3	0.4	0.3	0.2	0.4	0.2
Boron (Total)	µg/g	120	3.3	2.2	14.1	9.1	13.4	5.5
Boron (Hot Water Soluble)	µg/g	1.5	0.02	0.05	0.11	0.06	0.06	0.05
Cadmium	µg/g	1.2	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5
Chromium (Total)	µg/g	160	18	26	24	16	16	14
Chromium VI	µg/g	8	< 0.2	< 0.2	<0.2	<0.2	<0.2	< 0.2
Cobalt	µg/g	22	8	9	7	5	6	6
Copper	µg/g	140	16	18	15	12	12	10
Lead	µg/g	120	< 5	6	<5	<5	5	6
Mercury	µg/g	0.27	0.005	0.007	<0.01	0.02	0.02	0.005
Molybdenum	µg/g	6.9	< 1	< 1	<1	<1	<1	< 1
Nickel	µg/g	100	13	17	15	10	11	11
Selenium	µg/g	2.4	< 0.5	< 0.5	0.7	0.6	0.6	< 0.5
Silver	µg/g	20	< 0.2	< 0.2	<0.2	<0.2	<0.2	< 0.2
Thallium	µg/g	1	0.1	0.10	0.10	<0.1	<0.1	0.10
Uranium	µg/g	23	0.6	4	0.7	0.5	0.7	0.4
Vanadium	µg/g	86	34	43	32	25	24	25
Zinc	µg/g	340	29	37	27	26	29	26
Inorganics								
pH	pH Units	5 to 9	7.94	7.57	7.49	7.79	7.85	7.9
Conductivity	mS/cm	0.7	**1.28**	**1.33**	0.376	0.631	0.665	0.527
Sodium Adsorption Ratio	-	5	**14.2**	**27.1**	0.6	2.1	2.1	4.0
Cyanide (Free)	µg/g	0.051	< 0.05	< 0.05	<0.05	<0.05	<0.05	< 0.05

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 (coarse 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 Groundwater - PHC and VOC
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Sample ID	UNITS	Provincial	Samples			
		MECP Table 3 Residential[1]	BH-9	MW22-02	DUP (Dup MW22-02)	ENV-4
Sampling Date			**31-May-2023**	**31-May-2023**	**31-May-2023**	**31-May-2023**
Sceen Depth			9.4 to 12.4	3.1 to 4.6	3.1 to 4.6	2.3 to 3.8
Petroleum Hydrocarbons						
F1 PHC (C6-C10)*	µg/L	750	<25	<25	<25	<25
F2 PHC (C10-C16)	µg/L	150	<50	<50	<50	<50
F3 PHC (C16-C34)	µg/L	500	<400	<400	<400	<400
F4 PHC (C34-C50)	µg/L	500	<400	<400	<400	<400
Volatile Organic Compounds						
Acetone (2-Propanone)	µg/L	130000	<30	<30	<30	<30
Benzene	µg/L	44	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	85000	<2	<2	<2	<2
Bromoform	µg/L	380	<5	<5	<5	<5
Bromomethane	µg/L	5.6	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.79	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	630	<0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	2.4	<1	<1	<1	<1
Dibromochloromethane	µg/L	82000	<2	<2	<2	<2
1,2-Dichlorobenzene	µg/L	4600	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L	9600	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L	8	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (FREON 12)	µg/L	4400	<2	<2	<2	<2
1,1-Dichloroethane	µg/L	320	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	16	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/L	NV	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	µg/L	NV	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene (cis+trans)	µg/L	5.2	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	2300	<0.5	<0.5	<0.5	<0.5
Ethylene Dibromide	µg/L	0.25	<0.2	<0.2	<0.2	<0.2
Hexane	µg/L	51	<5	<5	<5	<5
Methylene Chloride(Dichloromethane)	µg/L	610	<5	<5	<5	<5
Methyl Ethyl Ketone (2-Butanone)	µg/L	470000	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	140000	<20	<20	<20	<20
Methyl t-butyl ether (MTBE)	µg/L	190	<2	<2	<2	<2
Styrene	µg/L	1300	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	µg/L	3.3	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L	3.2	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	18000	2.3	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	640	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	4.7	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L	1.6	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (FREON 11)	µg/L	2500	<5	<5	<5	<5
Vinyl Chloride	µg/L	0.5	<0.2	<0.2	<0.2	<0.2
p+m-Xylene	µg/L	NV	<1	<1	<1	<1
o-Xylene	µg/L	NV	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	4200	<1.1	<1.1	<1.1	<1.1

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 (coarse 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 4 - Analytical Results in Groundwater - Inorganic Parameters
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Sample ID	UNITS	Provincial	Sample			
		MECP Table 3 Residential[1]	BH-9	MW22-02	DUP (Dup MW22-02)	ENV-4
Sampling Date			**31-May-2023**	**31-May-2023**	**31-May-2023**	**31-May-2023**
Screen Depth			9.4 to 12.4	3.1 to 4.6	3.1 to 4.6	2.3 to 3.8
Metals						
Antimony	µg/L	20000	0.5	<0.1	<0.1	0.2
Arsenic	µg/L	1900	3.7	0.2	0.2	0.2
Barium	µg/L	29000	95	148	150	387
Beryllium	µg/L	67	<0.1	<0.1	<0.1	<0.1
Boron	µg/L	45000	1200	165	138	219
Cadmium	µg/L	2.7	0.223	0.045	0.074	0.134
Chromium	µg/L	810	<1	<1	<1	1
Chromium VI	µg/L	140	<10	<10	<10	<10
Cobalt	µg/L	66	2.8	0.7	0.5	1.8
Copper	µg/L	87	20.3	2.4	2.0	1.5
Lead	µg/L	25	0.1	0.1	0.1	<0.02
Mercury	µg/L	0.29	<0.02	<0.02	<0.02	<0.02
Molybdenum	µg/L	9200	170	4.6	1.6	3.7
Nickel	µg/L	490	10.6	5.4	5.6	7.5
Sodium	µg/L	2300000	320000	3260000	3120000	2870000
Selenium	µg/L	63	2	2	3	3
Silver	µg/L	1.5	0.3	0.9	1.5	<0.1
Thallium	µg/L	510	<0.05	0.27	0.28	0.07
Uranium	µg/L	420	2.44	1.86	1.82	3.67
Vanadium	µg/L	250	1.9	0.4	0.5	0.8
Zinc	µg/L	1100	<5	6	7	<5

NOTES:

2	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 (coarse textured soils)
<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
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Sample Location	Sample Depth (m bgs)	Sampling Date	Maximum Concentration	MECP Table 3 Residential
Petroleum Hydrocarbons					
F1 PHC (C6-C10)	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<10	55
F2 PHC (C10-C16)	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<5	98
F3 PHC (C16-C34)	BH22-02	0.8 to 1.5	26-Apr-22	54	300
F4 PHC (C34-C50)	BH22-02	0.8 to 1.5	26-Apr-22	81	2800
Volatile Organic Compounds					
Acetone	All Locations	0.8 to 3.5	All 2022 and 2023 dates		16
Benzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.02	0.210
Bromodichloromethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		13
Bromoform	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.27
Bromomethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Carbon Tetrachloride	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Chlorobenzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		2.4
Chloroform	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Dibromochloromethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		9.4
1,2-Dichlorobenzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		3.4
1,3-Dichlorobenzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		4.8
1,4-Dichlorobenzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.083
Dichlorodifluoromethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		16
1,1-Dichloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		3.5
1,2-Dichloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
1,1-Dichloroethylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Cis-1,2-Dichloroethylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		3.4
Trans-1,2-Dichloroethylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.084
1,2-Dichloropropane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Cis-1,3-Dichloropropylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		NV
Trans-1,3-Dichloropropylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		NV
1,3-Dichloropropylene, Total	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Ethylbenzene	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.05	2
Ethylene Dibromide	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Hexane(n)	All Locations	0.8 to 3.5	All 2022 and 2023 dates		2.8
Methylene Chloride	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.1
Methyl Ethyl Ketone	All Locations	0.8 to 3.5	All 2022 and 2023 dates		16
Methyl Isobutyl Ketone	All Locations	0.8 to 3.5	All 2022 and 2023 dates		1.7
Methyl-t-Butyl Ether	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.75
Styrene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.7
1,1,1,2-Tetrachloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.058
1,1,2,2-Tetrachloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Tetrachloroethylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.28
Toluene	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.2	2.3
1,1,1-Trichloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.38
1,1,2-Trichloroethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.05
Trichloroethylene	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.061
Trichlorofluoromethane	All Locations	0.8 to 3.5	All 2022 and 2023 dates		4
Vinyl Chloride	All Locations	0.8 to 3.5	All 2022 and 2023 dates		0.02
Total Xylenes	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.03	3.1
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	All 2022 Locations	0.8 to 3.5	26-Apr-22, 27-Apr-2022	<0.0050	7.9
Acenaphthylene	All 2022 Locations	0.8 to 3.5	26-Apr-22, 27-Apr-2022	<0.0050	0.15
Anthracene	BH22-03	0.8 to 1.5	26-Apr-22	0.0081	0.67
Benzo(a)anthracene	BH22-03	0.8 to 1.5	26-Apr-22	0.027	0.5
Benzo(a)pyrene	BH22-03	0.8 to 1.5	26-Apr-22	0.028	0.3
Benzo(b/j)fluoranthene	BH22-03, BH22-06	0.8 to 1.5	26-Apr-22	0.041	0.78
Benzo(ghi)perylene	BH22-03	0.8 to 1.5	26-Apr-22	0.019	6.6
Benzo(k)fluoranthene	BH22-03, BH22-06	0.8 to 1.5	26-Apr-22	0.014	0.78
Chrysene	BH22-03, BH22-06	0.8 to 1.5	26-Apr-22	0.026	7
Dibenzo(a,h)anthracene	All 2022 Locations	0.8 to 3.5	26-Apr-22, 27-Apr-2022	<0.0050	0.1
Fluoranthene	BH22-03	0.8 to 1.5	26-Apr-22	0.059	0.69
Fluorene	All 2022 Locations	0.8 to 3.5	26-Apr-22, 27-Apr-2022	<0.0050	62
Indeno(1,2,3-cd)pyrene	BH22-06	0.8 to 1.5	26-Apr-22	0.019	0.38
1-Methylnaphthalene	BH22-03	0.8 to 1.5	26-Apr-22	0.0090	0.99
2-Methylnaphthalene	BH22-01	1.5 to 2.0	26-Apr-22	0.0095	0.99
Methylnaphthalene, 2-(1-)	BH22-03	0.8 to 1.5	26-Apr-22	0.020	0.99
Naphthalene	BH22-03	0.8 to 1.5	26-Apr-22	0.0071	0.6
Phenanthrene	BH22-01	1.5 to 2.0	26-Apr-22	0.027	6.2
Pyrene	BH22-03	0.8 to 1.5	26-Apr-22	0.050	78
Metals					
Antimony	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.5	7.5
Arsenic	ENV-4	2.1 to 2.7	12-May-23	1.7	18
Barium	BH22-03	0.8 to 1.5	26-Apr-22	390	390
Beryllium	ENV-2, ENV-4	1.5 to 2.7	4-May-2023, 12-May-23	0.4	4
Boron (Total)	ENV-3	1.4 to 2.0	12-May-23	14.1	120
Cadmium	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.5	1.2
Chromium (Total)	ENV-2	1.5 to 2.1	4-May-23	26	160
Cobalt	ENV-2	1.5 to 2.1	4-May-23	9	22
Copper	ENV-2	1.5 to 2.1	4-May-23	18	140
Lead	BH22-03	0.8 to 1.5	26-Apr-22	17	120
Molybdenum	BH22-03	0.8 to 1.5	26-Apr-22	0.70	6.9
Nickel	ENV-2	1.5 to 2.1	4-May-23	17	100
Selenium	ENV-3	1.4 to 2.0	12-May-23	0.7	2.4
Silver	All Locations	0.8 to 3.5	All 2022 and 2023 dates	<0.2	20
Thallium	BH22-01	1.5 to 2.0	26-Apr-22	0.14	1
Uranium	ENV-2	1.5 to 2.1	4-May-23	4	23
Vanadium	ENV-2	1.5 to 2.1	4-May-23	43	86
Zinc	BH22-03	0.8 to 1.5	26-Apr-22	61	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 (coarse textured soils)

NV No Value

\- Parameter not analyzed

m bgs Metres below ground surface

Table 6 - Maximum Concentrations in Groundwater
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Sample Location	Sample Depth (m bgs)	Sampling Date	Maximum Concentration	MECP Table 3 Residential
Petroleum Hydrocarbons					
F1 PHC (C6-C10)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<25	750
F2 PHC (C10-C16)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<50	150
F3 PHC (C16-C34)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<400	500
F4 PHC (C34-C50)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<400	500
Volatile Organic Compounds					
Acetone (2-Propanone)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.5	130000
Benzene	BH-9	9.4 to 12.4	31-May-23	2.3	44
Bromodichloromethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	85000
Bromoform	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	380
Bromomethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	5.6
Carbon Tetrachloride	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	0.79
Chlorobenzene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	630
Chloroform	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	2.4
Dibromochloromethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	82000
1,2-Dichlorobenzene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	4600
1,3-Dichlorobenzene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	9600
1,4-Dichlorobenzene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	8
Dichlorodifluoromethane (FREON 12)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	4400
1,1-Dichloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	320
1,2-Dichloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	1.6
1,1-Dichloroethylene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	1.6
cis-1,2-Dichloroethylene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	1.6
trans-1,2-Dichloroethylene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	1.6
1,2-Dichloropropane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	16
cis-1,3-Dichloropropene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	NV
trans-1,3-Dichloropropene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	NV
1,3-Dichloropropene (cis+trans)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	5.2
Ethylbenzene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<0.5	2300
Ethylene Dibromide	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	0.25
Hexane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	51
Methylene Chloride(Dichloromethane)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	610
Methyl Ethyl Ketone (2-Butanone)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.5	470000
Methyl Isobutyl Ketone	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.5	140000
Methyl t-butyl ether (MTBE)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	190
Styrene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	1300
1,1,1,2-Tetrachloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	3.3
1,1,2,2-Tetrachloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	3.2
Tetrachloroethylene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	1.6
Toluene	BH-9	9.4 to 12.4	31-May-23	2.3	18000
1,1,1-Trichloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	640
1,1,2-Trichloroethane	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	4.7
Trichloroethylene	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.05	1.6
Trichlorofluoromethane (FREON 11)	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	2500
Vinyl Chloride	All Locations	2.3 to 12.4	All 2022 and 2023 dates	< 0.02	0.5
Total Xylenes	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<1.1	4200
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	600
Acenaphthylene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	1.8
Anthracene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	130000
Benzo(a)anthracene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	4.7
Benzo(a)pyrene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.0090	0.81
Benzo(b/j)fluoranthene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	0.75
Benzo(ghi)perylene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	0.2
Benzo(k)fluoranthene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	0.4
Chrysene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	1
Dibenzo(a,h)anthracene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	0.52
Fluoranthene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	130
Fluorene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	400
Indeno(1,2,3-cd)pyrene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	0.2
1-Methylnaphthalene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	1800
2-Methylnaphthalene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	1800
Methylnaphthalene, 2-(1-)	All 2022 Locations	3.1 to 9.2	3-May-22	<0.071	1800
Naphthalene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	1400
Phenanthrene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	580
Pyrene	All 2022 Locations	3.1 to 9.2	3-May-22	<0.050	68
Metals					
Antimony	BH-9	9.4 to 12.4	31-May-23	0.5	20000
Arsenic	BH-9	9.4 to 12.4	31-May-23	3.7	1900
Barium	ENV-4	2.3 to 3.8	31-May-23	387	29000
Beryllium	All Locations	2.3 to 12.4	All 2022 and 2023 dates	<0.1	67
Boron	BH-9	9.4 to 12.4	31-May-23	1200	45000
Cadmium	BH-9	9.4 to 12.4	31-May-23	0.223	2.7
Chromium	ENV-4	2.3 to 3.8	31-May-23	1	810
Cobalt	MW22-04	3.1 to 6.1	19-Jun-23	81	66
Copper	BH-9	9.4 to 12.4	31-May-23	20.3	87
Lead	MW22-05	3.1 to 6.1	3-May-22	0.80	25
Molybdenum	BH-9	9.4 to 12.4	31-May-23	170	9200
Nickel	MW22-04	3.1 to 6.1	3-May-22	130	490
Sodium	MW22-01	3.1 to 6.1	3-May-22	4700000	2300000
Selenium	ENV-4	2.3 to 3.8	31-May-23	3	63
Silver	MW22-02	3.1 to 4.6	3-May-22	1.5	1.5
Thallium	MW22-02	3.1 to 4.6	3-May-22	0.28	510
Uranium	MW22-01	3.1 to 6.1	3-May-22	15	420
Vanadium	BH-9	9.4 to 12.4	31-May-23	1.9	250
Zinc	MW22-01	3.1 to 6.1	3-May-22	33	1100

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 2 Full Depth Generic Site Condition Standards (SCS) in a 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 VOC in Soil
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Units	RDL	ENV-4-SS5	DUP A	RPD (%)	Alert Limit (%)
			12-May-2023	12-May-2023		
Petroleum Hydrocarbons						
F1 PHC (C6 - C10) - BTEX	ug/g dry	10	< 10	< 10	nc	60
F2 PHC (C10-C16)	ug/g dry	10	< 5	< 5	nc	60
F3 PHC (C16-C34)	ug/g dry	50	< 10	17	nc	60
F4 PHC (C34-C50)	ug/g dry	50	< 10	26	nc	60
Volatiles						
Acetone	ug/g dry	0.50	< 0.5	< 0.5	nc	100
Benzene	ug/g dry	0.0060	< 0.02	< 0.02	nc	100
Bromodichloromethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Bromoform	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Bromomethane	ug/g dry	0.050	< 0.05	< 0.05	nc	100
Carbon Tetrachloride	ug/g dry	0.050	< 0.05	< 0.05	nc	100
Chlorobenzene	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Chloroform	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Dibromochloromethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Dichlorodifluoromethane	ug/g dry	0.050	< 0.05	< 0.05	nc	100
1,2-Dichlorobenzene	ug/g dry	0.050	< 0.05	< 0.05	nc	100
1,3-Dichlorobenzene	ug/g dry	0.050	< 0.05	< 0.05	nc	100
1,4-Dichlorobenzene	ug/g dry	0.050	< 0.05	< 0.05	nc	100
1,1-Dichloroethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
1,2-Dichloroethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
1,1-Dichloroethylene	ug/g dry	0.050	< 0.02	< 0.02	nc	100
cis-1,2-Dichloroethylene	ug/g dry	0.050	< 0.02	< 0.02	nc	100
trans-1,2-Dichloroethylene	ug/g dry	0.050	< 0.02	< 0.02	nc	100
1,2-Dichloropropane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
cis-1,3-Dichloropropylene	ug/g dry	0.030	< 0.02	< 0.02	nc	100
trans-1,3-Dichloropropylene	ug/g dry	0.040	< 0.02	< 0.02	nc	100
1,3-Dichloropropene, total	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Ethylbenzene	ug/g dry	0.010	< 0.05	< 0.05	nc	100
Ethylene dibromide (dibromoethane, 1,2-	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Hexane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.50	< 0.05	< 0.05	nc	100
Methyl Isobutyl Ketone	ug/g dry	0.50	< 0.5	< 0.5	nc	100
Methyl tert-butyl ether	ug/g dry	0.50	< 0.5	< 0.5	nc	100
Methylene Chloride	ug/g dry	0.050	< 0.05	< 0.05	nc	100
Styrene	ug/g dry	0.050	< 0.05	< 0.05	nc	100
1,1,1,2-Tetrachloroethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
1,1,2,2-Tetrachloroethane	ug/g dry	0.050	< 0.05	< 0.05	nc	100
Tetrachloroethylene	ug/g dry	0.050	< 0.05	< 0.05	nc	100
Toluene	ug/g dry	0.020	< 0.2	< 0.2	nc	100
1,1,1-Trichloroethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
1,1,2-Trichloroethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Trichloroethylene	ug/g dry	0.010	< 0.05	< 0.05	nc	100
Trichlorofluoromethane	ug/g dry	0.050	< 0.02	< 0.02	nc	100
Vinyl Chloride	ug/g dry	0.020	< 0.02	< 0.02	nc	100
Xylenes, total	ug/g dry	0.020	< 0.03	< 0.03	nc	100

NOTES:

Analysis by Caduceon Environmental 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 - Metals in Soil
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Units	RDL	ENV-3-SS2	DUP B	RPD (%)	Alert Limit (%)
			12-May-2023	12-May-2023		
Metals						
Antimony	ug/g dry	0.20	<0.5	<0.5	nc	60
Arsenic	ug/g dry	1.0	1.4	1.3	nc	60
Barium	ug/g dry	0.50	84	51	49	60
Beryllium	ug/g dry	0.20	0.3	0.2	nc	60
Boron	ug/g dry	5.0	14.1	9.1	nc	60
Boron (Hot Water Soluble)	ug/g dry	0.05	0.11	0.06	nc	60
Cadmium	ug/g dry	0.10	<0.5	<0.5	nc	60
Chromium	ug/g dry	1.0	24	16	40	60
Chromium VI	ug/g dry	0.2	<0.2	<0.2	nc	60
Cobalt	ug/g dry	0.10	7	5	33	60
Copper	ug/g dry	0.50	15	12	22	60
Lead	ug/g dry	1.0	<5	<5	nc	60
Mercury	ug/g dry	0.01	<0.01	0.02	nc	60
Molybdenum	ug/g dry	0.50	<1	<1	nc	60
Nickel	ug/g dry	0.50	15	10	40	60
Selenium	ug/g dry	0.50	0.7	0.6	nc	60
Silver	ug/g dry	0.20	<0.2	<0.2	nc	60
Thallium	ug/g dry	0.050	0.1	<0.1	nc	60
Uranium	ug/g dry	0.050	0.7	0.5	33	60
Vanadium	ug/g dry	5.0	32	25	25	60
Zinc	ug/g dry	5.0	27	26	4	60

NOTES:

Analysis by Caduceon Environmental 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 9 - Relative Percent Differences - PHC and VOC in Groundwater
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Units	RDL	MW22-02	DUP	RPD (%)	Alert Limit (%)
			31-May-2023	31-May-2023		
Petroleum Hydrocarbons						
F1 PHC (C6 - C10) - BTEX	ug/L	25	<25	<25	nc	60
F2 PHC (C10-C16)	ug/L	100	<50	<50	nc	60
F3 PHC (C16-C34)	ug/L	100	<400	<400	nc	60
F4 PHC (C34-C50)	ug/L	100	<400	<400	nc	60
Volatiles						
Acetone	ug/L	5.0	<30	<30	nc	60
Benzene	ug/L	0.5	<0.5	<0.5	nc	60
Bromodichloromethane	ug/L	0.5	<2	<2	nc	60
Bromoform	ug/L	0.5	<5	<5	nc	60
Bromomethane	ug/L	0.5	<0.5	<0.5	nc	60
Carbon Tetrachloride	ug/L	0.2	<0.2	<0.2	nc	60
Chlorobenzene	ug/L	0.5	<0.5	<0.5	nc	60
Chloroform	ug/L	0.5	<1	<1	nc	60
Dibromochloromethane	ug/L	0.5	<2	<2	nc	60
Dichlorodifluoromethane	ug/L	1.0	<0.5	<0.5	nc	60
1,2-Dichlorobenzene	ug/L	0.5	<0.5	<0.5	nc	60
1,3-Dichlorobenzene	ug/L	0.5	<0.5	<0.5	nc	60
1,4-Dichlorobenzene	ug/L	0.5	<2	<2	nc	60
1,1-Dichloroethane	ug/L	0.5	<0.5	<0.5	nc	60
1,2-Dichloroethane	ug/L	0.5	<0.5	<0.5	nc	60
1,1-Dichloroethylene	ug/L	0.5	<0.5	<0.5	nc	60
cis-1,2-Dichloroethylene	ug/L	0.5	<0.5	<0.5	nc	60
trans-1,2-Dichloroethylene	ug/L	0.5	<0.5	<0.5	nc	60
1,2-Dichloropropane	ug/L	0.5	<0.5	<0.5	nc	60
cis-1,3-Dichloropropylene	ug/L	0.5	<0.5	<0.5	nc	60
trans-1,3-Dichloropropylene	ug/L	0.5	<0.5	<0.5	nc	60
1,3-Dichloropropene, total	ug/L	0.5	<0.5	<0.5	nc	60
Ethylbenzene	ug/L	0.5	<0.5	<0.5	nc	60
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.2	<0.2	<0.2	nc	60
Hexane	ug/L	1.0	<5	<5	nc	60
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	<5	<5	nc	60
Methyl Isobutyl Ketone	ug/L	5.0	<20	<20	nc	60
Methyl tert-butyl ether	ug/L	2.0	<20	<20	nc	60
Methylene Chloride	ug/L	5.0	<2	<2	nc	60
Styrene	ug/L	0.5	<0.5	<0.5	nc	60
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	<0.5	nc	60
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	<0.5	nc	60
Tetrachloroethylene	ug/L	0.5	<0.5	<0.5	nc	60
Toluene	ug/L	0.5	<0.5	<0.5	nc	60
1,1,1-Trichloroethane	ug/L	0.5	<0.5	<0.5	nc	60
1,1,2-Trichloroethane	ug/L	0.5	<0.5	<0.5	nc	60
Trichloroethylene	ug/L	0.5	<0.5	<0.5	nc	60
Trichlorofluoromethane	ug/L	1.0	<5	<5	nc	60
Vinyl Chloride	ug/L	0.5	<0.2	<0.2	nc	60
m/p-Xylene	ug/L	0.5	<1	<1	nc	60
o-Xylene	ug/L	0.5	<0.5	<0.5	nc	60
Xylenes, total	ug/L	0.5	<1.1	<1.1	nc	60

NOTES:

Analysis by Caduceon Environmental 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**

Table 10 - Relative Percent Differences - Metals in Groundwater
1640-1660 Carling Avenue, Ottawa, Ontario
OTT-22015769-A0

Parameter	Units	RDL	MW22-02	DUP	RPD (%)	Alert Limit (%)
			31-May-2023	31-May-2023		
Inorganics						
Antimony	ug/L	0.50	<0.1	<0.1	nc	40
Arsenic	ug/L	0.10	0.2	0.2	nc	40
Barium	ug/L	1.0	148	150	1	40
Beryllium	ug/L	0.10	<0.1	<0.1	nc	40
Boron	ug/L	50	165	138	nc	40
Cadmium	ug/L	0.010	0.045	0.074	nc	40
Chromium	ug/L	1.0	<1	<1	nc	40
Chromium VI	ug/L	10	<10	<10	nc	40
Cobalt	ug/L	0.20	0.7	0.5	nc	40
Copper	ug/L	0.20	2.4	2	18	40
Lead	ug/L	0.1	0.05	0.06	nc	40
Mercury	ug/L	0.02	<0.02	<0.02	nc	40
Molybdenum	ug/L	1.0	4.6	1.6	nc	40
Nickel	ug/L	1.0	5.4	5.6	4	40
Sodium	ug/L	100.0	3260000	3120000	4	40
Selenium	ug/L	0.10	2	3	40	40
Silver	ug/L	0.100	0.9	1.5	**50**	40
Thallium	ug/L	0.010	0.27	0.28	4	40
Uranium	ug/L	0.10	1.86	1.82	2	40
Vanadium	ug/L	5.0	0.4	0.5	nc	40
Zinc	ug/L	5.0	6	7	nc	40

NOTES:

Analysis by Caduceon Environmental Labratories
Non-detectable results are shown as "ND (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

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 100656 **REPORT No: 23-010393 - Rev. 0**

Report To:
EXP Services Inc - Ottawa
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Chris Kimmerly

DATE RECEIVED: 2023-May-12
DATE REPORTED: 2023-May-24
SAMPLE MATRIX: Soil

CUSTOMER PROJECT: OTT-22015769-AO
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Conductivity Meter (Solid)	3	OTTAWA	MDON	2023-May-17	A-COND-03	MECP E3530
Cyanide WAD (Solid)	3	KINGSTON	KWELCH	2023-May-18	CN-001	EPA 9012B
Boron-HWS (Solid)	3	OTTAWA	NHOGAN	2023-May-18	D-ICP-01	MECP E3470
Chromium VI (Solid)	3	OTTAWA	STAILLON	2023-May-17	D-CRVI-02	EPA 7196A
ICP/MS (Solid)	3	OTTAWA	TPRICE	2023-May-17	D-ICPMS-01	EPA 6020B
ICP/OES (Solid)	3	OTTAWA	NHOGAN	2023-May-18	D-ICP-02	EPA 6010
Mercury (Solid)	3	OTTAWA	APRUDYVUS	2023-May-18	D-HG-01	EPA 7471A
SAR analysed by ICPOES (Solid)	3	OTTAWA	NHOGAN	2023-May-18	D-ICP-02	EPA 6010
Moisture	6	KINGSTON	KPARKER	2023-May-16	% Moisture	SM 2540
pH Meter (Solid)	3	OTTAWA	MDON	2023-May-17	pH-03	MECP E3530
PHC F1 (Solid)	3	RICHMOND_HILL	CBURKE	2023-May-17	C-VPHS-01	CWS Tier 1
PHC F4G (Solid)	1	KINGSTON	TTHEAL	2023-May-19	PHC-S-001	CWS Tier 1
PHC F2-4 (Solid)	3	KINGSTON	KPARKER	2023-May-18	PHC-S-001	CWS Tier 1
VOC-Volatiles (Solid)	3	RICHMOND_HILL	JEVANS	2023-May-17	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

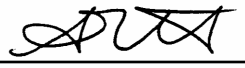
Steve Garrett
Director of Laboratory Services

			Client I.D.	ENV-3-SS2	DUPB	ENV-4-SS4
			Sample I.D.	23-010393-1	23-010393-3	23-010393-4
			Date Collected	2023-05-12	2023-05-12	2023-05-12
Parameter	**Units**	**R.L.**		-	-	-
Conductivity @25°C	mS/cm	0.001		0.376	0.631	0.665
pH @25°C	-	-		7.49	7.79	7.85
Cyanide (WAD)	µg/g	0.05		<0.05	<0.05	<0.05
Sodium Adsorption Ratio	-	-		0.62	2.10	2.12
Barium	µg/g	1		84	51	54
Beryllium	µg/g	0.2		0.3	0.2	0.4
Boron	µg/g	0.5		14.1	9.1	13.4
Cadmium	µg/g	0.5		<0.5	<0.5	<0.5
Chromium	µg/g	1		24	16	16
Cobalt	µg/g	1		7	5	6
Copper	µg/g	1		15	12	12
Lead	µg/g	5		<5	<5	5
Molybdenum	µg/g	1		<1	<1	<1
Nickel	µg/g	1		15	10	11
Vanadium	µg/g	1		32	25	24
Zinc	µg/g	3		27	26	29
Antimony	µg/g	0.5		<0.5	<0.5	<0.5
Arsenic	µg/g	0.5		1.4	1.3	1.7
Selenium	µg/g	0.5		0.7	0.6	0.6
Silver	µg/g	0.2		<0.2	<0.2	<0.2
Thallium	µg/g	0.1		0.1	<0.1	<0.1

Steve Garrett

Director of Laboratory Services

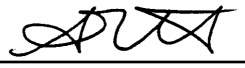
	Client I.D.		ENV-3-SS2	DUPB	ENV-4-SS4
	Sample I.D.		23-010393-1	23-010393-3	23-010393-4
	Date Collected		2023-05-12	2023-05-12	2023-05-12
Parameter	**Units**	**R.L.**	-	-	-
Uranium	µg/g	0.1	0.7	0.5	0.7
Boron (HWS)	µg/g	0.02	0.11	0.06	0.06
Chromium (VI)	µg/g	0.2	<0.2	<0.2	<0.2
Mercury	µg/g	0.01	<0.01	0.02	0.02



Steve Garrett

Director of Laboratory Services

Parameter	Units	R.L.	Client I.D.	ENV-3-SS2	ENV-3-SS3	DUPB	ENV-4-SS4	ENV-4-SS5
			Sample I.D.	23-010393-1	23-010393-2	23-010393-3	23-010393-4	23-010393-5
			Date Collected	2023-05-12	2023-05-12	2023-05-12	2023-05-12	2023-05-12
				-	-	-	-	-
Acetone	µg/g	0.5			<0.5			<0.5
Benzene	µg/g	0.02			<0.02			<0.02
Bromodichloromethane	µg/g	0.02			<0.02			<0.02
Bromoform	µg/g	0.02			<0.02			<0.02
Bromomethane	µg/g	0.05			<0.05			<0.05
Carbon Tetrachloride	µg/g	0.05			<0.05			<0.05
Chlorobenzene	µg/g	0.02			<0.02			<0.02
Chloroform	µg/g	0.02			<0.02			<0.02
Dibromochloromethane	µg/g	0.02			<0.02			<0.02
Ethylene Dibromide	µg/g	0.02			<0.02			<0.02
Dichlorobenzene,1,2-	µg/g	0.05			<0.05			<0.05
Dichlorobenzene,1,3-	µg/g	0.05			<0.05			<0.05
Dichlorobenzene,1,4-	µg/g	0.05			<0.05			<0.05
Dichlorodifluoromethane (Freon 12)	µg/g	0.05			<0.05			<0.05
Dichloroethane,1,1-	µg/g	0.02			<0.02			<0.02
Dichloroethane,1,2-	µg/g	0.02			<0.02			<0.02
Dichloroethylene,1,1-	µg/g	0.02			<0.02			<0.02
Dichloroethylene,1,2-cis-	µg/g	0.02			<0.02			<0.02
Dichloroethylene,1,2-trans-	µg/g	0.02			<0.02			<0.02
Dichloropropane,1,2-	µg/g	0.02			<0.02			<0.02
Dichloropropene,1,3-cis-	µg/g	0.02			<0.02			<0.02



Steve Garrett

Director of Laboratory Services

	Client I.D.	ENV-3-SS2	ENV-3-SS3	DUPB	ENV-4-SS4	ENV-4-SS5
	Sample I.D.	23-010393-1	23-010393-2	23-010393-3	23-010393-4	23-010393-5
	Date Collected	2023-05-12	2023-05-12	2023-05-12	2023-05-12	2023-05-12
Parameter	**Units** **R.L.**	-	-	-	-	-
Dichloropropene,1,3-cis+trans- (Calculated)	µg/g 0.02		<0.02			<0.02
Dichloropropene,1,3-trans-	µg/g 0.02		<0.02			<0.02
Ethylbenzene	µg/g 0.05		<0.05			<0.05
Hexane	µg/g 0.02		<0.02			<0.02
Dichloromethane (Methylene Chloride)	µg/g 0.05		<0.05			<0.05
Methyl Ethyl Ketone	µg/g 0.5		<0.5			<0.5
Methyl Isobutyl Ketone	µg/g 0.5		<0.5			<0.5
Methyl tert-Butyl Ether (MTBE)	µg/g 0.05		<0.05			<0.05
Styrene	µg/g 0.05		<0.05			<0.05
Tetrachloroethane,1,1,1,2-	µg/g 0.02		<0.02			<0.02
Tetrachloroethane,1,1,2,2-	µg/g 0.05		<0.05			<0.05
Tetrachloroethylene	µg/g 0.05		<0.05			<0.05
Toluene	µg/g 0.2		<0.2			<0.2
Trichloroethane,1,1,1-	µg/g 0.02		<0.02			<0.02
Trichloroethane,1,1,2-	µg/g 0.02		<0.02			<0.02
Trichloroethylene	µg/g 0.05		<0.05			<0.05
Trichlorofluoromethane (Freon 11)	µg/g 0.02		<0.02			<0.02
Vinyl Chloride	µg/g 0.02		<0.02			<0.02
Xylene, m,p-	µg/g 0.03		<0.03			<0.03
Xylene, m,p,o-	µg/g 0.03		<0.03			<0.03
Xylene, o-	µg/g 0.03		<0.03			<0.03

Steve Garrett

Director of Laboratory Services

	Client I.D.	ENV-3-SS2	ENV-3-SS3	DUPB	ENV-4-SS4	ENV-4-SS5
	Sample I.D.	23-010393-1	23-010393-2	23-010393-3	23-010393-4	23-010393-5
	Date Collected	2023-05-12	2023-05-12	2023-05-12	2023-05-12	2023-05-12
Parameter	**Units** / **R.L.**	-	-	-	-	-
PHC F1 (C6-C10)	µg/g / 10		<10			<10
PHC F2 (>C10-C16)	µg/g / 5		<5			<5
PHC F3 (>C16-C34)	µg/g / 10		<10			<10
PHC F4 (>C34-C50)	µg/g / 10		<10			<10
Moisture	% / -	11.5	12.4	8.13	8.43	14.5

Steve Garrett

Director of Laboratory Services

			Client I.D.	DUPA
			Sample I.D.	23-010393-6
			Date Collected	2023-05-12
Parameter	Units	R.L.	-	
Acetone	µg/g	0.5	<0.5	
Benzene	µg/g	0.02	<0.02	
Bromodichloromethane	µg/g	0.02	<0.02	
Bromoform	µg/g	0.02	<0.02	
Bromomethane	µg/g	0.05	<0.05	
Carbon Tetrachloride	µg/g	0.05	<0.05	
Chlorobenzene	µg/g	0.02	<0.02	
Chloroform	µg/g	0.02	<0.02	
Dibromochloromethane	µg/g	0.02	<0.02	
Ethylene Dibromide	µg/g	0.02	<0.02	
Dichlorobenzene,1,2-	µg/g	0.05	<0.05	
Dichlorobenzene,1,3-	µg/g	0.05	<0.05	
Dichlorobenzene,1,4-	µg/g	0.05	<0.05	
Dichlorodifluoromethane (Freon 12)	µg/g	0.05	<0.05	
Dichloroethane,1,1-	µg/g	0.02	<0.02	
Dichloroethane,1,2-	µg/g	0.02	<0.02	
Dichloroethylene,1,1-	µg/g	0.02	<0.02	
Dichloroethylene,1,2-cis-	µg/g	0.02	<0.02	
Dichloroethylene,1,2-trans-	µg/g	0.02	<0.02	
Dichloropropane,1,2-	µg/g	0.02	<0.02	
Dichloropropene,1,3-cis-	µg/g	0.02	<0.02	

Steve Garrett

Director of Laboratory Services

			Client I.D.	DUPA
			Sample I.D.	23-010393-6
			Date Collected	2023-05-12
Parameter	Units	R.L.	-	
Dichloropropene,1,3-cis+trans- (Calculated)	µg/g	0.02	<0.02	
Dichloropropene,1,3-trans-	µg/g	0.02	<0.02	
Ethylbenzene	µg/g	0.05	<0.05	
Hexane	µg/g	0.02	<0.02	
Dichloromethane (Methylene Chloride)	µg/g	0.05	<0.05	
Methyl Ethyl Ketone	µg/g	0.5	<0.5	
Methyl Isobutyl Ketone	µg/g	0.5	<0.5	
Methyl tert-Butyl Ether (MTBE)	µg/g	0.05	<0.05	
Styrene	µg/g	0.05	<0.05	
Tetrachloroethane,1,1,1,2-	µg/g	0.02	<0.02	
Tetrachloroethane,1,1,2,2-	µg/g	0.05	<0.05	
Tetrachloroethylene	µg/g	0.05	<0.05	
Toluene	µg/g	0.2	<0.2	
Trichloroethane,1,1,1-	µg/g	0.02	<0.02	
Trichloroethane,1,1,2-	µg/g	0.02	<0.02	
Trichloroethylene	µg/g	0.05	<0.05	
Trichlorofluoromethane (Freon 11)	µg/g	0.02	<0.02	
Vinyl Chloride	µg/g	0.02	<0.02	
Xylene, m,p-	µg/g	0.03	<0.03	
Xylene, m,p,o-	µg/g	0.03	<0.03	
Xylene, o-	µg/g	0.03	<0.03	

Steve Garrett

Director of Laboratory Services

	Client I.D.		DUPA
	Sample I.D.		23-010393-6
	Date Collected		2023-05-12
Parameter	**Units**	**R.L.**	-
PHC F1 (C6-C10)	µg/g	10	<10
PHC F2 (>C10-C16)	µg/g	5	<5
PHC F3 (>C16-C34)	µg/g	10	17
PHC F4 (>C34-C50)	µg/g	10	26
PHC F4 (Gravimetric)	µg/g	50	365
PHC F4 (Gravimetric) Silica Gel Cleaned	µg/g	50	162
Moisture	%	-	14.8

Steve Garrett

Director of Laboratory Services

CADUCEON™
ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (i)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	3	Kingston	kwe	16-May-23	A-CN s K	in house
Conductivity	3	Holly Lane	MDO	16-May-23	A-COND-01 (o)	SM 2510B
pH	3	Holly Lane	MDO	16-May-23	A-PH-01 (o)	SM 4500H
Chromium (VI)	3	Holly Lane	ST	15-May-23	D-CRVI-02 (o)	EPA7196A
Mercury	3	Holly Lane	APR	16-May-23	D-HG-01 (o)	EPA 7471A
Boron - HWS	3	Holly Lane	aoz	16-May-23	D-HWE s	MOE3470
Sodium Adsorption Ratio	3	Holly Lane	aoz	16-May-23	D-ICP-01 SAR (o)	SM 3120
Metals - ICP-OES	3	Holly Lane	aoz	16-May-23	D-ICP-02 (o)	EPA 6010
Metals - ICP-MS	3	Holly Lane	TPR	16-May-23	D-ICPMS-01 (o)	EPA 6020

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Steve Garrett
Director of Laboratory Services

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (i)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		ENV-1-SS3	ENV-2-SS3	ENV-5-SS4		O. Reg. 153	
	Sample I.D.		B23-03379-1	B23-03379-2	B23-03379-3			
	Date Collected		04-May-23	04-May-23	04-May-23			
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.94	7.57	7.90			
Conductivity @25°C	mS/cm	0.001	1.28	1.33	0.527			
Sodium Adsorption Ratio	units		14.2	27.1	3.97			
Cyanide (Free)	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Antimony	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Arsenic	µg/g	0.5	1.3	1.4	1.0			
Barium	µg/g	1	75	93	75			
Beryllium	µg/g	0.2	0.3	0.4	0.2			
Boron	µg/g	0.5	3.3	2.2	5.5			
Boron (HWS)	µg/g	0.02	0.02	0.05	0.05			
Cadmium	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Chromium	µg/g	1	18	26	14			
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2			
Cobalt	µg/g	1	8	9	6			
Copper	µg/g	1	16	18	10			
Lead	µg/g	5	< 5	6	6			
Mercury	µg/g	0.005	0.005	0.007	0.005			
Molybdenum	µg/g	1	< 1	< 1	< 1			
Nickel	µg/g	1	13	17	11			
Selenium	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Silver	µg/g	0.2	< 0.2	< 0.2	< 0.2			
Thallium	µg/g	0.1	0.1	0.1	0.1			
Uranium	µg/g	0.1	0.6	4.0	0.4			
Vanadium	µg/g	1	34	43	25			
Zinc	µg/g	3	29	37	26			

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Steve Garrett
Director of Laboratory Services

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (i)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (ii)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	3	Richmond Hill	FAL	16-May-23	A-% moisture RH	
PHC(F2-F4)	3	Kingston	KPR	12-May-23	C-PHC-S-001 (k)	CWS Tier 1
VOC's	3	Richmond Hill	FAL	16-May-23	C-VOC-02 (rh)	EPA 8260
PHC(F1)	3	Richmond Hill	FAL	16-May-23	C-VPHS-01 (rh)	CWS Tier 1

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (ii)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		ENV-1-SS3	ENV-2-SS3	ENV-5-SS4		O. Reg. 153	
	Sample I.D.		B23-03379-1	B23-03379-2	B23-03379-3			
	Date Collected		04-May-23	04-May-23	04-May-23			
Parameter	**Units**	**R.L.**						
PHC F1 (C6-C10)	µg/g	10	< 10	< 10	< 10			
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5	< 5			
PHC F3 (>C16-C34)	µg/g	10	51	< 10	< 10			
PHC F4 (>C34-C50)	µg/g	10	54	< 10	< 10			
% moisture	%		12.7	15.2	6.8			
Acetone	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Benzene	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Bromoform	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Chloroform	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichlorobenzene,1,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dichlorobenzene,1,3-	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dichlorobenzene,1,4-	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dichloroethane,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloroethane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloroethylene,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloropropane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02			

O. Reg. 153 - Soil, Ground Water and Sediment Standards

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

C.O.C.: G105051 **REPORT No. B23-03379 (ii)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		ENV-1-SS3	ENV-2-SS3	ENV-5-SS4		O. Reg. 153	
	Sample I.D.		B23-03379-1	B23-03379-2	B23-03379-3			
	Date Collected		04-May-23	04-May-23	04-May-23			
Parameter	**Units**	**R.L.**						
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Dichloropropene 1,3-cis+trans	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Hexane	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5			
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Styrene	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Toluene	µg/g	0.2	< 0.2	< 0.2	< 0.2			
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02			
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03	< 0.03			
Xylene, o-	µg/g	0.03	< 0.03	< 0.03	< 0.03			
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03	< 0.03			

O. Reg. 153 - Soil, Ground Water and Sediment Standards

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G105051 **REPORT No. B23-03379 (ii)**

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 11-May-23
DATE REPORTED: 17-May-23
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: OTT-2015769-AO
P.O. NUMBER:
WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 100655 **REPORT No: 23-012425 - Rev. 0**

Report To:
EXP Services Inc - Ottawa
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6

Attention: Chris Kimmerly

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

DATE RECEIVED: 2023-May-31
DATE REPORTED: 2023-Jun-08
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: OTT-22015769-AO
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Chromium VI (Liquid)	4	OTTAWA	STAILLON	2023-Jun-07	D-CRVI-01	MECP E3056
ICP/MS (Liquid)	4	OTTAWA	TPRICE	2023-Jun-06	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	4	OTTAWA	NHOGAN	2023-Jun-05	D-ICP-01	SM 3120B
Mercury (Liquid)	4	OTTAWA	APRUDYVUS	2023-Jun-07	D-HG-02	SM 3112B
PHC F1 (Liquid)	4	RICHMOND_HILL	FLENA	2023-Jun-02	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	4	KINGSTON	KPARKER	2023-Jun-06	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	4	RICHMOND_HILL	FLENA	2023-Jun-03	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

Steve Garrett
Director of Laboratory Services

			Client I.D.	BH-9	MW23-02	DUP	ENV-4
			Sample I.D.	23-012425-1	23-012425-2	23-012425-3	23-012425-4
			Date Collected	2023-05-31	2023-05-31	2023-05-31	2023-05-31
Parameter	**Units**	**R.L.**		-	-	-	-
Barium	mg/L	0.001		0.095	0.148	0.150	0.387
Boron	mg/L	0.005		1.20	0.165	0.138	0.219
Sodium	mg/L	0.2		320	3260	3120	2870
Zinc	mg/L	0.005		<0.005	0.006	0.007	<0.005
Antimony	mg/L	0.0001		0.0005	<0.0001	<0.0001	0.0002
Arsenic	mg/L	0.0001		0.0037	0.0002	0.0002	0.0002
Beryllium	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015		0.000223	0.000045	0.000074	0.000134
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	0.001
Cobalt	mg/L	0.0001		0.0028	0.0007	0.0005	0.0018
Copper	mg/L	0.0001		0.0203	0.0024	0.0020	0.0015
Lead	mg/L	0.00002		0.00010	0.00005	0.00006	<0.00002
Molybdenum	mg/L	0.0001		0.170	0.0046	0.0016	0.0037
Nickel	mg/L	0.0002		0.0106	0.0054	0.0056	0.0075
Selenium	mg/L	0.001		0.002	0.002	0.003	0.003
Silver	mg/L	0.0001		0.0003	0.0009	0.0015	<0.0001
Thallium	mg/L	0.00005		<0.00005	0.00027	0.00028	0.00007
Uranium	mg/L	0.00005		0.00244	0.00186	0.00182	0.00367
Vanadium	mg/L	0.0001		0.0019	0.0004	0.0005	0.0008
Chromium (VI)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002		<0.00002	<0.00002	<0.00002	<0.00002

Steve Garrett

Director of Laboratory Services

			Client I.D.	BH-9	MW23-02	DUP	ENV-4
			Sample I.D.	23-012425-1	23-012425-2	23-012425-3	23-012425-4
			Date Collected	2023-05-31	2023-05-31	2023-05-31	2023-05-31
Parameter	**Units**	**R.L.**		-	-	-	-
Acetone	µg/L	30		<30	<30	<30	<30
Benzene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	2		<2	<2	<2	<2
Bromoform	µg/L	5		<5	<5	<5	<5
Bromomethane	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2		<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	1		<1	<1	<1	<1
Dibromochloromethane	µg/L	2		<2	<2	<2	<2
Ethylene Dibromide	µg/L	0.2		<0.2	<0.2	<0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (Freon 12)	µg/L	2		<2	<2	<2	<2
Dichloroethane,1,1-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5		<0.5	<0.5	<0.5	<0.5

Steve Garrett

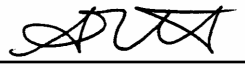
Director of Laboratory Services

	Client I.D.	BH-9	MW23-02	DUP	ENV-4
	Sample I.D.	23-012425-1	23-012425-2	23-012425-3	23-012425-4
	Date Collected	2023-05-31	2023-05-31	2023-05-31	2023-05-31
Parameter	**Units** **R.L.**	-	-	-	-
Dichloropropene,1,3-cis+trans- (Calculated)	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-trans-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Hexane	µg/L 5	<5	<5	<5	<5
Dichloromethane (Methylene Chloride)	µg/L 5	<5	<5	<5	<5
Methyl Ethyl Ketone	µg/L 20	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L 20	<20	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L 2	<2	<2	<2	<2
Styrene	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane,1,1,1,2-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane,1,1,2,2-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L 0.5	2.3	<0.5	<0.5	<0.5
Trichloroethane,1,1,1-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane,1,1,2-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L 0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L 5	<5	<5	<5	<5
Vinyl Chloride	µg/L 0.2	<0.2	<0.2	<0.2	<0.2
Xylene, m,p-	µg/L 1	<1	<1	<1	<1
Xylene, m,p,o-	µg/L 1.1	<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L 0.5	<0.5	<0.5	<0.5	<0.5

Steve Garrett

Director of Laboratory Services

		Client I.D.	BH-9	MW23-02	DUP	ENV-4
		Sample I.D.	23-012425-1	23-012425-2	23-012425-3	23-012425-4
		Date Collected	2023-05-31	2023-05-31	2023-05-31	2023-05-31
Parameter	**Units**	**R.L.**	-	-	-	-
PHC F1 (C6-C10)	µg/L	25	<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50	<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400	<400	<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400	<400	<400	<400	<400



Steve Garrett

Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 110858 **REPORT No: 23-014413 - Rev. 0**

Report To:
EXP Services Inc - Ottawa
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6

Attention: Leah Wells

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

DATE RECEIVED: 2023-Jun-19
DATE REPORTED: 2023-Jun-20
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: OTT-21016315-D1
P.O. NUMBER:

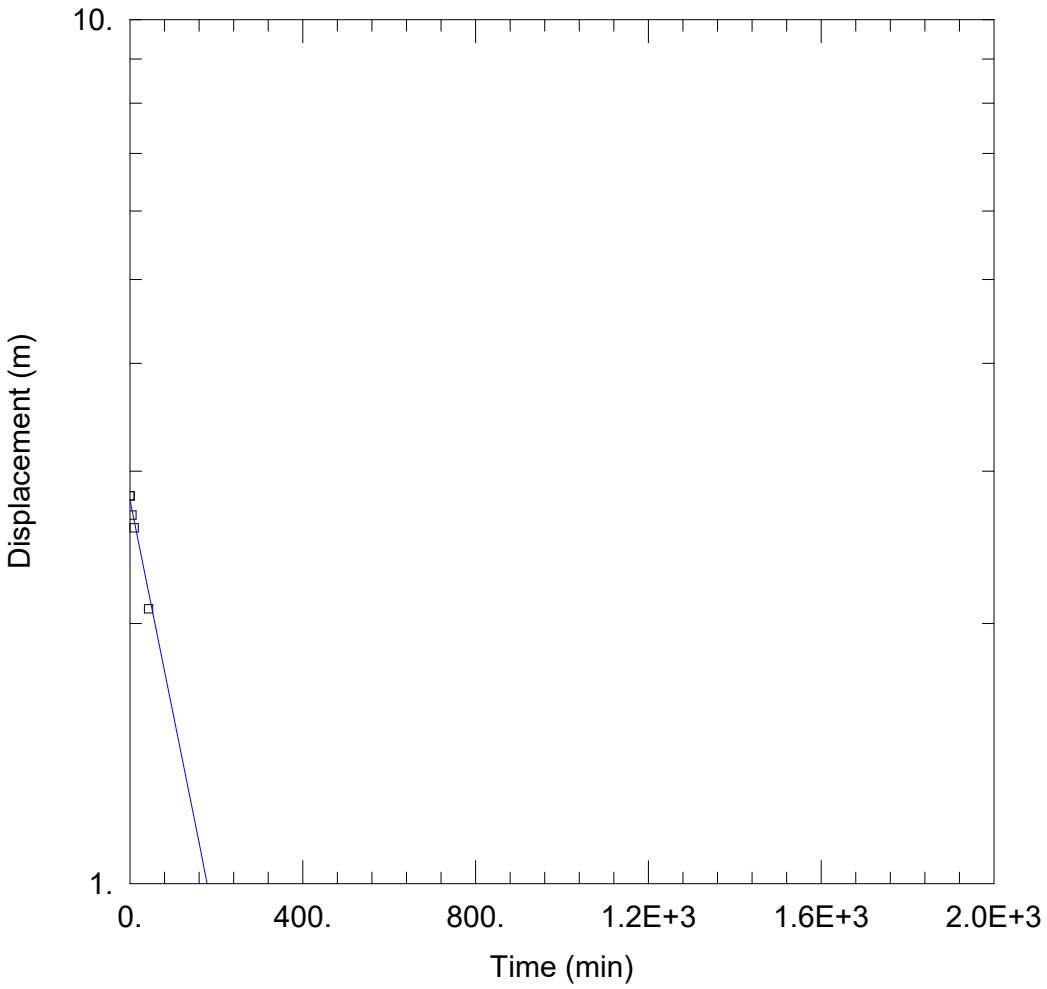
Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
ICP/MS (Liquid)	1	OTTAWA	TPRICE	2023-Jun-20	D-ICPMS-01	EPA 200.8

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

			Client I.D.	MW22-04
			Sample I.D.	23-014413-1
			Date Collected	2023-06-19
Parameter	**Units**	**R.L.**		-
Cobalt	mg/L	0.0001		0.0814

Steve Garrett
Director of Laboratory Services

Appendix H: Hydraulic Conductivity Testing



WELL TEST ANALYSIS

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt.aqt
Date: 06/14/23 Time: 08:35:17

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Well: BH-02
Test Date: May 31, 2023

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH-02)

Initial Displacement: 2.81 m
Total Well Penetration Depth: 12.4 m
Casing Radius: 0.05 m
Static Water Column Height: 8.28 m
Screen Length: 3. m
Well Radius: 0.07 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 7.566E-8 m/sec y0 = 2.78 m

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt.aqt
Date: 06/14/23
Time: 08:36:49

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Date: May 31, 2023
Test Well: BH-02

AQUIFER DATA

Saturated Thickness: 3. m
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: BH-02

X Location: 0. m
Y Location: 0. m

Initial Displacement: 2.81 m
Static Water Column Height: 8.28 m
Casing Radius: 0.05 m
Well Radius: 0.07 m
Well Skin Radius: 0.1 m
Screen Length: 3. m
Total Well Penetration Depth: 12.4 m

No. of Observations: 5

Observation Data

Time (min)	Displacement (m)	Time (min)	Displacement (m)
0.	2.81	43.	2.08
5.	2.67	1011.	0.
10.	2.58		

SOLUTION

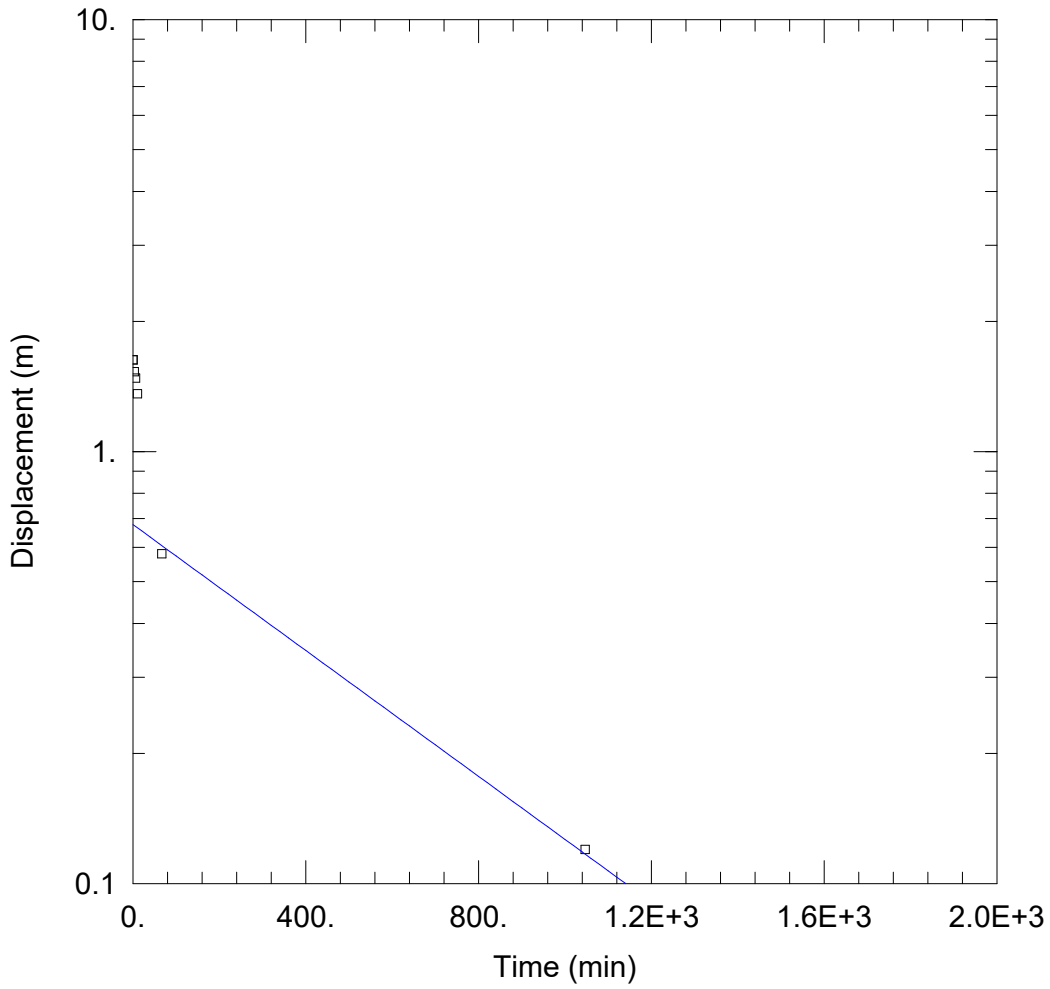
Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	7.566E-8	m/sec
y0	2.78	m

K = 7.566E-6 cm/sec
T = K*b = 2.27E-7 m²/sec (0.00227 sq. cm/sec)



WELL TEST ANALYSIS

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH4.aqt
Date: 06/14/23 Time: 08:45:01

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Well: BH-02
Test Date: May 31, 2023

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH-04)

Initial Displacement: 1.63 m
Total Well Penetration Depth: 12.4 m
Casing Radius: 0.05 m
Static Water Column Height: 4.52 m
Screen Length: 3. m
Well Radius: 0.07 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 2.223E-8 m/sec y0 = 0.6775 m

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH4.aqt
Date: 06/14/23
Time: 08:53:46

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Date: May 31, 2023
Test Well: BH-02

AQUIFER DATA

Saturated Thickness: 3. m
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: BH-04

X Location: 0. m
Y Location: 0. m

Initial Displacement: 1.63 m
Static Water Column Height: 4.52 m
Casing Radius: 0.05 m
Well Radius: 0.07 m
Well Skin Radius: 0.1 m
Screen Length: 3. m
Total Well Penetration Depth: 12.4 m

No. of Observations: 6

Observation Data

Time (min)	Displacement (m)	Time (min)	Displacement (m)
0.	1.63	11.	1.36
3.	1.53	67.	0.58
6.	1.48	1047.	0.12

SOLUTION

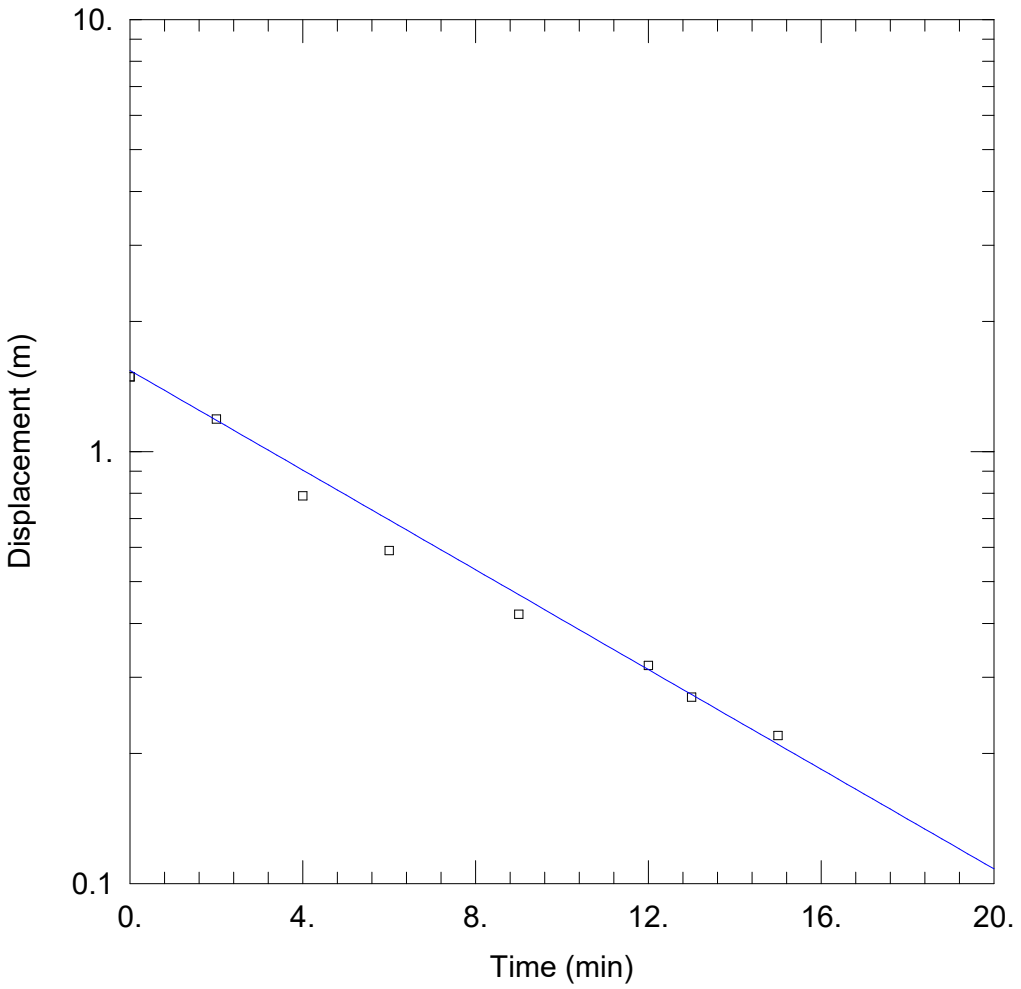
Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2.223E-8	m/sec
y0	0.6775	m

K = 2.223E-6 cm/sec
T = K*b = 6.668E-8 m²/sec (0.0006668 sq. cm/sec)



WELL TEST ANALYSIS

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH9.aqt
Date: 06/14/23 Time: 08:59:34

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Well: BH-09
Test Date: May 31, 2023

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH-09)

Initial Displacement: 1.49 m
Total Well Penetration Depth: 12.4 m
Casing Radius: 0.05 m
Static Water Column Height: 6.68 m
Screen Length: 3. m
Well Radius: 0.07 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.759E-6 m/sec y0 = 1.54 m

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH9.aqt
Date: 06/14/23
Time: 09:00:02

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Date: May 31, 2023
Test Well: BH-02

AQUIFER DATA

Saturated Thickness: 3. m
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: BH-09

X Location: 0. m
Y Location: 0. m

Initial Displacement: 1.49 m
Static Water Column Height: 6.68 m
Casing Radius: 0.05 m
Well Radius: 0.07 m
Well Skin Radius: 0.1 m
Screen Length: 3. m
Total Well Penetration Depth: 12.4 m

No. of Observations: 8

Observation Data

Time (min)	Displacement (m)	Time (min)	Displacement (m)
0.	1.49	9.	0.42
2.	1.19	12.	0.32
4.	0.79	13.	0.27
6.	0.59	15.	0.22

SOLUTION

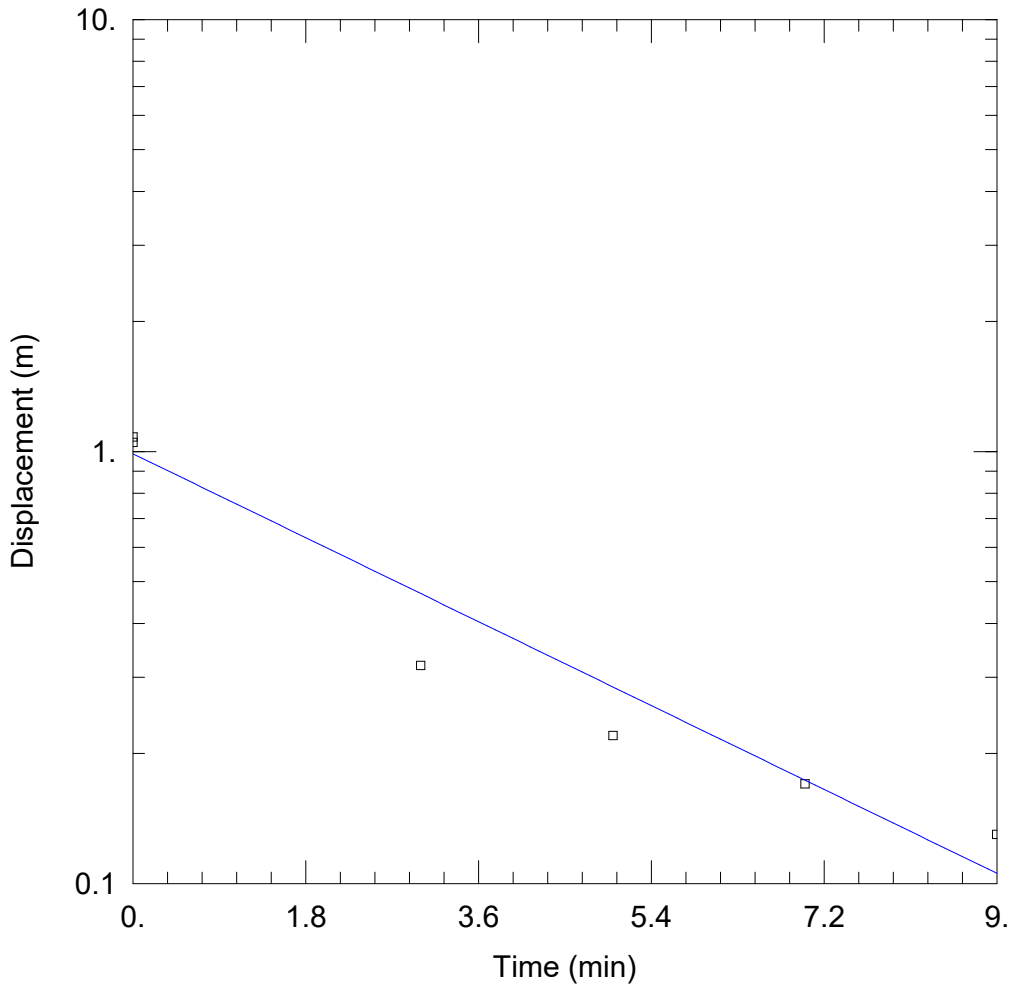
Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	1.759E-6	m/sec
y0	1.54	m

K = 0.0001759 cm/sec
T = K*b = 5.277E-6 m²/sec (0.05277 sq. cm/sec)



WELL TEST ANALYSIS

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH11.aqt
Date: 06/14/23 Time: 10:14:06

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Well: BH-11
Test Date: May 31, 2023

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH-11)

Initial Displacement: 1.05 m
Total Well Penetration Depth: 12.4 m
Casing Radius: 0.05 m
Static Water Column Height: 8.99 m
Screen Length: 3. m
Well Radius: 0.07 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 3.29E-6 m/sec y0 = 0.9879 m

Data Set: C:\Users\AhmedD\OneDrive - EXP\Desktop\Stranherd LTC Bental HG Scope\Aqt BH11.aqt
Date: 06/14/23
Time: 10:14:35

PROJECT INFORMATION

Company: exp
Project: OTT-20015768
Location: 1660 Carling Avenue, Ottawa
Test Date: May 31, 2023
Test Well: BH-02

AQUIFER DATA

Saturated Thickness: 3. m
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: BH-11

X Location: 0. m
Y Location: 0. m

Initial Displacement: 1.05 m
Static Water Column Height: 8.99 m
Casing Radius: 0.05 m
Well Radius: 0.07 m
Well Skin Radius: 0.1 m
Screen Length: 3. m
Total Well Penetration Depth: 12.4 m

No. of Observations: 5

Observation Data

Time (min)	Displacement (m)	Time (min)	Displacement (m)
0.	1.08	7.	0.17
3.	0.32	9.	0.13
5.	0.22		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	3.29E-6	m/sec
y0	0.9879	m

K = 0.000329 cm/sec
T = K*b = 9.871E-6 m²/sec (0.09871 sq. cm/sec)