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Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

patersongroup

Phase II Environmental Site Assessment

2046 and 2050 Scott Street
295, 297, 299 and 301 Ashton Avenue
Ottawa, Ontario

Prepared For

Scott Street Developments Inc.

April 24, 2020

Report: PE4892-2R

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the property addressed 2046 and 2050 Scott Street, and 295, 297, 299 and 301 Ashton Avenue, Ottawa, Ontario. Together these properties comprise the Phase II Property. The purpose of the Phase II ESA was to address areas of potential environmental concerns (APECs) identified on the property during the March 2020 Phase I ESA prepared by Paterson, and to delineate soil and groundwater impacts previously identified by others. The Phase II ESA, carried out in conjunction with a Geotechnical Investigation, consisted of the placement of five (5) boreholes across the Phase II Property, with boreholes placed primarily on the northern portion of the site. All of the boreholes, with the exception BH4, were cored into the bedrock and constructed with monitoring well installations to access the groundwater table.

Soil samples obtained from each borehole were screened using visual observations and combustible vapour measurements. Combustible vapour measurements were generally less than 100ppm and not considered to be indicative of potential PHC concentrations. No other visual or olfactory indications of potential contamination were noted. Six (6) soil samples were selected based on the results of the soil screening program in combination with their locations relative to previously identified impacts, and submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4), volatile organic compounds (VOCs) and/or metals (including As, Se, Sb, Hg and CrVI).

Based on the analytical test results, no BTEX or PHC parameters were identified in any of the samples analysed, while metal parameters identified in each of the analysed samples comply with the MECP Table 3 standards. As presented on the drawings in the Figures Section of this report, soil impacted with lead and PHC (F1, F2 and/or F3) concentrations exceeding the MECP Table 3 standards, was previously identified by others on the northern portion of the Phase II Property.

Groundwater samples recovered from monitoring wells MW1 through MW4, previously installed by others, were recovered and submitted for analysis of BTEX or VOC and PHC parameters. Similar to the 2018 findings, analytical test results identified PHC F1, F2 and/or F3 fractions at concentrations exceeding the MECP Table 3 standards in the overburden wells installed at MW1, MW2 and MW4.

While PHC and hexane concentrations exceeding the MECP Table 3 standards were previously identified in MW3, installed at depth within the bedrock, current analytical testing identified no PHC or VOC parameters in the groundwater recovered from MW3.

Groundwater samples recovered from the wells newly installed within the bedrock at BH1, BH2, BH3 and BH5 were also submitted for analytical testing of BTEX or VOCs and PHCs. Based on the analytical test results, no BTEX, VOC or PHC parameters were identified in any of the samples analysed.

Recommendations

Based on the findings of the Phase II ESA, it is recommended that a soil and groundwater remediation program be carried out at the Phase II Property. The remediation can be completed at the time of the construction excavation. It is anticipated that the impacted groundwater will be removed in conjunction with the excavation and removal of the impacted soil and upper levels of the underlying bedrock.

Prior to remedial activities it is recommended that a representative sample of impacted soil be submitted for a leachate analysis in accordance with O.Reg. 347/558, as required for disposal at an approved landfill site. It is also recommended that Paterson personnel be on-site at the time of the remedial activities to direct excavation and segregation of impacted soil, and to collect additional delineation and confirmatory soil samples as required in accordance with O.Reg. 347/558 to support the filing of a Record of Site Condition.

The monitoring wells installed at the Phase II Property will be registered with the MECP under Ontario Regulation 903. It is recommended that the integrity of the monitoring wells be maintained for possible future groundwater monitoring events in advance of the remedial activities. It is anticipated that the monitoring wells will be subsequently removed at the time of the construction excavation.

1.0 INTRODUCTION

At the request of Scott Street Developments Inc., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for the properties addressed 2046 and 2050 Scott Street, and 295, 297, 299 and 301 Ashton Avenue, in the City of Ottawa, Ontario. Together these properties comprise the Phase II Property. The purpose of this Phase II ESA was to address areas of potential environmental concern (APECs) identified in the Phase I ESA conducted by Paterson and dated March 2020.

1.1 Site Description

Address:	2046 and 2050 Scott Street, and 295, 297 to 299 and 301 Ashton Avenue, Ottawa, Ontario
Legal Description:	Lots 22, 23, 28, and 29 on Plan 184, RP5R-11217, in the City of Ottawa.
Property Identification Numbers:	04020-0118 (2046 Scott Street); 04020-0117 (2050 Scott Street); 04020-0109 (295 Ashton Avenue); 04020-0263 and 04020-0264 (297-299 Ashton Avenue); and 04020-0111 (301 Ashton Avenue).
Location:	The Phase II Property, situated approximately 40m east of Winona Avenue, is bounded to the north and south by Scott Street and Ashton Avenue, in the City of Ottawa, Ontario. Refer to Figure 1 - Key Plan in the Figures section following the text.
Latitude and Longitude:	45° 23’ 43.49" N, 75° 45' 13.46" W
Configuration:	Irregular
Site Area:	2,432 m^2 (approximate)

1.2 Property Ownership

The subject property is currently owned by 347313 Canada Inc. and 2662118 Ontario Inc. Paterson was retained by Mr. Jakub Ulak of Scott Street Developments Inc., to complete this Phase II ESA. Mr. Ulak can be contacted by telephone at 613-255-5507.

1.3 Current and Proposed Future Uses

The Phase II Property is currently used for both residential and commercial purposes. The commercial properties occupy the northern portion of the Phase II Property and are occupied by Bob Peter's Garage (2046 Scott Street) and Chinook Hot Tubs & Saunas (1050 Scott Street), while the residential properties occupy the southern portion of the Phase II Property and front onto Ashton Avenue. It is our understanding that the Phase II Property will be redeveloped with a multi-storey residential building with 2 or 3 levels of underground parking.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ontario Ministry of the Environment (MECP), April 2011. The MECP Table 3 Residential Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions;
- ❒ Full depth generic site conditions;
- ❒ Non-potable groundwater conditions; and
- ❒ Residential land use.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is located in an urban area surrounded by various sized commercial and residential structures. Site topography is relatively flat and at a similar grade as the adjacent properties, while the regional topography slopes gently down to the north-northwest towards the Ottawa River. Site drainage consists primarily of sheet flow to catch basins along Scott Street and Ashton Avenue. The Phase II Property is situated within a municipally serviced area.

2.2 Past Investigations

Paterson conducted a Phase I ESA for the Phase I Property, dated March 2020. As part of the Phase I ESA Paterson reviewed previous subsurface investigations conducted by others for 2046 and 2050 Scott Street. The findings of these reports identified lead and/or petroleum hydrocarbon impacted soil at the Scott Street properties, while impacted groundwater was identified within the overburden at 2050 Scott Street. Additional details of the previous investigations are provided in the Phase I ESA. Analytical test results reported in the previous investigations are presented on the drawings provided in the Figures Section of this report.

Based on the findings of the March 2020 Phase I ESA, several historical on-site and off-site potentially contaminating activities (PCAs) were considered to result in six areas of potential environmental concern (APECs) on the subject property, as shown in Table 1 below.

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1: Resulting from automotive service garage at 2046 Scott Street	Northeastern portion of Phase I Property	PCA: 52 – Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	On-site	BTEX PHC (F1-F4) VOCs	Soil, Groundwater
APEC 2: Resulting from former engine shop and pump service station	Northwestern portion of Phase I Property	PCA: 52 – Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	On-site	BTEX PHC (F1-F4) VOCs	Soil, Groundwater
APEC 3: Resulting from former underground storage tank and pump service station (UST)	Northeastern portion of the Phase I Property	PCA: 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHC (F1-F4)	Soil, Groundwater
APEC 4: Resulting from fill material	Northern portion of Phase I Property	PCA: 30 - Importation of Fill Material of Unknown Quality	On-site	Metals As, Sb, Se, Hg, CrVI PAHs	Soil
APEC 5: Resulting from weigh scale on adjacent property to east	Northeastern portion of Phase I Property	PCA: Other – unknown operations in vicinity of former weigh-scale on adjacent property to the east	Off-site	BTEX PHC (F1-F4)	Groundwater

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 6: Resulting from reported former automotive service garage on adjacent property to the west	Northwestern portion of the Phase I Property	PCA: 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-site	BTEX PHC (F1-F4) VOC	Groundwater

A Phase II ESA was recommended to address the aforementioned APECs and to delineate soil and groudnwater impacts previously identified on site. The APECs are outlined in red on Drawing PE4892-1 – Site Plan, appended to the Phase I ESA report.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was carried out on March 19 and March 20, 2020 in conjunction with a Geotechnical Investigation and consisted of drilling five (5) boreholes across the Phase II Property. The boreholes were completed to depths ranging from approximately 2.3 to 12m below ground surface (mbgs). Four (4) boreholes were cored into the bedrock and completed with monitoring well installations in order to access the groundwater table.

3.2 Media Investigated

During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing these media is based on the Contaminants of Potential Concern (CPCs) identified in the Phase I ESA.

As noted in Table 1 in Section 2.2, CPCs for soil and groundwater include benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, fractions F1-F4), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and/or metals (including arsenic, antimony, selenium, mercury and hexavalent chromium).

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on the information from NRCAN, bedrock in the area of the site consists of interbedded limestone and dolomite of the Gull River Formation. Based on the maps, the surficial geology consists of plain till with an overburden thickness ranging from 2 to 3 m. The geological setting reported by NRCAN is supported by the findings of previous subsurface investigations.

Based on regional topography, the location of the Ottawa River approximately 530m to the west of the Phase I Property at its closest point, and our knowledge of the Ottawa area, the groundwater flow in the vicinity of the Phase I Property is expected to be to the northwest.

Fill Placement

No evidence of fill placement was observed at the time of the site visit. Based on the findings of a previous subsurface investigation, lead-impacted fill material was identified at 2046 Scott Street. The impacted fill material is expected to be associated with material imported for grading purposes during construction.

Water Bodies and Areas of Natural Significance

No areas of natural significance or water bodies were identified on the Phase I Property or within the Phase I Study Area.

Drinking Water Wells

There are no potable water wells on the Phase I Property or within the Phase I Study Area.

Monitoring Wells

Records of two (2) abandoned monitoring wells were identified for the Phase I Property (2046 Scott Street). No other well records were identified for the Phase I Property, although four (4) monitoring wells were observed on the property addressed 2050 Scott Street at the time of the site visit.

Well records were identified for the following properties within the Phase I Study Area: 475 Richmond Road, 309 Athlone Avenue, 320 Bloomfield Avenue and 250 Lanark Avenue. The well records were dated from 2005 to 2018. PCAs have been identified at these properties as shown on Drawing PE4892-2 – Surrounding Land Use Plana appended to the Phase I ESA. As previously discussed, they are not considered to represent APECs on the Phase I Property based on their separation distances and/or orientation relative to the subject land.

Based on the monitoring well records the general stratigraphy in the area of the Phase I Property consists of fill material and/or sand and gravel followed by limestone bedrock. Bedrock was reportedly encountered at depths ranging from approximately 1.2 to 3.1m below grade. Static water levels were not recorded on the well records.

Existing Buildings and Structures

The parcel of land addressed 2046 Scott Street is occupied by a one-storey slab-on-grade building occupied by Bob Peter's Garage. The building, considered to have been constructed in the 1950's, is of concrete block construction with exterior clad-metal siding and a flat, tar-and-gravel style roof. A small storage structure is present at the southeast corner of this parcel of land.

The parcel of land addressed 2050 Scott Street is also occupied by a one-storey slab-on-grade building occupied by Chinook Hot Tubs and Saunas. The building, considered to have been constructed in the 1950's, is of concrete block construction with exterior clad-metal siding and a flat, tar-and-gravel style roof. A small storage shed is situated to the southwest of the building.

The parcel of land addressed 295 Ashton Avenue is occupied by a three-storey residential apartment building with a full basement level. The building, constructed circa 1993-1994, has a poured concrete foundation and is finished on the exterior with red brick and vinyl siding. The roof is sloped and covered with asphaltic shingles.

The parcel of land addressed 297 to 299 Ashton Avenue is occupied by a three (3) storey residential duplex with a full basement level constructed circa 2018. The building has a poured concrete foundation and is finished on the exterior with wood and vinyl siding. The roof is sloped and covered with asphaltic shingles.

The property addressed 301 Ashton Avenue is occupied by a two (2) storey single-family dwelling with a full basement. The dwelling was constructed in 1988 with a poured concrete foundation and is finished on the exterior with brick, vinyl siding and a sloped roof covered with asphaltic shingles.

The buildings are heated with natural gas-fired equipment and/or electrical baseboard heaters. No other buildings or permanent structures are present on the Phase I Property.

Subsurface Structures and Utilities

The Phase I Property is situated in a municipally serviced area. Underground utility services on the subject land include natural gas, electricity, cable, water and sewer services. Services enter the Phase I Property from both Scott Street and Ashton Avenue.

No potable wells or private sewage systems were observed on the properties at the time of the site visit. As noted above, four (4) existing monitoring wells were observed at 2050 Scott Street and an oil-water separator was observed on the interior of 2046 Scott Street. No other subsurface structures were identified at the time of the site visit.

Based on the findings of previous subsurface investigations conducted by others, groundwater was present at shallow depths within the overburden, and at deeper depths within the bedrock. Based on the depth of standard service trenches, underground services may have the potential to create preferential pathways for contaminant migration.

Neighbouring Land Use

Neighbouring land use in the Phase I Study Area consists of a combination of residential, commercial (offices and retail) and community (Granite Curling Club, parks).

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 2.2 of this report, 3 on-site and 2 off-site PCAs are considered to result in 6 APECs on the Phase I Property. The PCAs, APECs and associated contaminants of potential concern (CPCs) are summarized in the Table 1.

As shown in green on Drawing PE4892-2-Surrouding Land Use Plan, appended to the Phase I ESA, additional off-site PCAs were identified within the Phase I Study Area. Based on their separation distances and/or orientations relative to the Phase I Property, they are not considered to represent APECs on the subject land.

Contaminants of Potential Concern

As per Table 1 in Section 2.2, contaminants of potential concern (CPCs) in the soil and/or groundwater beneath the Phase I Property include the following:

- Benzene, ethylbenzene, toluene and xylenes (BTEX);
- Petroleum hydrocarbons (PHCs, Fractions F1-F4);
- Volatile organic compounds (VOCs);
- Polycylcic Aromatic Hydrocarbons (PAHs);
- Metals (including Arsenic, Antimony and Selenium (As, Sb,Se));
- Mercury (Hg); and
- Hexavalent Chromium (CrVI).

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are historical on-site and off-site PCAs that have resulted in APECs on the Phase I Property. Additional off-site PCAs identified within the study area are not considered to represent APECs on the Phase I Properties based on their separation distances and/or orientations relative to the subject land.

A variety of independent sources were consulted as part of this assessment, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

3.4 Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) for this project is included in Appendix 1 of this report. Borehole BH4 was completed on practical refusal to augering at 2.34m below grade and was not completed with an overburden monitoring well as per the SAP. Borehole BH3 was not completed with an overburden monitoring well based on soil observations and the depth at which bedrock was encountered; a monitoring well was instead installed within the upper bedrock to delineate shallow groundwater impacts. Boreholes BH2 and BH3 were to be placed further south of MW1 for horizontal delineation (to the south) of impacts identified at MW1. As discussed below, stockpiled snow limited borehole locations. There were no other deviations from the SAP.

3.5 Impediments

The selection of borehole locations was limited during the field program due to snow stockpiles and trees along the rear of the Scott Street properties, as well services and landscaping on the Ashton Avenue properties. In addition to these impediments, the dense nature of the glacial till material limited the scope of work (as noted above, BH4 was not completed with a monitoring well). No other physical impediments were encountered during the field portion of the Phase II ESA.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted on March 19 and March 20, 2020 in conjunction with a Geotechnical Investigation. The field program consisted of drilling five (5) boreholes across the Phase II Property, to depths ranging from approximately 2.3 to 12m below grade. Four (4) of the boreholes were cored into the bedrock and completed with monitoring well installations to access the groundwater table.

The boreholes were placed to address the aforementioned areas of potential environmental concern (APECs) and to provide coverage of the proposed building footprint. The boreholes were drilled with a track-mounted CME 55 low clearance drill rig. The track-mounted drill rig was provided by George Downing Estate Drilling of Hawkesbury, Ontario. Borehole locations are shown on Drawing PE4892-3 – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of 21 soil samples were obtained from the boreholes by means of direct sampling from auger flights and split spoon sampling. The depths at which auger and split spoon samples were obtained from the boreholes are shown as "**AU**" and "**SS**" on the Soil Profile and Test Data Sheets, appended to this report.

Upon refusal of the augers, boreholes BH1, BH2, BH3 and BH5 were advanced into bedrock using a diamond coring system. An additional 16 rock core samples were recovered and are shown as "**RC**" on the Soil Profile and Test Data Sheets.

Site soils generally consist of asphaltic concrete over fill material, followed by native glacial till (comprised of a silty sand matrix with gravel and cobbles), underlain by limestone bedrock. The fill material present beneath the pavement structure generally consisted of brown silty sand with gravel and extended to depths ranging from approximately 0.76 to 2.4m below grade. No deleterious materials or signs of potential contamination were identified in the fill material. Borehole BH2 was terminated in the glacial till at a depth of approximately 2.34m below grade, while the remaining boreholes were cored into the bedrock to depths ranging from approximately 5.96 to 11.92m below grade.

4.3 Field Screening Measurements

A gastech calibrated to Hexane was used to measure the combustible vapour concentrations in the headspace of all soil samples obtained from the boreholes. The soil vapours were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated, and the peak readings recorded.

The combustible vapour readings were generally less than 100ppm in the soil samples obtained and were not considered to be indicative of potential hydrocarbon impacts. No obvious staining or odours were noted in the soil samples. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

4.4 Groundwater Monitoring Well Installation

Groundwater monitoring wells were installed in 4 boreholes placed on the Phase II Property. The monitoring wells consisted of 32 mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 2 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

Table 2: Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH1	63.31	11.86	10.34-11.86	10-11.86	0.30-10	Flushmount
BH2	63.39	8.71	5.66-8.71	5.66-8.71	0.30-5.66	Flushmount
BH3	63.03	5.92	4.40-5.92	4.00-4.40	0.30-4.00	Flushmount
BH5	63.04	8.86	5.81-8.86	5.45-5.81	0.30-5.45	Flushmount

4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted at BH1, BH2, BH3 and BH5 on March 26, 2020. At this time, water quality parameters were measured in the field using a multi-parameter analyzer. Parameters measured in the field included temperature, pH and electrical conductivity.

Field parameters were measured after each well volume purged. Wells were purged prior to sampling until at least three well volumes had been removed or the field parameters were relatively stable. Stabilized field parameter values are summarized in Table 3.

Table 3: Field Measurement of Water Quality Parameters

Parameter	BH1	BH2	BH3	BH5
Temperature (ºC)	9.5	9.0	6.0	9.3
pH	8.18	7.80	8.51	7.90
Electrical Conductivity (µS/cm)	12.05	12.81	12.48	12.42

Monitoring wells MW1 through MW4, previously installed by others, were sampled prior to the drilling program, March 17, 2020, however field parameters were not measured at this time.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated May 1996. Groundwater samples were obtained from each monitoring well, using dedicated sampling equipment. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation.

Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.7 Analytical Testing

Based on the guidelines outlined in the Sampling and Analysis Plan in Appendix 1, the soil and groundwater samples submitted for analytical testing are presented in Tables 4 and 5.

Table 4: Soil Samples Submitted

Sample ID	Sample Depth and Stratigraphic Unit	Parameters Analyzed				Rationale
		BTEX	PHC (F1-F4)	Metals (As, Sb, and Se)	Hg and CrVI	
BH1-SS5	3.05-3.66m; Glacial Till	X	X			Sample selected based on location in proximity to water table.
BH2-SS4	2.29-2.90m; Glacial Till	X	X			Sample selected for delineation purposes.
BH3-SS2	0.76-1.37m; Fill			X	X	Sample selected to assess fill material.
BH3-SS4	2.29-2.90m; Glacial Till	X	X			Sample selected based on highest vapour reading and for delineation purposes.
BH4-AU1	0-0.61m; Fill			X	X	Sample selected to assess fill material.
BH5-SS2	0.76-1.37m; Fill			X	X	Sample selected to assess fill material.

Table 5: Groundwater Samples Submitted

Sample ID	Screened Interval and Stratigraphic Unit	Parameters Analyzed			Rationale
		BTEX	PHCs (F_1-F_4)	VOCs	
March 17, 2020					
MW1-GW	2.29-3.81m; Glacial Till	X	X		To confirm findings by others.
MW2-GW	1.52-4.57m; Glacial Till	X	X		
MW3-GW	6.09-9.14m; Bedrock	X	X		
MW4-GW	0.91-3.96m; Glacial Till	X	X	X	
March 26, 2020					
BH1-GW1	10.34-11.86m; Bedrock	X	X		Vertical delineation of impacts previously identified in MW3.
BH2-GW1	5.66-8.71m; Bedrock	X	X		Horizontal delineation of impacts previously identified in MW2 and MW4.
BH3-GW1	4.40-5.92m; Bedrock	X	X	X	
BH5-GW1	5.81-8.86m; Bedrock	X	X		

Paracel Laboratories (Paracel), of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA). Paracel is accredited and certified by SCC/CALA for specific tests registered with the association.

4.7 Residue Management

All excavated soil, purge water and fluids from equipment cleaning were retained on-site.

4.8 Elevation Surveying

An elevation survey of all borehole locations was completed by Paterson at the time of the subsurface investigation. All borehole elevations are referenced to the top of spindle of a fire hydrant located on the south side of Scott Street, east of the Phase II Property, with a geodetic elevation of 63.98m.

4.9 Quality Assurance and Quality Control Measures

A summary of quality assurance and quality control (QA/QC) measures, including sampling containers, preservation, labelling, handling, and custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

Site soils generally consist of asphaltic concrete over fill material, underlain by glacial till and limestone bedrock, which was encountered at depths ranging from approximately 2.49 to 3.81m below grade.

Groundwater was encountered within the overburden on the northwestern portion of the Phase II Property at depths ranging from approximately 3.15 to 3.3m below existing grade. Groundwater was encountered in the bedrock at depths ranging from approximately 5.32 to 6.33m below grade.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during groundwater sampling events on March 17 and 26, 2020 using an electronic water level meter. Groundwater levels are summarized below in Table 6. All measurements are relative to the top spindle of the fire hydrant, with geodetic elevation of 63.98m, on the south side of Scott Street, east of the Phase II Property.

Table 6: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
MW1[1]	63.21	0	63.21	March 17, 2020
MW2	63.42	3.15	60.27	
MW3	63.39	6.25	57.14	
MW4	63.56	3.30	60.26	
BH1	63.31	6.31	57.00	March 26, 2020
BH2	63.39	6.33	57.06	
BH3	63.03	5.32	57.71	
BH5	63.04	5.98	57.06	

Notes:
1 – surface water was pooled around the monitoring well location at the time of the sampling event; upon purging the well, the water level was interpreted to be approximately 3.3m

Groundwater contour mapping was completed for groundwater levels measured in the bedrock wells, which is interpreted to be the true groundwater table. The groundwater within the overburden is considered to be representative of a perched groundwater condition. Based on the contour mapping, groundwater flow beneath the Phase II Property appears to flow towards the northwest, as shown on Drawing PE4892-4 – Groundwater Contour Plan. An average horizontal hydraulic gradient of approximately 0.05m/m was calculated.

5.3 Fine-Coarse Soil Texture

Based on field soil observations, fine-grained soil standards are not applicable to the Phase II Property.

5.4 Soil: Field Screening

The combustible vapour readings were generally less than 100ppm in the soil samples obtained and were not considered to be indicative of potential hydrocarbon impacts. No obvious staining or odours were noted in the soil samples and no evidence of deleterious material was identified in the fill material at the borehole locations.

Field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

Based on the findings of the field screening, in combination with sample depth and location, a total of 6 soil samples were submitted for analysis of a combination of BTEX, PHC (F1-F4) and metals. The results of the analytical testing and the selected soil standards are presented in Tables 7 and 8. The laboratory certificates of analysis are provided in Appendix 1.

Table 7: Analytical Test Results – Soil
BTEX and PHCs (Fractions 1 to 4)

Parameter	MDL (ug/g)	Soil Samples (µg/g)			MECP Table 3 Residential Standards (µg/g)
		Mar.19, 2020		Mar.20, 2020	
		BH1-SS5 3.05-3.66m	BH2-SS4 2.29-2.90m	BH3-SS4 2.29-2.90m	
Benzene	0.02	nd	nd	nd	0.2
Ethylbenzene	0.05	nd	nd	nd	2
Toluene	0.05	nd	nd	nd	2.3
Xylenes	0.05	nd	nd	nd	3.1
PHC F1	7	nd	nd	nd	55
PHC F2	4	nd	nd	nd	98
PHC F3	8	nd	nd	nd	300
PHC F4	6	nd	nd	nd	2,800

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

No BTEX or PHC concentrations were identified in the samples analysed. The results comply with the MECP Table 3 standards.

Table 8: Analytical Test Results – Soil
Metals (including As, Sb, Se) Hg, and CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g)				MECP Table 3 Residential Standards (µg/g)
		Mar.19, 2020	Mar.20, 2020			
		BH3-SS2 0.76-1.37m	BH4-AU1 0-0.61m	BH5-SS2 0.76-1.37m	DUP 0.76-1.37m	
Antimony	1.0	nd	1.1	nd	nd	7.5
Arsenic	1.0	3.7	5.0	2.9	2.3	18
Barium	1.0	115	293	173	87.8	390
Beryllium	1.0	nd	nd	nd	nd	4
Boron	1.0	7.7	9.2	5.5	5.6	120
Cadmium	0.5	nd	0.7	nd	nd	1.2
Chromium	1.0	25.9	13.9	14.1	13.0	160
Chromium VI	0.2	nd	nd	nd	nd	8
Cobalt	1.0	8.0	5.9	7.3	5.4	22
Copper	1.0	19.7	21.9	5.8	5.2	140
Lead	1.0	47.4	114	12.3	9.6	120
Mercury	0.1	nd	nd	nd	nd	0.27
Molybdenum	1.0	1.1	1.9	nd	nd	6.9
Nickel	1.0	15.9	13.6	8.5	8.1	100
Selenium	1.0	nd	nd	nd	nd	2.4

Table 8 Continued: Analytical Test Results – Soil
Metals (including As, Sb, Se) Hg, and CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g)				MECP Table 3 Residential Standards (µg/g)
		Mar.19, 2020	Mar.20, 2020			
		BH3-SS2 0.76-1.37m	BH4-AU1 0-0.61m	BH5-SS2 0.76-1.37m	DUP 0.76-1.37m	
Silver	0.5	nd	nd	nd	nd	20
Thallium	1.0	nd	nd	nd	nd	1
Uranium	1.0	nd	nd	nd	nd	23
Vanadium	1.0	33.9	14.7	31.2	27.1	86
Zinc	1.0	47.1	90.4	39.5	30.4	340

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Metal concentrations identified comply with the MECP Table 3 standards.

The maximum concentrations of analyzed parameters in the soil at the Phase II Property, including previous results by others, are summarized below in Table 9.

Table 9: Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Borehole	Depth Interval (m BGS)
Toluene	0.047	MW4	3.1-4
Ethylbenzene	0.17	MW4	3.1-4
Xylenes	1.4	MW4	3.1-4
PHC F1	**82**	MW4	3.1-4
PHC F2	**1,000**	MW4	3.1-4
PHC F3	**2,220**	BH18-09	2.4-2.7
PHC F4	396	BH11-02	1.52
Antimony	1.1	BH4-AU1	0-0.61
Arsenic	5.0	BH4-AU1	0-0.61
Barium	293	BH4-AU1	0-0.61
Boron	13.5	BH18-01	0-1.4
Cadmium	1.0	BH18-06	**0-0.8**
Chromium	2.9	BH18-05	0-0.8
Cobalt	10	BH18-06	0-0.8
Copper	42	BH18-06	0-0.8
Lead	**388**	BH18-06	0-0.8
Molybdenum	1.9	BH4-AU1	0-0.61
Nickel	20	BH18-06	0-0.8
Vanadium	48	BH18-06	0-0.8

Table 9 Continued: Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Borehole	Depth Interval (m BGS)
Zinc	118	BH18-06	0-0.8
Acenaphthene	0.24	MW2	3.1-3.8
Acenaphthylene	0.05	MW2	3.1-3.8
Anthracene	0.16	MW2	3.1-3.8
Benzo[a]anthracene	0.13	BH18-06	0-0.8
Benzo[a]pyrene	0.12	BH18-06	0-0.8
Benzo[b]fluoranthene	0.18	BH18-06	0-0.8
Benzo[g,h,i]perylene	0.10	BH18-06	0-0.8
Benzo[k]fluoranthene	0.10	BH18-06	0-0.8
Chrysene	0.19	BH18-06	0-0.8
Dibenzo[a,h]anthracene	0.03	BH18-06	0-0.8
Fluoranthene	0.32	BH18-06	0-0.8
Fluorene	1.4	MW4	3.1-4
Indeno[1,2,3-cd]pyrene	0.10	BH18-06	0-0.8
Methylnaphthalene (1&2)	29	MW4	3.1-4
Naphthalene	4.1	MW4	3.1-4
Phenathrene	1.3	MW4	3.1-4
Pyrene	0.26	BH18-06	0-0.8

Notes:
- **Bold** – bold and underlined values exceed the MECP Table 3 standards

All other parameter concentrations were below laboratory method detection limits.

5.6 Groundwater Quality

Groundwater samples from MW1 through MW4 (installed by others) and from BH1, BH2, BH3 and BH5, installed during the current investigation, were submitted for laboratory analysis of a combination of PHCs, BTEX and/or VOCs. The groundwater samples were obtained from the screened intervals noted on Table 2.

It should be noted that visual and olfactory indications of petroleum hydrocarbon impacts were identified on the groundwater samples recovered from MW1, MW2 and MW4.

The results of the analytical testing are presented below in Tables 10 and 11. The laboratory certificates of analysis are provided in Appendix 1.

Table 10: Analytical Test Results – Groundwater
BTEX and PHCs (Fractions 1 to 4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) March 17, 2020				MECP Table 3 Standards (µg/L)
		MW1-GW (2.29-3.31m)	MW2-GW (1.52-4.57m)	MW3-GW (6.09-9.14m)	MW4-GW (0.91-3.96m)	
Benzene	0.5	nd	nd	nd	nd	44
Ethylbenzene	0.5	nd	24.5	nd	5.3	2,300
Toluene	0.5	nd	2.0	nd	2.1	18,000
Xylenes	0.5	nd	266	nd	130	4,200
PHC F1	25	nd	680	nd	**763**	750
PHC F2	100	**476**	**2,240**	nd	**27,200**	150
PHC F3	100	**1,680**	**1,530**	nd	**15,400**	500
PHC F4	100	nd	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **bold** – concentration exceeds the MECP Table 3 standard

Table 10 Continued: Analytical Test Results – Groundwater
BTEX and PHCs (Fractions 1 to 4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) March 26, 2020				MECP Table 3 Standards (µg/L)
		BH1-GW1 (10.34-11.86m)	BH2-GW1 (5.66-8.71m)	BH3-GW1 (4.40-5.92m)	BH5-GW1 (5.81-8.86m)	
Benzene	0.5	nd	nd	nd	nd	44
Ethylbenzene	0.5	nd	nd	nd	nd	2,300
Toluene	0.5	nd	nd	nd	nd	18,000
Xylenes	0.5	nd	nd	nd	nd	4,200
PHC F1	25	nd	nd	nd	nd	750
PHC F2	100	nd	nd	nd	nd	150
PHC F3	100	nd	nd	nd	nd	500
PHC F4	100	nd	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

No BTEX concentrations were identified in any of the samples analysed with the exception of Samples MW2-GW and MW4-GW, in which ethylbenzene, toluene and xylene were identified at concentrations below the MECP Table 3 standards.

Petroleum hydrocarbon concentrations (PHC F2, F3 and/or F4) were identified in groundwater Samples MW1-GW, MW2-GW and MW4-GW. With the exception of a PHC F1 concentration identified in MW2-GW, all identified parameter concentrations exceed the MECP Table 3 standards. No PHC concentrations were identified in the remaining groundwater samples analysed.

Table 11: Analytical Test Results – Groundwater
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)		MECP Table 3 Standards (µg/L)
		March 17, 2020	March 26, 2020	
		MW4-GW (0.91-3.96m)	BH3-GW1 (4.40-5.92m)	
Acetone	5.0	nd	nd	130,000
Benzene	0.5	nd	nd	44
Bromodichloromethane	0.5	nd	nd	85,000
Bromoform	0.5	nd	nd	380
Bromomethane	0.5	nd	nd	5.6
Carbon Tetrachloride	0.2	nd	nd	0.79
Chlorobenzene	0.5	nd	nd	630
Chloroform	0.5	nd	nd	2.4
Dibromochloromethane	0.5	nd	nd	82,000
Dichlorodifluoromethane	1.0	nd	nd	4,400
1,2-Dibromoethane	0.2	nd	nd	0.25
1,2-Dichlorobenzene	0.5	nd	nd	4,600
1,3-Dichlorobenzene	0.5	nd	nd	9,600
1,4-Dichlorobenzene	0.5	nd	nd	8
1,1-Dichloroethane	0.5	nd	nd	320
1,2-Dichloroethane	0.5	nd	nd	1.6
1,1-Dichloroethylene	0.5	nd	nd	1.6
cis-1,2-Dichloroethylene	0.5	nd	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	nd	1.6
1,2-Dichloropropane	0.5	nd	nd	16
1,3-Dichloropropene	0.5	nd	nd	5.2
Ethylbenzene	0.5	5.3	nd	2,300
Hexane	1.0	nd	nd	51
Methyl Ethyl Ketone	5.0	nd	nd	470,000
Methyl Isobutyl Ketone	5.0	nd	nd	140,000
Methyl tert-butyl Ether	2.0	nd	nd	1900
Methylene Chloride	5.0	nd	nd	610
Styrene	0.5	nd	nd	1,300
1,1,1,2-Tetrachloroethane	0.5	nd	nd	3.4
1,1,2,2-Tetrachloroethane	0.5	nd	nd	3.2
Tetrachloroethylene	0.5	nd	nd	1.6
Toluene	0.5	2.1	nd	18,000
1,1,1-Trichloroethane	0.5	nd	nd	640
1,1,2-Trichloroethane	0.5	nd	nd	4.7
Trichloroethylene	0.5	nd	nd	1.6
Trichlorofluoromethane	1.0	nd	nd	2,500
Vinyl Chloride	0.5	nd	nd	0.5
Xylenes	0.5	130	nd	4,200

Notes:
- MDL – Method Detection Limit, nd – not detected above the MDL

Other than BTEX concentrations identified in Sample MW4-GW, no VOC parameters were identified in the samples analysed. As noted previously, BTEX concentrations identified comply with the MECP Table 3 standards.

The maximum concentrations of analyzed parameters in the groundwater at the Phase II Property, including concentrations identified during previous investigations, are summarized below in Table 12.

Table 12: Maximum Concentrations – Groundwater

Parameter	Maximum Concentration (µg/g)	Monitoring Well	Depth Interval (m BGS)
Ethylbenzene	24.5	MW2	1.52-4.57
Toluene	2.1	MW4	0.91-3.96
Xylenes	266	MW2	1.52-4.57
PHC, F1	**763**	MW4	0.91-3.96
PHC, F2	**27,200**	MW4	0.91-3.96
PHC, F3	**15,400**	MW4	0.91-3.96
Arsenic	1	MW11-01	3.66-6.7
Barium	50	MW11-01	3.66-6.7
Boron	279	MW11-06	2.74-5.79
Cadmium	1.3	MW11-01	3.66-6.7
Chromium	4	MW11-06	2.74-5.79
Cobalt	44.9	MW11-01	3.66-6.7
Copper	2.3	MW11-01	3.66-6.7
Lead	0.1	MW11-06	2.74-5.79
Molybdenum	11.1	MW11-01	3.66-6.7
Nickel	301	MW11-01	3.66-6.7
Selenium	4	MW11-01	3.66-6.7
Thallium	0.2	MW11-01	3.66-6.7
Uranium	2.9	MW11-06	2.74-5.79
Vanadium	10.1	MW11-06	2.74-5.79
Zinc	227	MW11-01	3.66-6.7
Acenaphthene	3.7	MW2	1.52-4.57
Anthracene	0.63	MW2	1.52-4.57
Benzo(a)pyrene	0.018	MW2	1.52-4.57
Fluorene	2.2	MW1	**2.29-3.81**
Naphthalene	190	MW2	1.52-4.57
Phenanthrene	8.4	MW2	1.52-4.57
Pyrene	0.52	MW2	1.52-4.57
Methylnaphthalene	460	MW2	1.52-4.57

Notes:
- **Bold** – bold and underlined values exceed the MECP Table 3 standards

All other parameter concentrations were below laboratory method detection limits.

5.7 Quality Assurance and Quality Control Results

As per the Sampling and Analysis Plan, a duplicate soil sample was obtained at BH5. The RPD calculations for the original and duplicate sample are provided below in Table 13.

Table 13
QA/QC Calculations – Soil

Parameter	MDL (µg/g)	BH2-SS2	DUP1	RPD (%)	QA/QC Result
Arsenic	1.0	2.9	2.3	23	Outside the acceptable range
Barium	1.0	173	87.8	65	Outside the acceptable range
Boron	1.0	5.5	5.6	1.8	Within the acceptable range
Chromium	1.0	14.1	13.0	8.1	Within the acceptable range
Cobalt	1.0	7.3	5.4	30	Outside the acceptable range
Copper	1.0	5.8	5.2	11	Within the acceptable range
Lead	1.0	12.3	9.6	24.6	Outside the acceptable range
Nickel	1.0	8.5	8.1	4.8	Within the acceptable range
Vanadium	1.0	31.2	27.1	14	Within the acceptable range
Zinc	1.0	39.5	30.4	26	Outside the acceptable range

Notes:
- All other parameter concentrations were below laboratory detection limits for both BH5-SS2 and DUP1, and as such, are within acceptable QA/QC parameters.

Several of the QA/QC results are outside the acceptable range. Based on previous reports, lead impacted fill material is present on the northeastern portion of the Phase II Property. Based on the heterogeneous nature of the fill, pockets of impacted fill are expected to be present across the northern portion of the site. As such, above-noted QA/QC results are not expected to impact the findings of the Phase II ESA.

Overall, the quality of the field data collected during this Phase II-ESA is considered to be sufficient to meet the overall objectives of this assessment.

5.8 Phase II Conceptual Site Model

The following section has been prepared in accordance with the requirements of O.Reg. 153/04, as amended under the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As per Table 1 in section 2.2, the following PCAs are considered to have resulted in 6 APECs on the Phase II Property:

- PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks – this PCA is associated with a former UST situated south of the building addressed 2050 Scott Street on the northwestern portion of the Phase I Property (APEC 3);
- PCA 30 – Importation of Fill Material of Unknown Quality – this PCA is associated with fill material identified at 2046 and 2050 Scott Street, on the northern portion of the Phase I Property, during previous subsurface investigations (APEC 4);
- PCA 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems – this PCA is associated with a current automotive service garage at 2046 Scott Street on the northeastern portion of the Phase I Property (APEC 1); a former engine shop and “Campbell’s pump service station” at 2050 Scott Street on the northwestern portion of the Phase I Property (APEC 2); and a reported former off-site automotive service garage at 323 Winona Avenue (APEC 6).

Although not defined in Table 2 of O.Reg. 153/04, an additional off-site PCA was considered to result in an APEC on the Phase I Property:

- A former weigh-scale was depicted on the adjacent property to the east on the 1956 FIP and a 1965 aerial photograph. Based on the limited information available and unknown nature of the activity in combination with its close proximity to the site, it has been identified as a PCA resulting in APEC 5.

The aforementioned APECs are identified on Drawing PE4892-1 – Site Plan, appended to the Phase I ESA.

Contaminants of Potential Concern

Contaminants of potential environmental concern associated with the aforementioned APECs on the Phase II Property include the following:

- ❒ Benzene, ethylbenzene, toluene and xylenes (BTEX);
- ❒ Petroleum hydrocarbons (PHCs, Fractions F1-F4);
- ❒ Volatile Organic Compounds (VOCs);
- ❒ Polycyclic aromatic hydrocarbons (PAHs);
- ❒ Metals (including hydride-forming compounds (As, Sb, Se));
- ❒ Mercury (Hg); and
- ❒ Hexavalent Chromium (CrVI).

Subsurface Structures and Utilities

The Phase I Property is situated in a municipally serviced area. Underground utility services on the subject land include natural gas, electricity, cable, water and sewer services. Services enter the Phase I Property from both Scott Street and Ashton Avenue.

No potable wells or private sewage systems were observed on the properties at the time of the site visit. As noted above, four (4) existing monitoring wells were observed at 2050 Scott Street and an oil-water separator was observed on the interior of 2046 Scott Street. No other subsurface structures were identified at the time of the site visit. A former underground storage tank (UST) was located adjacent to the south face of the original building structure at 2050 Scott Street. Granular backfill material beneath the original building and building addition, within the area of the former UST, may have contributed to contaminant migration.

Based on standard practice for subsurface utility installation, service trenches are expected to be present approximately 1 to 2 m below existing grade. In general, trench backfill may provide a preferential pathway for contaminant transport if the water table is at or above the base of the trenches. Based on the findings of the Phase II ESA, contaminated groundwater is present at shallow depths within the overburden. Given the location of utility services in relation to impacted areas, utility services are not considered to have significantly contributed to contaminant migration.

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Physical Setting

Site Stratigraphy

The site stratigraphy consists of the following:

- Pavement structure consisting of approximately 25mm asphaltic concrete over fill material, generally consisting of brown silty sand and gravel extending to depths ranging from approximately 0.76 to 2.4m below grade.
- Glacial till (silty sand with gravel and cobbles) to a depth of approximately 2.49 to 3.81m below grade. Borehole BH2 was terminated in this stratigraphic unit on practical auger refusal at 2.34m below grade.
- Limestone bedrock encountered at depths ranging from approximately 2.49 to 3.81m below grade. This is the deepest unit investigated. With the exception of BH2, all boreholes were terminated in this unit at depths ranging from approximately 5.96 to 11.92m below grade. Groundwater was identified in this stratigraphic unit.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered within the Glacial Till layer, at MW1, MW2 and MW4, previously installed by others. This unit is interpreted to represent a perched groundwater condition. Water levels were measured on March 17, 2020 at depths ranging from approximately 3.15 to 3.3m below grade.

Groundwater at the Phase II Property was also encountered within the limestone bedrock at the remaining monitoring well locations. This unit is interpreted to represent an unconfined aquifer. Water levels measured on March 26, 2020 (and March 17, 2020 at MW3) ranged from approximately 5.32 to 6.33m below grade.

Groundwater contour mapping was conducted for groundwater elevations measured at the monitoring wells installed in the bedrock. Groundwater flow at the subject site is towards the northwest, with an average hydraulic gradient of approximately 0.05 m/m.

Approximate Depth to Bedrock

Bedrock was identified at depths ranging from approximately 2.49 to 3.81m below grade.

Approximate Depth to Water Table

Depth to water table at the subject site varies between approximately 3.15 to 3.3m below grade in the overburden (perched groundwater condition) and between 5.32 to 6.33m below grade in the bedrock.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the subject site as the Phase II Property is not within 30m of an environmentally sensitive area, the pH of the subsurface soil is between 5 and 9 and the pH of the subsurface soil is between 5 and 11.

Section 43.1 of the Regulation does not apply to the subject site in that the subject site is not a Shallow Soil Property and is not within 30 m of a water body.

Fill Placement

Fill material was identified across the Phase II Property beneath the asphaltic concrete and extending to depths ranging from approximately 0.76 to 2.4m below grade. The fill material generally consists of silty sand and gravel with some crushed stone and is considered to be associated with the pavement structure and grading at the time of construction.

No visual or olfactory evidence of deleterious materials or contamination were identified in the fill material.

Proposed Buildings and Other Structures

It is our understanding that the Phase II Property will be redeveloped with a multi-storey residential building with 2 to 3 levels of underground parking.

Existing Buildings and Structures

The parcel of land addressed 2046 Scott Street is occupied by a one-storey slab-on-grade building occupied by Bob Peter's Garage. The building, considered to have been constructed in the 1950's, is of concrete block construction with exterior clad-metal siding and a flat, tar-and-gravel style roof. A small storage structure is present at the southeast corner of this parcel of land.

The parcel of land addressed 2050 Scott Street is also occupied by a one-storey slab-on-grade building occupied by Chinook Hot Tubs and Saunas). The building, considered to have been constructed in the 1950's, is of concrete block construction with exterior clad-metal siding and a flat, tar-and-gravel style roof. A small storage shed is situated to the southwest of the building.

The parcel of land addressed 295 Ashton Avenue is occupied by a three-storey residential apartment building with a full basement level. The building, constructed circa 1993-1994, has a poured concrete foundation and is finished on the exterior with red brick and vinyl siding. The roof is sloped and covered with asphaltic shingles.

The parcel of land addressed 297 to 299 Ashton Avenue is occupied by a three (3) storey residential duplex with a full basement level constructed circa 2018. The building has a poured concrete foundation and is finished on the exterior with wood and vinyl siding. The roof is sloped and covered with asphaltic shingles.

The property addressed 301 Ashton Avenue is occupied by a two (2) storey single-family dwelling with a full basement. The dwelling was constructed in 1988 with a poured concrete foundation and is finished on the exterior with brick, vinyl siding and a sloped roof covered with asphaltic shingles.

The buildings are heated with natural gas-fired equipment and/or electrical baseboard heaters. No other buildings or permanent structures are present on the Phase I Property.

Water Bodies and Areas of Natural Significance

There are no natural water bodies or areas of natural significance on or within 30m of the Phase II Property.

Environmental Condition

Areas Where Contaminants are Present

Based on the findings of 2018 subsurface investigations conducted by others, soil impacted with PHC concentrations exceeding the MECP Table 3 standards is present on the northern portion of the Phase II Property, in the immediate vicinity of and/or beneath the commercial buildings. Fill material impacted with a lead concentration exceeding the MECP Table 3 standard was also identified on the northeastern portion of the Phase II Property at this time.

Impacted groundwater was identified beneath the northwestern portion of the Phase II Property in the immediate vicinity of the commercial building addressed 2050 Scott Street. Areas where contaminants are present are identified on Drawings PE4892-5A– Analytical Testing Plan – Soil (BTEX, PHC, VOC and PAH), PE4892-6A – Analytical Testing Plan – Soil (Metals) and PE4892-7A – Analytical Testing Plan – Groundwater (BTEX, PHC, VOC and PAH).

Types of Contaminants

Based on the findings of the Phase II ESA, types of contaminants on or beneath the Phase II Property include PHC F1, F2 and/or F3 in the soil and groundwater and lead in the soil.

It should be noted that cobalt was identified in MW11-01 at a concentration exceeding the MECP Table 3 standard. Based on the results of a second groundwater sampling event, the cobalt concentration identified was below the MECP Table 3 standards. Cobalt is not considered to be a contaminant of concern.

It should also be noted that a hexane concentration exceeding the MECP Table 3 standard was identified in MW4 during a 2018 subsurface investigation conducted by Pinchin. Based on the results of the current Phase II ESA, hexane was not detected in the groundwater at this location and is not considered to be a contaminant of concern.

Contaminated Media

Contaminated media on or beneath the Phase II Property include both soil and perched groundwater within the overburden.

What Is Known About Areas Where Contaminants Are Present

Based on historical information, an underground storage tank (UST) was present on the northwestern portion of the Phase II Property, immediately south of the original portion of commercial building addressed 2050 Scott Street. Impacted soil and groundwater, are present to depths up to 4.57m below grade, within the immediate vicinity of the former UST at 2050 Scott Street.

Soil impacted with PHC F3 is present beneath the automotive service garage at 2046 Scott Street, on the northeastern portion of the Phase II Property, to a depth of at least 2.7m below grade.

Fill material impacted with lead was also identified on the northeastern portion of the Phase II Property, south of the building at 2046 Scott Street. The lead impacted fill was identified at a depth of approximately 0-0.8m below grade. Based on the heterogeneous nature of fill material, pockets of impacted fill material may be present over the northern portion of the Phase II Property.

Distribution and Migration of Contaminants

The approximate horizontal distribution of soil and groundwater contaminants exceeding MECP Table 3 standards, are shown on the following figures:

- Drawing PE4892-5A - Analytical Testing Plan – Soil (BTEX, PHC, VOC and PAHs);
- Drawing PE4892-6A - Analytical Testing Plan – Soil (Metals); and
- Drawing PE4892-7A - Analytical Testing Plan – Groundwater (BTEX, PHC, VOC and PAH).

The approximate vertical distribution of soil and groundwater contaminants exceeding the MECP Table 3 standards are show on the following figures:

- Drawing PE4892-5B - Cross-Section A-A' – Soil (BTEX, PHC, VOC and PAHs); and
- Drawing PE4892 -7B - Cross-Section A-A' – Groundwater (BTEX, PHC, VOC and PAH).

Discharge of Contaminants

The PHC F1, F2 and/or F3 concentrations identified in the soil and groundwater on the northwestern portion of the Phase II Property are considered to have resulted from a leak in the former UST or associated piping/distribution lines, located immediately south of the original portion of the building addressed 2050 Scott Street.

The PHC F3 concentration identified in the soil on the northeastern portion of the Phase II Property, beneath the building addressed 2046 Scott Street, is considered to be associated with the use of the property as an automotive service garage. Petroleum hydrocarbons may have been released directly to the subsurface through leaks in floor drains and/or the oil-water separator.

The lead impacted fill material is considered to have been imported to the site for grading purposes at the time of development. Based on the findings of the 2018 subsurface investigation by Geofirma, brick and possible ash fragments were identified in the fill material on the northeastern portion of the Phase II Property, addressed 2046 Scott Street.

Migration of Contaminants

Based on the findings of the Phase II ESA, soil and shallow/perched groundwater in the overburden is impacted with PHC F1, F2 and/or F3 at concentrations exceeding the MECP Table 3 standards. Based on the analytical test results, groundwater impacts are limited to the groundwater within the overburden and are not considered to have vertically migrated to the deeper bedrock aquifer. As noted previously, impacts are considered to have been released directly to the soil and/or shallow groundwater, from the former UST at 2050 Scott Street. Based on analytical testing, fluctuations in the groundwater level and flow on the northwestern portion of the property may have contributed to limited horizontal migration of the PHC impacts.

Based on analytical testing, PHC F3 impacts on the northeastern portion of the Phase II Property are considered to be limited to the soil beneath the footprint of the automotive service garage. Based on analytical testing and the low solubility of metals, lead impacts identified on the northeastern portion of the Phase II Property are considered to be vertically limited to the fill material, although impacted pockets of fill material may be present across the site.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two (2) ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally.

Given the northern portion of the Phase II Property is covered by asphaltic concrete or building structures, the downward leaching of contaminants by means of the infiltration of precipitation, is not considered to have affected contaminant distribution at the Phase II Property. The seasonal fluctuation of groundwater levels and/or flow is considered to have had the potential to impact contaminant migration at the Phase II Property.

Potential for Vapour Intrusion

Based on the PHC F1 and F2 concentrations identified in the soil and groundwater beneath the building addressed 2050 Scott Street on the northwestern portion of the Phase II Property, there is some potential for vapour intrusion within the building. Given that PHC F3 has a low volatility, the potential for vapour intrusion within the automotive service garage on the northeastern portion of the Phase II Property is considered negligible.

6.0 CONCLUSIONS

A Phase II ESA was conducted for the property addressed 2046 and 2050 Scott Street, and 295, 297, 299 and 301 Ashton Avenue, Ottawa, Ontario. Together these properties comprise the Phase II Property. The purpose of the Phase II ESA was to address areas of potential environmental concerns (APECs) identified on the property during the March 2020 Phase I ESA prepared by Paterson, and to delineate soil and groundwater impacts previously identified by others. The Phase II ESA, carried out in conjunction with a Geotechnical Investigation, consisted of the placement of five (5) boreholes across the Phase II Property, with boreholes placed primarily on the northern portion of the site. All of the boreholes, with the exception BH4, were cored into the bedrock and constructed with monitoring well installations to access the groundwater table.

Soil samples obtained from each borehole were screened using visual observations and combustible vapour measurements. Combustible vapour measurements were generally less than 100ppm and not considered to be indicative of potential PHC concentrations. No other visual or olfactory indications of potential contamination were noted. Six (6) soil samples were selected based on the results of the soil screening program in combination with their locations relative to previously identified impacts, and submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4), volatile organic compounds (VOCs) and/or metals (including As, Se, Sb, Hg and CrVI).

Based on the analytical test results, no BTEX or PHC parameters were identified in any of the samples analysed, while metal parameters identified in each of the analysed samples comply with the MECP Table 3 standards. As presented on the drawings in the Figures Section of this report, soil impacted with lead and PHC (F1, F2 and/or F3) concentrations exceeding the MECP Table 3 standards, was previously identified by others on the northern portion of the Phase II Property.

Groundwater samples recovered from monitoring wells MW1 through MW4, previously installed by others, were recovered and submitted for analysis of BTEX or VOC and PHC parameters. Similar to the 2018 findings, analytical test results identified PHC F1, F2 and/or F3 fractions at concentrations exceeding the MECP Table 3 standards in the overburden wells installed at MW1, MW2 and MW4.

While PHC and hexane concentrations exceeding the MECP Table 3 standards were previously identified in MW3, installed at depth within the bedrock, current analytical testing identified no PHC or VOC parameters in the groundwater recovered from MW3.

Groundwater samples recovered from the wells newly installed within the bedrock at BH1, BH2, BH3 and BH5 were also submitted for analytical testing of BTEX or VOCs and PHCs. Based on the analytical test results, no BTEX, VOC or PHC parameters were identified in any of the samples analysed.

Recommendations

Based on the findings of the Phase II ESA, it is recommended that a soil and groundwater remediation program be carried out at the Phase II Property. The remediation can be completed at the time of the construction excavation. It is anticipated that the impacted groundwater will be removed in conjunction with the excavation and removal of the impacted soil and upper levels of the underlying bedrock.

Prior to remedial activities it is recommended that a representative sample of impacted soil be submitted for a leachate analysis in accordance with O.Reg. 347/558, as required for disposal at an approved landfill site. It is also recommended that Paterson personnel be on-site at the time of the remedial activities to direct excavation and segregation of impacted soil, and to collect additional delineation and confirmatory soil samples as required in accordance with O.Reg. 347/558 to support the filing of a Record of Site Condition.

The monitoring wells installed at the Phase II Property will be registered with the MECP under Ontario Regulation 903. It is recommended that the integrity of the monitoring wells be maintained for possible future groundwater monitoring events in advance of the remedial activities. It is anticipated that the monitoring wells will be subsequently removed at the time of the construction excavation.

7.0 STATEMENT OF LIMITATIONS

This Phase II - Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04 as amended by the Environmental Protection Act and meets the requirements of CSA Z769-00. The conclusions presented herein are based on information gathered from a limited sampling and testing program. The test results represent conditions at specific test locations at the time of the field program.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes themselves.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Scott Street Developments Inc. Notification from Scott Street Developments Inc. and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Karyn Munch, P.Eng., QP$_{ESA}$

Mark D'Arcy, P.Eng., QP$_{ESA}$

Report Distribution:

- ❒ Scott Street Development Inc.
- ❒ Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4892-3 – TEST HOLE LOCATION PLAN

DRAWING PE4892-4 – GROUNDWATER CONTOUR PLAN

DRAWING PE4892-5A – ANALYTICAL TESTING PLAN – SOIL (BTEX, PHC, VOC AND PAH)

DRAWING PE4892-5B – CROSS-SECTION A-A' – SOIL (BTEX, PHC, VOC AND PAH)

DRAWING PE4892-6A – ANALYTICAL TESTING PLAN – SOIL (METALS)

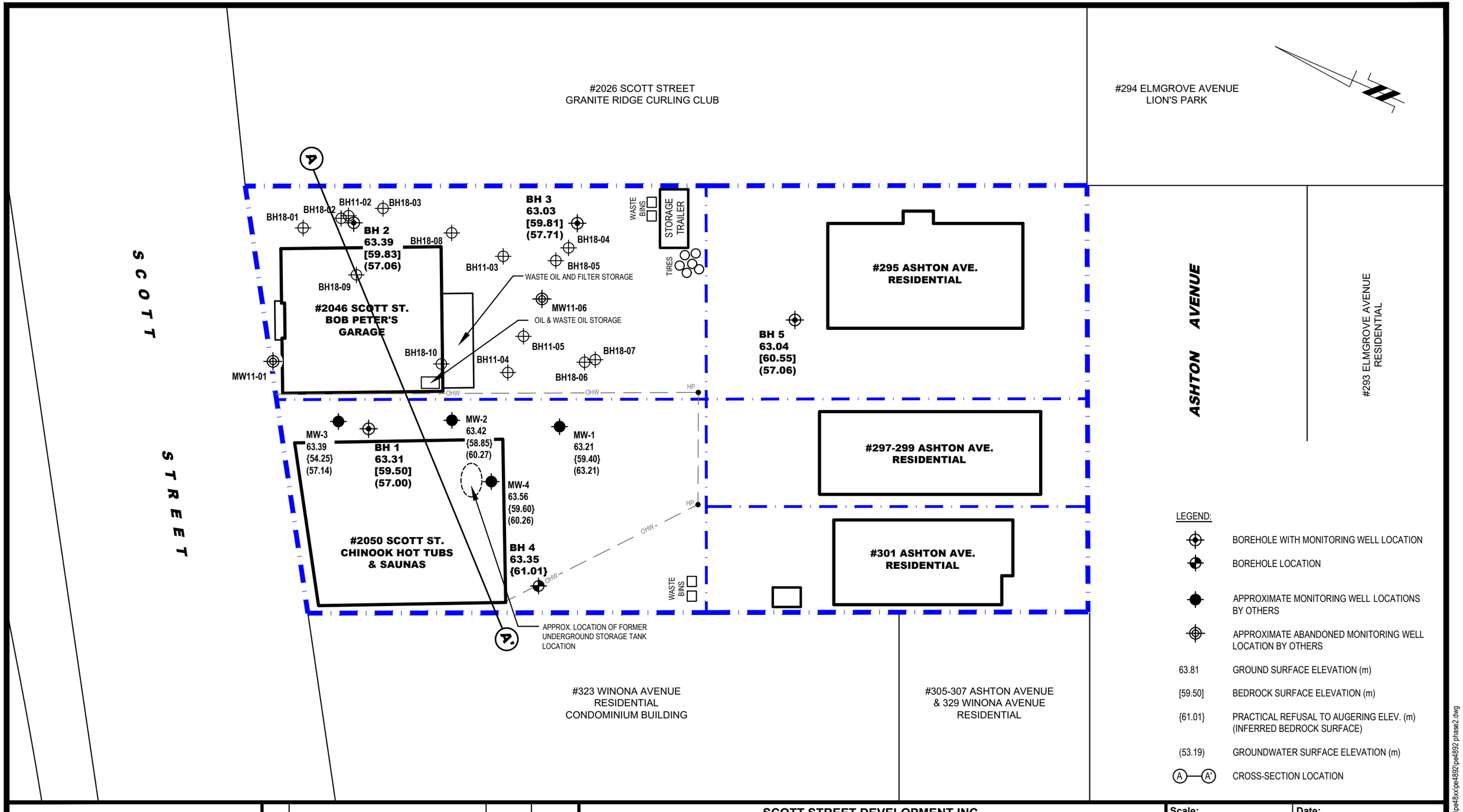
DRAWING PE4892-6B – CROSS-SECTION A-A' – SOIL (METALS)

DRAWING PE4892-7A – ANALYTICAL TESTING PLAN – GROUNDWATER (BTEX, PHC, VOC AND PAH)

DRAWING PE4892-7B – CROSS-SECTION B-B' – GROUNDWATER (BTEX, PHC, VOC AND PAH)

DRAWING PE4892-8A – ANALYTICAL TESTING PLAN – GROUNDWATER (METALS)

DRAWING PE4892-8B – CROSS-SECTION A-A' – GROUNDWATER (METALS)



LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS BY OTHERS
- APPROXIMATE ABANDONED MONITORING WELL LOCATION BY OTHERS
- 63.81 — GROUND SURFACE ELEVATION (m)
- [59.50] — BEDROCK SURFACE ELEVATION (m)
- {61.01} — PRACTICAL REFUSAL TO AUGERING ELEV. (m) (INFERRED BEDROCK SURFACE)
- (53.19) — GROUNDWATER SURFACE ELEVATION (m)
- A — A' — CROSS-SECTION LOCATION

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-3
Approved by: MSD	Revision No.:

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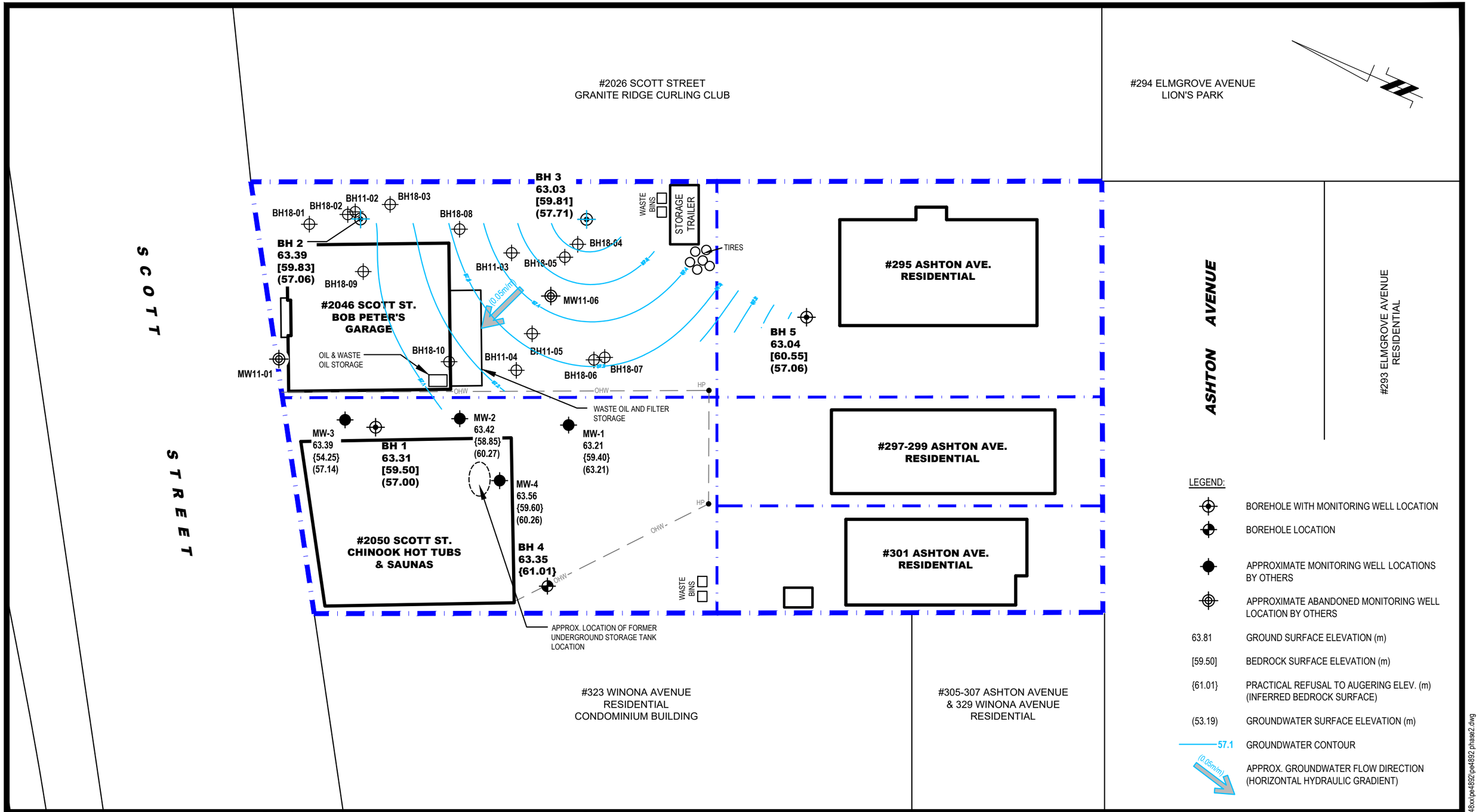

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS BY OTHERS
- APPROXIMATE ABANDONED MONITORING WELL LOCATION BY OTHERS
- 63.81 — GROUND SURFACE ELEVATION (m)
- [59.50] — BEDROCK SURFACE ELEVATION (m)
- {61.01} — PRACTICAL REFUSAL TO AUGERING ELEV. (m) (INFERRED BEDROCK SURFACE)
- (53.19) — GROUNDWATER SURFACE ELEVATION (m)
- 57.1 — GROUNDWATER CONTOUR
- (0.05m/m) — APPROX. GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title:
GROUNDWATER CONTOUR PLAN

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-4
Approved by: MSD	Revision No.:

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BH11-03-SA2 (1.52m) Oct. 11, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3

BH2-SS4 (2.29-2.90m) March 19, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

BH11-02-SA2 (1.52m) Oct. 11, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3

BH18-02-3 (1.2-2.4m) April 6, 2018
BTEX and PHC (F1-F4) comply with MECP Table 3

BH18-09-5 (2.4-2.7m) April 6, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F3	2220	300

BTEX and PHC (F1, F2 & F4) comply with MECP Table 3 Standards

BH18-08-5 (2.4-4.3m) April 6, 2018
BTEX and PHC (F1-F4) comply with MECP Table 3

BH18-04-2 (1.2-1.8m) April 6, 2018
BTEX and PHC (F1-F4) comply with MECP Table 3

BH3-SS4 (2.29-2.90m) March 20, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

MW11-06-SA2 (1.52m) Oct. 11, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3

BH11-05-SA2 (1.52m) Oct. 11, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3

#294 ELMGROVE AVENUE
LION'S PARK

ASHTON AVENUE

#293 ELMGROVE AVENUE
RESIDENTIAL

SCOTT STREET

BH11-02
BH18-03
BH18-01
BH18-02
BH18-08
BH18-09
BH18-10
BH11-03
BH18-05
BH18-04
BH11-04
BH18-07
BH18-06
BH11-05
MW11-06
MW11-01
MW-3
63.39
{54.25}
(57.14)
MW-2
63.42
{58.85}
(60.27)
MW-1
63.21
{59.40}
(63.21)
MW-4
63.56
{59.60}
(60.26)

BH 2
63.39
[59.83]
(57.06)

BH 1
63.31
[59.50]
(57.00)

BH 3
63.03
[59.81]
(57.71)

BH 4
63.35
{61.01}

BH 5
63.04
[60.55]
(57.06)

#2046 SCOTT ST.
BOB PETER'S
GARAGE

#2050 SCOTT ST.
CHINOOK HOT TUBS
& SAUNAS

#295 ASHTON AVE.
RESIDENTIAL

#297-299 ASHTON AVE.
RESIDENTIAL

#301 ASHTON AVE.
RESIDENTIAL

WASTE OIL AND
FILTER STORAGE

OIL & WASTE OIL STORAGE

STORAGE
TRAILER

WASTE
BINS

TIRES

OHW

HP

BH18-06-1 (0-0.8m) April 6, 2018
PAHs comply with MECP Table 3 Standards

MW3-SS4 (2.3-3.1m) Nov. 22, 2018
BTEX, PHC (F1-F4), VOCs & PAHs comply with MECP Table 3 Standards

BH1-SS5 (3.05-3.66m) March 19, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

MW1-SS5 (3.1-3.8m) Nov. 22, 2018
BTEX, PHC (F1-F4), VOCs & PAHs comply with MECP Table 3 Standards

MW2-SS5 (3.1-3.8m) Nov. 22, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F2	750	230

BTEX, PHC (F1, F3 & F4), VOCs and PAHs comply with MECP Table 3 Standards

MW4-SS5 (3.1-3.8m) Nov. 22, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F1	82	55
PHC-F2	1000	230

BTEX, PHC (F3 & F4), VOCs and PAHs comply with MECP Table 3 Standards

APPROX. LOCATION OF FORMER
UNDERGROUND STORAGE TANK
LOCATION

#323 WINONA AVENUE
RESIDENTIAL
CONDOMINIUM BUILDING

#305-307 ASHTON AVENUE
& 329 WINONA AVENUE
RESIDENTIAL

LEGEND:

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

SOIL PARAMETERS EXCEED MECP TABLE 3 STANDARDS

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS BY OTHERS
- APPROXIMATE ABANDONED MONITORING WELL LOCATION BY OTHERS
- 63.81 GROUND SURFACE ELEVATION (m)
- [59.50] BEDROCK SURFACE ELEVATION (m)
- {61.01} PRACTICAL REFUSAL TO AUGERING ELEV. (m) (INFERRED BEDROCK SURFACE)
- (53.19) GROUNDWATER SURFACE ELEVATION (m)

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title: ANALYTICAL TESTING PLAN - SOIL
(BTEX, PHCs, VOCs and PAHs)

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-5A
Approved by: MSD	Revision No.:

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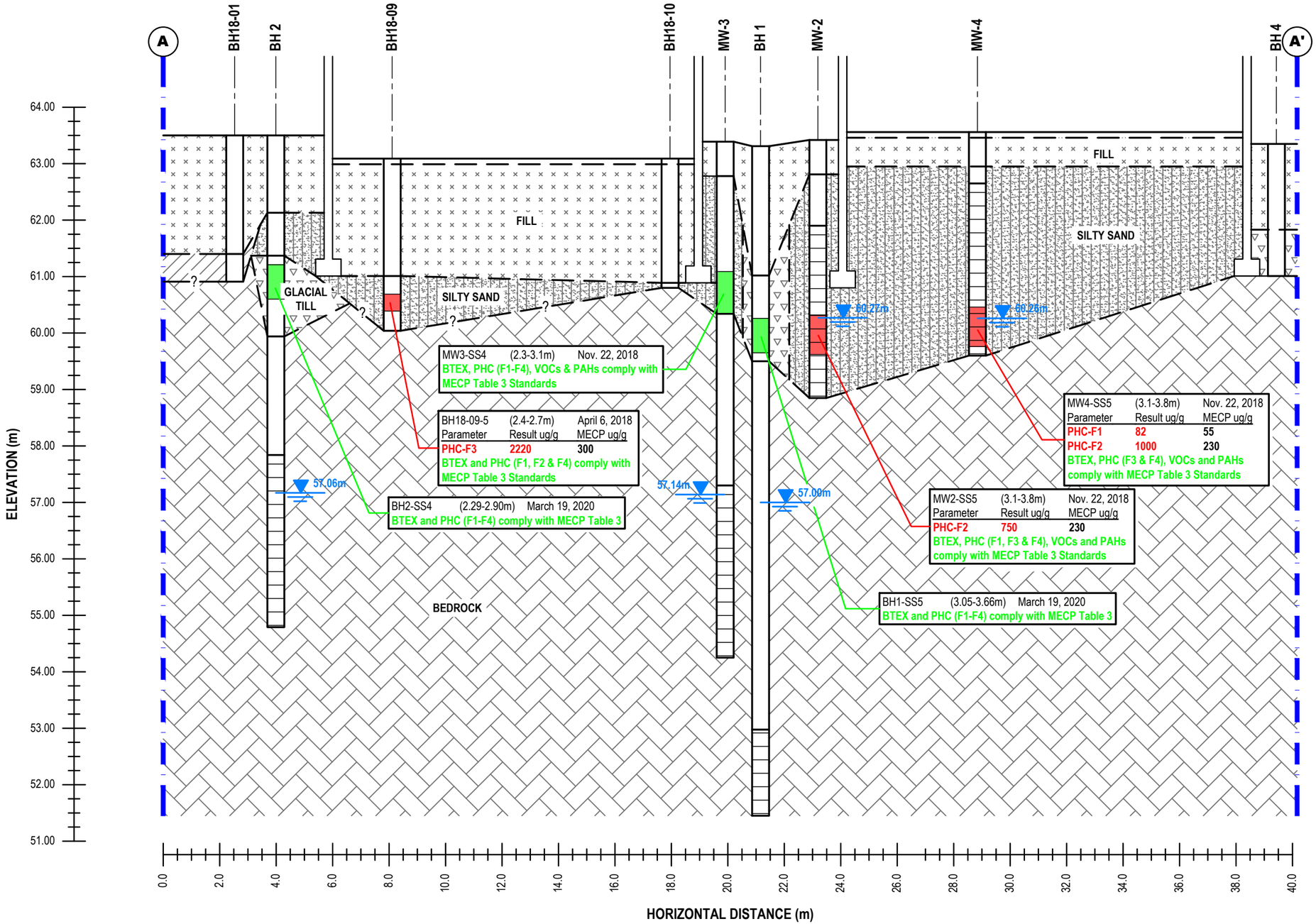

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

SOIL PARAMETERS EXCEED MECP TABLE 3 STANDARDS

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title: CROSS-SECTION A-A' - SOIL (BTEX, PHCs, VOCs and PAHs)

Scale: AS SHOWN	Date: 04/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-5B
Approved by: MSD	Revision No.:

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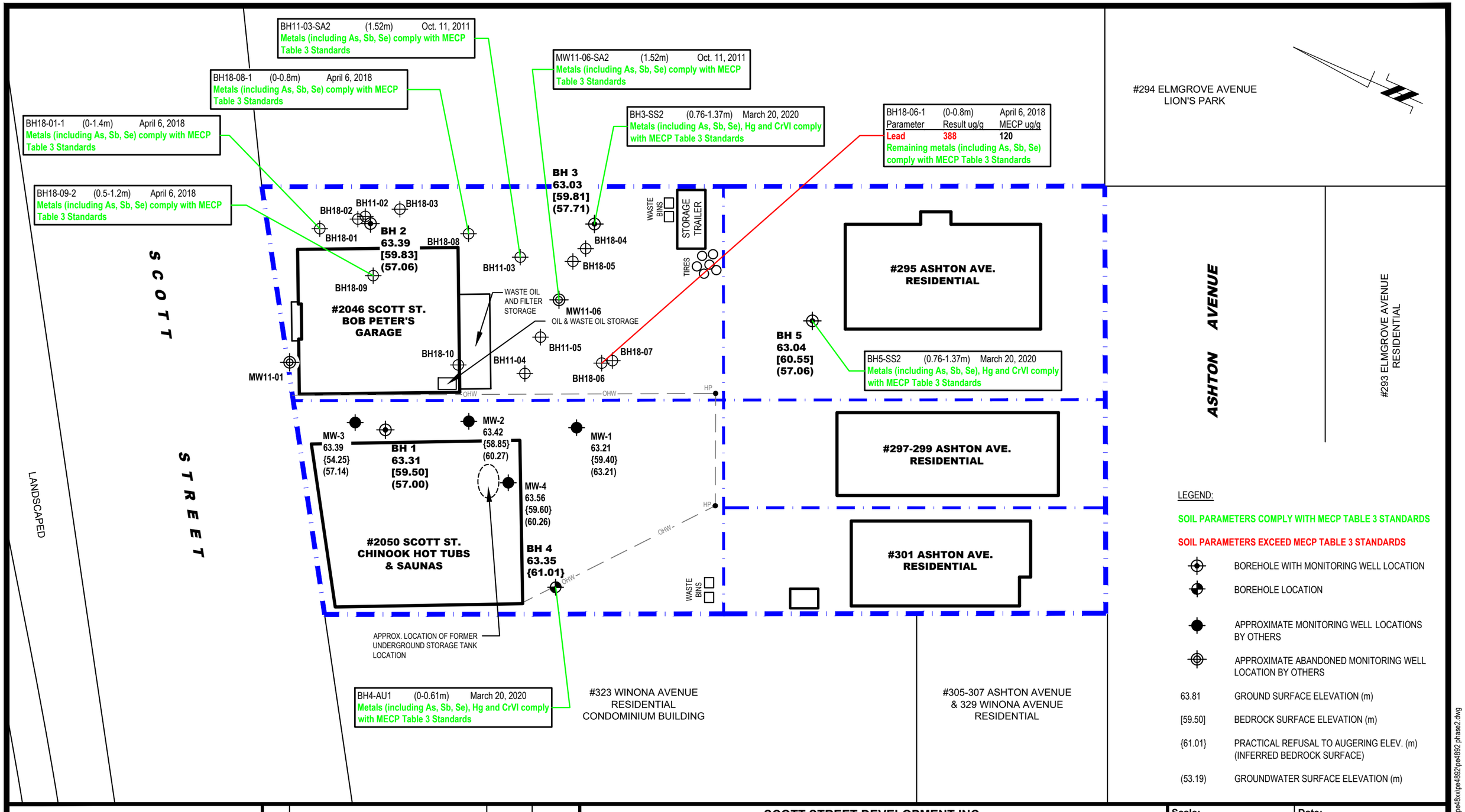

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN - SOIL (METALS)

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-6A
Approved by: MSD	Revision No.:

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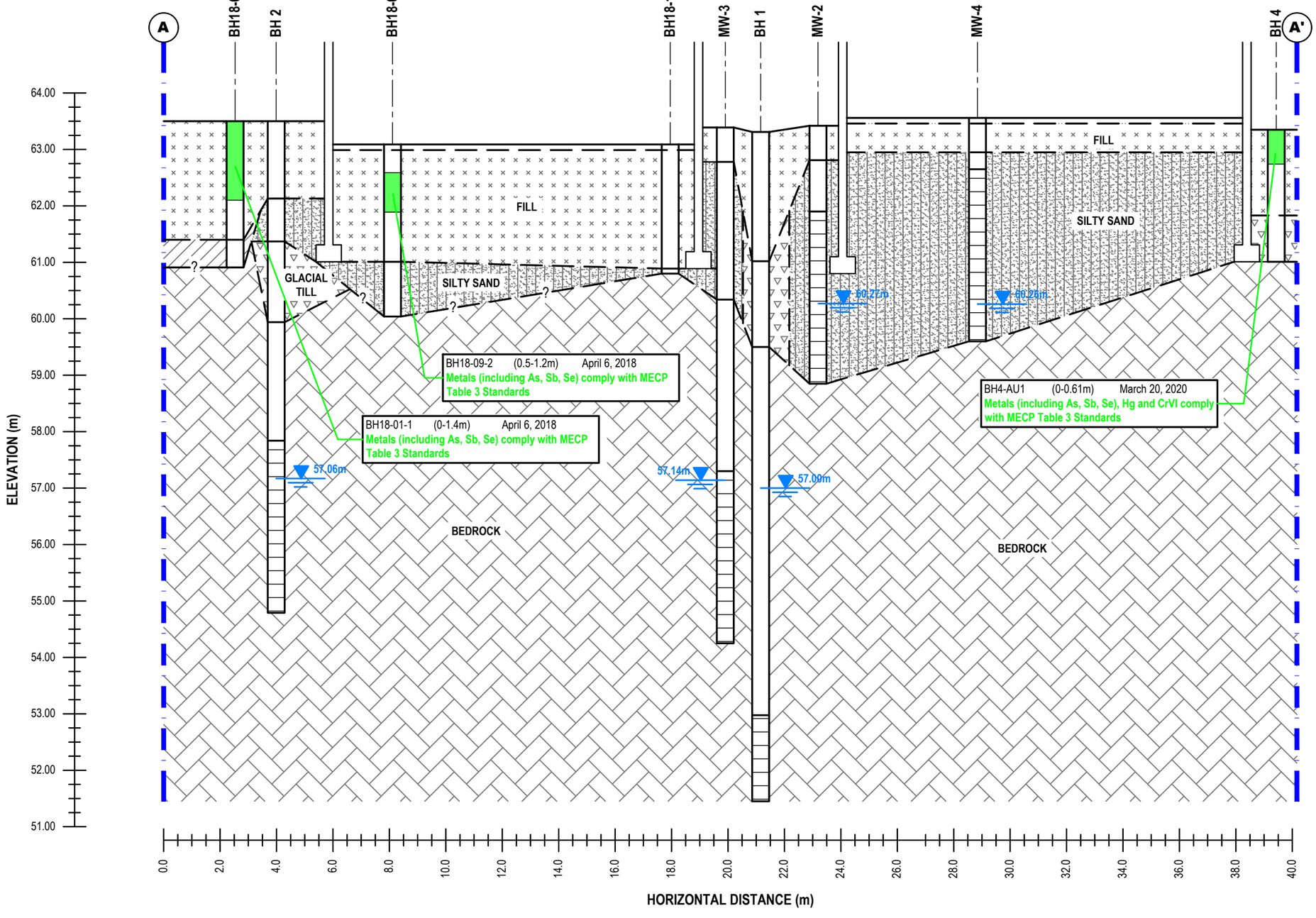

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title:
CROSS-SECTION A-A' - SOIL (METALS)

Scale: AS SHOWN	Date: 04/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-6B
Approved by: MSD	Revision No.:

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MW11-06 (2.74-5.79m) Oct. 13, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3 Standards

BH3-GW1 (4.40-5.92m) March 26, 2020
BTEX, PHC (F1-F4) and VOCs comply with MECP Table 3

BH2-GW1 (5.66-8.71m) March 26, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

#294 ELMGROVE AVENUE
LION'S PARK

BH11-02
BH18-03
BH18-01
BH18-02
BH 2
63.39
[59.83]
(57.06)
BH18-08
BH11-03
BH18-09
BH 3
63.03
[59.81]
(57.71)
BH18-04
BH18-05
MW11-06
WASTE BINS
STORAGE TRAILER
TIRES
WASTE OIL AND FILTER STORAGE
OIL & WASTE OIL STORAGE
BH11-05
BH18-07
BH18-06
BH18-10
BH11-04
MW11-01
MW11-01 (3.66-6.7m) Oct. 13, 2011
BTEX and PHC (F1-F4) comply with MECP Table 3 Standards

#2046 SCOTT ST.
BOB PETER'S
GARAGE

SCOTT STREET

#295 ASHTON AVE.
RESIDENTIAL

BH 5
63.04
[60.55]
(57.06)

BH5-GW1 (5.81-8.86m) March 26, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

ASHTON AVENUE

#293 ELMGROVE AVENUE
RESIDENTIAL

OHW
HP
MW-3
63.39
{54.25}
(57.14)
MW-2
63.42
{58.85}
(60.27)
MW-1
63.21
{59.40}
(63.21)
BH 1
63.31
[59.50]
(57.00)
MW-4
63.56
{59.60}
(60.26)
#297-299 ASHTON AVE.
RESIDENTIAL

MW-3 (6.09-9.14m) Dec. 3, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F2	310	150

BTEX, PHC (F1, F3, F4), VOCs and PAHs comply with MECP Table 3 Standards

MW-3 (6.09-9.14m) March 17, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3 Standards

#301 ASHTON AVE.
RESIDENTIAL

BH 4
63.35
{61.01}
WASTE BINS

#2050 SCOTT ST.
CHINOOK HOT TUBS
& SAUNAS

APPROX. LOCATION OF FORMER UNDERGROUND STORAGE TANK LOCATION

BH1-GW1 (10.34-11.86m) March 26, 2020
BTEX and PHC (F1-F4) comply with MECP Table 3

MW-2 (1.52-4.57m) Dec. 3, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F1	3100	750
PHC-F2	14000	150
PHC-F3	6500	500

BTEX, PHC (F1), VOCs and PAHs comply with MECP Table 3 Standards

MW-2 (1.52-4.57m) March 17, 2020

Parameter	Result ug/g	MECP ug/g
PHC-F2	2240	150
PCH-F3	1530	500

BTEX and PHC (F1, F4) comply with MECP Table 3 Standards

MW-4 (0.91-3.96m) Dec. 3, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F2	750	150
Hexane	95	51

Remaining VOCs, BTEX, PHC (F1, F3, F4) and PAHs comply with MECP Table 3 Standards

MW-4 (0.91-3.96m) March 17, 2020

Parameter	Result ug/g	MECP ug/g
PHC-F1	763	750
PHC-F2	27200	150
PCH-F3	15400	500

BTEX, VOCs and PHC (F4) comply with MECP Table 3 Standards

MW-1 (2.29-3.81m) Dec. 3, 2018

Parameter	Result ug/g	MECP ug/g
PHC-F2	3100	150

BTEX, PHC (F1), VOCs and PAHs comply with MECP Table 3 Standards

MW-1 (2.29-3.81m) March 17, 2020

Parameter	Result ug/g	MECP ug/g
PHC-F2	476	150
PCH-F3	1600	500

BTEX and PHC (F1, F4) comply with MECP Table 3 Standards

#305-307 ASHTON AVENUE
& 329 WINONA AVENUE
RESIDENTIAL

LEGEND:

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS EXCEED MECP TABLE 3 STANDARDS

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS BY OTHERS
- APPROXIMATE ABANDONED MONITORING WELL LOCATION BY OTHERS
- 63.81 GROUND SURFACE ELEVATION (m)
- [59.50] BEDROCK SURFACE ELEVATION (m)
- {61.01} PRACTICAL REFUSAL TO AUGERING ELEV. (m) (INFERRED BEDROCK SURFACE)
- (53.19) GROUNDWATER SURFACE ELEVATION (m)

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title: ANALYTICAL TESTING PLAN - GROUNDWATER (BTEX, PHCs, VOCs and PAHs)

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-7A
Approved by: MSD	Revision No.:

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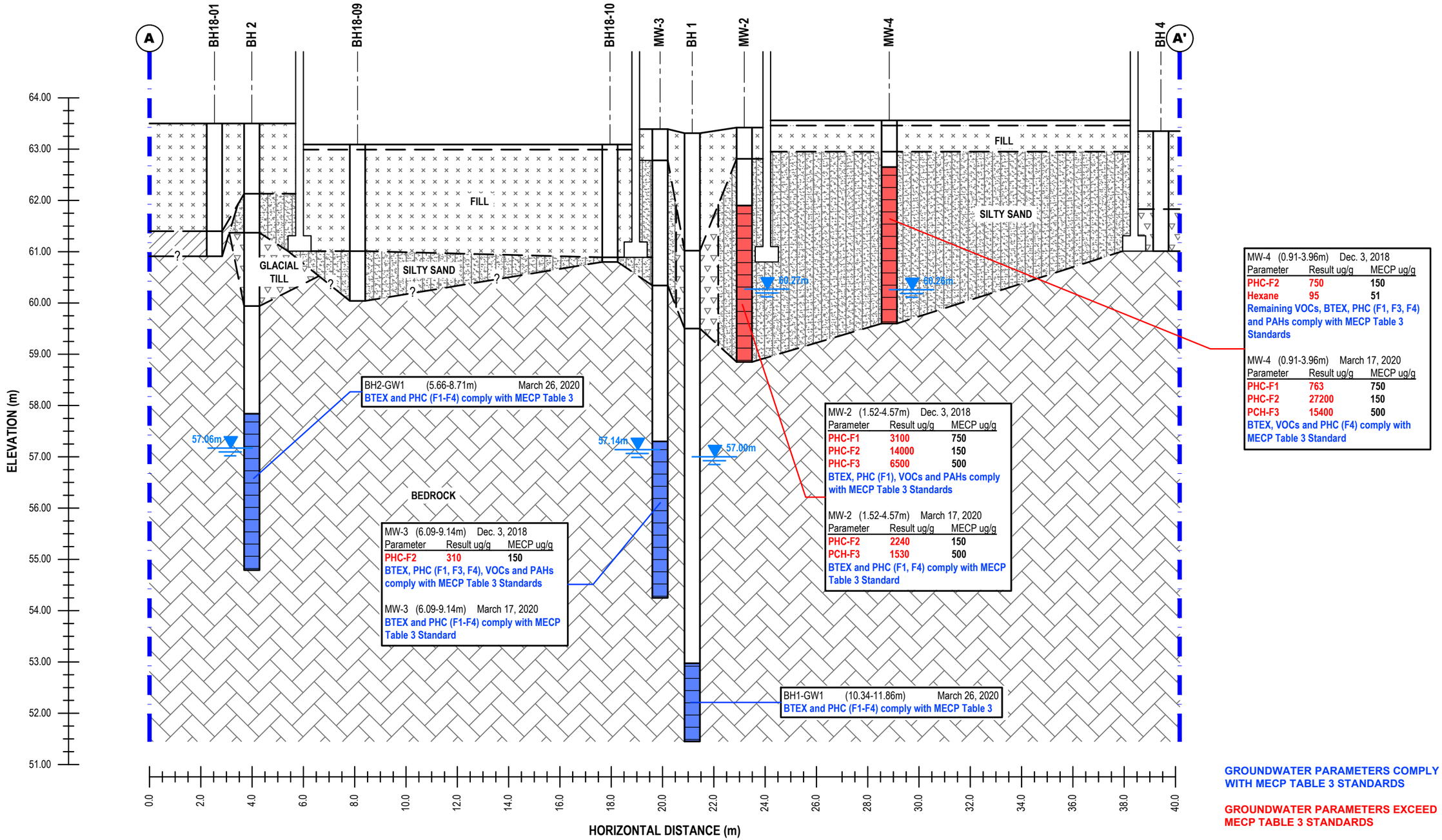

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title: CROSS-SECTION A-A' - GROUNDWATER (BTEX, PHCs, VOCs and PAHs)

Scale: AS SHOWN	Date: 04/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-7B
Approved by: MSD	Revision No.:

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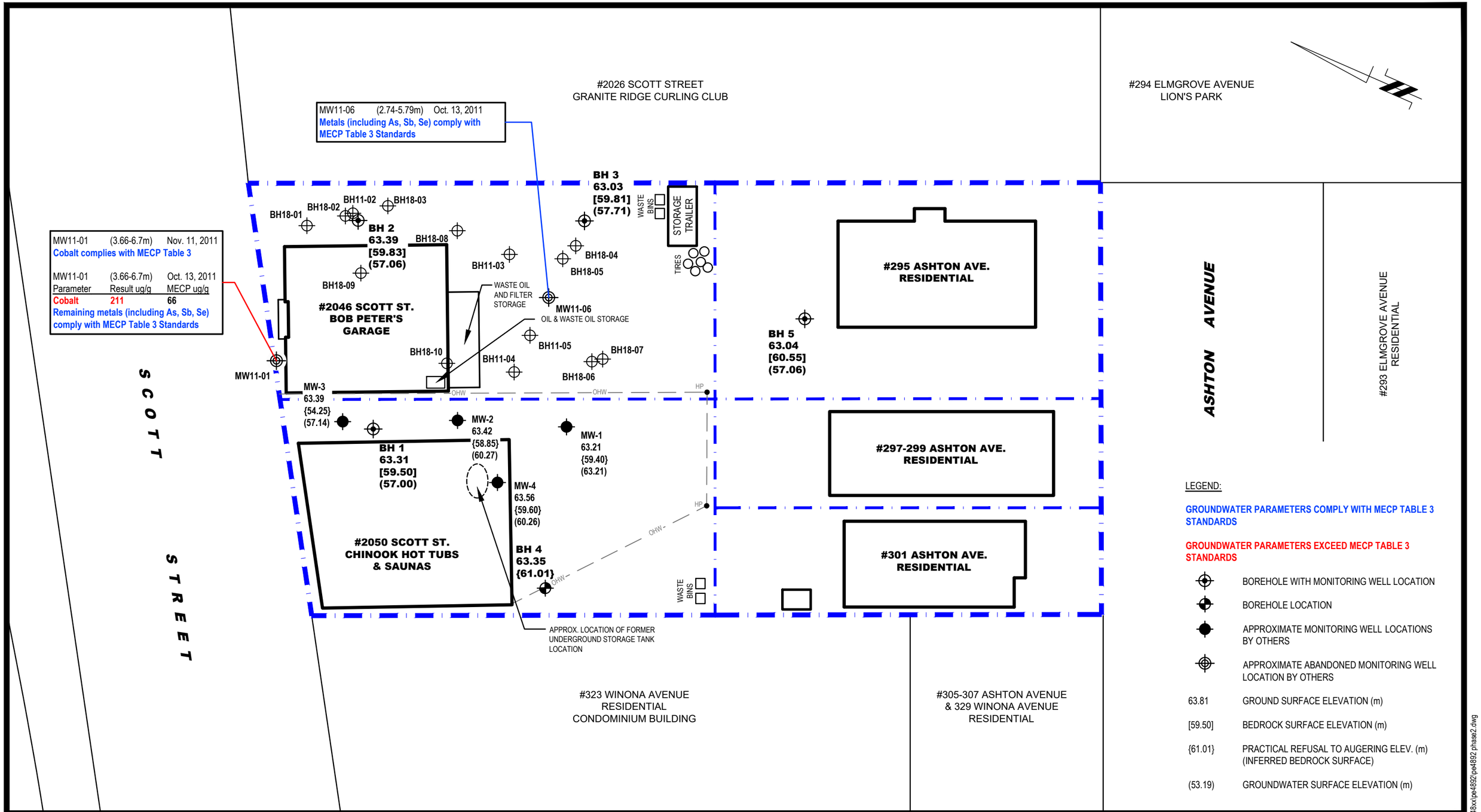

LEGEND:

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS EXCEED MECP TABLE 3 STANDARDS

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS BY OTHERS
- APPROXIMATE ABANDONED MONITORING WELL LOCATION BY OTHERS
- 63.81 GROUND SURFACE ELEVATION (m)
- [59.50] BEDROCK SURFACE ELEVATION (m)
- {61.01} PRACTICAL REFUSAL TO AUGERING ELEV. (m) (INFERRED BEDROCK SURFACE)
- (53.19) GROUNDWATER SURFACE ELEVATION (m)

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title: ANALYTICAL TESTING PLAN - GROUNDWATER (METALS)

Scale: 1:300	Date: 03/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-8A
Approved by: MSD	Revision No.:

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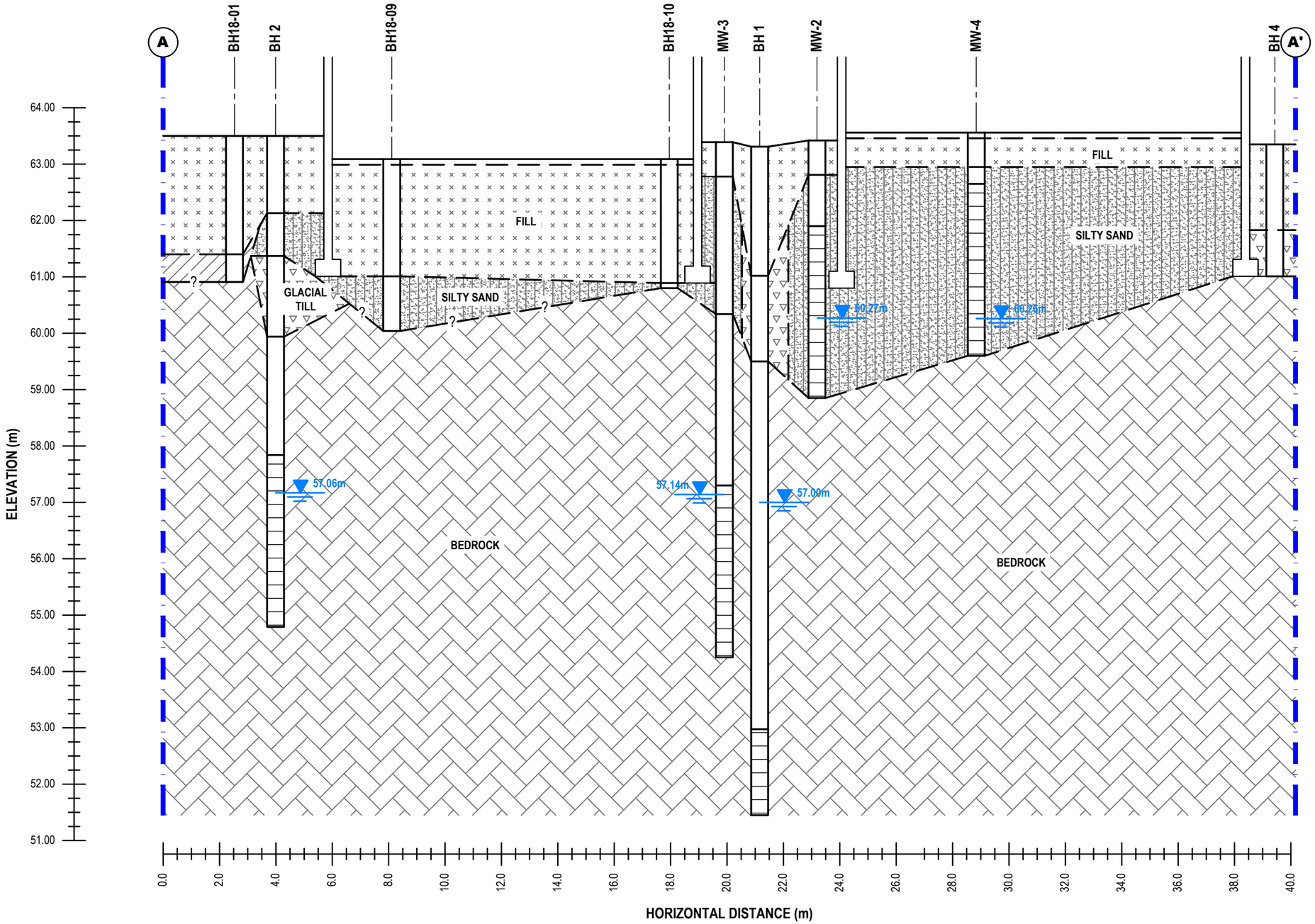

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
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SCOTT STREET DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
2046 & 2050 SCOTT STREET AND 295, 297, 299 & 301 ASHTON AVE.
OTTAWA, ONTARIO

Title:
CROSS-SECTION A-A' - GROUNDWATER (METALS)

Scale: AS SHOWN	Date: 04/2020
Drawn by: MPG	Report No.: PE4892-2
Checked by: KM	PE4892-8B
Approved by: MSD	Revision No.:

11x17

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

patersongroup

Sampling & Analysis Plan

2046 and 2050 Scott Street
295, 297, 299 and 301 Ashton Avenue
Ottawa, Ontario

Prepared For

Scott Street Developments Inc.

March 2020

Report: PE4892-SAP

TABLE OF CONTENTS

1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Scott Street Developments Inc. to conduct a Phase II Environmental Site Assessment (ESA) for the properties addressed 2046 and 2050 Scott Street, as well as 295, 297, 299 and 301 Ashton Avenue, in the City of Ottawa, Ontario. Based on the Phase I ESA conducted by Paterson and a review of previous subsurface investigations conducted by others, a subsurface investigation program consisting of borehole drilling, was developed.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1	Place borehole near existing borehole MW3 for vertical delineation purposes.	Drill to a depth of at least 11m and install a monitoring well with a 1.5m screen, to vertically delineate PHC impacts identified at MW3 during a previous investigation.
BH2	Place borehole east of the central portion of the building at 2046 Scott Street, in the vicinity of PHC impacted soil previously identified.	Drill to a depth of at least 8.5 and install a monitoring well with a 3m screen, for horizontal delineation of impacts previously identified at MW3.
BH3	Place borehole on the northeastern portion of the Phase II Property (2046 Scott Street). Ensure the borehole is situated further to the south of MW1 for delineation purposes.	Drill to bedrock refusal and install an overburden monitoring well to horizontally delineate impacts previously identified in MW1.
BH4	Place borehole on the northwestern portion of the Phase II Property (2050 Scott Street). Ensure the borehole is situated further to the south of MW1 for delineation purposes.	Drill to bedrock refusal and install an overburden monitoring well to horizontally delineate impacts previously identified in MW1.
BH5	Place borehole on the southeastern portion of the Phase II Property (295 Ashton Avenue) for horizontal delineation purposes.	Drill to a depth of at least 8.5m and install a monitoring well with a 3m screen, for horizontal delineation purposes.

At each borehole, split-spoon samples of overburden soils will be obtained at 0.76 m (2'6") intervals until practical refusal to augering. All soil samples will be retained, and samples will be selected for submission following a preliminary screening analysis.

Following borehole drilling, monitoring wells will be installed in selected boreholes (as above) for the measurement of water levels and the collection of groundwater samples. Borehole locations are shown on the Test Hole Location Plan appended to the main report.

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the subject site is based on the following general considerations:

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MOECC site condition standards.
- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.
- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I ESA.

The analytical testing program for groundwater at the subject site is based on the following general considerations:

- ❒ Groundwater monitoring wells should be installed in all boreholes with visual or olfactory evidence of soil contamination, in stratigraphic units where soil contamination was encountered, where those stratigraphic units are at or below the water table (i.e. a water sample can be obtained).
- ❒ Groundwater monitoring well screens should straddle the water table at sites where the contaminants of concern are suspected to be LNAPLs.
- ❒ At least one groundwater monitoring well should be installed in a stratigraphic unit below the suspected contamination, where said stratigraphic unit is water-bearing.
- ❒ Parameters analyzed should be consistent with the Contaminants of Concern identified in the Phase I ESA and with the contaminants identified in the soil samples.

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

The purpose of environmental boreholes is to identify and/or delineate contamination within the soil and/or to install groundwater monitoring wells in order to identify contamination within the groundwater.

Equipment

The following is a list of equipment that is in addition to regular drilling equipment stated in the geotechnical drilling SOP:

- ❒ glass soil sample jars
- ❒ two buckets
- ❒ cleaning brush (toilet brush works well)
- ❒ dish detergent
- ❒ methyl hydrate
- ❒ water (if not available on site - water jugs available in trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

If conditions on site are not as suspected, and planned borehole locations cannot be drilled, **call the office to discuss**. Alternative borehole locations will be determined in conversation with the field technician and supervising engineer.

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a fire hydrant located on Alymer Avenue. with geodetic elevation of 72.57m above sea level (asl).

Drilling Procedure

The actual drilling procedure for environmental boreholes is the same as geotechnical boreholes (see SOP for drilling and sampling) with a few exceptions as follows:

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F1, a soil core from each soil sample which may be analyzed must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.
- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

All sampling equipment (spilt spoons, etc.) must be washed between samples in order to prevent cross contamination of soil samples.

- ❒ Obtain two buckets of water (preferably hot if available)
- ❒ Add a small amount of dish soap to one bucket
- ❒ Scrub spoons with brush in soapy water, inside and out, including tip
- ❒ Rinse in clean water
- ❒ Apply a small amount of methyl hydrate to the inside of the spoon. (A spray bottle or water bottle with a small hole in the cap works well)
- ❒ Allow to dry (takes seconds)
- ❒ Rinse with distilled water, a spray bottle works well.

The methyl hydrate eliminates any soap residue that may be on the spoon, and is especially important when dealing with suspected VOCs.

Screening Procedure

The RKI Eagle is used to screen most soil samples, particularly where petroleum hydrocarbon contamination is suspected. The MiniRae is used when VOCs are suspected, however it also can be useful for detecting petroleum. These tools are for screening purposes only and cannot be used in place of laboratory testing. Vapour results obtained from the RKI Eagle and the PID are relative and must be interpreted.

Screening equipment should be calibrated on an approximately monthly basis, more frequently if heavily used.

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.
- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

- ❒ 5' x 2" [1.52 m x 50 mm] threaded sections of Schedule 40 PVC slotted well screen (5' x 1 ¼" [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ 5' x 2" [1.52 m x 50 mm] threaded sections of Schedule 40 PVC riser pipe (5' x 1 ¼" [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ Threaded end-cap
- ❒ Slip-cap or J-plug
- ❒ Asphalt cold patch or concrete
- ❒ Silica Sand
- ❒ Bentonite chips (Holeplug)
- ❒ Steel flushmount casing

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.
- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).

- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

- ❒ Water level metre or interface probe on hydrocarbon/LNAPL sites
- ❒ Spray bottles containing water and methanol to clean water level tape or interface probe
- ❒ Peristaltic pump
- ❒ Polyethylene tubing for peristaltic pump
- ❒ Flexible tubing for peristaltic pump
- ❒ Latex or nitrile gloves (depending on suspected contaminant)
- ❒ Allen keys and/or 9/16" socket wrench to remove well caps
- ❒ Graduated bucket with volume measurements
- ❒ pH/Temperature/Conductivity combo pen
- ❒ Laboratory-supplied sample bottles

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).

- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The QA/QC program for this Phase II ESA is as follows:

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.
- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).
- ❒ Where groundwater samples are to be analyzed for VOCs, one laboratory-provided trip blank will be submitted for analysis with every laboratory submission.
- ❒ Approximately one (1) field duplicate will be submitted for every ten (10) samples submitted for laboratory analysis. A minimum of one (1) field duplicate per project will be submitted. Field duplicates will be submitted for soil and groundwater samples
- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

The purpose of setting data quality objectives (DQOs) is to ensure that the level of uncertainty in data collected during the Phase II ESA is low enough that decision-making is not affected, and that the overall objectives of the investigation are met.

The quality of data is assessed by comparing field duplicates with original samples. If the relative percent difference (RPD) between the duplicate and the sample is within 20%, the data are considered to be of sufficient quality so as not to affect decision-making. The RPD is calculated as follows:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100\%$$

Where x_1 is the concentration of a given parameter in an original sample and x_2 is the concentration of that same parameter in the field duplicate sample.

For the purpose of calculating the RPD, it is desirable to select field duplicates from samples for which parameters are present in concentrations above laboratory detection limits, i.e. samples which are expected to be contaminated. If parameters are below laboratory detection limits for selected samples or duplicates, the RPD may be calculated using a concentration equal to one half (0.5 x) the laboratory detection limit.

It is also important to consider data quality in the overall context of the project. For example, if the DQOs are not met for a given sample, yet the concentrations of contaminants in both the sample and the duplicate exceed the MOE site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired. The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples.

These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

- ❒ The location of underground utilities
- ❒ Poor recovery of split-spoon soil samples
- ❒ Insufficient groundwater volume for groundwater samples
- ❒ Breakage of sampling containers following sampling or while in transit to the laboratory
- ❒ Elevated detection limits due to matrix interference (generally related to soil colour or presence of organic material)
- ❒ Elevated detection limits due to high concentrations of certain parameters, necessitating dilution of samples in laboratory
- ❒ Drill rig breakdowns
- ❒ Winter conditions
- ❒ Other site-specific impediments

Site-specific impediments to the Sampling and Analysis plan are discussed in the body of the Phase II ESA report.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2046 & 2050 Scott St. and 295-301 Ashton Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4892

REMARKS

HOLE NO. BH 1

BORINGS BY CME-55 Low Clearance Drill **DATE** March 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	63.31
FILL: Brown silty sand with crushed stone, grave and cobbles		AU	1				
		SS	2	46	52	1	62.31
		SS	3	42	71	2	61.31
2.29							
GLACIAL TILL: Dense, brown silty sand with gravel, some cobbles		SS	4	54	40	3	60.31
		SS	5	24	55		
3.81						4	59.31
		RC	1	100	71		
						5	58.31
		RC	2	100	89		
						6	57.31
		RC	3	100	85		
BEDROCK: Fair to good quality, grey limestone						7	56.31
		RC	4	100	55	8	55.31
						9	54.31
		RC	5	100	79		
						10	53.31
		RC	6	100	71	11	52.31
11.86							
End of Borehole							
(GWL @ 6.31m - March 26, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

Monitoring Well Construction

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2046 & 2050 Scott St. and 295-301 Ashton Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4892

REMARKS

HOLE NO. BH 2

BORINGS BY CME-55 Low Clearance Drill **DATE** March 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	63.39
25mm Asphaltic concrete		AU	1				
FILL: Brown silty sand with crushed stone		SS	2	25	13	1	62.39
1.37							
Loose, brown **SILTY SAND**		SS	3	46	4	2	61.39
2.13							
GLACIAL TILL: Dense, grey-brown silty sand with gravel and cobbles		SS	4	38	50		
		SS	5	10	47	3	60.39
3.56							
		RC	1	100	34	4	59.39
		RC	2	100	6	5	58.39
BEDROCK: Poor to good quality, grey limestone						6	57.39
		RC	3	100	76	7	56.39
		RC	4	100	47	8	55.39
8.71							
End of Borehole							
(GWL @ 6.33m - March 26, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2046 & 2050 Scott St. and 295-301 Ashton Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4892

REMARKS

HOLE NO. BH 3

BORINGS BY CME-55 Low Clearance Drill **DATE** March 20, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Asphaltic concrete 0.05		AU	1			0	63.03
FILL: Brown silty sand with crushed stone		SS	2	17	14	1	62.03
		SS	3	60	50+	2	61.03
2.29		SS	4	56	50+		
GLACIAL TILL: Very dense, brown silty sand with gravel, trace clay 3.22						3	60.03
BEDROCK: Poor to good quality, grey limestone		RC	1	100	47	4	59.03
		RC	2	100	86	5	58.03
5.92							
End of Borehole							
(GWL @ 5.32m - March 26, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**
20 40 60 80

Monitoring Well Construction

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2046 & 2050 Scott St. and 295-301 Ashton Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4892

REMARKS

HOLE NO. BH 4

BORINGS BY CME-55 Low Clearance Drill **DATE** March 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	63.35
FILL: Brown silty sand with crushed stone, trace cobbles		AU	1				
		SS	2	9	50+	1	62.35
1.52							
GLACIAL TILL: Very dense, brown silty sand with gravel and clay		SS	3	33	50+	2	61.35
2.34							
End of Borehole							
Practical refusal to augering at 2.34m depth							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
2046 & 2050 Scott St. and 295-301 Ashton Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4892

REMARKS

HOLE NO. BH 5

BORINGS BY CME-55 Low Clearance Drill **DATE** March 19, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	63.04
Asphaltic concrete 0.08		AU	1				
FILL: Brown silty sand with crushed stone, trace gravel		SS	2	54	8	1	62.04
1.37							
Compact, brown **SILTY SAND**		SS	3	62	28	2	61.04
2.13							
GLACIAL TILL: Dense, brown silty sand with gravel and clay 2.49		SS	4	25	50+		
		RC	1	86	54	3	60.04
						4	59.04
BEDROCK: Fair to good quality, grey limestone		RC	2	100	64	5	58.04
						6	57.04
		RC	3	100	78		
						7	56.04
		RC	4	100	82	8	55.04
8.86							
End of Borehole							
(GWL @ 5.98m - March 26, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

Monitoring Well Construction

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

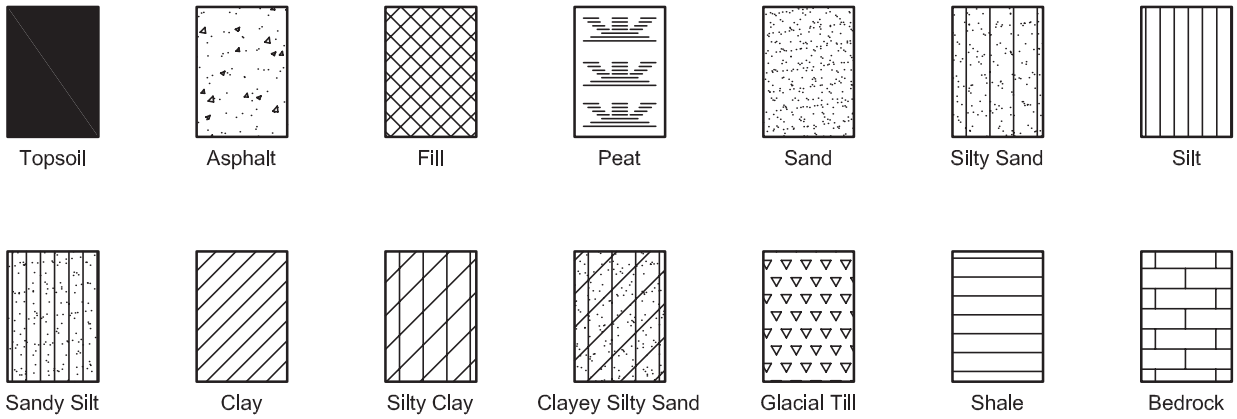
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

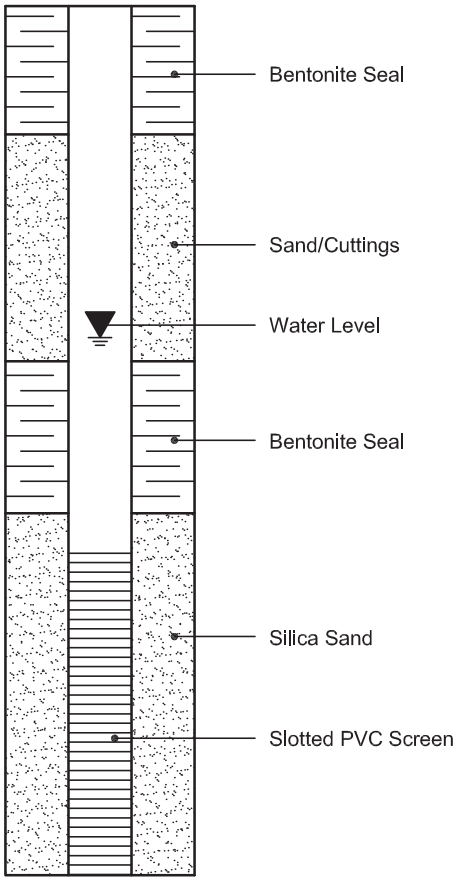
SYMBOLS AND TERMS (continued)

STRATA PLOT

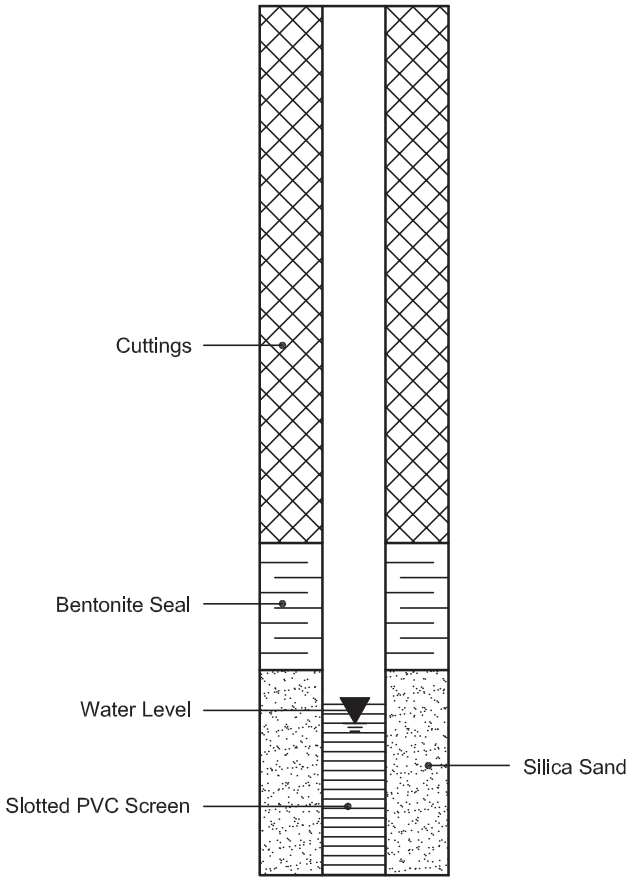


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29712
Project: PE4892
Custody: 126439

Report Date: 30-Mar-2020
Order Date: 24-Mar-2020

Order #: 2013106

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

Paracel ID	Client ID
2013106-01	BH1-SS5
2013106-02	BH2-SS4
2013106-03	BH3-SS2
2013106-04	BH3-SS4
2013106-05	BH4-AU1
2013106-06	BH5-SS2
2013106-07	Dup

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 30-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 24-Mar-2020

Client PO: 29712

Project Description: PE4892

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	25-Mar-20	25-Mar-20
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	24-Mar-20	25-Mar-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	25-Mar-20	25-Mar-20
PHC F1	CWS Tier 1 - P&T GC-FID	25-Mar-20	25-Mar-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-Mar-20	26-Mar-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	25-Mar-20	25-Mar-20
Solids, %	Gravimetric, calculation	30-Mar-20	30-Mar-20

Certificate of Analysis

Report Date: 30-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 24-Mar-2020

Client PO: 29712

Project Description: PE4892

	Client ID:	BH1-SS5	BH2-SS4	BH3-SS2	BH3-SS4
	Sample Date:	19-Mar-20 09:00	19-Mar-20 12:00	20-Mar-20 09:00	20-Mar-20 09:00
	Sample ID:	2013106-01	2013106-02	2013106-03	2013106-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.2	91.0	86.0	90.3
Metals					
Antimony	1.0 ug/g dry	-	-	<1.0	-
Arsenic	1.0 ug/g dry	-	-	3.7	-
Barium	1.0 ug/g dry	-	-	115	-
Beryllium	0.5 ug/g dry	-	-	<0.5	-
Boron	5.0 ug/g dry	-	-	7.7	-
Cadmium	0.5 ug/g dry	-	-	<0.5	-
Chromium	5.0 ug/g dry	-	-	25.9	-
Chromium (VI)	0.2 ug/g dry	-	-	<0.2	-
Cobalt	1.0 ug/g dry	-	-	8.0	-
Copper	5.0 ug/g dry	-	-	19.7	-
Lead	1.0 ug/g dry	-	-	47.4	-
Mercury	0.1 ug/g dry	-	-	<0.1	-
Molybdenum	1.0 ug/g dry	-	-	1.1	-
Nickel	5.0 ug/g dry	-	-	15.9	-
Selenium	1.0 ug/g dry	-	-	<1.0	-
Silver	0.3 ug/g dry	-	-	<0.3	-
Thallium	1.0 ug/g dry	-	-	<1.0	-
Uranium	1.0 ug/g dry	-	-	<1.0	-
Vanadium	10.0 ug/g dry	-	-	33.9	-
Zinc	20.0 ug/g dry	-	-	47.1	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	-	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	-	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	<0.05
Toluene-d8	Surrogate	120%	118%	-	121%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	-	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	<6

Certificate of Analysis

Report Date: 30-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 24-Mar-2020

Client PO: 29712

Project Description: PE4892

	Client ID:	BH4-AU1	BH5-SS2	Dup	-
	Sample Date:	20-Mar-20 09:00	20-Mar-20 12:00	20-Mar-20 09:00	-
	Sample ID:	2013106-05	2013106-06	2013106-07	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	91.6	88.8	90.5	-
Metals					
Antimony	1.0 ug/g dry	1.1	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	5.0	2.9	2.3	-
Barium	1.0 ug/g dry	293	173	87.8	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	9.2	5.5	5.6	-
Cadmium	0.5 ug/g dry	0.7	<0.5	<0.5	-
Chromium	5.0 ug/g dry	13.9	14.1	13.0	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	5.9	7.3	5.4	-
Copper	5.0 ug/g dry	21.9	5.8	5.2	-
Lead	1.0 ug/g dry	114	12.3	9.6	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	1.9	<1.0	<1.0	-
Nickel	5.0 ug/g dry	13.6	8.5	8.1	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	14.7	31.2	27.1	-
Zinc	20.0 ug/g dry	90.4	39.5	30.4	-

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						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
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	*3.77*		*ug/g*		*118*	*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 dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			NC	30	
Arsenic	4.1	1.0	ug/g dry	3.9			4.4	30	
Barium	33.0	1.0	ug/g dry	30.1			9.1	30	
Beryllium	0.6	0.5	ug/g dry	ND			NC	30	
Boron	5.1	5.0	ug/g dry	ND			NC	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	13.3	5.0	ug/g dry	12.6			5.4	30	
Cobalt	6.2	1.0	ug/g dry	5.7			8.3	30	
Copper	13.5	5.0	ug/g dry	12.9			4.2	30	
Lead	7.3	1.0	ug/g dry	6.8			7.7	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	11.5	5.0	ug/g dry	10.8			6.5	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	22.4	10.0	ug/g dry	20.9			7.1	30	
Zinc	32.8	20.0	ug/g dry	31.0			5.5	30	
Physical Characteristics									
% Solids	77.8	0.1	% by Wt.	78.6			1.0	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*4.29*		*ug/g dry*		*120*	*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)	180	7	ug/g	ND	90.1	80-120			
F2 PHCs (C10-C16)	91	4	ug/g	ND	101	60-140			
F3 PHCs (C16-C34)	229	8	ug/g	ND	104	60-140			
F4 PHCs (C34-C50)	115	6	ug/g	ND	83.1	60-140			
Metals									
Antimony	45.4	1.0	ug/g	ND	90.4	70-130			
Arsenic	52.6	1.0	ug/g	1.6	102	70-130			
Barium	58.7	1.0	ug/g	12.0	93.3	70-130			
Beryllium	43.3	0.5	ug/g	ND	86.2	70-130			
Boron	41.4	5.0	ug/g	ND	79.4	70-130			
Cadmium	45.8	0.5	ug/g	ND	91.5	70-130			
Chromium (VI)	0.2	0.2	ug/g	ND	75.0	70-130			
Chromium	52.6	5.0	ug/g	5.1	95.0	70-130			
Cobalt	48.2	1.0	ug/g	2.3	91.7	70-130			
Copper	49.3	5.0	ug/g	5.2	88.3	70-130			
Lead	50.3	1.0	ug/g	2.7	95.2	70-130			
Mercury	1.47	0.1	ug/g	ND	97.9	70-130			
Molybdenum	47.3	1.0	ug/g	ND	94.3	70-130			
Nickel	49.9	5.0	ug/g	ND	91.1	70-130			
Selenium	45.2	1.0	ug/g	ND	90.2	70-130			
Silver	46.0	0.3	ug/g	ND	91.8	70-130			
Thallium	47.4	1.0	ug/g	ND	94.6	70-130			
Uranium	50.0	1.0	ug/g	ND	99.6	70-130			
Vanadium	55.8	10.0	ug/g	ND	94.9	70-130			
Zinc	57.7	20.0	ug/g	ND	90.5	70-130			
Volatiles									
Benzene	2.86	0.02	ug/g	ND	71.6	60-130			
Ethylbenzene	3.78	0.05	ug/g	ND	94.5	60-130			
Toluene	3.64	0.05	ug/g	ND	91.1	60-130			
m,p-Xylenes	7.49	0.05	ug/g	ND	93.6	60-130			
o-Xylene	4.02	0.05	ug/g	ND	101	60-130			
Surrogate: Toluene-d8	*3.05*		*ug/g*		*95.2*	*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

Paracel ID: 2013106

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2013106	Nº 126439

Client Name: Paterson Group Inc.	Project Ref: PE4892	Page __ of __
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 154 Colonnade Rd S.	PO #: 29712	☐ 1 day ☐ 3 day
	E-mail: kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone:		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 ___	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+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH1-SS5	S		2	March 19/20	am	✓												✓
2	BH2-SS4	S		2	March 19/20	pm	✓												✓
3	BH3-SS2	S		1	March 20/20	am				✓	✓	✓							✓
4	BH3-SS4	S		2	March 20/20	am	✓												✓
5	BH4-~~SS3~~ ALL	S		1	March 20/20	am				✓	✓	✓							✓
6	BH5-SS2	S		1	March 20/20	pm				✓	✓	✓							✓
7	DUP	S		1	March 20/20	am				✓	✓	✓							✓
8																			
9																			
10																			

Comments:

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Relinquished By (Print): Joshua Dempsey	Date/Time:	Date/Time: Mar 24, 2020 10:50	Date/Time: 03-24-2020
Date/Time: March 23, 2020	Temperature: °C	Temperature: 7.8 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29613
Project: PE4892
Custody: 126425/26

Report Date: 23-Mar-2020
Order Date: 18-Mar-2020

Order #: 2012324

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

Paracel ID	Client ID
2012324-01	MW3-GW
2012324-02	MW1-GW
2012324-03	MW2-GW
2012324-04	MW4-GW

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 23-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 18-Mar-2020

Client PO: 29613

Project Description: PE4892

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	20-Mar-20	20-Mar-20
PHC F1	CWS Tier 1 - P&T GC-FID	20-Mar-20	20-Mar-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	20-Mar-20	20-Mar-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	20-Mar-20	20-Mar-20

Certificate of Analysis

Report Date: 23-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 18-Mar-2020

Client PO: 29613

Project Description: PE4892

	Client ID:	MW3-GW	MW1-GW	MW2-GW	MW4-GW
	Sample Date:	17-Mar-20 15:00	17-Mar-20 12:00	17-Mar-20 14:15	17-Mar-20 12:30
	Sample ID:	2012324-01	2012324-02	2012324-03	2012324-04
	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	-	-	-	5.3
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	-	-	-	2.1
1,1,1-Trichloroethane	0.5 ug/L	-	-	-	<0.5

Certificate of Analysis

Report Date: 23-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 18-Mar-2020

Client PO: 29613

Project Description: PE4892

	Client ID:	MW3-GW	MW1-GW	MW2-GW	MW4-GW
	Sample Date:	17-Mar-20 15:00	17-Mar-20 12:00	17-Mar-20 14:15	17-Mar-20 12:30
	Sample ID:	2012324-01	2012324-02	2012324-03	2012324-04
	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	-	-	-	61.2
o-Xylene	0.5 ug/L	-	-	-	68.5
Xylenes, total	0.5 ug/L	-	-	-	130
4-Bromofluorobenzene	Surrogate	-	-	-	79.3%
Dibromofluoromethane	Surrogate	-	-	-	86.8%
Toluene-d8	Surrogate	-	-	-	102%
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	24.5	-
Toluene	0.5 ug/L	<0.5	<0.5	2.0	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	266	-
o-Xylene	0.5 ug/L	<0.5	<0.5	29.2	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	295	-
Toluene-d8	Surrogate	98.9%	100%	94.8%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	680	763
F2 PHCs (C10-C16)	100 ug/L	<100	476	2240	27200
F3 PHCs (C16-C34)	100 ug/L	<100	1680	1530	15400
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100

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	*81.6*		*ug/L*		*102*	*50-140*			
Surrogate: Dibromofluoromethane	*78.3*		*ug/L*		*97.8*	*50-140*			
Surrogate: Toluene-d8	*79.0*		*ug/L*		*98.7*	*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	*79.0*		*ug/L*		*98.7*	*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	*73.7*		*ug/L*		*92.1*	*50-140*			
Surrogate: Dibromofluoromethane	*80.4*		*ug/L*		*100*	*50-140*			
Surrogate: Toluene-d8	*78.7*		*ug/L*		*98.3*	*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	*78.7*		*ug/L*		*98.3*	*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)	1710	25	ug/L	ND	85.3	68-117			
F2 PHCs (C10-C16)	1610	100	ug/L	ND	101	60-140			
F3 PHCs (C16-C34)	4260	100	ug/L	ND	109	60-140			
F4 PHCs (C34-C50)	2410	100	ug/L	ND	97.4	60-140			
Volatiles									
Acetone	115	5.0	ug/L	ND	115	50-140			
Benzene	38.9	0.5	ug/L	ND	97.3	60-130			
Bromodichloromethane	45.5	0.5	ug/L	ND	114	60-130			
Bromoform	39.6	0.5	ug/L	ND	99.0	60-130			
Bromomethane	27.4	0.5	ug/L	ND	68.6	50-140			
Carbon Tetrachloride	43.8	0.2	ug/L	ND	109	60-130			
Chlorobenzene	36.4	0.5	ug/L	ND	90.9	60-130			
Chloroform	43.2	0.5	ug/L	ND	108	60-130			
Dibromochloromethane	41.5	0.5	ug/L	ND	104	60-130			
Dichlorodifluoromethane	44.5	1.0	ug/L	ND	111	50-140			
1,2-Dichlorobenzene	33.4	0.5	ug/L	ND	83.5	60-130			
1,3-Dichlorobenzene	32.6	0.5	ug/L	ND	81.6	60-130			
1,4-Dichlorobenzene	33.1	0.5	ug/L	ND	82.7	60-130			
1,1-Dichloroethane	43.3	0.5	ug/L	ND	108	60-130			
1,2-Dichloroethane	50.0	0.5	ug/L	ND	125	60-130			
1,1-Dichloroethylene	45.3	0.5	ug/L	ND	113	60-130			
cis-1,2-Dichloroethylene	42.2	0.5	ug/L	ND	105	60-130			
trans-1,2-Dichloroethylene	43.3	0.5	ug/L	ND	108	60-130			
1,2-Dichloropropane	37.7	0.5	ug/L	ND	94.2	60-130			
cis-1,3-Dichloropropylene	42.9	0.5	ug/L	ND	107	60-130			
trans-1,3-Dichloropropylene	41.1	0.5	ug/L	ND	103	60-130			
Ethylbenzene	36.3	0.5	ug/L	ND	90.8	60-130			
Ethylene dibromide (dibromoethane, 1,2-	37.0	0.2	ug/L	ND	92.4	60-130			
Hexane	37.6	1.0	ug/L	ND	94.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	99.3	5.0	ug/L	ND	99.3	50-140			
Methyl Isobutyl Ketone	98.8	5.0	ug/L	ND	98.8	50-140			
Methyl tert-butyl ether	75.3	2.0	ug/L	ND	75.3	50-140			
Methylene Chloride	39.8	5.0	ug/L	ND	99.4	60-130			
Styrene	26.4	0.5	ug/L	ND	65.9	60-130			
1,1,1,2-Tetrachloroethane	39.0	0.5	ug/L	ND	97.5	60-130			
1,1,2,2-Tetrachloroethane	38.4	0.5	ug/L	ND	96.0	60-130			
Tetrachloroethylene	36.6	0.5	ug/L	ND	91.6	60-130			
Toluene	34.5	0.5	ug/L	ND	86.2	60-130			
1,1,1-Trichloroethane	46.2	0.5	ug/L	ND	115	60-130			
1,1,2-Trichloroethane	39.9	0.5	ug/L	ND	99.8	60-130			
Trichloroethylene	41.0	0.5	ug/L	ND	102	60-130			
Trichlorofluoromethane	46.2	1.0	ug/L	ND	116	60-130			
Vinyl chloride	50.0	0.5	ug/L	ND	125	50-140			
m,p-Xylenes	57.4	0.5	ug/L	ND	71.8	60-130			
o-Xylene	33.0	0.5	ug/L	ND	82.4	60-130			
Surrogate: 4-Bromofluorobenzene	*63.3*		*ug/L*		*79.1*	*50-140*			
Surrogate: Dibromofluoromethane	*79.0*		*ug/L*		*98.7*	*50-140*			
Surrogate: Toluene-d8	*73.1*		*ug/L*		*91.4*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	38.9	0.5	ug/L	ND	97.3	60-130			
Ethylbenzene	36.3	0.5	ug/L	ND	90.8	60-130			
Toluene	34.5	0.5	ug/L	ND	86.2	60-130			
m,p-Xylenes	57.4	0.5	ug/L	ND	71.8	60-130			
o-Xylene	33.0	0.5	ug/L	ND	82.4	60-130			
Surrogate: Toluene-d8	*73.1*		*ug/L*		*91.4*	*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

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: 2012324

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2012324	№ 126426

Client Name: Paterson Group, Inc.	Project Ref: PE4892	Page 1 of 2
Contact Name: [redacted] Karyn Munch	Quote #:	**Turnaround Time**
Address: 154 Colonnade Rd. Ottawa, ON	PO #: 29613	~~☒ 1 day~~ ☐ 3 day
	E-mail: kmunch@patersongroup.ca jandrechek@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		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 ___	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)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
1	MW3 - GW	GW		3	17-MAR-2020	3:00 PM	✓											
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received By Driver/Depot: [signature]	Received at Lab: [signature]	Verified By: [signature]
Relinquished By (Print): Jesse Andrechek	Date/Time: 18/03/20 3:40	Date/Time: Mar 18, 2020 04.3[illegible]	Date/Time: Mar 18/2020 17:08
Date/Time: 18-MAR-2020 3:40	Temperature: °C PH.	Temperature: 8.9 °C	pH Verified: ☐ By:

PARACEL LABORATORIES LTD.

Paracel ID: 2012324

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2012324	Nº 126425

Client Name: Paterson Group, Inc.	Project Ref: PE4892	Page 2 of 2
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 154 Colonnade Rd. Ottawa, ON	PO #: 29613	☐ 1 day ☐ 3 day
Telephone: 613-226-7381	E-mail: kmunch@patersongroup.ca jandrechek@patersongroup.ca	☐ 2 day ☒ Regular
		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	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+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	MW1 - GW	GW		3	17-MAR-2020	12:00 PM	✓												✓
2	MW2 - GW	GW		3	17-MAR-2020	2:15 PM	✓												✓
3	MW4 - GW	GW		3	17-MAR-2020	12:30 PM	✓												✓
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot: A. Fleurse	Received at Lab: Jinnee Perri	Verified By:
Relinquished By (Print): Jesse Andrechek	Date/Time: 18/03/20 3:40	Date/Time: Mar 18, 2020 04:30	Date/Time: Mar 18/2020 17:00
Date/Time: 18-MAR-2020 3:40	Temperature: °C FH.	Temperature: 8.9 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29624
Project: PE4892
Custody: 126459

Report Date: 31-Mar-2020
Order Date: 27-Mar-2020

Order #: 2013373

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

Paracel ID	Client ID
2013373-01	BH1-GW1
2013373-02	BH2-GW1
2013373-03	BH3-GW1
2013373-04	BH5-GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 31-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 27-Mar-2020

Client PO: 29624

Project Description: PE4892

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	27-Mar-20	27-Mar-20
PHC F1	CWS Tier 1 - P&T GC-FID	27-Mar-20	27-Mar-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	30-Mar-20	30-Mar-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	27-Mar-20	27-Mar-20

Certificate of Analysis

Report Date: 31-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 27-Mar-2020

Client PO: 29624

Project Description: PE4892

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	BH5-GW1
	Sample Date:	26-Mar-20 13:00	26-Mar-20 12:00	26-Mar-20 11:00	26-Mar-20 14:00
	Sample ID:	2013373-01	2013373-02	2013373-03	2013373-04
	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

Report Date: 31-Mar-2020

Client: Paterson Group Consulting Engineers

Order Date: 27-Mar-2020

Client PO: 29624

Project Description: PE4892

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	BH5-GW1
	Sample Date:	26-Mar-20 13:00	26-Mar-20 12:00	26-Mar-20 11:00	26-Mar-20 14:00
	Sample ID:	2013373-01	2013373-02	2013373-03	2013373-04
	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	-	-	91.1%	-
Dibromofluoromethane	Surrogate	-	-	104%	-
Toluene-d8	Surrogate	-	-	96.8%	-
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	97.5%	98.8%	-	98.0%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100

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						
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	*77.5*		*ug/L*		*96.9*	*50-140*			
Surrogate: Dibromofluoromethane	*76.9*		*ug/L*		*96.2*	*50-140*			
Surrogate: Toluene-d8	*79.4*		*ug/L*		*99.3*	*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	*79.4*		*ug/L*		*99.3*	*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	3.28	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	3.22	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	*76.5*		*ug/L*		*95.7*	*50-140*			
Surrogate: Dibromofluoromethane	*79.7*		*ug/L*		*99.7*	*50-140*			
Surrogate: Toluene-d8	*77.7*		*ug/L*		*97.1*	*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	*77.7*		*ug/L*		*97.1*	*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)	1610	25	ug/L	ND	80.6	68-117			
Volatiles									
Acetone	95.8	5.0	ug/L	ND	95.8	50-140			
Benzene	38.2	0.5	ug/L	ND	95.6	60-130			
Bromodichloromethane	43.4	0.5	ug/L	ND	109	60-130			
Bromoform	39.1	0.5	ug/L	ND	97.7	60-130			
Bromomethane	9.06	0.5	ug/L	ND	22.6	50-140			
Carbon Tetrachloride	42.5	0.2	ug/L	ND	106	60-130			
Chlorobenzene	36.0	0.5	ug/L	ND	89.9	60-130			
Chloroform	43.0	0.5	ug/L	ND	107	60-130			
Dibromochloromethane	40.8	0.5	ug/L	ND	102	60-130			
Dichlorodifluoromethane	42.9	1.0	ug/L	ND	107	50-140			
1,2-Dichlorobenzene	32.8	0.5	ug/L	ND	81.9	60-130			
1,3-Dichlorobenzene	32.8	0.5	ug/L	ND	82.1	60-130			
1,4-Dichlorobenzene	32.0	0.5	ug/L	ND	80.0	60-130			
1,1-Dichloroethane	40.3	0.5	ug/L	ND	101	60-130			
1,2-Dichloroethane	47.8	0.5	ug/L	ND	120	60-130			
1,1-Dichloroethylene	43.2	0.5	ug/L	ND	108	60-130			
cis-1,2-Dichloroethylene	42.5	0.5	ug/L	ND	106	60-130			
trans-1,2-Dichloroethylene	41.4	0.5	ug/L	ND	104	60-130			
1,2-Dichloropropane	37.8	0.5	ug/L	ND	94.6	60-130			
cis-1,3-Dichloropropylene	41.5	0.5	ug/L	ND	104	60-130			
trans-1,3-Dichloropropylene	41.1	0.5	ug/L	ND	103	60-130			
Ethylbenzene	35.8	0.5	ug/L	ND	89.6	60-130			
Ethylene dibromide (dibromoethane, 1,2	36.7	0.2	ug/L	ND	91.7	60-130			
Hexane	40.6	1.0	ug/L	ND	101	60-130			
Methyl Ethyl Ketone (2-Butanone)	95.2	5.0	ug/L	ND	95.2	50-140			
Methyl Isobutyl Ketone	95.8	5.0	ug/L	ND	95.8	50-140			
Methyl tert-butyl ether	76.3	2.0	ug/L	ND	76.3	50-140			
Methylene Chloride	38.3	5.0	ug/L	ND	95.8	60-130			
Styrene	26.4	0.5	ug/L	ND	66.1	60-130			
1,1,1,2-Tetrachloroethane	38.6	0.5	ug/L	ND	96.4	60-130			
1,1,2,2-Tetrachloroethane	38.3	0.5	ug/L	ND	95.6	60-130			
Tetrachloroethylene	37.6	0.5	ug/L	ND	94.0	60-130			
Toluene	33.0	0.5	ug/L	ND	82.4	60-130			
1,1,1-Trichloroethane	43.8	0.5	ug/L	ND	110	60-130			
1,1,2-Trichloroethane	40.8	0.5	ug/L	ND	102	60-130			
Trichloroethylene	39.7	0.5	ug/L	ND	99.2	60-130			
Trichlorofluoromethane	41.5	1.0	ug/L	ND	104	60-130			
Vinyl chloride	47.8	0.5	ug/L	ND	120	50-140			
m,p-Xylenes	55.4	0.5	ug/L	ND	69.3	60-130			
o-Xylene	31.7	0.5	ug/L	ND	79.2	60-130			
Surrogate: 4-Bromofluorobenzene	*64.9*		*ug/L*		*81.2*	*50-140*			
Surrogate: Dibromofluoromethane	*76.2*		*ug/L*		*95.2*	*50-140*			
Surrogate: Toluene-d8	*72.8*		*ug/L*		*91.0*	*50-140*			
Benzene	38.2	0.5	ug/L	ND	95.6	60-130			
Ethylbenzene	35.8	0.5	ug/L	ND	89.6	60-130			
Toluene	33.0	0.5	ug/L	ND	82.4	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
m,p-Xylenes	55.4	0.5	ug/L	ND	69.3	60-130			
o-Xylene	31.7	0.5	ug/L	ND	79.2	60-130			
Surrogate: Toluene-d8	*72.8*		*ug/L*		*91.0*	*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

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.

PA LABOR

Paracel ID: 2013373

Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Paracel Order Number (Lab Use Only): 2013373

Chain Of Custody (Lab Use Only): № 126459

Client Name: Paterson Group, Inc.
Project Ref: PE4892
Page __ of __

Contact Name: Karyn Munch
Quote #:

Address: 154 Colonnade Rd.
Ottawa, ON
PO #: 29624

E-mail: kmunch@patersongroup.ca
jandrechek@ " " "

Telephone: 613-226-7381

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☐ Table ___ 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: PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PHCs F1 - F4					
1	BH1-GW1	GW		3	26-MAR-2020	1:00	X												✓
2	BH2-GW1	↓		↓	↓	12:00	X												✓
3	BH3-GW1	↓		↓	↓	11:00		X						X					✓
4	BH5-GW1	↓		↓	↓	2:00	X												✓
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Sneepavan Dhanaj	Verified By:
Relinquished By (Print): Jesse Andrechek	Date/Time:	Date/Time: Mar 27, 2020 01:55	Date/Time: 03-27-20 14:45
Date/Time: 27-MAR-2020	Temperature: °C	Temperature: 10.9 °C	pH Verified: ☐ By: