Phase II
Environmental Site Assessment

5254 Bank Street
Ottawa, Ontario

Prepared for:

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Attention: Rayan Zaher

LRL File No.: 220011

April 13, 2022

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EXECUTIVE SUMMARY

Rayan Zaher has retained LRL Associates Ltd. (LRL) to complete a Phase II Environmental Site Assessment (ESA) on the existing residential located at 5254 Bank Street in Ottawa, Ontario (herein referred to as the 'Site'). It is our understanding that this assessment was conducted in the context of property rezoning and redevelopment.

At the time of the investigation, the Site was developed with a single-storey residence on the southeast portion of the property. Several detached accessory buildings are situated west of the residence, including a garage, and two large divided sheds. The garage is of temporary construction, with wood frame directly on the asphalt driveway surface. The sheds are constructed of wood and sheet metal.

Based on information from the Phase I Environmental Site Assessment completed for the Site in 2019, the Site has been developed with a residence since at least the mid 1960's. The property has a rectangular shape being approximately 20 m wide (north-south) by 75 m deep, for a total area of approximately 1,740 m^2 (0.43 acres). The topography is relatively flat, sloping westward, with an elevation of 120 m above mean sea level (amsl). The Phase I ESA noted two areas of potential environmental concern (APECs) that were recommended to be further investigated via a Phase II ESA which included:

PCA	Location of PCA	Location of APEC On-Site	Contaminants of Potential Concern	Media Potentially Impacted
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, northwestern shed	Under the northwestern storage shed around the AST.	PHC, VOCs	Soil and groundwater
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, basement of residence where a former fuel oil AST was present	Beneath the location of the former fuel oil AST in the basement of the residence.	PHC and BTEX	Soil and groundwater

Notes: PCA – Potentially Contaminating Activity
VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons

The Site Condition Standards (SCS) set out in Ministry of Environment, Conservation and Parks (MECP) 'Soil, Ground Water and Sediment Standards for Use Under Part IV.1 of the Environmental Protection Act, April 15, 2011' were used for this investigation. The applicable SCS used was Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition due to the presence of shallow groundwater and bedrock in portions of the Site.

The Phase II ESA investigation included the advancement of six (6) boreholes across the Site to allow for soil sampling across the Site. Three (3) of the boreholes were completed as monitoring wells to facilitate groundwater sampling. Representative soil and groundwater samples submitted to an accredited laboratory for analysis of suspected parameters of concern.

The general subsurface stratigraphy soil encountered in the boreholes varied across the eastern and western portions of the Site, due to an elevation difference of approximately four (4) meters with the western portion of the Site being lower.

The eastern portion of the Site, around the existing residence, had subsurface stratigraphy generally consisting of sand with trace gravel from surface through to bedrock which was encountered between 2.7 and 3.4 m bgs. In MW22-1, a 0.15 m thick layer of pavement structure (asphalt over granular crushed stone with sand fill) was encountered on the top as the borehole was located at the parking lot of the residence.

Based on the results of the soil and groundwater sampling and laboratory analytical programs compared to the applicable MECP Table 7 SCS, LRL made the following conclusions regarding environmental conditions of the subject site:

- Soil Quality
    - Olfactory evidence of petroleum hydrocarbon impacts was not observed in the soils collected throughout all boreholes.
    - CSV concentrations of all soil samples collected were non-detect (<0.1 ppm)
    - BTEX and VOC parameter concentrations were below the detection limits in all samples. PHC parameters analysed were not detected in any soil samples submitted for analysis, with the exception of MW22-1/SS3 and MW22-2/SS4 which had detectable levels of PHC F3 and F4. The PHC concentrations measured were found to be within the MECP Table 7 criteria.
- Groundwater Quality
    - No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed in the groundwater collected from the monitoring wells on the Site.
    - Headspace VOC levels in the installed monitoring wells were not detected.
    - PHC, BTEX, and VOC parameter concentrations were below the detection limit in all monitoring wells sampled.

Based on the findings of Phase II ESA the soil and groundwater at the Site are generally in compliance with MECP Table 7 criteria. Further, the concentrations of PHCs and VOCs at the Site were found to be compliant with MECP Table 1 background criteria as well. As such, the Site is considered to be “clean” with regards to the parameters analysed, and no further delineation or environmental work is considered to be warranted at this time.

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

Rayan Zaher has retained LRL Associates Ltd. (LRL) to complete a Phase II Environmental Site Assessment (ESA) on the existing residential located at 5254 Bank Street in Ottawa, Ontario (herein referred to as the 'Site'). It is our understanding that this assessment was conducted in the context of property rezoning and redevelopment.

1.1 Site Description

1.1.1 Subject Property

The site under investigation is the residential property located at the at 5254 Bank Street in Ottawa, Ontario. The Site's location is presented in **Figure 1**. The property has a rectangular shape being approximately 20 m wide (north-south) by 75 m deep, for a total area of approximately 1,740 m^2 (0.43 acres). The topography is relatively flat, sloping westward, with an elevation of 120 m above mean sea level (amsl).

The Site is currently developed with a single-storey residence on the southeast portion of the property. Several detached accessory buildings are situated west of the residence, including a garage, with a footprint of approximately 45 m^2, and two large divided sheds (approximately 160 m^2 each). The garage is of temporary construction, with wood frame construction directly on the asphalt driveway surface. The sheds are constructed of wood and steel panel. Flooring consists of wood, concrete, and dirt.

1.1.2 Surrounding Land Use

Surrounding land use is as follows:

Directions	Current Land Use	Current Occupant
North	Commercial	Grandor Lumber
South	Forested followed by Residential	Forested followed by Residential
East	Bank Street followed by forested and residential	Forested and Residential homes
West	Forested followed by Undeveloped portion of a quarry property	Forested followed by a quarry property

1.1.3 Site Services

The residence is serviced by municipal water and is heated by natural gas. Sewage is disposed of via a private septic system.

1.2 Current and Proposed Future Uses

Current property use is residential. It is understood that the proposed use would become commercial. This is considered a less sensitive Site use, and therefore a record of site condition would not be required.

1.3 Background Information

1.3.1 Physical Settings

A review of topographic maps from Natural Resource Canada indicates that topography of the area is generally flat, with an elevation of 120 m amsl. The Site is relatively flat, sloping westward with an elevation of 120 m amsl. The nearest waterbody is Rideau River, approximately 9 km west of the Site. A series of man-made quarry lakes are present in the area, the nearest of which is approximately 520 m to the west.

Geological maps were reviewed to obtain information on regional geology and surficial soils. Surficial soil deposit mapping indicates that the subsurface overburden material on the Site consists of stone-poor till with sandy silt to silty sand (Ontario Geological Survey, 2010). Bedrock mapping indicates that the overburden is underlain by dolostone and sandstone of the Beekmantown Group (Ontario Geological Survey, 2011).

1.3.2 Site History

The Site currently contains a single-storey residence and several detached accessory buildings, including a garage, and two large divided sheds. The garage is of temporary construction, with wood frame construction directly on the asphalt driveway surface. The sheds are constructed of wood and steel panel. Flooring consists of wood, concrete, and dirt.

Based on available records received by our client as part of this assessment, in addition to aerial imagery available on the City of Ottawa's interactive map, the Site has been developed with a residence since at least the mid 1960's. The adjacent properties show some commercial development to the north and east but remain largely agricultural and residential. Quarrying activity is visible to the far north, south and west, and expands continually approaching the Site between 1966 and 2008. In 2008, the property to the immediate north of the Site is developed with a lumber yard. The quarrying/industrial activity can be seen continuing expansion between 2008 and 2021.

1.3.3 Previous Investigation

Phase I Environmental Site Assessment (ESA) was completed at the Site in 2019 by LRL Engineering to identify potential environmental concerns or liabilities related to the past and present operations conducted on the property and the adjacent lands.

Report:	Phase I – Environmental Site Assessment, 5254 Bank Street, Ottawa, Ontario
Date:	November 22, 2019 (rev. April 2021)
Author:	LRL Engineering
Prepared for:	Holzman Consultants Inc.
Description of data, analysis and findings relevant to the Phase I ESA:	
This report was retrieved from LRLs archives. This assessment was conducted in the context of property rezoning and redevelopment. The subject Site was found to be a rectangular shaped with an approximate area of 1,740 m2 (0.43 acres). The Site is developed with a residence estimated to have been constructed in at least the mid 1960's. The residence is serviced by municipal water and is heated by natural gas. Sewage is disposed via private septic system.	

Based on the Phase I report findings, there were five potentially contaminating activites (PCAs) associated with the current and historical use of the Site and surrounding lands were identified. Most of the PCAs were deemed unlikely to contribute to an on Site area of potential environmental concern (APEC), however two (2) on Site APECs were identified:

PCA	Location of PCA	Location of APEC On-Site	Contaminants of Potential Concern	Media Potentially Impacted
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, northwestern shed	Under the northwestern storage shed around the AST.	PHC, VOCs	Soil and groundwater
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, basement of residence where a former fuel oil AST was present	Beneath the location of the former fuel oil AST in the basement of the residence.	PHC, VOCs	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons

Based on the findings of the Phase I ESA, it was recommended that a Phase II ESA be conducted on the Site to confirm the impacts of the potential environmental concerns identified.

It was also noted that due to the estimated age of construction of the building (circa 1965) there may be the presence of designated substances such as asbestos containing material (ACM) or lead-based paint. If construction or demolition activities were to occur on the building, it was recommended that sampling be performed to determine whether the presence of designated substances are present so they can be addressed accordingly to ensure that the contractors or building occupants do not come into contact with these materials.

1.4 Scope of the investigation

1.4.1 Overview of Site Investigation

Purpose of this Phase II ESA is to assess the areas of potential environmental concern (APECs) identified through the Phase I ESA on the property, and to determine the actual presence/absence of contamination at the Site from the PCAs identified. Such an assessment provides information regarding the nature and extent of potential contamination to assist in making informed business decisions about the property.

The APECs identified that require investigation are:

PCA	Location of PCA	Location of APEC On-Site	Contaminants of Potential Concern	Media Potentially Impacted
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, northwestern shed	Under the northwestern storage shed around the AST.	PHC, VOCs	Soil and groundwater

PCA	Location of PCA	Location of APEC On-Site	Contaminants of Potential Concern	Media Potentially Impacted
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, basement of residence where a former fuel oil AST was present	Beneath the location of the former fuel oil AST in the basement of the residence.	PHC, VOCs	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons

Findings and conclusions presented in this report apply only to these recognized environmental conditions assessed.

1.4.2 Media Investigated

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 context of the current regulations and guidelines applicable to contaminated sites.

1.4.3 Scope of Work

Primary objective of this Phase II ESA was to evaluate current conditions of the Site in context of the applicable legislative and regulatory requirements. LRL's scope of work was as follows:

- Advance six (6) boreholes at strategic locations based on APECs identified, to allow for soil sampling;
- Complete three (3) of the boreholes as monitoring wells to assess hydrogeological conditions and facilitate groundwater sampling;
- Collect groundwater samples from the three (3) existing groundwater monitoring wells present on the Site;
- Submit representative soil (if applicable) and groundwater samples to an accredited laboratory for analysis of suspected parameters of concern; and
- Interpret results in relation to current provincial guidelines to determine subsurface soil and groundwater quality.

This report will present results of Site activities carried out between March 28th and March 30th, 2022.

2 INVESTIGATION METHODOLOGY

2.1 Field Preparation

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

2.2 Borehole/Auger Hole Drilling

Six (6) boreholes (BH) were advanced across the Site on March 28th and 29th, 2022, three (3) of which were completed into monitoring wells (MW):

Borehole/ Monitoring Well	Location	Rational
MW22-1	Near residence north wall directly adjacent to former basement AST location.	To establish the potential soil and/or groundwater impacts from the former basement heating oil AST.
MW22-2	South of the residence, directly south of the former basement AST	To establish the potential soil and/or groundwater impacts from the former basement heating oil AST.
BH22-3	Northeast of the former AST along the residence north wall in grass.	To establish the potential soil impacts from the former basement heating oil AST.
MW22-4	Directly south of the former AST location near the shed.	To establish the potential soil and/or groundwater impacts from the former AST in the storage shed.
BH22-5	Near the southwest corner of the shed building.	To establish the potential soil impacts from the former AST in the storage shed.
BH22-6	To the west of the shed building (dependent on access)	To establish the potential soil impacts from the former AST in the storage shed.

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

Boreholes were advanced to depths between 1.85 and 3.45 m bgs using a CME 55 truck-mounted drill rig equipped with 203 mm diameter hollow stem augers. The drilling contractor was CCC Geotechnical and Environmental Drilling Ltd. (Ottawa, Ontario) and worked under LRL field staff supervision. Soil samples were collected continuously using a split spoon sampler of 0.6 m in length. Between each spoon, the sampling equipment was thoroughly decontaminated.

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

2.3 Soil Sampling and Field Screening

Representative soil samples from each soil stratum encountered or split sampler were collected and transferred immediately into sealed laboratory supplied glass jars and “Ziploc” freezer bags. Samples were examined for soil type, colour, staining/discoloration 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 2000 Photoionization Detector (PID).

2.4 Monitoring Well Installation

Three (3) boreholes were completed into monitoring wells MW22-1, MW22-2, and MW22-4. Monitoring wells were constructed within 203 mm diameter boreholes with a 32 mm slotted PVC

piezometer placed bisecting the groundwater table. 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 of at least 0.3 m was placed above the sand pack. Remaining back fill in boreholes consisted of soil cuttings and/or additional sand. Monitoring wells were finished at the surface with a flush-mount aluminum protective cover.

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

2.5 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 on the centre surface of the first step at the residence west entrance. It was given an arbitrary elevation of 100.00 m.

2.6 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.

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 developed by removing ten (10) well volumes using dedicated LDPE tubing and foot valve. The well development was completed on March 29th, 2022. LRL returned to the Site on March 30th, 2022, once the monitoring wells had recovered, to collect the groundwater samples. Prior to sample collection, each well was purged (three well volumes). Purge water was observed for color, sheens or odour. Using the dedicated LDPE tubing, groundwater was transferred into laboratory supplied water bottles. Samples were logged, labelled and stored on-Site in a cooler chilled with ice.

2.7 Analytical Testing

Representative soil and groundwater samples collected during the investigation were submitted for laboratory analysis. Samples were submitted to Paracel Laboratories Ltd., Ottawa, ON for the following contaminants of concern: Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Volatile Organic Compounds (VOC) in some cases, and Petroleum Hydrocarbons (PHC) fractions F1 (C6 – C10), F2 (>C11 – C16), F3 (>C16 – C34), F4 (>C34).

Potential Environmental Concern	Soil		Groundwater	
	Sample No.	Analysis	Sample No.	Analysis
Former heating oil tanks (residence)	MW22-1/SS3	PHC and BTEXs	MW22-1 And duplicate (MW22-10)	PHC and BTEXs
Former heating oil tanks (residence)	MW22-2/SS4 and duplicate (MW22-2 SS10)	PHC and BTEXs	MW22-2	PHC and BTEXs

Potential Environmental Concern	Soil		Groundwater	
	Sample No.	Analysis	Sample No.	Analysis
Former heating oil tanks (residence)	BH22-3/SS4	PHC and BTEXs	-	-
Former heating oil tanks (Shade)	MW22-4/SS2	PHC and VOCs	MW22-4	PHC and VOCs
Former heating oil tanks (Shade)	BH22-5/SS3	PHC and VOCs	-	-
Former heating oil tanks (Shade)	BH22-2/SS2	PHC and VOCs	-	-

Laboratory Certificates of Analysis are included in **Appendix B**.

2.8 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 the Environment (MOE) *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario",* revised February 1997; and
- Canadian Standards Association (CSA) Phase II Environmental Site Assessment, Z769-00 (R2013).

Field protocols that were employed include:

- All field-screening devices, such as a combustible gas detector, were calibrated prior to use, to ensure accuracy and reliability of readings;
- Thorough decontamination of all drilling and sampling equipment. Dedicated sampling equipment was used 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.

3 SUBSURFACE CONDITIONS

3.1 Site Geology

The general subsurface stratigraphy soil encountered in the boreholes varied across the eastern and western portions of the Site, due to an elevation difference of approximately four (4) meters with the western portion of the Site being lower.

The eastern portion of the Site, around the existing residence, had subsurface stratigraphy generally consisting of sand with trace gravel from surface through to bedrock which was encountered between 2.7 and 3.4 m bgs. In MW22-1, a 0.15 m thick layer of pavement structure

(asphalt over granular crushed stone with sand fill) was encountered on the top as the borehole was located at the parking lot of the residence.

The lower western portion of the Site generally had the same sand with trace gravel overburden, but bedrock was encountered between 1.8 and 3.0 m bgs.

Detailed borehole logs of all borings are presented in **Appendix A**.

3.2 Site Hydrogeology

Static groundwater elevations measured at each monitoring well are summarized in **Table 1**. Groundwater depth measurements in the monitoring wells were measured between 0.41 and 2.41 m bgs, which corresponded to elevations between 96.46 and 98.28 m. Groundwater contours are presented in **Figure 3**. Based on these elevations the groundwater flow direction on the Site is towards the south.

3.3 Regulatory Criteria

Site Condition Standards (SCS) are set out in Ministry of Environment, Conservation and Parks (MECP) '*Soil, Ground Water and Sediment Standards for Use Under Part IV.1 of the Environmental Protection Act*, *April 15, 2011'*. The applicable SCS used was Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition.

- The Site and surrounding properties within 250 m are serviced by the municipal drinking water supply. Records of potable water supply wells were present within 250 m of the Site, but all were dated prior to 1965 and as such it is assumed that all properties are now getting their water supplied through the municipal grid;
- Bedrock and/or groundwater were generally encountered less than 2 m below the ground surface at the Site.

3.4 Soil Analytical Results

3.4.1 Field Screening

Olfactory evidences of petroleum hydrocarbon impacts were not observed in the soil samples collected, with the exception of staining which was noted at MW22-1 from 1.2 to 1.8 m bgs in the sand; and at the MW22-2 from 1.8 to 2.4 m bgs in the sand.

Observations were verified through CSV concentrations measured. CSV concentrations of all soil samples collected were non-detect (<0.1 ppm).

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

3.4.2 Soil Quality

Results of soil analysis and respective MECP standards are presented in **Table 2**. At least one soil sample, considered to be "worst case" based on field observations, from each borehole was submitted for chemical analysis to confirm the field observations of petroleum hydrocarbon impacts. The samples were submitted for analysis of PHCs, BTEX, and/or VOCs.

All BTEX and VOC results were below detection limit. PHCs parameters analysed were not detected in soil samples, with the exception of MW22-1/SS3 and MW22-2/SS4 where PHCs (F3 and F4) were detected. However, the detectable levels of PHCs at the Site were within the MECP Table 7 criteria.

3.5 Groundwater Analytical Results

3.5.1 Field Screening

Headspace VOC levels in the installed monitoring wells were not detected. No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed in the groundwater collected from the monitoring wells on the Site.

3.5.2 Groundwater Quality

Groundwater analysis results and respective MECP standards are summarized in **Table 3**. PHCs parameters were analyzed for all wells, as well as BTEX or VOC for selected wells; all results were below detection limit.

3.6 Data Quality Review

The quality assurance assessment of the field duplicate sample results was conducted according to the document entitled *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* dated March 9, 2009 (amended in July 2009 and effective as of July 1, 2011) (analytical protocols). Results of all quality assurance and quality control samples can be found in the Tables following this report.

3.6.1 Relative Percent Differences (RPDs)

To assess the precision of the analytical methods and field sampling procedures, blind duplicate samples were collected during the soil and groundwater sampling. Precision is calculated by the relative percent difference (RPD) between the duplicate and original samples and was calculated as follows:

$$RPD = \frac{|x_1 - x_2|}{x_m}$$

Where x_1 = initial sample results

x_2 = duplicate sample results

x_m = mean of x_1 and x_2

RPDs are calculated only if the concentrations of a parameter are greater than the laboratory minimum detection limit (MDL) in both the duplicate and original samples. In addition, lower precision in the RPD calculation is expected when concentrations of analytes are less than ten (10) times the MDL. Therefore, the RPDs were calculated for the original and duplicate groundwater and soil samples on in cases where the measured concentrations of analytes in both samples were ten (10) times greater than the MDL.

The following RPD limits were considered reasonable and are based on the analytical protocol: RPDs in soil, 30% for metals, 50% for VOCs, and 30% for PHCs; and in groundwater, 20% for metals, 30% for VOCs, and 30% for PHCs.

RPDs could not be calculated for any PHC and VOC result pairs in the original and duplicate soil and groundwater samples, as these results were either below the laboratory MDL or less than 10 times the MDL.

4 PHASE II CONCEPTUAL SITE MODEL

4.1 Potentially Contaminating Activities (PCAs)

Based on the known information of the general area of the Site, there was two (2) on-Site PCA, and three (3) off-Site PCAs identified in the Study Area:

O. Reg 153/04 Schedule D PCA	Location of PCA	Description and Source Information	Contribution to an APEC
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, northwestern shed	An AST was observed in a shed during the Site visit.	The PCA is located on the Site and is therefore automatically considered to contribute to an on-site APEC.
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, basement of residence where a former fuel oil AST was present	Interview with the Site owner	The PCA is located on the Site and is therefore automatically considered to contribute to an on-site APEC.
PCA 59: Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products	Off-Site, 5224 Bank Street, adjacent property to the north	The Site operates as a lumber yard and sells treated and preserved wood products. Waste generator records confirmed solvent and petroleum distillate waste generation.	As the primary wood storage areas appear to be at the rear of the property, located at least 150 m to the west and trans-gradient to the subject Site, it is not considered likely that the storage of treated wood products on the adjacent property are likely to contribute to an on-Site APEC.
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	Off-Site, 5227 Bank Street, approximately 50 m northeast of the Site.	An unknown quantity of furnace oil had leaked into the basement of the residence. Soil contamination was deemed possible.	While the PCA is located upgradient of the Site, based on the single record of a spill, and position 50 m away and across a roadway, it is not considered likely to contribute to an on-Site APEC.
PCA 10: Commercial Autobody Shop	Off-Site, 5217 Bank Street, approximately 120 m north of the Site.	An automobile service garage is present. Record of intentional dumping to the ditch and 136 L spill of fuel-oil to the garage floor were reported.	Based on the location of the PCA 120 m to the north and trans-gradient of the Site, it is not considered likely to have contributed to an on-Site APEC.

4.2 Areas of Potential Environmental Concern (APECs)

The potentially contaminating activities considered to represent areas of potential environmental concern for the Site are:

PCA	Location of PCA	Location of APEC On-Site	Contaminants of Potential Concern	Media Potentially Impacted
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, northwestern shed	Under the northwestern storage shed around the AST.	PHC, VOCs	Soil and groundwater
PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site, basement of residence where a former fuel oil AST was present	Beneath the location of the former fuel oil AST in the basement of the residence.	PHC, BTEX	Soil and groundwater

Notes: VOC – Volatile Organic Compounds
PHC – Petroleum Hydrocarbons

4.3 Contaminants of Potential Concern (COPCs)

The contaminants of potential concern (COPCs) in soil and groundwater for the Site were based on the APECs identified at the Site during Phase I ESA and observations at the time of the drilling program. The following CPCs for the Site were suspected to be associated former on site fuel oil ASTs:

1. Petroleum Hydrocarbons ranges F1-F4 (PHCs) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEXs)
2. Volatile Organic Compounds (VOCs)

An assessment of the COPCs for the Site was completed as part of the Phase II ESA analytical submission program. Soil and groundwater samples were submitted for a combination of the COPCs dependant on borehole/monitoring well locations with respect to the APECs.

4.4 Subsurface Conditions

Municipal water services and natural gas are supplied by underground service trenches on the east portion of the Site leading to Bank Street. Electricity and telecommunications are supplied via overhead lines. These service trenches are considered to have the potential to act as conduits for contaminant migration.

Based on boreholes completed as part of the Phase II ESA, the general subsurface stratigraphy of the soil encountered in the boreholes varied across the eastern and western portions of the Site, due to an elevation difference of approximately four (4) meters with the western portion of the Site being lower.

The eastern portion of the Site, around the existing residence, had subsurface stratigraphy generally consisting of sand with trace gravel from surface through to bedrock which was encountered between 2.7 and 3.4 m bgs. In MW22-1, a 0.15 m thick layer of pavement structure (asphalt over granular crushed stone with sand fill) was encountered on the top as the borehole was located at the parking lot of the residence.

The lower western portion of the Site generally had the same sand with trace gravel overburden, but bedrock was encountered between 1.8 and 3.0 m bgs.

4.5 Physical Setting – Hydrogeological

The interpretation of groundwater flow was based upon the generally known geology, the location and flow direction of surface water bodies and the static water levels collected from monitoring wells completed on the Site as part of this assessment. The overburden groundwater flows to the south. Based on the recorded groundwater elevations in Table 5.2, and a lateral separation distance between monitoring well locations, the horizontal hydraulic gradient is approximately 0.08 m/m. The hydraulic gradient is expected to vary with seasonal and weather conditions. Based on the geology observed at the Site, the overburden aquifer is considered as unconfined.

4.6 Physical Setting – Sensitive or Shallow or Surface Water

There are no Areas of Natural Scientific Interest (ANSI) identified by the Ministry of Natural Resources (MNR) within 250 m. As the Site does not contain an area of natural significance, and properties within 30 m of the Site limits do not contain areas of natural significance, the Site is not classified as an environmentally sensitive property (O. Reg. 153/04, s41) hence the generic criteria of Table 1 of O. Reg. 153 (Sensitive Site) would not be considered applicable.

No natural surface water bodies were identified on the Site or within the Phase One Study Area. The nearest natural surface body is the Rideau River, which is located approximately 9 km to the west of the Site. Several manmade quarry lakes are located approximately 500 - 900 m southwest of the Site. There is no open surface water bodies within 30 m of the Site limits. As the property does not include all or part of a water body, and the property is not adjacent to a water body, and does not includes land that is within 30 m of a water body, the Property is not considered a Surface Water site (O. Reg. 153/04, s43.1). The generic criteria of Tables 8 and 9 of O. Reg. 153/04 (Surface Water) would not be considered applicable.

Drilling conducted as part of this investigation revealed that there is less than 2 m of overburden soil in two of the six boreholes advanced on the Site. Further, two of three monitoring wells showed the groundwater table to be less than 2 m bgs. As less than 2/3 of the Site consists of soil or groundwater (excluding any non-soil surface treatment such as asphalt, concrete or aggregate) less than 2 m in depth, the Property is considered a Shallow Soil site (O. Reg. 153/04, s43.1[3]). The generic criteria of Tables 6 and 7 of O. Reg. 153/04 (Shallow Soil) are considered applicable. The Property, and all other properties located, in whole or in part, within 250 m of the boundaries of the property, are supplied by a municipal drinking water system. The Site is not in an area designated on the City of Ottawa official plan as an intake protection zone (IPZ). The Site is not in an area designated on the City of Ottawa official plan as a well-head protection area (WHPA). The Site is not an agricultural property. The Site is considered as being non-potable water use as per Section 35 of the Ontario Regulation 153/04 as amended 2011 (O. Reg. 153/04, s35). The existing property use is residential. The proposed property use will be commercial. The residential/parkland/institutional land use is applied as the more conservative approach, as per Section 3 of the Ontario Regulation 153/04 as amended 2011 (O. Reg. 153/04, s1[3]). Accordingly, the appropriate Site classification under O. Reg. 153/04 will be generic non-potable shallow soil residential land use (O. Reg. 153/04, Table 7).

4.7 Physical Setting – Existing and Proposed Structures

At the time of report preparation the current property use is residential. LRL understands that the Client intends to demolish the existing buildings at the Site and redevelop the Site as commercial with associated parking areas and access roads. The Property is currently used for residential

purposes and therefore will not require a Record of Site Condition (RSC), required for a change in land use to more sensitive land uses.

4.8 Contamination

Soil samples were collected from the boreholes advanced on March 28th, 2022 and were analysed for a combination of PHCs, BTEXs, and VOCs. No exceedances of the applicable MECP Table 7 criteria were detected.

Groundwater was sampled and analysed for PHCs and VOCs or BTEX on March 30th, 2022. All of analysed groundwater sample results were in compliance with the O. Reg. 153/04 Table 7 criteria

5 CONCLUSIONS

Based on our Site visit, results of soil and groundwater sampling and laboratory analytical programs compared to the applicable MECP Table 7 SCS, LRL offers the following conclusions regarding environmental conditions of the subject site:

- Soil Quality
    - Olfactory evidence of petroleum hydrocarbon impacts was not observed in the soils collected throughout all boreholes.
    - CSV concentrations of all soil samples collected were non-detect (<0.1 ppm)
    - BTEX and VOC parameter concentrations were below the detection limits in all samples. PHC parameters analysed were not detected in any soil samples submitted for analysis, with the exception of MW22-1/SS3 and MW22-2/SS4 which had detectable levels of PHC F3 and F4. The PHC concentrations measured were found to be within the MECP Table 7 criteria.
- Groundwater Quality
    - No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed in the groundwater collected from the monitoring wells on the Site.
    - Headspace VOC levels in the installed monitoring wells were not detected.
    - PHC, BTEX, and VOC parameter concentrations were below the detection limit in all monitoring wells sampled.

Based on the findings of Phase II ESA the soil and groundwater at the Site are generally in compliance with MECP Table 7 criteria. Further, the concentrations of PHCs and VOCs at the Site were found to be compliant with MECP Table 1 background criteria as well. As such, the Site is considered to be “clean” with regards to the parameters analysed, and no further delineation or environmental work is considered to be warranted at this time.

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.

6 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 during fieldwork completed between March 28th and March 30th, 2022. 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 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 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 sole use of Rayan Zaher and his 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 property value, its saleability or ability to gain financing, through reporting of factual information.

Yours truly,
LRL Associates Ltd.

Abdul Kader Alhaj
Environmental Technician

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7 REFERENCE

Canadian Standards Association, *Phase II Environmental Site Assessment CAN/CSA-Z769-00*, March 2000 (R2013).

City of Ottawa, Ottawa Maps, geoOttawa, http://maps.ottawa.ca/geoOttawa/.

St-Onge, D.A., Surficial geology, lower Ottawa valley, Ontario-Quebec, Geological Survey of Canada, Map 2140A, Scale 1:125,000, 2009.

Ministry of Environment, Conservations and Parks, Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Environmental Protection Act, as amended.

Ontario Ministry of the Environment, *Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, April 15, 2011.Ontario Regulation 903, made under the Water Resources Act of the Environmental Protection Act, *Wells*, R.R.O. 1990.

Harrison, J.E., Generalized Bedrock Geology, Ottawa-Hull, Ontario-Quebec, Geological Survey of Canada, Scale 1:125,000, Map 1508A, 1976.

Phase II – Environmental Site Assessment, Existing Retail Fuel Outlet 1030-1035 Pleasant Park Road, Ottawa, Ontario, prepared by Paterson Group, October 3, 2013.

FIGURES

LRL
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PROJECT

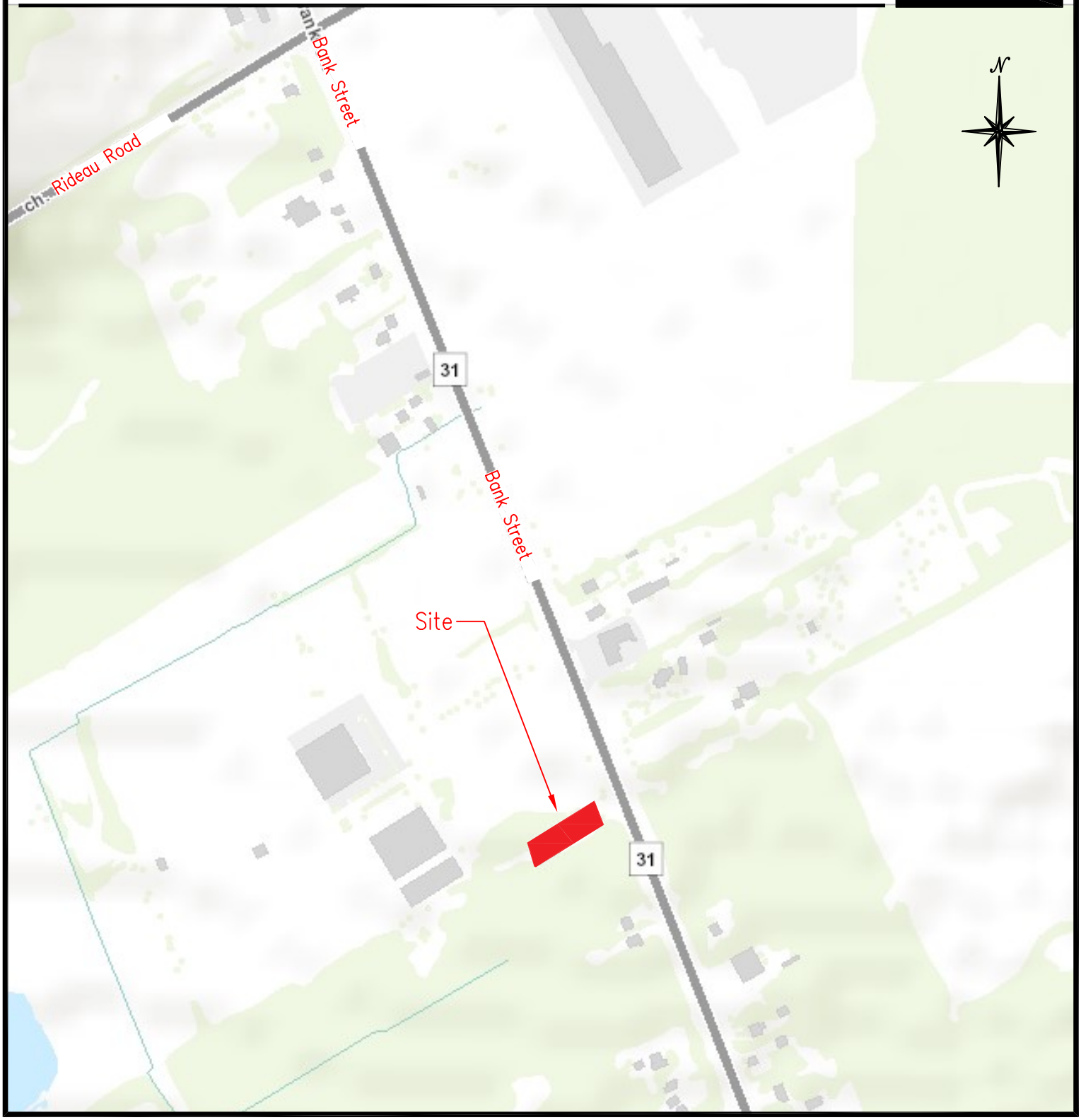
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
5254 BANK STREET
OTTAWA, ONTARIO

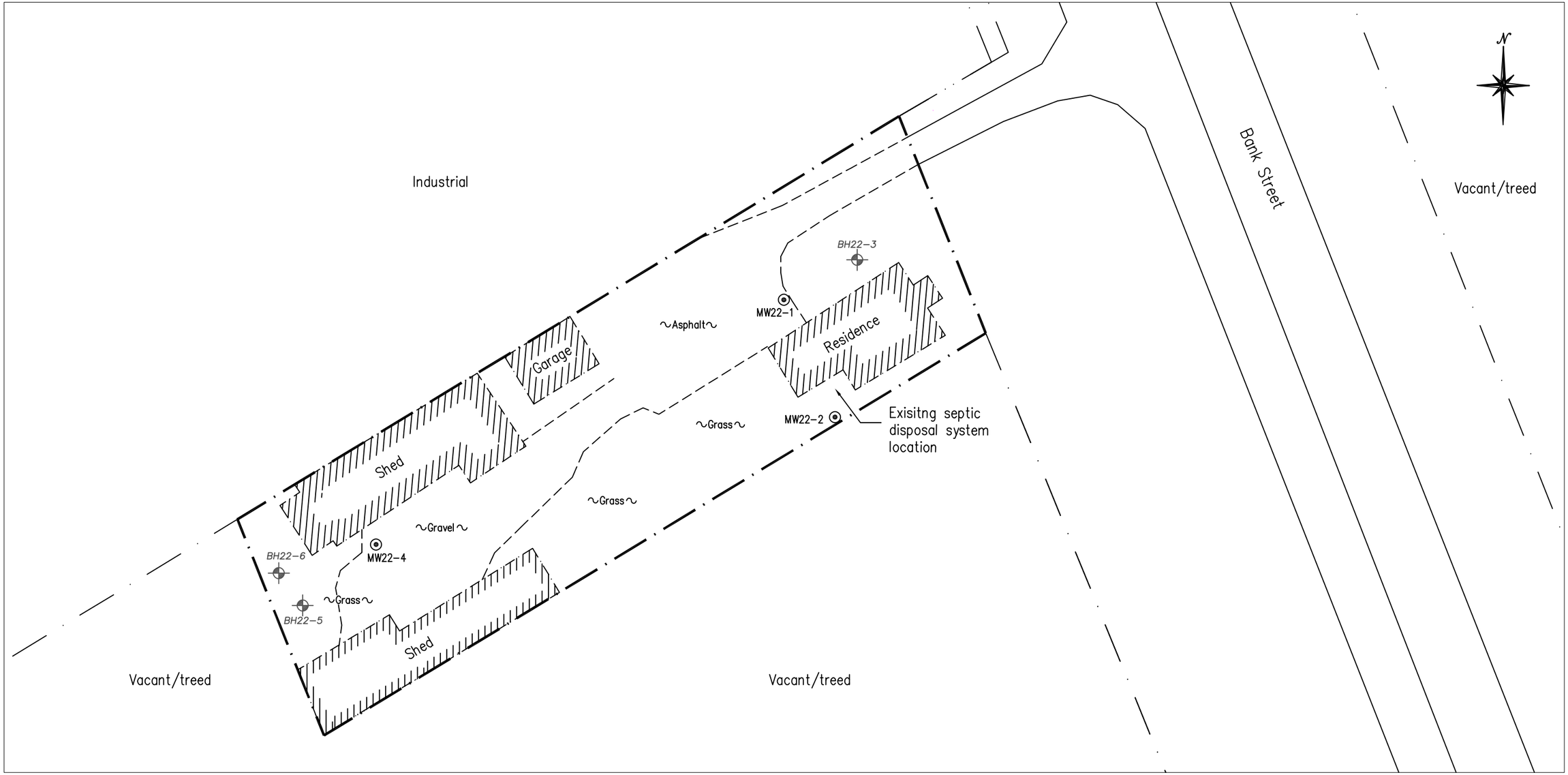
DRAWING TITLE

SITE LOCATION
(NOT TO SCALE)
SOURCE: GeoOTTAWA

CLIENT	DATE	PROJECT
RAYAN ZAHER	APRIL 2022	220011

FIGURE 1





LEGEND

- Property Line
- Existing Building
- BH22-99 Borehole
- MW22-99 Monitoring Well

5m 0 10 20m

SCALE: 1:400

No.	REVISIONS	BY	DATE
01	FINAL	A.K.	08/04/22

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CLIENT
RAYAN ZAHER

DESIGNED BY:	DRAWN BY:	APPROVED BY:
	A.K.	A.W.

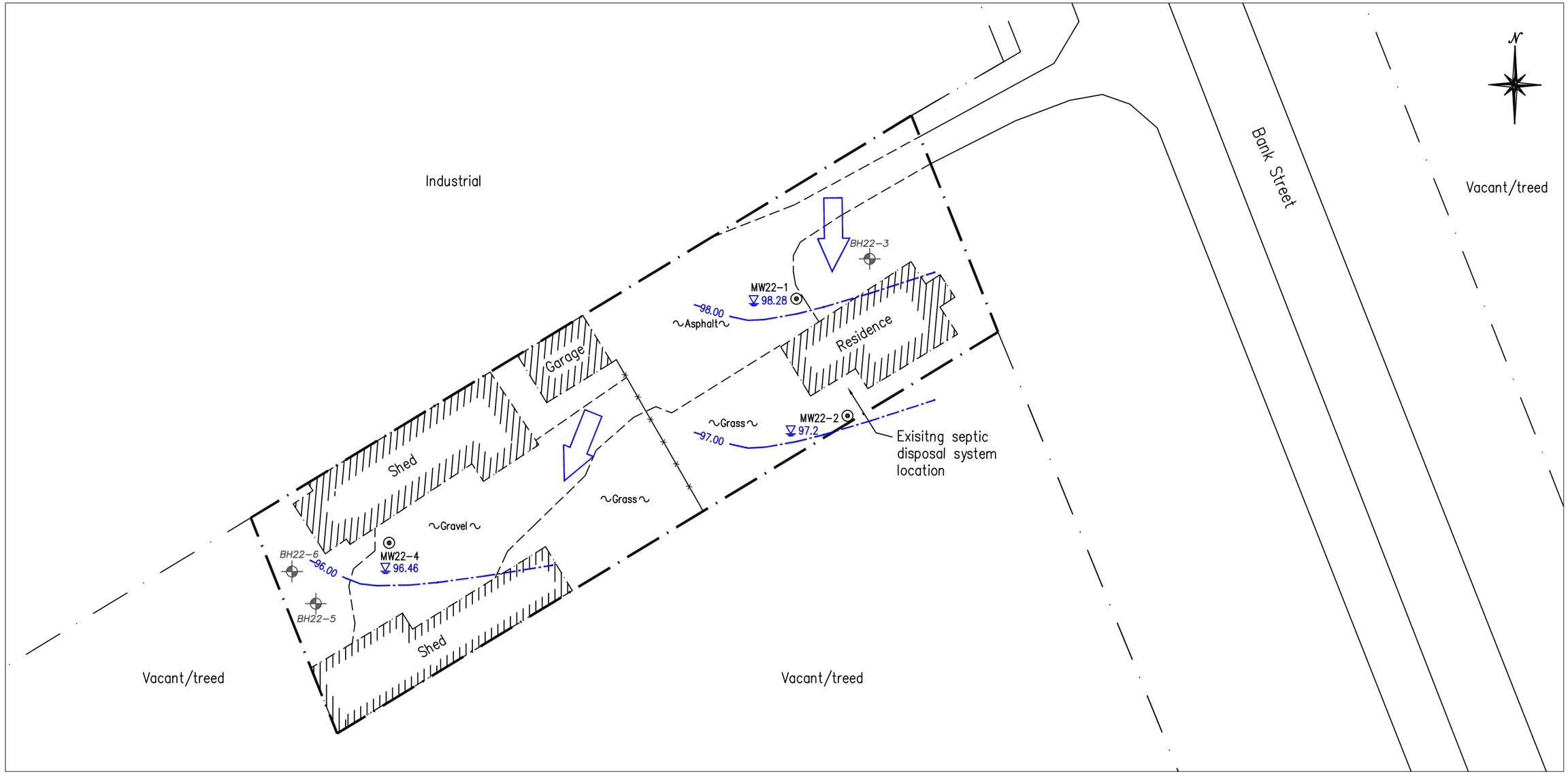
PROJECT
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
5254 BANK STREET
OTTAWA, ONTARIO

DRAWING TITLE
SITE PLAN - MONITORING WELL AND BOREHOLE LOCATIONS

PROJECT NO.
220011

DATE
APRIL 2022

FIGURE 2



LEGEND

- Property Line
- Existing Building
- BH22-99 Borehole
- MW22-99 Monitoring Well
- 99.99 Groundwater Elevation
- Groundwater Contour
- Inferred Groundwater Flow Direction

5m 0 10 20m

SCALE: 1:400

No.	REVISIONS	BY	DATE
01	FINAL	A.K.	08/04/22

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CLIENT
RAYAN ZAHER

DESIGNED BY:	DRAWN BY:	APPROVED BY:
	A.K.	A.W.

PROJECT
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
5254 BANK STREET
OTTAWA, ONTARIO

DRAWING TITLE
GROUNDWATER ELEVATION CONTOURS - MARCH 2022

PROJECT NO.
220011

DATE
APRIL 2022

FIGURE 3

TABLES

Table 1
Summary of Groundsurface and Groundwater Elevations (March 30, 2022)
Phase II Environmental Site Assessment
5254 BankStreet, Ottawa, ON
LRL File: 220011

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	100.24	100.19	1.91	1.96	98.28
MW22-2	99.66	99.61	2.41	2.46	97.20
MW22-4	96.92	96.87	0.41	0.46	96.46

NOTES

[1] Elevations measured from temporary benchmark established on the centre surface of the first step at the residence west entrance (100.00 m).

[2] Reference elevation is top of PVC riser.

Table 2
Summary of Soil VOC and PHC Analysis
Phase II Environmental Site Assessment
5254 BankStreet, Ottawa, ON
LRL File: 220011

Parameter	Units	MDL	O. Reg. 153/04[1] Table 7[2] Non-Potable Ground Water	Sample						
					Duplicate					
				MW22-1/SS3	MW22-2/SS4	MW22-2/SS10	BH22-3/SS4	MW22-4/SS2	BH22-5/SS3	BH22-6/SS2
Sample Date (d/m/y)			--	28-Mar-22	29-Mar-22		28-Mar-22	28-Mar-22	28-Mar-22	28-Mar-22
Depth	m		--	1.2 - 1.8	1.2 - 1.8		1.8 - 2.4	0.6 - 1.2	1.2 - 1.8	0.6 - 1.2
CSV Readings[3]	ppm	<0.1	--	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1
Physical Characteristics										
% Solids	% by wt.	0.1		85.6	91	92.3	84	83.6	76	85
Volatiles										
Acetone	ug/L	0.5	16	--	--	--	--	<0.5	<0.5	<0.5
Benzene	ug/L	0.02	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	ug/L	0.05	13	--	--	--	--	<0.05	<0.05	<0.05
Bromoform	ug/L	0.05	0.27	--	--	--	--	<0.05	<0.05	<0.05
Bromomethane	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Chlorobenzene	ug/L	0.05	2.4	--	--	--	--	<0.05	<0.05	<0.05
Chloroform	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Dibromochloromethane	ug/L	0.05	9.4	--	--	--	--	<0.05	<0.05	<0.05
Dichlorodifluoromethane	ug/L	0.05	16	--	--	--	--	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/L	0.05	3.4	--	--	--	--	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/L	0.05	4.8	--	--	--	--	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/L	0.05	0.083	--	--	--	--	<0.05	<0.05	<0.05
1,1-Dichloroethane	ug/L	0.05	3.5	--	--	--	--	<0.05	<0.05	<0.05
1,2-Dichloroethane	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
1,1-Dichloroethylene	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	ug/L	0.05	3.4	--	--	--	--	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	ug/L	0.05	0.084	--	--	--	--	<0.05	<0.05	<0.05
1,2-Dichloropropane	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Ethylbenzene	ug/L	0.05	2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Hexane	ug/L	0.05	2.8	--	--	--	--	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	ug/L	0.5	16	--	--	--	--	<0.5	<0.5	<0.5
Methyl Isobutyl Ketone	ug/L	0.5	1.7	--	--	--	--	<0.5	<0.5	<0.5
Methyl tert-butyl ether	ug/L	0.05	0.75	--	--	--	--	<0.05	<0.05	<0.05
Methylene Chloride	ug/L	0.05	0.1	--	--	--	--	<0.05	<0.05	<0.05
Styrene	ug/L	0.05	0.7	--	--	--	--	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/L	0.05	0.05	--	--	--	--	<0.05	<0.05	<0.05
Tetrachloroethylene	ug/L	0.05	0.28	--	--	--	--	<0.05	<0.05	<0.05
Toluene	ug/L	0.05	2.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	ug/L	0.5	0.38	--	--	--	--	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	ug/L	0.5	0.05	--	--	--	--	<0.05	<0.05	<0.05
Trichloroethylene	ug/L	0.5	0.061	--	--	--	--	<0.05	<0.05	<0.05
Trichlorofluoromethane	ug/L	1.0	4	--	--	--	--	<0.05	<0.05	<0.05
Vinyl Chloride	ug/L	0.02	0.02	--	--	--	--	<0.02	<0.02	<0.02
m/p-Xylene	ug/L	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/L	0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes, total	ug/L	0.05	3.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hydrocarbons										
F1 PHCs (C6-C10)	ug/L	7	55	<7	<7	<7	<7	<7	<7	<7
F2 PHCs (C10-C16)	ug/L	4	98	<4	<4	<4	<4	<4	<4	<4
F3 PHCs (C16-C34)	ug/L	8	300	23	14	<8	<8	<8	<8	<8
F4 PHCs (C34-C50)	ug/L	6	2800	108	17	<6	<6	<6	<6	<6

NOTES:

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

[2] Table 7: Generic site condition standards for shallow soils in anon-potable groundwater condition.

[3] Headspace values were measured with a MiniRAE 2000 PID or 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

BOLD Above Table 3 Standard

Table 3
Summary of Groundwater VOC and PHC Analysis
Phase II Environmental Site Assessment
5254 BankStreet, Ottawa, ON
LRL File: 220011

Parameter	Units	MDL	O. Reg. 153/04[1] Table 7[2] Non-Potable Ground Water	Sample			
				MW22-1	Duplicate MW22-10	MW22-2	MW22-4
Sample Date (d/m/y)				**30-Mar-22**	**30-Mar-22**	**30-Mar-22**	**30-Mar-22**
Headspace VOC Readings[3]	ppm	0.1		<0.1		<0.1	<0.1
Evidence of free product?	--	--	[4]	No		No	No
Volatiles				--	--	--	
Acetone	ug/L	5.0	100000	--	--	--	<5.0
Benzene	ug/L	0.5	0.5	<0.1	<0.1	<0.1	<0.5
Bromodichloromethane	ug/L	0.5	67000	--	--	--	<0.5
Bromoform	ug/L	0.5	5	--	--	--	<0.5
Bromomethane	ug/L	0.5	0.89	--	--	--	<0.5
Carbon Tetrachloride	ug/L	0.2	0.2	--	--	--	<0.2
Chlorobenzene	ug/L	0.5	140	--	--	--	<0.5
Chloroform	ug/L	0.5	2	--	--	--	<0.5
Dibromochloromethane	ug/L	0.5	65000	--	--	--	<0.5
Dichlorodifluoromethane	ug/L	1.0	3500	--	--	--	<1.0
1,2-Dichlorobenzene	ug/L	0.5	150	--	--	--	<0.5
1,3-Dichlorobenzene	ug/L	0.5	7600	--	--	--	<0.5
1,4-Dichlorobenzene	ug/L	0.5	0.5	--	--	--	<0.5
1,1-Dichloroethane	ug/L	0.5	11	--	--	--	<0.5
1,2-Dichloroethane	ug/L	0.5	0.5	--	--	--	<0.5
1,1-Dichloroethylene	ug/L	0.5	0.5	--	--	--	<0.5
cis-1,2-Dichloroethylene	ug/L	0.5	1.6	--	--	--	<0.5
trans-1,2-Dichloroethylene	ug/L	0.5	1.6	--	--	--	<0.5
1,2-Dichloropropane	ug/L	0.5	0.5	--	--	--	<0.5
cis-1,3-Dichloropropylene	ug/L	0.5	--	--	--	--	<0.5
trans-1,3-Dichloropropylene	ug/L	0.5	--	--	--	--	<0.5
1,3-Dichloropropene, total	ug/L	0.5	0.5	--	--	--	<0.5
Ethylbenzene	ug/L	0.5	54	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.2	0.2	--	--	--	<0.2
Hexane	ug/L	1.0	5	--	--	--	<1.0
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	21000	--	--	--	<5.0
Methyl Isobutyl Ketone	ug/L	5.0	5200	--	--	--	<5.0
Methyl tert-butyl ether	ug/L	0.2	15	--	--	--	<0.2
Methylene Chloride	ug/L	5.0	26	--	--	--	<5.0
Styrene	ug/L	0.5	43	--	--	--	<0.5
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1	--	--	--	<0.5
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5	--	--	--	<0.5
Tetrachloroethylene	ug/L	0.5	0.5	--	--	--	<0.5
Toluene	ug/L	0.5	320	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ug/L	0.5	23	--	--	--	<0.5
1,1,2-Trichloroethane	ug/L	0.5	0.5	--	--	--	<0.5
Trichloroethylene	ug/L	0.5	0.5	--	--	--	<0.5
Trichlorofluoromethane	ug/L	1.0	2000	--	--	--	<1.0
Vinyl Chloride	ug/L	0.5	0.5	--	--	--	<0.5
m/p-Xylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	0.5	--	<0.5	<0.5	<0.5	<0.5
Xylenes, total	ug/L	0.5	72	<0.5	<0.5	<0.5	<0.5
Hydrocarbons							
F1 PHCs (C6-C10)	ug/L	25	420	<25	<25	<25	<25
F2 PHCs (C10-C16)	ug/L	100	150	<100	<100	<100	<100
F3 PHCs (C16-C34)	ug/L	100	500	<100	<100	<100	<100
F4 PHCs (C34-C50)	ug/L	100	500	<100	<100	<100	<100

NOTES:

[1] MOE's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
[2] Table 7: Generic site condition standards for shallow soils in anon-potable groundwater condition.
[3] Headspace values were measured with a MiniRAE 2000 PID or 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
BOLD Above Table 3 Standard

APPENDIX A

Borehole Logs

Borehole Log: MW22-1

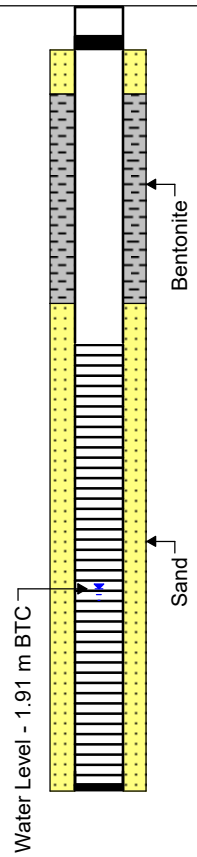
Project No.: 220011 | **Project:** Phase II ESA

Client: Rayan Zaher | **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 28, 2022 | **Field Personnel:** AK

Driller: CCC Drilling Ltd. | **Drilling Equipment:** CME-55 Truck-Mount | **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	100.24								
0.0	0.0	**ASPHALT**	0.00 100.09								
1.0		**SAND** dry, brown, stains	0.15			SS1				<0.1	
2.0			99.64								
3.0	1.0	**SAND** Fine grained, wet, brown, stains between 1.2 - 1.8 mbgs.	0.60			SS2		46		<0.1	
4.0											
5.0						SS3		46		<0.1	
6.0	2.0										
7.0						SS4		46		<0.1	
8.0			97.60								
9.0		End of Borehole Bedrock	2.64								
10.0	3.0										
11.0											
12.0											
13.0											



Easting: 0454740 | **Northing:** 5015271

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 100.24 | **Top of Riser Elev.:** 100.19

Hole Diameter: 200 mm | **Monitoring Well Diameter:** 32 mm

NOTES

Borehole Log: MW22-2

Project No.: 220011 **Project:** Phase II ESA

Client: Rayan Zaher **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 29, 2022 **Field Personnel:** AK

Driller: CCC Drilling Ltd. **Drilling Equipment:** Multi-power Truck **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	99.66								
0.0	0.0	**Top Soil**	0.00								
1.0		**SAND** some gravel, brown, frozen.	99.06			SS1		50		<0.1	
2.0		**SAND** Fine to medium grained with some gravel, dry, brown.	0.60			SS2		54		<0.1	
3.0	1.0										
4.0						SS3		45		<0.1	
5.0											
6.0		**SAND** Fine to medium grained, moist, brown, stains	97.86 1.80			SS4		75		<0.1	
7.0	2.0										
8.0		**SAND** Fine to medium grained, moist to wet, brown	97.26 2.40			SS5		75		<0.1	
9.0											
10.0	3.0					SS6		79		<0.1	
11.0			96.26 3.40								
12.0		End of Borehole Bedrock									
13.0											

Monitoring Well Details: Bentonite; Sand; Water Level - 2.41 m BTC

Easting: 0454783 **Northing:** 5015276

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 99.66 **Top of Riser Elev.:** 99.61

Hole Diameter: 200 mm **Monitoring Well Diameter:** 32 mm

NOTES

Borehole Log: BH22-3

Project No.: 220011 **Project:** Phase II ESA

Client: Rayan Zaher **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 28, 2022 **Field Personnel:** AK

Driller: CCC Drilling Ltd. **Drilling Equipment:** CME-55 Truck-Mount **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 / % LEL)	Monitoring Well Details
		Ground Surface	100.41								
0.0	0.0	**Top Soil**	0.00								
1.0		**SAND** Brown, dry				SS1				<0.1	
2.0			99.81								
3.0	1.0	**SAND** Fine grained with some gravel, dry, brown.	0.60			SS2		42		<0.1	
4.0			99.21								
5.0		**SAND** Fine grained with some gravel, wet, brown, 0.15 m boulders at the bottom of borhole	1.20			SS3		42		<0.1	
6.0	2.0										
7.0						SS4		38		<0.1	
8.0											
9.0						SS5		89		<0.1	
			97.51								
10.0	3.0	End of Borehole Bedrock	2.90								
11.0											
12.0											
13.0											

Easting: 0454798 **Northing:** 5015297

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 100.41 **Top of Riser Elev.:** NA

Hole Diameter: NA **Monitoring Well Diameter:** NA

NOTES

Borehole Log: MW22-4

Project No.: 220011 **Project:** Phase II ESA

Client: Rayan Zaher **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 28, 2022 **Field Personnel:** AK

Driller: CCC Drilling Ltd. **Drilling Equipment:** CME-55 Truck-Mount **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	96.92								
0.0	0.0	**Top Soil**	0.00 96.77								
		SAND Fine grained, brown, moist.	0.15			SS1		42		<0.1	
						SS2		62		<0.1	
	1.0		95.72								
		SAND Fine grained, brown, wet.	1.20			SS3		62		<0.1	
						SS4		70		<0.1	
	2.0										
						SS5		70		<0.1	
	3.0		93.92								
		End of Borehole	3.00								

Combustible Soil Vapours: ppm 20 40 60 80; % LEL 10 20 30 40 50 60 70 80 90

Monitoring Well Details: Water Level - 0.41 m BTC; Bentonite; Sand

Easting: 0454749 **Northing:** 5015271

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 96.92 **Top of Riser Elev.:** 96.87

Hole Diameter: 200 mm **Monitoring Well Diameter:** 32 mm

NOTES

Borehole Log: BH22-5

Project No.: 220011 **Project:** Phase II ESA

Client: Rayan Zaher **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 28, 2022 **Field Personnel:** AK

Driller: CCC Drilling Ltd. **Drilling Equipment:** CME-55 Truck-Mount **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	96.44								
	Top Soil	0.00								
1.0	**SAND** Fine grained, brown, moist				SS1		46		<0.1	
2.0		95.84 0.60								
3.0 / 1.0	**SAND** Fine grained, moist to wet, brown.				SS2		75		<0.1	
4.0										
5.0					SS3		62		<0.1	
6.0 / 2.0	End of Borehole	94.64 1.80								
7.0										
8.0										
9.0										
10.0 / 3.0										
11.0										
12.0										
13.0										

Easting: 0454737 **Northing:** 5015273

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 96.44 **Top of Riser Elev.:** NA

Hole Diameter: NA **Monitoring Well Diameter:** NA

NOTES

Borehole Log: BH22-6

Project No.: 220011 | **Project:** Phase II ESA

Client: Rayan Zaher | **Location:** 5254 Bank Street, Ottawa, Ontario

Date: March 28, 2022 | **Field Personnel:** AK

Driller: CCC Drilling Ltd. | **Drilling Equipment:** CME-55 Truck-Mount | **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 / % LEL)	Monitoring Well Details
		Ground Surface	96.53								
0.0	0.0	**Top Soil**	0.00								
		SAND Dark brown, moist, frozen				SS1		50		<0.1	
2.0			95.93								
		SAND Fine grained, wet, brown to grey.	0.60								
3.0	1.0					SS2		70		<0.1	
4.0											
5.0						SS3		58		<0.1	
6.0			94.73								
		End of Borehole	1.80								
	2.0										
7.0											
8.0											
9.0											
10.0	3.0										
11.0											
12.0											
13.0											

Easting: 0454724 | **Northing:** 5015332

Site Datum: Center of the first step at the residence entrance (west)

Groundsurface Elevation: 96.53 | **Top of Riser Elev.:** NA

Hole Diameter: NA | **Monitoring Well Diameter:** NA

NOTES

APPENDIX B

Laboratory Certificates of Analysis

PARACEL LABORATORIES LTD.

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Certificate of Analysis

LRL Associates Ltd.

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

Client PO:
Project: 220011
Custody: 128955

Report Date: 31-Mar-2022
Order Date: 28-Mar-2022

Order #: 2214099

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

Paracel ID	Client ID
2214099-01	MW22-1/SS3
2214099-02	BH22-3/SS4
2214099-03	MW22-4/SS2
2214099-04	BH22-5/SS3
2214099-05	BH22-6/SS2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	29-Mar-22	29-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	29-Mar-22	29-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	29-Mar-22	30-Mar-22
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	29-Mar-22	29-Mar-22
Solids, %	Gravimetric, calculation	29-Mar-22	29-Mar-22

Certificate of Analysis

Client: **LRL Associates Ltd.**

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

	Client ID:	MW22-1/SS3	BH22-3/SS4	MW22-4/SS2	BH22-5/SS3
	Sample Date:	28-Mar-22 12:00	28-Mar-22 12:00	28-Mar-22 12:00	28-Mar-22 09:00
	Sample ID:	2214099-01	2214099-02	2214099-03	2214099-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.6	84.0	83.6	76.0
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
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, 1,2-)	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

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

	Client ID:	MW22-1/SS3	BH22-3/SS4	MW22-4/SS2	BH22-5/SS3
	Sample Date:	28-Mar-22 12:00	28-Mar-22 12:00	28-Mar-22 12:00	28-Mar-22 09:00
	Sample ID:	2214099-01	2214099-02	2214099-03	2214099-04
	MDL/Units	Soil	Soil	Soil	Soil
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
Xylenes, total	0.05 ug/g dry	-	-	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	-	-	122%	129%
Dibromofluoromethane	Surrogate	-	-	78.5%	88.4%
Toluene-d8	Surrogate	-	-	112%	119%
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene-d8	Surrogate	106%	113%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	23	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	108	<6	<6	<6

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

	Client ID:	BH22-6/SS2	-	-	-
	Sample Date:	28-Mar-22 09:00	-	-	-
	Sample ID:	2214099-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	85.0	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethane, 1	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

	Client ID:	BH22-6/SS2	-	-	-
	Sample Date:	28-Mar-22 09:00	-	-	-
	Sample ID:	2214099-05	-	-	-
	MDL/Units	Soil	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	121%	-	-	-
Dibromofluoromethane	Surrogate	86.0%	-	-	-
Toluene-d8	Surrogate	109%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
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	*3.23*		*ug/g*		*101*	*50-140*			
Surrogate: Dibromofluoromethane	*2.36*		*ug/g*		*73.8*	*50-140*			
Surrogate: Toluene-d8	*3.16*		*ug/g*		*98.6*	*50-140*			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	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: Toluene-d8	*3.16*		*ug/g*		*98.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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)	21	8	ug/g	22			1.7	30	
F4 PHCs (C34-C50)	21	6	ug/g	26			18.1	30	
Physical Characteristics									
% Solids	66.7	0.1	% by Wt.	68.0			2.0	25	
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	*4.21*		*ug/g*		*116*	*50-140*			
Surrogate: Dibromofluoromethane	*2.62*		*ug/g*		*72.4*	*50-140*			
Surrogate: Toluene-d8	*3.88*		*ug/g*		*107*	*50-140*			
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	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: Toluene-d8	*3.88*		*ug/g*		*107*	*50-140*			

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 31-Mar-2022

Order Date: 28-Mar-2022

Project Description: 220011

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	220	7	ug/g	ND	110	80-120			
F2 PHCs (C10-C16)	80	4	ug/g	ND	100	60-140			
F3 PHCs (C16-C34)	230	8	ug/g	22	106	60-140			
F4 PHCs (C34-C50)	185	6	ug/g	26	128	60-140			
Volatiles									
Acetone	10.4	0.50	ug/g	ND	104	50-140			
Benzene	2.96	0.02	ug/g	ND	74.0	60-130			
Bromodichloromethane	3.79	0.05	ug/g	ND	94.8	60-130			
Bromoform	2.82	0.05	ug/g	ND	70.4	60-130			
Bromomethane	3.45	0.05	ug/g	ND	86.3	50-140			
Carbon Tetrachloride	3.83	0.05	ug/g	ND	95.8	60-130			
Chlorobenzene	2.86	0.05	ug/g	ND	71.5	60-130			
Chloroform	3.85	0.05	ug/g	ND	96.3	60-130			
Dibromochloromethane	2.86	0.05	ug/g	ND	71.5	60-130			
Dichlorodifluoromethane	4.92	0.05	ug/g	ND	123	50-140			
1,2-Dichlorobenzene	3.88	0.05	ug/g	ND	96.9	60-130			
1,3-Dichlorobenzene	3.82	0.05	ug/g	ND	95.4	60-130			
1,4-Dichlorobenzene	4.12	0.05	ug/g	ND	103	60-130			
1,1-Dichloroethane	3.93	0.05	ug/g	ND	98.1	60-130			
1,2-Dichloroethane	3.49	0.05	ug/g	ND	87.1	60-130			
1,1-Dichloroethylene	4.25	0.05	ug/g	ND	106	60-130			
cis-1,2-Dichloroethylene	3.23	0.05	ug/g	ND	80.8	60-130			
trans-1,2-Dichloroethylene	3.61	0.05	ug/g	ND	90.2	60-130			
1,2-Dichloropropane	2.89	0.05	ug/g	ND	72.3	60-130			
cis-1,3-Dichloropropylene	4.30	0.05	ug/g	ND	108	60-130			
trans-1,3-Dichloropropylene	2.88	0.05	ug/g	ND	72.0	60-130			
Ethylbenzene	2.76	0.05	ug/g	ND	69.1	60-130			
Ethylene dibromide (dibromoethane, 1,2-	2.63	0.05	ug/g	ND	65.8	60-130			
Hexane	4.67	0.05	ug/g	ND	117	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.59	0.50	ug/g	ND	85.9	50-140			
Methyl Isobutyl Ketone	6.49	0.50	ug/g	ND	64.9	50-140			
Methyl tert-butyl ether	9.67	0.05	ug/g	ND	96.7	50-140			
Methylene Chloride	3.93	0.05	ug/g	ND	98.4	60-130			
Styrene	2.82	0.05	ug/g	ND	70.5	60-130			
1,1,1,2-Tetrachloroethane	3.23	0.05	ug/g	ND	80.8	60-130			
1,1,2,2-Tetrachloroethane	3.37	0.05	ug/g	ND	84.3	60-130			
Tetrachloroethylene	2.61	0.05	ug/g	ND	65.3	60-130			
Toluene	2.84	0.05	ug/g	ND	71.1	60-130			
1,1,1-Trichloroethane	3.70	0.05	ug/g	ND	92.6	60-130			
1,1,2-Trichloroethane	3.35	0.05	ug/g	ND	83.9	60-130			
Trichloroethylene	2.86	0.05	ug/g	ND	71.5	60-130			
Trichlorofluoromethane	4.48	0.05	ug/g	ND	112	50-140			
Vinyl chloride	4.76	0.02	ug/g	ND	119	50-140			
m,p-Xylenes	6.31	0.05	ug/g	ND	78.9	60-130			
o-Xylene	3.22	0.05	ug/g	ND	80.6	60-130			
Surrogate: 4-Bromofluorobenzene	*3.44*		*ug/g*		*107*	*50-140*			
Surrogate: Dibromofluoromethane	*2.90*		*ug/g*		*90.7*	*50-140*			
Surrogate: Toluene-d8	*3.37*		*ug/g*		*105*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	2.96	0.02	ug/g	ND	74.0	60-130			
Ethylbenzene	2.76	0.05	ug/g	ND	69.1	60-130			
Toluene	2.84	0.05	ug/g	ND	71.1	60-130			
m,p-Xylenes	6.31	0.05	ug/g	ND	78.9	60-130			
o-Xylene	3.22	0.05	ug/g	ND	80.6	60-130			
Surrogate: Toluene-d8	*3.37*		*ug/g*		*105*	*50-140*			

Qualifier Notes:

None

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

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

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.

PARACEL LABORATORIES LTD.

Paracel ID: 2214099

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2214098	№ 128955

Client Name: LRL	Project Ref: 220011	Page 1 of 1
Contact Name: Abdul Kader @lrl.ca	Quote #:	Turnaround Time
Address: 5430 Canotek Rd Ottawa, ON	PO #:	☐ 1 day ☐ 3 day
	E-mail: akader@lrl.ca awood@lrl.ca	☐ 2 day ☒ Regular
Telephone: 613 315 6602		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☒ Table 7	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4	VOCs	BTEX	Metals by ICP	Hg	CrVI	B (HWS)
1	MW22-1/SS3	S		2	28.03.22	P.m	X		X				
2	BH22-3/SS4	↓		↓	↓	P.m	X		X				
3	MW22-4/SS2					P.m	X	X					
4	BH22-5/SS3					A.m	X	X					
5	BH22-6/SS2					A.m	X	X					
6													
7													
8													
9													
10													

Comments:

Method of Delivery: drop box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Abdul Kader	Date/Time:	Date/Time: mar 28 2022 9:45	Date/Time: mar 28 2022 9:54
Date/Time: 28.03.2022/4.20	Temperature: °C	Temperature: 9.2 °C	pH Verified: ☐ By:

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Certificate of Analysis

LRL Associates Ltd.

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

Client PO:
Project: 220011
Custody: 64867

Report Date: 1-Apr-2022
Order Date: 29-Mar-2022

Order #: 2214192

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

Paracel ID	Client ID
2214192-01	MW22-2/SS4
2214192-02	MW22-2/SS10

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 01-Apr-2022

Order Date: 29-Mar-2022

Project Description: 220011

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	30-Mar-22	30-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	30-Mar-22	30-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	29-Mar-22	1-Apr-22
Solids, %	Gravimetric, calculation	30-Mar-22	30-Mar-22

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 01-Apr-2022

Order Date: 29-Mar-2022

Project Description: 220011

	Client ID:	MW22-2/SS4	MW22-2/SS10	-	-
	Sample Date:	29-Mar-22 09:00	29-Mar-22 09:00	-	-
	Sample ID:	2214192-01	2214192-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	80.9	90.3	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene-d8	Surrogate	109%	104%	-	-
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	14	<8	-	-
F4 PHCs (C34-C50)	6 ug/g dry	17	<6	-	-

Certificate of Analysis

Report Date: 01-Apr-2022

Client: LRL Associates Ltd.

Order Date: 29-Mar-2022

Client PO:

Project Description: 220011

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	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: Toluene-d8	*2.98*		*ug/g*		*93.2*	*50-140*			

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 01-Apr-2022

Order Date: 29-Mar-2022

Project Description: 220011

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Physical Characteristics									
% Solids	79.2	0.1	% by Wt.	80.9			2.1	25	
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	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: Toluene-d8	*3.30*		*ug/g*		*99.0*	*50-140*			

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 01-Apr-2022

Order Date: 29-Mar-2022

Project Description: 220011

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	186	7	ug/g	ND	93.2	80-120			
F2 PHCs (C10-C16)	100	4	ug/g	ND	98.7	60-140			
F3 PHCs (C16-C34)	273	8	ug/g	ND	110	60-140			
F4 PHCs (C34-C50)	209	6	ug/g	ND	133	60-140			
Volatiles									
Benzene	3.91	0.02	ug/g	ND	97.8	60-130			
Ethylbenzene	3.24	0.05	ug/g	ND	80.9	60-130			
Toluene	3.08	0.05	ug/g	ND	77.0	60-130			
m,p-Xylenes	7.41	0.05	ug/g	ND	92.6	60-130			
o-Xylene	3.12	0.05	ug/g	ND	78.1	60-130			
Surrogate: Toluene-d8	*2.25*		*ug/g*		*70.3*	*50-140*			

Certificate of Analysis

Report Date: 01-Apr-2022

Client: LRL Associates Ltd.

Order Date: 29-Mar-2022

Client PO:

Project Description: 220011

Qualifier Notes:

None

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

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

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.

PARACEL LABORATORIES LTD

Paracel ID: 2214192

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2214192	№ 64867

Client Name: LRL	Project Ref: 220011	Page 1 of 1
Contact Name: Abdul Kader Alhaj	Quote #:	Turnaround Time
Address: 5430 Canotek Rd Ottawa, ON	PO #:	☐ 1 day ☐ 3 day
	E-mail: akader@lrl.ca jarthurs@lrl.ca	☐ 2 day ☒ Regular
Telephone: 613 315 6602		Date Required:

☐ REG 153/04 ☐ REG 406/19	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☒ Table 7	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: PHC	Required Analysis: BTEX
1	MW22-2/SS4	S		2	29.03.22	A.m	X	X
2	MW22-2/SS10	S		2	29.03.22	A.m	X	X
3								
4								
5								
6								
7								
8								
9								
10								

Comments:

Method of Delivery: Drop box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Abdul Kader	Date/Time:	Date/Time: mar 29 2022 3:05	Date/Time: mar 29 2022 3:14
Date/Time: 29.03.2022 / 3:0	Temperature: °C	Temperature: 19.5 °C	pH Verified: ☐ By:

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Certificate of Analysis

LRL Associates Ltd.

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

Client PO:
Project: 220011
Custody: 64869

Report Date: 5-Apr-2022
Order Date: 30-Mar-2022

Order #: 2214293

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

Paracel ID	Client ID
2214293-01	MW22-1
2214293-02	MW22-10
2214293-03	MW22-2
2214293-04	MW22-4

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 05-Apr-2022

Order Date: 30-Mar-2022

Project Description: 220011

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	1-Apr-22	1-Apr-22
PHC F1	CWS Tier 1 - P&T GC-FID	31-Mar-22	1-Apr-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Apr-22	4-Apr-22
REG 153: VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	5-Apr-22	5-Apr-22

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 05-Apr-2022

Order Date: 30-Mar-2022

Project Description: 220011

	Client ID:	MW22-1	MW22-10	MW22-2	MW22-4
	Sample Date:	30-Mar-22 13:00	30-Mar-22 13:05	30-Mar-22 13:30	30-Mar-22 12:30
	Sample ID:	2214293-01	2214293-02	2214293-03	2214293-04
	MDL/Units	Water	Water	Water	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, 1,2-)	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
1,1,1-Trichloroethane	0.5 ug/L	-	-	-	<0.5

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 05-Apr-2022

Order Date: 30-Mar-2022

Project Description: 220011

	Client ID:	MW22-1	MW22-10	MW22-2	MW22-4
	Sample Date:	30-Mar-22 13:00	30-Mar-22 13:05	30-Mar-22 13:30	30-Mar-22 12:30
	Sample ID:	2214293-01	2214293-02	2214293-03	2214293-04
	MDL/Units	Water	Water	Water	Water
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	-	-	-	110%
Dibromofluoromethane	Surrogate	-	-	-	76.4%
Toluene-d8	Surrogate	-	-	-	110%
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene-d8	Surrogate	109%	108%	109%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	-	-	-	<25
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100 [3]	<100 [3]	<100 [3]	<100 [3]
F3 PHCs (C16-C34)	100 ug/L	<100 [3]	<100 [3]	<100 [3]	<100 [3]
F4 PHCs (C34-C50)	100 ug/L	<100 [3]	<100 [3]	<100 [3]	<100 [3]

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
Volatiles									
Acetone	ND	5.0	ug/L						
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	*88.3*		*ug/L*		*110*	*50-140*			
Surrogate: Dibromofluoromethane	*63.8*		*ug/L*		*79.7*	*50-140*			
Surrogate: Toluene-d8	*88.0*		*ug/L*		*110*	*50-140*			
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	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: Toluene-d8	*88.8*		*ug/L*		*111*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	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	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
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	
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	*89.1*		*ug/L*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*61.3*		*ug/L*		*76.6*	*50-140*			
Surrogate: Toluene-d8	*87.9*		*ug/L*		*110*	*50-140*			
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	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: Toluene-d8	*87.1*		*ug/L*		*109*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1780	25	ug/L	ND	88.9	68-117			
F2 PHCs (C10-C16)	1300	100	ug/L	ND	81.2	60-140			
F3 PHCs (C16-C34)	3310	100	ug/L	ND	84.5	60-140			
F4 PHCs (C34-C50)	2570	100	ug/L	ND	104	60-140			
Volatiles									
Acetone	95.7	5.0	ug/L	ND	95.7	50-140			
Benzene	36.9	0.5	ug/L	ND	91.8	60-130			
Bromodichloromethane	38.0	0.5	ug/L	ND	94.5	60-130			
Bromoform	36.0	0.5	ug/L	ND	89.6	60-130			
Bromomethane	27.6	0.5	ug/L	ND	69.0	50-140			
Carbon Tetrachloride	38.8	0.2	ug/L	ND	96.9	60-130			
Chlorobenzene	35.0	0.5	ug/L	ND	87.0	60-130			
Chloroform	36.0	0.5	ug/L	ND	89.6	60-130			
Dibromochloromethane	36.6	0.5	ug/L	ND	91.6	60-130			
Dichlorodifluoromethane	32.0	1.0	ug/L	ND	80.1	50-140			
1,2-Dichlorobenzene	33.9	0.5	ug/L	ND	84.8	60-130			
1,3-Dichlorobenzene	35.0	0.5	ug/L	ND	87.4	60-130			
1,4-Dichlorobenzene	35.0	0.5	ug/L	ND	87.0	60-130			
1,1-Dichloroethane	38.6	0.5	ug/L	ND	96.5	60-130			
1,2-Dichloroethane	38.1	0.5	ug/L	ND	94.7	60-130			
1,1-Dichloroethylene	38.6	0.5	ug/L	ND	96.5	60-130			
cis-1,2-Dichloroethylene	38.6	0.5	ug/L	ND	96.1	60-130			
trans-1,2-Dichloroethylene	37.7	0.5	ug/L	ND	93.9	60-130			
1,2-Dichloropropane	37.2	0.5	ug/L	ND	92.9	60-130			
cis-1,3-Dichloropropylene	36.9	0.5	ug/L	ND	92.2	60-130			
trans-1,3-Dichloropropylene	36.9	0.5	ug/L	ND	91.8	60-130			
Ethylbenzene	35.4	0.5	ug/L	ND	88.1	60-130			
Ethylene dibromide (dibromoethane, 1,2-	35.1	0.2	ug/L	ND	87.2	60-130			
Hexane	36.0	1.0	ug/L	ND	90.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	87.5	5.0	ug/L	ND	87.5	50-140			
Methyl Isobutyl Ketone	87.3	5.0	ug/L	ND	87.3	50-140			
Methyl tert-butyl ether	93.5	2.0	ug/L	ND	93.5	50-140			
Methylene Chloride	37.3	5.0	ug/L	ND	92.8	60-130			
Styrene	35.2	0.5	ug/L	ND	87.2	60-130			
1,1,1,2-Tetrachloroethane	35.1	0.5	ug/L	ND	87.8	60-130			
1,1,2,2-Tetrachloroethane	33.4	0.5	ug/L	ND	83.1	60-130			
Tetrachloroethylene	36.9	0.5	ug/L	ND	91.9	60-130			
Toluene	35.9	0.5	ug/L	ND	89.8	60-130			
1,1,1-Trichloroethane	38.6	0.5	ug/L	ND	96.5	60-130			
1,1,2-Trichloroethane	36.2	0.5	ug/L	ND	90.1	60-130			
Trichloroethylene	37.5	0.5	ug/L	ND	93.2	60-130			
Trichlorofluoromethane	35.2	1.0	ug/L	ND	88.1	60-130			
Vinyl chloride	33.9	0.5	ug/L	ND	84.8	50-140			
m,p-Xylenes	70.2	0.5	ug/L	ND	87.6	60-130			
o-Xylene	34.2	0.5	ug/L	ND	85.0	60-130			
Surrogate: 4-Bromofluorobenzene	*85.6*		*ug/L*		*107*	*50-140*			
Surrogate: Dibromofluoromethane	*97.8*		*ug/L*		*122*	*50-140*			
Surrogate: Toluene-d8	*77.9*		*ug/L*		*97.4*	*50-140*			

Certificate of Analysis

Client: LRL Associates Ltd.

Client PO:

Report Date: 05-Apr-2022

Order Date: 30-Mar-2022

Project Description: 220011

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	29.7	0.5	ug/L	ND	74.3	60-130			
Ethylbenzene	38.3	0.5	ug/L	ND	95.8	60-130			
Toluene	39.5	0.5	ug/L	ND	98.7	60-130			
m,p-Xylenes	73.4	0.5	ug/L	ND	91.7	60-130			
o-Xylene	36.2	0.5	ug/L	ND	90.5	60-130			
Surrogate: Toluene-d8	*84.4*		*ug/L*		*106*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - 1x vial reads MW22-11; COC reads MW22-4.
Applies to samples: MW22-4

Sample - Received with >5% sediment, instructed to decant and analyze without sediment
Applies to samples: MW22-2

Sample Qualifiers :

3 : Sample decanted prior to analysis due to sediments.

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.

PARACEL LABORATORIES LTD

Paracel ID: 2214293

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2214293	№ 64869

Client Name: LRL	Project Ref: 220011	Page 1 of 1
Contact Name: Abdul Kader	Quote #:	**Turnaround Time**
Address: 5430 Canotek Rd Ottawa, ON	PO #:	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613 315 6602	E-mail: akader@lrl.ca awood@lrl.ca	Date Required:

☐ REG 153/04 ☐ REG 406/19

☐ Table 1 ☒ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table 7
For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: PHC	BTEX	VOC
1	MW22-1	GW		3	30.03.2022	1:0	X	X	
2	MW22-10	↓		↓	↓	1:05	↓	X	
3	MW22-2					1:30		X	
4	MW22-4					12:30			X
5									
6									
7									
8									
9									
10									

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jumeepam Dkrmai	Verified By:
Relinquished By (Print): Abdul Kader	Date/Time:	Date/Time: May 30, 2022 02:33	Date/Time: March 30,22 14:46
Date/Time: 30.03.2022/2:10	Temperature: °C	Temperature: 7.6 °C	pH Verified: ☐ By: