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Phase II Environmental Site Assessment

1335 and 1339 Bank Street
Ottawa, Ontario

Prepared For

Lofty Riverside GP Inc.

December 23, 2019

Report: PE4347-2

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the property addressed 1335 and 1339 Bank Street, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to vertically delineate contamination and summarize the areas of concerns on the Phase II Property that were identified during the Phase I ESA.

The Phase II ESA was carried out in conjunction with a Geotechnical Investigation and consisted of drilling three (3) boreholes across the southern portion of the Phase II Property, all of which were constructed with groundwater monitoring well installations.

The soil profile consisted of either a topsoil or pavement structure, followed by fill material consisting of silty sand with some grave, underlain by silty clay/clayey silt, followed by silty sand, underlain by shale bedrock. Boreholes were terminated at a maximum depth of 10.3m below the ground surface. Soil samples were obtained from the boreholes and screened using combustible vapour measurements along with visual and olfactory observations.

Based on the screening results in combination with sample depth and location, seven (7) soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and petroleum hydrocarbons (PHCs, F_1-F_4), and polycyclic aromatic hydrocarbons (PAHs). BTEX, PHC and PAH parameters were identified and in excess of the selected MECP Table 9 Standards in the soil samples analyzed.

Groundwater samples from the monitoring wells were recovered and analyzed for PHC, VOC and metals. No free-phase product was observed on the groundwater at any of the monitoring well locations during the groundwater sampling events. With the exception of chloroform and dicholodiflouromethane, all BTEX, PHC and VOC parameter concentrations were undetected in the groundwater samples analyzed. Chloroform was identified in BH2-19 in excess of the selected MECP standards; however, the chloroform concentration is considered to be residual from the municipal water used during rock coring, and thus, is not considered a contaminant. Metal concentrations were identifed in the groundwater samples, however, below the MECP Standards. All groundwater results are in compliance with the MECP Table 9 Standards.

Recommendations

Existing ancillary equipment associated with former Retail Fuel Outlet

It is our recommendation that the USTs and underground ancillary equipment situated on the north side of the Phase II Property be removed under supervised by a Technical Standards and Safety Authority (TSSA) certified personnel.

Soil

Based on the findings of the Phase II ESA, overburden on the Phase II Property is impacted with BTEX, PHCs, PAH, VOCs and metals. It is expected that the contaminated soil will be removed from the subject site during the redevelopment process. The excavation of the soil from the property should be monitored and confirmed by Paterson. Any contaminated soil and construction debris being removed from the property is to be disposed of at an approved waste disposal facility.

Groundwater

It is recommended that any monitoring wells that had elevated chloroform concentrations in them be resampled to confirm that the chloroform has dissipated.

Monitoring Wells

If the monitoring wells installed on the subject site are not going to be used in the future, or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903. The wells will be registered with the MECP under this regulation.

1.0 INTRODUCTION

At the request of Lofty Riverside GP Inc., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for the property addressed 1335 and 1339 Bank Street, in the City of Ottawa, Ontario, herein referred to as the Phase II Property. The purpose of this Phase II ESA was to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson in December 2019.

1.1 Site Description

Address:	1335 and 1339 Bank Street, Ottawa, Ontario
Legal Description:	Part of the North Half of the West Half of Lot 18, Concession Junction Gore and Part 1 of 4R-12718, in the City of Ottawa, Ontario.
Property Identification Number (PIN):	04193-0192 and 04193-0193
Location:	The Phase II Property is located on the east side of Bank Street bounded by Riverside Drive, in the City of Ottawa, Ontario. Bank Street is assumed to run in a north-south direction. Refer to Figure 1 - Key Plan in the Figures section following the text.
Latitude and Longitude:	45° 23' 43.16" N, 75° 41' 3.72" W
Zoning:	AM8 – Arterial Mainstreet Zone with mixed commercial and residential use.
Configuration:	Irregular
Area:	2,822 m^2 (approximately)

1.2 Property Ownership

Paterson was retained to complete this Phase II ESA by Mr. Michael Wiebe of Lofty Riverside GP Inc., the current property owner. Mr. Wiebe can be reached by telephone at (819) 595-8828.

1.3 Current and Proposed Future Uses

The Phase II Property is currently occupied an automotive repair garage and used car lot at 1335 Bank Street and a fast-food restaurant at 1339 Bank Street.
It is our understanding that the proposed site redevelopment for the Phase II Property consists of a multi-storey residential building with two (2) levels of underground parking. The footprint of the development will cover the majority of the site and will be municipally serviced with water and sewer.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 9 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ministry of the Environment, Conservation and Parks (MECP), April 2011. The selected MECP Table 9 Standards are based on the following considerations:

- ❑ Coarse-grained soil conditions
- ❑ Generic site conditions for use within 30 m of a water body
- ❑ Non-potable groundwater conditions
- ❑ Residential/Parkland/Institutional land use

These standards were selected based on the future land use of the subject site. Coarse-grained soil standards, which are considered conservative, were chosen to represent the current site conditions of the Phase II Property.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is situated in a mixed-use area, consisting of commercial and residential land use. Adjacent and neighbouring properties consist of a residential development to the south, commercial to the east, west and north.

The Phase II Property consists of a used car lot and automotive repair garage on the northern portion and a fast-food restaurant on the southern portions of property. The majority of the site is asphaltic concrete covered with some landscaped areas along the north and northwest property line.

The majority of the site is relatively flat and at the grade of Bank Street and slopes slightly down to the north towards the Rideau River, approximately 27m north of the site. Site drainage consists primarily of sheet flow to catch basins located along Bank Street and Riverside Drive.

The regional topography slopes down in a northerly direction towards the Rideau River. Groundwater in the area is anticipated to flow in a northerly direction as well.

2.2 Past Investigations

A Phase I-ESA was completed by Paterson on December 6, 2019 in general accordance with the Ontario Regulation (O.Reg.) 153/04, as amended. The Phase I ESA identified several historical potentially contaminating activities (PCAs) and existing PCAs on-site that resulted in areas of potential environmental concern (APECs) on the Phase II Property and are as follows:

- APEC 1: Resulting from the on-site underground storage tanks (USTs) situated on the northeastern corner of the Phase II Property (1335 Bank Street);
- APEC 2: Resulting from the former on-site pump islands situated on the northern portion of the Phase II Property (1335 Bank Street);
- APEC 3: Resulting from an existing automotive repair garage located on the northeastern portion of the Phase II Property (1335 Bank Street);
- APEC 4: Resulting from the former automotive repair garage located on the central portion of the Phase II Property (formerly 1339 Bank Street);

- APEC 5: Resulting from the former retail fuel outlet situated on the central portion of the Phase II Property (formerly 1339 Bank Street);
- APEC 6: Resulting from the former automotive repair garage located on the southeastern portion of the Phase II Property (formerly 1345 Bank Street, now 1339 Bank Street);
- APEC 7: Resulting from the importation of backfill/fill material of unknown quality on the northern portion of the Phase II Property (1335 Bank Street); and
- APEC 8: Resulting from the off-site retail fuel outlet situated approximately 27m west of the Phase II Property (1330 Bank Street).

It should be noted that road salt utilized on the Phase I Property for pedestrian safety is not considered a PCA.

Previous work conducted by Trow (1999), Paterson (2007), Pinchin (2010) and Exp (2016) et al., has been completed to address some of the APECs on the Phase II Property. The results of previous reports identifed that the overburden on the Phase II Property is impacted with BTEX, PHC, PAH, VOC and metal concentrations in excess of the selected MECP Site Condition Standards. Similarly, groundwater in the overburden is impacted with BTEX, PHC, PAH, VOC (chloroform) and metal concentrations in excess of the selected standards.

Given the findings of these previous environmental reports conducted by others, in combination with no remedial work conducted on the Phase II Property, it is expected that the level of contamination in soil would exceed the MECP Table 9 Residential Standards. Therefore, the former on-site PCAs remain areas of concern and hence, result in APECs on the Phase II Property.

A Phase II ESA was recommended to summarize all previous work and delineate the areas of concern as a result of the aforementioned APECs on the southern portion property (1339 Bank Street). It should be noted that Exp (2016) had delineated the above APECs on the northern portion of the Phase II Property (1335 Bank Street).

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted on October 31 and November 1, 2019, in conjunction with a Geotechnical Investigation. The field program consisted of drilling three (3) boreholes, all of which were instrumented with groundwater monitoring wells for environmental purposes. Boreholes were drilled to an approximate depth of 10.2 m below the ground surface (mbgs).

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. These CPCs include benzene, toluene, ethylbenzene, xylenes (BTEX). petroleum hydrocarbons (PHC, F_1-F_4) and polycyclic aromatic hydrocarbons in soil and/or groundwater.

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

Based on our Phase II ESA, the subsurface soils generally consisted of a pavement structure over fill material, underlain by silty clay or silty sand, followed by glacial till, overlying shale bedrock. Bedrock was encountered at approximate depths of 6.5 to 7.5 m below ground surface (mbgs). Groundwater was intercepted in the silty sand and bedrock layer at depths of approximately 3.8 to 6.7 mbgs.

According to the Geological Survey of Canada, bedrock in the area of the Phase II Property is reported to consist of interbedded limestone and shale of the Billings Formation. Based on the mapping, overburden on the Phase II Property consists of silty sand and clay over till with a drift thickness ranging from 5 to 10 m.

The local groundwater flow beneath the Phase II Property is inferred to be in a northerly direction towards the Rideau River. The regional topography slopes down towards the Rideau River as well.

Subsurface Structures and Utilities

Existing subsurface structures on the Phase II Property include two (2) USTs and former ancillary equipment associated with the RFO at 1335 Bank Street. Presently, underground services include natural gas entering the north face of the subject building from Bank Street. A storm sewer connects two on-site catch basins which lead to a sewer main on Bank Street.

The existing subsurface infrastructures may potentially have affected contaminant distribution at the Phase II Property. No other subsurface structures or utilities are present on the Phase II Property.

The approximate locations of the on-site underground structures are shown on Drawing PE4347-3 –Test Hole Location Plan.

Fill Material

Based on our recent investigation at 1339 Bank Street and the geotechnical investigation conducted by Exp in 2017 at 1335 Bank Street, fill material was identifed beneath the pavement structure and extended to depths of approximately 2.4 to 5.33 mbgs. Traces of asphalt, brick and wood chips were identified in the fill layer, which is suspected to be associated with an original pavement structure or the decommissioning of the former on-site buildings. In both subsurface investigations, visual and olfactory evidence of contamination were identifed in the fill material as well as the underlying soils.

Existing Buildings and Structures

The northern and southern portions of the Phase II Property are occupied by single storey, slab-on-grade buildings constructed circa 1930 and 1980, respectively. Both structure exteriors are clad in metal siding, concrete block and brick with a flat tar-gravel style roof.

USTs and former pump island structures are present on the northern portion of the Phase II Property.

Water Bodies and Areas of Natural Significance

No areas of natural significance are known to exist on the Phase II Property or within the Phase I Study Area. The Rideau River and Sawmill Creek are the located approximately 26 m northwest and 120m northeast, of the Phase II Property, respectively.

Potable Water Well Records

No potable well records were identified for the Phase II Property. The MECP online interactive well record mapping system identified two (2) potable well records, dated 1953 and 1957, approximately more than 120 m east and south of the Phase II Property. It is expected that these wells are not in-use since the area had been municipally serviced. No abandonment records regarding potable water wells were found for the Phase I Study Area.

Monitoring Well Records

According to the MECP online interactive well record mapping system, there are five (5) monitoring wells identified on the southern portion of the Phase II Property as part of the Pinchin 2010 Phase II ESA work. During the site visit, only three (3) monitoring wells were identified on-site.

Neighbouring Land Use

Neighbouring land use within the Phase I Study Area consists of commercial businesses/retailers and offices to the north, west and east, and residential to the south. The current use of the surrounding lands did not identifed any new PCAs.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Table 2, O.Reg. 153/04, as amended, eight (8) on-site potentially contaminating activities (PCAs) and one off-site PCA were identifed and considered to result in areas of potential environmental concern (APECs) on the Phase II Property. The PCAs that are considered to represent APECs are listed in Table 1, along with their respective locations and contaminants of potential concern (CPCs) on the Phase II Property.

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 on-site USTs)	Northeastern corner of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, 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 2 (Resulting from former on-site pump island)	Northwestern portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, Groundwater
APEC 3 (Resulting from an existing automotive repair garage)	Northeastern portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs Metals	Soil, Groundwater
APEC 4 (Resulting from former on-site automotive repair garage)	Central portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs	Soil, Groundwater
APEC 5 (Resulting from former retail fuel outlet)	Central portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, Groundwater
APEC 6 (Resulting from former on-site automotive repair garage)	Central portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs VOCs Metals	Soil, Groundwater

TABLE 1 Continue: 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 and/or soil)
APEC 7 (Resulting from importation of fill material of unknown quality)	Northern portion of the Phase II Property	PCA 30 – Importation of fill material of an unknown quality	On-site	Metals PAHs	Soil, Groundwater
APEC 8 (Resulting from former RFO located at 1330 Bank Street)	Northwestern portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	Off-site	BTEX PHCs	Soil, Groundwater

It should be noted that road salt for de-icing purposes was not considered an on-site PCA. Based on the personal interviews, the tenant at 1335 Bank Street did not use road salt on the used car lot. The Harvey's restaurant at 1339 Bank Street uses road salt on-site for pedestrian safety under snow and icy conditions. Therefore, the use of road salt is not considered to result an APEC on the Phase II Property.

Several off-site PCAs were identified within the Phase I Study Area, however, based on separation distances and/or cross-gradient orientation with respect to the subject land, as groundwater is considered to flow in a northerly direction, other off-site PCAs are not considered to represent APECs on the Phase II Property.

Contaminants of Potential Concern (CPCs)

Based on the APECs identified on the Phase II Property, the contaminants of potential concern (CPCs) in the soil and/or groundwater include:

- Benzene, ethylbenzene, toluene and xylenes (BTEX);
- Petroleum hydrocarbons (PHCs, Fractions F_1-F_4);
- Polycyclic aromatic hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Metals (including hexavalent chromium and mercury.

❒ **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 and existing on-site PCAs that have resulted in APECs on the Phase II Property. While several historical PCAs were identifed in previous Phase I ESAs and Phase II ESAs conducted by others as well as Paterson, no new PCAs that would result in APECs were identifed during this assessment.

Based on the Phase II ESA conducted at 1335 Bank Street (Exp, 2016), it is our opinion that the former on-site PCAs (former UST nest, USTs and former pump island, and importation of fill material of unknown quality) and off-site PCAs that generated APECs on 1335 Bank Street have been addressed by the Phase II ESA (Exp, 2016). However, the USTs remain on-site and a site remediation has not been conducted to date, and as such, the contamination at 1335 Bank Street remains an area of potential environmental concerns (APEC) on the Phase II Property.

Several off-site PCAs were not considered to generate APECs to the Phase II Property, based on either the separation distances and/or cross-gradient orientation with respect to the Phase II Property.

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 for this project is included in Appendix 1 of this report.

3.5 Impediments

No physical impediments were encountered during the Phase II ESA program, aside from existing buildings and utility structures.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation, completed in conjunction with a Geotechnical Investigation, was conducted on October 31 and November 1, 2019. The field program consisted of drilling three (3) boreholes on the Phase II Property.

The boreholes were drilled to a maximum depth of 10.26 m below the ground surface (mbgs). All boreholes were completed as groundwater monitoring wells.

The boreholes (BH1-19 through BH3-19) were placed to address to vertically delineate the contaminants of concern associated with the aforementioned APECs, as well as completed for geotechnical purposes. The boreholes were drilled using a truck mounted drill rig provided by George Downing Estate Drilling Ltd. of Hawkesberry, Ontario, under the full-time supervision of Paterson personnel. The borehole locations are indicated on the attached Drawing PE4347-3 – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of twenty-eight (28) soil samples were obtained from the boreholes by means of grab sampling from auger flights and split spoon sampling. Split spoon samples were taken at approximate 0.76 m intervals. The depths at which auger samples 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.

The soil stratigraphy at the borehole locations generally consisted of either an asphaltic concrete paved structure or topsoil underlain by fill material, followed by silty clay and silty sand, overlying shale bedrock. Bedrock was encountered at depths varying between 6.53 to 7.47mbgs.

4.3 Field Screening Measurements

An RKI Eagle gastech with methane elimination and calibrated to hexane was used to measure the combustible vapour concentrations in the headspace of the soil samples. The results of the vapour survey are discussed in Subsection 5.4 and are available on the Soil Profile & Test Data sheets in Appendix 1.

The technical protocol was obtained from Appendix C of the MECP document entitled “Interim Guidelines for the Remediation of Petroleum Contamination at Operating Retail and Private Fuel Outlets in Ontario”, dated March 1992.

Soil samples recovered at the time of sampling were placed immediately into airtight plastic bags with nominal headspace. All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to ambient temperature prior to conducting the vapour survey. Allowing the samples to stabilize to ambient temperature ensures consistency of readings between samples.

To measure the soil vapours, the analyser probe is inserted into the nominal headspace above the soil sample. A gastech calibrated to hexane was used for this purpose. The sample is agitated/manipulated gently as the measurement is taken. The peak reading registered within the first 15 seconds is recorded as the vapour measurement.

The parts per million (ppm) scale is used to measure concentrations of hydrocarbon vapours that are too low to register on the Lower Explosive Limit (LEL) scale. The explosive point, 100% LEL, represents the leanest mixture which will burn (or explode) if ignited.

4.4 Groundwater Monitoring Well Installation

Three (3) groundwater monitoring wells were installed on the Phase II Property as part of the subsurface investigation. The monitoring wells consisted of 32 mm diameter, Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed 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
BH1-19	59.75	10.26	7.26-10.26	6.7-10.29	0.6-6.7	Flushmount
BH2-19	59.68	10.19	8.69-10.19	8.3-10.19	0.6-8.3	Flushmount
BH3-19	59.64	10.21	8.71-10.21	8.2-10.21	0.6-0.82	Flushmount

4.5 Field Measurement of Water Quality Parameters

Groundwater samples were collected on November 6, November 29 and December 2, 2019. The water levels were the only parameter measured in the field during the sampling events.

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 3 and 4.

TABLE 3: Soil Samples Submitted and Analyzed Parameters

Sample ID	Sample Depth or Stratigraphic Unit	Parameters Analyzed			Rationale
		PHCs (F1-F4)	BTEX	PAH	
October 31, 2019					
BH1-SS7	4.57-6.65m Silty sand	X	X		Delineate the contaminants of concern due to the former automotive repair garage.
BH1-SS9	6.09-6.7m Glacial till	X	X		Delineate the contaminants of concern due to the former and current use of the Phase II Property.
November 1, 2019					
BH2-SS9	6.09-6.18m Silty sand	X	X		Delineate the contaminants of concern due to the former and current use of the Phase II Property.
BH3-SS2	1.52-2.13m Silty clay			X	Delineate the contaminants of concern due to the former and current use of the Phase II Property.
BH3-SS6	1.52-2.13m Silty sand	X	X		Assess potential impact in the soil due to the former use of the property (delineation purposes).

TABLE 4: Groundwater Samples Submitted and Analyzed Parameters					
Sample ID	Screened Interval (m)	Parameters Analyzed			Rationale
		PHCs (F1-F4)	VOC	Metals	
November 6, 2019					
BH1-GW1	7.26-10.26	X	X		Assess potential impact in the groundwater due to former presence of a RFO and garages.
BH2-GW1	8.69-10.19	X	X		Assess potential impact in the groundwater due to former presence of a RFO and garages.
BH3-GW1	8.71-10.21	X	X		Assess potential impact in the groundwater due to former presence of a RFO and garages.
December 2, 2019					
BH1-GW1	7.26-10.26			X	Assess potential impact in the groundwater due to the former and current use of the Phase II Property.
BH2-GW1	8.69-10.19			X	Assess potential impact in the groundwater due to the former and current use of the Phase II Property.
BH3-GW1	8.71-10.21			X	Assess potential impact in the groundwater due to the former and current use of the Phase II Property.

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.

4.8 Residue Management

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

4.9 Elevation Surveying

The borehole locations were selected by Paterson for both environmental and geotechnical purposes. Boreholes were located and surveyed in the field by Paterson. The benchmark (BM) was taken from the top of the grate of a catch basin located on the northern corner of Bank Street and Riverside Drive. The geodetic datum was 59.43m.

The locations and elevations of the boreholes are presented on Drawing PE4347-3 – Test Hole Location Plan, appended to this report.

4.10 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

The subsurface profile generally consists of an asphaltic concrete pavement structure or topsoil, followed by fill material consisting of sand, some silt and gravel, underlain by silty clay followed by sandy silt, overlying glacial till consisting of silty sand and clay, gravel and shale, followed by bedrock (shale). Bedrock was encountered at depths ranging from 6.5 to 7.5 mbgs. The boreholes were terminated at depths ranging from 10.19 to 10.26 mbgs.

Groundwater was encountered within the overburden at depths ranging from approximately 3.82 to 6.70 mbgs. Site geology details are provided in the Soil Profile and Test Data Sheets provided in Appendix 1.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling events using an electronic water level meter. Groundwater levels are summarized below in Table 5.

TABLE 5: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH1-19	59.75	3.92	55.83	November 29, 2019
BH2-19	59.68	3.83	55.85	November 29, 2019
BH3-19	59.64	6.70	52.94	November 29, 2019

Based on the groundwater elevations measured during the sampling event, a reliable groundwater contour plan was not completed due to the non stabilized groundwater levels obtained on the November 29, 2019 sampling date. The groundwater contours from Exp (2016) are shown on Drawing PE4347-4 – Groundwater Contour Plan. Based on groundwater contouring mapping the

overburden groundwater flow is in a southerly direction with a horizontal hydraulic gradient of approximately 0.02 m/m.

5.3 Fine-Course Soil Texture

No grain size analysis was completed for the subject site. Coarse grained standards were chosen as a conservative approach.

5.4 Soil: Field Screening

Field screening of the soil samples collected from BH1-19 to BH3-19 resulted in vapour readings ranging from 0 to 30 ppm.

Visual and olfactory odours were identified in the soil samples and indicative of potential hydrocarbon impacts. Soil samples were selected based on a combination of the results of the vapour screening, visual and olfactory screening, sample depth and/or sample location. The field screening results of each individual soil sample (BH1-19 to BH3-19) are provided on the Soil Profile and Test Data Sheets, appended to this report.

5.5 Soil Quality

Four (4) soil samples from BH1-19 to BH3-19 were submitted for BTEX, PHC (F_1-F_4) and PAH analyses. The results of the analytical testing are presented in Tables 6 and 7. The laboratory certificates of analysis are provided in Appendix 1.

TABLE 6: Analytical Test Results – Soil – BTEX and PHC (F_1-F_4)

Parameter	MDL (µg/g)	Soil Samples (µg/g)				MECP Table 9 Standards (µg/g)
		October 31, 2019		November 1, 2019		
		BH1-SS7	BH1-SS9	BH2-SS9	BH3-SS6	
Benzene	0.02	nd	nd	nd	nd	0.02
Ethylbenzene	0.05	nd	**0.11**	nd	nd	0.05
Toluene	0.05	nd	nd	nd	nd	0.2
Xylenes (total)	0.05	nd	**0.17**	nd	nd	0.05
PHC F_1	7	nd	11	nd	nd	25
PHC F_2	4	**16**	**35**	nd	nd	10
PHC F_3	8	13	35	nd	nd	240
PHC F_4	6	nd	nd	nd	nd	120

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Underlined and BOLD** – Parameter exceeds the selected MECP standards

Detectable BTEX or PHC concentrations were identified in several of the soil samples analyzed. BTEX (ethylbenzene and xylenes) and PHCs (F2) exceeded the selected MECP Table 9 Standards. The analytical results for BTEX and PHC parameters tested in soil are shown on Drawing PE4347-5A and PE4347-5B, respectively.

TABLE 7: Analytical Test Results – Soil – PAH

Parameter	MDL (µg/g)	Soil Samples (µg/g) November 1, 2019 BH3-SS2	MECP Table 9 Standards (µg/g)
Acenaphthene	0.02	<0.4	0.072
Acenaphthylene	0.02	<0.4	0.93
Anthracene	0.02	**0.64**	0.22
Benzo[a]anthracene	0.02	<0.4	0.36
Benzo[a]pyrene	0.02	<0.4	0.3
Benzo[b]fluoranthene	0.02	<0.4	0.47
Benzo[g,h,i]perylene	0.02	0.65	0.68
Benzo[k]fluoranthene	0.02	<0.4	0.48
Chrysene	0.02	<0.4	2.8
Dibenzo[a,h]anthracene	0.02	<0.4	0.1
Fluoranthene	0.02	0.60	0.69
Fluorene	0.02	<0.4	0.19
Indeno[1,2,3-cd]pyrene	0.02	<0.4	0.23
1-Methylnaphthalene	0.02	<0.4	0.59
2-Methylnaphthalene	0.02	<0.4	0.59
Methylnaphthalene (1&2)	0.04	<0.4	0.59
Naphthalene	0.01	**0.23**	0.09
Phenanthrene	0.02	0.60	0.69
Pyrene	0.02	0.48	1.0

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Underlined and BOLD** – Parameter exceeds the selected MECP standards

Two (2) PAH parameter concentrations (anthracene and naphthalene) exceeded the selected MECP Table 9 Standards. The analytical results for PAH parameters tested in soil are shown on Drawing PE4347-5C.

The maximum concentrations of analyzed parameters in the soil at the site are summarized in Table 8.

Table 8: Maximum Concentrations – Soil			
Parameter	**Maximum Concentration (µg/g)**	**Soil Sample**	**Depth Interval (m BGS)**
Ethylbenzene	**0.11**	BH1-SS9	6.09-6.18m; Silty sand
Xylenes (total)	**0.17**	BH1-SS9	6.09-6.18m; Silty sand
PHC F_2	**35**	BH1-SS9	6.09-6.18m; Silty sand
Anthracene	**0.64**	BH3-SS2	1.52-2.13m; Fill
Naphthalene	**0.23**	BH3-SS2	1.52-2.13m; Fill

Notes:
- **Bold and Underlined** – Value exceeds MECP Table 9 Standards

The maximum BTEX, PHC and PAH parameter concentrations as well as the sodium absorption ratio and electrical conductivity present in the soil samples analyzed are in exceedance of the MECP Table 9 Standards. The remaining parameters were not detected above the laboratory method detection limits.

5.6 Groundwater Quality

Groundwater samples from monitoring wells installed in BH1-19, BH2-19 and BH3-19 were submitted for laboratory analysis of PHC (F_1-F_4), VOC parameters and metals as wells as chloride. The groundwater samples were obtained from the screened intervals noted in Table 2.

The results of the analytical testing are presented in Tables 9, 10 and 11. The laboratory certificates of analysis are provided in Appendix 1.

TABLE 9: Analytical Test Results – Groundwater – BTEXs and PHCs					
Parameter	**MDL (µg/L)**	**Groundwater Samples (µg/L)**			**MECP Table 9 Standards (µg/L)**
		November 6, 2019			
		BH1-GW1	**BH2-GW1**	**BH3-GW1**	
Benzene	0.5	nd	nd	nd	44
Ethylbenzene	0.5	nd	nd	nd	1800
Toluene	0.5	nd	nd	nd	14000
Xylenes (total)	0.5	nd	nd	nd	3300
PHC F_1	25	nd	nd	nd	420
PHC F_2	100	nd	nd	nd	150
PHC F_3	100	nd	nd	nd	500
PHC F_4	100	nd	nd	nd	500

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

No detectable BTEX of PHC concentrations were identified in the groundwater samples analyzed. All test results are in compliance with the MECP Table 9 Standards.

Analytical results of BTEX and PHC in the groundwater with respect to borehole locations are shown on Drawing PE4347-6A and Drawing PE4347-6B, respectively.

TABLE 10: Analytical Test Results – Groundwater – VOC

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) November 6, 2019			MECP Table 9 Standards (µg/L)
		BH1-GW1	BH2-GW1	BH3-GW1	
Acetone	5	nd	nd	nd	100,000
Benzene	0.5	nd	nd	nd	44
Bromodichloromethane	0.5	nd	nd	nd	67,000
Bromoform	0.5	nd	nd	nd	380
Bromomethane	0.5	nd	nd	nd	5.6
Carbon Tetrachloride	0.2	nd	nd	nd	0.79
Chlorobenzene	0.5	nd	nd	nd	500
Chloroform	0.5	nd	**4.7**	nd	2.4
Dibromochloromethane	0.5	nd	nd	nd	65,000
Dichlorodifluoromethane	1	nd	4.7	nd	3,500
1,2-Dichlorobenzene	0.5	nd	nd	nd	4,600
1,3-Dichlorobenzene	0.5	nd	nd	nd	7,600
1,4-Dichlorobenzene	0.5	nd	nd	nd	8
1,1-Dichloroethane	0.5	nd	nd	nd	320
1,2-Dichloroethane	0.5	nd	nd	nd	1.6
1,1-Dichloroethylene	0.5	nd	nd	nd	1.6
cis-1,2-Dichloroethylene	0.5	nd	nd	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	nd	nd	1.6
1,2-Dichloropropane	0.5	nd	nd	nd	16
cis-1,3-Dichloropropylene	0.5	nd	nd	nd	5
trans-1,3-Dichloropropylene	0.5	nd	nd	nd	0.5
1,3-Dichloropropene, total	0.2	nd	nd	nd	5.2
Ethylbenzene	1	nd	nd	nd	1,800
Ethylene dibromide (dibromoethane, 1,2-)	5	nd	nd	nd	0.25
Hexane	5	nd	nd	nd	51
Methyl Ethyl Ketone (2-Butanone)	2	nd	nd	nd	470,000
Methyl Isobutyl Ketone	5	nd	nd	nd	140,000
Methyl tert-butyl ether	0.5	nd	nd	nd	190
Methylene Chloride	0.5	nd	nd	nd	610
Styrene	0.5	nd	nd	nd	1,300
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	3.3
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	3.2
Tetrachloroethylene	0.5	nd	nd	nd	1.6
Toluene	0.5	nd	nd	nd	14,000
1,1,1-Trichloroethane	0.5	nd	nd	nd	640
1,1,2-Trichloroethane	1	nd	nd	nd	4.7
Trichloroethylene	0.5	nd	nd	nd	1.6

TABLE 10: Analytical Test Results – Groundwater – VOC

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) November 6, 2019			MECP Table 9 Standards (µg/L)
		BH1-GW1	BH2-GW1	BH3-GW1	
Trichlorofluoromethane	1	nd	nd	nd	2,000
Vinyl Chloride	0.5	nd	nd	nd	0.5
Xylenes, total	0.5	nd	nd	nd	3,300

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Underlined and BOLD** – Parameter exceeds the selected MECP standards

With the exception of chloroform and one VOC parameter, no other VOCs parameter were detected in the groundwater sample analyzed. The presence of chloroform was identified in BH2-19 in excess of the selected MECP standards; however, the chloroform concentration is considered to be residual from the municipal water used during rock coring, and thus, is not considered a contaminant. All VOC parameters comply with the MECP Table 9 Standards. Analytical results of VOCs in the groundwater with respect to borehole locations are shown on Drawing PE4347-6D.

TABLE 11: Analytical Test Results – Groundwater – Metals

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) December 2, 2019			MECP Table 9 Standards (µg/L)
		BH1-GW1	BH2-GW1	BH3-GW1	
Antimony	0.5	nd	0.7	nd	16000
Arsenic	1	1	2	nd	1500
Barium	1	88	169	883	23000
Beryllium	0.5	nd	nd	nd	53
Boron	10	62	72	195	36000
Cadmium	0.1	nd	nd	nd	2.1
Chromium	1	nd	4	nd	640
Cobalt	0.5	nd	0.8	nd	52
Copper	0.5	1.4	7.2	0.8	69
Lead	0.1	0.3	2.6	nd	20
Molybdenum	0.5	4.0	16.2	1.8	7300
Nickel	1	nd	3	nd	390
Selenium	1	nd	nd	nd	50
Silver	0.1	nd	nd	nd	1.2
Sodium	200	60100	89300	104000	1800000
Thallium	0.1	nd	nd	nd	400
Uranium	0.1	0.3	2.3	0.7	330
Vanadium	0.5	0.6	4.5	nd	200
Zinc	5	5	25	7	890

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

Metal concentrations were detected in the groundwater samples analyzed; however, all groundwater results comply with the MECP Table 9 Standards. Analytical results of metal in the groundwater with respect to borehole locations are shown on Drawing PE4347-6E.

The maximum concentrations of analyzed parameters in the groundwater at the site are summarized in Table 12.

Table 12: Maximum Concentrations – Groundwater

Parameter	Maximum Concentration (µg/L)	Groundwater Sample	Screened Interval (m BGS)
Chloroform	**4.7**	BH2-GW1	8.69-10.19
Antimony	0.7	BH2-GW1	8.69-10.19
Arsenic	2	BH2-GW1	8.69-10.19
Barium	883	BH3-GW1	8.71-10.21
Boron	195	BH3-GW1	8.71-10.21
Chromium	4	BH2-GW1	8.69-10.19
Cobalt	0.8	BH2-GW1	8.69-10.19
Copper	7.2	BH2-GW1	8.69-10.19
Dichlorodifluoromethane	4.7	BH2-GW1	8.69-10.19
Lead	2.6	BH2-GW1	8.69-10.19
Molybdenum	16.2	BH2-GW1	8.69-10.19
Nickel	3	BH2-GW1	8.69-10.19
Sodium	104000	BH2-GW1	8.69-10.19
Uranium	2.3	BH2-GW1	8.69-10.19
Vanadium	4.5	BH2-GW1	8.69-10.19
Zinc	25	BH2-GW1	8.69-10.19
Chloride	122	BH2-GW1	8.69-10.19

Notes:
- **Bold and Underlined** – Value exceeds MECP Table 9 Standards

With the exception of chloroform, the maximum concentrations in groundwater are in compliance with the selected MECP Table 9 Standards. As previously discussed, the elevated chloroform concentration is residual from the municipal water used for drilling/coring into bedrock, and thus, is not considered a contaminant. The remaining parameters were not detected above the laboratory method detection limits.

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of the October 31, through December 2, 2019 sampling events were handled in accordance with the Analytical Protocol with respect to preservation method, storage requirement, and container type.

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 general accordance with the requirements of O.Reg. 153/04, as amended by 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 indicated in Section 2.2 of this report, several historical and existing PCAs were identifed and considered to result in APECs on the Phase II Property, as per Column A of Table 2 of the O.Reg. 153/04, as amended, as well as a non-specific PCA (item no) from Table 2, include the following:

- PCA 1: Item 28 – "Gasoline and Associated Products Storage in Fixed Tanks," associated with two (2) underground storage tanks situated on the northeast corner of the Phase II Property (1335 Bank Street).
- PCA 2: Item 28 – "Gasoline and Associated Products Storage in Fixed Tanks," associated with two (2) pump island situated on the northern portion of the Phase II Property (1335 Bank Street).
- PCA 3: Item 52 – "Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems," associated with an existing automotive repair garage located on the northern portion of the Phase II Property (1335 Bank Street).
- PCA 4: Item 52 – "Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems," associated with a former automotive repair garage situated on the central portion of the Phase II Property (formerly 1339 Bank Street).
- PCA 5: Item 28 – "Gasoline and Associated Products Storage in Fixed Tanks," associated with former retail fuel outlet (RFO) situated on the central portion of the Phase II Property (formerly 1339 Bank Street).
- PCA 6: Item 52 – "Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems," associated with a historical automotive repair garage on the southeastern portion of the Phase II Property (formerly 1345 Bank Street).

- PCA 7: Item 30 – "Importation of Fill Material of Unknown Quality," associated with backfilling the former UST nest (1335 Bank Street), repair garages on the central (formerly 1339 Bank Street) and southern (formerly 1345 Bank Street) portions of the Phase II Property (in other words, the entire Phase II Property).

Several off-site PCAs were identified within the Phase I Study Area; however, one was considered to generate an APEC:

- PCA 8: Item 28 – "Gasoline and Associated Products Storage in Fixed Tanks," associated with former RFO located at 1330 Bank Street, approximately 27m west of the Phase II Property.

A summary of the PCAs that represent APECs on the Phase II Property, as well as the contaminants of potential concern (CPCs) are presented in Table 13.

TABLE 13: 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 on-site USTs)	Northeastern corner of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, Groundwater
APEC 2 (Resulting from former on-site pump island)	Northwestern portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, Groundwater
APEC 3 (Resulting from an existing automotive repair garage)	Northeastern portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs Metals	Soil, Groundwater

TABLE 13 Continued: 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 4 (Resulting from former on-site automotive repair garage)	Central portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs	Soil, Groundwater
APEC 5 (Resulting from former retail fuel outlet)	Central portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs	Soil, Groundwater
APEC 6 (Resulting from former on-site automotive repair garage)	Central portion of the Phase II Property	PCA 52 – Storage, maintenance, fuelling and repairing of equipment, vehicles, and materials used to maintain transportation systems	On-site	BTEX PHCs PAHs Metals	Soil, Groundwater
APEC 7 (Resulting from importation of fill material of unknown quality)	Northern portion of the Phase II Property	PCA 30 – Importation of fill material of an unknown quality	On-site	Metals PAHs	Soil, Groundwater
APEC 8 (Resulting from former RFO located at 1330 Bank Street)	Northwestern portion of the Phase II Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	Off-site	BTEX PHCs	Soil, Groundwater

It should be noted that road salt for de-icing purposes was not considered an on-site PCA. Based on the personal interviews, the tenant at 1335 Bank Street did not use road salt on the used car lot. The Harvey's restaurant at 1339 Bank Street uses road salt on-site for pedestrian safety under snow and icy conditions. Therefore, the use of road on-site is not considered to result an APEC on the Phase II Property.

The rationale for identifying the above APECs were based on a historical research, previous engineering reports, personal interviews and the site investigation.

Contaminants of Potential Concern

Based on the APECs identified on the Phase II Property, the contaminants of potential concern (CPCs) present in soil and/or groundwater include Benzene, ethylbenzene, toluene and xylenes (BTEX); Petroleum hydrocarbons (PHCs, Fractions F_1-F_4); Polycyclic aromatic hydrocarbons (PAHs); volatile organic compounds (VOCs) and Metals.

Subsurface Structures and Utilities

Existing subsurface structures on the Phase II Property include two (2) USTs and former ancillary equipment associated with the RFO at 1335 Bank Street. Presently, underground services include natural gas entering the north face of the subject building from Bank Street. A storm sewer connects two on-site catch basins which lead to a sewer main on Bank Street.

Former and existing subsurface infrastructure may potentially have affected contaminant distribution at the Phase II Property. No other subsurface structures or utilities are present on the Phase II Property.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on Drawings PE4347-7 – Cross-section A-A' and PE4347-9 – Cross-section B-B' for soils and Drawings PE4347-8 – Cross-section A-A' and PE4347-10 – Cross-section B-B' for groundwater. The site stratigraphy consists of:

- ❒ Asphaltic concrete pavement structure in BH1-19 and BH2-19 with a thickness of 0.08 m. Groundwater was not encountered in this layer.
- ❒ Topsoil was encountered in BH3-19 and extended to a depth of 0.15 mbgs. Groundwater was not encountered in this layer.
- ❒ Fill material consisting of silty sand with some gravel and brick/asphalt was encountered in BH1-19 through BH3-19 and extended at depths of2.30 to 3.20 mbgs. Groundwater was not encountered in this layer.

- Silty clay was identified beneath the fill material in BH1-19 and BH2-19 and extended to depths of 4.5 to 5.33 mbgs. Groundwater was encountered in this layer at BH1-19 and BH2-19.
- Sand was encountered in BH3-19 and extended to a depth of 4.27 mbgs. Groundwater was encountered in this layer at BH1-19 and BH2-19.
- Silty sand was identifed beneath the silty clay and sand layer in all boreholes and extended to depths of 6.17 to 7.47 mbgs. Groundwater was encountered in this layer at BH1-19 and BH2-19.
- Glacial till was identifed in BH1-19 beneath the silty sand layer and encountered to a depth of 6.65 mbgs. Groundwater was encountered in this layer at BH1-19 and BH2-19.
- Bedrock (shale) was identifed in all boreholes and extended to depth ranging from 10.19 to 10.26 mbgs. Groundwater was encountered in this layer at BH3-19.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered in the overburden (BH1-19 and BH2-19) and in shale bedrock (BH3-19) ranging at depths of approximately 3.82 to 6.7 mbgs. The range in water levels obtained on the November 29, 2019 sampling event may be attributed to the fact that the water levels had not yet stabilized at that time. Based on EXP 2016 Phase II ESA, groundwater flow in the overburden was determined to be in a southerly direction with a horizontal hydraulic gradient of 0.02m/m.

Groundwater contours are shown on Drawing PE4347-4–Groundwater Contour Plan.

Approximate Depth to Water Table

The depth to the water table at the subject site varies between approximately 3.82 to 6.70 mbgs.

Approximate Depth to Bedrock

Bedrock was confirmed during the drilling program at depths ranging from 6.53 to 7.47 mbgs. All boreholes were completed in shale bedrock at depths ranging between 10.19 to 10.26 mbgs.

Well records for the immediate area of the Phase II Property indicated that the site is situated on a silty sand and sandy clay deposit, followed by bedrock encountered within the range of 5 to 10 mbgs.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation does not apply to the Phase II Property, in that the subject property is not within 30m of an environmentally sensitive area.

Section 43.1 of the Regulation does apply to the Phase II Property as the subject land is situated within 30 m of a natural body of water. The Rideau River is situated 27 m north of the Phase II Property.

Fill Placement

Based on the findings of the subsurface investigation, fill material was encountered and consisted of a mixture of silty sand with clay, gravel, cobbles and some fragments of shale, brick and asphalt.

Existing Buildings and Structures

The northern and southern portions of the Phase II Property are occupied by single storey, slab-on-grade buildings constructed circa 1930 and 1980, respectively. Both structure exteriors are clad in metal siding, concrete block and brick with a flat tar-gravel style roof.

Two (2) abandoned USTs and former pump island structures are present on the northern portion of the Phase II Property.

Proposed Buildings and Other Structures

The proposed development for the Phase II Property includes a multi-storey residential building with two (2) underground levels of parking. The footprint of the development will cover the majority of the site.

Areas of Natural Significance

No areas of natural significance are present on the Phase II Property or within the 250 m study area.

Water Bodies

The Phase II Property is situated within 30 m of a natural body of water. The Rideau River is approximately 27m north of the Phase I Property.

Environmental Condition

Areas Where Contaminants are Present

Based on the analytical results, including past investigations, on-site soil exceeds the selected MECP Table 9 Standards, as shown on Drawing PE4347-5A-5E – Soil. Groundwater exceeds the selected standards regarding several BTEX, PHC and PAH parameters, as shown on Drawings PE4347-6 – Groundwater.

Types of Contaminants

Based on the analytical results for soil and groundwater, the types of contaminants include BTEX, PHCs, PAHs, VOCs and metals. As previously discussed, while chloroform was identifed and exceeded the MECP Table 9 Standards in this current assessment as well as in the 2016 (Exp, 2016) assessment, it is not considered a contaminant as it is residual from municipal water used during the coring/drilling process.

Contaminated Media

Based on the findings of the Phase II ESA, fill, native soil, glacial till and groundwater on the Phase II Property are contaminated with BTEX, PHCs, PAHs, VOCs and/or metals.

What Is Known About Areas Where Contaminants Are Present

The contaminants are present in areas of the former gasoline handling activities, automotive servicing and /or as a result of fill materials placed on site historically.

Distribution and Migration of Contaminants

Based on the findings of the Phase II ESA, the distribution and migration of contaminants is considered to have occurred historically on the Phase II Property, primarily from the former retail fuel outlets on and off-site. Based on the current analytical results in combination with the EXP 2016 Phase II ESA result, the BTEX and PHC impacts were identifed beyond the fill material and into the underlying native silty sand and glacial till, which are shown in Drawing PE4347-7A, 7B, 8A, 8B, 9A, and 10A.

Based on the analytical results, vertical migration has occurred and extends to the water table, however, more recent analytical results show that contaminants of concern have decreased through natural attenuation.

The marginal metals impacts identified in the fill are not expected to migrate into the glacial till. Based on the vertical delineation samples the till has not been impacted.

PAH and VOC impacts were identifed in the overburden and appear to be concentrated on the north-western portion of the Phase II Property. Vertical migration has occurred and extends into the glacial till and to the water table at locations MW1A/1B and MW2A/2B.

Discharge of Contaminants

Based on the findings of the Phase II ESA, the impacted soil and groundwater is considered to be associated with the historical use of the Phase II Property (i.e. retail fuel outlets, repair garages and possible importation of fill material).

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.

Based on our findings , climatic and meteorological conditions are considered to have contributed to contaminant transport in the past.

Potential for Vapour Intrusion

Based on the findings of the Phase II ESA and the nature of the on-site buildings, the potential for vapour intrusion on the Phase II Property is considered to be low.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the property addressed 1335 and 1339 Bank Street, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to vertically delineate contamination and summarize the areas of concerns on the Phase II Property that were identified during the Phase I ESA.

The Phase II ESA was carried out in conjunction with a Geotechnical Investigation and consisted of drilling three (3) boreholes across the southern portion of the Phase II Property, all of which were constructed with groundwater monitoring well installations.

The soil profile consisted of either a topsoil or pavement structure, followed by fill material consisting of silty sand with some grave, underlain by silty clay/clayey silt, followed by silty sand, underlain by shale bedrock. Boreholes were terminated at a maximum depth of 10.3m below the ground surface. Soil samples were obtained from the boreholes and screened using combustible vapour measurements along with visual and olfactory observations.

Based on the screening results in combination with sample depth and location, seven (7) soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and petroleum hydrocarbons (PHCs, F_1-F_4), and polycyclic aromatic hydrocarbons (PAHs). BTEX, PHC and PAH parameters were identified and in excess of the selected MECP Table 9 Standards in the soil samples analyzed.

Groundwater samples from the monitoring wells were recovered and analyzed for PHC, VOC and metals. No free-phase product was observed on the groundwater at any of the monitoring well locations during the groundwater sampling events. With the exception of chloroform and dicholodiflouromethane, all BTEX, PHC and VOC parameter concentrations were undetected in the groundwater samples analyzed. Chloroform was identified in BH2-19 in excess of the selected MECP standards; however, the chloroform concentration is considered to be residual from the municipal water used during rock coring, and thus, is not considered a contaminant. Metal concentrations were identifed in the groundwater samples, however, below the MECP Standards. All groundwater results are in compliance with the MECP Table 9 Standards.

Recommendations

Existing ancillary equipment associated with former Retail Fuel Outlet

It is our recommendation that the USTs and underground ancillary equipment situated on the north side of the Phase II Property be removed under supervised by a Technical Standards and Safety Authority (TSSA) certified personnel.

Soil

Based on the findings of the Phase II ESA, overburden on the Phase II Property is impacted with BTEX, PHCs, PAH, VOCs and metals. It is expected that the contaminated soil will be removed from the subject site during the redevelopment process. The excavation of the soil from the property should be monitored and confirmed by Paterson. Any contaminated soil and construction debris being removed from the property is to be disposed of at an approved waste disposal facility.

Groundwater

It is recommended that any monitoring wells that had elevated chloroform concentrations in them be resampled to confirm that the chloroform has dissipated.

Monitoring Wells

If the monitoring wells installed on the subject site are not going to be used in the future, or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903. The wells will be registered with the MECP under this regulation.

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, 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.

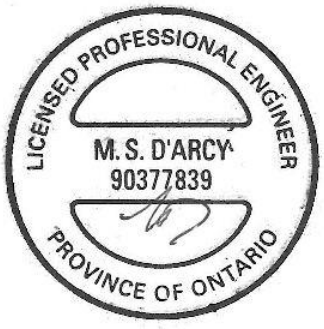
Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

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

Paterson Group Inc.

Mandy Witteman, B.Eng., M.A.Sc.

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



Report Distribution:

- Lofty Riverside GP Inc.
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4347-3 – TEST HOLE LOCATION PLAN

DRAWING PE4347-4 – GROUNDWATER CONTOUR PLAN

DRAWING PE4347-5A – ANALYTICAL TESTING PLAN – SOIL (BTEX)

DRAWING PE4347-5B – ANALYTICAL TESTING PLAN – SOIL (PHC)

DRAWING PE4347-5B – ANALYTICAL TESTING PLAN – SOIL (PAH)

DRAWING PE4347-5C – ANALYTICAL TESTING PLAN – SOIL (VOC)

DRAWING PE4347-5D– ANALYTICAL TESTING PLAN – SOIL (Metals)

DRAWING PE4347-6A – ANALYTICAL TESTING PLAN – GROUNDWATER (BTEX)

DRAWING PE4347-6B– ANALYTICAL TESTING PLAN – GROUNDWATER (PHC)

DRAWING PE4347-6C – ANALYTICAL TESTING PLAN – GROUNDWATER (PAH)

DRAWING PE4347-6D – ANALYTICAL TESTING PLAN – GROUNDWATER (VOC)

DRAWING PE4347-6E – ANALYTICAL TESTING PLAN – GROUNDWATER (Metals)

FIGURES

DRAWING PE4347-7A – CROSS-SECTION A – A' – SOIL (BTEX)

DRAWING PE4347-7B – CROSS-SECTION A – A' – SOIL (PHC)

DRAWING PE4347-7C – CROSS-SECTION A – A' – SOIL (PAH)

DRAWING PE4347-7D – CROSS-SECTION A – A' – SOIL (VOC)

DRAWING PE4347-7E – CROSS-SECTION A – A' – SOIL (Metals)

DRAWING PE4347-8A – CROSS-SECTION A – A' – GROUNDWATER (BTEX)

DRAWING PE4347-8B – CROSS-SECTION A – A' – GROUNDWATER (PHC)

DRAWING PE4347-8C – CROSS-SECTION A – A' – GROUNDWATER (PAH)

DRAWING PE4347-8D – CROSS-SECTION A – A' – GROUNDWATER (VOC)

DRAWING PE4347-8E – CROSS-SECTION A – A' – GROUNDWATER (Metals)

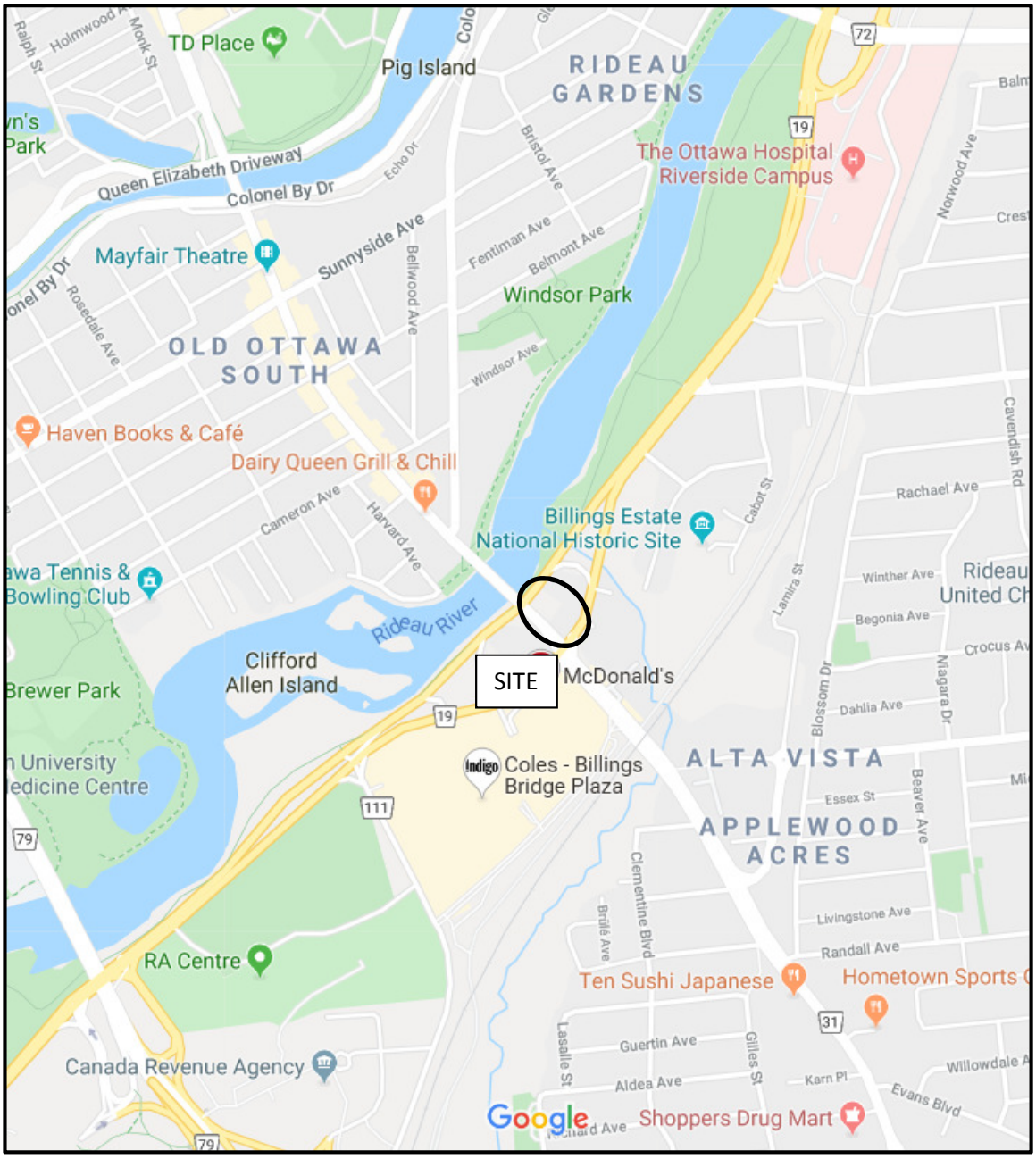


FIGURE 1

KEY PLAN

2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

RIVERSIDE DRIVE

APPROX LOCATION OF CURRENT UST'S

Concrete Retaining Wall

CONCRETE RETAINING WALL

1 STOREY
BRICK, CONCRETE BLOCK
& METAL SIDED BUILDING

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

FORMER RETAIL FUEL OUTLET

ASPHALTIC CONCRETE

COMMERCIAL
(HARVEY'S RESTAURANT)

DRIVE THRU LANE

Concrete Pad

Concrete Island

Metal Sign Base

LANDSCAPED

Depressed Curb

Concrete Curb

Concrete Sidewalk

Crown of Asphalt

BANK STREET

BH-2
BH-3
MW3B
MW3A
BH101
BH 1-19
59.75
(55.83)
MW101
BH 4
100.11
BH7
BH8
BH 2
BH 1
BH 3-19
59.64
(52.94)
MW104
BH 5
MW5
BH9
MW103
MW10-7
BH 2-19
59.68
(55.85)
BH 3
99.80
BH11
BH 6
BH10
MW105
MW10-6
MW102
MW2B
MW2A
MW1B
MW1A

A
A'
B
B'

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELLS BY OTHERS LOCATION (EXP 2016)
- BOREHOLE BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)
- A—A CROSS SECTION LOCATION
- 59.64 GROUND SURFACE ELEVATION(m)
- (55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL
0			

LOFTY RIVERSIDE GP INC.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:300	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	PE4347-3
Approved by: MSD	Revision No.:

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2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

RIVERSIDE DRIVE

APPROX LOCATION OF CURRENT UST'S

Concrete Retaining Wall

CONCRETE RETAINING WALL

1 STOREY BRICK, CONCRETE BLOCK & METAL SIDED BUILDING

ASPHALTIC CONCRETE

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

FORMER RETAIL FUEL OUTLET

COMMERCIAL (HARVEY'S RESTAURANT)

DRIVE THRU LANE

Concrete Pad

Concrete Island

Metal Sign Base

Sign

LANDSCAPED

Concrete Curb

Concrete Sidewalk

Depressed Curb

Crown of Asphalt

BANK STREET

BH-2
BH-3
MW3B 59.92 (57.72)
MW3A
BH 1-19 59.75 (55.83)
BH101
BH7
BH8
MW101
BH 4 100.11
BH 5
MW5
BH9
MW102
MW2B 60.15 (57.45)
MW2A
MW1B 60.13 (57.33)
MW1A
MW103
BH 2-19 59.68 (55.85)
BH11
BH 6
BH10
MW105
MW10-6
BH 2
BH 1
MW10-7
BH 3 99.80
BH 3-19 59.64 (52.94)
MW104

(0.02m/m)

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)
- 57.4 GROUNDWATER CONTOUR(m)
- (0.02m/m) APPROX. GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)
- 59.64 GROUND SURFACE ELEVATION(m)
- (55.83) GROUNDWATER SURFACE ELEV. (m) (OCTOBER 27 2016)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

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

NO.	REVISIONS	DATE	INITIAL
0			

LOFTY RIVERSIDE GP INC.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

GROUNDWATER CONTOUR PLAN

Scale: 1:300	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	PE4347-4
Approved by: MSD	Revision No.:

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RIVERSIDE DRIVE

RIVERSIDE DRIVE (SOUTH)

2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

#2197
7 Storey
Stucco Building

BH1-SS7 4.57-5.18m 31-Oct-19
BTEX comply with MECP Table 9 Standards

BH1-SS9	6.09-6.65m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.11	0.05
Xylenes	0.17	0.05

Remaining BTEX parameters comply

BH101-SS4 3.1-4.0m 25-Apr-10
BTEX comply with MECP Table 9 Standards

MW101-SS3 3.1-4.6m 25-Apr-10
BTEX comply with MECP Table 9 Standards

APPROX LOCATION OF CURRENT USTs

CONCRETE RETAINING WALL

MW3-SS4	3.0-3.6m	27-Dec-13

BTEX comply with the MECP Table 9 Standards

MW3-SS4(DUP)	3.1-3.6m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.26	0.02
Ethylbenznee	0.15	0.05
Xylenes	0.49	0.05

MW2-SS5	3.8-4.4m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.69	0.02
Ethylbenzene	132	0.02
Toluene	125	0.2
Xylenes	558	0.05

BH2-SS2	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.64	0.02
Ethylbenzene	0.09	0.05
Xylenes	0.43	0.05

Remaining BTEX parameters comply

MW1B-SS1	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.8	0.02
Ethylbenzene	1.11	0.05
Toluene	0.27	0.2
Xylenes	3.23	0.05

Remaining BTEX parameters comply

MW1B-SS1(DUP)	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.09	0.05
Xylenes	0.3	0.05

Remaining BTEX parameters comply

MW1-SS2	1.5-2.1m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.15	0.05
Xylenes	0.68	0.05

Remaining BTEX parameters comply

MW1-SS5	3.8-4.4m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.4	0.02
Ethylbenzene	43.9	0.02
Toluene	31.9	0.2
Xylenes	178	0.05

Remaining BTEX parameters comply

MW102-SS3 4.3-5.0m 25-Apr-10
BTEX comply with MECP Table 9 Standards

BH6-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
Xylenes	0.39	0.05

Remaining BTEX parameters comply

BH 1-19
59.75
(55.83)

BH 4
100.11

BH 5

BH 2-19
59.68
(55.85)

BH 6

BH 3
99.80

BH 3-19
59.64
(52.94)

BH 1

BH 2

BH7

BH8

BH9

BH10

BH11

BH-2

BH-3

MW3B

MW3A

MW2B

MW2A

MW1B

MW1A

MW101

MW102

MW103

MW104

MW105

MW10-6

MW10-7

MW5

1 STOREY
BRICK, CONCRETE BLOCK
& METAL SIDED BUILDING

ASPHALTIC CONCRETE

FORMER RETAIL FUEL OUTLET

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

COMMERCIAL
(HARVEY'S RESTAURANT)

DRIVETHRU LANE

LANDSCAPED

Concrete Pad

Concrete Island

Metal Sign Base

Concrete Curb

Concrete Sidewalk

Depressed Curb

Sidewalk

BANK STREET

BH2-SS9 6.09-6.7m 31-Oct-19
BTEX comply with the MECP Table 9 Standards

BH-11-SS8 4.57m 29-Oct-10

Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenze	0.08	0.05
Xylenes	0.27	0.05

Remaining BTEX parameters comply with MECP Table 9 Standards

BH-9-SS8 4.57m 29-Oct-10
BTEX comply with the MECP Table 9 Standards

BH5-SS5 3.5-4.3m 4-Dec-07
BTEX comply with the MECP Table 9 Standards

BH-10-SS8 4.57m 29-Oct-10

Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.08	0.02
Ethylbenze	0.07	0.05
Xylenes	0.25	0.05

Remaining BTEX parameters comply

BH-7-SS9 5.18m 29-Oct-10

Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.5	0.05

BH-8-SS8 4.57m 29-Oct-10

Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.06	0.05
Xylenes	0.1	0.05

BH4-SS5 3.5-4.3m 4-Dec-07

Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.89	0.05
Xylenes	0.92	0.05

Remaining BTEX parameters comply

MW103-SS5 3.5-4.3m 25-Apr-10
BTEX comply with MECP Table 9 Standards

BH3-SS6 3.84-4.45m 1-Nov-19
BTEX comply with the MECP Table 9 Standards

BH10-7-SS8 4.57m 29-Oct-10
BTEX comply with the MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
BTEX comply with MECP Table 9 Standards

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-SOIL (BTEX)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-5A
Approved by: MSD	Revision No.:

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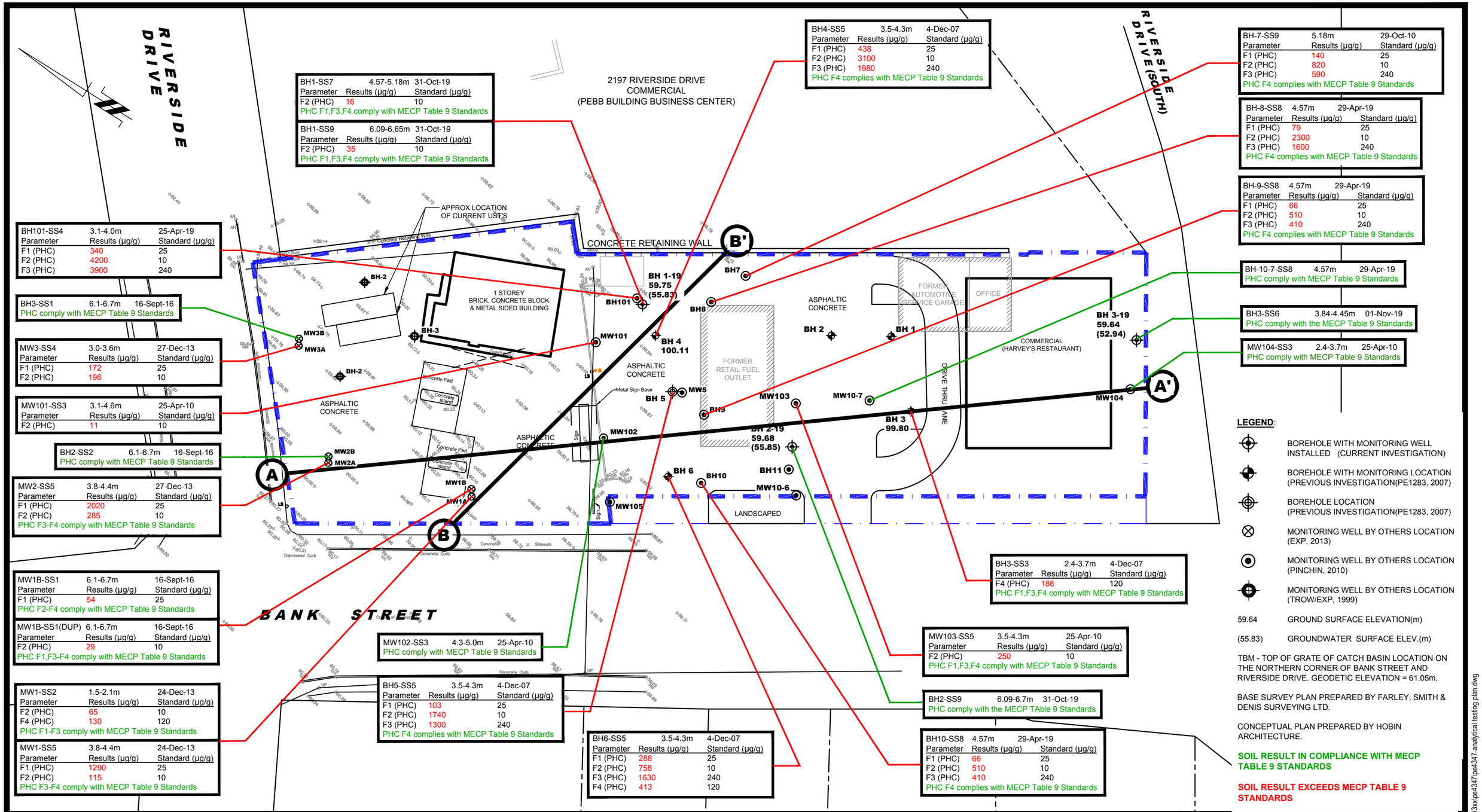

BH1-SS7	4.57-5.18m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	16	10

PHC F1,F3,F4 comply with MECP Table 9 Standards

BH1-SS9	6.09-6.65m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	35	10

PHC F1,F3,F4 comply with MECP Table 9 Standards

BH4-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	438	25
F2 (PHC)	3100	10
F3 (PHC)	1980	240

PHC F4 complies with MECP Table 9 Standards

BH101-SS4	3.1-4.0m	25-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	340	25
F2 (PHC)	4200	10
F3 (PHC)	3900	240

BH3-SS1 6.1-6.7m 16-Sept-16
PHC comply with MECP Table 9 Standards

MW3-SS4	3.0-3.6m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	172	25
F2 (PHC)	196	10

MW101-SS3	3.1-4.6m	25-Apr-10
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	11	10

BH2-SS2 6.1-6.7m 16-Sept-16
PHC comply with MECP Table 9 Standards

MW2-SS5	3.8-4.4m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	2020	25
F2 (PHC)	285	10

PHC F3-F4 comply with MECP Table 9 Standards

MW1B-SS1	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	54	25

PHC F2-F4 comply with MECP Table 9 Standards

MW1B-SS1(DUP)	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	29	10

PHC F1,F3-F4 comply with MECP Table 9 Standards

MW1-SS2	1.5-2.1m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	65	10
F4 (PHC)	130	120

PHC F1-F3 comply with MECP Table 9 Standards

MW1-SS5	3.8-4.4m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	1290	25
F2 (PHC)	115	10

PHC F3-F4 comply with MECP Table 9 Standards

MW102-SS3 4.3-5.0m 25-Apr-10
PHC comply with MECP Table 9 Standards

BH5-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	103	25
F2 (PHC)	1740	10
F3 (PHC)	1300	240

PHC F4 complies with MECP Table 9 Standards

BH6-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	288	25
F2 (PHC)	758	10
F3 (PHC)	1630	240
F4 (PHC)	413	120

BH3-SS3	2.4-3.7m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F4 (PHC)	186	120

PHC F1,F3,F4 comply with MECP Table 9 Standards

MW103-SS5	3.5-4.3m	25-Apr-10
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	250	10

PHC F1,F3,F4 comply with MECP Table 9 Standards

BH2-SS9 6.09-6.7m 31-Oct-19
PHC comply with the MECP Table 9 Standards

BH10-SS8	4.57m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	66	25
F2 (PHC)	510	10
F3 (PHC)	410	240

PHC F4 complies with MECP Table 9 Standards

BH-7-SS9	5.18m	29-Oct-10
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	140	25
F2 (PHC)	820	10
F3 (PHC)	590	240

PHC F4 complies with MECP Table 9 Standards

BH-8-SS8	4.57m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	79	25
F2 (PHC)	2300	10
F3 (PHC)	1600	240

PHC F4 complies with MECP Table 9 Standards

BH-9-SS8	4.57m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	66	25
F2 (PHC)	510	10
F3 (PHC)	410	240

PHC F4 complies with MECP Table 9 Standards

BH-10-7-SS8 4.57m 29-Apr-19
PHC comply with MECP Table 9 Standards

BH3-SS6 3.84-4.45m 01-Nov-19
PHC comply with the MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
PHC comply with MECP Table 9 Standards

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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consulting engineers
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Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-SOIL (PHC)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-5B
Approved by: MSD	Revision No.:

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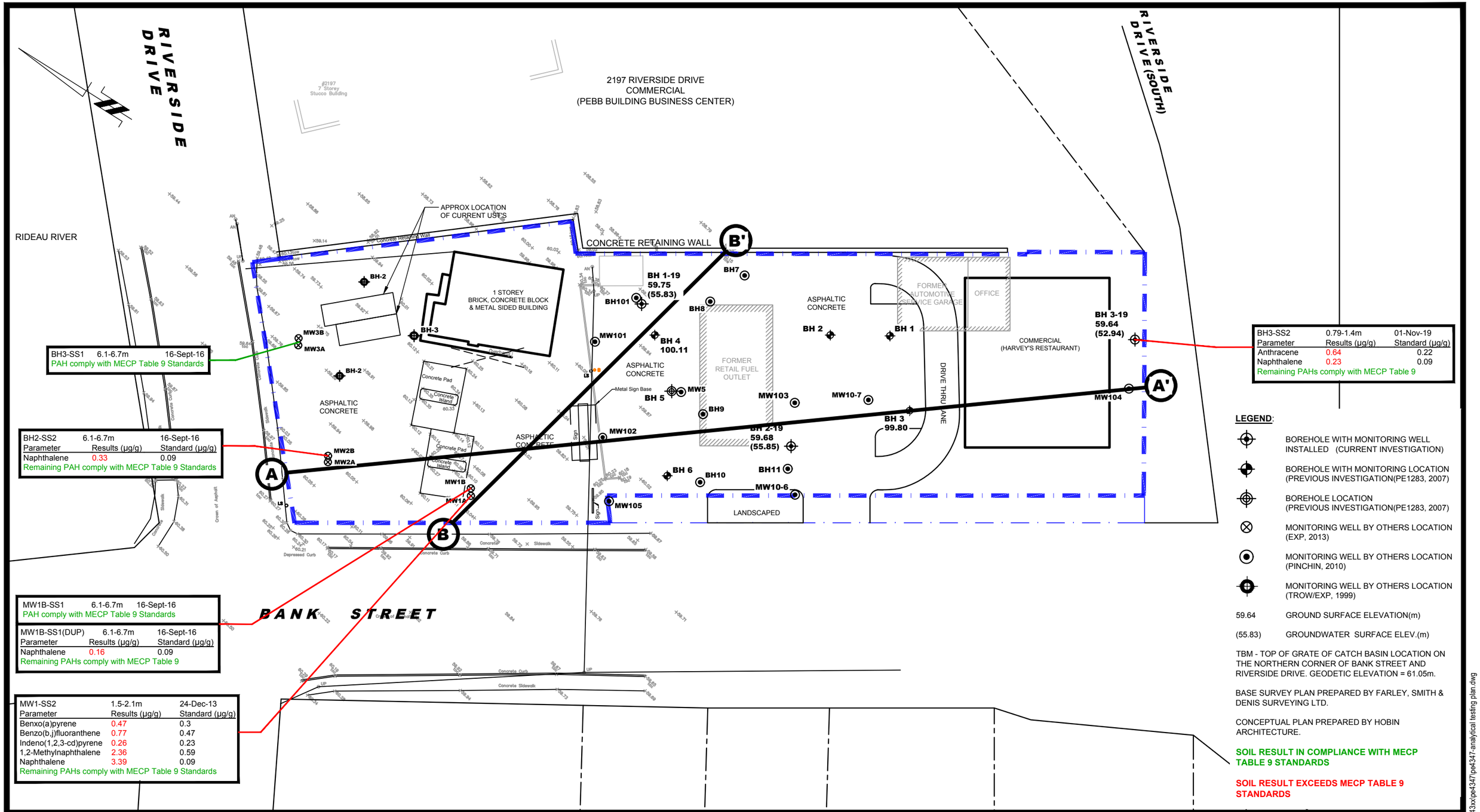

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
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- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-SOIL (PAH)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-5C
Approved by: MSD	Revision No.:

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RIVERSIDE DRIVE

RIVERSIDE DRIVE (SOUTH)

2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

#2197
7 Storey
Stucco Building

RIDEAU RIVER

BH101-SS4 3.1-4.0m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW3-SS4 3.0-3.6m 27-Dec-13
VOC comply with the MECP Table 9 Standards

MW3-SS4(DUP) 3.0-3.6m 27-Dec-13
VOC comply with the MECP Table 9 Standards

BH3-SS1 6.1-6.7m 16-Sept-16

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	0.11	0.05

Remaining VOCs comply with Table 9 Standards

MW101-SS3 3.1-4.6m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW102-SS3 4.3-5.0m 25-Apr-10
VOC comply with MECP Table 9 Standards

BH2-SS2 6.1-6.7m 16-Sept-16
VOC comply with MECP Table 9 Standards

MW2-SS5 3.8-4.4m 27-Dec-13

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	74.3	0.05

Remaining VOCs comply with Table 9 Standards

MW1B-SS1 6.1-6.7m 16-Sept-16

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	0.17	0.05

MW1-SS2 1.5-2.1m 24-Dec-13
VOC comply with MECP Table 9 Standards

MW1-SS5 3.8-4.4m 24-Dec-13

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	152	0.05

Remaining VOCs comply with Table 9 Standards

MW103-SS5 3.5-4.3m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
VOC comply with MECP Table 9 Standards

APPROX LOCATION OF CURRENT USTs

CONCRETE RETAINING WALL

1 STOREY
BRICK, CONCRETE BLOCK
& METAL SIDED BUILDING

FORMER RETAIL FUEL OUTLET

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

COMMERCIAL
(HARVEY'S RESTAURANT)

DRIVE THRU LANE

ASPHALTIC CONCRETE

LANDSCAPED

Concrete Pad

Concrete Island

Metal Sign Base

Concrete Curb

Concrete Sidewalk

Depressed Curb

Sign

LS

BH-2 BH-3 BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9 BH10 BH11

BH 1-19
59.75
(55.83)

BH 2-19
59.68
(55.85)

BH 3-19
59.64
(52.94)

BH 3
99.80

BH 4
100.11

MW1A MW1B MW2A MW2B MW3A MW3B MW101 MW102 MW103 MW104 MW105 MW10-6 MW10-7

A A' B B'

BANK STREET

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-SOIL (VOC)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-5D
Approved by: MSD	Revision No.:

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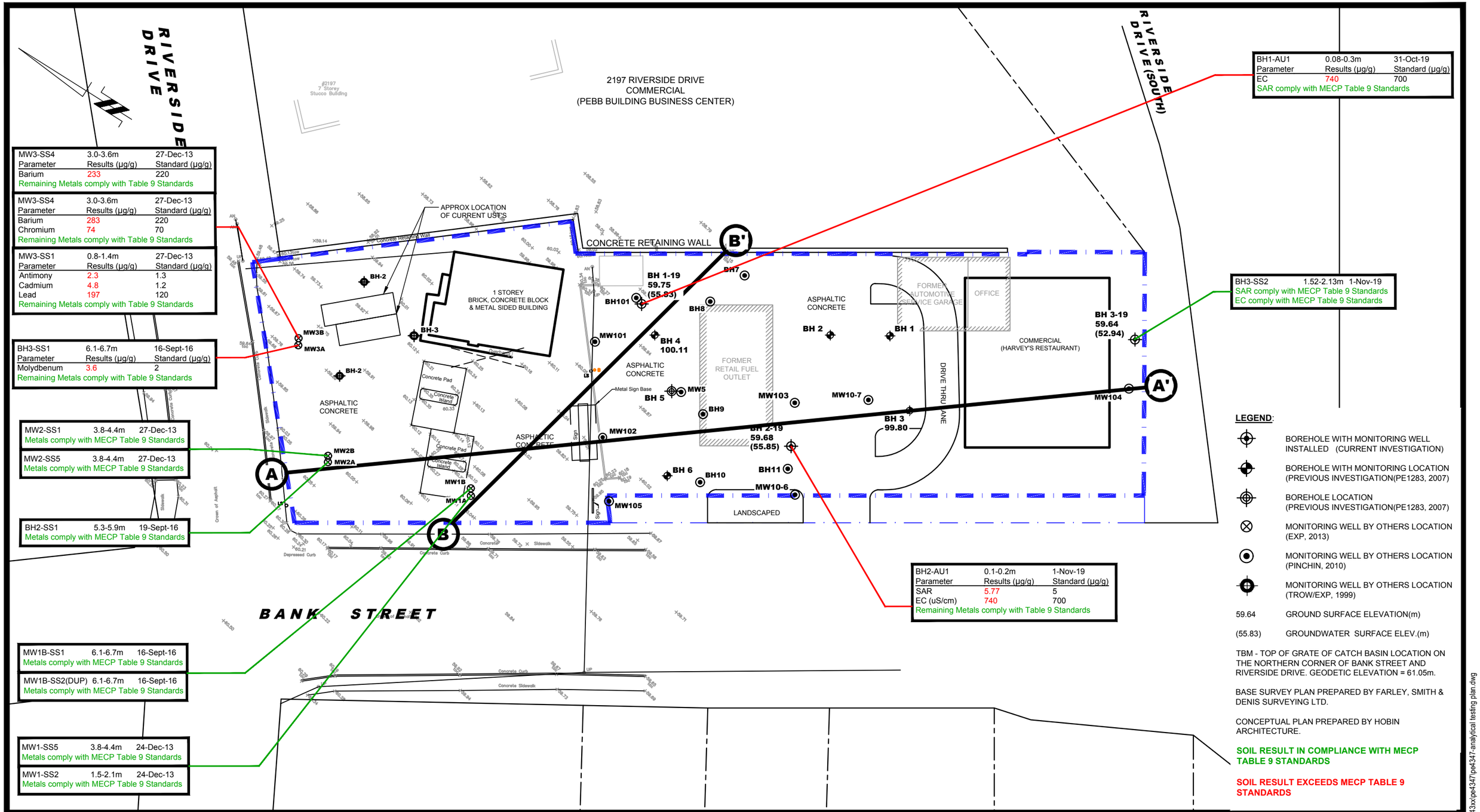

MW3-SS4	3.0-3.6m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Barium	233	220

Remaining Metals comply with Table 9 Standards

MW3-SS4	3.0-3.6m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Barium	283	220
Chromium	74	70

Remaining Metals comply with Table 9 Standards

MW3-SS1	0.8-1.4m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Antimony	2.3	1.3
Cadmium	4.8	1.2
Lead	197	120

Remaining Metals comply with Table 9 Standards

BH3-SS1	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Molydbenum	3.6	2

Remaining Metals comply with Table 9 Standards

MW2-SS1 3.8-4.4m 27-Dec-13
Metals comply with MECP Table 9 Standards

MW2-SS5 3.8-4.4m 27-Dec-13
Metals comply with MECP Table 9 Standards

BH2-SS1 5.3-5.9m 19-Sept-16
Metals comply with MECP Table 9 Standards

MW1B-SS1 6.1-6.7m 16-Sept-16
Metals comply with MECP Table 9 Standards

MW1B-SS2(DUP) 6.1-6.7m 16-Sept-16
Metals comply with MECP Table 9 Standards

MW1-SS5 3.8-4.4m 24-Dec-13
Metals comply with MECP Table 9 Standards

MW1-SS2 1.5-2.1m 24-Dec-13
Metals comply with MECP Table 9 Standards

BH1-AU1	0.08-0.3m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
EC	740	700

SAR comply with MECP Table 9 Standards

BH3-SS2 1.52-2.13m 1-Nov-19
SAR comply with MECP Table 9 Standards
EC comply with MECP Table 9 Standards

BH2-AU1	0.1-0.2m	1-Nov-19
Parameter	Results (µg/g)	Standard (µg/g)
SAR	5.77	5
EC (uS/cm)	740	700

Remaining Metals comply with Table 9 Standards

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-SOIL (METALS)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-5E
Approved by: MSD	Revision No.:

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2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

RIVERSIDE DRIVE (SOUTH)

RIVERSIDE DRIVE

RIDEAU RIVER

BANK STREET

BANK STREET
I-EAST OTTAWA
TY HEALTH CENTRE

MW3B 6.95-10.15m 16-Jan-14
BTEX comply with MECP Table 9 Standards

MW3B 6.95-10.15m 27-Sept-16
BTEX comply with MECP Table 9 Standards

MW3A 1.54-4.64m 16-Jan-14
BTEX comply with MECP Table 9 Standards

MW3A 1.54-4.64m 27-Sept-16
BTEX comply with MECP Table 9 Standards

MW1B 8.8-11.44m 27-Sept-16
BTEX comply with MECP Table 9 Standards

MW1A	5.18-6.68m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
Benzene	113	44
Xylenes	3690	3300

MW1A	5.18-6.68m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
Benzene	113	44
Ethylbenzene	2540	1800
Xylenes	11500	3300

MW2B 8.32-11.52m 16-Jan-14
BTEX comply with MECP Table 9 Standards

MW2B 8.32-11.52m 27-Sept-16
BTEX comply with MECP Table 9 Standards

MW2A	1.35-4.45m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
Benzene	678	44
Ethylbenzene	1840	1800
Xylenes	10600	3300

MW2A 1.35-4.45m 27-Sept-16
BTEX comply with MECP Table 9 Standards

MW102 2.79-5.79m 27-Apr-10
BTEX comply with MECP Table 9 Standards

MW101 2.47-5.47m 27-Apr-10
BTEX comply with MECP Table 9 Standards

BH1-GW1 7.26-10.26m 6-Nov-19
BTEX comply with MECP Table 9 Standards

BH5-GW1 3.45-4.95m 7-Dec-07
BTEX comply with MECP Table 9 Standards

MW103 2.49-5.49m 27-Apr-10
BTEX comply with MECP Table 9 Standards

BH3-GW1 8.71-10.21m 6-Nov-19
BTEX comply with MECP Table 9 Standards

MW104 3.10-6.10m 27-Apr-10
BTEX comply with MECP Table 9 Standards

MW103 2.49-5.49m 27-Apr-10
BTEX comply with MECP Table 9 Standards

BH2-GW1 8.69-10.19m 6-Nov-19
PHC comply with MECP Table 9 Standards

APPROX LOCATION OF CURRENT USES

CONCRETE RETAINING WALL

1 STOREY BRICK, CONCRETE BLOCK & METAL SIDED BUILDING

ASPHALTIC CONCRETE

FORMER RETAIL FUEL OUTLET

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

COMMERCIAL (HARVEY'S RESTAURANT)

DRIVE THRU LANE

LANDSCAPED

BH 1-19 59.75 (55.83)
BH 2-19 59.68 (55.85)
BH 3-19 59.64 (52.94)
BH 3 99.80
BH 4 100.11

BH-2 BH-3 BH1 BH2 BH5 BH6 BH7 BH8 BH9 BH10 BH11 BH101

MW1A MW1B MW2A MW2B MW3A MW3B MW5 MW10-6 MW10-7 MW101 MW102 MW103 MW104 MW105

Concrete Pad Concrete Island Metal Sign Base Sign Concrete Curb Concrete Sidewalk Depressed Curb Crown of Asphalt

1330 BANK STREET
VACANT

2211RIVERSIDE DRIVE
MULTI-UNIT
COMMERCIAL BUILDING

1340 BANK STREET
COMMERCIAL
(RESTAURANTS)

1346 BANK STREET
COMMERCIAL
(CLOTHING STORE)

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN-GROUNDWATER (BTEX)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-6A
Approved by: MSD	Revision No.:

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MW101	2.47-5.47m	27-Apr-10
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	16000	420
F2 (PHC)	2200	150
F3 (PHC)	3500	500
F4 (PHC)	1900	500

MW101	2.47-5.47m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	830	420
F2 (PHC)	260	150

MW3B 6.95-10.15m 16-Jan-14
PHCs comply with MECP Table 9 Standards

MW3B 6.95-10.15m 27-Sept-16
PHCs comply with MECP Table 9 Standards

MW3A 1.54-4.64m 16-Jan-14
PHCs comply with MECP Table 9 Standards

MW3A 1.54-4.64m 27-Sept-16
PHCs comply with MECP Table 9 Standards

MW102 2.79-5.79m 27-Apr-10
PHC comply with MECP Table 9 Standards

MW102 2.79-5.79m 2-Nov-10
PHC comply with MECP Table 9 Standards

MW2B 8.32-11.52m 16-Jan-14
PHCs comply with MECP Table 9 Standards

MW2B 8.32-11.52m 27-Sept-16
PHCs comply with MECP Table 9 Standards

MW2A	1.35-4.45m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	12800	420

MW2A	1.35-4.45m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	12800	420

MW1B 8.8-11.44m 27-Sept-16
PHCs comply with MECP Table 9 Standards

MW1A	5.18-6.68m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	9850	420

MW1A	5.18-6.68m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	9850	420
F2 (PHC)	885	150

BH1-GW1 7.26-10.26m 6-Nov-19
PHC comply with MECP Table 9 Standards

BH5-GW1	3.45-4.95m	7-Dec-07
Parameter	Results (µg/L)	Standard (µg/L)
F2 (PHC)	42600	150
F3 (PHC)	31200	500

MW10-7	2.25-3.75m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F2 (PHC)	1000	150
F3 (PHC)	1400	500
F4 (PHC)	38000	500

BH3-GW1 8.71-10.21m 6-Nov-19
PHC comply with MECP Table 9 Standards

MW104 3.10-6.10m 27-Apr-10
PHC comply with MECP Table 9 Standards

MW104 3.10-6.10m 2-Nov-10
PHC comply with MECP Table 9 Standards

MW103	2.49-5.49m	27-Apr-10
Parameter	Results (µg/L)	Standard (µg/L)
F3 (PHC)	630	500
F4 (PHC)	1400	500

MW103	2.49-5.49m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F3 (PHC)	900	500
F4 (PHC)	2100	500

BH2-GW1 8.69-10.19m 6-Nov-19
PHC comply with MECP Table 9 Standards

2197 RIVERSIDE DRIVE
COMMERCIAL
(PEBB BUILDING BUSINESS CENTER)

APPROX LOCATION OF CURRENT UST'S

CONCRETE RETAINING WALL

1 STOREY BRICK, CONCRETE BLOCK & METAL SIDED BUILDING

FORMER AUTOMOTIVE SERVICE GARAGE

OFFICE

COMMERCIAL (HARVEY'S RESTAURANT)

FORMER RETAIL FUEL OUTLET

ASPHALTIC CONCRETE

DRIVE THRU LANE

LANDSCAPED

RIVERSIDE DRIVE

BANK STREET

BH 1-19 59.75 (55.83)
BH 2-19 59.68 (55.85)
BH 3-19 59.64 (52.94)
BH 1 99.80
BH 2 100.11
BH 3 99.80

BH-2, BH-3, BH101, BH7, BH8, BH9, BH10, BH11, BH 1, BH 2, BH 3, BH 4, BH 5, BH 6, MW1A, MW1B, MW2A, MW2B, MW3A, MW3B, MW101, MW102, MW103, MW104, MW105, MW10-6, MW10-7, MW5

1330 BANK STREET
VACANT

2211RIVERSIDE DRIVE
MULTI-UNIT
COMMERCIAL BUILDING

1340 BANK STREET
COMMERCIAL
(RESTAURANTS)

1346 BANK STREET
COMMERCIAL
(CLOTHING STORE)

RIDEAU RIVER

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- BOREHOLE/MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN-GROUNDWATER (PHC)

Scale:	Date:
1:400	12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-6B
Approved by: MSD	Revision No.:

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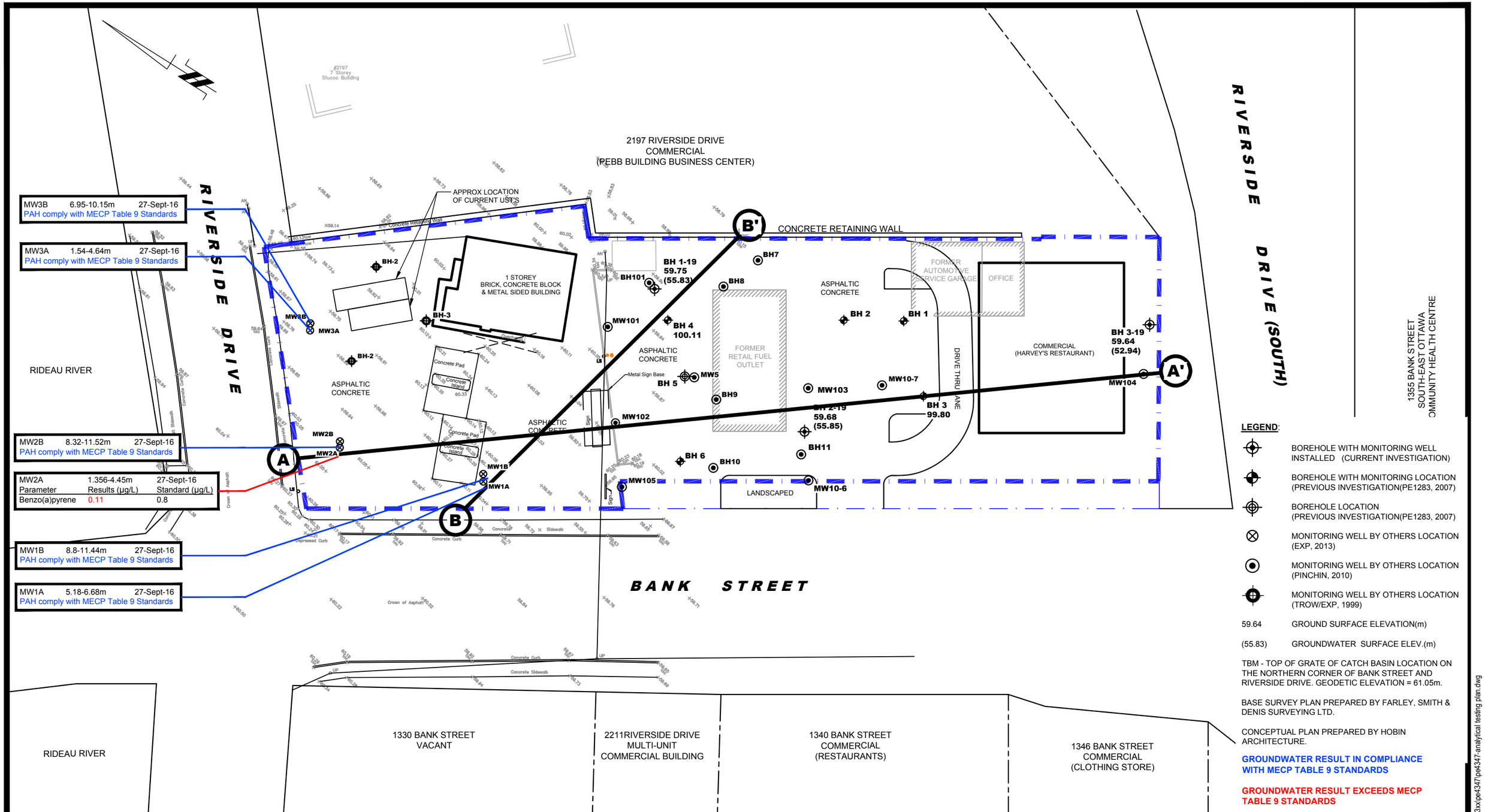

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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Ottawa, Ontario K2E 7J5
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NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN-GROUNDWATER (PAH)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-6C
Approved by: MSD	Revision No.:

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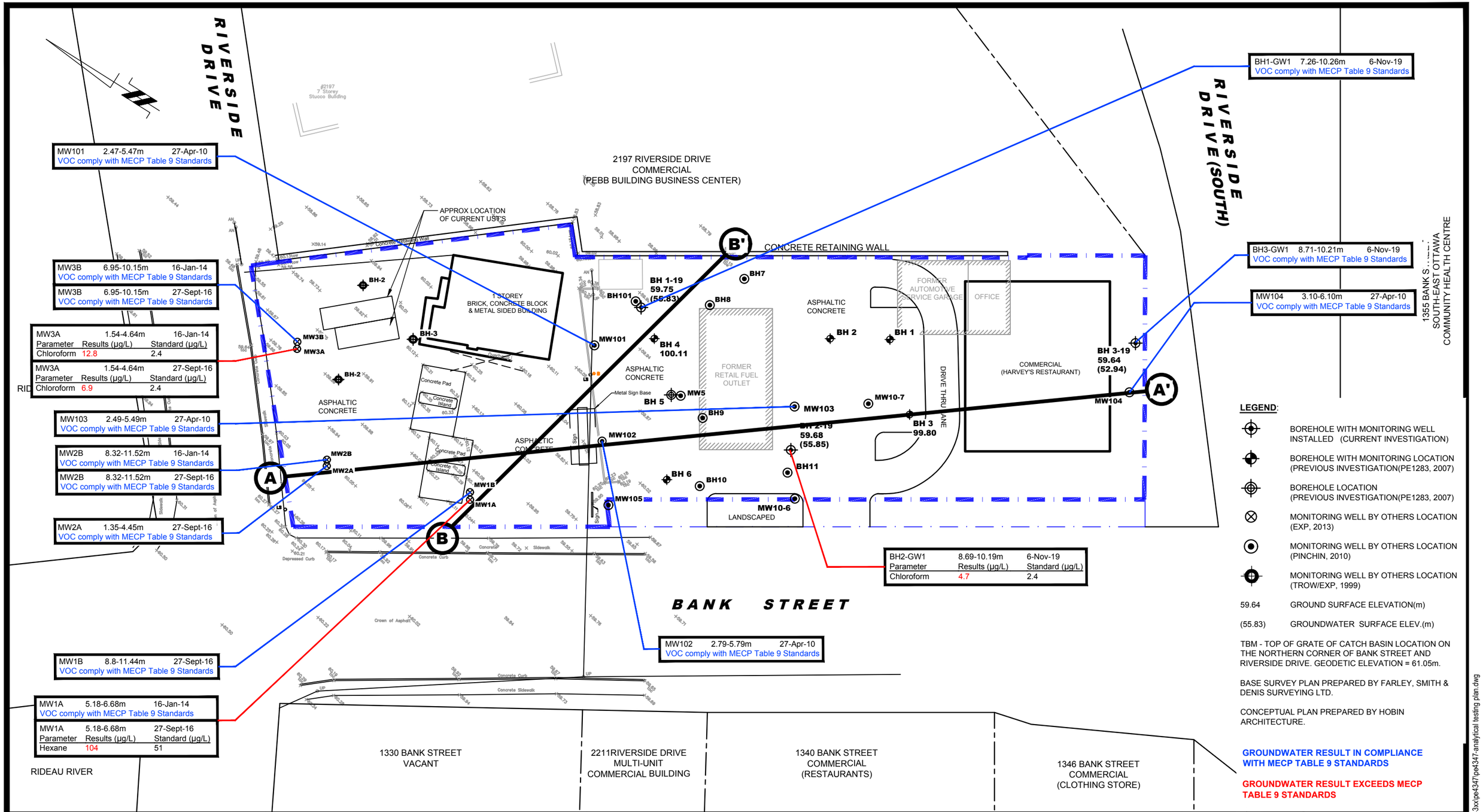

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN-GROUNDWATER (VOC)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-6D
Approved by: MSD	Revision No.:

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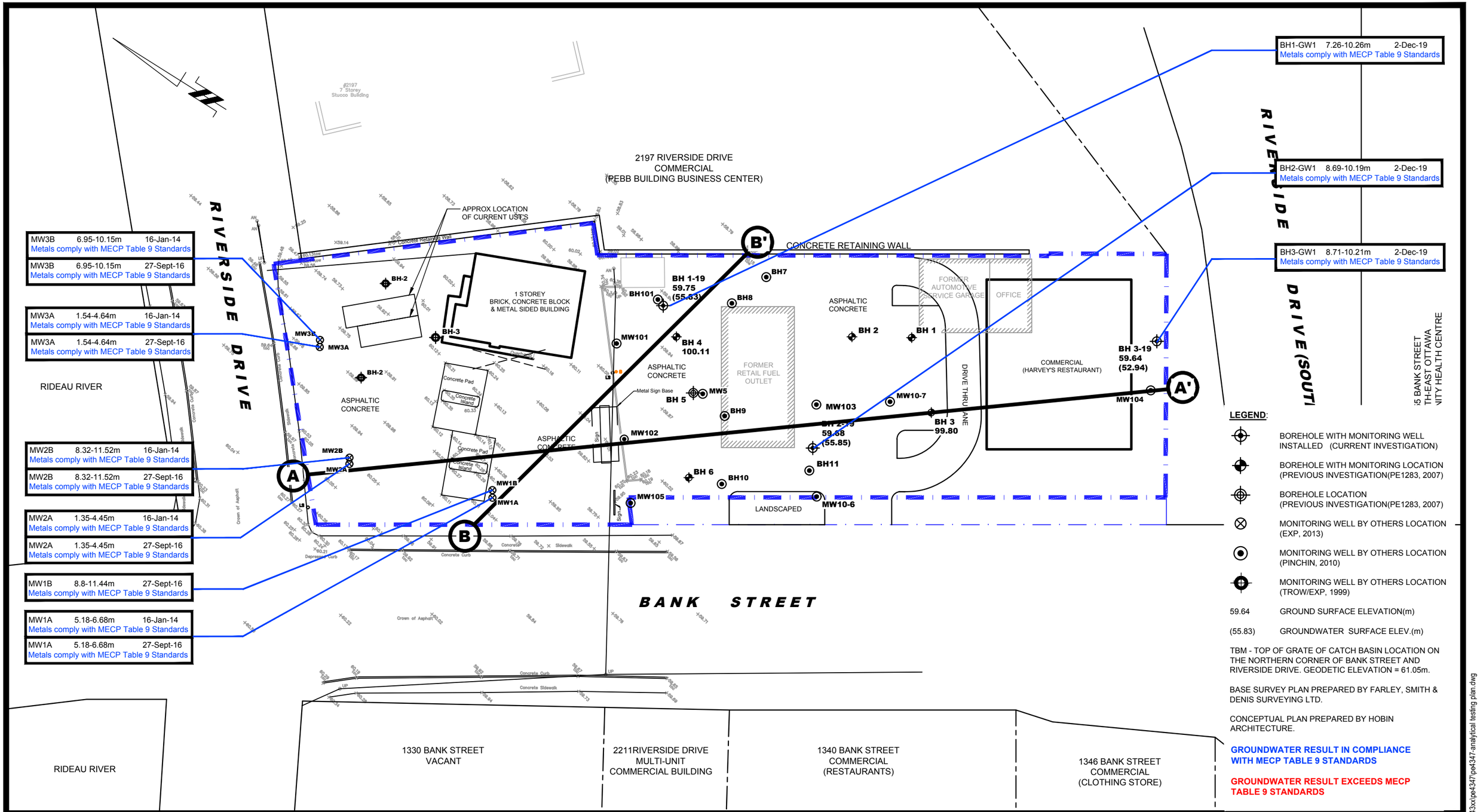

LEGEND:

- BOREHOLE WITH MONITORING WELL INSTALLED (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- BOREHOLE LOCATION (PREVIOUS INVESTIGATION(PE1283, 2007)
- MONITORING WELL BY OTHERS LOCATION (EXP, 2013)
- MONITORING WELL BY OTHERS LOCATION (PINCHIN, 2010)
- MONITORING WELL BY OTHERS LOCATION (TROW/EXP, 1999)

59.64 GROUND SURFACE ELEVATION(m)

(55.83) GROUNDWATER SURFACE ELEV.(m)

TBM - TOP OF GRATE OF CATCH BASIN LOCATION ON THE NORTHERN CORNER OF BANK STREET AND RIVERSIDE DRIVE. GEODETIC ELEVATION = 61.05m.

BASE SURVEY PLAN PREPARED BY FARLEY, SMITH & DENIS SURVEYING LTD.

CONCEPTUAL PLAN PREPARED BY HOBIN ARCHITECTURE.

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET
OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN-GROUNDWATER (METALS)

Scale: 1:400	Date: 12/2019
Drawn by: RCG	Report No.: PE4347-2
Checked by: MW	Dwg. No.: PE4347-6E
Approved by: MSD	Revision No.:

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MW2-SS5	3.8-4.4m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.69	0.02
Ethylbenzene	132	0.02
Toluene	125	0.2
Xylenes	558	0.05

BH5-SS5 3.5-4.3m 4-Dec-07
BTEX comply with the MECP Table 9 Standards

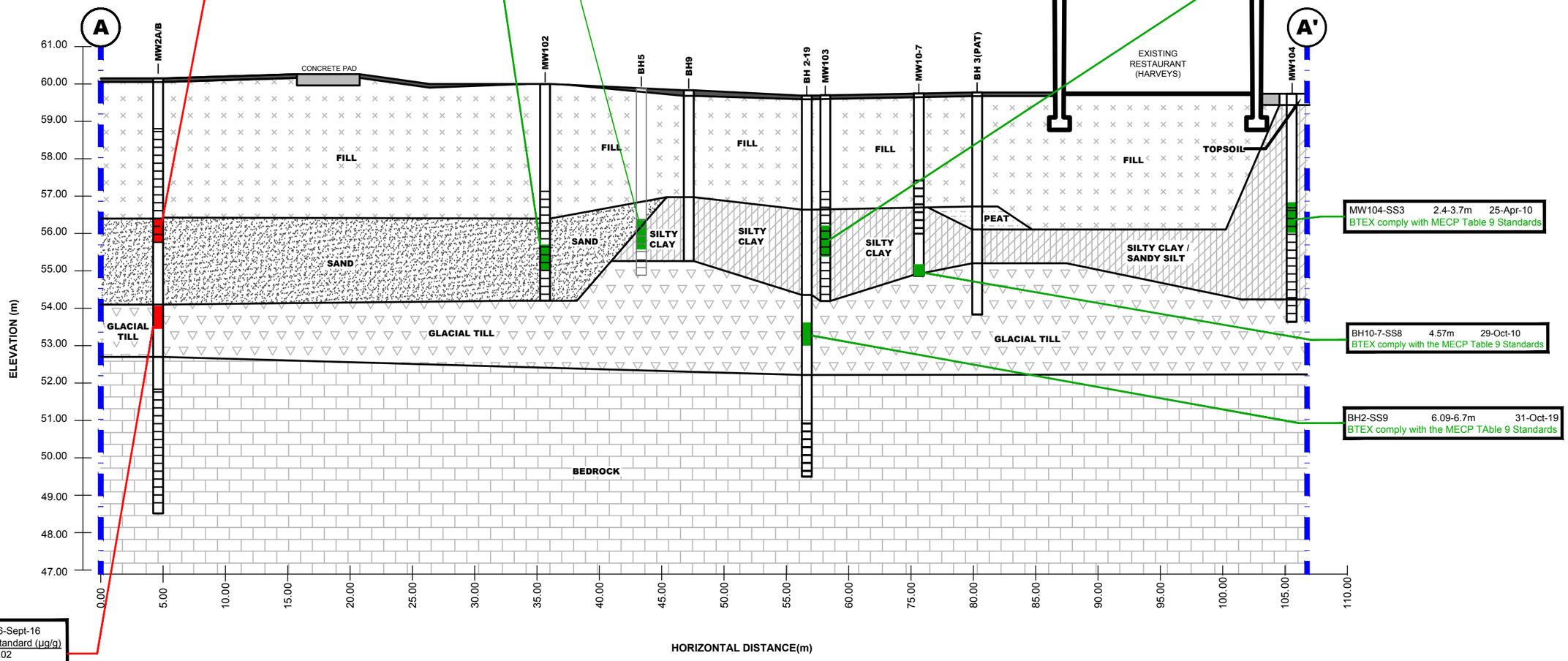
MW102-SS3 4.3-5.0m 25-Apr-10
BTEX comply with MECP Table 9 Standards

MW103-SS5 3.5-4.3m 25-Apr-10
BTEX comply with MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
BTEX comply with MECP Table 9 Standards

BH10-7-SS8 4.57m 29-Oct-10
BTEX comply with the MECP Table 9 Standards

BH2-SS9 6.09-6.7m 31-Oct-19
BTEX comply with the MECP TAble 9 Standards



BH2-SS2	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.64	0.02
Ethylbenzene	0.09	0.05
Xylenes	0.43	0.05

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (BTEX)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-7A
Approved by: MSD	Revision No.:

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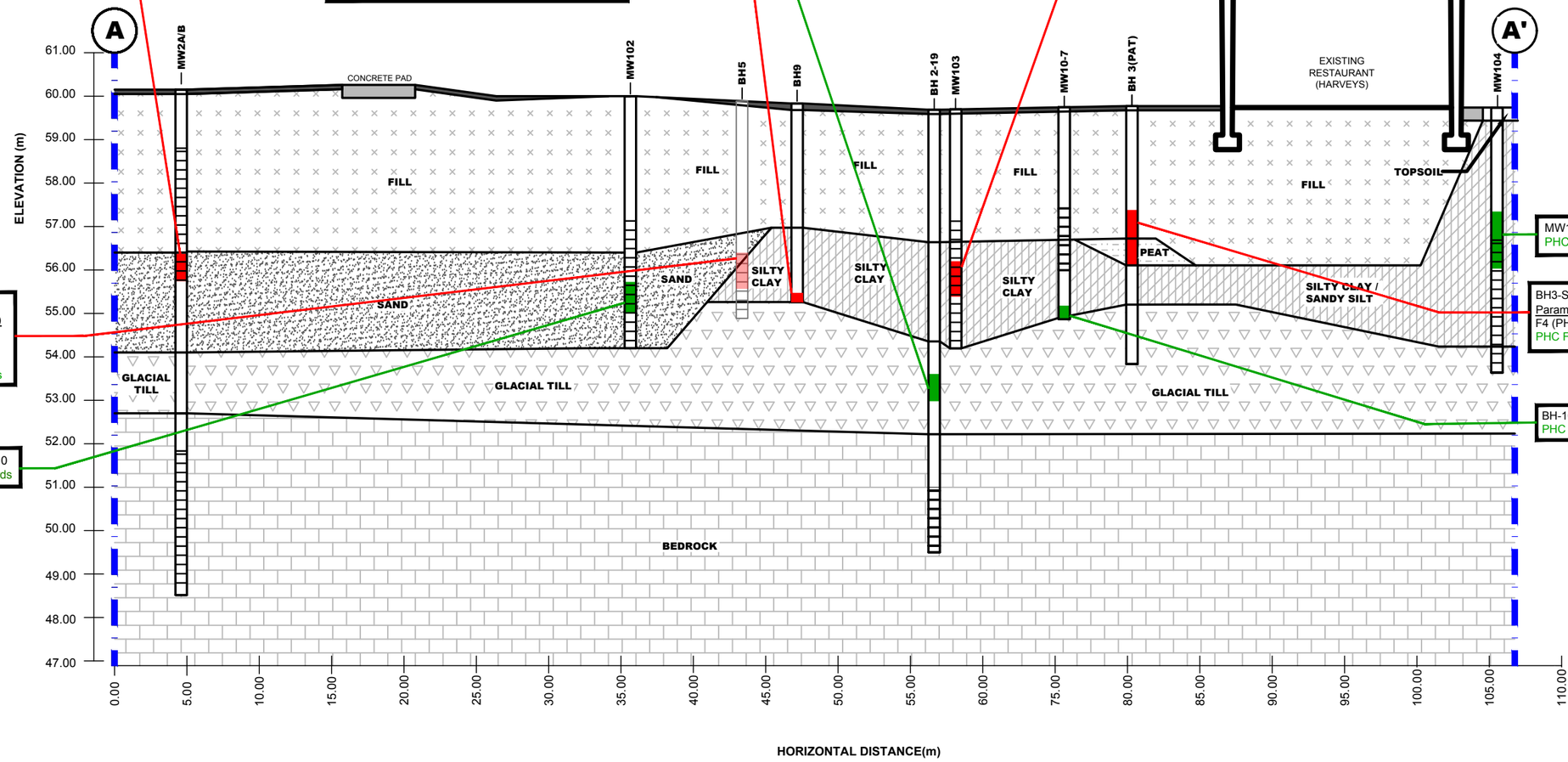
MW2-SS5	3.8-4.4m	27-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	2020	25
F2 (PHC)	285	10

BH2-SS9 6.09-6.7m 01-Nov-19
PHC comply with the MECP Table 9 Standards

BH-9-SS8	4.57m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	66	25
F2 (PHC)	510	10
F3 (PHC)	410	240

PHC F4 complies with MECP Table 9 Standards

MW103-SS5	3.5-4.3m	25-Apr-10
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	250	10



BH5-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	103	25
F2 (PHC)	1740	10
F3 (PHC)	1300	240

PHC F4 complies with MECP Table 9 Standards

MW102-SS3 4.3-5.0m 25-Apr-10
PHC comply with MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
PHC comply with MECP Table 9 Standards

BH3-SS3	2.4-3.7m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F4 (PHC)	186	120

PHC F1,F3,F4 comply with MECP Table 9 Standards

BH-10-7-SS8 4.57m 29-Apr-19
PHC comply with MECP Table 9 Standards

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (PHC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-7B
Approved by: MSD	Revision No.:

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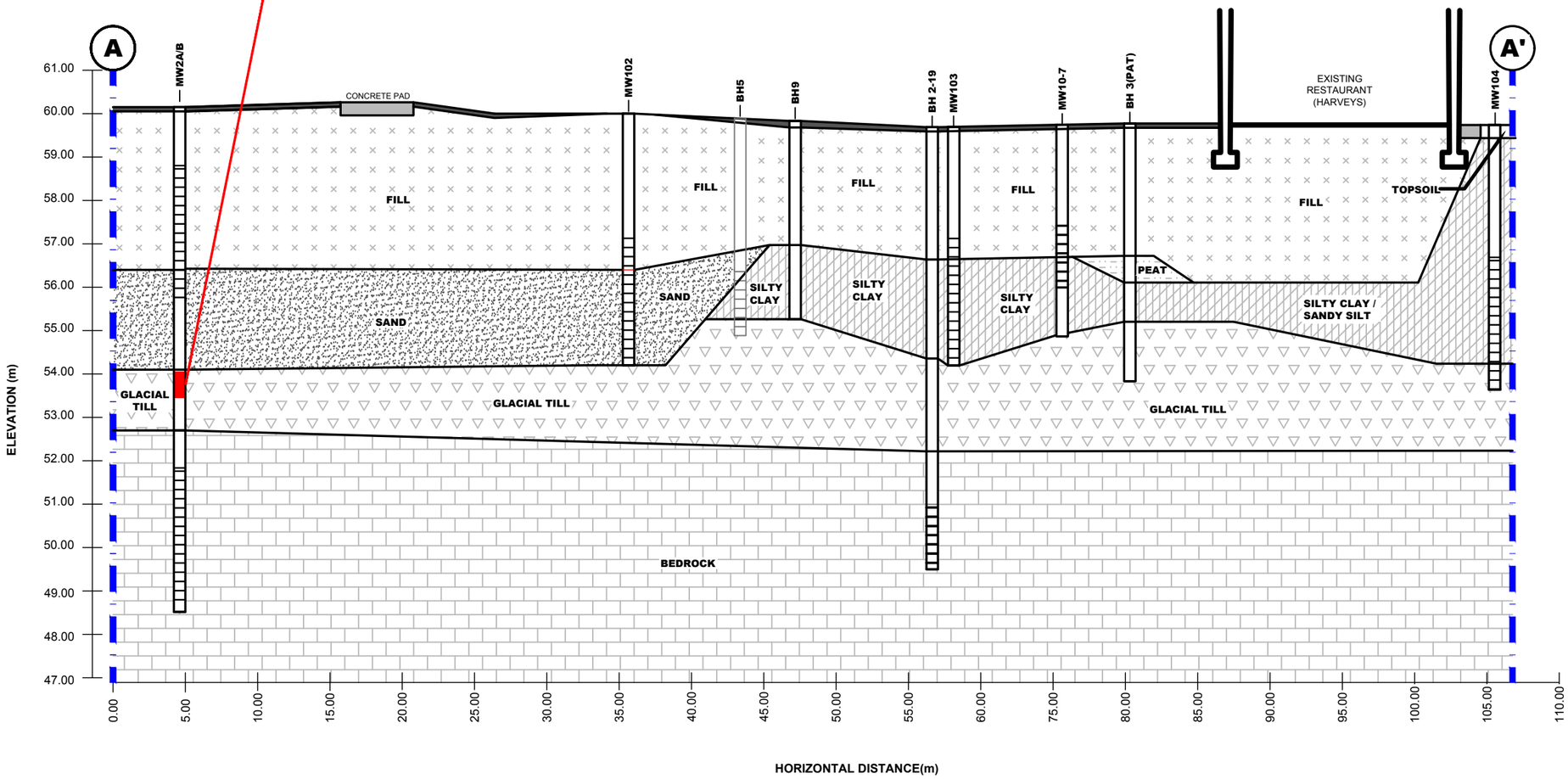
BH2-SS2	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Naphthalene	0.33	0.09

Remaining PAH comply with MECP Table 9 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (PAH)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-7C
Approved by: MSD	Revision No.:

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MW102-SS3 4.3-5.0m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW103-SS5 3.5-4.3m 25-Apr-10
VOC comply with MECP Table 9 Standards

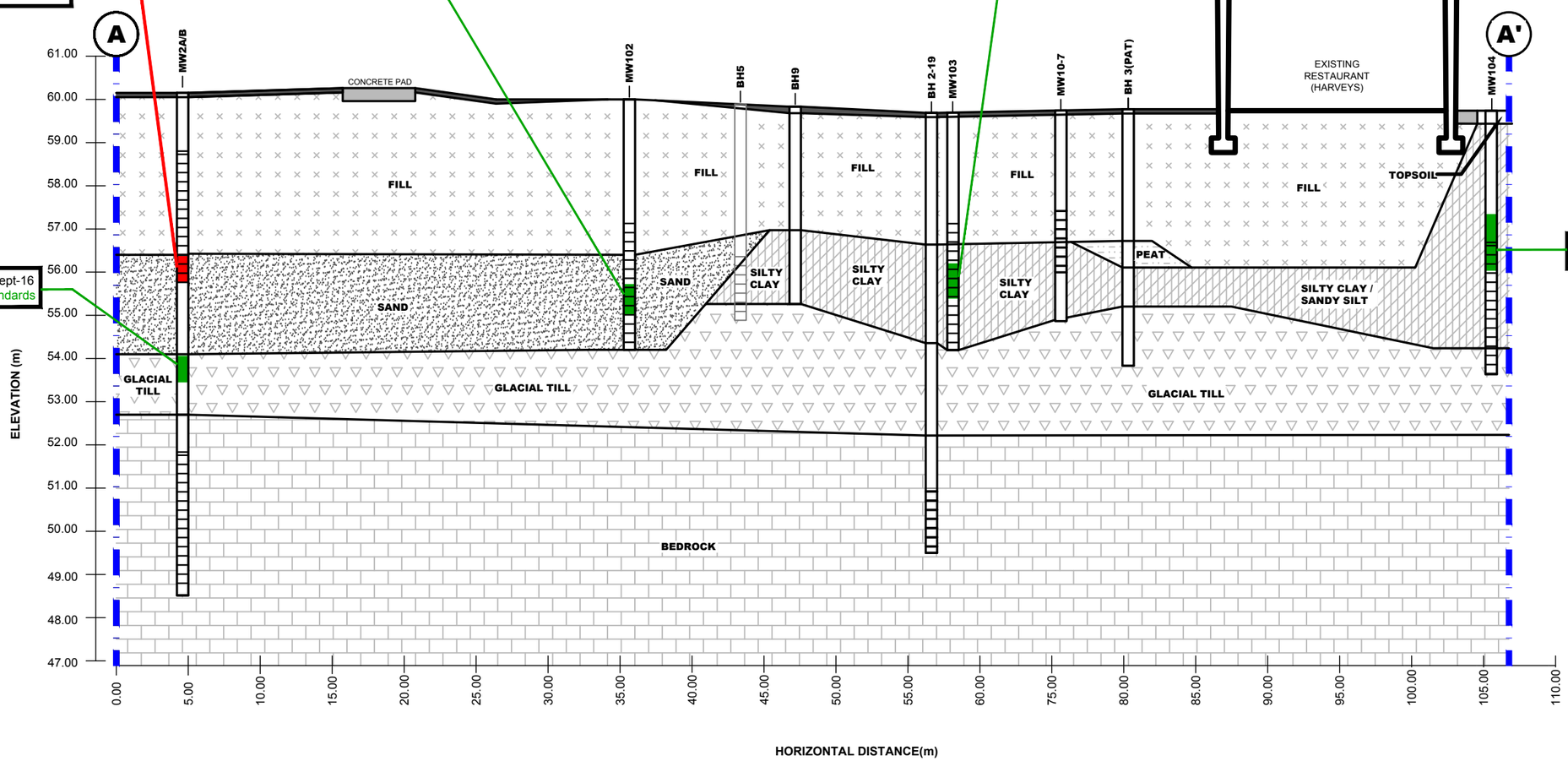
MW2-SS5 3.8-4.4m 27-Dec-13

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	74.3	0.05

Remaining VOCs comply with Table 9 Standards

BH2-SS2 6.1-6.7m 16-Sept-16
VOC comply with MECP Table 9 Standards

MW104-SS3 2.4-3.7m 25-Apr-10
VOC comply with MECP Table 9 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (VOC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-7D
Approved by: MSD	Revision No.:

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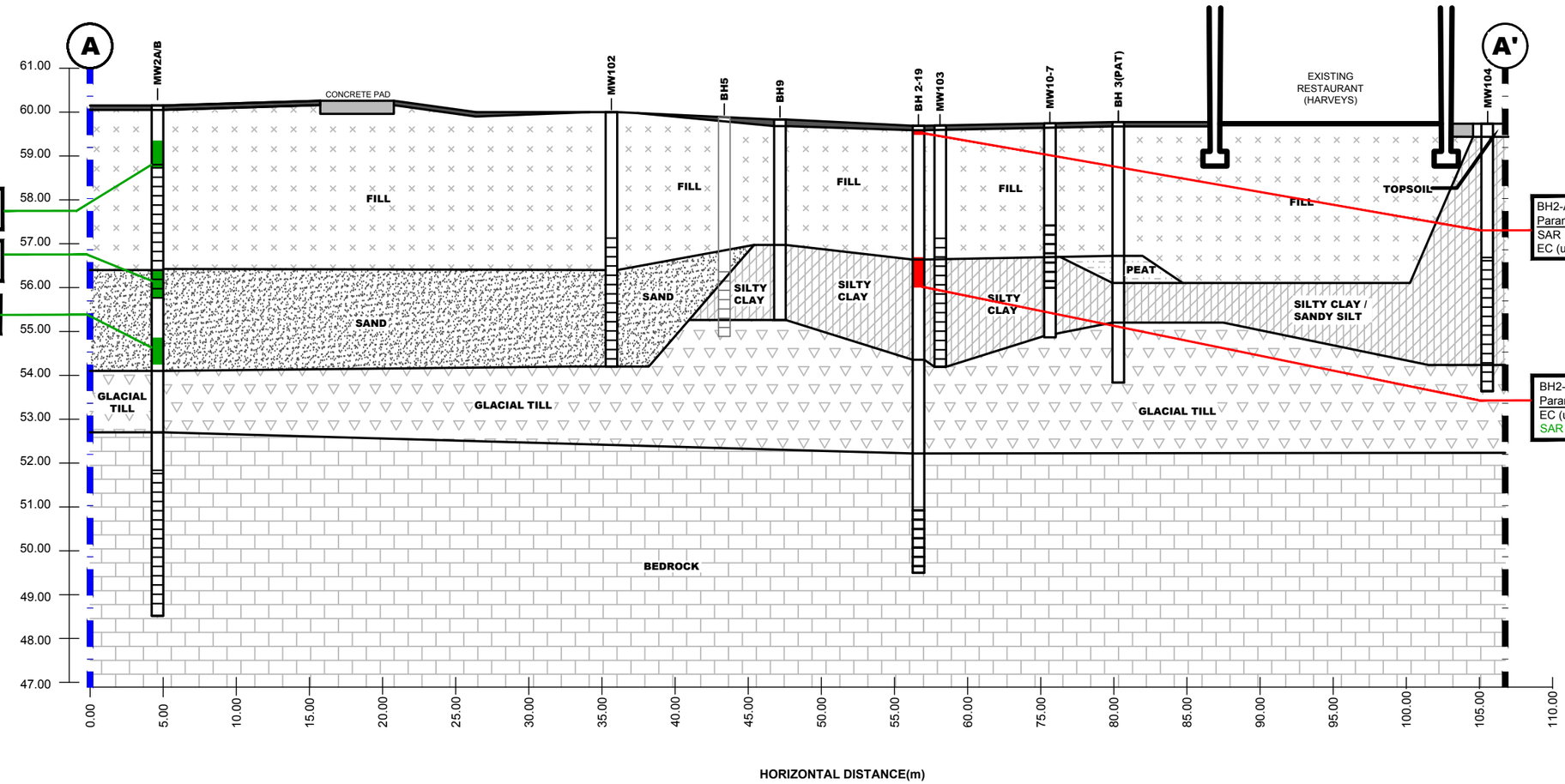

MW2-SS1 0.8-1.4m 27-Dec-13
Metals comply with MECP Table 9 Standards

MW2-SS5 3.8-4.4m 27-Dec-13
Metals comply with MECP Table 9 Standards

BH2-SS1 5.3-5.9m 19-Sept-16
Metals comply with MECP Table 9 Standards

BH2-AU1	0.1-0.2m	1-Nov-19
Parameter	Results (µg/g)	Standard (µg/g)
SAR	5.77	5
EC (uS/cm)	740	700

BH2-SS5	3.0-3.65m	1-Nov-19
Parameter	Results (µg/g)	Standard (µg/g)
EC (uS/cm)	1450	700

SAR comply with MECP Table 9 Standards

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A'- SOIL (METALS)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-7E
Approved by: MSD	Revision No.:

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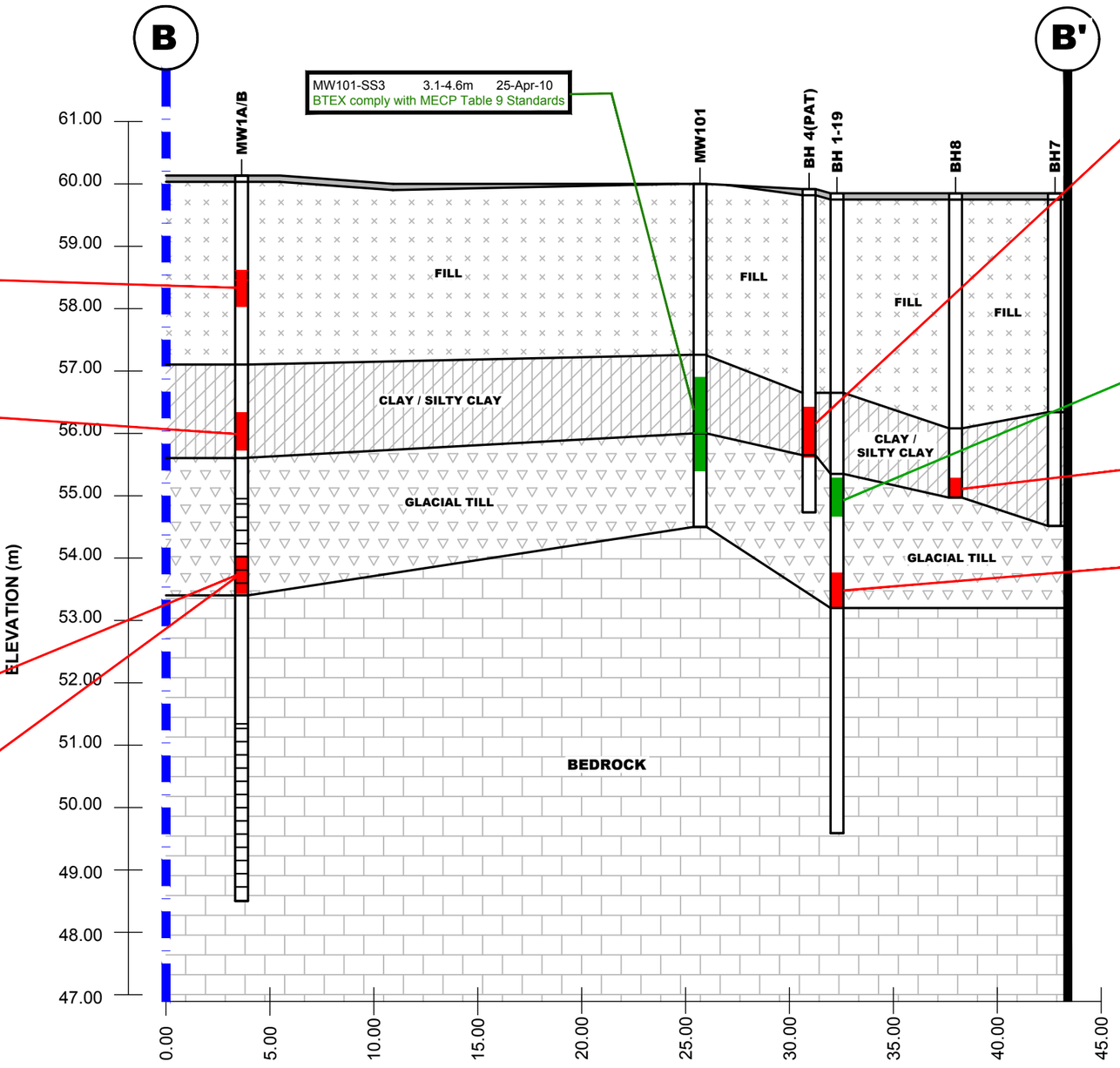

MW1-SS2	1.5-2.1m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenze	0.15	0.05
Xylenes	0.68	0.05

MW1-SS5	3.8-4.4m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.4	0.02
Ethylbenze	43.9	0.02
Toluene	31.9	0.2
Xylenes	178	0.05

MW1B-SS1	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Benzene	0.8	0.02
Ethylbenze	1.11	0.05
Toluene	0.27	0.2
Xylenes	3.23	0.05

MW1B-SS2	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenze	0.09	0.05
Xylenes	0.3	0.05

BH4-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenze	0.89	0.05
Xylenes	0.92	0.05

BH1-SS7 4.57-5.18m 31-Oct-19
BTEX comply with MECP Table 9 Standards

BH-8-SS8	4.57m	29-Oct-10
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.06	0.05
Xylenes	0.1	0.05

BH1-SS9	6.09-6.65m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
Ethylbenzene	0.11	0.05
Xylenes	0.17	0.05

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (BTEX)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-8A
Approved by: MSD	Revision No.:

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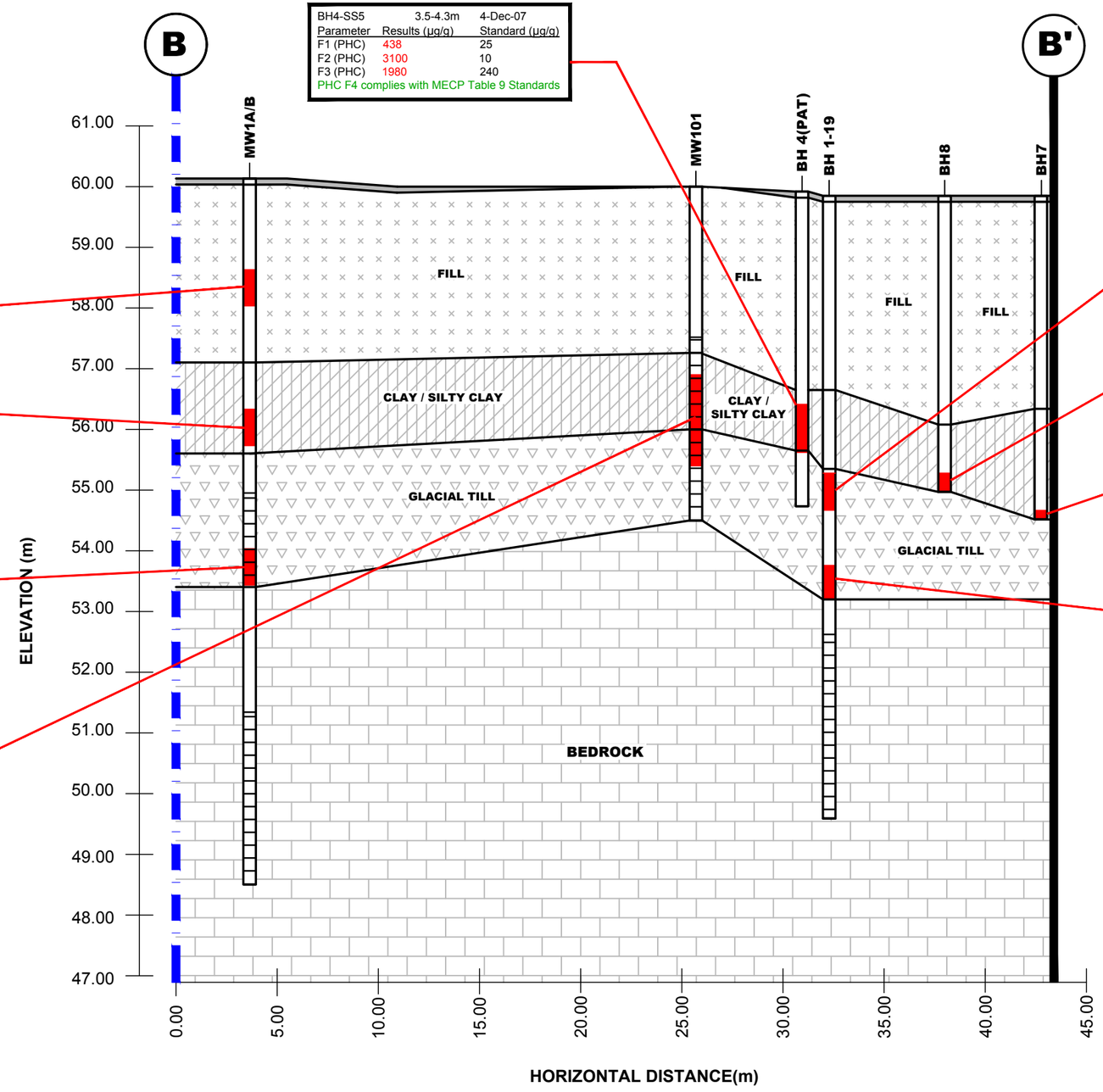

BH4-SS5	3.5-4.3m	4-Dec-07
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	438	25
F2 (PHC)	3100	10
F3 (PHC)	1980	240

PHC F4 complies with MECP Table 9 Standards

MW1-SS2	1.5-2.1m	12-Jan-14
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	65	10
F4 (PHC)	130	120

PHC F1-F3 comply with MECP Table 9 Standards

MW1-SS5	3.8-4.4m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	1290	25
F2 (PHC)	115	10

PHC F3-F4 comply with MECP Table 9 Standards

MW1B-SS1	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	54	25

PHC F2-F4 comply with MECP Table 9 Standards

MW1B-SS1(DUP)	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	29	10

PHC F1,F3-F4 comply with MECP Table 9 Standards

MW101-SS3	3.1-4.6m	25-Apr-10
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	11	10

BH1-SS7	4.57-5.18m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	16	10

BH-8-SS8	4.57m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	79	25
F2 (PHC)	2300	10
F3 (PHC)	1600	240

PHC F4 complies with MECP Table 9 Standards

BH-7-SS9	5.18m	29-Apr-19
Parameter	Results (µg/g)	Standard (µg/g)
F1 (PHC)	140	25
F2 (PHC)	820	10
F3 (PHC)	590	240

BH1-SS9	6.09-6.65m	31-Oct-19
Parameter	Results (µg/g)	Standard (µg/g)
F2 (PHC)	35	10

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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NO.	REVISIONS	DATE	INITIAL
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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (PHC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-8B
Approved by: MSD	Revision No.:

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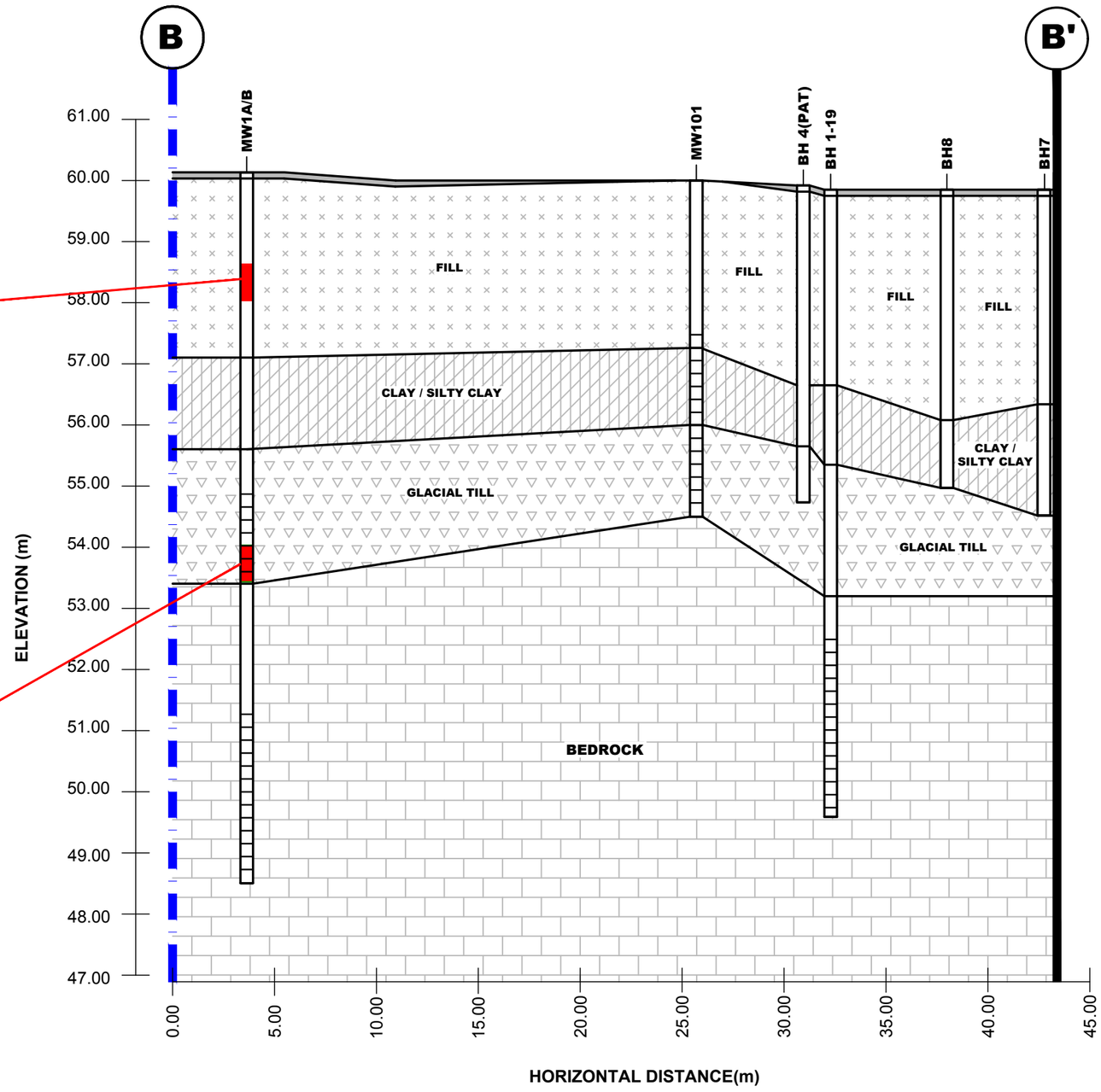
MW1-SS2	1.5-2.1m	24-Dec-13
Parameter	Results (µg/g)	Standard (µg/g)
Benxo(a)pyrene	0.47	0.3
Benzo(b,j)fluoranthene	0.77	0.47
Indeno(1,2,3-cd)pyrene	0.26	0.23
1,2-Methylnaphthalene	2.36	0.59
Naphthalene	3.39	0.09

MW1B-SS1	6.1-6.7m	16-Sept-16
PAH comply with MECP Table 9 Standards		

MW1B-SS1(DUP)	6.1-6.7m	16-Sept-16
Parameter	Results (µg/g)	Standard (µg/g)
Naphthalene	0.16	0.09



SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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NO.	REVISIONS	DATE	INITIAL
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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (PAH)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-8C
Approved by: MSD	Revision No.:

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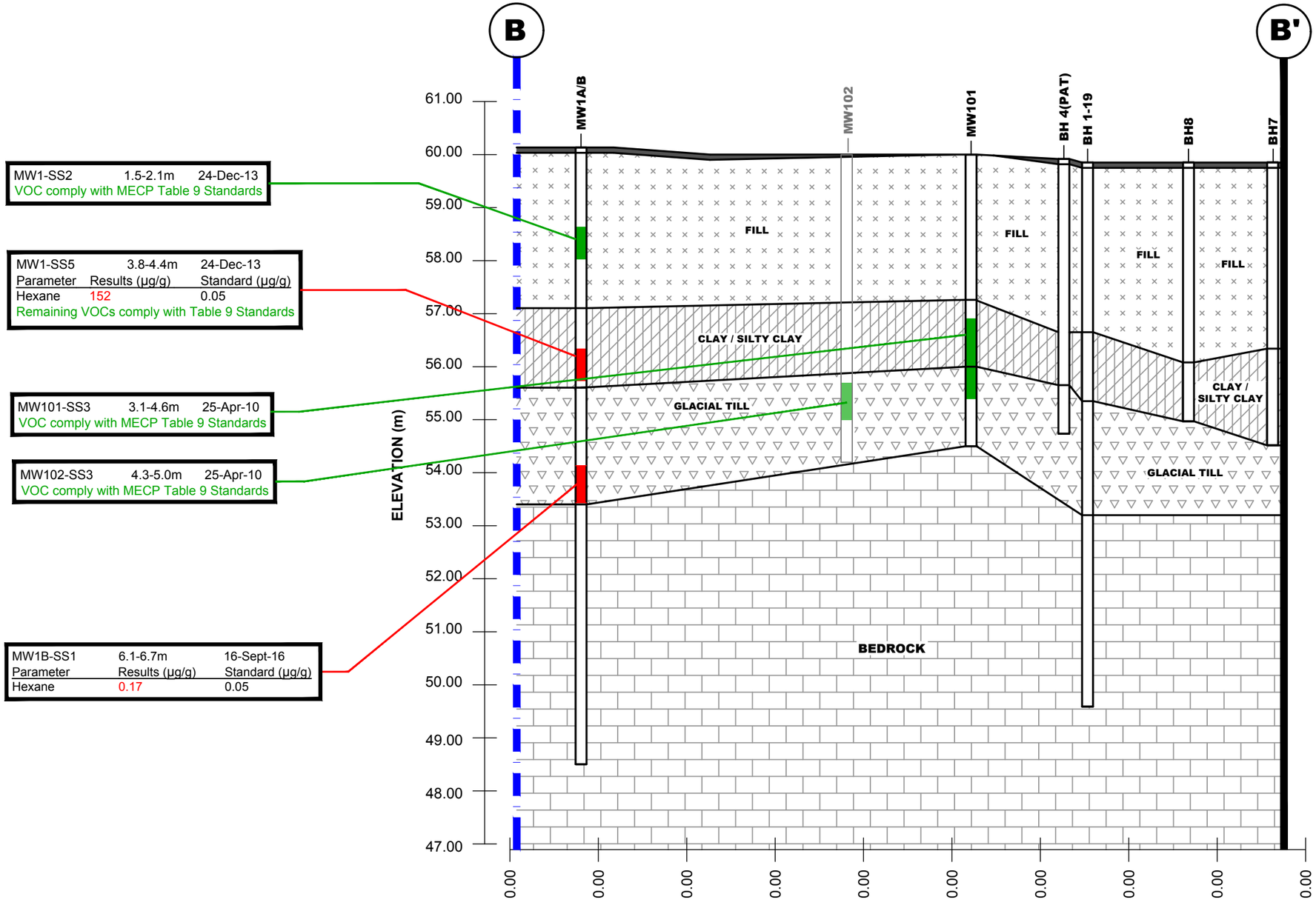

MW1-SS2 1.5-2.1m 24-Dec-13
VOC comply with MECP Table 9 Standards

MW1-SS5 3.8-4.4m 24-Dec-13

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	152	0.05

Remaining VOCs comply with Table 9 Standards

MW101-SS3 3.1-4.6m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW102-SS3 4.3-5.0m 25-Apr-10
VOC comply with MECP Table 9 Standards

MW1B-SS1 6.1-6.7m 16-Sept-16

Parameter	Results (µg/g)	Standard (µg/g)
Hexane	0.17	0.05

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (VOC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-8D
Approved by: MSD	Revision No.:

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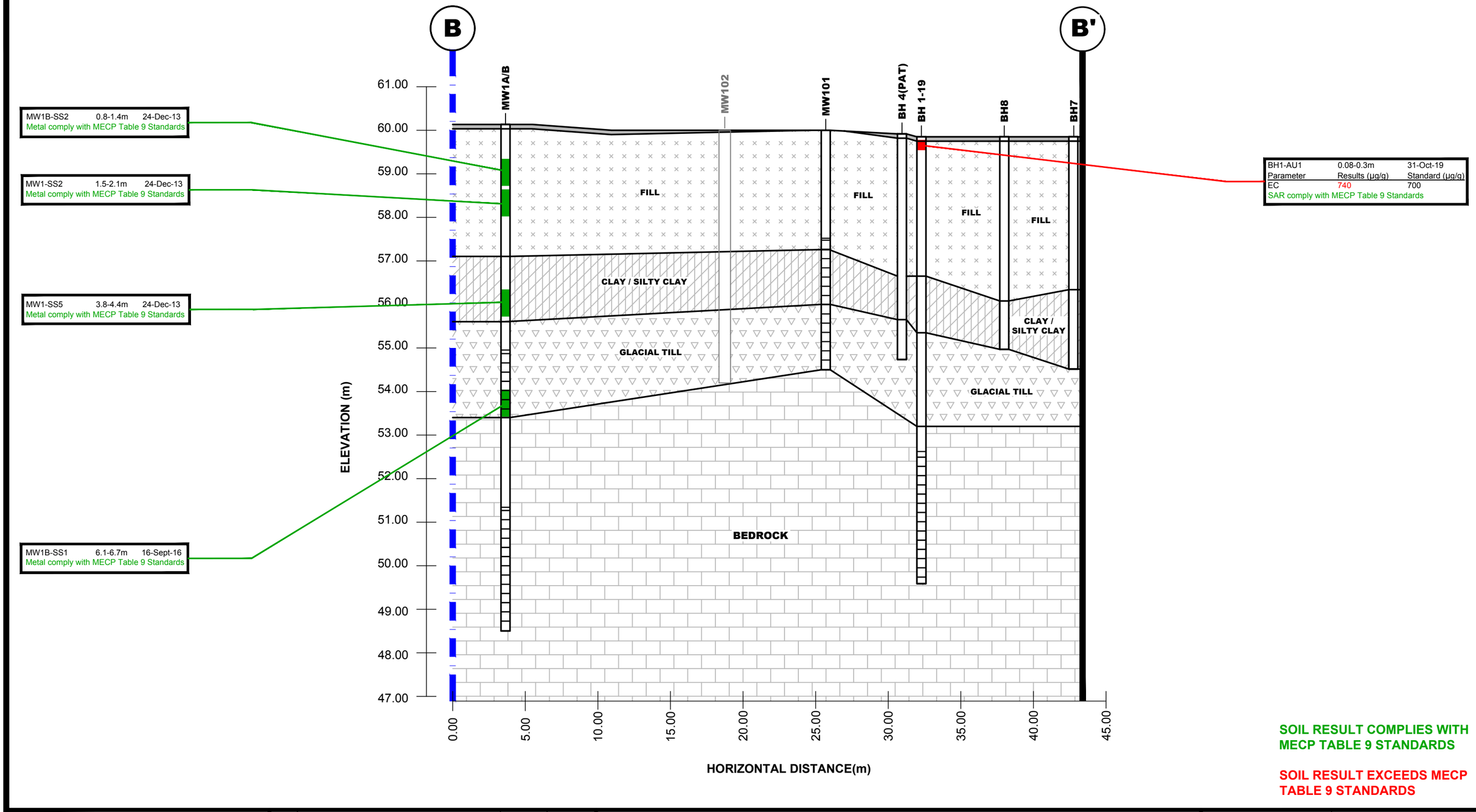

SOIL RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (METALS)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	Dwg. No.: PE4347-8E
Approved by: MSD	Revision No.:

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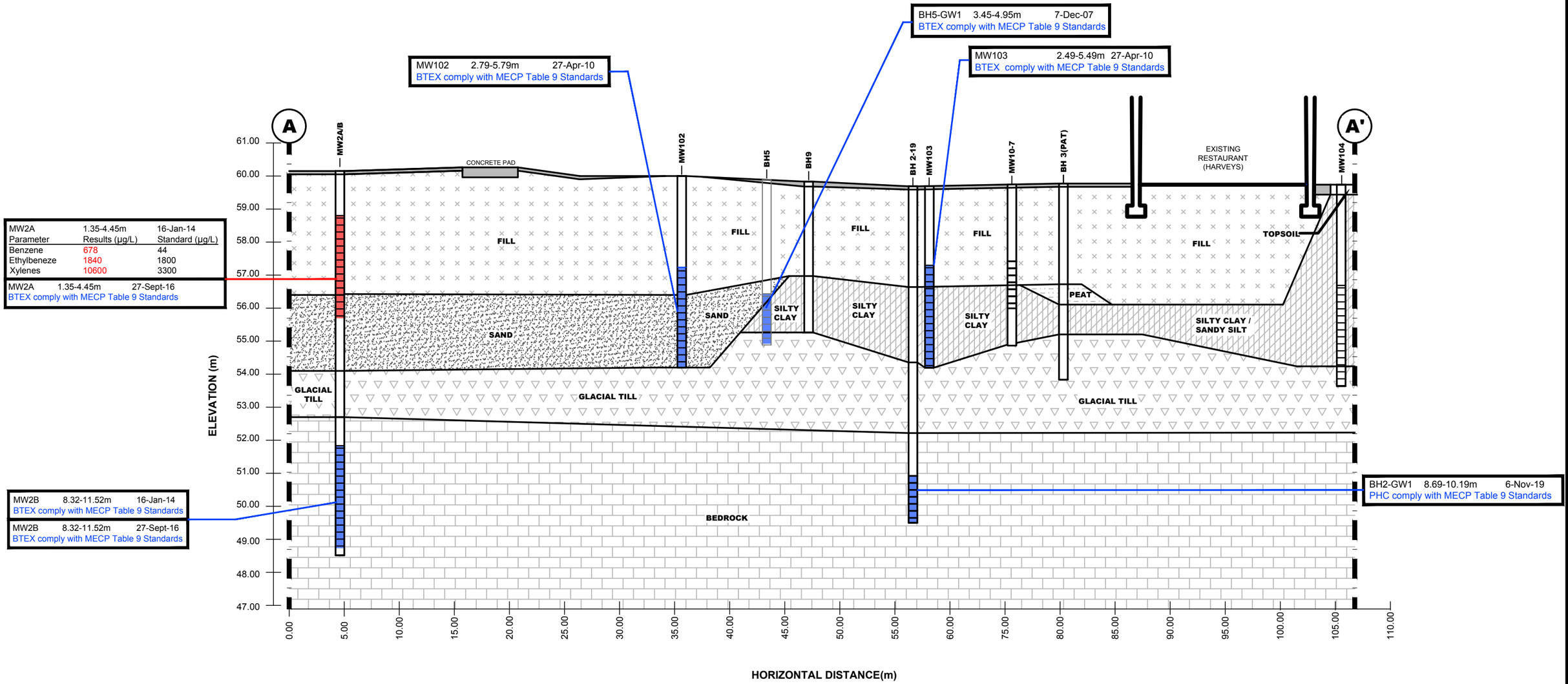

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER (BTEX)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	PE4347-9A
Approved by: MSD	Revision No.:

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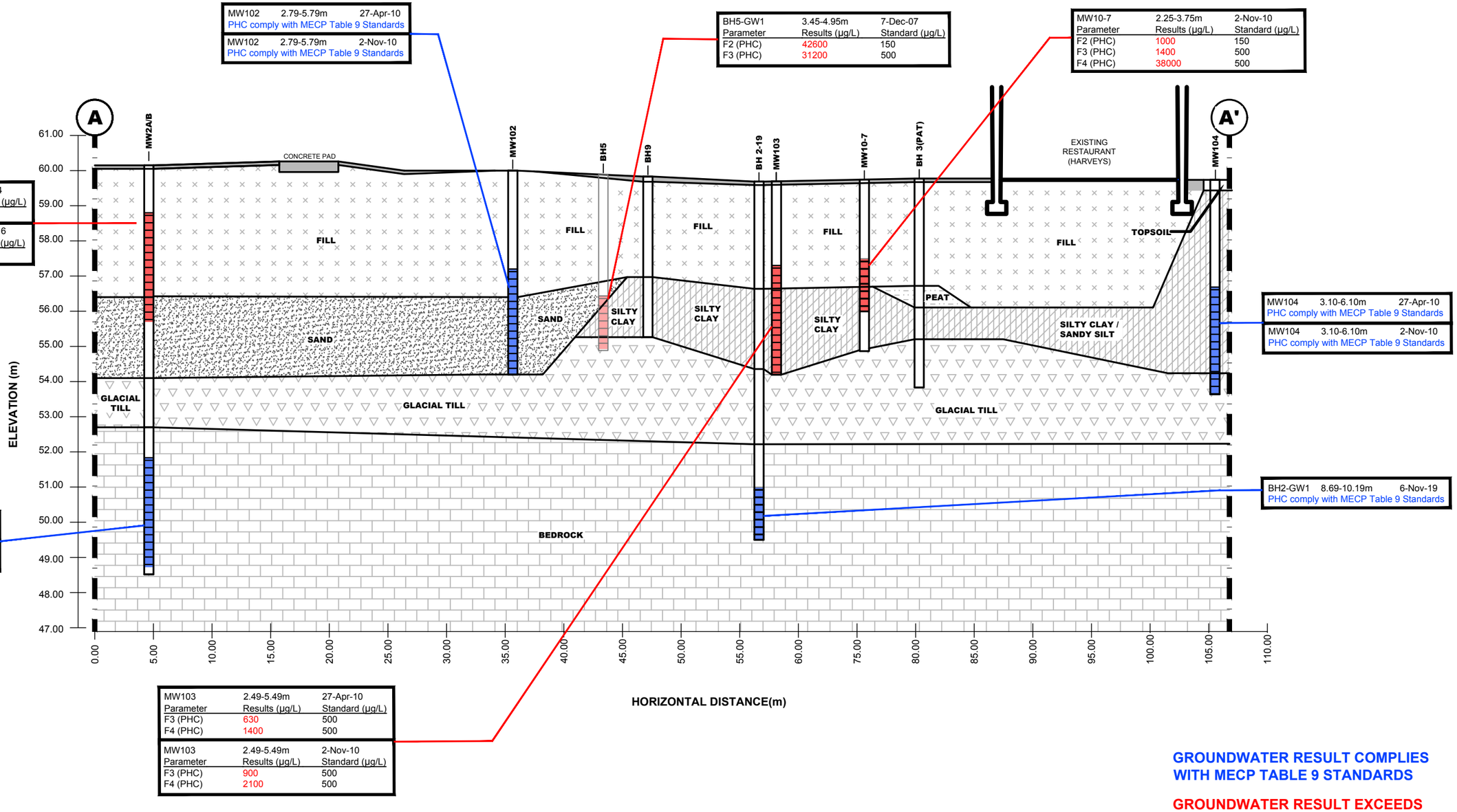

MW102	2.79-5.79m	27-Apr-10
PHC comply with MECP Table 9 Standards		
MW102	2.79-5.79m	2-Nov-10
PHC comply with MECP Table 9 Standards		

BH5-GW1	3.45-4.95m	7-Dec-07
Parameter	Results (µg/L)	Standard (µg/L)
F2 (PHC)	42600	150
F3 (PHC)	31200	500

MW10-7	2.25-3.75m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F2 (PHC)	1000	150
F3 (PHC)	1400	500
F4 (PHC)	38000	500

MW2A	1.35-4.45m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	12800	420
MW2A	1.35-4.45m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	12800	420

MW104	3.10-6.10m	27-Apr-10
PHC comply with MECP Table 9 Standards		
MW104	3.10-6.10m	2-Nov-10
PHC comply with MECP Table 9 Standards		

MW2B	8.32-11.52m	16-Jan-14
PHCs comply with MECP Table 9 Standards		
MW2B	8.32-11.52m	27-Sept-16
PHCs comply with MECP Table 9 Standards		

BH2-GW1	8.69-10.19m	6-Nov-19
PHC comply with MECP Table 9 Standards		

MW103	2.49-5.49m	27-Apr-10
Parameter	Results (µg/L)	Standard (µg/L)
F3 (PHC)	630	500
F4 (PHC)	1400	500
MW103	2.49-5.49m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F3 (PHC)	900	500
F4 (PHC)	2100	500

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER (PHC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	PE4347-9B
Approved by: MSD	Revision No.:

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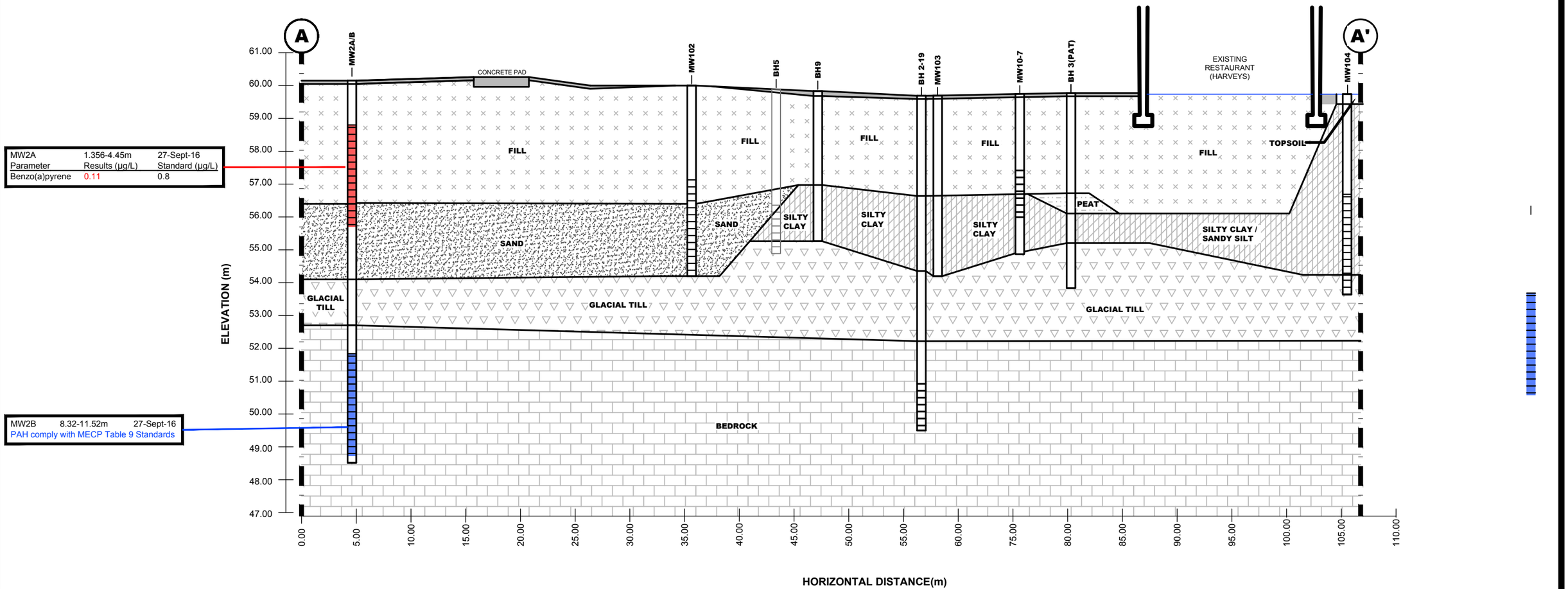

MW2A	1.356-4.45m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
Benzo(a)pyrene	0.11	0.8

MW2B 8.32-11.52m 27-Sept-16
PAH comply with MECP Table 9 Standards

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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1335 & 1339 BANK STREET

OTTAWA, ONTARIO

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

Scale: AS SHOWN	Date: 12/2019
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Checked by: MW	**PE4347-9C**
Approved by: MSD	Revision No.:

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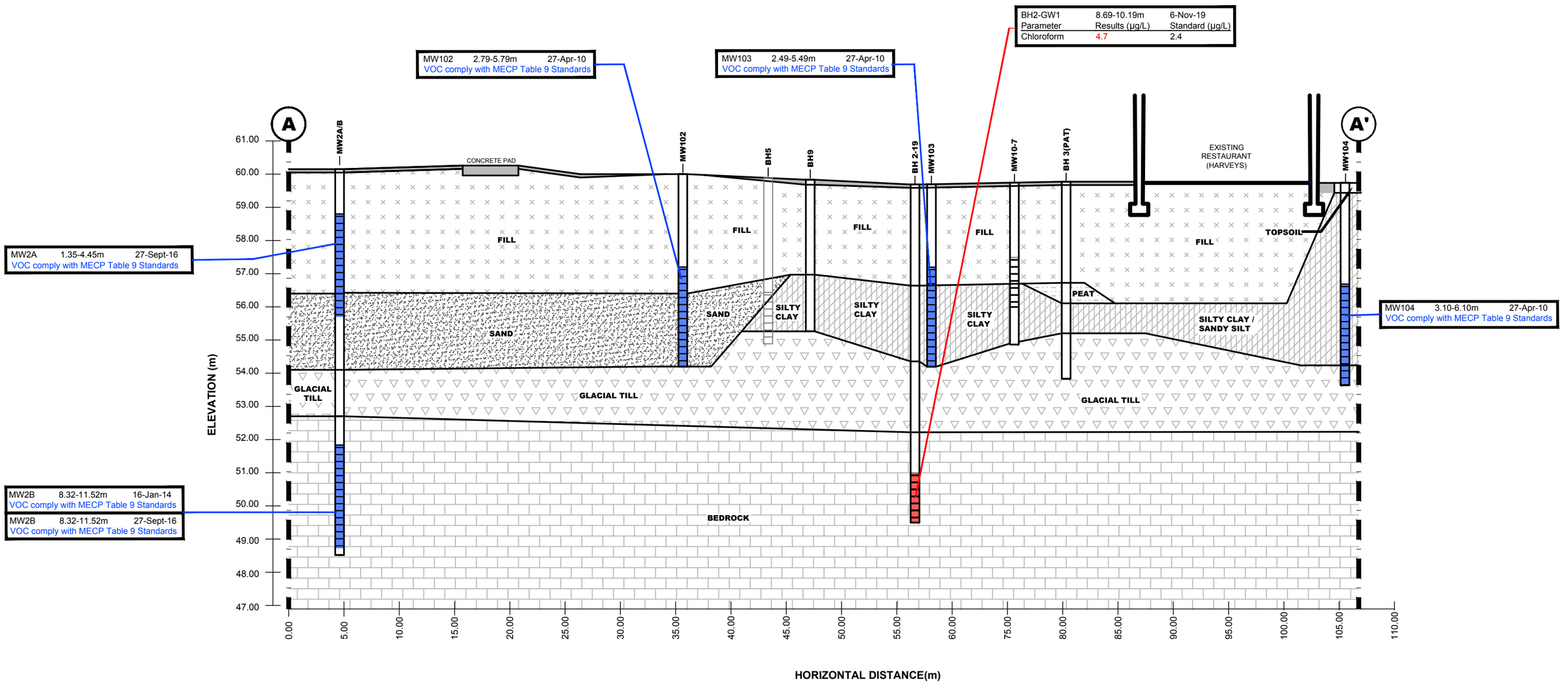

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER (VOC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	PE4347-9D
Approved by: MSD	Revision No.:

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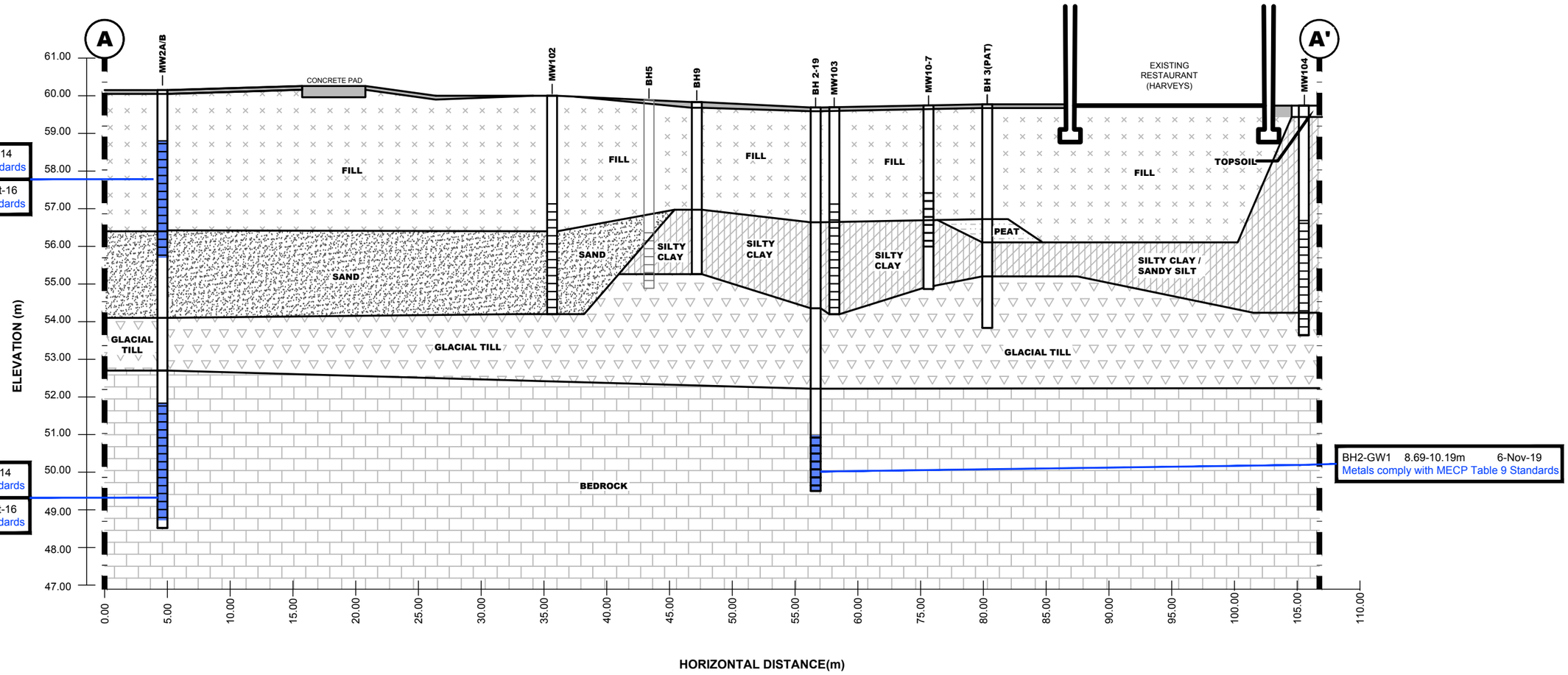

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LOFTY RIVERSIDE GP INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

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

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	PE4347-9E
Approved by: MSD	Revision No.:

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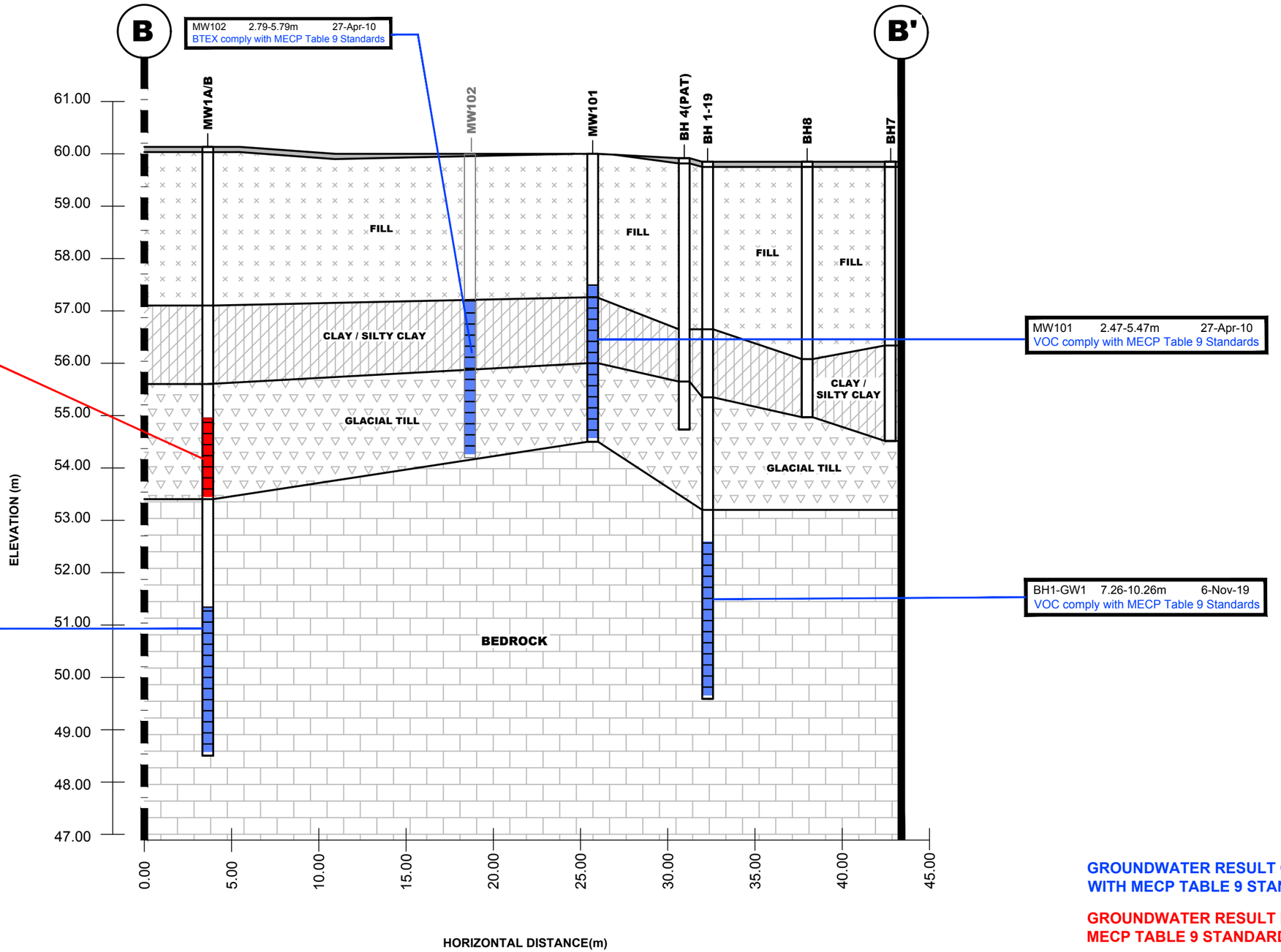

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:
CROSS SECTION B-B' - GROUNDWATER (BTEX)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
Checked by: MW	PE4347-10A
Approved by: MSD	Revision No.:

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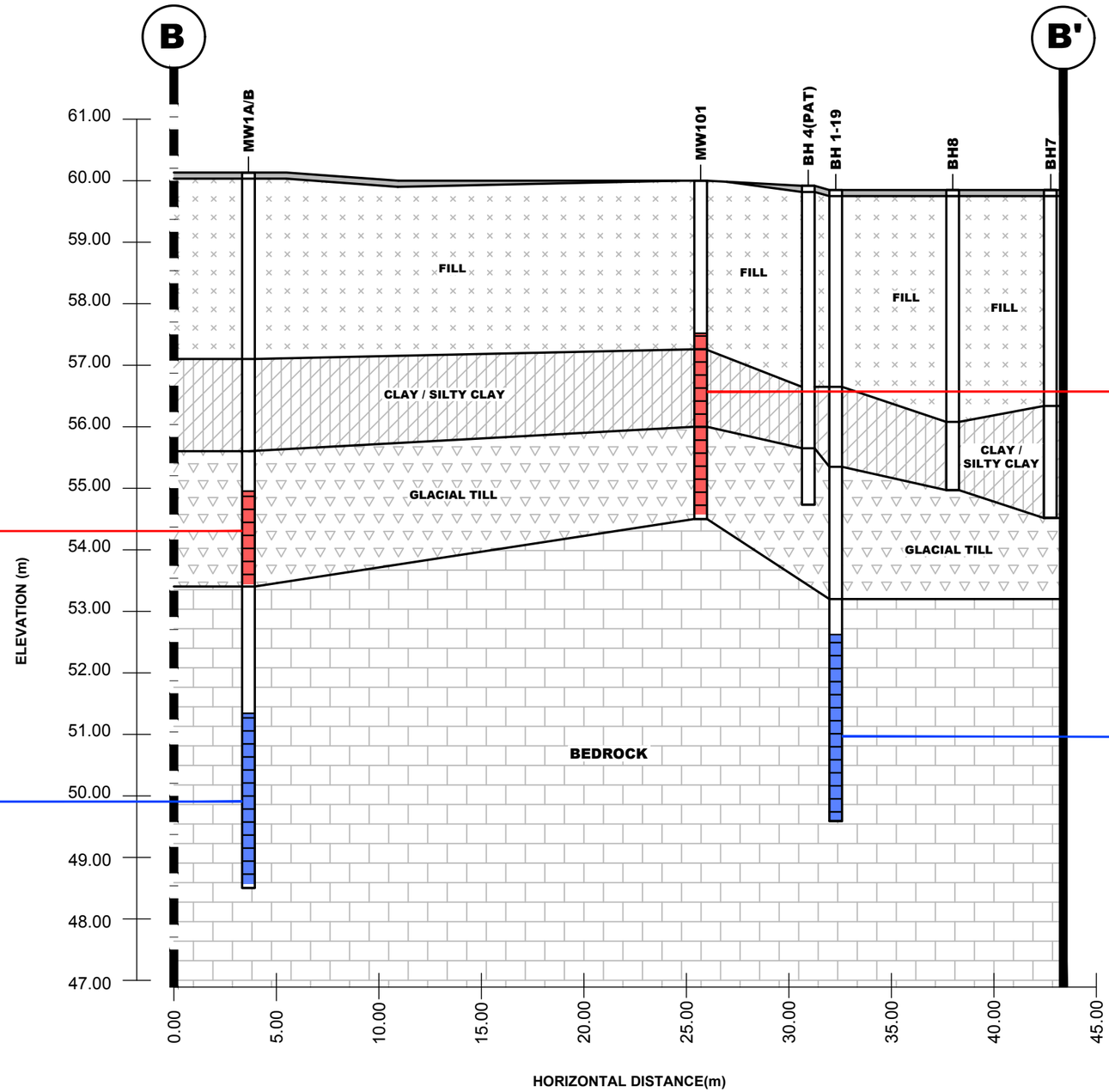

MW1A	5.18-6.68m	16-Jan-14
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	9850	420

MW1A	5.18-6.68m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	9850	420
F2 (PHC)	885	150

MW1B 8.8-11.44m 27-Sept-16
PHCs comply with MECP Table 9 Standards

MW101	2.47-5.47m	27-Apr-10
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	16000	420
F2 (PHC)	2200	150
F3 (PHC)	3500	500
F4 (PHC)	1900	500

MW101	2.47-5.47m	2-Nov-10
Parameter	Results (µg/L)	Standard (µg/L)
F1 (PHC)	830	420
F2 (PHC)	260	150

BH1-GW1 7.26-10.26m 6-Nov-19
PHC comply with MECP Table 9 Standards

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 9 STANDARDS

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OTTAWA, ONTARIO

Title:
CROSS SECTION B-B' - GROUNDWATER (PHC)

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Checked by: MW	PE4347-10B
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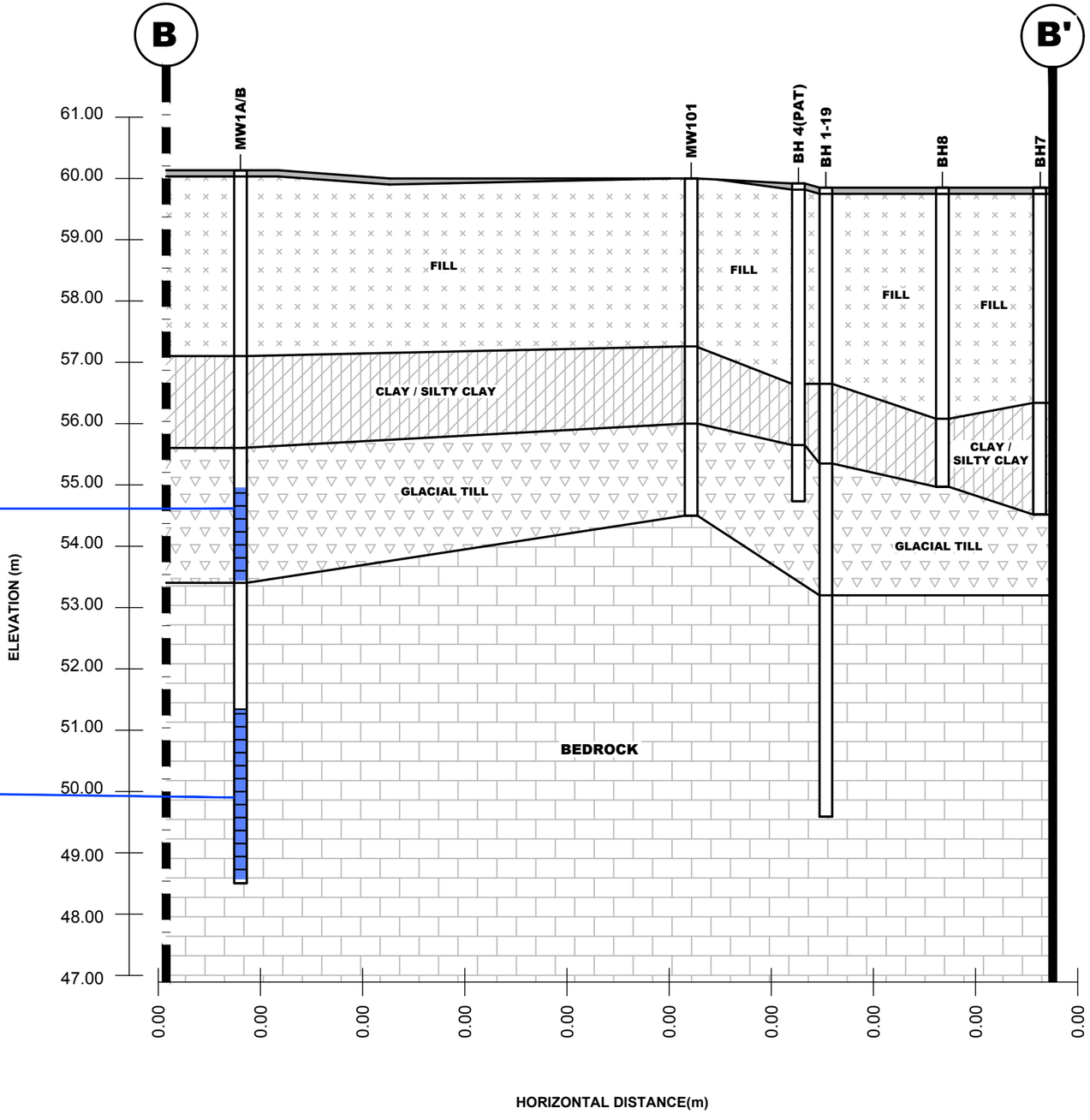

MW1A 5.18-6.68m 27-Sept-16
PAH comply with MECP Table 9 Standards

MW1B 8.8-11.44m 27-Sept-16
PAH comply with MECP Table 9 Standards

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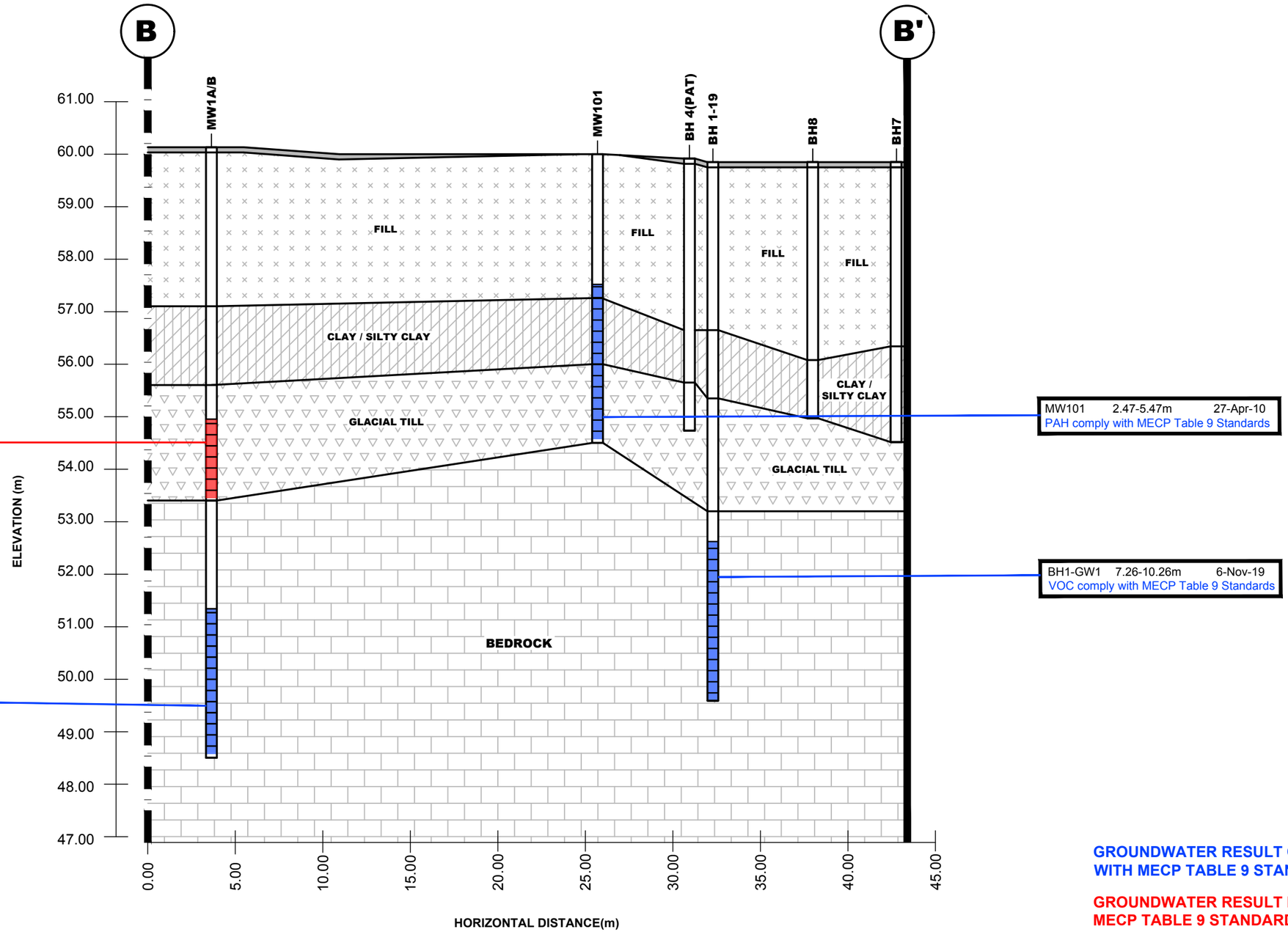

MW1A	5.18-6.68m	16-Jan-14
VOC comply with MECP Table 9 Standards		

MW1A	5.18-6.68m	27-Sept-16
Parameter	Results (µg/L)	Standard (µg/L)
Hexane	104	51

MW1B	8.8-11.44m	27-Sept-16
VOC comply with MECP Table 9 Standards		

MW101	2.47-5.47m	27-Apr-10
PAH comply with MECP Table 9 Standards		

BH1-GW1	7.26-10.26m	6-Nov-19
VOC comply with MECP Table 9 Standards		

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 9 STANDARDS

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1335 & 1339 BANK STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - GROUNDWATER (VOC)

Scale: AS SHOWN	Date: 12/2019
Drawn by: RCG	Report No.: PE4347
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Approved by: MSD	Revision No.:

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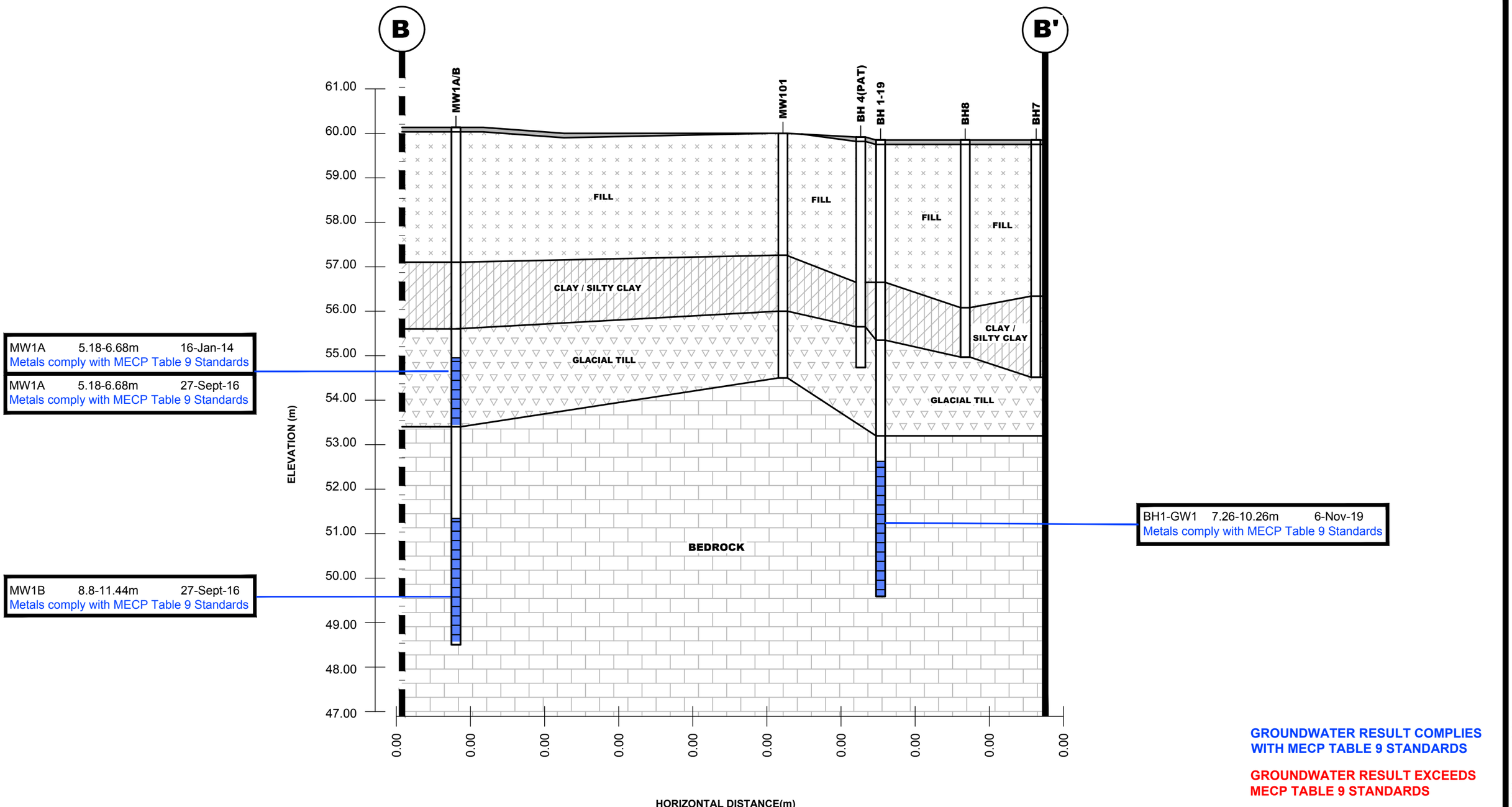

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APPENDIX 1

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
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Sampling & Analysis Plan

Phase II Environmental Site Assessment
1335 and 1339 Bank Street
Ottawa, Ontario

Prepared For

Lofty Riverside GP Inc.

October 2019

Report: PE4347-SAP

Table of Contents

1.0 SAMPLING PROGRAM

Paterson was retained by Mr. Michael Wiebe of Lofty Riverside GP Inc., to conduct a Phase II Environmental Site Assessment (ESA) for the property addressed 1335 and 1339 Bank Street, in the City of Ottawa, Ontario.

The Phase II ESA was carried out to address the areas of potential environmental concern on the Phase II Property. The following subsurface investigation program was developed to identify and delineate potential concerns. A Geotechnical Investigation was conducted concurrently with the environmental subsurface investigation.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1-19	Place on the northeastern corner of 1339 Bank Street to vertically delineate contaminants of potential concern and for geotechnical purposes.	Borehole to be advanced and cored into bedrock, approximately 10 mbgs to install deep well.
BH2-19	Place on the central-west side of 1339 Bank Street to vertically delineate contaminants of potential concern and for geotechnical purposes.	Borehole to be advanced and cored into bedrock, approximately 10 mbgs to install deep well.
BH3-19	Place on the southern property boundary of 1339 Bank Street to vertically delineate contaminants of potential concern and for geotechnical purposes.	Borehole to be advanced and cored into bedrock, approximately 10 mbgs to install deep well.

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 should be measured using a measuring tape or wheel rather than paced off. Boreholes were located and surveyed in the field by Paterson. The benchmark (BM) was taken from the top of the grate of a catch basin located on the northern corner of Bank Street and Riverside Drive. The geodetic datum was measured 59.43m. The locations of the boreholes and elevations were measured by Paterson.

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 MECP 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
1335 Bank Street
Ottawa, Ontario

DATUM BM - Top of grate of catch basin located on the northern corner of Bank Street and Riverside Drive. Geodetic elevation = 59.434m.

FILE NO. PE4347

REMARKS

HOLE NO. BH 1-19

BORINGS BY CME 55 Power Auger **DATE** 2019 October 31

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.75
Asphaltic concrete 0.08							
FILL: Brown silty sand 0.30		AU	1				
		SS	2	38	5	1	58.75
FILL: Brown sand, some silt, gravel and brick		SS	3	42	3	2	57.75
		SS	4	0	2		
3.05						3	56.75
FILL: Dark grey silty clay 3.20		SS	5	79	2		
Firm, grey **SILTY CLAY**		SS	6	62	4	4	55.75
4.50							
Loose, brown **SILTY SAND-GRAVEL** 5.33		SS	7	62	6	5	54.75
Loose, grey **SILTY SAND,** occasional gravel		SS	8	100	5		
6.30						6	53.75
GLACIAL TILL: Dense, brown silty sand with clay, gravel and shale fragments 6.65		SS	9	59	37		
		RC	1	100	0		
		RC	2	100	0	7	52.75
BEDROCK: Poor to fair quality, black shale		RC	3	100	40	8	51.75
- 100mm mud seam at 6.8m depth						9	50.75
		RC	4	100	52		
10.26						10	49.75
End of Borehole							
(GWL @ 3.92m - Nov. 29, 2019)							

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.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
1335 Bank Street
Ottawa, Ontario

DATUM BM - Top of grate of catch basin located on the northern corner of Bank Street and Riverside Drive. Geodetic elevation = 59.434m.

FILE NO. PE4347

REMARKS

HOLE NO. BH 2-19

BORINGS BY CME 55 Power Auger **DATE** 2019 November 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.68
Asphaltic concrete 0.10		AU	1				
FILL: Brown silty sand and gravel with some brick and possible asphaltic concrete		SS	2	67	7	1	58.68
		SS	3	21	5	2	57.68
3.05		SS	4	33	2	3	56.68
Dark grey to grey **SILTY CLAY/CLAYEY SILT**		SS	5	71	3	4	55.68
		SS	6	100	3		
5.33		SS	7	92	2	5	54.68
Compact to dense, brown **SILTY SAND,** some gravel		SS	8	21	20	6	53.68
		SS	9	100	11		
7.47		SS	3	62	33	7	52.68
BEDROCK: Poor to fair quality, black shale		RC	1	100	38	8	51.68
		RC	2	95	59	9	50.68
10.19						10	49.68
End of Borehole							
(GWL @ 3.83m - Nov. 29, 2019)							

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
1335 Bank Street
Ottawa, Ontario

DATUM BM - Top of grate of catch basin located on the northern corner of Bank Street and Riverside Drive. Geodetic elevation = 59.434m.

FILE NO. PE4347

REMARKS

HOLE NO. BH 3-19

BORINGS BY CME 55 Power Auger **DATE** 2019 November 1

SOIL DESCRIPTION		STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE										
TOPSOIL	0.15		SS	1	58	10	0	59.64		
FILL: Brown sand with gravel, some silt	0.76									
FILL: Brown silty sand, some gravel	1.52		SS	2	50	10	1	58.64		
FILL: Dark brown silty sand, some clay, trace gravel	2.39		SS	3	71	11	2	57.64		
			SS	4	42	31				
Dense to compact, brown **SAND** with silt, occasional gravel			SS	5	54	8	3	56.64		
	4.27		SS	6	62	14	4	55.64		
Compact to very dense, brown **SILTY FINE SAND**	5.33		SS	7	88	23	5	54.64		
Very dense, grey **SILTY SAND-GRAVEL**			SS	8	83	64				
	6.17		SS	9	67	50+	6	53.64		
BOULDERS	6.53		RC	1	100	0				
							7	52.64		
BEDROCK: Poor to fair quality, black shale			RC	2	100	44	8	51.64		
							9	50.64		
			RC	3	92	70				
	10.21						10	49.64		
End of Borehole										
(GWL @ 6.70m - Nov. 29, 2019)										

Lower Explosive Limit %: 20 40 60 80

RKI Eagle Rdg. (ppm): 100 200 300 400 500

▲ 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 relative strength of cohesionless soils is the compactness condition, 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. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'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 shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

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, S_t, is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

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 NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, 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, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water 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 at 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

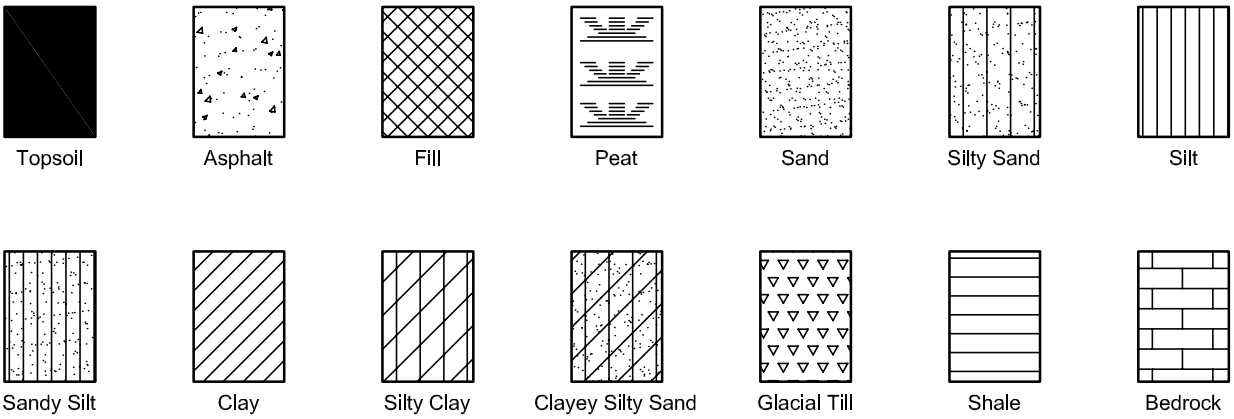
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void 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.

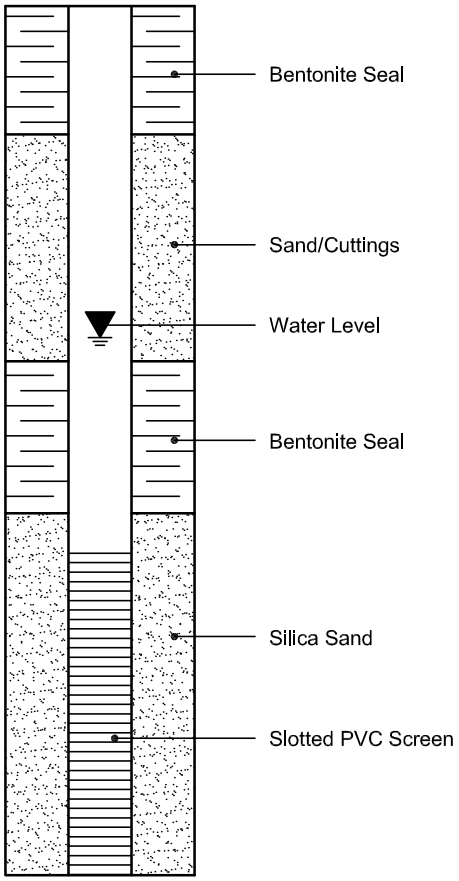
SYMBOLS AND TERMS (continued)

STRATA PLOT

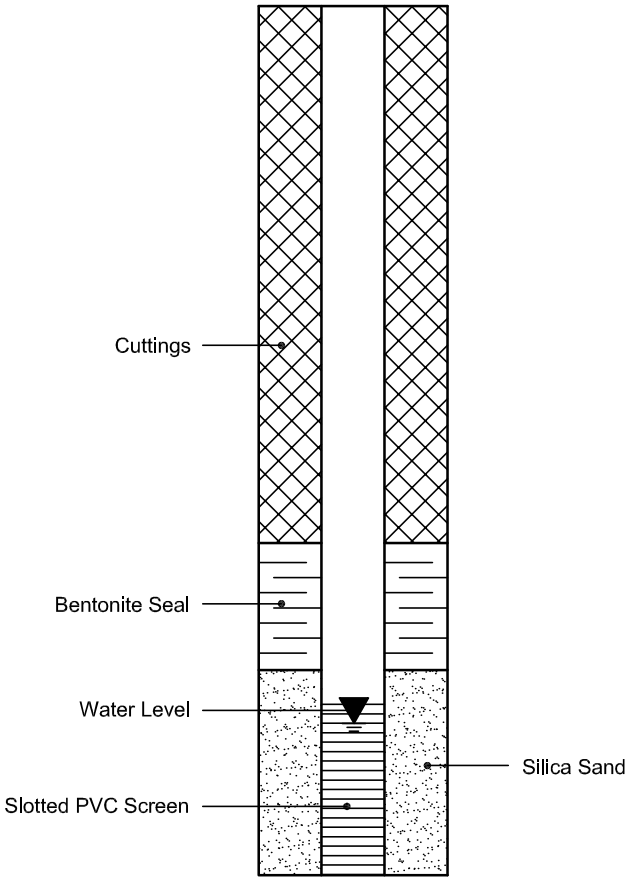


MONITORING WELL AND PIEZOMETER CONSTRUCTION

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: Mark D'Arcy

Client PO: 28460
Project: PE4347
Custody: 51645

Report Date: 8-Nov-2019
Order Date: 4-Nov-2019

Order #: 1945149

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

Paracel ID	Client ID
1945149-01	BH1-SS7
1945149-02	BH1-SS9
1945149-03	BH2-SS9
1945149-04	BH3-SS2
1945149-05	BH3-SS6

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 28460

Report Date: 08-Nov-2019
Order Date: 4-Nov-2019
Project Description: PE4347

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	6-Nov-19	7-Nov-19
PHC F1	CWS Tier 1 - P&T GC-FID	6-Nov-19	7-Nov-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	5-Nov-19	8-Nov-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	4-Nov-19	6-Nov-19
Solids, %	Gravimetric, calculation	5-Nov-19	5-Nov-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 28460

Report Date: 08-Nov-2019

Order Date: 4-Nov-2019

Project Description: PE4347

	Client ID:	BH1-SS7	BH1-SS9	BH2-SS9	BH3-SS2
	Sample Date:	31-Oct-19 09:30	31-Oct-19 10:00	01-Nov-19 08:30	01-Nov-19 10:30
	Sample ID:	1945149-01	1945149-02	1945149-03	1945149-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	93.4	91.4	87.5	87.9
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	0.11	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	0.13	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	0.17	<0.05	-
Toluene-d8	Surrogate	96.0%	102%	96.9%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	11	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	16	35	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	13	35	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	-	-	<0.40 [1]
Acenaphthylene	0.02 ug/g dry	-	-	-	<0.40 [1]
Anthracene	0.02 ug/g dry	-	-	-	0.64 [1]
Benzo [a] anthracene	0.02 ug/g dry	-	-	-	<0.40 [1]
Benzo [a] pyrene	0.02 ug/g dry	-	-	-	<0.40 [1]
Benzo [b] fluoranthene	0.02 ug/g dry	-	-	-	<0.40 [1]
Benzo [g,h,i] perylene	0.02 ug/g dry	-	-	-	0.65 [1]
Benzo [k] fluoranthene	0.02 ug/g dry	-	-	-	<0.40 [1]
Chrysene	0.02 ug/g dry	-	-	-	<0.40 [1]
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	-	-	<0.40 [1]
Fluoranthene	0.02 ug/g dry	-	-	-	0.60 [1]
Fluorene	0.02 ug/g dry	-	-	-	<0.40 [1]
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	-	-	<0.40 [1]
1-Methylnaphthalene	0.02 ug/g dry	-	-	-	<0.40 [1]
2-Methylnaphthalene	0.02 ug/g dry	-	-	-	<0.40 [1]
Methylnaphthalene (1&2)	0.04 ug/g dry	-	-	-	<0.80 [1]
Naphthalene	0.01 ug/g dry	-	-	-	0.23 [1]
Phenanthrene	0.02 ug/g dry	-	-	-	0.60 [1]
Pyrene	0.02 ug/g dry	-	-	-	0.48 [1]
2-Fluorobiphenyl	Surrogate	-	-	-	78.0% [1]
Terphenyl-d14	Surrogate	-	-	-	91.1% [1]

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 28460

Report Date: 08-Nov-2019

Order Date: 4-Nov-2019

Project Description: PE4347

	Client ID:	BH3-SS6	-	-	-
	Sample Date:	01-Nov-19 11:30	-	-	-
	Sample ID:	1945149-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	83.1	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	96.2%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*0.982*		*ug/g*		*73.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.33*		*ug/g*		*99.6*	*50-140*			
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	*7.82*		*ug/g*		*97.7*	*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	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Physical Characteristics									
% Solids	86.1	0.1	% by Wt.	85.6			0.6	25	
Semi-Volatiles									
Acenaphthene	ND	0.40	ug/g dry	ND				40	
Acenaphthylene	ND	0.40	ug/g dry	ND			0.0	40	
Anthracene	ND	0.40	ug/g dry	ND			0.0	40	
Benzo [a] anthracene	ND	0.40	ug/g dry	ND			0.0	40	
Benzo [a] pyrene	ND	0.40	ug/g dry	ND			0.0	40	
Benzo [b] fluoranthene	ND	0.40	ug/g dry	ND			0.0	40	
Benzo [g,h,i] perylene	ND	0.40	ug/g dry	ND			0.0	40	
Benzo [k] fluoranthene	ND	0.40	ug/g dry	ND			0.0	40	
Chrysene	ND	0.40	ug/g dry	ND			0.0	40	
Dibenzo [a,h] anthracene	ND	0.40	ug/g dry	ND			0.0	40	
Fluoranthene	ND	0.40	ug/g dry	ND			0.0	40	
Fluorene	ND	0.40	ug/g dry	ND			0.0	40	
Indeno [1,2,3-cd] pyrene	ND	0.40	ug/g dry	ND			0.0	40	
1-Methylnaphthalene	ND	0.40	ug/g dry	ND			0.0	40	
2-Methylnaphthalene	ND	0.40	ug/g dry	ND			0.0	40	
Naphthalene	ND	0.20	ug/g dry	ND			0.0	40	
Phenanthrene	ND	0.40	ug/g dry	ND			0.0	40	
Pyrene	ND	0.40	ug/g dry	ND			0.0	40	
Surrogate: 2-Fluorobiphenyl	*1.25*		*ug/g dry*		*88.4*	*50-140*			
Surrogate: Terphenyl-d14	*1.39*		*ug/g dry*		*98.6*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	*8.68*		*ug/g dry*		*101*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 28460

Report Date: 08-Nov-2019
Order Date: 4-Nov-2019
Project Description: PE4347

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	168	7	ug/g		83.9	80-120			
F2 PHCs (C10-C16)	84	4	ug/g	ND	98.8	60-140			
F3 PHCs (C16-C34)	240	8	ug/g	ND	115	60-140			
F4 PHCs (C34-C50)	172	6	ug/g	ND	130	60-140			
Semi-Volatiles									
Acenaphthene	0.161	0.02	ug/g		96.4	50-140			
Acenaphthylene	0.136	0.02	ug/g		81.3	50-140			
Anthracene	0.164	0.02	ug/g		98.5	50-140			
Benzo [a] anthracene	0.158	0.02	ug/g		94.5	50-140			
Benzo [a] pyrene	0.130	0.02	ug/g		77.8	50-140			
Benzo [b] fluoranthene	0.206	0.02	ug/g		124	50-140			
Benzo [g,h,i] perylene	0.138	0.02	ug/g		82.9	50-140			
Benzo [k] fluoranthene	0.187	0.02	ug/g		112	50-140			
Chrysene	0.193	0.02	ug/g		116	50-140			
Dibenzo [a,h] anthracene	0.140	0.02	ug/g		84.0	50-140			
Fluoranthene	0.163	0.02	ug/g		97.6	50-140			
Fluorene	0.166	0.02	ug/g		99.6	50-140			
Indeno [1,2,3-cd] pyrene	0.119	0.02	ug/g		71.3	50-140			
1-Methylnaphthalene	0.151	0.02	ug/g		90.4	50-140			
2-Methylnaphthalene	0.166	0.02	ug/g		99.9	50-140			
Naphthalene	0.160	0.01	ug/g		95.9	50-140			
Phenanthrene	0.170	0.02	ug/g		102	50-140			
Pyrene	0.167	0.02	ug/g		100	50-140			
Surrogate: 2-Fluorobiphenyl	*1.40*		*ug/g*		*105*	*50-140*			
Volatiles									
Benzene	3.70	0.02	ug/g		92.5	60-130			
Ethylbenzene	4.21	0.05	ug/g		105	60-130			
Toluene	3.90	0.05	ug/g		97.6	60-130			
m,p-Xylenes	8.02	0.05	ug/g		100	60-130			
o-Xylene	4.21	0.05	ug/g		105	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limits due to the nature of the sample matrix.

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.

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 ID: 1945149

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1945149	№ 51645

Client Name: Paterson Group	Project Ref: PE4347	Page 1 of 1
Contact Name: Mark D'Arcy	Quote #:	Turnaround Time
Address:	PO #: 28460	☐ 1 day ☐ 3 day
	E-mail:	☐ 2 day ☑ Regular
Telephone: 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)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: BTEX/PHCs	PAHs										
1	BH1-SS7	S	-	2	Oct 31/19	9:30	✓					250 ml + 1 vial						✓
2	BH1-SS9	S		2	Oct 31/19	10:00	✓					↓						✓
3	BH2-SS9	S	-	2	Nov 1/19	8:30	✓					120ml + 1 vial						✓
4	BH3-SS2	S	-	1	Nov. 1/19	10:30		✓				120 ml						✓
5	BH3-SS6	S	-	2	Nov. 1/19	11:30	✓					120ml + 1 vial						✓
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Nicolas Doucette	Date/Time: 04/11/19 2:45	Date/Time: Nov 04, 2019 05:20	Date/Time: 11-04-19 19:07
Date/Time:	Temperature: °C	Temperature: 15.6 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 27635
Project: PE4347
Custody: 51662

Report Date: 12-Nov-2019
Order Date: 7-Nov-2019

Order #: 1945573

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

Paracel ID	Client ID
1945573-01	BH1-GW1
1945573-02	BH2-GW1
1945573-03	BH3-GW1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27635

Report Date: 12-Nov-2019
Order Date: 7-Nov-2019
Project Description: PE4347

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	9-Nov-19	10-Nov-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Nov-19	9-Nov-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	9-Nov-19	10-Nov-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27635

Report Date: 12-Nov-2019

Order Date: 7-Nov-2019

Project Description: PE4347

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	06-Nov-19 09:00	06-Nov-19 09:00	06-Nov-19 09:00	-
	Sample ID:	1945573-01	1945573-02	1945573-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroform	0.5 ug/L	<0.5	4.7	<0.5	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	4.7	<1.0	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	<0.2	<0.2	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27635

Report Date: 12-Nov-2019

Order Date: 7-Nov-2019

Project Description: PE4347

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	06-Nov-19 09:00	06-Nov-19 09:00	06-Nov-19 09:00	-
	Sample ID:	1945573-01	1945573-02	1945573-03	-
	MDL/Units	Water	Water	Water	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Vinyl chloride	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	-
4-Bromofluorobenzene	Surrogate	116%	113%	116%	-
Dibromofluoromethane	Surrogate	84.6%	85.0%	89.4%	-
Toluene-d8	Surrogate	99.1%	99.3%	98.2%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<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	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	*89.3*		*ug/L*		*112*	*50-140*			
Surrogate: Dibromofluoromethane	*63.3*		*ug/L*		*79.1*	*50-140*			
Surrogate: Toluene-d8	*78.2*		*ug/L*		*97.8*	*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				30	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*89.5*		*ug/L*		*112*	*50-140*			
Surrogate: Dibromofluoromethane	*59.3*		*ug/L*		*74.2*	*50-140*			
Surrogate: Toluene-d8	*75.5*		*ug/L*		*94.4*	*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)	1830	25	ug/L		91.4	68-117			
F2 PHCs (C10-C16)	1160	100	ug/L		72.5	60-140			
F3 PHCs (C16-C34)	2970	100	ug/L		75.6	60-140			
F4 PHCs (C34-C50)	1860	100	ug/L		74.9	60-140			
Volatiles									
Acetone	75.8	5.0	ug/L		75.8	50-140			
Benzene	45.5	0.5	ug/L		114	60-130			
Bromodichloromethane	35.4	0.5	ug/L		88.6	60-130			
Bromoform	32.2	0.5	ug/L		80.4	60-130			
Bromomethane	33.6	0.5	ug/L		84.0	50-140			
Carbon Tetrachloride	33.6	0.2	ug/L		83.9	60-130			
Chlorobenzene	33.2	0.5	ug/L		83.0	60-130			
Chloroform	36.4	0.5	ug/L		91.1	60-130			
Dibromochloromethane	32.9	0.5	ug/L		82.2	60-130			
Dichlorodifluoromethane	36.3	1.0	ug/L		90.8	50-140			
1,2-Dichlorobenzene	33.1	0.5	ug/L		82.8	60-130			
1,3-Dichlorobenzene	32.8	0.5	ug/L		82.1	60-130			
1,4-Dichlorobenzene	33.6	0.5	ug/L		84.1	60-130			
1,1-Dichloroethane	38.7	0.5	ug/L		96.7	60-130			
1,2-Dichloroethane	35.5	0.5	ug/L		88.7	60-130			
1,1-Dichloroethylene	44.2	0.5	ug/L		110	60-130			
cis-1,2-Dichloroethylene	43.7	0.5	ug/L		109	60-130			
trans-1,2-Dichloroethylene	45.5	0.5	ug/L		114	60-130			
1,2-Dichloropropane	43.3	0.5	ug/L		108	60-130			
cis-1,3-Dichloropropylene	35.5	0.5	ug/L		88.7	60-130			
trans-1,3-Dichloropropylene	36.6	0.5	ug/L		91.6	60-130			
Ethylbenzene	29.4	0.5	ug/L		73.5	60-130			
Ethylene dibromide (dibromoethane	32.0	0.2	ug/L		79.9	60-130			
Hexane	39.0	1.0	ug/L		97.5	60-130			
Methyl Ethyl Ketone (2-Butanone)	85.5	5.0	ug/L		85.5	50-140			
Methyl Isobutyl Ketone	77.5	5.0	ug/L		77.5	50-140			
Methyl tert-butyl ether	82.6	2.0	ug/L		82.6	50-140			
Methylene Chloride	38.6	5.0	ug/L		96.5	60-130			
Styrene	30.2	0.5	ug/L		75.4	60-130			
1,1,1,2-Tetrachloroethane	31.7	0.5	ug/L		79.3	60-130			
1,1,2,2-Tetrachloroethane	36.8	0.5	ug/L		91.9	60-130			
Tetrachloroethylene	35.6	0.5	ug/L		89.1	60-130			
Toluene	31.8	0.5	ug/L		79.5	60-130			
1,1,1-Trichloroethane	32.3	0.5	ug/L		80.8	60-130			
1,1,2-Trichloroethane	46.5	0.5	ug/L		116	60-130			
Trichloroethylene	39.0	0.5	ug/L		97.4	60-130			
Trichlorofluoromethane	31.2	1.0	ug/L		77.9	60-130			
Vinyl chloride	35.5	0.5	ug/L		88.7	50-140			
m,p-Xylenes	65.7	0.5	ug/L		82.1	60-130			
o-Xylene	29.4	0.5	ug/L		73.5	60-130			
Surrogate: 4-Bromofluorobenzene	*86.7*		*ug/L*		*108*	*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.

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: 1945573

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1945573	№ 51662

Client Name: Paterson	Project Ref: PE4347	Page 1 of 1
Contact Name: Mark D'Arcy	Quote #:	Turnaround Time: ☐ 1 day ☑ 3 day ☐ 2 day ☐ Regular
Address: 154 Colonnade Rd	PO #: 27635	Date Required:
Telephone: 613 226 7381	E-mail: MDarcy@Patersongroup.ca	

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	Required Analysis: PHC (F1 - F4)	Required Analysis: VOC
1	BH1-GW1	W		3	6 Nov 2019	-	✓	✓
2	BH2-GW1	W		3	6 Nov 2019	-	✓	✓
3	BH3-GW1	W		3	6 Nov 2019	-	✓	✓
4								
5								
6								
7								
8								
9								
10								

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot: 1262	Received at Lab: BGam	Verified By: DGama
Relinquished By (Print): PHILIP PRICE	Date/Time: 3:41 PM	Date/Time: 11/07/19 17:41	Date/Time: 8 Nov 9 8:35
Date/Time: 7 Nov 2019 10 Am	Temperature: °C	Temperature: 10.0 °C	pH Verified: ☐ By: NA

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 29206
Project: PE4347
Custody: 51731

Report Date: 3-Dec-2019
Order Date: 29-Nov-2019

Order #: 1948648

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

Paracel ID	Client ID
1948648-01	BH1-AU1
1948648-02	BH2-AU1
1948648-03	BH3-SS2
1948648-04	BH2-SS5

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 29206

Report Date: 03-Dec-2019
Order Date: 29-Nov-2019
Project Description: PE4347

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Conductivity	MOE E3138 - probe @25 °C, water ext	3-Dec-19	3-Dec-19
SAR	Calculated	3-Dec-19	3-Dec-19
Solids, %	Gravimetric, calculation	2-Dec-19	2-Dec-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29206

Report Date: 03-Dec-2019

Order Date: 29-Nov-2019

Project Description: PE4347

	Client ID:	BH1-AU1	BH2-AU1	BH3-SS2	BH2-SS5
	Sample Date:	31-Oct-19 09:00	31-Oct-19 09:00	01-Nov-19 09:00	31-Oct-19 09:00
	Sample ID:	1948648-01	1948648-02	1948648-03	1948648-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	92.5	94.5	85.3	71.2
General Inorganics					
SAR	0.01 N/A	2.68	5.77	0.12	1.30
Conductivity	5 uS/cm	740 [1]	1010 [1]	233 [1]	1450 [1]

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	2.67	0.01	N/A	2.56			4.2	200	
Conductivity	718	5	uS/cm	717			0.2	5	
Physical Characteristics									
% Solids	84.8	0.1	% by Wt.	85.4			0.6	25	

Qualifier Notes:

Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match - reads BH2-AU1
Applies to samples: BH2-AU1

Sample - One or more parameter received past hold time -
Applies to samples: BH1-AU1, BH2-AU1, BH2-SS5

Sample Qualifiers :

1 : This analysis was conducted after the accepted holding time had been exceeded.

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.

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.

PARACE LABORATORIES LTD

Paracel ID: 1948648

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1948648	№ 51731

Client Name: Paterson Group Inc.
Contact Name: Mark D'Arcy
Address: 154 Colonnade Rd S.
Telephone: (613) 226-7381

Project Ref: PE4347
Quote #: ~~29206~~
PO #: 29206
E-mail: mdarcy@patersongroup.ca

Page 1 of 1

Turnaround Time
☐ 1 day ☐ 3 day
☐ 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)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	EC + SAR										
1	BH1 - AU1	S		1	Oct. 31/19		X									12 cm	
2	BH2 - AU2	S		1	↓		X										
3	BH3 - SS2	S		1	Nov. 1/19		X										
4	~~BH3 - SS5~~	S		1	Oct. 31/19		X										
5	BH2 - SS5																
6																	
7																	
8																	
9																	
10																	

reads AU1 (particles) AU1

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): N. Sullivan	Received By Driver/Depot: A. Fouse	Received at Lab: Stem	Verified By: Stem
Relinquished By (Print): Nick Sullivan	Date/Time: 29/11/19 4:20	Date/Time: 11/29/19 17:24	Date/Time: 11/30/19 11:24
Date/Time: Nov. 29.19 @ 4:00	Temperature: °C PH.	Temperature: 8.7 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 29210
Project: PE4347
Custody: 51737

Report Date: 4-Dec-2019
Order Date: 2-Dec-2019

Order #: 1949083

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

Paracel ID	Client ID
1949083-01	BH1-GW1
1949083-02	BH2-GW1
1949083-03	BH3-GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 29210

Report Date: 04-Dec-2019
Order Date: 2-Dec-2019
Project Description: PE4347

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	4-Dec-19	4-Dec-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	4-Dec-19	4-Dec-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29210

Report Date: 04-Dec-2019

Order Date: 2-Dec-2019

Project Description: PE4347

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	02-Dec-19 11:15	02-Dec-19 11:40	02-Dec-19 12:10	-
	Sample ID:	1949083-01	1949083-02	1949083-03	-
	MDL/Units	Water	Water	Water	-
Anions					
Chloride	1 mg/L	22	122	105	-
Metals					
Antimony	0.5 ug/L	<0.5	0.7	<0.5	-
Arsenic	1 ug/L	1	2	<1	-
Barium	1 ug/L	88	169	883	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-
Boron	10 ug/L	62	72	195	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	-
Chromium	1 ug/L	<1	4	<1	-
Cobalt	0.5 ug/L	<0.5	0.8	<0.5	-
Copper	0.5 ug/L	1.4	7.2	0.8	-
Lead	0.1 ug/L	0.3	2.6	<0.1	-
Molybdenum	0.5 ug/L	4.0	16.2	1.8	-
Nickel	1 ug/L	<1	3	<1	-
Selenium	1 ug/L	<1	<1	<1	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-
Sodium	200 ug/L	60100	89300	104000	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-
Uranium	0.1 ug/L	0.3	2.3	0.7	-
Vanadium	0.5 ug/L	0.6	4.5	<0.5	-
Zinc	5 ug/L	5	25	7	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 29210

Report Date: 04-Dec-2019
Order Date: 2-Dec-2019
Project Description: PE4347

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Metals									
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	23.4	1	mg/L	21.9			6.4	10	
Metals									
Antimony	1.02	0.5	ug/L	ND			0.0	20	
Arsenic	1.0	1	ug/L	1.1			10.0	20	
Barium	90.9	1	ug/L	88.3			2.9	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	65	10	ug/L	62			4.4	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	1.36	0.5	ug/L	1.36			0.4	20	
Lead	0.33	0.1	ug/L	0.29			12.1	20	
Molybdenum	4.07	0.5	ug/L	4.04			0.7	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	59100	200	ug/L	60100			1.7	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	0.3	0.1	ug/L	0.3			5.6	20	
Vanadium	0.63	0.5	ug/L	0.64			1.4	20	
Zinc	5	5	ug/L	5			7.3	20	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.6	1	mg/L		106	85-115			
Metals									
Antimony	48.8		ug/L	ND	97.0	80-120			
Arsenic	58.1		ug/L	1.1	114	80-120			
Barium	141		ug/L	88.3	105	80-120			
Beryllium	53.8		ug/L	ND	108	80-120			
Boron	110		ug/L	62	95.9	80-120			
Cadmium	52.3		ug/L	ND	105	80-120			
Chromium	57.6		ug/L	ND	114	80-120			
Cobalt	53.2		ug/L	ND	106	80-120			
Copper	55.8		ug/L	1.36	109	80-120			
Lead	48.8		ug/L	0.29	96.9	80-120			
Molybdenum	55.4		ug/L	4.04	103	80-120			
Nickel	53.2		ug/L	ND	105	80-120			
Selenium	52.7		ug/L	ND	105	80-120			
Silver	46.3		ug/L	ND	92.6	80-120			
Sodium	9620		ug/L		96.2	80-120			
Thallium	48.8		ug/L	ND	97.7	80-120			
Uranium	52.1		ug/L	0.3	104	80-120			
Vanadium	56.9		ug/L	0.64	112	80-120			
Zinc	57		ug/L	5	104	80-120			

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.

PARACEL LABORATORIES

Paracel ID: 1949083

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319 St. Laurent Blvd.
a, Ontario K1G 4J8
00-749-1947
acel@paracellabs.com
paracellabs.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1949083	№ 51737

Client Name: Paterson Group	Project Ref: PE 4347
Contact Name: Mark D'Arcy	Quote #:
Address: 154 Colonnade Rd South Ottawa, ON	PO #: 29210
Telephone: (613) 226-7381	E-mail: mdarcy@patersongroup.ca

Page _ of _

Turnaround Time

☐ 1 day ☐ 3 day
☒ 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 9	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	metals, TKP	sodium + chloride										
1	BH1-GW1	GW		2	Dec 2/19	11:15am	X	X										
2	BH2-GW1	↓		↓	↓	11:40am	X	X										
3	BH3-GW1	↓		↓	↓	12:10am	X	X										
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): N. Sullivan	Received By Driver/Depot: T. Rouse	Received at Lab: Sumeporn Dohmai	Verified By: [illegible]
Relinquished By (Print): Nick Sullivan	Date/Time: 02/12/19 3:50	Date/Time: Dec 03, 2019 04.48	Date/Time: 12-02-19 17:12
Date/Time: Dec. 2. 2019	Temperature: °C PM.	Temperature: 11.4 °C	pH Verified: ☒ By: MA

Chain of Custody (Blank).xlsx

Revision 3.0