Phase II
Environmental Site Assessment

211 Clarence Street
Ottawa, Ontario

Prepared for:

Clarence Gate Holdings Inc.
1376 Bank Street, Unit 500
Ottawa, Ontario
K1H 7Y3

Attention: Mr. Alex Diaz

LRL File No.: 180647

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5430 Canotek Road | Ottawa, ON, K1J 9G2 | info@lrl.ca | www.lrl.ca | (613) 842-3434

EXECUTIVE SUMMARY

Clarence Gate Holdings Inc. has retained LRL Associates Ltd. (LRL) to complete a Phase II Environmental Site Assessment (ESA) on the property located at 211 Clarence Street in Ottawa, Ontario (herein referred to as the "Site"). The Site is set within a residential, institutional, and commercial area of Ottawa. The Site is rectangular with an approximate area of 285 m^2 (0.07 acres) and is currently vacant. The property was developed with a residence from at least 1878 until 2016 at which point demolition of the house was requested by the City of Ottawa due to fire damage. It is anticipated that the property will be redeveloped as a residential high-rise building. The assessment was completed to support a site plan application with the City of Ottawa as per CSA Standards. Should a Record of Site Condition (RSC) be required, the due diligence report will need to be revised to meet the Requirements of O.Reg 153/04 as amended.

The purpose of a Phase II ESA is to determine if recognized potential environmental concerns have negatively impacted soil and groundwater quality of the subject Site. Such an assessment provides information regarding the nature and extent of potential contamination to assist in making informed business decisions about the property. Areas of Potential Environmental Contamination (APECs) were identified during the Phase I ESA completed by LRL which included: the former firewater spill on-Site, the fill of unknown quality brought on-Site, the former underground storage tanks to the west and northwest of the Site, the former coal storage 130 m south-southeast of the Site, and the former autobody shop 245 m south of the Site. Contaminants of potential concern (COPCs) associated with these APECs included: Petroleum Hydrocarbon Compounds (PHCs), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAH), Polychlorinated Biphenyls (PCBs), metals, and inorganics.

Regulatory requirements for assessing environmental conditions of a site are established by Ontario Regulation 153/04 – Records of Site Conditions, Part XV.1 of the Environmental Protection Act (O. Reg. 153/04). Site condition standards are set out in the MECP's "*Soil, Ground Water and Sediment Standards for Use Under Part IV.1 of the Environmental Protection Act",* as amended. The applicable Site Condition Standards (SCS) used was the Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, residential property use and fine textured soils.

The investigation involved advancing five (5) boreholes across the Site at strategic locations based on areas of potential environmental concern. Three (3) of the boreholes were completed as monitoring wells to assess hydrogeological conditions and facilitate groundwater sampling.

Subsurface soil conditions in the area investigated on the Site generally consist of fill to depths between 1.2 and 1.5 m bgs, followed by silt and clay to depths of 6.1 m bgs, where the boreholes were terminated. The fill generally consists of medium-grained sand with trace gravel and organics. In the southwest portion of the Site in the vicinity of the former residence (BH22-3), the fill was fine to medium grained sand. In the northeast corner of the Site (BH22-5), the fill was black and contained debris. The overburden material was moist at depths between 2.1 and 3.0 m bgs and saturated at depths between 4.9 and 5.5 m bgs.

No olfactory or visual evidence of petroleum hydrocarbon impacts were observed in the soils collected from all boreholes. The CSV concentrations measured in the soil samples collected ranged between non-detect (<0.1 ppm) and 0.4 ppm. Debris was noted in BH22-5 from surface to 1.2 m bgs.

Based on the groundwater elevations measured on July 12, 2022, the groundwater flow direction in the overburden is interpreted to be towards the east, and this may change once static conditions are achieved for each monitoring well.

Headspace VOC levels in MW22-1, MW22-2, and MW22-3 were 0.9 ppm, <0.1 ppm and <0.1 ppm, respectively, prior to development of the wells. During the sampling event, following purging, the levels rose to 2.1 ppm, 0.3 ppm and 0.1 ppm, respectively.

Select soil and groundwater samples were submitted for analysis to establish if areas of potential environmental concern have negatively impacted soil and groundwater conditions. Rationale for selecting soil and groundwater samples submitted for analysis was based on results of sample field screening (CSVs), visual/olfactory observations and/or proximity to the water table. Potential contaminants of concern were Petroleum Hydrocarbon Compounds (PHCs), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and metals.

In the soil, exceedances to the applicable standards were detected in surficial samples from BH22-2 and BH22-5. Exceeding metal parameters include barium, copper, lead, and/or zinc, and exceeding PAH parameters include acenaphthylene, anthracene benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, and indeno[1,2,3-cd]pyrene. VOC, PHC, and PCB parameters analysed were not detected in any of the soil samples submitted for analysis.

In the groundwater, PHC parameters were not detected with the exception of PHC F3 and PHC F4 in MW22-1 with levels of 176 µg/L and 180 µg/L, below the applicable Table 3 SCS's of 500 µg/L. The levels in the duplicate of MW22-1 were non-detect. VOC parameters were not detected with the exception of dichlorodifluoromethane which was detected in the duplicate sample of MW22-1 and in MW22-2 with levels of 98 µg/L and 856 µg/L, below the SCS of 4400 µg/L. Select metal and PAH parameters were detected, however all levels are below the applicable SCS's. PCB's were not detected.

Based on our observations during drilling activities, along with screening of samples and laboratory analysis, there is evidence of PAH and metals impacts to the surface soil in the northeast portion of the Site.

The horizontal and vertical extent of contaminated soil has not been fully delineated; however, it is anticipated that the fill across the majority of the Site is contaminated.

It is recommended that further delineation be undertaken prior to remediation to quantify the amount of actual soil for offsite disposal. It is recommended that remediation be conducted in the form of excavation of contaminated soil for disposal at an approved facility.

It is recommended that if groundwater monitoring wells are not required for future monitoring purposes, they should be decommissioned in accordance with O. Reg. 903.

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1 INTRODUCTION

Clarence Gate Holdings Inc. retained LRL Associates Ltd. (LRL) to complete a Phase II Environmental Site Assessment (ESA) on the property located at 211 Clarence Street in Ottawa, Ontario (herein referred to as the "Site"). The assessment was conducted in the context of property development. The property was developed with a residence from at least 1878 until 2016 at which point demolition of the house was requested by the City of Ottawa due to fire damage. It is anticipated that the property will be redeveloped as a residential high-rise building. The assessment was completed to support a site plan application with the City of Ottawa as per Canadian Standards Association (CSA) Standards. Should a Record of Site Condition (RSC) be required, the due diligence report will need to be revised to meet the Requirements of O. Reg. 153/04 as amended.

2 PURPOSE

The purpose of a Phase II ESA is to determine if recognized potential environmental concerns have negatively impacted soil and groundwater quality of the subject Site. Such an assessment provides information regarding the nature and extent of potential contamination to assist in making informed business decisions about the property. Potential environmental concerns identified during the Phase One ESA that require further discussion and potential investigation include: the former fire on-Site, the fill of unknown quality brought on-Site, and the former underground storage tanks to the west and northwest of the Site.

Contaminants of concern are:

- Petroleum Hydrocarbon Compounds (PHCs);
- Volatile Organic Compounds (VOCs);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Polychlorinated Biphenyls (PCB);
- Regulation 153/04 Metals; and
- General Inorganics.

The Phase II ESA will establish the Site's subsurface geology and hydrogeological conditions. Soil and groundwater conditions will be evaluated with respect to the contaminants of concern in the context of the current regulations and guidelines applicable to contaminated sites. Findings and conclusions presented in this report apply only to the recognized environmental conditions assessed.

2.1 Property Information

Address:	211 Clarence Street, Ottawa, Ontario
Frontage:	Clarence Street
Zoning:	Residential Fourth Density Zone (R4UD S77)
Legal description:	Part Lot 2, Plan 42482, N Clarence St (Formerly Parry St), as in CR626349, T/W CR626349; Ottawa
Dimensions:	Rectangular: Being approximately 9 m wide (east-west) by approximately 31.5 m deep.
Area:	Approximately 285 m^2 (0.07 acres)

The Site's location is shown in **Figure 1** and the general Site configuration is shown on the Site Plan in **Figure 2.**

2.2 Site Occupancy

Current owner:	Clarence Gate Holdings Inc.
Owner since:	June 2010
Current use:	Vacant
Current use since:	2016

3 SCOPE OF INVESTIGATION

LRL conducted this work in accordance with the standard Phase II ESA procedures, which generally reflect the requirements of:

- Canadian Standards Association (CSA) Phase II Environmental Site Assessment, Z769-00 (R2018).
- Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of the Environment and Energy, December 1996; and
- O. Reg. 153/04, as amended.

The scope of work for this investigation consisted of the following:

Phase II ESA:

- Advance five (5) boreholes at strategic locations based on potential areas of environmental concern, to allow for soil sampling;
- Complete three (3) of the boreholes as monitoring wells to assess hydrogeological conditions and facilitate groundwater sampling;
- Submit representative soil and groundwater samples to an accredited laboratory for analysis of suspected contaminants of concern; and
- Interpret results in relation to current provincial guidelines to determine subsurface soil and groundwater quality.

This report will present the results of the ESA carried out between July 6th and 12th, 2022.

4 PHASE I ENVIRONMENTAL SITE ASSESSMENT

4.1 Phase I ESA Conceptual Site Model

The following describes the Phase I ESA Conceptual Site Model (CSM) for the Site based on the information obtained and reviewed as part of this Phase I ESA:

- The Site is rectangular in shape with an area of approximately 285 m^2 (0.07 acres). The Site is current vacant. The property was developed with a residence from at least 1878 until 2016 at which point demolition of the house was requested by the City of Ottawa due to fire damage.
- The nearest open water body identified is the Rideau River located approximately 585 m northeast of the Site. The Ottawa River is approximately 835 m northwest, and the Rideau Canal is approximately 800 m southwest of the Site The topography of the Site is generally flat with an elevation of 57 m above mean sea level (amsl). The general area slopes gently

to the northeast towards the Rideau River. The inferred groundwater flow direction is towards the north. The activities on the Site and lands within 250 m are residential, institutional, and commercial.

Based on the findings of the Phase I ESA, there are several PCAs, both on-Site and off-Site, that were identified (presented in section 7.2.1 of this report), five of which are considered to be of potential concern that result in APECs are discussed below:

APEC #	PCA	Location of PCA	Location of APEC On-Site	COPCs	Media Potentially Impacted
A	**#1 PCA 30:** Importation of Fill of Unknown Quality	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater
B	**#2 Unlisted PCA:** Firewater spill	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater
C	**#3 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, adjacent property to the northwest	Northwest portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
D	**#4 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, adjacent property to the west	Western portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
E	**#5 Unlisted PCA:** Coal Storage	Approx. 130 m south of the Site.	Southern portion of the Site	PAH	Soil and groundwater
F	**PCA 10:** Commercial Autobody Shop	Approx. 245 m south of the Site.	Southern portion of the Site	PHC, VOC, PAH, PCB, and metals	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons
PCB – Polychlorinated biphenyls
PAH – Polycyclic Aromatic Hydrocarbons

4.2 Potentially Contaminating Activity

Based on the results of the Phase I Environmental Site Assessment the following potentially contaminating activities (PCAs) as well as their location, contaminants of potential concern (COPC), potential media impacted, and likelihood to contribute to an on-site APEC were identified:

# on Fig	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
1	**Unlisted PCA:** Firewater spill	On-Site	The residence on-Site was damaged by a fire in 2016 (interview).	As the PCA is on-site, it is considered an APEC.
2	**PCA 30:** Importation of Fill Material of Unknown Quality	On-Site	Following demolition of the residence, the area was backfilled with sand (interview).	As the PCA is on-site, it is considered an APEC.
3	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, adjacent northwest of the Site.	Present from at least 1922 to 1992 as determined from FIPs, city directories and Fuel Storage Tank database.	Based on its proximity to the Site, it is considered an APEC to the north portion of the Site.
4	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, adjacent west of the Site.	Present from at least 1962 to 1982 as determined by the city directories.	Based on its proximity to the Site, it is considered an APEC to the western portion of the Site.
5	**PCA 9:** Coal Gasification **PCA 58:** Waste Disposal and Waste Management **PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 130 m south-southeast of the Site.	Coal gasification plant present from at least 1878 to 1915 as determined from FIPs. Coal storage occurred in the western portion which is south of the Site. Listed as a landfill prior to 1925. A diesel UST with a 13,650 L capacity was installed in 1990.	Based on its position up- to trans-gradient of the Site, it is considered an APEC to the Site.
6	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 170 m north of the Site.	Garage with fuel oil storage tank in at least 1922 (FIPs).	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
7	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 170 m north of the Site.	Garage with underground storage tank from at least 1922 –1958 (FIPs).	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
8	**PCA 31:** Ink Manufacturing, Processing and Bulk Storage	Approx. 170 m north of the Site.	Printing facility form at least 1922 – 1970 (FIPs and Intera Report)	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
9	**PCA 24:** Fire Training	Approx. 210 m south of the Site.	Fire Station No. 4 is listed as a training school from	Based on its location up-gradient, it is considered an APEC.

# on Fig	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
			at least 1922- 1958 (FIPs)	
10	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks. **PCA 10:** Commercial Autobody Shop	Approx. 175 m southwest of the Site.	230 Gallon gasoline storage tank from at least 1922 – 1958 (FIPs) and garage: “repairs and paint shop” in 1922.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
11	**PCA 34:** Metal Fabrication	Approx. 175 m west of the Site.	Aluminum product manufacturer in at least 1948 (FIPs)	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
12	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 100 m northeast of the Site	Gasoline service station with three (3) USTs from at least 1958 to 2009 (FIPs and spill database). Also listed as Oil Changers with a fuel storage tank.	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
13	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 150 m northeast of the Site.	Gasoline service station with four (4) USTs from at least 1958 to 1989 (FIPs and multiple fuel storage tank databases).	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
14	**PCA 33:** Metal treatment, coating, plating, and finishing.	Approx. 200 m northeast of the Site.	Brass Manufacturer in at least 1958 (FIPs).	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
15	**PCA 10:** Commercial Autobody Shop	Approx. 245 m south of the Site.	Repair garage and paint shop in at least 1922 (FIPs)	Based on its location up-gradient, it is considered an APEC.
16	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 50 m west of the Site.	Oil tank present prior to 2015 as indicated by a spill that occurred during its removal.	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
17	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 130 m east of the Site.	Gasoline services station as described in a spill that occurred in 1991.	Based on its position trans-gradient of the Site, it is not considered likely to

# on Fig	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
				have contributed to an on-Site APEC.
18	**PCA 55:** Transformer Manufacturing, Processing and Use	Approx. 140 m southeast of the Site.	Transformer use as indicated by a spill in 1988.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
19	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 130 m north of the Site.	USTs from at least 1985 to 1993 as indicated through multiple fuel storage tank databases.	Based on the position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
20	**PCA 37:** Operation of Dry Cleaning Equipment (where chemicals are used)	Approx. 210 m southwest of the Site.	Generator of dry cleaning chemicals from 1986 to 1998.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
21	**PCA 37:** Operation of Dry Cleaning Equipment (where chemicals are used)	Approx. 220 m northwest of the Site.	Generator of dry cleaning chemicals from 1994 to 2015 and listed un dry cleaning facilities database.	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.

4.3 Areas of Potential Environmental Contamination (APECs)

Based on the assessment of the PCAs identified within the Phase I Study Area, the following Areas of Potential Environmental Concern (APECs), their contributing PCA, the associated contaminants of potential concern (COPC), and the potentially contaminated media, are detailed in the table below:

APEC #	PCA	Location of PCA	Location of APEC On-Site	COPCs	Media Potentially Impacted
A	**#1 PCA 30:** Importation of Fill of Unknown Quality	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater
B	**#2 Unlisted PCA:** Firewater spill	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater

APEC #	PCA	Location of PCA	Location of APEC On-Site	COPCs	Media Potentially Impacted
C	**#3 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, adjacent property to the northwest	Northwest portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
D	**#4 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, adjacent property to the west	Western portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
E	**#5 Unlisted PCA:** Coal Storage	Approx. 130 m south of the Site.	Southern portion of the Site	PAH	Soil and groundwater
F	**PCA 10:** Commercial Autobody Shop	Approx. 245 m south of the Site.	Southern portion of the Site	PHC, VOC, PAH, PCB, and metals	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons
PCB – Polychlorinated biphenyls
PAH – Polycyclic Aromatic Hydrocarbons

4.4 Phase I ESA Conclusions and Recommendations

Based on the findings of the Phase I ESA, it is recommended that a Phase II ESA be conducted on the Site. Recommendations to address areas of potential environmental concerns are as follows:

Area of Potential Environmental Concern	Recommendation
APEC A: Fill on-site in the area of the former residence	Advance one (1) borehole in the southwest corner of the Site and one (1) in the central west portion and complete both as monitoring wells to allow for sampling and analysis of soil and groundwater for contaminants of concern.
APEC B: Firewater spill on-Site	
APEC E: Coal Storage	
APEC F: Former autobody shop	
APEC C: Former USTs adjacent to the northwest of the Site	Advance two (2) boreholes in the north portion of the Site and complete one (1) as a monitoring well to allow for sampling and analysis of soil and groundwater for contaminants of concern.
APEC D: Former USTs adjacent west of the Site	Advance three (3) boreholes along the west portion of the Site and complete two (2) as monitoring wells to allow for sampling and analysis of soil and groundwater for contaminants of concern.

5 APPLICABLE GUIDELINE CRITERIA

Regulatory requirements for assessing the environmental conditions of a site are established by Ontario Regulation 153/04 – Records of Site Conditions, Part XV.1 of the Environmental Protection Act (O. Reg. 153/04). The site condition standards are set out in the Ministry of Environment, Conservation and Parks' "*Soil, Ground Water and Sediment Standards for Use Under Part IV.1 of the Environmental Protection Act*", as amended. The applicable site condition standard used was the Table 3 Full Depth Generic Site Condition Standards (SCS) in a non-potable groundwater condition, residential property use and fine textured soils for the following reasons:

- The Site and surrounding properties within 250 m are serviced by municipal water;
- Native subsurface material encountered was silty clay to clay and silt. Based on laboratory grain size analysis (Section 7.4) it was determined to be fine textured;
- The Site is zoned as residential; and
- The Site is not considered environmentally sensitive as there was more than 2 m of overburden overlying the bedrock.

6 INVESTIGATION METHOD

6.1 Field Preparation

Location of all buried and overhead services were obtained by LRL prior to initiation of the subsurface investigation.

6.2 Intrusive Investigation

An intrusive investigation was carried out on July 6 & 7, 2022. Five (5) boreholes were advanced across the Site, three (3) of which were completed as monitoring wells (MW):

APEC	Location	Targeting Borehole/ Monitoring Well
APEC A: Fill of unknown quality on-Site in the area of the former residence	Southwest corner of the Site	BH/MW22-3, BH22-4
APEC B: Firewater spill on-Site	Southwest corner of the Site	BH/MW22-2, BH/MW22-3, BH22-4
APEC C: Former USTs adjacent to the northwest of the Site	North portion of the Site	BH/MW22-1, BH22-5
APEC D: Former USTs adjacent west of the Site	West portion of the Site	BH/MW22-1, BH/MW22-3 BH22-4
APEC E: Coal Storage approximately 130 m south-southeast of the Site.	South portion of the Site	BH/MW22-2, BH/MW22-3
APEC F: Former autobody shop approximately 245 m south of the Site.	South portion of the Site	BH/MW22-2, BH/MW22-3

Borehole and monitoring well locations are presented in **Figure 2.**

6.3 Borehole Drilling

The intrusive investigation was conducted on July 6 & 7, 2022. The drilling contractor was CCC Group (Ottawa, Ontario) and worked under LRL field staff supervision. Five (5) boreholes (BH22-1, BH22-2, BH22-3, BH22-4, and BH22-5) were advanced within the overburden to depths of 6.1 m bgs using a CME 55 track-mounted drill rig equipped with 203 mm diameter hollow stem augers. Soil samples were collected continuously using a split-spoon sampler of 0.6 m in length. Between each spoon, the sampling equipment was thoroughly cleaned.

Details of the borehole drilling are provided in the borehole logs in **Appendix A**. Locations of the boreholes are presented in **Figure 2**.

6.4 Soil Sampling and Field Screening

Representative soil samples from each soil stratum encountered or tube sampler/split sampler were collected and transferred immediately into sealed laboratory supplied glass containers and polyethylene freezer bags. Samples were examined for soil type, colour, staining/discolouration and odours. Samples were logged, labelled and stored on-Site in a cooler chilled with ice to prevent evaporation of potential combustible soil vapours (CSV). Soil samples stored in bags were screened for CSV presence using a Mini Rae 3000 Photoionization Detector (PID).

6.5 Monitoring Well Installation

Three (3) boreholes were completed as monitoring wells: BH22-1, BH22-2 and BH22-3 (herein referred to as MW22-1, MW22-2 and MW22-3). Monitoring wells were constructed within 91 mm diameter boreholes with a 51 mm slotted PVC piezometer. The top of the screen was extended to the ground surface using a solid riser pipe. Annular space around the slotted portion of the piezometer was backfilled with pre-washed and graded silica sand up to 300 mm above the top of the screen. A bentonite seal was placed above the sand pack and soil cuttings were used to fill the remainder of the hole to the surface. Monitoring wells were finished at the surface with a flush-mount aluminum casing.

Details of monitoring wells are provided in borehole logs in **Appendix A**.

6.6 Elevation Surveying

Ground surface elevations and tops of all monitoring well risers were surveyed and referenced to a temporary benchmark. Subsequent measurements of water elevations were made in reference to top of well risers. This benchmark was established as the top of the fire hydrant across Clarence Street to the southeast. It was given an elevation of 100.00 m.

6.7 Groundwater Monitoring and Sampling

Headspace vapour measurements for volatile organic compounds (VOC) were measured in each monitoring well immediately after removing the cap, prior to purging and sampling. VOC concentrations were measured by placing the combustible soil vapour nozzle at least 15 cm below the top of the casing and recording the peak VOC reading.

Newly installed wells were instrumented with dedicated LDPE tubing to facilitate well development, purging and sampling requirements. Prior to sampling, water levels were measured using an electronic water level meter and reduced to static elevations based on monitoring well survey data. Each well was purged (three well volumes) using dedicated LDPE tubing and foot valve. Purge water was observed for colour, sheens, or odour. Using a dedicated bailer and LDPE tubing, groundwater was transferred into laboratory supplied water bottles. Samples were

logged, labelled and stored on site in a cooler chilled with ice. Purge water was stored in a secure and appropriate drum awaiting off-Site disposal at an approved facility by a licenced contractor.

6.8 Analytical Testing

Representative soil and groundwater samples collected during the investigation were submitted for laboratory analysis. The rationale for selection of the samples submitted for analysis was based on the results of the sample field screening (CSVs), visual/olfactory observations and/or proximity to the water table.

Samples were submitted to Paracel Laboratories Ltd., Ottawa, ON for the following contaminants of concern: VOC, PHC fractions F1 (C6 – C10), F2 (>C11 – C16), F3 (>C16 – C34) and F4 (>C34), PAH, PCB, metals, and general inorganics.

Area of Potential Environmental Concern	Soil		Groundwater	
	Sample No.	Analysis	Sample No.	Analysis
APEC A: Fill of unknown quality on-Site	BH22-2-SS1 BH22-3-SS1 BH22-5-SS2	PAH, Metals, PCB, general inorganics	MW22-2, MW22-3	PHC, VOC, PAH, Metals, PCB
APEC B: Firewater spill on-Site	BH22-2-SS7 BH22-3-SS9 BH22-4-SS10	PHC, VOC, Metals, PCB	MW22-2, MW22-3	PHC, VOC, PAH, Metals, PCB
APEC C: Former USTs adjacent to the northwest of the Site	BH22-1-SS8 (Dup. SS16) BH22-5-SS8	PHC, VOC, Metals, PCB	MW22-1	PHC, VOC, PAH, Metals, PCB
APEC D: Former USTs adjacent west of the Site	BH22-1-SS8 (Dup. SS16) BH22-3-SS9 BH22-4-SS10	PHC, VOC, Metals, PCB	MW22-1, MW22-3	PHC, VOC, PAH, Metals, PCB
APEC E: Coal Storage approximately 130 m south-southeast of the Site.	BH22-2-SS7 BH22-3-SS9	PHC, VOC, Metals, PCB	MW22-2, MW22-3	PHC, VOC, PAH, Metals, PCB
APEC F: Former autobody shop approximately 245 m south of the Site.	BH22-2-SS7 BH22-3-SS9	PHC, VOC, Metals, PCB	MW22-2, MW22-3	PHC, VOC, PAH, Metals, PCB

Laboratory Certificates of Analysis are included in **Appendix B**. All remaining samples not analyzed will be kept in storage for a period of one month following submission of this report at which time they shall be disposed of unless a written or verbal notice is received, stating otherwise.

6.9 QA/QC Protocols

Quality assurance/quality control (QA/QC) protocols were followed during the borehole drilling and sampling to ensure that representative samples were obtained. The protocols were generally performed in accordance with the following:

- Ontario Ministry of Environment, Conservation and Parks' (MECP) "*Guidance on* Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", revised February 1997.
- Canadian Standards Association (CSA) Phase II Environmental Site Assessment, Z769-00 (R2018).

Field protocols that were employed include:

- All field-screening devices such as the combustible gas detector, were calibrated prior to use, to ensure accuracy and reliability of readings;
- Thorough decontamination of all sampling equipment. Use of dedicated sampling equipment when possible;
- Soil and groundwater samples collected were placed in laboratory supplied glass sample containers;
- Thorough documentation of all field activities and sample handling practices including field notes, chain of custody forms, memos to files, etc.; and
- Samples were submitted to a laboratory which is certified by the Canadian Association for Laboratory Accreditation (CALA).

Other QA/QC procedures conducted by LRL are outlined in the methodologies detailed below.

7 REVIEW & EVALUATION

7.1 Geology

The subsurface soil conditions in the area investigated on the Site generally consist of fill to depths between 1.2 and 1.5 m below bgs, followed by silt and clay to depths of 6.1 m bgs, where the boreholes were terminated. The fill generally consists of medium-grained sand with trace gravel and organics. In the southwest portion of the Site in the vicinity of the former residence (BH22-3), the fill was fine- to medium-grained sand. In the northeast corner of the Site (BH22-5), the fill was black and contained debris. The overburden material was moist at depths between 2.1 and 3.0 m bgs and saturated at depths between 4.9 and 5.5 m bgs.

Detailed borehole logs are presented in **Appendix A**.

7.2 Groundwater Elevations & Flow Direction

Static groundwater elevations measured at each monitoring well are summarized in **Table 1**. Groundwater depth measurements were between 5.25 and 5.53 m bgs, which corresponded to elevations between 94.06 and 94.10 m. The groundwater elevations and interpreted flow contours are shown in **Figure 3**. Based on these elevations the groundwater flow direction on the Site is towards the east.

7.3 Soil: Field Screening

No olfactory or visual evidence of petroleum hydrocarbon impacts were observed in the soils collected from all boreholes. The CSV concentrations measured in the soil samples collected ranged between non-detect (<0.1 ppm) and 0.4 ppm. Debris was noted in BH22-5 from surface to 1.2 m bgs.

CSV measurements are summarized in the borehole logs in **Appendix A**.

7.4 Soil Texture

Native subsurface soil was observed to consist of silt and clay. A soil sample was submitted for a grain size distribution analysis. The soil was reported as fine-grained. The laboratory certificate of analysis is included in **Appendix B**.

7.5 Soil Quality

The analytical results of the submitted soil samples and respective MECP standards are presented in **Table 2** and **Table 3**. The soil exceedances are presented in **Figure 4-1** and **4-2**. At least one soil sample from each borehole was submitted for chemical analysis to determine the impacts of recognized APECs. The laboratory certificates of analysis for soil are included in **Appendix B**.

VOC, PHC, and PCB parameters analysed were not detected in any of the soil samples submitted for analysis. PAH parameters analysed were detected with levels above the Table 3 SCS's in the following samples:

- BH22-2-SS1, collected from between the surface and 0.6 m bgs, with the following exceedances:
    - Benzo[a]anthracene with a level of 1.13 µg/g, above the SCS of 0.63 µg/g;
    - Benzo[a]pyrene with a level of 1.37 µg/g, above the SCS of 0.3 µg/g;
    - Benzo[b]fluoranthene with a level of 1.33 µg/g, above the SCS of 0.78 µg/g;
    - Dibenzo[a,h]anthracene with a level of 0.20 µg/g, above the SCS of 0.1 µg/g;
    - Fluoranthene with a level of 1.70 µg/g, above the SCS of 0.69 µg/g; and
    - Indeno[1,2,3-cd]pyrene with a level of 0.71 µg/g, above the SCS of 0.48 µg/g.

- BH22-5-SS2, collected from between 0.6 and 1.2 m bgs, with the following exceedances:
    - Acenaphthylene with a level of 2.13 µg/g, above the SCS of 0.17 µg/g;
    - Anthracene with a level of 2.03 µg/g, above the SCS of 0.74 µg/g;
    - Benzo[a]anthracene with a level of 6.91 µg/g, above the SCS of 0.63 µg/g;
    - Benzo[a]pyrene with a level of 7.54 µg/g, above the SCS of 0.3 µg/g;
    - Benzo[b]fluoranthene with a level of 6.33 µg/g, above the SCS of 0.78 µg/g;
    - Benzo[k]fluoranthene with a level of 3.92 µg/g, above the SCS of 0.78 µg/g;
    - Dibenzo[a,h]anthracene with a level of 0.96 µg/g, above the SCS of 0.1 µg/g;
    - Fluoranthene with a level of 12.9 µg/g, above the SCS of 0.69 µg/g; and
    - Indeno[1,2,3-cd]pyrene with a level of 3.41 µg/g, above the SCS of 0.48 µg/g.

PAH exceedances in soil are presented in **Figure 4-1**.

Select metal parameters were detected in all soil samples collected, however levels were measured below applicable Table 3 SCS's, with the exception of the following samples:

- BH22-2-SS1, collected from between the surface and 0.6 m bgs, where reported levels of barium, lead, and zinc were above the respective SCS's of 390 µg/g, 120 µg/g, and 340 µg/g with levels of 709 µg/g, 423 µg/g, and 355 µg/g, respectively; and
- BH22-5-SS2, collected from between 0.6 and 1.2 m bgs, where reported levels of barium, copper, lead, and zinc were above the respective SCS's of 390 µg/g, 180 µg/g, 120 µg/g, and 340 µg/g with levels of 585 µg/g, 233 µg/g, 512 µg/g, and 422 µg/g, respectively.

Metals exceedances in soil are presented in **Figure 4-2**.

No additional exceedances to the applicable provincial standards were detected in the samples submitted from across the subject Site.

7.6 Groundwater Quality

The groundwater analytical results and respective MECP standards are summarized in **Table 4**, **Table 5**, and **Table 6**. Laboratory certificates of analysis for the data can be found in **Appendix B**.

Headspace VOC levels in MW22-1, MW22-2, and MW22-3 were 0.9 ppm, <0.1 ppm and <0.1 ppm, respectively, prior to development of the wells. During the sampling event, following purging, the levels rose to 2.1 ppm, 0.3 ppm and 0.1 ppm, respectively.

PHC parameters were not detected with the exception of PHC F3 and PHC F4 in MW22-1 with levels of 176 µg/L and 180 µg/L, below the applicable Table 3 SCS's of 500 µg/L. The levels in the duplicate of MW22-1 were non-detect.

VOC parameters were not detected with the exception of dichlorodifluoromethane which was detected in the duplicate sample of MW22-1 and in MW22-2 with levels of 98 µg/L and 856 µg/L, below the SCS of 4400 µg/L.

Select metal and PAH parameters were detected, however all levels are below the applicable SCS's. PCB's were not detected.

8 PHASE II CONCEPTUAL SITE MODEL

The Phase II Conceptual Site Model (CSM) consists of a narrative description of the current condition of the Site and accompanying diagrams, cross-sections and Figures. The Phase II conceptual site model is presented in the following sections and the Figures that comprise the Phase II CSM include:

Figure 1 – Site Location

Figure 2 – Site Plan, Borehole and Monitoring Well Locations

Figure 3 – Groundwater Elevations and Interpreted Groundwater Flow Direction – July 12, 2022

Figure 4-1 – Soil Exceedances: PAHs

Figure 4-2 – Soil Exceedances: Metals

Figure 5-1: Cross Section A – A'

Figure 5-2: Cross Section B – B'

8.1 Current and Historical Site Use and Surrounding Land Use

From LRL's review of aerial photography and information reviewed as part of the Phase I ESA, the only use of the Phase I Property was residential since at least 1878 until 2016 at which point demolition of the house was requested by the City of Ottawa due to fire damage. The surrounding areas have been primarily residential as well.

8.2 Potential Sources of Contamination

8.2.1 Potentially Contaminating Activities

Based on the results of the Phase I Environmental Site Assessment the following potentially contaminating activities (PCAs) as well as their location, contaminants of potential concern

(COPC), potential media impacted, and likelihood to contribute to an on-site APEC were identified:

#	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
1	**Unlisted PCA:** Firewater spill	On-Site	The residence on-Site was damaged by a fire in 2016 (interview).	As the PCA is on-site, it is considered an APEC.
2	**PCA 30:** Importation of Fill Material of Unknown Quality	On-Site	Following demolition of the residence, the area was backfilled with sand (interview).	As the PCA is on-site, it is considered an APEC.
3	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, adjacent northwest of the Site.	Present from at least 1922 to 1992 as determined from FIPs, city directories and Fuel Storage Tank database.	Based on its proximity to the Site, it is considered an APEC to the north portion of the Site.
4	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, adjacent west of the Site.	Present from at least 1962 to 1982 as determined by the city directories.	Based on its proximity to the Site, it is considered an APEC to the western portion of the Site.
5	**PCA 9:** Coal Gasification **PCA 58:** Waste Disposal and Waste Management **PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 130 m south-southeast of the Site.	Coal gasification plant present from at least 1878 to 1915 as determined from FIPs. Coal storage occurred in the western portion which is south of the Site. Listed as a landfill prior to 1925. A diesel UST with a 13,650 L capacity was installed in 1990.	Based on its position up- to trans-gradient of the Site, it is considered an APEC to the Site.
6	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 170 m north of the Site.	Garage with fuel oil storage tank in at least 1922 (FIPs).	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
7	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 170 m north of the Site.	Garage with underground storage tank from at least 1922 –1958 (FIPs).	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
8	**PCA 31:** Ink Manufacturing, Processing and Bulk Storage	Approx. 170 m north of the Site.	Printing facility form at least 1922 – 1970 (FIPs and Intera Report)	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.

#	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
9	**PCA 24:** Fire Training	Approx. 210 m south of the Site.	Fire Station No. 4 is listed as a training school from at least 1922- 1958 (FIPs)	Based on its location up-gradient, it is considered an APEC.
10	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks. **PCA 10:** Commercial Autobody Shop	Approx. 175 m southwest of the Site.	230 Gallon gasoline storage tank from at least 1922 – 1958 (FIPs) and garage: “repairs and paint shop” in 1922.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
11	**PCA 34:** Metal Fabrication	Approx. 175 m west of the Site.	Aluminum product manufacturer in at least 1948 (FIPs)	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
12	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 100 m northeast of the Site	Gasoline service station with three (3) USTs from at least 1958 to 2009 (FIPs and spill database). Also listed as Oil Changers with a fuel storage tank.	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
13	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 150 m northeast of the Site.	Gasoline service station with four (4) USTs from at least 1958 to 1989 (FIPs and multiple fuel storage tank databases).	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
14	**PCA 33:** Metal treatment, coating, plating, and finishing.	Approx. 200 m northeast of the Site.	Brass Manufacturer in at least 1958 (FIPs).	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
15	**PCA 10:** Commercial Autobody Shop	Approx. 245 m south of the Site.	Repair garage and paint shop in at least 1922 (FIPs)	Based on its location up-gradient, it is considered an APEC.
16	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 50 m west of the Site.	Oil tank present prior to 2015 as indicated by a spill that occurred during its removal.	Based on its position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
17	**PCA 28:** Gasoline and Associated	Approx. 130 m east of the Site.	Gasoline services station as described in a spill that occurred in 1991.	Based on its position trans-gradient of the Site, it is not

#	O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
	Products Storage in Fixed Tanks.			considered likely to have contributed to an on-Site APEC.
18	**PCA 55:** Transformer Manufacturing, Processing and Use	Approx. 140 m southeast of the Site.	Transformer use as indicated by a spill in 1988.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
19	**PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	Approx. 130 m north of the Site.	USTs from at least 1985 to 1993 as indicated through multiple fuel storage tank databases.	Based on the position trans- to down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
20	**PCA 37:** Operation of Dry Cleaning Equipment (where chemicals are used)	Approx. 210 m southwest of the Site.	Generator of dry cleaning chemicals from 1986 to 1998.	Based on its position trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.
21	**PCA 37:** Operation of Dry Cleaning Equipment (where chemicals are used)	Approx. 220 m northwest of the Site.	Generator of dry cleaning chemicals from 1994 to 2015 and listed un dry cleaning facilities database.	Based on its position down-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.

8.2.2 Areas of Potential Environmental Concern

Based on the assessment of the PCAs identified within the Phase I Study Area, the following Areas of Potential Environmental Concern (APECs), their contributing PCA, the associated contaminants of potential concern (COPC), and the potentially contaminated media, are detailed in the table below:

APEC #	PCA	Location of PCA	Location of APEC On-Site	COPCs	Media Potentially Impacted
A	**#1 PCA 30:** Importation of Fill of Unknown Quality	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater
B	**#2 Unlisted PCA:** Firewater spill	On-Site	Southwest corner of the Site.	PAH, PCB, metals including cyanide and mercury, and inorganics	Soil and groundwater

APEC #	PCA	Location of PCA	Location of APEC On-Site	COPCs	Media Potentially Impacted
C	**#3 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, adjacent property to the northwest	Northwest portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
D	**#4 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, adjacent property to the west	Western portion of the Site	PHC, VOC, PCB, and metals	Soil and groundwater
E	**#5 Unlisted PCA:** Coal Storage	Approx. 130 m south of the Site.	Southern portion of the Site	PAH	Soil and groundwater
F	**PCA 10:** Commercial Autobody Shop	Approx. 245 m south of the Site.	Southern portion of the Site	PHC, VOC, PAH, PCB, and metals	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons
PCB – Polychlorinated biphenyls
PAH – Polycyclic Aromatic Hydrocarbons

8.2.3 Subsurface Structures and Utilities and Potential Migration of COCs

Underground utility drawings available for the Phase II Property indicate that utilities are currently not running from Clarence Street onto the Site. In the past, however, gas, water, and sewer lines would have run to the former building. The presence of subsurface utilities could act as preferential pathways promoting the migration of COCs. However, due to the depth of the water table onsite (average of 5.42 m bgs), the water table is not expected to have intercepted buried utilities or subsurface structures at the Phase II Property.

8.3 Physical Setting

8.3.1 Stratigraphy

Boreholes were advanced to a maximum depth of 6.1 m bgs. In general, the Site stratigraphy consists of fill to depths between 1.2 and 1.5 m bgs, followed by silt and clay to depths of 6.1 m bgs, where the boreholes were terminated. The fill generally consists of medium-grained sand with trace gravel and organics. In the southwest portion of the Site in the vicinity of the former residence (BH22-3), the fill was fine- to medium-grained sand. In the northeast corner of the Site (BH22-5), the fill was black and contained debris. The overburden material was moist at depths between 2.1 and 3.0 m bgs and saturated at depths between 4.9 and 5.5 m bgs.

Given that the thickness of overburden at the Site is greater than 2 m, the Site is not considered to be a shallow soil property as defined by O. Reg 153/04 (as amended).

8.3.2 Hydrogeological Characteristics

The Rideau River is located approximately 585 m northeast of the Site and the Ottawa River is approximately 835 m northwest. The regional groundwater flow direction is expected to follow the topography towards the north. Based on the interpreted groundwater elevation contours presented in **Figure 3**, the inferred direction of the local groundwater flow is to the east towards the Rideau River.

8.3.2.1 Groundwater Levels and Flow Directions

Static groundwater levels were measured in the monitoring wells located across the Site during water sampling on July 12, 2022. **Figure 3** shows the groundwater elevations and the interpreted groundwater flow direction. The groundwater levels in were between 5.25 and 5.53 m bgs, which corresponded to relative elevations between 94.06 and 94.10 m and an east flow direction.

8.3.2.2 Horizontal Hydraulic Gradients

The average horizontal hydraulic gradient was estimated for the overburden groundwater conditions based on water levels collected on July 12, 2022, and the inferred groundwater contours are presented on **Figure 3**. The horizontal hydraulic gradient was calculated to be 0.0018 m/m.

8.3.2.3 Vertical Hydraulic Gradients

Vertical hydraulic gradients were not calculated at this time since the groundwater met the MECP Table 3 Standards. Had exceedances of the Site Condition Standards (SCS) been encountered, the vertical hydraulic gradient must be calculated in accordance with O.Reg 153/04 as amended. Furthermore, deeper monitoring wells would be necessary assess whether there is more than one (1) aquifer or aquitard.

8.4 Shallow Soil Property or Water Body (as per section 43.1 of O.Reg. 153/04)

Bedrock was not encountered during the investigation. As such, based on the depth of the boreholes (6.1 m bgs), the Site is not considered a shallow soil property.

8.5 Potable Water Wells

No potable water wells are located on the Site or within 250 m of the Site, based on the results of the Phase I ESA. As such, the Site is not considered to be a potable water site.

8.6 Environmentally Sensitive Areas (as per section 41 of O.Reg. 153/04)

No areas of natural and scientific interest (ANSI) are known to be located on the Site. Available information indicated that the Sites not considered to be an environmentally sensitive area. Additionally, the pH of the soil was 7.15 to 7.46 which is within the 5≤pH≤9 limits for surface soil, and 5≤pH≤11 for subsurface soil. The sample ranged from surface to 1.2 m bgs, and 4.3 m to 6.1 m bgs, capturing both what is considered the surface and subsurface for purposes of pH. As such, the Site is not considered to be environmentally sensitive.

8.7 Applicable Site Condition Standards

The analytical results of the samples collected for this Phase II ESA were compared to the Table 3 generic site condition standards (residential property use, fine soil texture) presented in the MECP “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, dated April 15, 2011. The applicable site condition standards were selected based on the following rationale:

- The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system;
- The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water;
- Native subsurface material encountered was silt and clay. Based on laboratory grain size analysis (Section 7.4) it was determined to be fine-textured;
- The closest water body is the Rideau River, located 585 m northeast of the Phase II Property;
- There are no features on the Phase II Property that would meet the conditions of an environmentally sensitive site, as described in Section 41 of the Regulation;
- The average pH of surface soil is 5≤pH≤9 and the pH of sub-surface soil meets the requirement that 5≤pH≤11;
- The intended land use for the Phase II Property is residential;
- The overburden thickness is greater than 2 metres throughout the Phase II Property;
- The average depth to the water table is 5.42 m bgs with the shallowest being 5.25 m bgs.

8.8 Findings of the Phase II ESA (LRL, 2022) with Respect to APECs

To address the APEC identified at the Site, soil and groundwater sampling and analysis of potential COCs was completed as part of this Phase II ESA. MECP Table 3 Standards (April 15, 2011) were used for comparison of the soil and groundwater results. A summary of the findings of the Phase II ESA with respect to the APECs identified by the Phase I ESA (LRL, 2022) is provided in the table below:

APEC #	Area of Potential Environmental Concern	Potentially Contaminating Activity	Contaminants of Potential Concern	Soil and/or Groundwater Exceedances of 2011 MECP Table 3 SCS
A	Southwest corner of the Site where the former residence was located	**#1 PCA 30:** Importation of Fill of Unknown Quality	PAH, PCB, metals including cyanide and mercury, and inorganics	Fill encountered beyond the footprint of the residence (BH22-2 and BH22-5) exceeded for PAHs and Metals.
B	Southwest portion of the Site.	**#2 Unlisted PCA:** Firewater spill	PAH, PCB, metals including cyanide and mercury, and inorganics	None.
C	Northwest portion of the Site	**#3 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	PHC, VOC, PCB, and metals	None.
D	Western portion of the Site	**#4 PCA 28:** Gasoline and Associated	PHC, VOC, PCB, and metals	None.

APEC #	Area of Potential Environmental Concern	Potentially Contaminating Activity	Contaminants of Potential Concern	Soil and/or Groundwater Exceedances of 2011 MECP Table 3 SCS
		Products Storage in Fixed Tanks.		
E	Southern portion of the Site	**#5 Unlisted PCA:** Coal Storage	PAH	None.
F	Southern portion of the Site	**PCA 10:** Commercial Autobody Shop	PHC, VOC, PAH, PCB, and metals	None.

As summarized in the above table, the results of this Phase II ESA indicate surface soil onsite is contaminated with COPCs associated with one or more of the APECs.

8.9 Meteorological and Climatic Considerations

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events, seasonal trends could not be identified, however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

8.10 Soil Vapour Intrusion Pathways

Headspace readings from the monitoring wells onsite showed low levels of VOCs (<0.1 to 2.1 ppm) and is not considered a concern. A former landfill is located approximately 130 m southeast of the Site, however the risk of methane migration to the Site is low. Based on the review of radon maps of Eastern Ontario as part of the Phase I ESA, radon levels in the area of the Site are low to moderate. Vapour intrusion beyond the above-mentioned was not investigated as part of this Phase II ESA.

8.11 Cross-Sections

8.11.1 Horizontal and Vertical Distribution of Contaminants

Representative cross-sections of the Site are presented in **Figure 5-1** and **Figure 5-2**.

8.11.2 Horizontal Distribution of Soil Contamination

The fill material encountered in BH22-2 and BH22-5 has exceedances for PAH and Metals. This fill was encountered across the Site with the exception of the area of the former residence (BH22-3). The contamination has not been laterally delineated; however, it is likely extending to the south, east of the former residence, and west to include BH22-1 and BH22-4.

8.11.3 Vertical Distribution of Soil Contamination

Soil contamination is delineated vertically for metals at BH22-2 and BH22-5. Based on laboratory analysis, it is confirmed not to extend beyond 3.7 m in BH22-2 and 4.3 m in BH22-5. It is likely that the contamination is contained within the fill layer and possibly into the upper layer of silt and clay. As for PAH, the contamination is not delineated in the deeper soil. PAHs can be generated during the combustion processes or released from older forms of pressured treated wood, fuel oil, and oil grease. The recent fire onsite likely contributed to the PAHs in the fill soils.

9 CONCLUSIONS OF THE PHASE II ENVIRONMENTAL SITE ASSESSMENT

Based on our Site visit, results of soil and groundwater sampling and laboratory analytical programs, LRL offers the following conclusions regarding environmental conditions of the subject Site:

- The Site under investigation is the vacant property located at 211 Clarence Street in Ottawa, Ontario. The Site is rectangular in shape with an area of approximately 285 m^2 (0.07 acres). The topography is generally flat.
- The property was developed with a residence from at least 1878 until 2016 at which point demolition of the house was requested by the City of Ottawa due to fire damage.
- Areas of potential environmental concerns identified included:

APEC #	APEC	Location of PCA
A	**#1 PCA 30:** Importation of Fill of Unknown Quality	On-Site in the area of the former residence.
B	**#2 Unlisted PCA:** Firewater spill	On-Site in the area of the former residence.
C	**#3 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	305 Cumberland Street, the adjacent property to the northwest.
D	**#4 PCA 28:** Gasoline and Associated Products Storage in Fixed Tanks.	309 Cumberland Street, the adjacent property to the west.
E	**#5 Unlisted PCA:** Coal Storage	350 King Edward Avenue, approximately 130 m south-southeast of the Site.
F	**PCA 10:** Commercial Autobody Shop	Approximately 245 m south of the Site.

- Regulatory requirements for assessing environmental conditions of a site are established by Ontario Regulation 153/04 – Records of Site Conditions, Part XV.1 of the Environmental Protection Act (O. Reg. 153/04). Site condition standards are set out in the MECP's "*Soil, Ground Water and Sediment Standards for Use Under Part IV.1 of the Environmental Protection Act*", April 15, 2011, as amended. The applicable SCS used was the Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, residential property use and fine textured soils.
- The investigation involved advancing five (5) boreholes across the Site at strategic locations based on areas of potential environmental concern. Three (3) of the boreholes were completed as monitoring wells to assess hydrogeological conditions and facilitate groundwater sampling.
- Subsurface soil conditions in the area investigated on the Site generally consist of fill to depths between 1.2 and 1.5 m bgs, followed by silt and clay to depths of 6.1 m bgs, where the boreholes were terminated. The fill generally consists of medium-grained sand with trace gravel and organics. In the southwest portion of the Site in the vicinity of the former residence (BH22-3), the fill was fine- to medium-grained sand. In the northeast corner of the Site (BH22-5), the fill was black and contained debris. The

overburden material was moist at depths between 2.1 and 3.0 m bgs and saturated at depths between 4.9 and 5.5 m bgs.

- Based on the groundwater elevations measured on July 12, 2022, the groundwater flow direction in the overburden is interpreted to be towards the east;
- No olfactory or visual evidence of petroleum hydrocarbon impacts were observed in the soils collected from all boreholes. The CSV concentrations measured in the soil samples collected ranged between non-detect (<0.1 ppm) and 0.4 ppm. Debris was noted in BH22-5 from surface to 1.2 m bgs.
- Headspace VOC levels in MW22-1, MW22-2, and MW22-3 were 0.9 ppm, <0.1 ppm and <0.1 ppm, respectively, prior to development of the wells. During the sampling event, following purging, the levels rose to 2.1 ppm, 0.3 ppm and 0.1 ppm, respectively.
- In the soil, exceedances to the applicable standards were detected in surficial samples from BH22-2 and BH22-5. Exceeding metal parameters include barium, copper, lead, and/or zinc, and exceeding PAH parameters include acenaphthylene, anthracene benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, fluoranthene, and indeno[1,2,3-cd]pyrene. VOC, PHC, and PCB parameters analysed were not detected in any of the soil samples submitted for analysis.
- In the groundwater, PHC parameters were not detected with the exception of PHC F3 and PHC F4 in MW22-1 with levels of 176 µg/L and 180 µg/L, below the applicable Table 3 SCS's of 500 µg/L. The levels in the duplicate of MW22-1 were non-detect. VOC parameters were not detected with the exception of dichlorodifluoromethane which was detected in the duplicate sample of MW22-1 and in MW22-2 with levels of 98 µg/L and 856 µg/L, below the SCS of 4400 µg/L. Select metal and PAH parameters were detected, however all levels are below the applicable SCS's. PCB's were not detected.

Based on our observations during drilling activities, along with screening of samples and laboratory analysis, there is evidence of PAH and metals impacts to the surface soil in the northeast portion of the Site.

The horizontal and vertical extent of contaminated soil has not been fully delineated; however, it is anticipated that the fill across the majority of the Site maybe contaminated.

It is recommended that further delineation be undertaken prior to remediation to quantify the amount of actual soil for offsite disposal. It is recommended that remediation be conducted in the form of excavation of contaminated soil for disposal at an approved facility.

It is recommended that if groundwater monitoring wells are not required for future monitoring purposes, they should be decommissioned in accordance with O. Reg. 903.

10 LIMITATIONS AND USE OF REPORT

Results of this Phase II ESA should not be considered a warranty that the subject property is free from any and all contaminants from former and current practices, other than those noted in this report, nor that all compliance issues have been addressed.

Findings contained in this report are based on data and information collected during the Phase II ESA of the subject property conducted by LRL Associates Ltd. Conclusions and recommendations are based solely on-site conditions encountered at the time of our fieldwork

between July 6th and 12th, 2022, supplemented by historical information and data obtained as described in this report. No assurance is made regarding changes in conditions subsequent to the time of this investigation. If additional information is discovered or obtained, LRL Associates Ltd. should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required.

In evaluating the subject property, LRL Associates Ltd. has relied in good faith on information provided by individuals as noted in this report. We assume that the information provided is factual and accurate. We accept no responsibility for any deficiencies, misstatements or inaccuracies contained in this report as a result of omissions, misinterpretation or fraudulent acts of the persons contacted.

This report is intended for the sole use of Clarence Gate Holdings Inc. and their authorized agents. LRL Associates Ltd. will not be responsible for any use of the information contained within this report by any third party.

In addition, LRL Associates Ltd. will not be responsible for the real or perceived decrease in the property value, its saleability or ability to gain financing, through the reporting of factual information.

Yours truly,
LRL Associates Ltd.

Geneviève Marcoux
Environmental Technician

John (Gianni) Lametti, P. Eng. QPESA
Environmental Engineer

W:\FILES 2018\180647\04 Environmental\02 PhaseIIESA\05 Reports\180647.REPORT.Phase II ESA. 211 Clarence Street Ottawa Ontario.10.08.2022.R0.docx

11 REFERENCES

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FIGURES

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PROJECT

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
211 CLARENCE STREET
OTTAWA, ONTARIO

DRAWING TITLE

SITE LOCATION
(NOT TO SCALE)
Source: GeoOttawa

CLIENT	DATE	PROJECT
CLARENCE GATE HOLDINGS INC.	AUGUST 2022	180647

FIGURE 1

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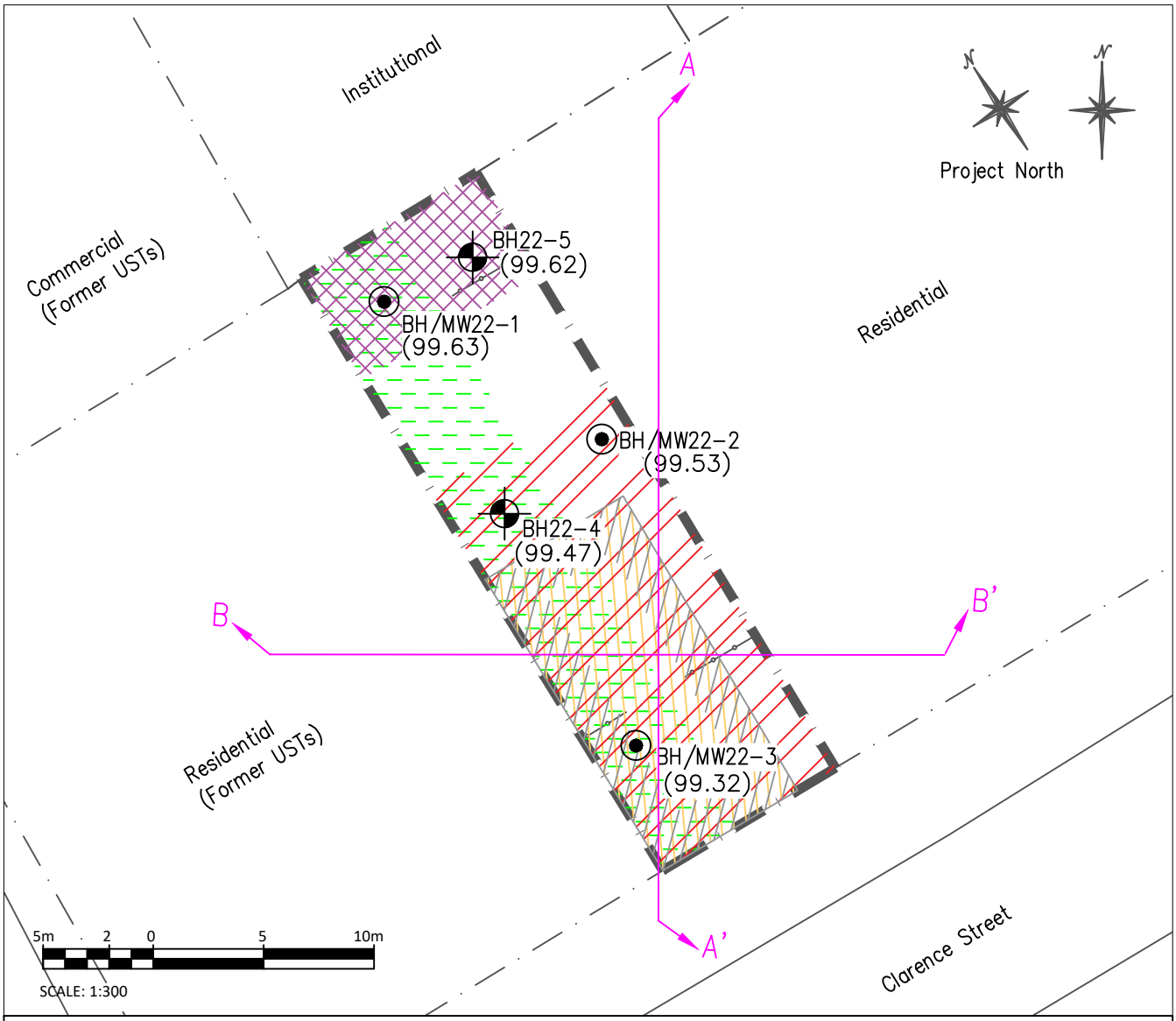
DRAWING TITLE

SITE PLAN, BOREHOLE &
MONITORING WELL LOCATIONS

CLIENT	DATE	PROJECT
CLARENCE GATE HOLDINGS INC.	AUGUST 2022	180647

FIGURE 2



Legend

- Property Line
- Fenceline
- Former Building
- BH99-9 Borehole
- BH/MW99-9 Monitoring Well
- (99.99) Ground Surface Elevation

- APEC A (on-site source): Fill of unknown quality
- APEC C (off-site source): Former USTs adjacent to the northwest
- APEC D (off-site sources): Former USTs adjacent to the west
- APEC B, E & F (On- and off-site source): Former firewater spill onsite, former coal storage approx. 130 m south of the Site, and former commercial autobody shop approx. 245 m south of the Site.
- X X' Cross Section Segment

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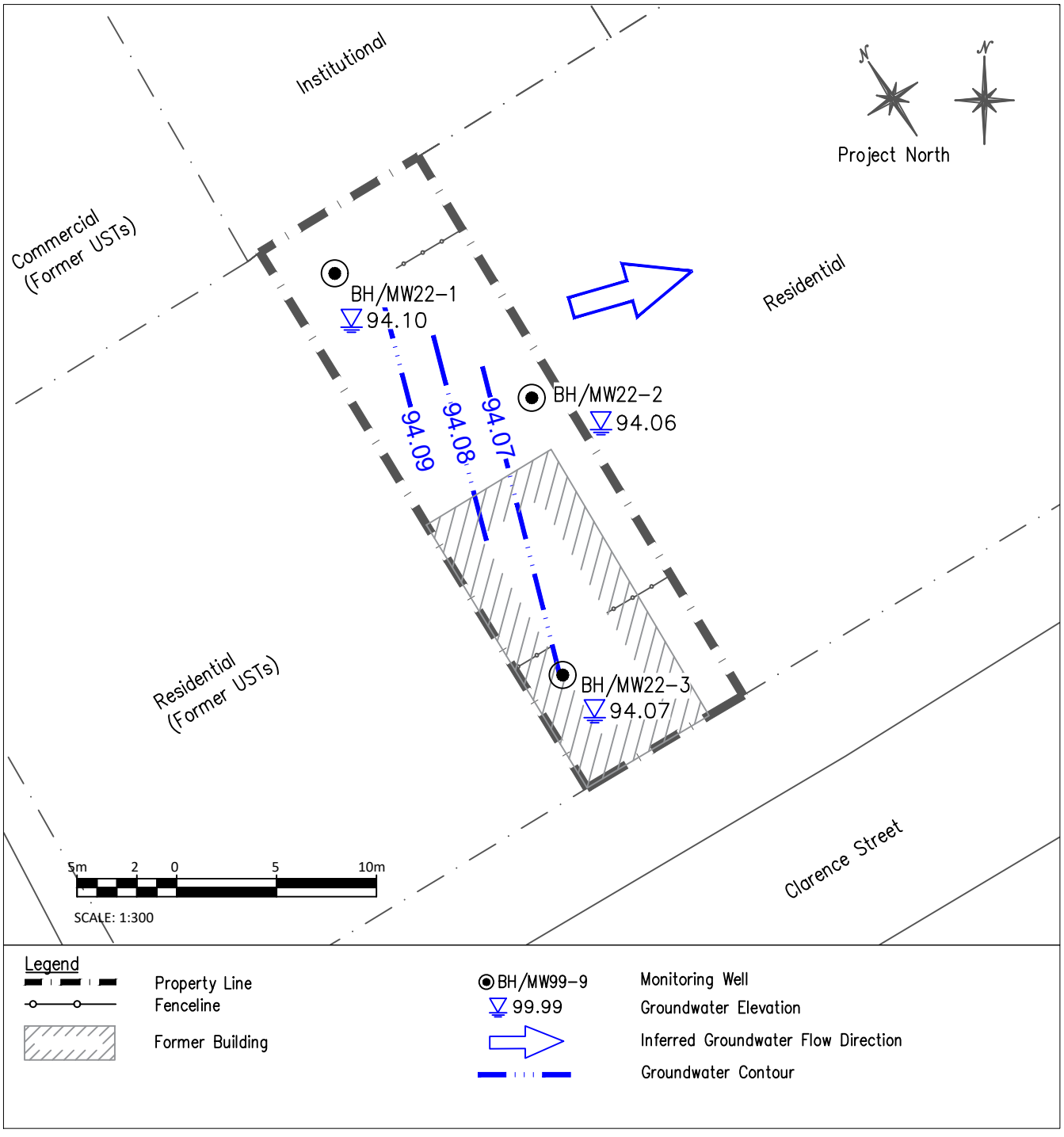
DRAWING TITLE

GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTION - JULY 12, 2022

CLIENT	DATE	PROJECT
CLARENCE GATE HOLDINGS INC.	AUGUST 2022	180647

FIGURE 3



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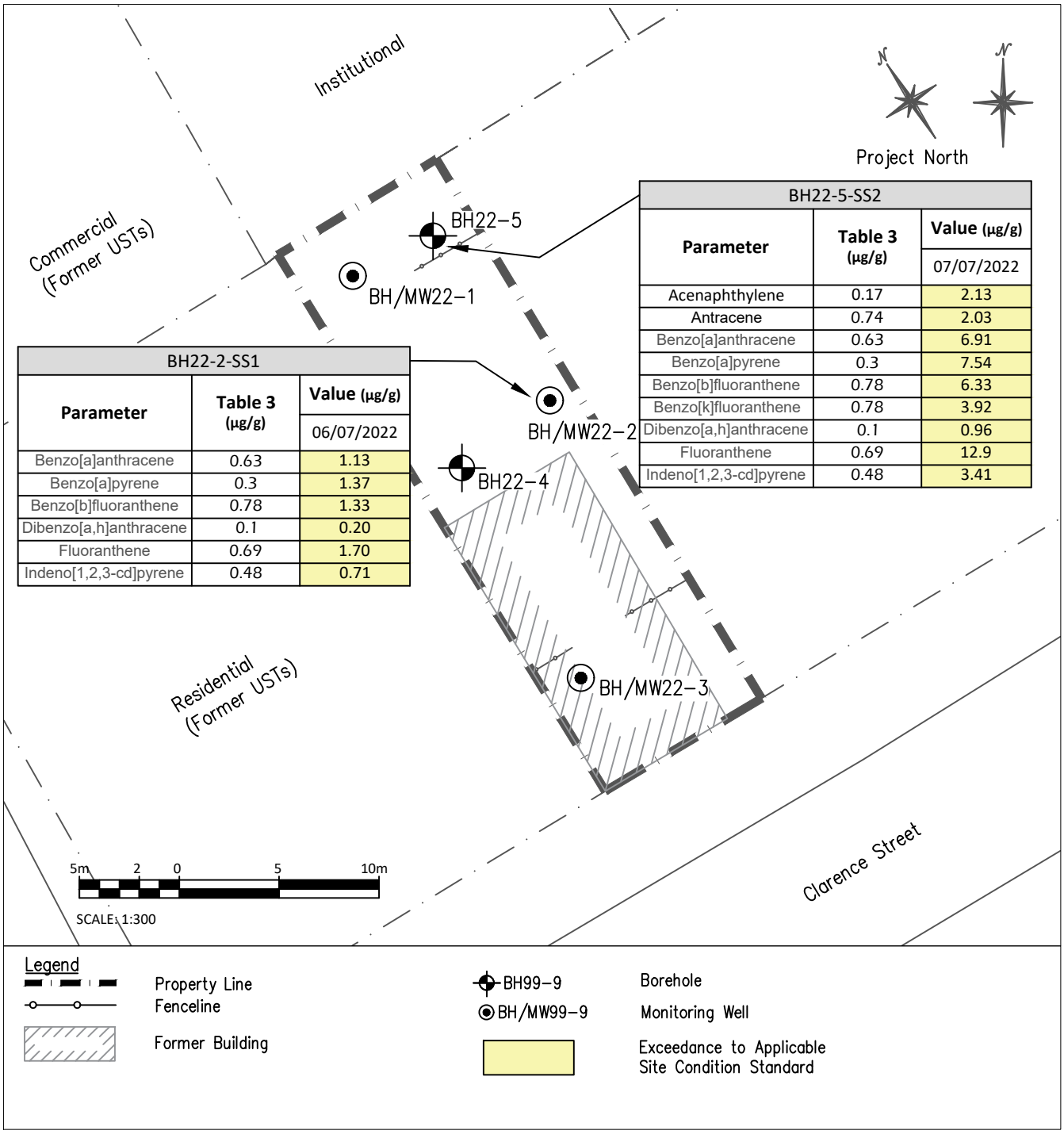
OTTAWA, ONTARIO

DRAWING TITLE

SOIL EXCEEDANCES: PAHs

CLIENT	DATE	PROJECT
CLARENCE GATE HOLDINGS INC.	AUGUST 2022	180647

FIGURE 4-1



BH22-2-SS1

Parameter	Table 3 (µg/g)	Value (µg/g) 06/07/2022
Benzo[a]anthracene	0.63	1.13
Benzo[a]pyrene	0.3	1.37
Benzo[b]fluoranthene	0.78	1.33
Dibenzo[a,h]anthracene	0.1	0.20
Fluoranthene	0.69	1.70
Indeno[1,2,3-cd]pyrene	0.48	0.71

BH22-5-SS2

Parameter	Table 3 (µg/g)	Value (µg/g) 07/07/2022
Acenaphthylene	0.17	2.13
Antracene	0.74	2.03
Benzo[a]anthracene	0.63	6.91
Benzo[a]pyrene	0.3	7.54
Benzo[b]fluoranthene	0.78	6.33
Benzo[k]fluoranthene	0.78	3.92
Dibenzo[a,h]anthracene	0.1	0.96
Fluoranthene	0.69	12.9
Indeno[1,2,3-cd]pyrene	0.48	3.41

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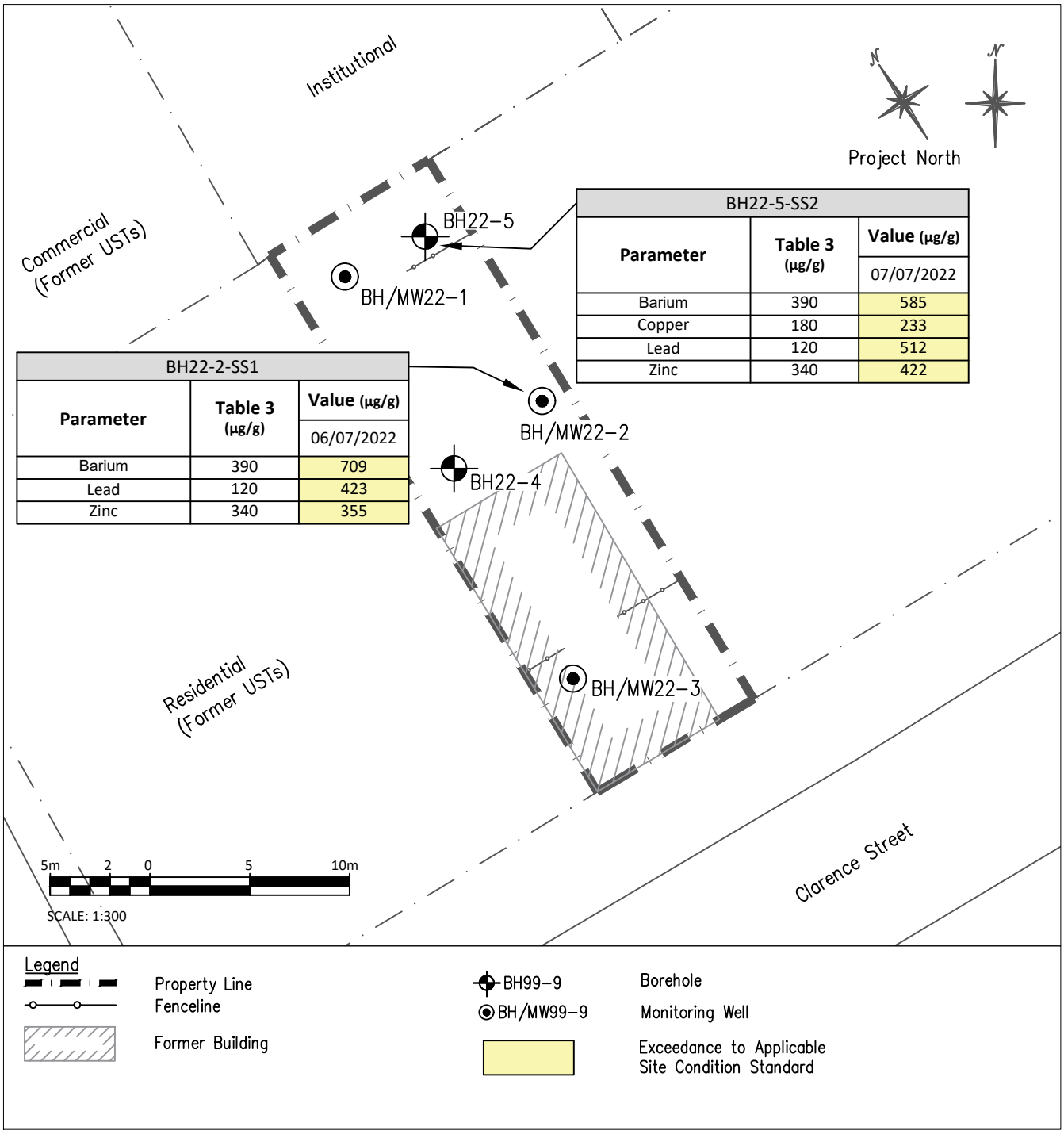
ENVIRONMENTAL SITE ASSESSMENT
211 CLARENCE STREET
OTTAWA, ONTARIO

DRAWING TITLE

SOIL EXCEEDANCES: METALS

CLIENT	DATE	PROJECT
CLARENCE GATE HOLDINGS INC.	AUGUST 2022	180647

FIGURE 4-2



BH22-5-SS2

Parameter	Table 3 (µg/g)	Value (µg/g) 07/07/2022
Barium	390	585
Copper	180	233
Lead	120	512
Zinc	340	422

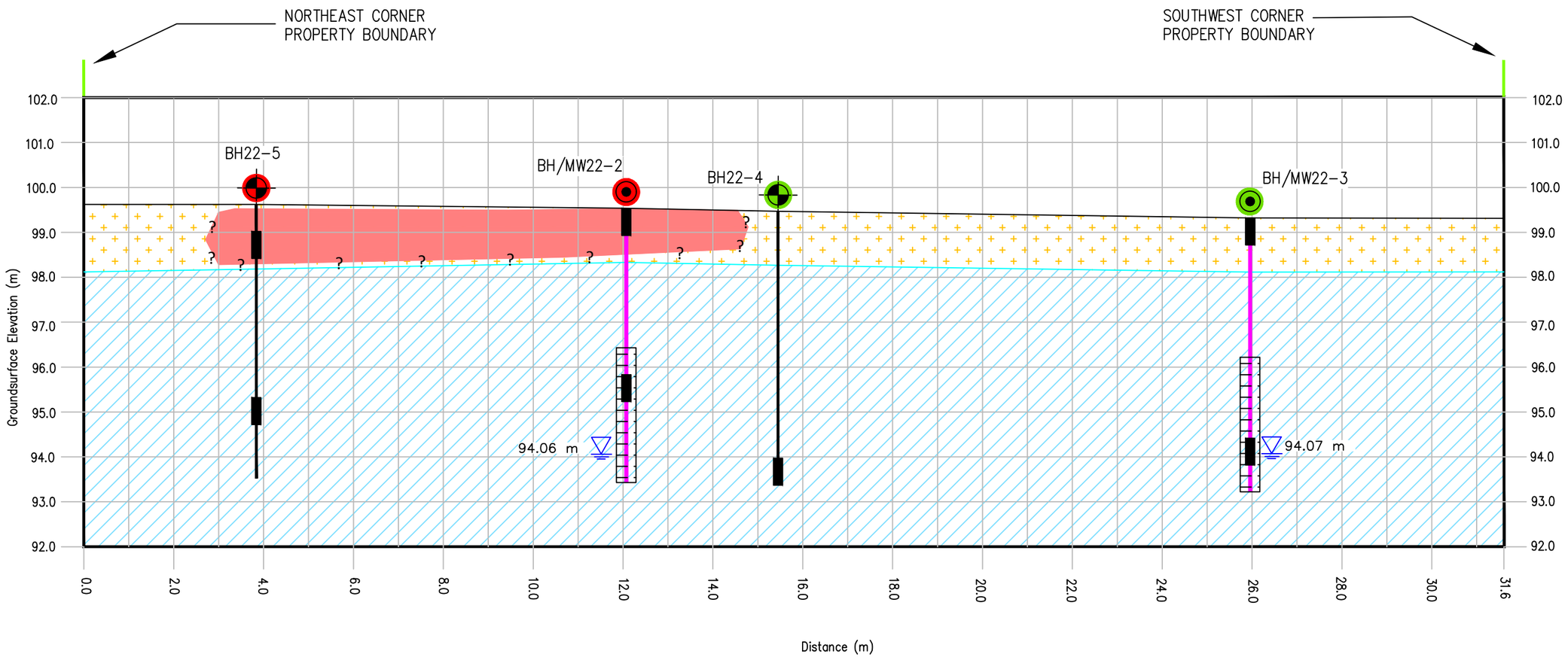
BH22-2-SS1

Parameter	Table 3 (µg/g)	Value (µg/g) 06/07/2022
Barium	390	709
Lead	120	423
Zinc	340	355

Cross Section A – A'

A

A'



Legend

- Fill stratum
- Silt and Clay stratum
- xxxx — Monitoring Well
- 99.99 — Groundwater Elevation
- BH22-99 — Borehole
- Property Boundary
- Monitoring Well – Screen Section
- Sample Submission Location
- Borehole/Monitoring Well with Soil Exceedances to SCS
- Borehole/Monitoring Well with no Soil Exceedances to SCS
- Estimated Extents of Soil Exceedance
- ? ? Full Extent of Soil Exceedance Not Determined

No.	REVISIONS	BY	DATE
01	FINAL	G.M.	09/08/2022

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DESIGNED BY:	DRAWN BY:	APPROVED BY:
	G.M.	J.L.

PROJECT
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
211 CLARENCE STREET
OTTAWA, ONTARIO

DRAWING TITLE
CROSS SECTION
SEGMENT A - A'

PROJECT NO.
180647

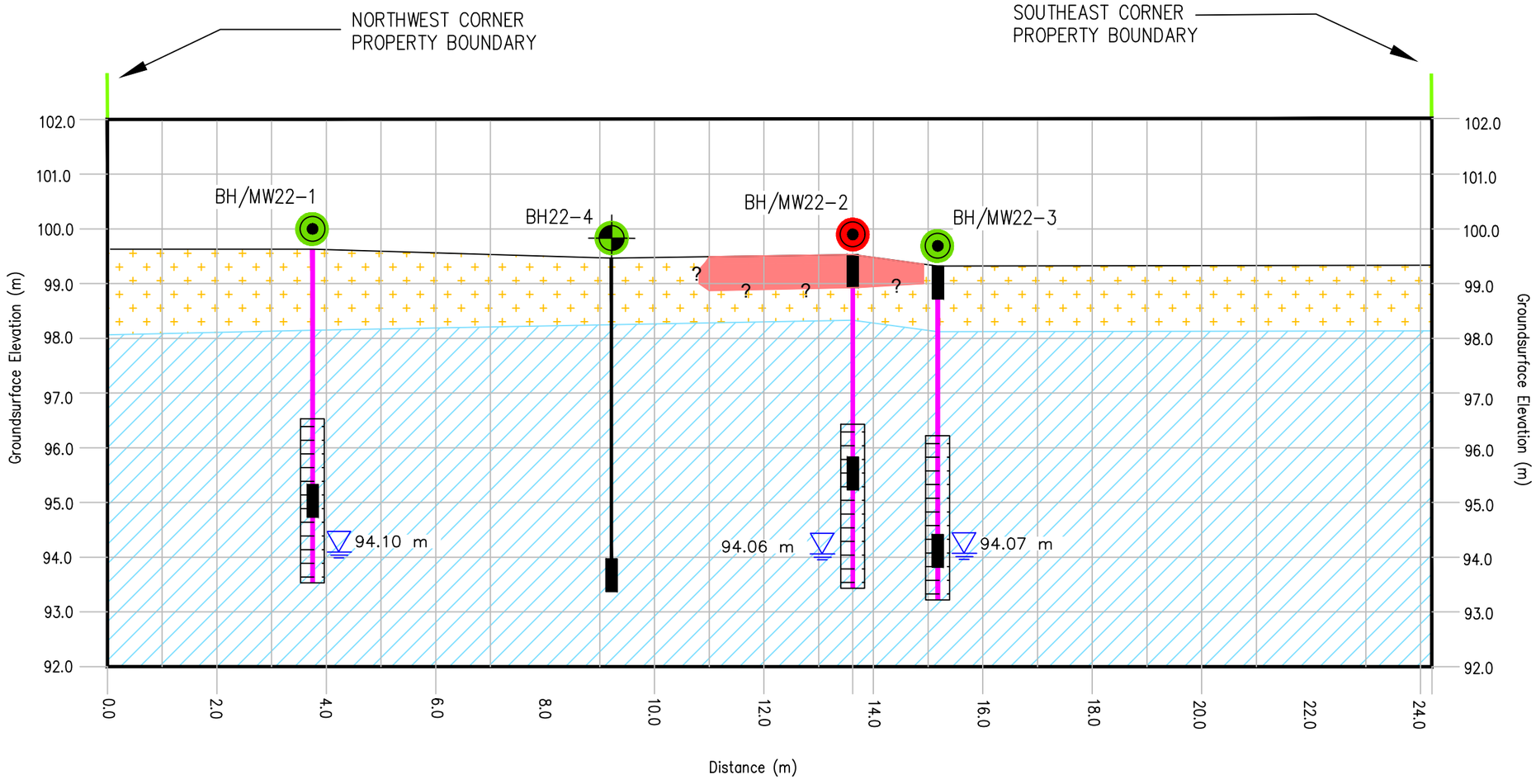
DATE
AUGUST 2022

FIGURE 5-1

B

Cross Section B – B'

B'



Legend

- Fill stratum
- Silt and Clay stratum
- xxxx Monitoring Well
- 99.99 Groundwater Elevation
- BH22-99 Borehole
- Property Boundary
- Monitoring Well – Screen Section
- Sample Submission Location
- Borehole/Monitoring Well with Soil Exceedances to SCS
- Borehole/Monitoring Well with no Soil Exceedances to SCS
- Estimated Extents of Soil Exceedance
- ? ? Full Extent of Soil Exceedance Not Determined

No.	REVISIONS	BY	DATE
01	FINAL	G.M.	09/08/2022

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	G.M.	J.L.

PROJECT
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
211 CLARENCE STREET
OTTAWA, ONTARIO

DRAWING TITLE
CROSS SECTION
SEGMENT B - B'

PROJECT NO.
180647

DATE
AUGUST 2022

FIGURE 5-2

TABLES

Table 1
Summary of Ground Surface and Groundwater Elevations (July 12, 2022)
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
211 Clarence Street, Ottawa, Ontario
LRL File: 180647

Monitoring Well	Ground Surface Elevation[1] (m)	Reference Elevation[2] (m)	Depth To Water Table (m)		Groundwater Elevation (m)
			Reference Point	Ground Surface	
MW22-1	99.63	99.55	5.45	5.53	94.10
MW22-2	99.53	99.41	5.35	5.47	94.06
MW22-3	99.32	99.22	5.16	5.25	94.07
BH22-4	99.47	--	--	--	--
BH22-5	99.62	--	--	--	--

NOTES

[1] Elevations measured from temporary benchmark established at the top of the hydrant across Clarence Street (100.00 m).

[2] Reference elevation is top of PVC riser.

Table 2
Summary of Soil VOC, PHC, PCB, and General Inorganics Analysis
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
44 MacDonald Street North, Arnprior, Ontario
LRL File: 180647

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Residential Property Use Fine textured soil	Sample								
				Duplicate								
				BH22-1-SS8	BH22-1-SS16	BH22-2-SS7	BH22-3-SS9	BH22-4-SS10	BH22-5-SS8	BH22-2-SS1	BH22-3-SS1	BH22-5-SS2
Sample Date (d/m/y)			--	06-Jul-22		06-Jul-22	06-Jul-22	07-Jul-22	07-Jul-22	06-Jul-22	06-Jul-22	07-Jul-22
Depth below top of Ground	m		--	4.3 - 4.9		3.7 - 4.3	4.9 - 5.5	5.5 - 6.1	4.3 - 4.9	0.0 - 0.6	0.0 - 0.6	0.6 - 1.2
CSV Readings[3]	ppm	5	--	0.1		<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1
Physical Characteristics												
% Solids	% by wt.	0.1	--	67.7	66.9	69.4	74.2	75.8	67.1	85.0	98.9	81.0
>0.075 mm	%	0.1	--	--	--	--	--	--	--	--	--	--
<0.075 mm	%	0.1	--	--	--	--	--	--	--	--	--	--
Texture	%	0.1	--	--	--	--	--	--	--	--	--	--
General Inorganics												
SAR	N/A	0.01	5	--	--	--	--	--	--	0.06	0.14	0.09
Conductivity	uS/cm	5	700	--	--	--	--	--	--	179	60	163
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	pH Units	0.1	--	--	--	--	--	7.46	7.32	7.38	7.43	7.15
Volatiles												
Acetone	ug/g dry	0.50	28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
Benzene	ug/g dry	0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	--	--	--
Bromodichloromethane	ug/g dry	0.05	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Bromoform	ug/g dry	0.05	0.26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Bromomethane	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Carbon Tetrachloride	ug/g dry	0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Chlorobenzene	ug/g dry	0.05	2.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Chloroform	ug/g dry	0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Dibromochloromethane	ug/g dry	0.05	9.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Dichlorodifluoromethane	ug/g dry	0.05	25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,2-Dichlorobenzene	ug/g dry	0.05	4.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,3-Dichlorobenzene	ug/g dry	0.05	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,4-Dichlorobenzene	ug/g dry	0.05	0.097	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1-Dichloroethane	ug/g dry	0.05	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,2-Dichloroethane	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1-Dichloroethylene	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
cis-1,2-Dichloroethylene	ug/g dry	0.05	30	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.75	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,2-Dichloropropane	ug/g dry	0.05	0.085	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
cis-1,3-Dichloropropylene	ug/g dry	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
trans-1,3-Dichloropropylene	ug/g dry	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,3-Dichloropropene, total	ug/g dry	0.05	0.083	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Ethylbenzene	ug/g dry	0.05	15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Ethylene dibromide (dibromoethane, 1,2-)	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Hexane	ug/g dry	0.05	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.50	44	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
Methyl Isobutyl Ketone	ug/g dry	0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--
Methyl tert-butyl ether	ug/g dry	0.05	1.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Methylene Chloride	ug/g dry	0.05	0.96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Styrene	ug/g dry	0.05	2.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Tetrachloroethylene	ug/g dry	0.05	2.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Toluene	ug/g dry	0.05	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1,1-Trichloroethane	ug/g dry	0.05	3.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
1,1,2-Trichloroethane	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Trichloroethylene	ug/g dry	0.05	0.52	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Trichlorofluoromethane	ug/g dry	0.05	5.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Vinyl Chloride	ug/g dry	0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	--	--	--
m/p-Xylene	ug/g dry	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
o-Xylene	ug/g dry	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Xylenes, total	ug/g dry	0.05	25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--	--
Hydrocarbons												
F1 PHCs (C6-C10)	ug/g dry	7	65	<7	<7	<7	<7	<7	<7	--	--	--
F2 PHCs (C10-C16)	ug/g dry	4	150	<4	<4	<4	<4	<4	<4	--	--	--
F3 PHCs (C16-C34)	ug/g dry	8	1300	<8	<8	<8	<8	<8	<8	--	--	--
F4 PHCs (C34-C50)	ug/g dry	6	5600	<6	<6	<6	<6	<6	<6	--	--	--
PCBs												
PCBs, total	ug/g dry	0.05	0.35	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

NOTES:
[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
[2] Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential property use.
[3] Combustible soil vapour concentrations measured with a MiniRAE 3000 PID
MDL Method Detection Limit
-- No Value/Not Analysed
PHC Petroleum Hydrocarbon

Table 3
Summary of Soil PAH and Metals Analysis
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
211 Clarence Street, Ottawa, Ontario
LRL File: 180647

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Residential Property Use Fine textured soil	Sample								
				Duplicate								
				BH22-1-SS8	BH22-1-SS16	BH22-2-SS7	BH22-3-SS9	BH22-4-SS10	BH22-5-SS8	BH22-2-SS1	BH22-3-SS1	BH22-5-SS2
Sample Date (d/m/y)			--	06-Jul-22		06-Jul-22	06-Jul-22	07-Jul-22	07-Jul-22	06-Jul-22	06-Jul-22	07-Jul-22
Depth below ground surface	m		--	4.3 - 4.9		3.7 - 4.3	4.9 - 5.5	5.5 - 6.1	4.3 - 4.9	0.0 - 0.6	0.0 - 0.6	0.6 - 1.2
CSV Readings[3]	ppm	5	--	0.1		<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1
Physical Characteristics												
% Solids	% by wt.	0.1	--	67.7	66.9	69.4	74.2	75.8	67.1	85	98.9	81
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	ug/g dry	0.02	58	--	--	--	--	--	--	0.04	<0.02	<0.04
Acenaphthylene	ug/g dry	0.02	0.17	--	--	--	--	--	--	0.14	<0.02	**2.13**
Anthracene	ug/g dry	0.02	0.74	--	--	--	--	--	--	0.27	<0.02	**2.03**
Benzo[a]anthracene	ug/g dry	0.02	0.63	--	--	--	--	--	--	**1.13**	<0.02	**6.91**
Benzo[a]pyrene	ug/g dry	0.02	0.3	--	--	--	--	--	--	**1.37**	<0.02	**7.54**
Benzo[b]fluoranthene	ug/g dry	0.02	0.78	--	--	--	--	--	--	**1.33**	<0.02	**6.33**
Benzo[g,h,i]perylene	ug/g dry	0.02	7.8	--	--	--	--	--	--	0.80	<0.02	3.69
Benzo[k]fluoranthene	ug/g dry	0.02	0.78	--	--	--	--	--	--	0.69	<0.02	**3.92**
Chrysene	ug/g dry	0.02	7.8	--	--	--	--	--	--	1.51	<0.02	6.50
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1	--	--	--	--	--	--	**0.20**	<0.02	**0.96**
Fluoranthene	ug/g dry	0.02	0.69	--	--	--	--	--	--	**1.70**	<0.02	**12.9**
Fluorene	ug/g dry	0.02	69	--	--	--	--	--	--	0.04	<0.02	<0.04
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.48	--	--	--	--	--	--	**0.71**	<0.02	**3.41**
1-Methylnaphthalene	ug/g dry	0.02	3.4	--	--	--	--	--	--	0.02	<0.02	<0.04
2-Methylnaphthalene	ug/g dry	0.02	3.4	--	--	--	--	--	--	0.03	<0.02	<0.04
Methylnaphthalene (1&2)	ug/g dry	0.04	3.4	--	--	--	--	--	--	0.05	<0.04	<0.80
Naphthalene	ug/g dry	0.01	0.75	--	--	--	--	--	--	0.03	<0.01	<0.2
Phenanthrene	ug/g dry	0.02	7.8	--	--	--	--	--	--	0.82	<0.02	3.49
Pyrene	ug/g dry	0.02	78	--	--	--	--	--	--	1.54	<0.02	12.30
Metals												
Antimony	ug/g dry	1.0	7.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.8	<1.0	2.4
Arsenic	ug/g dry	1.0	18	2.7	2.8	4.2	2.0	2.1	2.4	8.3	1.3	11.6
Barium	ug/g dry	1.0	390	251	307	185	178	172	253	**709**	21	**585**
Beryllium	ug/g dry	1.0	5	0.8	0.9	0.7	0.6	0.6	0.7	<0.5	<0.5	0.6
Boron	ug/g dry	1.0	120	7.0	7.7	8.1	5.2	5.4	6.4	9.6	<5.0	7.5
Cadmium	ug/g dry	0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.5
Chromium VI	ug/g dry	0.2	10	--	--	--	--	--	--	<0.2	<0.2	<0.2
Chromium	ug/g dry	1.0	160	58.5	65.4	43.9	37.3	33.1	56.8	27.5	7.5	32.8
Cobalt	ug/g dry	1.0	22	15.3	17.2	12.6	9.8	9.0	14.8	6.1	2.3	7.9
Copper	ug/g dry	1.0	180	29.2	32.4	22.9	19.9	18.4	27.5	47.8	5.4	**233**
Lead	ug/g dry	1.0	120	4.9	5.0	4.4	3.1	3.4	4.4	**423**	2.3	**512**
Mercury	ug/g dry	0.1	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.00	<0.1	1.30
Molybdenum	ug/g dry	1.0	6.9	<1.0	1.30	<1.0	<1.0	<1.0	<1.0	1.00	<1.0	1.60
Nickel	ug/g dry	1.0	130	33.2	37.1	25.7	20.2	18.0	31.5	15.1	<5.0	18.9
Selenium	ug/g dry	1.0	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.80
Silver	ug/g dry	0.3	25	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.70	<0.3	0.70
Thallium	ug/g dry	1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	23	1.10	1.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	1.0	86	76.9	84.0	62.2	53.7	50.5	73.4	24.1	16.3	34.4
Zinc	ug/g dry	1.0	340	87.8	96.0	71.3	53.2	46.9	85.7	**355**	<20	**422**

NOTES:
1 MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
2 Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential property use.
3 Combustible soil vapour concentrations measured with a MiniRAE 3000 PID
MDL Method Detection Limit
-- No Value/Not Analysed
BOLD Above Table 3 Standard

Table 4
Summary of Groundwater VOC and PHC Analysis
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
211 Clarence Street, Ottawa, Ontario
LRL File: 180647

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Residential Property Use Fine textured soil	Sample	Duplicate			
				MW22-1	MW22-10	MW22-2	MW22-3	Trip Blank
Sample Date (d/m/y)			--	12-Jul-22		12-Jul-22	12-Jul-22	12-Jul-22
Depth of groundwater below top of casing	m		--	5.45		5.35	5.16	--
Headspace VOC Readings[3]	ppm	0.1	--	2.1		0.3	0.1	--
Evidence of free product?	--	--	[4]	No		No	No	--
General Inorganics								
Cyanide, free	ug/g dry	2		<2	<2	<2	<2	--
pH	pH Units	0.1		7.6	7.9	7.6	7.7	--
Volatiles								
Acetone	ug/L	5.0	130000	<5.0	<5.0	<5.0	<5.0	<5.0
Benzene	ug/L	0.5	430	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L	0.5	85000	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	ug/L	0.5	770	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	ug/L	0.5	56	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	ug/L	0.2	8.4	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	ug/L	0.5	630	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	ug/L	0.5	22	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ug/L	0.5	82000	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ug/L	1.0	4400	<1.0	98	856	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	0.5	9600	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	ug/L	0.5	9600	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	0.5	67	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	ug/L	0.5	3100	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ug/L	0.5	12	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	ug/L	0.5	17	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L	0.5	17	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L	0.5	17	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	0.5	140	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	ug/L	0.5	45	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	0.5	2300	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.2	0.83	<0.2	<0.2	<0.2	<0.2	<0.2
Hexane	ug/L	1.0	520	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	500000	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	ug/L	5.0	580000	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	ug/L	2.0	1400	<2.0	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	ug/L	5.0	5500	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	0.5	9100	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	ug/L	0.5	28	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ug/L	0.5	15	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	0.5	17	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	ug/L	0.5	18000	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ug/L	0.5	6700	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	0.5	30	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	0.5	17	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	ug/L	1.0	2500	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.5	1.7	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-Xylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes, total	ug/L	0.5	4200	<0.5	<0.5	<0.5	<0.5	<0.5
Hydrocarbons								
F1 PHCs (C6-C10)	ug/L	25	750	<25	<25	<25	<25	--
F2 PHCs (C10-C16)	ug/L	100	150	<100	<100	<100	<100	--
F3 PHCs (C16-C34)	ug/L	100	500	176	<100	<100	<100	--
F4 PHCs (C34-C50)	ug/L	100	500	180	<100	<100	<100	--

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

[2] Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential property use.

[3] Headspace values were measured with a MiniRAE 3000 PID

[4] To meet the standard there must be no evidence of free product including film or sheen.

MDL Method Detection Limit

-- No Value/Not Analysed

PHC Petroleum Hydrocarbon

Table 5
Summary of Groundwater Metals Analysis
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
211 Clarence Street, Ottawa, Ontario
LRL File: 180647

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Fine Textured Soil	Sample			
					Duplicate		
				MW22-1	MW22-10	MW22-2	MW22-3
Sample Date (d/m/y)			--	12-Jul-22		12-Jul-22	12-Jul-22
Metals							
Mercury	ug/L	0.1	2.8	<0.1	<0.1	<0.1	<0.1
Antimony	ug/L	0.5	20000	<0.5	<0.5	<0.5	<0.5
Arsenic	ug/L	1.0	1900	<1.0	<1.0	1.0	1.0
Barium	ug/L	1.0	29000	149	154	214	244
Beryllium	ug/L	0.5	67	<0.5	<0.5	<0.5	<0.5
Boron	ug/L	10	45000	104	96	138	75
Cadmium	ug/L	0.1	2.7	<0.1	<0.1	<0.1	<0.1
Chromium	ug/L	1.0	810	1.0	<1	<1.0	1.0
Cobalt	ug/L	0.5	66	1.3	1.3	1.1	1.0
Copper	ug/L	0.5	87	6.7	4.4	5.9	6.6
Lead	ug/L	0.1	25	0.2	<0.1	0.1	0.1
Molybdenum	ug/L	0.5	9200	5.5	5.6	4.5	3.8
Nickel	ug/L	1.0	490	4.0	3.0	3.0	3.0
Selenium	ug/L	1.0	63	<1.0	<1.0	<1.0	<1
Silver	ug/L	0.1	1.5	<0.1	<0.1	<0.1	<0.1
Sodium	ug/L	200	2300000	68200	68000	39300	155000
Thallium	ug/L	0.1	510	0.1	0.1	<0.1	0.1
Uranium	ug/L	0.1	420	10.5	11.1	5.0	4.4
Vanadium	ug/L	0.5	250	<0.5	<0.5	0.8	0.8
Zinc	ug/L	5	1100	7	6	7	<5

NOTES:
[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
[2] Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential property use.
MDL Method Detection Limit
-- No Value/Not Analysed

Table 6
Summary of Groundwater PCB and PAH Analysis
PhaseTwo Environmental Site Assessment & Environmental Site Remediation
211 Clarence Street, Ottawa, Ontario
LRL File: 180647

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Fine Textured Soil	Sample			
					Duplicate		
				MW22-1	MW22-10	MW22-2	MW22-3
Sample Date (d/m/y)			--	12-Jul-22		12-Jul-22	12-Jul-22
PCBs							
PCBs, total	ug/L	0.05	15	<0.05	<0.05	<0.05	<0.05
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	ug/L	0.05	1700	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	ug/L	0.05	1.8	<0.05	<0.05	<0.05	<0.05
Anthracene	ug/L	0.01	2.4	<0.01	<0.01	<0.01	<0.01
Benzo[a]anthracene	ug/L	0.01	4.7	<0.01	<0.01	<0.01	<0.01
Benzo[a]pyrene	ug/L	0.01	0.81	<0.01	<0.01	<0.01	<0.01
Benzo[b]fluoranthene	ug/L	0.05	0.75	<0.05	<0.05	<0.05	<0.05
Benzo[g,h,i]perylene	ug/L	0.05	0.2	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	ug/L	0.05	0.4	<0.05	<0.05	<0.05	<0.05
Chrysene	ug/L	0.05	1	<0.05	<0.05	<0.05	<0.05
Dibenzo[a,h]anthracene	ug/L	0.05	0.52	<0.05	<0.05	<0.05	<0.05
Fluoranthene	ug/L	0.01	130	<0.01	<0.01	0.03	0.04
Fluorene	ug/L	0.05	400	<0.05	<0.05	<0.05	<0.05
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	ug/L	0.05	1800	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	ug/L	0.05	1800	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	ug/L	0.1	1800	<0.1	<0.1	<0.1	<0.1
Naphthalene	ug/L	0.05	6400	<0.05	<0.05	<0.05	<0.05
Phenanthrene	ug/L	0.05	580	<0.05	<0.05	<0.05	0.07
Pyrene	ug/L	0.01	68	<0.01	<0.01	0.03	<0.01

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

[2] Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential property use.

MDL Method Detection Limit

-- No Value/Not Analysed

APPENDIX A

Borehole Logs

Borehole Log: BH/MW22-1

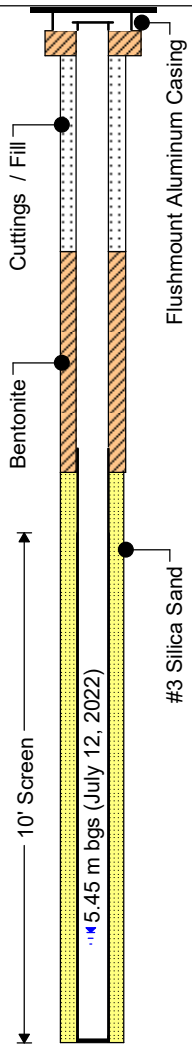
Project No.: 180647 **Project:** Phase II Environmental Site Assessment

Client: Clarence Gate Holdings Inc. **Location:** 211 Clarence Street, Ottawa, Ontario

Date: July 06, 2022 **Field Personnel:** GM

Driller: CCC Drilling **Drilling Equipment:** Truck-mounted CME 55 **Drilling Method:** Hollow Stem Auger

Depth (ft / m)	Soil Description	Elev./Depth (m)	Lithology	Type	Sample Number	N or RQD (%)	Recovery (%)	Lab Analysis	Combustible Soil Vapours (ppm)
0.0 / 0.0	Ground Surface	99.63 / 0.00							
0.0 – 5.0 / 0.0 – 1.5	**FILL** Sand with gravel, trace organics from 0.6 to 1.2 m bgs, loose, dry, dark brown, oxidation from 1.2 to 1.5 m bgs.				SS1	9	38		0.1
					SS2	6	46		0.1
		98.13 / 1.50			SS3	9	71		<0.1
5.0 – 20.0 / 1.5 – 6.0	**SILT AND CLAY** Trace stone at 3.0 mbgs, very soft, moist at 2.4 m bgs and saturated at 4.9 m bgs, grey, trace oxidation from 2.4 to 3.0 m bgs.				SS4	8	63		0.1
					SS5	2	79		0.1
					SS6	5	58		<0.1
					SS7	2	50		<0.1
					SS8	2	92	VOC, PHC, PCB, Metals ICP, Cyanide, and Mercury.	0.1
					SS9	3	100		0.1
					SS10	WOH	100		0.1
20.0 / 6.0	End of Borehole	93.53 / 6.10							



Easting: 0446073 **Northing:** 5031059

Site Datum: Top of the fire hydrant across Clarence Street to the southeast (100.00 m)

Groundsurface Elevation: 99.63 m **Top of Riser Elev.:** 99.55 m

Hole Diameter: 203 mm **Monitoring Well Diameter:** 50 mm

NOTES

- Duplicate samples collected of SS5 (identified as SS15), and SS8 (identified as SS16).
- Groundwater sample collected on July 12, 2022 was submitted for laboratory analysis of VOC, PHC, PAH, PCB, Reg.153 MetalS, General Inorganics.
- WOH: Weight of hummer

Borehole Log: BH/MW22-2

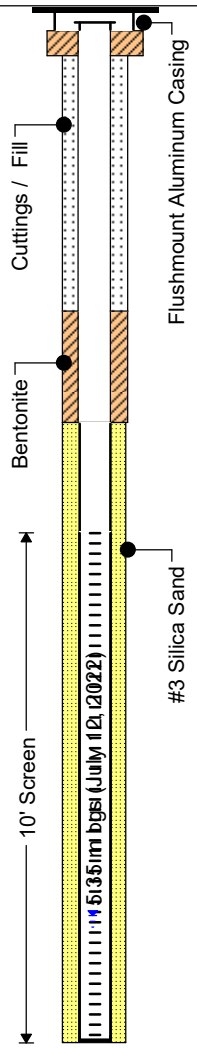
Project No.: 180647 **Project:** Phase II Environmental Site Assessment

Client: Clarence Gate Holdings Inc. **Location:** 211 Clarence Street, Ottawa, Ontario

Date: July 06, 2022 **Field Personnel:** GM

Driller: CCC Drilling **Drilling Equipment:** Truck-mounted CME 55 **Drilling Method:** Hollow Stem Auger

Depth (ft / m)	Soil Description	Elev./Depth (m)	Lithology	Type	Sample Number	N or RQD (%)	Recovery (%)	Lab Analysis	Combustible Soil Vapours (ppm / % LEL)
0.0 / 0.0	Ground Surface	99.53							
0.0 / 0.0	**FILL** Sandy clayey fill, gravel from 0.6 - 1.2 m bgs, organics from 0.6 to 1.2 m bgs, loose, dry, dark brown.	0.00			SS1	7	46	PAH, PCB, Inorganics, Metals ICP, Cyanide, and	0.1
					SS2	4	50		0.1
4.0 / 1.0	**SILT AND CLAY** Trace gravel at 5.5 m bgs, very soft, moist at 1.8 m bgs and saturated at 5.5 mbgs, grey, oxidation from 1.2 to 3.0 m bgs.	98.33 1.20			SS3	5	92		<0.1
6.0 / 2.0					SS4	10	100		<0.1
8.0 / 3.0					SS5	2	100		<0.1
10.0 / 3.0					SS6	1	100		<0.1
12.0 / 4.0					SS7	3	100	VOC, PHC, PCB, Metals ICP, Cyanide, and Mercury.	<0.1
14.0 / 4.0					SS8	1	100		<0.1
16.0 / 5.0					SS9	3	100		<0.1
18.0 / 5.0					SS10	2	79		<0.1
20.0 / 6.0	End of Borehole	93.43 6.10							
23.0 / 7.0									



Easting: 0446081 **Northing:** 5031049

Site Datum: Top of the fire hydrant across Clarence Street to the southeast (100.00 m)

Groundsurface Elevation: 99.53 m **Top of Riser Elev.:** 99.41 m

Hole Diameter: 203 mm **Monitoring Well Diameter:** 50 mm

NOTES

- Duplicate sample collected of SS6, identified as SS17.
- Groundwater sample collected on July 12, 2022 was submitted for laboratory analysis of VOC, PHC, PAH, PCB, Reg.153 MetalS, General Inorganics.

Borehole Log: BH/MW22-3

Project No.: 180647 **Project:** Phase II Environmental Site Assessment

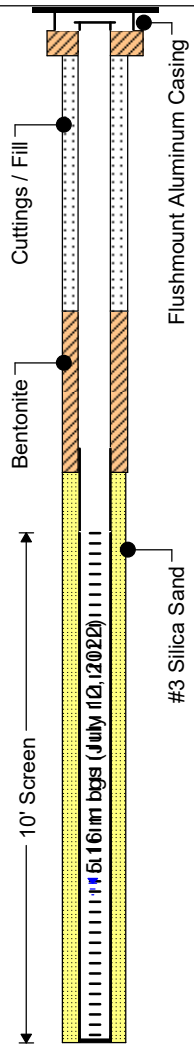
Client: Clarence Gate Holdings Inc. **Location:** 211 Clarence Street, Ottawa, Ontario

Date: July 06, 2022 **Field Personnel:** GM

Driller: CCC Drilling **Drilling Equipment:** Truck-mounted CME 55 **Drilling Method:** Hollow Stem Auger

Depth (ft / m)	Soil Description	Elev./Depth (m)	Lithology	Type	Sample Number	N or RQD (%)	Recovery (%)	Lab Analysis	Combustible Soil Vapours (ppm / % LEL)
0.0 / 0.0	Ground Surface	99.32							
0.0 / 0.0	**FILL** Sand, fine to medium grained, organics from 1.0 to 1.1 m bgs, very loose, dry, brown.	0.00			SS1	2	42	PAH, PCB, Inorganics, Metals ICP, Cyanide, and	<0.1
					SS2	4	46		<0.1 <0.1
1.0 / 1.0		98.17							
4.0 / 1.15	**SILT AND CLAY** more silt at 4.9 m bgs, stiff at 1.2 m bgs and soft at 1.95 m bgs, moist at 1.8 m bgs and saturated at 3.0 m bgs, grey, oxidation from 1.2 to 2.4 m bgs.				SS3	9	83		<0.1 <0.1 <0.1
2.0					SS4	7	100		<0.1
					SS5	1	75		<0.1
3.0					SS6	1	100		<0.1
					SS7	1	100		<0.1
4.0					SS8	1	100		<0.1
					SS9	3	100	VOC, PHC, PCB, Metals ICP, Cyanide, and Mercury.	<0.1
5.0					SS10	1	100		0.1
6.0		93.22							
6.10	End of Borehole								

Monitoring Well Details



Easting: 0446087 **Northing:** 5031039

Site Datum: Top of the fire hydrant across Clarence Street to the southeast (100.00 m)

Groundsurface Elevation: 99.32 m **Top of Riser Elev.:** 99.22 m

Hole Diameter: 203 mm **Monitoring Well Diameter:** 50 mm

NOTES

- Duplicate samples collected of SS8, identified as SS18.

- Groundwater sample collected on July 12, 2022 was submitted for laboratory analysis of VOC, PHC, PAH, PCB, Reg.153 MetalS, General Inorganics.

Borehole Log: BH22-4

Project No.: 180647 **Project:** Phase II Environmental Site Assessment

Client: Clarence Gate Holdings Inc. **Location:** 211 Clarence Street, Ottawa, Ontario

Date: July 07, 2022 **Field Personnel:** GM

Driller: CCC Drilling **Drilling Equipment:** Truck-mounted CME 55 **Drilling Method:** Hollow Stem Auger

Depth (ft / m)	Soil Description	Elev./Depth (m)	Lithology	Type	Sample Number	N or RQD (%)	Recovery (%)	Lab Analysis	Combustible Soil Vapours (ppm / % LEL)	Monitoring Well Details
0.0 / 0.0	Ground Surface	99.63								
0.0 – 3.3 / 0.0 – 1.0	**FILL** Fine graind sand at 1.0 m bgs, organics from 0.0 to 1.0 m bgs, loose, dry, dark brown, oxidation at 1.0 m bgs.	0.00			SS1	2	13		<0.1	
					SS2	6	50		0.1 <0.1	
3.3 – 6.6 / 1.0 – 2.0	**SILT AND CLAY** Sand at 1.3 to 1.35 m bgs, stiff at 1.2 and very soft at 2.4 m bgs, moist at 1.8 m bgs and saturated at 4.9 mbgs, grey, grey-brown from 1.2 to 1.8 m bgs, oxidation from 1.2 to 2.4 m bgs.	98.43 1.20			SS3	6	88		0.1 <0.1	
					SS4	8	100		<0.1	
6.6 – 9.8 / 2.0 – 3.0					SS5	2	100		<0.1	
					SS6	WOH	100		<0.1 <0.1	
9.8 – 13.1 / 3.0 – 4.0					SS7	2	100		<0.1	
					SS8	1	100		<0.1	
13.1 – 16.4 / 4.0 – 5.0					SS9	3	100		<0.1	
16.4 – 19.7 / 5.0 – 6.0					SS10	2	100	VOC, PHC, PCB, Metals ICP, Cyanide, and Mercury.	<0.1	
19.7 / 6.0	End of Borehole	93.53 6.10								
19.7 – 23.0 / 6.0 – 7.0										

Easting: 0446076 **Northing:** 5031057

Site Datum: Top of the fire hydrant across Clarence Street to the southeast (100.00 m)

Groundsurface Elevation: 99.47 m **Top of Riser Elev.:** --

Hole Diameter: 203 mm **Monitoring Well Diameter:** 50 mm

NOTES

- Duplicate samples collected of
  - * SS4 (identified as SS19), and
  - * SS10 (identified as SS20).
- WOH: Weight of hummer

-- : Not applicable/Not measured

Borehole Log: BH22-5

Project No.: 180647 | **Project:** Phase II Environmental Site Assessment

Client: Clarence Gate Holdings Inc. | **Location:** 211 Clarence Street, Ottawa, Ontario

Date: July 07, 2022 | **Field Personnel:** GM

Driller: CCC Drilling | **Drilling Equipment:** Truck-mounted CME 55 | **Drilling Method:** Hollow Stem Auger

Depth (ft)	Depth (m)	Soil Description	Elev./Depth (m)	Lithology	Type	Sample Number	N or RQD (%)	Recovery (%)	Lab Analysis	Combustible Soil Vapours (ppm)	Monitoring Well Details
		Ground Surface	99.62								
0.0	0.0	**FILL** Sand and gravel, sandy clay at 0.6 to 1.2 m bgs, loose, dry, black, brown from 1.2 to 1.45 m bgs, oxidation from 1.2 to 1.45 m bgs.	0.00			SS1	7	21		0.4	
1.0										<0.1	
2.0									PAH, PCB, Inorganics, Metals ICP, Cyanide, and		
3.0	1.0					SS2	4	42		<0.1	
4.0											
5.0		**SILT AND CLAY** Trace gravel at 5.5 to 6.1 m bgs, stiff at 1.8 and very soft at 2.4 m bgs, moist at 2.4 m bgs and saturated at 4.3 m bgs, grey, oxidation from 1.45 to 3.0 m bgs.	98.17 1.45			SS3	5	88		0.1	
6.0										0.1	
7.0	2.0					SS4	10	79		0.1	
8.0											
9.0						SS5	2	83		<0.1	
10.0	3.0										
11.0						SS6	1	85		0.1	
12.0											
13.0	4.0					SS7	WOH	100		0.1	
14.0									VOC, PHC, PCB, Metals ICP, Cyanide, and		
15.0						SS8	1	100		0.1	
16.0	5.0										
17.0						SS9	3	100		0.1	
18.0											
19.0						SS10	3	100		0.1	
20.0	6.0		93.52 6.10								
21.0		End of Borehole									
22.0											
23.0	7.0										

Easting: 0446074 | **Northing:** 5031059

Site Datum: Top of the fire hydrant across Clarence Street to the southeast (100.00 m)

Groundsurface Elevation: 99.62 m | **Top of Riser Elev.:** --

Hole Diameter: 203 mm | **Monitoring Well Diameter:** 50 mm

NOTES

- Duplicate samples collected of SS6, identified as SS21.
- WOH: Weight of hummer
- -- : Not applicable/Not measured

Symbols and Terms Used on Borehole and Test Pit Logs

The following explains the data presented in the borehole and test pit logs.

1. Soil Description

The soil descriptions presented in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves some judgement and LRL Associates Ltd. does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice. Boundaries between zones on the logs are often not distinct but transitional and were interpreted.

a. Proportion

The proportion of each constituent part, as defined by the grain size distribution, is denoted by the following terms:

Term	Proportions
"trace"	1% to 10%
"some"	10% to 20%
prefix (i.e. "sandy" silt)	20% to 35%
"and" (i.e. sand "and" gravel)	35% to 50%

b. Compactness and Consistency

The state of compactness of granular soils is defined on the basis of the Standard Penetration Test. See Section 2c for more details. The consistency of clayey or cohesive soils is based on the shear strength of the soil, as determined by field vane tests and by a visual and tactile assessment of the soil strength.

The state of compactness of granular soils is defined by the following terms:

State of Compactness Granular Soils	Standard Penetration Number "N"
Very loose	0 – 4
Loose	4 – 10
Compact or medium	10 - 30
Dense	30 - 50
Very dense	over - 50

The consistency of cohesive soils is defined by the following terms:

Consistency Cohesive Soils	Undrained Shear Strength (Cu) (kPa)
Very soft	under 10
Soft	10 - 25
Medium or firm	25 - 50
Stiff	50 - 100
Very stiff	100 - 200
Hard	over - 200

2. Sample Data

a. Elevation depth

This is a reference to the geodesic elevation of the soil or to a benchmark of an arbitrary elevation at the location of the borehole or test pit. The depth of geological boundaries is measured from ground surface.

b. Type

Symbol	Type	Letter Code
	Auger	AU
	Split spoon	SS
	Shelby tube	ST
	Rock Core	RC

c. Sample Number

Each sample taken from the borehole is numbered in the field as shown in this column.

LETTER CODE (as above) – Sample Number

d. Blows (N) or RQD

This column indicates the Standard Penetration Number (N) as per ASTM D-1586. This is used to determine the state of compactness of the soil sampled. It corresponds to the number of blows

required to drive 300 mm of the split spoon sampler using a 622 kg*m/s^2 hammer falling freely from a height of 760 mm. For a 600 mm long split spoon, the blow counts are recorded for every 150 mm. The "N" index is obtained by adding the number of blows from the 2nd and 3rd count. Technical refusal indicates a number of blows greater than 50.

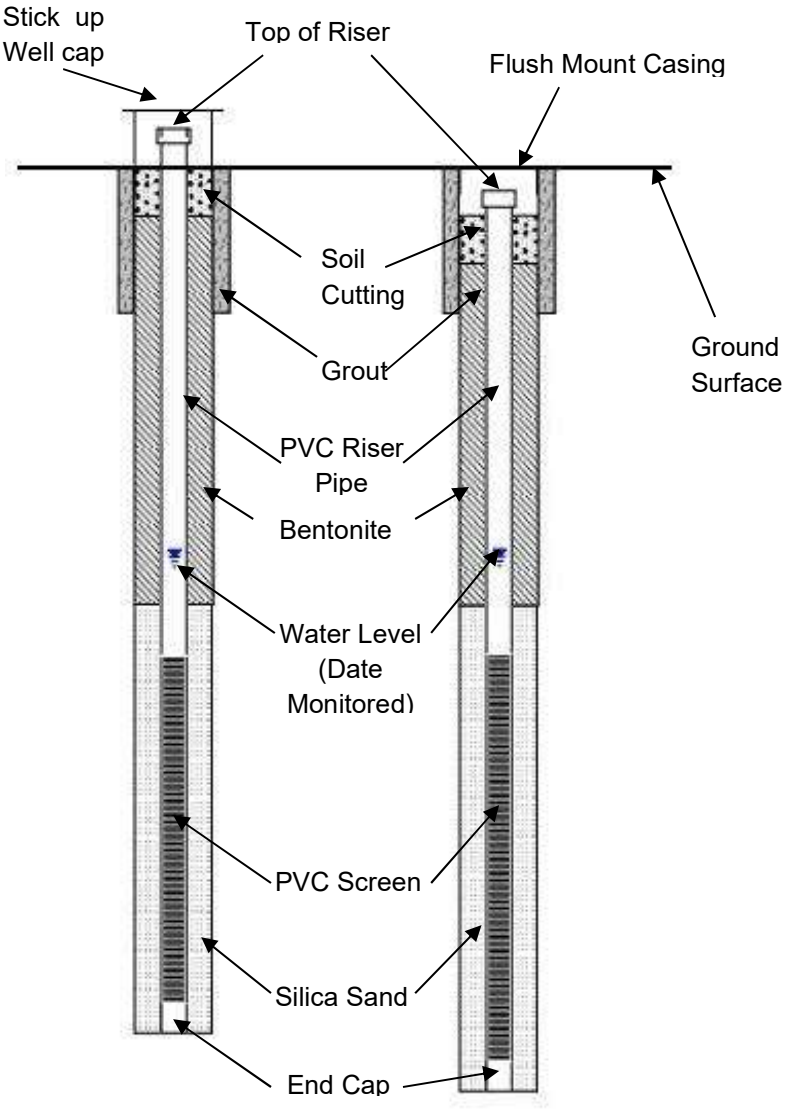
In the case of rock, this column presents the Rock Quality Designation (RQD). The RQD is calculated as the cumulative length of rock pieces recovered having lengths of 10 cm or more divided by the length of coring. The qualitative description of the bedrock based on RQD is given below.

Rock Quality Designation (RQD) (%)	Description of Rock Quality
0 –25	very poor
25 – 50	poor
50 – 75	fair
75 – 90	good
90 – 100	excellent

e. Recovery (%)

For soil samples this is the percentage of the recovered sample obtained versus the length sampled. In the case of rock, the percentage is the length of rock core recovered compared to the length of the drill run.

3. General Monitoring Well Data



APPENDIX B

Certificates of Laboratory Analysis

PARACEL LABORATORIES LTD.

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Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

LRL Associates Ltd.

5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Genevieve Marcoux

Client PO:
Project: 180647
Custody: 123275

Report Date: 29-Jul-2022
Order Date: 12-Jul-2022

Revised Report

Order #: 2229176

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2229176-01	BH22-1-SS8
2229176-02	BH22-1-SS16
2229176-03	BH22-2-SS7
2229176-04	BH22-3-SS9
2229176-05	BH22-4-SS10
2229176-06	BH22-5-SS8
2229176-07	BH22-2-SS1
2229176-08	BH22-3-SS1
2229176-09	BH22-5-SS2

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 29-Jul-2022

Client: LRL Associates Ltd.

Order Date: 12-Jul-2022

Client PO:

Project Description: 180647

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	18-Jul-22	18-Jul-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	15-Jul-22	18-Jul-22
Conductivity	MOE E3138 - probe @25 °C, water ext	18-Jul-22	18-Jul-22
Cyanide, free	MOE E3015 - Auto Colour, water extraction	15-Jul-22	18-Jul-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	18-Jul-22	19-Jul-22
PCBs, total	SW846 8082A - GC-ECD	14-Jul-22	15-Jul-22
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	14-Jul-22	15-Jul-22
PHC F1	CWS Tier 1 - P&T GC-FID	13-Jul-22	13-Jul-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Jul-22	16-Jul-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	18-Jul-22	18-Jul-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	13-Jul-22	16-Jul-22
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	13-Jul-22	13-Jul-22
SAR	Calculated	18-Jul-22	18-Jul-22
Solids, %	Gravimetric, calculation	18-Jul-22	18-Jul-22

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-1-SS8	BH22-1-SS16	BH22-2-SS7	BH22-3-SS9
	Sample Date:	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 12:00
	Sample ID:	2229176-01	2229176-02	2229176-03	2229176-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	67.7	66.9	69.4	74.2
General Inorganics					
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	<0.03
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.7	2.8	4.2	2.0
Barium	1.0 ug/g dry	251	307	185	178
Beryllium	0.5 ug/g dry	0.8	0.9	0.7	0.6
Boron	5.0 ug/g dry	7.0	7.7	8.1	5.2
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	58.7	65.4	43.9	37.3
Cobalt	1.0 ug/g dry	15.3	17.2	12.6	9.8
Copper	5.0 ug/g dry	29.2	32.4	22.9	19.9
Lead	1.0 ug/g dry	4.9	5.0	4.4	3.1
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	1.3	<1.0	<1.0
Nickel	5.0 ug/g dry	33.2	37.1	25.7	20.2
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.1	1.5	<1.0	<1.0
Vanadium	10.0 ug/g dry	76.9	84.0	62.2	53.7
Zinc	20.0 ug/g dry	87.8	96.0	71.3	53.2
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-1-SS8	BH22-1-SS16	BH22-2-SS7	BH22-3-SS9
	Sample Date:	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 12:00
	Sample ID:	2229176-01	2229176-02	2229176-03	2229176-04
	MDL/Units	Soil	Soil	Soil	Soil
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethane, 1,2-)	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	126%	133%	131%	125%
Dibromofluoromethane	Surrogate	73.2%	76.2%	75.8%	73.5%
Toluene-d8	Surrogate	110%	117%	113%	108%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-1-SS8	BH22-1-SS16	BH22-2-SS7	BH22-3-SS9
	Sample Date:	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 12:00
	Sample ID:	2229176-01	2229176-02	2229176-03	2229176-04
	MDL/Units	Soil	Soil	Soil	Soil
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	99.1%	104%	104%	101%

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-4-SS10	BH22-5-SS8	BH22-2-SS1	BH22-3-SS1
	Sample Date:	07-Jul-22 09:00	07-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00
	Sample ID:	2229176-05	2229176-06	2229176-07	2229176-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	75.8	67.1	85.0	98.9
General Inorganics					
SAR	0.01 N/A	-	-	0.06	0.14
Conductivity	5 uS/cm	-	-	179	60
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	<0.03
pH	0.05 pH Units	7.46	7.32	7.38	7.43
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	3.8	<1.0
Arsenic	1.0 ug/g dry	2.1	2.4	8.3	1.3
Barium	1.0 ug/g dry	172	253	709	21.2
Beryllium	0.5 ug/g dry	0.6	0.7	<0.5	<0.5
Boron	5.0 ug/g dry	5.4	6.4	9.6	<5.0
Boron, available	0.5 ug/g dry	-	-	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	0.9	<0.5
Chromium	5.0 ug/g dry	33.1	56.8	27.5	7.5
Chromium (VI)	0.2 ug/g dry	-	-	<0.2	<0.2
Cobalt	1.0 ug/g dry	9.0	14.8	6.1	2.3
Copper	5.0 ug/g dry	18.4	27.5	47.8	5.4
Lead	1.0 ug/g dry	3.4	4.4	423	2.3
Mercury	0.1 ug/g dry	<0.1	<0.1	1.0	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	1.0	<1.0
Nickel	5.0 ug/g dry	18.0	31.5	15.1	<5.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	0.7	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	50.5	73.4	24.1	16.3
Zinc	20.0 ug/g dry	46.9	85.7	355	<20.0
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-4-SS10	BH22-5-SS8	BH22-2-SS1	BH22-3-SS1
	Sample Date:	07-Jul-22 09:00	07-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00
	Sample ID:	2229176-05	2229176-06	2229176-07	2229176-08
	MDL/Units	Soil	Soil	Soil	Soil
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethane, 1	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-4-SS10	BH22-5-SS8	BH22-2-SS1	BH22-3-SS1
	Sample Date:	07-Jul-22 09:00	07-Jul-22 09:00	06-Jul-22 09:00	06-Jul-22 09:00
	Sample ID:	2229176-05	2229176-06	2229176-07	2229176-08
	MDL/Units	Soil	Soil	Soil	Soil
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	128%	133%	-	-
Dibromofluoromethane	Surrogate	73.3%	75.3%	-	-
Toluene-d8	Surrogate	108%	111%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	-	0.04	<0.02
Acenaphthylene	0.02 ug/g dry	-	-	0.14	<0.02
Anthracene	0.02 ug/g dry	-	-	0.27	<0.02
Benzo [a] anthracene	0.02 ug/g dry	-	-	1.13	<0.02
Benzo [a] pyrene	0.02 ug/g dry	-	-	1.37	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	-	-	1.33	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	-	-	0.80	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	-	-	0.69	<0.02
Chrysene	0.02 ug/g dry	-	-	1.51	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	-	0.20	<0.02
Fluoranthene	0.02 ug/g dry	-	-	1.70	<0.02
Fluorene	0.02 ug/g dry	-	-	0.04	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	-	0.71	<0.02
1-Methylnaphthalene	0.02 ug/g dry	-	-	0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	-	-	0.03	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	-	-	0.05	<0.04
Naphthalene	0.01 ug/g dry	-	-	0.03	<0.01
Phenanthrene	0.02 ug/g dry	-	-	0.82	<0.02
Pyrene	0.02 ug/g dry	-	-	1.54	<0.02
2-Fluorobiphenyl	Surrogate	-	-	102%	90.1%
Terphenyl-d14	Surrogate	-	-	98.9%	93.5%
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	97.2%	97.1%	95.1%	98.7%

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-5-SS2	-	-	-
	Sample Date:	07-Jul-22 09:00	-	-	-
	Sample ID:	2229176-09	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	81.0	-	-	-
General Inorganics					
SAR	0.01 N/A	0.09	-	-	-
Conductivity	5 uS/cm	163	-	-	-
Cyanide, free	0.03 ug/g dry	<0.03	-	-	-
pH	0.05 pH Units	7.15	-	-	-
Metals					
Antimony	1.0 ug/g dry	2.4	-	-	-
Arsenic	1.0 ug/g dry	11.6	-	-	-
Barium	1.0 ug/g dry	585	-	-	-
Beryllium	0.5 ug/g dry	0.6	-	-	-
Boron	5.0 ug/g dry	7.5	-	-	-
Boron, available	0.5 ug/g dry	0.6	-	-	-
Cadmium	0.5 ug/g dry	0.5	-	-	-
Chromium	5.0 ug/g dry	32.8	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	7.9	-	-	-
Copper	5.0 ug/g dry	233	-	-	-
Lead	1.0 ug/g dry	512	-	-	-
Mercury	0.1 ug/g dry	1.3	-	-	-
Molybdenum	1.0 ug/g dry	1.6	-	-	-
Nickel	5.0 ug/g dry	18.9	-	-	-
Selenium	1.0 ug/g dry	1.8	-	-	-
Silver	0.3 ug/g dry	0.7	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	34.4	-	-	-
Zinc	20.0 ug/g dry	422	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.40 [1]	-	-	-
Acenaphthylene	0.02 ug/g dry	2.13	-	-	-
Anthracene	0.02 ug/g dry	2.03	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	6.91	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	7.54	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	6.33	-	-	-

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 29-Jul-2022

Order Date: 12-Jul-2022

Project Description: 180647

	Client ID:	BH22-5-SS2	-	-	-
	Sample Date:	07-Jul-22 09:00	-	-	-
	Sample ID:	2229176-09	-	-	-
	MDL/Units	Soil	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	3.69	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	3.92	-	-	-
Chrysene	0.02 ug/g dry	6.50	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.96	-	-	-
Fluoranthene	0.02 ug/g dry	12.9	-	-	-
Fluorene	0.02 ug/g dry	<0.40 [1]	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	3.41	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.40 [1]	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.40 [1]	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.80 [1]	-	-	-
Naphthalene	0.01 ug/g dry	<0.20 [1]	-	-	-
Phenanthrene	0.02 ug/g dry	3.49	-	-	-
Pyrene	0.02 ug/g dry	12.3	-	-	-
2-Fluorobiphenyl	Surrogate	103%	-	-	-
Terphenyl-d14	Surrogate	93.5%	-	-	-
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	92.8%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	*0.103*		*ug/g*		*103*	*60-140*			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.14*		*ug/g*		*85.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.18*		*ug/g*		*88.5*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*2.96*		*ug/g*		*92.4*	*50-140*			
Surrogate: Dibromofluoromethane	*1.98*		*ug/g*		*62.0*	*50-140*			
Surrogate: Toluene-d8	*2.98*		*ug/g*		*93.1*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	1.19	0.01	N/A	1.46			20.4	30	
Conductivity	737	5	uS/cm	732			0.7	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	6.77	0.05	pH Units	6.78			0.1	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	35	8	ug/g	12			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	9			NC	30	
Metals									
Antimony	1.7	1.0	ug/g	2.1			25.5	30	
Arsenic	5.0	1.0	ug/g	6.2			20.7	30	
Barium	92.7	1.0	ug/g	115			21.5	30	
Beryllium	0.5	0.5	ug/g	0.6			21.5	30	
Boron, available	ND	0.5	ug/g	ND			NC	35	
Boron	12.9	5.0	ug/g	13.1			1.9	30	
Cadmium	1.6	0.5	ug/g	2.0			26.7	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	19.7	5.0	ug/g	22.5			13.2	30	
Cobalt	5.9	1.0	ug/g	6.8			13.8	30	
Copper	124	5.0	ug/g	157			23.4	30	
Lead	74.9	1.0	ug/g	84.2			11.8	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	15.2	5.0	ug/g	17.6			14.3	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	25.5	10.0	ug/g	29.7			15.2	30	
Zinc	331	20.0	ug/g	378			13.2	30	
PCBs									
PCBs, total	ND	0.05	ug/g	ND			NC	40	
Surrogate: Decachlorobiphenyl	*0.104*		*ug/g*		*103*	*60-140*			
Physical Characteristics									
% Solids	66.6	0.1	% by Wt.	67.7			1.6	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	0.027			NC	40	
Benzo [a] anthracene	0.054	0.02	ug/g	0.092			NC	40	
Benzo [a] pyrene	0.059	0.02	ug/g	0.091			NC	40	
Benzo [b] fluoranthene	0.083	0.02	ug/g	0.110			27.6	40	
Benzo [g,h,i] perylene	0.056	0.02	ug/g	0.077			31.5	40	
Benzo [k] fluoranthene	0.035	0.02	ug/g	0.061			NC	40	
Chrysene	0.058	0.02	ug/g	0.115			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	0.094	0.02	ug/g	0.160			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	0.047	0.02	ug/g	0.055			15.8	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	0.053	0.02	ug/g	0.093			NC	40	
Pyrene	0.084	0.02	ug/g	0.137			NC	40	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: 2-Fluorobiphenyl	*1.15*		*ug/g*		*80.2*	*50-140*			
Surrogate: Terphenyl-d14	*1.15*		*ug/g*		*80.3*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g	ND			NC	50	
Benzene	ND	0.02	ug/g	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g	ND			NC	50	
Bromoform	ND	0.05	ug/g	ND			NC	50	
Bromomethane	ND	0.05	ug/g	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g	ND			NC	50	
Chloroform	ND	0.05	ug/g	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g	ND			NC	50	
Hexane	ND	0.05	ug/g	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g	ND			NC	50	
Styrene	ND	0.05	ug/g	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: 4-Bromofluorobenzene	*3.78*		*ug/g*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*2.20*		*ug/g*		*62.0*	*50-140*			
Surrogate: Toluene-d8	*3.51*		*ug/g*		*98.7*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.155	0.03	ug/g	ND	44.0	50-150			QM-05
Hydrocarbons									
F1 PHCs (C6-C10)	164	7	ug/g	ND	81.8	80-120			
F2 PHCs (C10-C16)	83	4	ug/g	ND	96.5	60-140			
F3 PHCs (C16-C34)	255	8	ug/g	12	115	60-140			
F4 PHCs (C34-C50)	180	6	ug/g	9	127	60-140			
Metals									
Antimony	35.3	1.0	ug/g	ND	70.6	70-130			
Arsenic	52.1	1.0	ug/g	2.5	99.2	70-130			
Barium	66.9	1.0	ug/g	20.0	94.0	70-130			
Beryllium	53.9	0.5	ug/g	ND	107	70-130			
Boron, available	4.12	0.5	ug/g	ND	82.4	70-122			
Boron	55.6	5.0	ug/g	5.2	101	70-130			
Cadmium	37.9	0.5	ug/g	0.8	74.2	70-130			
Chromium (VI)	0.2	0.2	ug/g	ND	82.5	70-130			
Chromium	61.3	5.0	ug/g	9.0	105	70-130			
Cobalt	53.5	1.0	ug/g	2.7	102	70-130			
Copper	96.1	5.0	ug/g	62.8	66.5	70-130			QM-07
Lead	81.5	1.0	ug/g	33.7	95.7	70-130			
Mercury	1.33	0.1	ug/g	ND	88.8	70-130			
Molybdenum	49.4	1.0	ug/g	ND	98.0	70-130			
Nickel	55.8	5.0	ug/g	7.0	97.5	70-130			
Selenium	46.7	1.0	ug/g	ND	92.9	70-130			
Silver	38.0	0.3	ug/g	ND	75.7	70-130			
Thallium	39.6	1.0	ug/g	ND	79.1	70-130			
Uranium	56.7	1.0	ug/g	ND	113	70-130			
Vanadium	64.1	10.0	ug/g	11.9	105	70-130			
Zinc	71.3	20.0	ug/g	23.3	96.0	70-130			
PCBs									
PCBs, total	0.396	0.05	ug/g	ND	98.0	60-140			
Surrogate: Decachlorobiphenyl	*0.102*		*ug/g*		*101*	*60-140*			
Semi-Volatiles									
Acenaphthene	0.176	0.02	ug/g	ND	98.9	50-140			
Acenaphthylene	0.175	0.02	ug/g	ND	97.9	50-140			
Anthracene	0.187	0.02	ug/g	0.027	89.6	50-140			
Benzo [a] anthracene	0.244	0.02	ug/g	0.092	85.0	50-140			
Benzo [a] pyrene	0.263	0.02	ug/g	0.091	96.2	50-140			
Benzo [b] fluoranthene	0.349	0.02	ug/g	0.110	134	50-140			
Benzo [g,h,i] perylene	0.249	0.02	ug/g	0.077	96.4	50-140			
Benzo [k] fluoranthene	0.235	0.02	ug/g	0.061	97.4	50-140			
Chrysene	0.253	0.02	ug/g	0.115	77.5	50-140			
Dibenzo [a,h] anthracene	0.212	0.02	ug/g	ND	119	50-140			
Fluoranthene	0.258	0.02	ug/g	0.160	55.0	50-140			
Fluorene	0.179	0.02	ug/g	ND	100	50-140			
Indeno [1,2,3-cd] pyrene	0.244	0.02	ug/g	0.055	106	50-140			
1-Methylnaphthalene	0.226	0.02	ug/g	ND	127	50-140			
2-Methylnaphthalene	0.244	0.02	ug/g	ND	137	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Naphthalene	0.208	0.01	ug/g	ND	117	50-140			
Phenanthrene	0.224	0.02	ug/g	0.093	73.7	50-140			
Pyrene	0.255	0.02	ug/g	0.137	66.0	50-140			
Surrogate: 2-Fluorobiphenyl	*1.49*		*ug/g*		*104*	*50-140*			
Surrogate: Terphenyl-d14	*1.36*		*ug/g*		*95.0*	*50-140*			
Volatiles									
Acetone	9.14	0.50	ug/g	ND	91.4	50-140			
Benzene	3.18	0.02	ug/g	ND	79.5	60-130			
Bromodichloromethane	3.59	0.05	ug/g	ND	89.8	60-130			
Bromoform	4.03	0.05	ug/g	ND	101	60-130			
Bromomethane	4.37	0.05	ug/g	ND	109	50-140			
Carbon Tetrachloride	3.45	0.05	ug/g	ND	86.3	60-130			
Chlorobenzene	3.60	0.05	ug/g	ND	90.0	60-130			
Chloroform	3.59	0.05	ug/g	ND	89.8	60-130			
Dibromochloromethane	3.77	0.05	ug/g	ND	94.4	60-130			
Dichlorodifluoromethane	4.22	0.05	ug/g	ND	106	50-140			
1,2-Dichlorobenzene	4.41	0.05	ug/g	ND	110	60-130			
1,3-Dichlorobenzene	4.26	0.05	ug/g	ND	107	60-130			
1,4-Dichlorobenzene	4.26	0.05	ug/g	ND	106	60-130			
1,1-Dichloroethane	3.54	0.05	ug/g	ND	88.4	60-130			
1,2-Dichloroethane	3.88	0.05	ug/g	ND	97.0	60-130			
1,1-Dichloroethylene	3.61	0.05	ug/g	ND	90.2	60-130			
cis-1,2-Dichloroethylene	3.40	0.05	ug/g	ND	85.1	60-130			
trans-1,2-Dichloroethylene	3.51	0.05	ug/g	ND	87.7	60-130			
1,2-Dichloropropane	3.21	0.05	ug/g	ND	80.3	60-130			
cis-1,3-Dichloropropylene	3.83	0.05	ug/g	ND	95.8	60-130			
trans-1,3-Dichloropropylene	3.15	0.05	ug/g	ND	78.7	60-130			
Ethylbenzene	3.36	0.05	ug/g	ND	84.1	60-130			
Ethylene dibromide (dibromoethane, 1,2	3.65	0.05	ug/g	ND	91.2	60-130			
Hexane	4.02	0.05	ug/g	ND	101	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.2	0.50	ug/g	ND	102	50-140			
Methyl Isobutyl Ketone	11.6	0.50	ug/g	ND	116	50-140			
Methyl tert-butyl ether	9.92	0.05	ug/g	ND	99.2	50-140			
Methylene Chloride	3.60	0.05	ug/g	ND	90.1	60-130			
Styrene	3.30	0.05	ug/g	ND	82.4	60-130			
1,1,1,2-Tetrachloroethane	3.71	0.05	ug/g	ND	92.9	60-130			
1,1,2,2-Tetrachloroethane	3.57	0.05	ug/g	ND	89.3	60-130			
Tetrachloroethylene	3.65	0.05	ug/g	ND	91.3	60-130			
Toluene	3.43	0.05	ug/g	ND	85.8	60-130			
1,1,1-Trichloroethane	3.51	0.05	ug/g	ND	87.9	60-130			
1,1,2-Trichloroethane	3.41	0.05	ug/g	ND	85.2	60-130			
Trichloroethylene	3.39	0.05	ug/g	ND	84.7	60-130			
Trichlorofluoromethane	3.92	0.05	ug/g	ND	97.9	50-140			
Vinyl chloride	3.46	0.02	ug/g	ND	86.4	50-140			
m,p-Xylenes	7.01	0.05	ug/g	ND	87.6	60-130			
o-Xylene	3.58	0.05	ug/g	ND	89.5	60-130			
Surrogate: 4-Bromofluorobenzene	*1.93*		*ug/g*		*60.3*	*50-140*			
Surrogate: Dibromofluoromethane	*1.99*		*ug/g*		*62.2*	*50-140*			
Surrogate: Toluene-d8	*2.88*		*ug/g*		*90.0*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

QC Qualifiers :

QM-05 : The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1-Revised report includes additional pH data.

SAR extracted with sample to water ratio that deviated from standard prepartion.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

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Certificate of Analysis

LRL Associates Ltd.

5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Abdul Kader Alhaj

Client PO:
Project: 180647
Custody: 67906

Report Date: 25-Jul-2022
Order Date: 13-Jul-2022

Order #: 2229364

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2229364-01	MW22-1
2229364-02	MW22-2
2229364-03	MW22-3
2229364-04	MW22-10
2229364-05	Trip Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	19-Jul-22	19-Jul-22
Cyanide, free	MOE E3015 - Auto Colour	15-Jul-22	15-Jul-22
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	14-Jul-22	14-Jul-22
Metals, ICP-MS	EPA 200.8 - ICP-MS	20-Jul-22	20-Jul-22
PCBs, total	EPA 608 - GC-ECD	21-Jul-22	22-Jul-22
PHC F1	CWS Tier 1 - P&T GC-FID	14-Jul-22	14-Jul-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	19-Jul-22	19-Jul-22
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	19-Jul-22	19-Jul-22
REG 153: pH, water	EPA 150.1 - pH probe @25 °C	19-Jul-22	19-Jul-22
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	14-Jul-22	14-Jul-22

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

	Client ID:	MW22-1	MW22-2	MW22-3	MW22-10
	Sample Date:	12-Jul-22 02:00	12-Jul-22 02:30	12-Jul-22 03:00	12-Jul-22 02:10
	Sample ID:	2229364-01	2229364-02	2229364-03	2229364-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Cyanide, free	2 ug/L	<2	<2	<2	<2
pH	0.1 pH Units	7.6	7.9	7.6	7.7
Anions					
Chloride	1.0 mg/L	243	74.6	390	247
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	1	1	<1
Barium	1 ug/L	149	214	244	154
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	104	138	75	96
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	1	<1	1	<1
Cobalt	0.5 ug/L	1.3	1.1	1.0	1.3
Copper	0.5 ug/L	6.7	5.9	6.8	4.4
Lead	0.1 ug/L	0.2	0.1	0.1	<0.1
Molybdenum	0.5 ug/L	5.5	4.5	3.8	5.6
Nickel	1 ug/L	4	3	3	3
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	68200	39300	155000	68000
Thallium	0.1 ug/L	0.1	<0.1	0.1	0.1
Uranium	0.1 ug/L	10.5	5.0	4.4	11.1
Vanadium	0.5 ug/L	<0.5	0.8	0.8	<0.5
Zinc	5 ug/L	7	7	<5	6
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

	Client ID:	MW22-1	MW22-2	MW22-3	MW22-10
	Sample Date:	12-Jul-22 02:00	12-Jul-22 02:30	12-Jul-22 03:00	12-Jul-22 02:10
	Sample ID:	2229364-01	2229364-02	2229364-03	2229364-04
	MDL/Units	Water	Water	Water	Water
Dichlorodifluoromethane	1.0 ug/L	<1.0	98.0	856	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	105%	106%	107%	104%
Dibromofluoromethane	Surrogate	100%	104%	102%	102%
Toluene-d8	Surrogate	110%	108%	111%	110%

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

	Client ID:	MW22-1	MW22-2	MW22-3	MW22-10
	Sample Date:	12-Jul-22 02:00	12-Jul-22 02:30	12-Jul-22 03:00	12-Jul-22 02:10
	Sample ID:	2229364-01	2229364-02	2229364-03	2229364-04
	MDL/Units	Water	Water	Water	Water
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	0.03	0.04
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	<0.05	0.07
Pyrene	0.01 ug/L	<0.01	<0.01	0.03	<0.01
2-Fluorobiphenyl	Surrogate	96.9%	103%	103%	114%
Terphenyl-d14	Surrogate	102%	102%	103%	110%
PCBs					
PCBs, total	0.05 ug/L	<0.05	<0.05	<0.05	<0.10 [1]
Decachlorobiphenyl	Surrogate	89.5%	80.3%	95.9%	90.5% [1]

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

	Client ID:	Trip Blank	-	-	-
	Sample Date:	12-Jul-22 02:10	-	-	-
	Sample ID:	2229364-05	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethane, 1	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 25-Jul-2022

Order Date: 13-Jul-2022

Project Description: 180647

	Client ID:	Trip Blank	-	-	-
	Sample Date:	12-Jul-22 02:10	-	-	-
	Sample ID:	2229364-05	-	-	-
	MDL/Units	Water	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	100%	-	-	-
Dibromofluoromethane	Surrogate	98.7%	-	-	-
Toluene-d8	Surrogate	108%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1.0	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
PCBs									
PCBs, total	ND	0.05	ug/L						
Surrogate: Decachlorobiphenyl	*0.544*		*ug/L*		*109*	*60-140*			
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*18.8*		*ug/L*		*93.9*	*50-140*			
Surrogate: Terphenyl-d14	*19.4*		*ug/L*		*97.1*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*85.6*		*ug/L*		*107*	*50-140*			
Surrogate: Dibromofluoromethane	*78.7*		*ug/L*		*98.4*	*50-140*			
Surrogate: Toluene-d8	*89.0*		*ug/L*		*111*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	64.4	1.0	mg/L				200.0	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND			NC	20	
pH	7.6	0.1	pH Units	7.6			0.3	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	1.35	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	21.4	1	ug/L	22.4			4.6	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	18	10	ug/L	18			1.6	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.99	0.5	ug/L	1.00			0.9	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.53	0.5	ug/L	1.11			NC	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	13000	200	ug/L	12900			0.9	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	9	5	ug/L	9			2.4	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	7.98	0.5	ug/L	6.01			28.2	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	16.4	0.5	ug/L	13.3			20.8	30	
Dibromochloromethane	4.92	0.5	ug/L	3.46			34.8	30	QR-07
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*86.9*		*ug/L*		*109*	*50-140*			
Surrogate: Dibromofluoromethane	*79.1*		*ug/L*		*98.9*	*50-140*			
Surrogate: Toluene-d8	*87.7*		*ug/L*		*110*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.75	1.0	mg/L	ND	97.5	85-115			
General Inorganics									
Cyanide, free	54.7	2	ug/L	ND	109	61-139			
Hydrocarbons									
F1 PHCs (C6-C10)	2290	25	ug/L	ND	115	68-117			
F2 PHCs (C10-C16)	1490	100	ug/L	ND	93.2	60-140			
F3 PHCs (C16-C34)	4170	100	ug/L	ND	106	60-140			
F4 PHCs (C34-C50)	2570	100	ug/L	ND	104	60-140			
Metals									
Mercury	3.09	0.1	ug/L	ND	103	70-130			
Arsenic	49.4	1	ug/L	ND	97.8	80-120			
Barium	65.0	1	ug/L	22.4	85.2	80-120			
Beryllium	44.7	0.5	ug/L	ND	89.4	80-120			
Boron	59	10	ug/L	18	83.2	80-120			
Cadmium	43.0	0.1	ug/L	ND	86.0	80-120			
Chromium	46.5	1	ug/L	ND	92.9	80-120			
Cobalt	45.3	0.5	ug/L	ND	90.6	80-120			
Copper	43.7	0.5	ug/L	1.00	85.4	80-120			
Lead	42.7	0.1	ug/L	ND	85.4	80-120			
Molybdenum	43.9	0.5	ug/L	1.11	85.5	80-120			
Nickel	45.2	1	ug/L	ND	89.6	80-120			
Selenium	43.6	1	ug/L	ND	87.0	80-120			
Silver	42.7	0.1	ug/L	ND	85.4	80-120			
Sodium	8030	200	ug/L	ND	80.3	80-120			
Thallium	44.0	0.1	ug/L	ND	88.0	80-120			
Uranium	49.2	0.1	ug/L	ND	98.4	80-120			
Vanadium	47.1	0.5	ug/L	ND	93.9	80-120			
Zinc	51	5	ug/L	9	83.6	80-120			
PCBs									
PCBs, total	1.17	0.05	ug/L	ND	117	65-135			
Surrogate: Decachlorobiphenyl	*0.510*		*ug/L*		*102*	*60-140*			
Semi-Volatiles									
Acenaphthene	4.04	0.05	ug/L	ND	80.9	50-140			
Acenaphthylene	3.97	0.05	ug/L	ND	79.4	50-140			
Anthracene	5.04	0.01	ug/L	ND	101	50-140			
Benzo [a] anthracene	5.05	0.01	ug/L	ND	101	50-140			
Benzo [a] pyrene	5.41	0.01	ug/L	ND	108	50-140			
Benzo [b] fluoranthene	5.01	0.05	ug/L	ND	100	50-140			
Benzo [g,h,i] perylene	4.85	0.05	ug/L	ND	97.1	50-140			
Benzo [k] fluoranthene	4.88	0.05	ug/L	ND	97.6	50-140			
Chrysene	4.99	0.05	ug/L	ND	99.7	50-140			
Dibenzo [a,h] anthracene	5.18	0.05	ug/L	ND	104	50-140			
Fluoranthene	4.37	0.01	ug/L	ND	87.3	50-140			
Fluorene	4.18	0.05	ug/L	ND	83.6	50-140			
Indeno [1,2,3-cd] pyrene	5.21	0.05	ug/L	ND	104	50-140			
1-Methylnaphthalene	5.04	0.05	ug/L	ND	101	50-140			
2-Methylnaphthalene	5.44	0.05	ug/L	ND	109	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Naphthalene	4.42	0.05	ug/L	ND	88.4	50-140			
Phenanthrene	4.87	0.05	ug/L	ND	97.4	50-140			
Pyrene	4.52	0.01	ug/L	ND	90.3	50-140			
Surrogate: 2-Fluorobiphenyl	*19.9*		*ug/L*		*99.5*	*50-140*			
Surrogate: Terphenyl-d14	*19.9*		*ug/L*		*99.4*	*50-140*			
Volatiles									
Acetone	68.7	5.0	ug/L	ND	68.7	50-140			
Benzene	39.1	0.5	ug/L	ND	97.8	60-130			
Bromodichloromethane	36.2	0.5	ug/L	ND	90.4	60-130			
Bromoform	43.7	0.5	ug/L	ND	109	60-130			
Bromomethane	34.8	0.5	ug/L	ND	87.0	50-140			
Carbon Tetrachloride	39.7	0.2	ug/L	ND	99.2	60-130			
Chlorobenzene	40.4	0.5	ug/L	ND	101	60-130			
Chloroform	37.7	0.5	ug/L	ND	94.3	60-130			
Dibromochloromethane	40.5	0.5	ug/L	ND	101	60-130			
Dichlorodifluoromethane	32.2	1.0	ug/L	ND	80.4	50-140			
1,2-Dichlorobenzene	34.4	0.5	ug/L	ND	86.0	60-130			
1,3-Dichlorobenzene	35.2	0.5	ug/L	ND	88.1	60-130			
1,4-Dichlorobenzene	40.4	0.5	ug/L	ND	101	60-130			
1,1-Dichloroethane	37.6	0.5	ug/L	ND	94.0	60-130			
1,2-Dichloroethane	36.0	0.5	ug/L	ND	89.9	60-130			
1,1-Dichloroethylene	35.1	0.5	ug/L	ND	87.6	60-130			
cis-1,2-Dichloroethylene	35.3	0.5	ug/L	ND	88.2	60-130			
trans-1,2-Dichloroethylene	36.8	0.5	ug/L	ND	92.1	60-130			
1,2-Dichloropropane	38.6	0.5	ug/L	ND	96.6	60-130			
cis-1,3-Dichloropropylene	42.4	0.5	ug/L	ND	106	60-130			
trans-1,3-Dichloropropylene	38.8	0.5	ug/L	ND	97.0	60-130			
Ethylbenzene	37.5	0.5	ug/L	ND	93.7	60-130			
Ethylene dibromide (dibromoethane, 1,2	40.7	0.2	ug/L	ND	102	60-130			
Hexane	43.0	1.0	ug/L	ND	107	60-130			
Methyl Ethyl Ketone (2-Butanone)	79.1	5.0	ug/L	ND	79.1	50-140			
Methyl Isobutyl Ketone	107	5.0	ug/L	ND	107	50-140			
Methyl tert-butyl ether	92.5	2.0	ug/L	ND	92.5	50-140			
Methylene Chloride	37.2	5.0	ug/L	ND	93.1	60-130			
Styrene	40.0	0.5	ug/L	ND	100	60-130			
1,1,1,2-Tetrachloroethane	40.3	0.5	ug/L	ND	101	60-130			
1,1,2,2-Tetrachloroethane	42.6	0.5	ug/L	ND	107	60-130			
Tetrachloroethylene	41.0	0.5	ug/L	ND	103	60-130			
Toluene	38.4	0.5	ug/L	ND	95.9	60-130			
1,1,1-Trichloroethane	41.5	0.5	ug/L	ND	104	60-130			
1,1,2-Trichloroethane	30.4	0.5	ug/L	ND	76.0	60-130			
Trichloroethylene	36.4	0.5	ug/L	ND	91.0	60-130			
Trichlorofluoromethane	42.1	1.0	ug/L	ND	105	60-130			
Vinyl chloride	41.1	0.5	ug/L	ND	103	50-140			
m,p-Xylenes	73.1	0.5	ug/L	ND	91.4	60-130			
o-Xylene	38.6	0.5	ug/L	ND	96.6	60-130			
Surrogate: 4-Bromofluorobenzene	*76.3*		*ug/L*		*95.4*	*50-140*			
Surrogate: Dibromofluoromethane	*80.3*		*ug/L*		*100*	*50-140*			
Surrogate: Toluene-d8	*74.1*		*ug/L*		*92.6*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated Reporting Limits due to limited sample volume.

QC Qualifiers :

QR-07 : Duplicate result exceeds RPD limits due to non-homogeneity between multiple sample vials. Remainder of QA/QC is acceptable.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

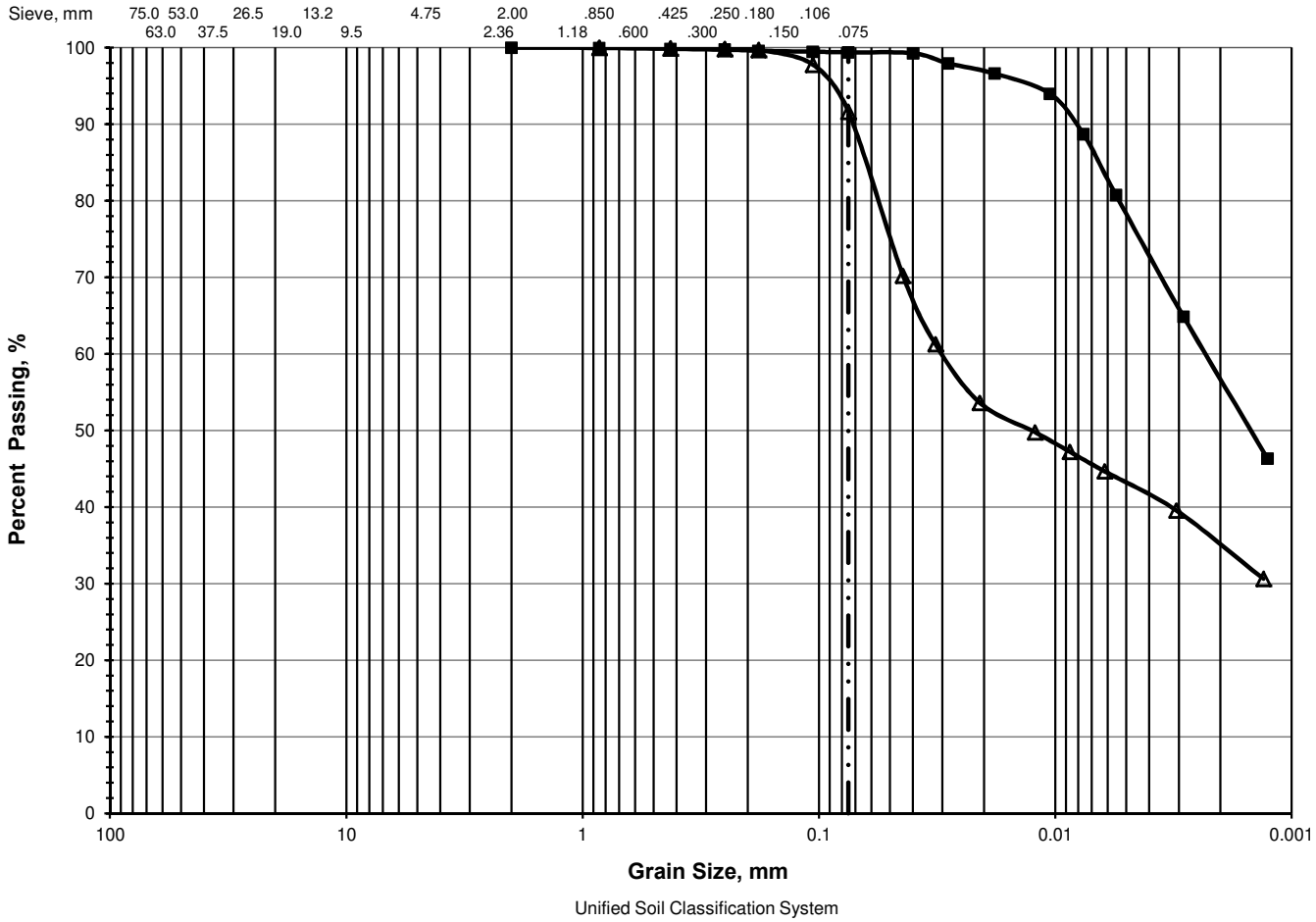
- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

LRL Associates Ltd.

PARTICLE SIZE ANALYSIS

ASTM D 422 / LS-702

Client:	Clarence Gate Holdings Inc.	**File No.:**	180647
Project:	Geotechnical Investigation	**Report No.:**	2
Location:	211 Clarence Street, Ottawa, ON.	**Date:**	July 7, 2022



Unified Soil Classification System

	> 75 mm	% GRAVEL		% SAND			% FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
△	0.0	0.0	0.0	0.0	0.1	8.4	57.4	34.1
■	0.0	0.0	0.0	0.0	0.2	0.5	44.5	54.8

	Location	Sample	Depth, m	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
△	BH 6	SS-4	2.29 - 2090	0.0303	0.0127					
■	BH 7	SS-6	4.57 - 5.18	0.0024	0.0016					