FINAL REPORT

Phase Two Environmental Site Assessment

Central Library Project- 555 Albert Street

Ottawa, Ontario

Submitted to:

City of Ottawa
Attention: Richard Barker
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Submitted by:

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Distribution List

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the City of Ottawa (the "City") to conduct a Phase Two Environmental Site Assessment (Phase Two ESA) for the proposed Central Library property located at 555 Albert Street, Ottawa, Ontario (the "Site" and the "Phase Two Property"), as shown on Figure 1.

Golder previously completed a Phase One ESA for the Site in general accordance with Ontario Regulation 153/04, as amended (O. Reg. 153/04), the results of which were documented in the draft report titled "*Phase One Environmental Site Assessment, Central Library Project, 555 Albert Street, Ottawa, Ontario*", dated September 2019 (the "Phase One ESA"). Based on the findings of the Phase One ESA, Golder completed this Phase Two ESA investigation.

Golder understands that this Phase Two ESA was undertaken by the City to support the planning application for the new Central Library project. This Phase Two ESA was completed in general accordance with O. Reg. 153/04, however the report is not intended or sufficient to be used for submission of a Record of Site Condition (RSC), pursuant to O. Reg. 153/04.

1.1 Site Ownership and Description

The RSC Property information is as follows:

Municipal Address	555 Albert Street, Ottawa
Property Identification Number	04112-0027, 04112-0029 and part of 04112-0154
Legal Description	All of Lots A & B, all of Lots 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 & 18, Block L, Plan 2 & Part of Lot 6, Block L, Plan 2, City of Ottawa, subject to Easement No. OC1749431. PIN 04112-0027.

The contact information for the Site is:

Site Owner/Client	Address	Contact Information
City of Ottawa	110 Laurier Avenue West, 5th Floor Ottawa, ON K1P 1J1	Richard Barker Phone: 613-580-2424 x12958 Email: Richard.Barker@ottawa.ca

1.2 Overview

The Site is an irregular shaped parcel of land bordered by Commissioner Street to the northeast, Albert Street to the southeast, the former Brickhill Road allowance to the southwest, the former Wellington Street road allowance to the northwest, and the west border of the Site is located adjacent to the Ottawa Light Rail Transit ("OLRT") rail corridor. The Site covers an area of approximately 0.95 hectares that is currently vacant land, formerly used as a construction staging area by the Ottawa Light Rail Transit Constructors ("OLRT-C"), except for the northern portion of the Site that is occupied by temporary pre-fabricated buildings that contain telecommunication infrastructure. The south and southwestern portions of the Site are currently being used as a parking area and soil stockpile storage area, respectively, by the Combined Sewage Storage Tunnel ("CSST") construction contractor. The surrounding properties to the Site include primarily commercial land uses and some residential buildings.

Given that the Site will be redeveloped for community purposes with a multi-storey library and archives building (hereafter refereed to as the “Ottawa Central Library”), it is interpreted that no change in land use from less sensitive to more sensitive is applicable (changing from commercial to community use). As such, there is no mandatory requirement for filing of a Record of Site Condition (RSC) for this property pursuant to O. Reg. 153/04. Regardless, this Phase Two ESA, was completed in accordance with the requirements of Schedule E of O. Reg. 153/04 (as amended).

1.3 Proposed Buildings and Structures

Future use of the Site is understood to consist of a multi-storey library and archives building- the Ottawa Central Library. This building will occupy most of the Phase Two Property and is expected to include subsurface parking structures requiring at least two basement levels to approximately 6 metres below ground surface (mbgs). As such, the fill layer is expected to be primarily removed as part of the construction excavation for the underground parking.

1.4 Applicable Site Condition Standards

The analytical results for the samples collected during this Phase Two ESA were compared to the Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (Industrial/Commercial/Community Property Use, coarse textured soil) presented in the Ministry of Environment, Conservation and Parks (“MECP”) “*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*”, dated April 15, 2011. The applicable site condition standards were selected based on the following rationale:

- The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system and there are no water supply wells which are in use.
- The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water.
- Grain size analysis performed for three soil samples (one from fill and two from native layer) indicated two coarse (one each from fill and native layer) and one (fill) fine grained soil at the Site. As such, standards for coarse textured soil were used.
- There are no water bodies on the Site. The nearest permanent watercourse is an open aqueduct located approximately 35m northwest of Site, which is water routed from the nearby Ottawa River through the adjacent pump house.
- There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41 of O.Reg.153/04 as amended. Based on the data obtained from previous reports, soil pH ranged from 7.70 to 7.85, which is within MECP's acceptable pH range of 5 to 9.
- The overburden thickness is greater than 2 metres over more than one-third of the Phase Two Property.

2.0 BACKGROND INFORMATION

2.1 Physical Settings

The Site, addressed 555 Albert Street, is an irregular shaped parcel of land bordered by Commissioner Street to the northeast, Albert Street to the southeast, the former Wellington Street road allowance to the northwest, and the west border of the Site is located adjacent to the OLRT rail corridor. The Site covers an area of approximately 0.95 hectares that is currently undeveloped land, formerly used as a construction staging area by the OLRT-C, except for the northern portion of the Site that is occupied by temporary prefabricated buildings containing telecommunication infrastructure. The surrounding properties include:

- **West**: A tunnel and construction area associated with the CSST was located adjacent west of the Site followed by large transformer panel associated with LRT tunnel infrastructure. LRT spur lines appear at surface further away of the Site.
- **North**: Bounded by Commissioner Street followed by a large residential apartment building to the northeast, a green space occupies the majority of the lands further away from the Site including a church, some residential apartments and office buildings. Northwest of the Site consists of OLRT tunnels below grade followed by a vegetated slope towards an open aqueduct. Also, a pumping station was observed northwest of the Site followed by a large residential apartment complex.
- **South**: Unpaved driveway (former Brickhill road allowance) off Albert Street adjacent to the Site followed by construction area for the CSST consisting of temporary office buildings and construction equipment storage yard. Further away from the Site, vacant lands and residential homes located north and south of Albert Street respectively.
- **East**: Bounded by Albert Street followed by undeveloped green space, followed by Slater Street. Land uses further away from the Site consist of residential and institutional property uses.

2.2 Past Investigation

A Phase One ESA was completed for the Site and the adjacent property to the west by Golder titled *"Phase I Environmental Site Assessment, 557 and Part of 584 Wellington Street, Ottawa, Ontario"* in May 2015 (the "2015 Phase One ESA"). Based on the recommendations for subsurface investigation in the 2015 Phase One ESA, a subsurface investigation was completed at the Site and for the adjacent property to the west which was summarized in a technical memo titled *"Summary of Phase II Environmental Site Assessment Results, 584 Wellington Street and Part of Adjacent Property, Ottawa, Ontario"* in May 2015 (the "2015 Phase II ESA"). Soil and groundwater results, associated with the Site, from the 2015 Phase II ESA have been reviewed and discussed further under section 5.4 (Soil and Groundwater Quality) and 6.5 (Summary of Current Site Condition).

As such, relevant information including historical uses and subsurface conditions (soil and groundwater quality) for the Site were considered during planning of this Phase Two ESA.

3.0 SCOPE OF THE INVESTIGATION

3.1 Overview of Site Investigation

This investigation to evaluate the Areas of Potential Environmental Concern (APEC) identified as part of the Phase One ESA was combined with a geotechnical investigation at the Phase Two Property which consisted of a nine-borehole program (BH19-01 to BH19-09) to be advanced for the Ottawa Central Library. Additionally, two boreholes (BH19-101 and BH19-102) were completed for environmental purposes only.

This Phase Two ESA was completed to evaluate the absence or presence of the contaminants of concerns (COCs) in relation to the APECs identified in the Phase One ESA. In addition, the Phase Two ESA was also used to characterize the subsurface conditions at the Phase Two Property and to determine if soil and groundwater quality at the Site meet the applicable site condition standards. To achieve these objectives, the location of the boreholes and monitoring wells as well as the parameters for chemical analysis of soil and groundwater samples were selected in relation to the identified APECs in the Phase One ESA completed by Golder.

3.2 Media Investigated

To address the APECs identified in the Phase One ESA, the Phase Two ESA field program included sampling of subsurface and surface soil from a total of eleven boreholes (BH19-01 to BH19-09 as well as BH19-101 and BH19-102) of which nine were installed with monitoring wells to allow for groundwater sampling. An additional borehole (19-09C) was advanced in the vicinity of BH19-09 to install a monitoring well, given no groundwater was encountered at 19-09 due to auger refusal at shallow depths. Furthermore, a subsurface investigation of the Site and adjacent property west of the Site was completed in 2015. The 2015 investigation consisted of three boreholes with monitoring wells (15-1, 15-2 and 15-3) advanced on-Site to depths ranging from approximately 7.0 to 14.5 mbgs. Construction details of the monitoring wells (both 2015 and 2019 investigations) as well as static groundwater levels in the wells are provided in Tables 1 and 2 following the text of this report. The locations of all boreholes and monitoring wells are shown on Figure 1.

No sediment was present at the Site and therefore no sediment sampling was completed. A summary of the samples collected from each media investigated (soil and groundwater) and submitted for laboratory analysis of the COCs is provided in Tables 3 and 4 following the text of this report.

3.3 Phase One ESA Conceptual Site Model

A Phase One ESA was completed for the Site in general accordance with O.Reg. 153/04 by Golder as documented in the draft report *"Phase One Environmental Site Assessment, Central Library Project, 555 Albert Street, Ottawa, Ontario"* dated September 2019 . The Phase One ESA included a review of previous historical reports, including previous subsurface investigations associated with the Site and adjacent property to the south and west (across former Brickhill road allowance).

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

- The Site is a rectangular shaped parcel of land bordered by Commissioner Street to the northeast, Albert Street to the southeast, former Wellington Street to the northwest, and the west border of the Site is located adjacent to the OLRT. The Site covers an area of approximately 0.95 hectares with vacant land, formerly used as construction staging area during OLRT construction whereas the northern portion of the Site consists of temporary prefabricated building for telecommunication infra-structure. The south and southwestern portions of the Site are currently being used for parking and as a stockpile storage area respectively, by the CSST construction project.

- Based on the earliest available aerial images, fire insurance plans, and city directories, the Site was primarily developed with residential buildings and some commercial activities including grocery stores and warehouses prior to 1878. The presence of a mixture of commercial, residential and industrial properties continued until the 1950s. Following 1960, buildings associated with commercial or industrial activities occupied the northern portion whereas the southern portion was vacant and used for parking.
- There are records of four monitoring wells installed on Site as part of the 2015 Phase II ESA. None of these wells were observed during the Site visit. Three monitoring wells installed on site in December 2017 and January 2018 were reportedly abandoned in April 2018. None of these wells are used for water supply and potable water is provided to the Site and Study Area by the City.
- The nearest permanent watercourse is an open aqueduct located approximately 35m northwest of Site. The aqueduct is water routed from the nearby Ottawa River through the adjacent pump house.
- Local groundwater is anticipated to flow towards the northwest based on previously completed subsurface investigations that evaluated groundwater flow direction based on water levels measured in groundwater monitoring wells. Regional groundwater is anticipated to flow in a northern direction towards the aqueduct and Ottawa River.
- No areas of natural and scientific interest (ANSI) are known to be located on the Site or on the Phase One Study Area.
- At the time of the Phase One ESA, the surrounding properties within the Phase One Study Area included:
  - **West**: A tunnel and construction area associated with CSST was located adjacent west of the Site followed by large transformer panel associated with LRT tunnel infrastructure. LRT spur lines appear at surface further away of the Site.
  - **North**: Bounded by Commissioner Street followed by a large residential apartment building to the northeast. A green space occupies the majority of the lands further away from the Site including a church, some residential apartments and office buildings. Northwest of the Site consists of OLRT tunnels below grade followed by a vegetated slope towards an open aqueduct. Also, a pumping station was observed northwest of the Site followed by a large residential apartment complex.
  - **South**: Unpaved driveway (former Brickhill road allowance) off Albert Street adjacent to the Site followed by construction area for CSST consisting of temporary office buildings and construction equipment storage yard. Further away from the Site, vacant lands and residential homes located north and south of Albert Street respectively.
  - **East**: Bounded by Albert Street followed by undeveloped green space, followed by Slater Street. Land uses further away from the Site consist of residential and institutional properties.
- Thirty-three (33) Potentially Contaminating Activities (PCAs) were identified in the Phase One Study Area, eight of which were on the Phase One Property, as shown on Figure 1. Based on site characteristics and the locations of the PCAs, a total of thirteen (13) Areas of Potential Environmental Concern (APECs) were identified for the Phase One Property as shown on Figure 1.
- There are no buildings on the Site, and thus no active utility connections. The Site is serviced by municipal water, electricity, and sanitary wastewater. Storm water infiltrates through the gravel area on-Site or flows to off-Site catch basins on adjacent roadways that are connected to the municipal sewer network.

- Soil at the Site consists primarily of fill materials overlying glacial till and Paleozoic Bedrock, made of limestone, dolomite, sandstone & local shale. Bedrock consists of interbedded limestone and shale. Previous environmental studies indicate subsurface conditions generally consisted of fill material comprised of silty sand to sand and gravelly sand with brick, ash or wood identified in some areas. The fill thickness was interpreted to be generally less in the southern portion of the Site (generally 1 to 2 m) and was greatest along the western property boundary north of Brickhill Street (generally 3 to 5 m in this area). The fill layer was underlain by native soil consisting of silty sand with some gravel (glacial till). The interpreted depth to bedrock was shallowest in the northern portion of the Site (generally 6 to 9 mbgs in this area) and deepest along the eastern property boundary in the southern portion of the Site (generally 12 to 14 mbgs in this area).

The following table summarizes the PCAs considered to have resulted in an APEC on the Phase Two Property as identified in the Phase One ESA. Figure 1 shows the locations of the identified APECs and their associated PCAs.

Phase One ESA Findings with respect to the PCAs resulting in APECs to the Site.

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1: PCA ID #2 – Former paint shop	Eastern portion of the Site	PCA 39: Paints Manufacturing, Processing and Bulk Storage	Off-Site	VOCs, PAHs	Soil and Ground water
APEC 2: PCA ID #6 – Former "City Iron & Bottle Co."	Northwestern portion of the Site	PCA 29: Glass Manufacturing PCA 32: Iron and Steel Manufacturing and Processing PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 3: PCA ID #7 – Former "Machine and Brass Works".	Northwestern portion of the Site	PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 4: PCA ID #11 – Former metal castings and moulding shop.	Northeastern portion of the Site	PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 5: PCA ID #28 – Registered Federal Contaminated Sites, that include the Site and surrounding areas.	Entire Site	N/A	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 6: PCA ID #12 – Former automotive garage and repairs, with a UST.	Northeastern portion of the Site	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	PHCs, VOCs	Ground water
APEC 7: PCA ID #13 – Former National Brake & Clutch Service, automotive garage with USTs.	Southern portion of the Site	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs, VOCs	Soil and Ground water
APEC 8: PCA ID #18 – Former welding company and automotive service station.	Northern portion of the Site	PCA 10: Commercial Autobody Shop PCA 34: Metal Fabrication	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 9: PCA ID #20 – Presence of fill containing waste with metals, polycyclic aromatic hydrocarbon (“PAH”) and petroleum hydrocarbon (“PHC”) impacts across the Site.	Entire Site	PCA 30: Importation of Fill of Unknown Quality	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 10: PCA ID #21 – Documented spill of 900L of furnace oil.	Northeastern portion of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	PHCs, VOCs	Soil and Ground water

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 11: PCA ID #24 – Former gas pump and auto repair garage.	Northeastern portion of the Site	PCA 10: Commercial Autobody Shop	Off-Site	PHCs, VOCs	Soil and Ground water
APEC 12: PCA ID #31 – Multiple oil ASTs located on Site.	Southern portion of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs, VOCs	Soil and Ground water
APEC 13: PCA ID #32 – Various storage drums and/or ASTs for chemicals stored on Site.	Eastern portion of Site	PCA 8: Chemical Manufacturing, Processing, and Bulk Storage	On-Site	PHCs, VOCs, PAHs	Soil and Ground water

3.4 Deviations from Sampling and Analysis Plan

A sampling and analysis plan which outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA was prepared at the initiation of the Phase Two ESA. The procedures described in the Sampling and Analysis Plan (SAP) were followed and there were no deviations from the SAP with the exception of two boreholes (19-04 and 19-101) which were not completed with monitoring wells due to shallow auger refusal with no evidence of groundwater observed. Two additional attempts to drill deeper were made in the vicinity of each of these locations; however, auger refusal was encountered around similar depths (between 0.69 and 3.66 mbgs).

3.5 Impediments

No impediments to the Phase Two ESA investigation were encountered.

4.0 PHASE TWO ESA INVESTIGATION METHOD

The primary objective of this Phase Two ESA was to assess the absence or presence of the contaminants of concern in relation to the APECs identified in the Phase One ESA completed by Golder. The Phase Two ESA was also used to characterize the subsurface conditions at the Phase Two Property and to determine if soil and groundwater quality at the Site meet the applicable site condition standards for the proposed construction of the Ottawa Central Library. To achieve these objectives, the location of the boreholes and monitoring wells as well as the parameters for chemical analysis of soil and groundwater samples were selected to assess the quality of soil and groundwater at the Site in relation to the APECs and PCAs identified in the Phase One ESA completed by Golder.

4.1 General

The following sections describe the pre-field work activities and field investigation methodology employed during the Phase Two ESA. The field investigation methods were carried out in accordance with Golder's Quality Assurance Program and the Standard Operating Procedures (SOPs). The current Phase Two ESA fieldwork was completed in November and December 2019. The 2015 Phase II ESA was completed between February 28 and March 9, 2015. The previous investigation in 2015 included four boreholes, of which three were located on-Site (15-1 to BH15-3) and completed with monitoring wells. Details of soil and groundwater sampling protocols as well as analytical lab results from these locations have been discussed in this report.

Prior to initiating the field work in 2019, Golder developed and implemented Site-specific protocols to protect the health and safety of its employees and subcontractors through the preparation of a Site-specific Health and Safety Plan. An assessment of potential health and safety hazards at the Phase Two Property and those associated with the proposed work was completed each day of the field program. Health and safety tail gate meetings were held with Golder's subcontractors each day prior to completion of the field work. The document was reviewed and signed on-Site by field personnel prior to commencing work. Additionally, prior to any intrusive investigations, including drilling, Golder retained CCC Geotechnical and Environmental Drilling Inc. of Ottawa, Ontario to coordinate utility clearances with the local utility companies and to clear boreholes locations. In addition, each proposed borehole location was cleared prior to any drilling activities with respect to other underground infra-structure including the OLRT tunnel which runs along the west boundary of the site as well as the CSST located transecting along the centre of the Site.

4.2 Drilling

Eleven boreholes (BH19-01 to BH19-09 as well as BH19-101 and BH19-102) were advanced at the Site using a CME 75 ATV drill rig operated by CCC Geotechnical and Environmental Drilling Inc. of Ottawa, Ontario. The borehole drilling and monitoring well installation activities were monitored in the field by Golder personnel. During borehole drilling, overburden soil samples were collected continuously using a 35 mm diameter split-spoon sampler. Due to shallow refusal in several locations (19-04, 19-09 and 19-101) with no evidence of groundwater, additional boreholes were completed in the vicinity of these locations to attempt to install wells. No groundwater was encountered in the vicinity of borehole locations 19-04 and 19-101, however, and these were completed as boreholes only. In the vicinity of borehole 19-09, coring was used to advance to a depth of 7.01 mbgs to install a monitoring well (19-09C), however no soil sampling was collected from 19-09C given the close proximity to 19-09. Some borehole locations (19-01, 19-02, 19-03 and 19-05) also required coring to drill through assumed boulders to reach the desired depth and install monitoring wells.

The 2015 subsurface investigation included the advancement of three boreholes (15-1 to 15-3) between February 28, 2015 and March 1, 2015 to depths ranging from 8.53 to 14.48 mbgs. The drilling depths for these boreholes were determined with consideration to intersect the water table at that time.

4.3 Soil: Sampling

Soil samples collected as part of the 2015 and 2019 subsurface investigations were split in the field into two components. One component of each sample was placed into laboratory supplied sample jars and stored in a cooler with ice for possible subsequent chemical analysis. The second component of the sample was placed inside a labelled plastic bag for subsequent field headspace screening. When handling all soil samples, a clean gloved hand was used and all equipment in contact with soils was decontaminated between sampling locations to minimize the potential for cross-contamination.

The subsurface soil conditions within the boreholes were described in terms of their texture, color, presence of staining, odour and debris, if any. Geologic descriptions of soil samples collected as part of the 2015 and 2019 investigations are presented in the Record of Borehole sheets (Appendix A).

All soil samples collected and submitted for chemical analysis were obtained from undisturbed soils, including fill materials (if present) and native overburden. Nitrile gloves were worn when handling soil samples and all equipment in contact with soils was washed between sample locations to prevent the potential of cross contamination.

Soil samples submitted for chemical analysis were selected based on visual or olfactory observations (e.g., staining, discolouration, free product, and/or odour, if any), from representative soil layers, and/or from the highest recorded field screening measurements. Otherwise, if no relevant observations were noted, depth horizons at which potential contamination was considered most likely to have occurred, such as from the upper fill layer or near the water table, were used to select which soil sample to submit for analysis from each test location. Details of soil samples collected and analyzed for various parameters is provided in Table 3 following the text of this report.

4.4 Field Screening Measurements

During the 2015 drilling program, headspace organic vapour screening for the soil samples (where sufficient soil sample were recovered) was completed using a photoionization detector (PID) MiniRAE 3000 or an RKI Eagle gas detector. During the 2019 field program, the measurements of sample headspace were made using the following equipment:

Equipment	Make and Model	Parameters Detected	Detection Limits	Precision	Accuracy	Calibration Standard	Calibration Procedure
RKI Eagle	Eagle-2, Serial# E2H102	Organic vapours	0 - 50,000 ppm	N/A	+/- 5%	100 ppm Isobutylene; 15% LEL (lower explosive limit)	By supplier prior to fieldwork & by Golder Associates field staff daily during work

The field screening measurements were used to provide an estimate of the relative concentrations of organic and combustible vapours in the headspace of each soil sample and was used to support selection of soil samples for submission for laboratory analysis as described above. Field screening measurements for the soil samples are indicated on the Record of Borehole Logs in Appendix A.

4.5 Groundwater: Monitoring Well Installation

The monitoring wells installed during the 2015 Phase II ESA (hereafter referred to as MW15-1 to MW15-3) at the Site were constructed with 51 millimetre diameter polyvinyl chloride (“PVC”) pipes, including a 1.5 m long (slot #10) screen for MW15-1 and MW15-2 and 3.05 m long (slot #10) screen for MW15-3 and a solid riser for each of the wells. These three monitoring wells were completed with a flush mount protective well casing.

Following the completion of drilling and soil sampling in 2019, ten borehole locations were completed with monitoring wells (19-01, 19-02, 19-03, 19-05, 19-06, 19-07, 19-08, 19-09, 19-09C, and 19-102). For well locations away from vehicular movement and for the ease of finding them during subsequent groundwater sampling, 19-01, 19-06, 19-07, and 19-08 were completed with stick-up monument casings, while the others were completed with flush mount casings. All monitoring wells in 2019 were constructed using threaded 32 mm diameter, schedule 40, PVC well screens and riser pipes, which were brought to the Site in sealed plastic bags. The annulus surrounding the screened portion of the well and a further 0.2 to 0.7 m portion of the riser pipe above the screen was filled with silica filter sand. A bentonite seal was placed above the sand filter pack with a minimum thickness of 0.3 m. The monitoring wells were completed with a flush mount or monument protective well casing set in concrete and the riser pipes were sealed with a protective cap.

The monitoring wells installed in 2019 were developed following drilling by removing up to ten well volumes or by removing groundwater until the well was purged three times dry, using dedicated Waterra® inertial pumps (polyethylene tubing with foot valves). During monitoring well development, qualitative observations were made of water colour, clarity, and the presence or absence of any hydrocarbon sheen or odours. Monitoring wells installed in 2015 could not be accessed at the time of the groundwater monitoring and sampling event in 2019 due to the presence of a layer of gravel that had been placed on top of these wells during Site use as a construction staging area by the OLRT-C. Frozen ground conditions prevented movement of the gravel layer to access the wells. Hence, static groundwater level measurements and samples could not be collected from MW15-1 to MW15-3 in 2019. However, data from samples collected and analyzed in 2015 have been included as part of this Phase Two ESA report.

Monitoring well construction details are summarized in Table 1 and presented in the Record of Borehole sheets (Appendix A).

4.6 Groundwater: Field Measurement

Prior to the groundwater sampling event, the static groundwater levels were recorded on December 10, 2019 from each well installed in 2019. No groundwater level measurements could be collected from MW15-1, MW15-2 and MW15-3 due to access issues as noted above. The water level measurements were collected more than 24 hours after the well development was completed. Groundwater levels were measured between 2.10 and 5.75 mbgs. Groundwater level measurements were taken from the top of the PVC riser and are summarized in Table 2 following the text of this report.

Following groundwater level measurements, the wells were purged prior to sampling and water quality parameters were measured in the field including pH, temperature, turbidity, conductivity, dissolved oxygen, and redox potential.

4.7 Groundwater Sampling

Following the water level measurement and prior to the groundwater sampling, the wells were purged using the low flow procedure. This method involved purging each well at a constant pumping rate (between 0.1 and 1 L/min) using dedicated 6.3 mm (1/4 inch) diameter low density polyethylene (LDPE) tubing attached to a peristaltic pump. During well purging, qualitative observations were made of water colour, clarity, the presence or absence of any hydrocarbon sheen and any odours present.

Following purging (determined by stabilization of water quality parameters within specified criteria over at least three consecutive readings), groundwater samples were collected into the laboratory provided sample bottles, placed in a cooler on ice and delivered under chain-of-custody procedures to Paracel Laboratories Ltd. Groundwater sampling was completed on December 10 and 11, 2019.

No groundwater samples could be collected from MW15-1 to MW15-3 due to access issues resulting from placement of fill over these wells and frozen ground conditions; however, groundwater results from the 2015 sampling event have been included and discussed in this report.

Groundwater samples collected in 2015 and 2019 were analyzed for one or more of the following parameters: petroleum hydrocarbons F1 to F4 (PHC F1-F4); volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs); metals; inorganics including pH, chloride and sodium; and/or polychlorinated biphenyls (PCBs) following chain-of-custody procedures. Details of the parameters analyzed at each monitoring well are presented in Table 4 following text of this report.

4.8 Sediment: Sampling

There is no sediment on the Site and as such, no sediment samples were collected as part of this investigation.

4.9 Analytical Testing

Soil and groundwater analyses were conducted by Paracel Laboratories. The contact information for the analytical laboratory is included below.

Paracel Laboratories
2319 St Laurent Boulevard
Ottawa, Ontario K1G 4J8
Laboratory Contact: Scott Clark, Account Manager
613-731-9577

The analytical laboratory is accredited in accordance with the International Standard ISO/IEC 17025 (CALA) (General Requirement for the Competence of Testing and Calibration Laboratories, May 5, 2005, as amended) and the standards for proficiency testing developed by the Standards Council of Canada, the Canadian Association for Laboratory Accreditation or another accreditation body accepted by the MECP.

4.10 Residue Management Procedure

Soil cuttings from the drilling program as well as purged groundwater and fluids from equipment cleaning during this Phase Two ESA were collected and retained on the Site. Soil cuttings and purge water drums will be disposed of following completion of this project in discussion with the City.

4.11 Elevation surveying

An Elevation survey was completed by the City in coordination with Golder following completion of the boreholes in 2019 using the NAD83 / MTM zone 9 as a reference.

4.12 Quality Assurance and Quality Control Measures

Golder's quality assurance program for environmental investigations was implemented to ensure that the analytical data obtained by the investigation in 2015 and 2019 were valid and representative. The quality assurance program included the following measures:

- The use of standard operating procedures for all field investigation activities.
- All monitoring wells were developed following installation to remove fine particles from the filter pack and any fluids introduced during drilling.
- Monitoring wells were appropriately purged prior to groundwater sample collection to remove stagnant water from the well bore and improve sample representativeness, minimizing sample agitation and aeration to the extent practicable.
- The collection of field duplicate samples at a minimum frequency of one duplicate for every ten samples.
- Submission of one trip blank, field blank and equipment blank for laboratory analysis of VOCs during the 2019 groundwater sampling event. The trip blank was supplied and sealed by the laboratory, were brought to the Site and then shipped back to the laboratory unopened for analysis of VOCs. The equipment blank was collected using laboratory supplied water to check cross-contamination that may occur during sample collection.
- Initial calibration of field equipment was performed at the start of each field day, with daily checks on calibration, as needed, using a standard of known concentration.
- Soil and groundwater samples were handled and stored in accordance with the sample collection and preservation requirement of the Ministry of the Environment, Conservation and Parks (MECP) *Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.I of the Environmental Protection Act*, July 1, 2011. Samples were collected directly into pre-cleaned, laboratory-supplied sample containers with the appropriate preservative for the analyte group. Upon collection, samples were placed in insulated coolers with ice for storage and transport to the analytical laboratory under chain-of-custody.
- Dedicated sampling equipment (tubing and foot valves) and clean disposable Nitrile™ gloves were used at each sampling location to prevent cross-contamination. All non-dedicated sampling equipment (e.g., water level meters, split spoons) was decontaminated between sampling locations. Sampling equipment in contact with soil, groundwater, or sediment was cleaned by mechanical means; washed with a laboratory-grade detergent (e.g., phosphate-free LiquiNox or AlcoNox) and, if necessary, an appropriate desorbing wash solution; and thoroughly rinsed with analyte-free water.
- Detailed field records documenting the methods and circumstances of collection for each field sample were prepared at the time of sample collection. Each sample was assigned a unique sample identification number recorded in the field notes, along with the date and time of sample collection, the sample matrix, and the requested analyses.

5.0 REVIEW AND EVALUATION

5.1 Geological Conditions

The soil conditions encountered during the drilling programs in 2015 and 2019 are presented in the Record of Borehole sheets (included in Appendix A), as well as in the cross sections presented in Figures 15 to 38 with the cross-section locations and orientation shown on Figure 2.

The subsurface stratigraphy at the Site generally consisted of a layer of fill overlying native glacial till overlying bedrock. The fill layer, extending to depths of between about 1.4 and 3.7 mbgs, at the Site is heterogeneous in nature and consists of gravelly sand, to gravelly silty sand, to silty sand, to sand and gravel, to sand, and contains brick fragments, concrete fragments, pockets of silty clay, ash, and cobbles and boulders.. A deposit of glacial till was encountered beneath the fill material at each of the boreholes.

The glacial till typically consists of a heterogeneous mixture of gravel, cobbles, and boulders in a matrix of sand and silt with a trace to some clay. At some locations, the till consists of clayey sand containing gravel, cobbles and boulders. The glacial till was not fully penetrated in the current investigation but was proven to depths of between about 2.9 and 8.2 m below the existing ground surface.

Bedrock was not encountered in any of the boreholes advanced in 2019; however, BH15-3 (completed as part of 2015 Phase II ESA) encountered inferred bedrock (limestone) from 14.02 mbgs to the end of the borehole at 14.48 mbgs.

5.2 Physical Hydrogeology

Groundwater Levels and Flow Directions

As part of the 2015 Phase II ESA, static groundwater levels were measured from three monitoring wells at the Site and the water levels on March 9, 2015 were measured between 4.54 and 5.53 mbgs, located within the glacial till layer. During the groundwater sampling event on December 10, 2019, measured static groundwater levels in newly installed wells (19-01, 19-02, 19-03, 19-05, 19-06, 19-08, 19-09C, and 19-102) were between 2.31 and 5.57 mbgs, with three located in the fill layer and remaining in the glacial till layer. The interpreted shallow groundwater flow directions based on groundwater level events in both 2015 and 2019 were both inferred to be to the west (as shown on Figure 2). Seasonal fluctuations in water levels on the Site are anticipated.

Horizontal and Vertical Hydraulic Gradients

The average horizontal hydraulic gradient was calculated based on the water level contours presented on Figure 2. The horizontal hydraulic gradient for shallow groundwater conditions was calculated to be approximately 0.06 m/m. Variability in hydraulic gradients may be present at the Phase Two property related to the presence of foundations/buried structure, bedding materials, and buried services at the Site.

The vertical hydraulic gradient could not be estimated given no monitoring well pairs (shallow and deeper) were present at the Site.

Groundwater Hydraulic Conductivity

Groundwater flow velocity was determined based on the hydraulic conductivity of 1.0×10^{-7} m/s and porosity of 37% for silty sand (*source: https://structx.com/Soil_Properties_006.html*) , and the horizontal gradient. The groundwater flow velocity within silty sand was calculated to be 1.62×10^{-8} m/s. Note that the actual groundwater velocity may vary significantly not only because of the variability of the hydraulic gradient, but also because of the variability of the hydraulic conductivity within the silty sand.

5.3 Soil: Field Screening

During this Phase Two ESA, , headspace combustible and organic vapour concentrations were measured in each borehole where sufficient soil volume was recovered. The vapour concentrations measured during environmental investigations in 2015 and 2019 are presented on the borehole logs in Appendix A.

5.4 Soil and Groundwater Quality

To address the APECs and PCAs identified at the Site, soil and groundwater sampling and analysis for potential COCs were completed as part of this Phase Two ESA. MECP Table 3 Standards (April 15, 2011) for industrial/commercial/community property use for coarse-textured soil in a non-potable groundwater condition were used to compare the soil and groundwater analytical results from 2015 and 2019. A summary of the findings from the Phase Two ESA with respect to the APECs and associated PCAs with respect to the Site is provided in the table below. Additional information with respect to collection, selection and depths of samples are provided in tables and figures following the text of this report.

Phase Two ESA Investigation Results for each APEC

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#1	PCA 39: Paints Manufacturing, Processing and Bulk Storage	Four soil samples (BH19-04 SA2, BH19-04 SA4, BH19-102 SA1 and BH19-102 SA4) as well as a field duplicate of BH19-04 SA2 (DUP-1) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-102) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloride exceedance in the groundwater sample likely from salt application on-Site and adjacent roadway (Albert Street).
#2	PCA 29: Glass Manufacturing PCA 32: Iron and Steel Manufacturing and Processing PCA 33: Metal Treatment, Coating, Plating, and Finishing	Six soil samples (BH15-2 SA2, BH15-2 SA3A, BH15-2 SA4, BH15-2 SA6, BH19-01 SA3 and BH19-01SA7) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and MW15-2) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of PHC F1 to F3) and PAH in BH15-2 SA3A (fill). No exceedances in any groundwater samples.
#3	PCA 33: Metal Treatment, Coating, Plating, and Finishing	Two soil samples (BH19-101 SA1 and BH19-101 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-05) from down-gradient of the APEC location was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloroform exceedance in groundwater sample.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#4	PCA 33: Metal Treatment, Coating, Plating, and Finishing	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-1 and 19-06) as well as a field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#5	Registered Federal Contaminated Sites, that include the Site and surrounding areas.	Seventeen (17) fill samples from across the Site including a field duplicate (DUP-1) of BH19-04 SA2 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and 19-06) from wells screen in the fill layer were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs and metals in total of nine fill samples (including DUP-1). Also, exceedance of PHC F1 to F3 in BH15-2 SA3A. No exceedances in any groundwater samples.
#6	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (MW15-1 and 19-06) as well as field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#7	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Two soil samples (BH19-08 SA3 and BH19-08 SA9) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-08) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	Exceedance of several PAHs, several metals and EC in fill sample (SA3) and exceedance of metal (Vanadium) in SA9. No exceedances in groundwater sample.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#8	PCA 10: Commercial Autobody Shop PCA 34: Metal Fabrication	Four soil samples (BH19-02 SA1, BH19-02 SA7, BH19-02 SA8, BH19-07 SA1) as well as a field duplicate (DUP-3) of BH19-02 SA7 was analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-02) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	Exceedance of barium in fill sample (BH19-07 SA1). Also, exceedance of PAH in the field duplicate sample from till layer. No exceedances in groundwater sample.
#9	PCA 30: Importation of Fill of Unknown Quality	Seventeen (17) fill samples from across the Site including a field duplicate (DUP-1) of BH19-04 SA2 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and 19-06) from well screens in the fill layer were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs and metals in total of nine fill samples (including DUP-1). Also, exceedance of PHC F1 to F3 in BH15-2 SA3A. No exceedances in any groundwater samples.
#10	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as a field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (MW15-1 and 19-06) as well as field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#11	PCA 10: Commercial Autobody Shop	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as a field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-1 and 19-06) as well as a field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#12	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-3 SA2, BH15-3 SA2A, BH15-3 SA3, BH19-09 SA1 and BH19-09 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-3 and 19-09C) as well as a field duplicate of MW19-09C (DUP-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs in BH15-3 SA2 (fill). No exceedances in any groundwater samples.
#13	PCA 8: Chemical Manufacturing, Processing, and Bulk Storage	Two soil samples (BH19-102 SA1 and BH19-102 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-102) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloride exceedance in the groundwater sample likely from salt application on-Site and adjacent roadway (Albert Street).

The results for soil and groundwater samples, analyzed along with exceedances over the applicable site condition standards (MECP Table 3), are presented in tables 5 and 6 respectively following the text of this report.

5.5 Sediment Quality

Sediment was not present at the Phase Two Property; therefore, no sediment samples were collected as part of this investigation.

5.6 Quality Assurance and Quality Control Results

The data collected as part of this Phase Two ESA field program followed QA/QC protocol of Golder, discussed under section 4.12

5.6.1 Precision

Precision is a measurement of the repeatability of the methods employed, i.e., sampling methods. Precision is evaluated through the testing of blind field duplicate samples. As such, Golder implemented the following laboratory analytical quality control measures:

- Collection of duplicate soil and groundwater samples for analyses of PHC F1 to F4, BTEX, VOCs, PAHs, metals, inorganics and/or PCBS as described in the table below:

Location		Original sample ID	Field duplicate ID	Parameters analyzed
On Site	Soil	BH19-02 SA7	DUP-3	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs
	Soil	BH19-04 SA2	DUP-1	
	Soil	BH19-06 SA5	DUP-2	
	Groundwater	MW15-1	DUP15-1	PHCs, VOCs, PAHs, Metals, and Inorganics
		19-9C	DUP-1	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs

To determine the precision of the duplicate and original sample results, the relative percent difference (RPD) was calculated according to the following equation:

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

Where, x_1 and x_2 are the original and duplicate concentrations. RPDs are calculated only if the concentrations of a parameter are greater than the analytical reportable detection limit (RDL) in both the duplicate and original samples. In addition, lower precision in the RPD calculation is expected when concentrations of the analytes are less than ten (10) times the RDL. Therefore, RPDs were calculated for the original and duplicate soil samples only in cases where the measured concentrations of analytes in both samples were ten (10) times greater than the RDL.

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

Soil RPD

RPDs could be calculated for PHCs, PAHs, metals, and PCBs, EC and SAR; however, RPDs could not be calculated for VOCs given that VOC parameter concentrations were not greater than ten (10) times than the RDL. All RPD values for soil samples above the acceptable range are shown in the table below.

Soil Sample & Duplicate	Parameter in Groundwater	RPD (%)
19-06 SA5 and DUP-2	PHC-F2	160.7
	PHC-F2	131.6
BH19-04 SA2 and DUP-1	Benzo[a]anthracene	64.9
	Benzo[a]pyrene	58.5
	Benzo[b]fluoranthene	73.9
	Chrysene	58.8
	Dibenzo[a,h]anthracene	71.9
	Phenanthrene	58.8
	Pyrene	71.9
	Barium	67,4
	Copper	99.6
	PCBs	153.5

Parameters which exceeded reasonable RPD limits in one duplicate (such as PHCs in DUP-2 only as well as PAHs and Metals in DUP-1 only), were adequately within the RPD limits in the other two duplicate samples. As such, RPDs beyond the reasonable limit is not consistent for any specific parameter group in more than one duplicate sample. In addition, a small amount of material (collected from the soil samples submitted) was used to run the analyses in the laboratory and the heterogeneous nature of the soil from the fill layer may have contributed to variability in the lab results between the same and the duplicate. Hence, the integrity of the analytical methods is considered generally acceptable in Golder's opinion. Furthermore, the higher concentration of the two results between the original and field duplicate samples was considered as a conservative approach for this Phase Two ESA.

Groundwater RPD

RPDs could not be calculated for PHCs, BTEX, VOCs, PAHs, metals and inorganics given that concentrations for same parameter associated with original and duplicate groundwater samples were not ten (10) times greater than the RDL.

The quality of the analytical results is further supported by Paracel's internal quality assurance program that includes laboratory blanks, spikes, surrogates and duplicate samples.

A certificate of analysis or analytical report has been received for each sample submitted for analysis and is provided in Appendix B. All certificates of analysis or analytical reports received pursuant to clause 47(2)(b) of O. Reg. 153/04 comply with subsection 47(3). The analytical laboratory did not qualify any of the analytical results.

Accordingly, the analytical data generated during the investigation are valid and representative and may be used in this Phase Two ESA without further qualification.

6.0 PHASE TWO ESA CONCEPTUAL SITE MODEL

Summary of Historical Site Use

The Site, located on the western portion of the Ottawa downtown area, was primarily developed with residential homes as well as some commercial/light industrial activities in the late-1870s. Use of the Site for various commercial and industrial activities included warehouses, office buildings and a mattress factory in the early 1900s; followed by a bottling factory, machine and brass works, and a auto service garage from the 1920s through to 1960s. Subsequently, the Site has been used as a parking until at least 2002 and remained vacant afterwards. Recent use of the Site, between 2014 and 2017, was as a construction staging area by the OLRT-C followed by parking area and stockpile storage area by the CSST contractors. The northern portion of the Site was occupied by temporary prefabricated buildings that contain telecommunication infrastructure.

6.1 Potentially Contaminating Activities (PCA) and Areas of Potential Environmental Concern (APEC)

The following table summarizes all the PCAs considered to have resulted in an APEC on the Phase Two Property. Figure 1 shows the locations of the identified APECs and their associated PCAs.

Phase Two ESA Findings with respect to the PCAs resulting in APECs to the Site.

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1: PCA ID #2 – Former paint shop	Eastern portion of the Site	PCA 39: Paints Manufacturing, Processing and Bulk Storage	Off-Site	VOCs, PAHs	Soil and Ground water
APEC 2: PCA ID #6 – Former "City Iron & Bottle Co."	Northwestern portion of the Site	PCA 29: Glass Manufacturing PCA 32: Iron and Steel Manufacturing and Processing PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 3: PCA ID #7 – Former "Machine and Brass Works".	Northwestern portion of the Site	PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 4: PCA ID #11 – Former metal castings and moulding shop.	Northeastern portion of the Site	PCA 33: Metal Treatment, Coating, Plating, and Finishing	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 5: PCA ID #28 – Registered Federal Contaminated Sites, that include the Site and surrounding areas.	Entire Site	N/A	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 6: PCA ID #12 – Former automotive garage and repairs, with a UST.	Northeastern portion of the Site	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	PHCs, VOCs	Ground water
APEC 7: PCA ID #13 – Former National Brake & Clutch Service, automotive garage with USTs.	Southern portion of the Site	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs, VOCs	Soil and Ground water
APEC 8: PCA ID #18 – Former welding company and automotive service station.	Northern portion of the Site	PCA 10: Commercial Autobody Shop PCA 34: Metal Fabrication	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water
APEC 9: PCA ID #20 – Presence of fill containing waste with metals, polycyclic aromatic hydrocarbon (“PAH”) and petroleum hydrocarbon (“PHC”) impacts across the Site.	Entire Site	PCA 30: Importation of Fill of Unknown Quality	On-Site	PHCs, VOCs, PAHs, Metals	Soil and Ground water

Areas of Potential Environmental Concern (APECs)	Location of APEC at the Site	Potentially Contaminating Activity (PCA)	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 10: PCA ID #21 – Documented spill of 900L of furnace oil.	Northeastern portion of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	PHCs, VOCs	Soil and Ground water
APEC 11: PCA ID #24 – Former gas pump and auto repair garage.	Northeastern portion of the Site	PCA 10: Commercial Autobody Shop	Off-Site	PHCs, VOCs	Soil and Ground water
APEC 12: PCA ID #31 – Multiple oil ASTs located on Site.	Southern portion of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs, VOCs	Soil and Ground water
APEC 13: PCA ID #32 – Various storage drums and/or ASTs for chemicals stored on Site.	Eastern portion of Site	PCA 8: Chemical Manufacturing, Processing, and Bulk Storage	On-Site	PHCs, VOCs, PAHs	Soil and Ground water

Subsurface Structure and Utilities

The Site and surrounding area are serviced with municipal water, sanitary and/or storm connections; however, presence of natural gas could not be confirmed. The utility lines present connect to the Phase Two Property building below ground from the adjacent roadways. Also, the existing CSST tunnel crosses beneath the proposed development area for Ottawa Central Library. Although detailed information regarding the location of CSST was not available, it is also understood that there is limited rock cover over the CSST at this site location and that it is installed by tunneling (i.e. not open cut). Furthermore, the existing OLRT right-of-way is located off-Site to the northwest of the proposed development.

6.2 Physical Settings

The Property Two Property, addressed as 555 Albert Street, is an irregular shaped parcel of land bordered by Commissioner Street to the northeast, Albert Street to the southeast, the former Wellington Street road allowance to the northwest, and the west border of the Site is located adjacent to the OLRT rail corridor. The Site covers an area of approximately 0.95 hectares that is currently undeveloped land, formerly used as a construction staging area by the OLRT-C, except for the northern portion of the Site that is occupied by a temporary prefabricated building for telecommunication infrastructure. The surrounding properties include residential and commercial buildings with some community land uses.

- **West**: A tunnel and construction area associated with CSST was located adjacent to the west of the Site followed by large transformer panel associated with LRT tunnel infrastructure. LRT spur lines appear at surface further away of the Site.
- **North**: Bounded by Commissioner Street followed by a large residential apartment building to the northeast. A green space occupies the majority of the lands further away from the Site including a church, some residential apartments and office buildings. Northwest of the Site consists of OLRT tunnels below grade followed by a vegetated slope towards an open aqueduct. Also, a pumping station was observed northwest of the Site followed by a large residential apartment complex.
- **South**: Unpaved driveway (former Brickhill road allowance) off Albert Street adjacent to the Site followed by construction area for CSST consisting of temporary office buildings and construction equipment storage yard. Further away from the Site, vacant lands and residential homes located north and south of Albert Street respectively.
- **East**:Bounded by Albert Street followed by undeveloped green space, followed by Slater Street. Land uses further away from the Site consist of residential and institutional properties.

Environmentally Sensitive Areas

There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41 of O.Reg.153/04. Based on the data obtained from previous reports, soil pH ranged from 7.70 to 7.85, meeting the requirement that the pH of surface soil is 5≤pH≤9 and the pH of sub-surface soil is 5≤pH≤11. Accordingly, Section 41 of the Regulation does not apply to the Phase Two Property.

Shallow Soil Property or Water Body

Based on review of the available borehole logs for the Site, the subsurface stratigraphy at the Site consists of fill layer underlain by glacial till followed by limestone bedrock. The fill layer extends up to 3.96 mbgs and is underlain by glacial till extending to maximum depths of 14.02 mbgs. Bedrock was inferred to have been encountered in one borehole location at a depth of 14.02 mbgs, based on rock cuttings. According to O.Reg.153/04 as amended, “shallow soil property” means a property of which 1/3 or more of the area consists of soil equal to or less than 2 metres in depth beneath the soil surface, excluding any non-soil surface treatment such as asphalt, concrete or aggregate. As such, the Site is not considered a shallow soil property.

Potable Water Wells

No potable wells are located within the Site. Several water well records (for domestic water supply) were available within 250 m of the Site; however, due to the availability of the municipal water service in the area, it is unlikely that these potable wells remain in service.

6.2.1 Geological Conditions

The soil conditions encountered during drilling program are presented in the Record of Borehole sheets (included in Appendix A of this report), as well as in the cross sections presented in Figures 15 and 38.

The subsurface stratigraphy at the Site generally consisted of a layer of fill overlying native glacial till overlying bedrock. The fill layer, extending to depths of between about 1.4 and 3.7 mbgs, at the Site is heterogeneous in nature and consists of gravelly sand, to gravelly silty sand, to silty sand, to sand and gravel, to sand, and contains brick fragments, concrete fragments, pockets of silty clay, ash, and cobbles and boulders.. A deposit of glacial till was encountered beneath the fill material at all of the boreholes.

The glacial till typically consists of a heterogeneous mixture of gravel, cobbles, and boulders in a matrix of sand and silt with a trace to some clay. At some locations, the till consists of clayey sand containing gravel, cobbles and boulders. The glacial till was not fully penetrated in the current investigation but was proven to depths of between about 2.9 and 8.2 m below the existing ground surface.

Bedrock was not encountered in any of the boreholes advanced in 2019; however, BH15-3 (completed as part of 2015 Phase II ESA) encountered inferred bedrock (limestone) from 14.02 mbgs to the end of the borehole at 14.48 mbgs.

6.2.2 Hydrogeological Characteristics

Groundwater Levels and Flow Directions

As part of a previous environmental investigation at the Site in 2015, static groundwater levels were measured from three monitoring wells (MW15-1 to MW15-3) between 4.54 and 5.53 mbgs. Eight of the eleven boreholes (19-01, 19-02, 19-03, 19-05, 19-06, 19-08, 19-09C, and 19-102) from the 2019 drilling were completed with monitoring wells and static groundwater levels in these wells were measured on December 10, 2019. The water levels in these eight wells were between 2.10 and 5.75 mbgs and the ensuing groundwater flow was inferred to be towards the northwest . This was in line with the groundwater flow directions noted during the 2015 investigation. Seasonal fluctuations in water levels on the Site are anticipated.

Horizontal and Vertical Hydraulic Gradients

The average horizontal hydraulic gradient was calculated based on the water level contours presented in Figure 2. The horizontal hydraulic gradient for shallow groundwater conditions was calculated to be approximately 0.06 m/m. Variability in hydraulic gradients may be present at the Phase Two property related to the presence of foundations/buried structure, bedding materials, and buried services at the Site.

The vertical hydraulic gradient could not be estimated given no monitoring well pairs (shallow and deeper) were present at the Site.

Groundwater Hydraulic Conductivity

Groundwater flow velocity was determined based on the hydraulic conductivity of 1.0×10^{-7} m/s and porosity of 37% for silty sand (*source: https://structx.com/Soil_Properties_006.html*) , and the horizontal gradient. The groundwater flow velocity within silty sand was calculated to be 1.62×10^{-8} m/s. Note that actual groundwater velocity may vary significantly not only because of variability of the hydraulic gradient, but also because of variability of the hydraulic conductivity within the silty sand.

6.2.3 Proposed Buildings and Structures

Future use of the Site is understood to consist of a multi-storey library and archives building- the Ottawa Central Library. This building will occupy most of the Phase Two Property and is expected to include subsurface parking structures requiring at least two basement levels to approximately 6 metres below ground surface (mbgs). As such, the fill layer is expected to be primarily removed as part of the construction excavation for the underground parking.

6.3 Findings of the Phase Two ESA with respect to the APECs

To address the APECs and PCAs identified at the Site, soil and groundwater sampling and analysis for potential COCs were completed. MECP Table 3 Standards (April 15, 2011) for industrial/commercial/community property use for coarse-textured soil in a non-potable groundwater condition were used to compare the soil and groundwater analytical results. A summary of the findings from the Phase Two ESA with respect to the APECs and associated PCAs with respect to the Site is provided in the table below. Exceedances are shown in plan view on Figures 3-14 and on the sections on Figures 15-38.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#1	PCA 39: Paints Manufacturing, Processing and Bulk Storage	Four soil samples (BH19-04 SA2, BH19-04 SA4, BH19-102 SA1 and BH19-102 SA4) as well as a field duplicate of BH19-04 SA2 (DUP-1) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-102) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloride exceedance in the groundwater sample likely from salt application on-Site and adjacent roadway (Albert Street).
#2	PCA 29: Glass Manufacturing PCA 32: Iron and Steel Manufacturing and Processing PCA 33: Metal Treatment, Coating, Plating, and Finishing	Six soil samples (BH15-2 SA2, BH15-2 SA3A, BH15-2 SA4, BH15-2 SA6, BH19-01 SA3 and BH19-01SA7) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and MW15-2) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of PHC F1 to F3) and PAH in BH15-2 SA3A (fill). No exceedances in any groundwater samples.
#3	PCA 33: Metal Treatment, Coating, Plating, and Finishing	Two soil samples (BH19-101 SA1 and BH19-101 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-05) from down-gradient of the APEC location was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloroform exceedance in groundwater sample.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#4	PCA 33: Metal Treatment, Coating, Plating, and Finishing	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-1 and 19-06) as well as a field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#5	Registered Federal Contaminated Sites, that include the Site and surrounding areas.	Seventeen (17) fill samples from across the Site including a field duplicate (DUP-1) of BH19-04 SA2 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and 19-06) from wells screen in the fill layer were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs and metals in total of nine fill samples (including DUP-1). Also, exceedance of PHC F1 to F3 in BH15-2 SA3A. No exceedances in any groundwater samples.
#6	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (MW15-1 and 19-06) as well as field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#7	PCA 10: Commercial Autobody Shop PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Two soil samples (BH19-08 SA3 and BH19-08 SA9) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-08) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	Exceedance of several PAHs, several metals and EC in fill sample (SA3) and exceedance of metal (Vanadium) in SA9. No exceedances in groundwater sample.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#8	PCA 10: Commercial Autobody Shop PCA 34: Metal Fabrication	Four soil samples (BH19-02 SA1, BH19-02 SA7, BH19-02 SA8, BH19-07 SA1) as well as a field duplicate (DUP-3) of BH19-02 SA7 was analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-02) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	Exceedance of barium in fill sample (BH19-07 SA1). Also, exceedance of PAH in the field duplicate sample from till layer. No exceedances in groundwater sample.
#9	PCA 30: Importation of Fill of Unknown Quality	Seventeen (17) fill samples from across the Site including a field duplicate (DUP-1) of BH19-04 SA2 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (19-01 and 19-06) from well screens in the fill layer were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs and metals in total of nine fill samples (including DUP-1). Also, exceedance of PHC F1 to F3 in BH15-2 SA3A. No exceedances in any groundwater samples.
#10	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as a field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs. Two groundwater samples (MW15-1 and 19-06) as well as field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.
#11	PCA 10: Commercial Autobody Shop	Five soil samples (BH15-1 SA1, BH15-1 SA3, BH15-1 SA3A, BH19-06 SA3 and BH19-06 SA5) as well as a field duplicate (DUP-2) of BH19-06 SA5 were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-1 and 19-06) as well as a field duplicate of MW15-1 (DUP15-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of lead and various PAHs in BH15-1 SA1 (fill). Sodium exceedances in MW15-1 and DUP15-1, likely associated with salt application at the Site.

APEC	PCA	Summary of Phase Two ESA Program	Summary of Exceedances
#12	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks	Five soil samples (BH15-3 SA2, BH15-3 SA2A, BH15-3 SA3, BH19-09 SA1 and BH19-09 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. Two groundwater samples (MW15-3 and 19-09C) as well as a field duplicate of MW19-09C (DUP-1) were analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and/or PCBs.	Exceedances of various PAHs in BH15-3 SA2 (fill). No exceedances in any groundwater samples.
#13	PCA 8: Chemical Manufacturing, Processing, and Bulk Storage	Two soil samples (BH19-102 SA1 and BH19-102 SA4) were analyzed for PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs. A groundwater sample (19-102) was analyzed for PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs.	No exceedances in any of the soil samples. Chloride exceedance in the groundwater sample likely from salt application on-Site and adjacent roadway (Albert Street).

6.4 Summary of Current Site Condition

The summary of the soil and groundwater conditions at the Site based on the results of this Phase Two ESA, by stratigraphic layer and media, is presented below:

- **Fill –** The fill layer at the Site is generally characterized as silty sand to sand and gravelly sand, which extended to 3.96 mbgs. Brick, ash, concrete fragments and wood were identified in portions of the fill layer. A total of seventeen (17) fill samples, collected as part the 2015 and 2019 field investigations, from across the Site were analyzed for PHCs, PAHs, VOCs, metals and inorganics, and/or PCBs. Discussion of the analytical results when compared against MECP Table 3 standards are discussed below by parameter groups.
  - PHCs and BTEX: Concentrations of BTEX and PHC exceeding the applicable MECP Table 3 standards were not detected in any of the fill samples except for BH15-2 SA3A. This sample had concentrations of PHC F1, F2 and F3 above the applicable MECP Table 3 standards.
  - VOCs: Concentrations of VOCs exceeding the applicable MECP Table 3 standards were not detected in any of the fill samples.
  - PAHs: Concentrations of PAHs exceeding the applicable MECP Table 3 standards were detected in the fill layer at six borehole locations across the Site, including acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene.

- Metals: Concentrations of metals exceeding the applicable MECP Table 3 standards were detected in the fill samples from five borehole locations across the Site, including arsenic, barium, cadmium, copper, lead, vanadium and zinc.
- Inorganics: Concentrations of inorganic parameters including SAR, EC and pH exceeding the applicable MECP Table 3 standards were not detected in the fill samples except for BH19-08 SA3. This sample had EC concentrations above the applicable MECP Table 3 standard.
- PCBs: Concentrations of PCBs exceeding the applicable MECP Table 3 standards were not detected in any of the fill samples from 2019 (no samples collected in 2015 were analyzed for PCBs).

- **Glacial Till (native soil)-** The native material at the Site consisted generally of silty sand to sandy silt with some gravel (glacial till) to a maximum depth of 12.95 mbgs underlain by cobbles and boulders (glacial till) to 14.0 mbgs. A total of eighteen (18) native soil samples, collected as part the 2015 and 2019 field investigations, from across the Site were analyzed for PHCs, PAHs, VOCs, metals, inorganics, and/or PCBs. Discussion of the analytical results when compared against MECP Table 3 standards are discussed below by parameter groups.
  - PHCs and BTEX: Concentrations of PHC and BTEX exceeding the applicable MECP Table 3 standards were not detected in any of the native soil samples.
  - VOCs: Concentrations of VOCs exceeding the applicable MECP Table 3 standards were not detected in any of the native soil samples.
  - PAHs: One glacial till sample (field duplicate collected from 4.57 to 5.18 mbgs at BH19-02) had a concentration of benzo[a]pyrene exceeding the applicable MECP Table 3 standard. PAH concentrations in a deeper sample (BH19-02 SA8) collected from 5.33 to 5.94 mbgs were less than the analytical detection limits, providing vertical delineation of the identified impacts.
  - Metals: Concentrations of metals exceeding the applicable MECP Table 3 standards were not detected except in two native soil samples from 19-05 (3.81 - 4.42 mbgs) and 19-08 (6.10 - 6.71 mbgs). Concentrations of vanadium in each of these samples exceeded the applicable MECP Table 3 standard.
  - Inorganics: Concentrations of inorganic parameters including SAR, EC and pH exceeding the applicable MECP Table 3 standards were not detected in any of the native samples.
  - PCBs: Concentrations of PCB exceeding the applicable MECP Table 3 standards were not detected in any of the native soil samples from 2019 (no samples collected in 2015 were analyzed for PCBs).
- **Groundwater-** The groundwater quality assessment at the Site consisted of groundwater sampling events in 2015 and 2019; however, the monitoring wells completed in 2015 could not resampled in 2019 due to access issues and frozen ground conditions. All groundwater samples in 2015 and 2019 were analyzed for PHCs, VOCs, PAHs, metals and inorganics, whereas PCB was analyzed for samples collected in 2019 only.
  - PHCs and BTEX: Concentrations of PHC and BTEX exceeding the applicable MECP Table 3 standards were not detected in the groundwater samples collected in 2015 and 2019.
  - VOCs: Concentrations of VOC exceeding the applicable MECP Table 3 standards were not detected except for chloroform in groundwater samples 19-3 and 19-102.

- PAHs: Concentrations of PAHs exceeding the applicable MECP Table 3 standards were not detected except in the groundwater sample from 19-3. This sample had concentrations of benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, indeno[1,2,3-cd]pyrene above the applicable MECP Table 3 standards
- Metals: Concentrations of metals exceeding the applicable MECP Table 3 standards were not detected except for sodium in the sample from MW15-1 and its field duplicate DUP15-1 (collected during a groundwater sampling event in 2015).
- Inorganics: Concentrations of inorganic parameters including chloride and pH exceeding the applicable MECP Table 3 standards were not detected except for chloride in the samples from 19-102.

The extent of current fill materials identified based on borehole logs from the drilling program, at the Site are presented as cross-sections in Figure 15 to 38. All samples analyzed are presented in these figures with details of exceedances above the applicable MECP Table 3 standards.

A sample of native soil from BH19-02 had an exceedance of PAH down to 5.18 mbgs. Vertical delineation was achieved with the subsequent deeper sample (collected from 5.33 to 5.94 mbgs) and this PAH exceedance is assumed to be localized, possibly resulting from reworked fill materials in the native layer. Furthermore, exceedances of vanadium in the glacial till layer at two locations may be associated with naturally occurring elevated concentrations commonly found in the Ottawa and surrounding areas and/or reworked fill materials with the upper glacial till layer.

The groundwater sample from monitoring well 19-3 exceeds applicable standards for several PAHs; however, no similar exceedances were observed in other wells in the vicinity (up or down-gradient locations) of this well. The presence of suspended particles/sediment in the groundwater sample may have contributed to this exceedance, given sufficient purging could not be accomplished due to insufficient well recharge (as indicated in the field notes from groundwater sampling event).

Exceedances of chloroform above the MECP Table 3 standards in two monitoring well locations is speculated to have resulted from possible leaks from municipal water source (i.e. watermain or sewer) and/or leftover drilling/coring water. As such, this is not considered a COC associated with any of the APECs for the Site. Other exceedances of the MECP Table 3 standards include sodium and chloride concentrations in one groundwater sample each from 2015 and 2019 respectively which is inferred to be related to the application of salt on the Site and surrounding roadways. Based on recent changes in the regulation, exceedances resulting from salt application for the safety of vehicular or pedestrian traffic under conditions of snow or ice is not considered an exceedance of applicable site condition standards.

6.5 Meteorological and Climatic Considerations

Seasonal fluctuations in groundwater levels are expected at the Site. Given the limited number of monitoring events seasonal trends could not be identified; however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter. Based on the information obtained from the static groundwater level measurement in 2019, the depth to the water table is between 2.10 and 5.75 mbgs and was located primarily in the silty sand glacial till layer. Although monitoring wells completed in 2015 could not be accessed for groundwater level measurements in 2019, the groundwater elevations (between 4.54 and 5.53 mbgs) in 2015 were found to be consistent with 2019 groundwater elevations.

6.6 Potential Exposure Pathways and Receptor

Golder understands that the fill material at the Site is expected to be excavated as part of the construction activities for the Ottawa Central Library and that excavation for the proposed underground parking structure for the Ottawa Central Library will extend to approximately 6 mbgs. As such, with the fill layer removed, remaining soil exceedances at the Site will include vanadium in the glacial till layer, inferred to be resulting from naturally occurring elevated concentrations common to Ottawa and surrounding areas. Groundwater impacts from PAHs appear to be localised and do not extend off-Site, given other groundwater samples (from up- and down-gradient location of this location) did not indicate PAH impacts. In addition, groundwater is not used as a potable source at the Site or surrounding area. As such, impacts to aquatic receptors via the groundwater to surface water pathway is not expected to be a complete exposure pathway, although the closest waterbody is approximately 35 m from the Site in a down-gradient location.

Given that the future use of the Site will include a building and paved parking, complete exposure pathways or applicable receptors are not expected at the Site. However, potential exposure pathways at the time of Site re-development need to be considered for workers involved with excavation and construction related activities at the Site. As such, risk management measures for the protection of human health (of construction workers) during excavation and construction activities may be required including health and safety procedures to block potential exposure pathways.

6.7 Contaminant Release and Migration Mechanism

Based on the information obtained during this Phase Two ESA, the fill layer across the entire Site is impacted with PAHs and/or metals likely from combination of imported fill used at the Site and historical commercial/industrial activities. However, these contaminants (PAHs and metals) in soil are generally considered to be of low migration potential given groundwater at the Site is located in the glacial till. In addition, fill materials from the Site are expected to be removed as part of proposed construction activities minimising the potential for future contaminant migration.

Impacts identified to the soil and groundwater quality from historical and on-going salt-application, on-Site and from adjacent roadways north (Commissioner Street) and southeast (Albert Street), are not considered exceedances of applicable site condition standards based on recently updated guidelines which exempts salt related exceedances if the salt is applied for safety of vehicular and pedestrian traffic under conditions of snow or ice. On-going contribution from the Site activities and surrounding roadways may continue to add salt to the Site soils and regional groundwater.

6.8 Soil Vapour Intrusion

Given that majority of the fill materials will be removed as part of the proposed construction activity, exceedances remaining at the Site will consist of PAHs and metals in soil as well as PAHs, EC, and SAR in groundwater. However, these parameters are not expected to present a vapour intrusion concern for future buildings at the Site.

7.0 CONCLUSIONS

A Phase Two ESA was carried out at the Site in general accordance with O.Reg. 153/04 to address and further investigate impacts in soil and/or groundwater associated with APECs identified in the Phase One ESA recently completed for the Site. These APECs were evaluated using information from soil and groundwater quality information obtained during this subsurface investigation (between November and December 2019) as well as soil and groundwater data from a 2015 subsurface investigation completed at the Site.

Based on the findings of this investigation, the fill material across the Site is inferred to be impacted with PHC, PAH and/or metals at concentrations above the applicable site condition standards. Future use of the Site is understood to consist of a multi-storey library and archives building- the Ottawa Central Library. This building will occupy most of the Phase Two Property and is expected to include subsurface parking structures requiring at least two basement levels to approximately 6 metres below ground surface (mbgs). As such, the fill layer is expected to be primarily removed as part of the construction excavation for the underground parking. Localized exceedance of PAHs in soil and groundwater at the Site have been delineated and can likely be managed as part of the construction process as well.

On December 4, 2019, MECP released O.Reg. 406/19, *On-Site and Excess Soil Management*, which imposes new requirements on both generators and receivers of excess soil, outlines a defined process for assessing excess soil, and provides new standards for the assessment of excess soil quality. The implementation dates for various sections of O.Reg. 406/19 are staggered over the next five years; the first provisions (including the excess soil standards) come into effect on July 1, 2020. Please note that the assessment provided herein was not intended to comply with O.Reg. 406/19; should excess soil management be anticipated to occur later than July 1, 2020, these findings should be re-evaluated in that context. Additional site assessment and/or sampling and analysis activities may be required.

8.0 LIMITATIONS

This report was prepared for the exclusive use of the City of Ottawa. The report, which specifically includes all tables, figures and appendices, is based on data and information, collected during conducting the Phase Two ESA, and is based solely on the conditions of the property at the time of conducting investigations, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

The assessment of environmental conditions at this Site has been made using the results of field screening techniques and chemical analysis of soil and groundwater samples at a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at the sampling locations. Conditions may vary from these sample locations. Additional study, including further investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a Site may be contaminated and remain undetected. The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party (other than as noted above) as a result of decisions made or actions based on this report.

The content of this report is based on information collected during the drilling, soil and groundwater sampling activities, our present understanding of the Site conditions, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report.
This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

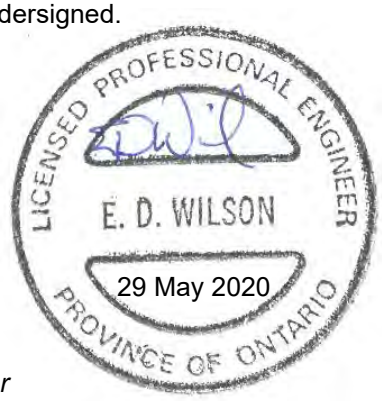
The monitoring wells installed as part of this project have been constructed using licensed drilling/well contractors employing licensed well technicians. It is owner's responsibility to have a licensed well technician properly abandon all monitoring wells, if required.

9.0 SIGNATURE

The undersigned Qualified Person confirms that he was responsible for conducting and/or supervising this Phase Two ESA and the associated findings and conclusions.

We trust that you will find the contents of this report satisfactory for your current needs. Should you require clarification of the information provided, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.



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https://golderassociates.sharepoint.com/sites/107028/project files/6 deliverables/phase ii esa/final/19120705_ph ii esa_central library-rev0.docx

Tables

Monitoring Well ID	Ground Surface Elevation (mASL)	Top of Pipe Elevation (mASL)	Borehole Depth (mbgs)	Borehole Depth (masl)	Screen Interval (masl)	Screened Media	Date of well Completion
MW15-1	62.18	62.08	9.75	52.43	52.53 - 54.05	Silty Sand (Till)	28-Feb-15
MW15-2	61.84	61.74	8.53	53.31	53.61 - 55.13	Silty Sand (Till)	28-Feb-15
MW15-3	62.82	62.72	14.48	48.34	55.81 - 58.86	Silty Sand (Till)	01-Mar-15
19-01*	60.99	61.70	5.33	55.66	55.66 - 58.70	Silty Sand and Gravel (Fill) and Silty Sand (Till)	28-Nov-19
19-02	63.63	63.52	6.23	57.4	57.38 - 60.43	Silty Sand (Till)	28-Nov-19
19-03	62.58	62.49	7.01	55.57	55.57 - 58.62	Silty Sand (Till)	26-Nov-19
19-05	61.71	61.62	6.99	54.72	54.88 - 57.92	Silty Sand (Till)	02-Dec-19
19-06*	64.38	65.23	3.60	60.78	60.77 - 62.30	Silty Sand and Gravel (Fill)	21-Nov-19
19-07*	61.11	62.12	2.44	58.67	58.67 - 60.20	Silty Sand (Till)	02-Dec-19
19-08*	61.38	62.27	7.47	53.91	53.91 - 56.96	Silty Sand (Till)	03-Dec-19
19-09	62.62	62.53	2.97	59.65	59.65 - 61.17	Silty Sand and Gravel (Fill) and Silty Sand (Till)	20-Nov-19
19-09C	62.66	62.63	7.01	55.65	55.65 - 58.70	Silty Sand (Till)	27-Nov-19
19-102	62.69	62.61	8.15	54.54	54.54 - 57.58	Silty Sand (Till)	21-Nov-19

Notes:
mASL- metres above sea level
mbgs-metres below ground surface

Monitoring Well	Top of Pipe Elevation (mASL)	Ground Surface Elevation (mASL)	Depth to Groundwater (mbTOP)	Depth to Groundwater (mbgs)	Groundwater Elevation (mASL)	Date of Measurement
MW15-1[(a)]	62.08	62.18	4.435	4.54	57.65	09-Mar-15
MW15-2[(a)]	61.74	61.84	5.425	5.53	56.32	09-Mar-15
MW15-3[(a)]	62.72	62.82	4.775	4.88	57.95	09-Mar-15
19-1*	61.70	60.99	3.30	2.59	58.40	10-Dec-19
19-2	63.52	63.63	3.36	3.25	60.16	10-Dec-19
19-3	62.49	62.58	5.66	5.57	56.83	10-Dec-19
19-5	61.62	61.71	5.17	5.08	56.45	10-Dec-19
19-6*	65.23	64.38	3.16	2.31	62.07	10-Dec-19
19-7*	62.12	61.11	n/a**	n/a	n/a	10-Dec-19
19-8*	62.27	61.38	5.52	4.63	56.75	10-Dec-19
19-9	62.53	62.62	n/a	n/a	n/a	10-Dec-19
19-9C(b)	62.63	62.66	4.50	4.47	58.13	10-Dec-19
19-102	62.61	62.69	4.25	4.17	58.36	10-Dec-19

* indicates wells completed with stick up monument casings
** 19-7 was observed to be effectively dry.
mbgs- metres below ground surface
mASL- metres above sea level
n/a - water levels not measured
No evidence of free product was observed during any elevation or sampling events.
(a) Ground surface elevations were measured using a Trimble GPS prior to completion of the 2015 monitoring wells.
(b) 19-09C was completed on November 27, 2019, given 19-09 was dry.

Location	Soil Samples Collected	Soil Samples Analyzed	Paramaters Analyzed	MECP Table 3 Exceedances [(1)]
BH15-1	BH15-1 SA1, BH15-1 SA2, BH15-1 SA3, BH15-1 SA3A, BH15-1 SA4, BH15-1 SA5, BH15-1 SA6	BH15-1 SA1 (0.91 - 1.52), BH15-1 SA3 (3.05 - 3.20), BH15-1 SA3A (3.20 - 4.57)	PHCs, PAHs, VOCs, and Metals	**SA1 for Lead; PAHs (Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenzo[a,h]anthracene, Indeno[1,2,3-cd]pyrene)**
BH15-2	BH15-2 SA1, BH15-2 SA2, BH15-2 SA3, BH15-2 SA3A, BH15-2 SA4, BH15-2 SA4A, BH15-2 SA5, BH15-2 SA5A, BH15-2 SA6	BH15-2 SA2 (1.52 - 3.05), BH15-2 SA3A (3.66 - 3.81), BH15-2 SA4 (3.96 - 4.71), BH15-2 SA6 (7.01 - 8.53)	PHCs, PAHs, VOCs, and Metals	**SA 3A for PHCs (F1, F2 and F3); PAHs (Benzo[a]pyrene)**
BH15-3	BH15-3 SA1, BH15-3 SA2, BH15-3 SA2A, BH15-3 SA3, BH15-3 SA3A, BH15-3 SA4, BH15-3 SA4A, BH15-3 SA5, BH15-3 SA5A, BH15-3 SA6, BH15-3 SA7, BH15-3 SA8	BH15-3 SA2 (1.52 - 2.51), BH15-3 SA2A (2.51 - 3.05), BH15-3 SA3 (3.05 - 3.75)	PHCs, PAHs, VOCs, and Metals	**SA2 for PAHs (Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenzo[a,h]anthracene)**
BH19-01	BH19-01 SA1, BH19-01 SA2, BH19-01 SA3, BH19-01 SA4, BH19-01 SA5, BH19-01 SA6, BH19-01 SA7	BH19-01 SA3 (1.52 - 2.29), BH19-01 SA7 (4.57 - 5.18)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	None
BH19-02	BH19-02 SA1, BH19-02 SA2, BH19-02 SA3, BH19-02 SA4, BH19-02 SA5, BH19-02 SA6, BH19-02 SA7, BH19-02 SA8, BH19-02 SA9	BH19-02 SA1 (0 - 0.60), BH19-02 SA7 (4.57 - 5.18), BH19-02 SA8 (5.33 - 5.94), DUP-3 (field duplicate of BH19-02 SA7)	PHCs, PAHs, VOCs, Metals and Inorganics, and/or PCBs	**DUP-3 for PAH (Benzo[a]pyrene)**
BH 19-03	BH19-03 SA1, BH19-03 SA2, BH19-03 SA3, BH19-03 SA4, BH19-03 SA5, BH19-03 SA6, BH19-03 SA7, BH19-03 SA8, BH19-03 SA9, BH19-03 SA10, BH19-03 SA11, BH19-03 SA12, BH19-03 S13	BH19-03 SA2 (0.76 - 1.37), BH19-03 SA7 (3.66 - 4.11)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	**SA2 for PAHs (Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene); Metals (Lead)**
BH19-04	BH19-04 SA1, BH19-04 SA2, BH19-04 SA3, BH19-04 SA4, BH19-04 SA5, BH19-04 SA6	BH19-04 SA2 (0.76 - 1.37), BH19-04 SA4 (2.28 - 2.89), DUP-1 (field duplicate of BH19-04 SA2)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	**SA2 for PAHs (Acenaphthylene, Benzo[a]pyrene); Metals (Barium, Lead, Zinc)** **DUP-1 for Metals (Copper, Lead, Zinc)**
BH19-05	BH19-05 SA1, BH19-05 SA2, BH19-05 SA3, BH19-05 SA4, BH19-05 SA5, BH19-05 SA6, BH19-05 SA7, BH19-05 SA8, BH19-05 SA9, BH19-05 SA10	BH19-05 SA2 (0.76 - 1.37), BH19-05 SA6 (3.81 - 4.42)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	**SA2 for Metals (Lead, Vanadium);** **SA6 for Metals (Vanadium)**
BH 19-06	BH19-06 SA1, BH19-06 SA2, BH19-06 SA3, BH19-06 SA4, BH19-06 SA5	BH19-06 SA3 (1.52 - 2.13), BH19-06 SA5 (3.04 - 3.60), DUP-2 (field duplicate of BH19-06 SA5)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	None
BH19-07	BH19-07 SA1, BH19-07 SA2, BH19-07 SA3	BH19-07 SA1 (0 - 0.61)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	**SA1 for Barium**

Location	Soil Samples Collected	Soil Samples Analyzed	Paramaters Analyzed	MECP Table 3 Exceedances [1]
BH19-08	BH19-08 SA1, BH19-08 SA2, BH19-08 SA3, BH19-08 SA4, BH19-08 SA5, BH19-08 SA6, BH19-08 SA7, BH19-08 SA8, BH19-08 SA9, BH19-08 SA10	BH19-08 SA3 (1.52 - 2.13), BH19-08 SA9 (6.10 - 6.71)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	**SA3 for PAHs (Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Indeno[1,2,3-cd]pyrene); Metals (Arsenic, Barium, Cadmium, Lead, Vanadium, Zinc); EC** **SA9 for Metals (Vanadium)**
BH 19-09	BH19-09 SA1, BH19-09 SA2, BH19-09 SA3, BH19-09 SA4	BH19-09 SA1 (0 - 0.60), BH19-09 SA4 (2.28 - 2.89)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	None
BH19-101	BH19-101 SA1, BH19-101 SA2, BH19-101 SA3, BH19-101 SA4	BH19101 SA1 (0 - 0.60), BH19-101 SA4 (2.28 - 2.89)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	None
BH19-102	BH19-102 SA1, BH19-102 SA2, BH19-102 SA3, BH19-102 SA4, BH19-102 SA5, BH19-102 SA6, BH19-102 SA7, BH19-102 SA8, BH19-102 SA9, BH19-102 SA10, BH19-102 SA11	BH19-102 SA1 (0 - 0.60), BH19-102 SA4 (2.28 - 2.89)	PHCs, PAHs, VOCs, Metals and Inorganics, and PCBs	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

PHCs: Petroleum Hydrocabons (F1-F4)

VOCs: Volatile Organic Compounds

PAHs: Polycyclic Aromatic Hydrocarbons

EC: Electrical Conductivity

PCBs: Polychlorinated biphenyls

Monitoring Well ID	Screen Interval (masl)	Screened Media	Groundwater Samples Submitted for Analysis	Analytical Paramaters	MECP Table 3 Exceedances (1)
MW15-1(2)	52.53 - 54.05	Silty Sand (Till)	MW15-1, DUP15-1 (field duplicate of MW15-1)	PHCs, VOCs, PAHs, Metals and Inorganics	**MW15-1 and DUP15-1 for Sodium**
MW15-2(2)	53.61 - 55.13	Silty Sand (Till)	MW15-2	PHCs, VOCs, PAHs, Metals and Inorganics	None
MW15-3(2)	55.81 - 58.86	Silty Sand (Till)	MW15-3	PHCs, VOCs, PAHs, Metals and Inorganics	None
19-1	55.66 - 58.70	Silty Sand and Gravel (Fill) and Silty Sand (Till)	19-1	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	None
19-2	57.38 - 60.43	Silty Sand (Till)	19-2	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	None
19-3	55.57 - 58.62	Silty Sand (Till)	19-3	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	**VOCs (Chloroform); PAHs (Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Indeno[1,2,3-cd]pyrene)**
19-5	54.88 - 57.92	Silty Sand (Till)	19-5	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	**Chloroform**
19-6	60.77 - 62.30	Silty Sand and Gravel (Fill)	19-6	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	None
19-8	53.91 - 56.96	Silty Sand (Till)	19-8	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	None
19-9C	55.65 - 58.70	Silty Sand (Till)	19-9C, DUP-1 (field duplicate of 19-9C)	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	None
19-102	54.54 - 57.58	Silty Sand (Till)	19-102	PHCs, VOCs, PAHs, Metals, Inorganics, and PCBs	**Chloride**

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

(2) MW15-1, MW15-2 and MW15-3 were sampled on March 9, 2015 with a field duplicate collected from MW15-1.

PHCs: Petroleum Hydrocabons (F1-F4)

VOCs: Volatile Organic Compounds

PAHs: Polycyclic Aromatic Hydrocarbons

PCBs: Polychlorinated biphenyls

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) (1)	BH15-1			BH15-2				BH15-3	
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample ID			BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	BH15-3 SA2	BH15-3 SA2A
Soil Type			Fill	Fill	Glacial Till	Fill	Fill	Glacial Till	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	1.52 - 2.51	2.51 - 3.05
Petroleum Hydrocarbons											
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	µg/g	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.06	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, Total	µg/g	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.42	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	ND (7)	ND (7)	ND (7)	ND (7)	**243**	ND (7)	ND (7)	ND (7)	ND (7)
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	230	ND (4)	ND (4)	ND (4)	ND (4)	**2720**	18	ND (4)	ND (4)	ND (4)
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	1700	53	ND (8)	ND (8)	ND (8)	**2490**	37	ND (8)	ND (8)	ND (8)
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	3300	ND (6)	ND (6)	ND (6)	ND (6)	92	ND (6)	ND (6)	ND (6)	ND (6)

Footnotes:

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Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) (1)		19-01		19-02				19-03	
Sample Date			28-Feb-2015	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	26-Nov-2019	26-Nov-2019
Sample ID			BH15-3 SA3	BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3	BH19-03 SA2	BH19-03 SA7
Soil Type			Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			3.05 - 3.75	1.52 - 2.29	4.57 - 5.18	0 - 0.60	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02 SA7	0.76 - 1.37	3.66 - 4.11
Petroleum Hydrocarbons											
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	n/a	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	µg/g	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	n/a	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	n/a	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, Total	µg/g	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	n/a	ND (0.05)	ND (0.05)	ND (0.05)
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	n/a	ND (7)	ND (7)	ND (7)
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	230	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	n/a	ND (4)	ND (4)	ND (4)
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	1700	ND (8)	ND (8)	ND (8)	32	ND (8)	n/a	ND (8)	97	ND (8)
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	3300	ND (6)	ND (6)	ND (6)	24	ND (6)	n/a	ND (6)	42	ND (6)

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) (1)	19-04			19-05		19-06		
Sample Date			21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	2-Dec-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample ID			BH19-04 SA2	BH19-04 SA4	DUP-1	BH19-05 SA2	BH19-05 SA6	BH19-06 SA3	BH19-06 SA5	DUP-2
Soil Type			Fill	Glacial Till	Fill	Fill	Glacial Till	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.76 - 1.37	2.28 - 2.89	Field duplicate of BH19-04 SA2	0.76 - 1.37	3.81 - 4.42	1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06 SA5
Petroleum Hydrocarbons										
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	µg/g	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, Total	µg/g	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	8	ND (7)
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	230	ND (40)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	23	211
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	1700	169	ND (8)	190	ND (8)	ND (8)	37	33	160
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	3300	219	ND (6)	89	ND (6)	ND (6)	18	ND (6)	ND (6)

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) (1)	19-07	19-08		19-09		19-101		19-102	
Sample Date			2-Dec-2019	3-Dec-2019	3-Dec-2019	20-Nov-2019	20-Nov-2019	21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-07 SA1	BH19-08 SA3	BH19-08 SA9	BH19-09 SA1	BH19-09 SA4	BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Fill	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0 - 0.61	1.52 - 2.13	6.10 - 6.71	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
Petroleum Hydrocarbons											
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	µg/g	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, Total	µg/g	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	230	7	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	1700	13	187	ND (8)	30	16	30	ND (8)	27	ND (8)
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	3300	ND (6)	68	ND (6)	8	ND (6)	7	ND (6)	ND (6)	ND (6)

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	BH15-1			BH15-2			
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample ID			BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Soil Type			Fill	Fill	Glacial Till	Fill	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Volatile Organic Compounds									
Acetone	µg/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	µg/g	18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromoform	µg/g	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromomethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Carbon Tetrachloride	µg/g	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chlorobenzene	µg/g	2.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chloroform	µg/g	0.47	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibromochloromethane	µg/g	13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dichlorodifluoromethane	µg/g	16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichlorobenzene	µg/g	6.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichlorobenzene	µg/g	9.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,4-Dichlorobenzene	µg/g	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethane	µg/g	17	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloroethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethylene	µg/g	0.064	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,2-Dichloroethylene	µg/g	55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,2-Dichloroethylene	µg/g	1.3	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloropropane	µg/g	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichloropropene, total	µg/g	0.18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.06	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-)	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hexane	µg/g	46	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	µg/g	70	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl Isobutyl Ketone	µg/g	31	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert-butyl ether	µg/g	11	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylene Chloride	µg/g	1.6 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Styrene	µg/g	34 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1,2-Tetrachloroethane	µg/g	0.087 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2,2-Tetrachloroethane	µg/g	0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Tetrachloroethylene		4.5 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene		68 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	µg/g	6.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2-Trichloroethane		0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichloroethylene	µg/g	0.91 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichlorofluoromethane	µg/g	4 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Vinyl Chloride	µg/g	0.032 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
m/p-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.28	ND (0.05)	ND (0.05)
o-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.14	ND (0.05)	ND (0.05)
Xylenes, total	µg/g	26 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.42	ND (0.05)	ND (0.05)

Footnotes:

Tables should be read in conjunction with the accompanying document.

ND (value) = Indicates parameter not detected above laboratory method detection limit.

n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	BH15-3			19-01		19-02			
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019
Sample ID			BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3
Soil Type			Fill	Glacial Till	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till
Sample Depth (mbgs)			1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	1.52 - 2.13	4.57 - 5.18	0 - 0.60	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02 SA7
Volatile Organic Compounds											
Acetone	µg/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	µg/g	18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.02)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromoform	µg/g	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.02)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromomethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Carbon Tetrachloride	µg/g	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chlorobenzene	µg/g	2.4	ND (0.05)	ND (0.05)	ND (0.05)	53	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chloroform	µg/g	0.47	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibromochloromethane	µg/g	13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dichlorodifluoromethane	µg/g	16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichlorobenzene	µg/g	6.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichlorobenzene	µg/g	9.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,4-Dichlorobenzene	µg/g	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethane	µg/g	17	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloroethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethylene	µg/g	0.064	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,2-Dichloroethylene	µg/g	55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,2-Dichloroethylene	µg/g	1.3	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloropropane	µg/g	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichloropropene, total	µg/g	0.18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-)	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hexane	µg/g	46	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	µg/g	70	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl Isobutyl Ketone	µg/g	31	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert-butyl ether	µg/g	11	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylene Chloride	µg/g	1.6 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Styrene	µg/g	34 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1,2-Tetrachloroethane	µg/g	0.087 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2,2-Tetrachloroethane	µg/g	0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Tetrachloroethylene		4.5 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene		68 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	µg/g	6.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2-Trichloroethane		0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichloroethylene	µg/g	0.91 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichlorofluoromethane	µg/g	4 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Vinyl Chloride	µg/g	0.032 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
m/p-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	µg/g	26 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

Footnotes:

Tables should be read in conjunction with the accompanying document.

ND (value) = Indicates parameter not detected above laboratory method detection limit.

n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-03		19-04			19-05		19-06		
Sample Date			26-Nov-2019	26-Nov-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	2-Dec-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample ID			BH19-03 SA2	BH19-03 SA7	BH19-04 SA2	BH19-04 SA4	DUP-1	BH19-05 SA2	BH19-05 SA6	BH19-06 SA3	BH19-06 SA5	DUP-2
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Fill	Fill	Glacial Till	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.76 - 1.37	3.66 - 4.11	0.76 - 1.37	2.28 - 2.89	Field duplicate of BH19-04 SA2	0.76 - 1.37	3.81 - 4.42	1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06 SA5
Volatile Organic Compounds												
Acetone	µg/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	µg/g	18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromoform	µg/g	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromomethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Carbon Tetrachloride	µg/g	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chlorobenzene	µg/g	2.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chloroform	µg/g	0.47	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibromochloromethane	µg/g	13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dichlorodifluoromethane	µg/g	16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichlorobenzene	µg/g	6.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichlorobenzene	µg/g	9.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,4-Dichlorobenzene	µg/g	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethane	µg/g	17	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloroethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethylene	µg/g	0.064	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,2-Dichloroethylene	µg/g	55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,2-Dichloroethylene	µg/g	1.3	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloropropane	µg/g	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichloropropene, total	µg/g	0.18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-)	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hexane	µg/g	46	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	µg/g	70	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl Isobutyl Ketone	µg/g	31	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert-butyl ether	µg/g	11	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylene Chloride	µg/g	1.6 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Styrene	µg/g	34 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1,2-Tetrachloroethane	µg/g	0.087 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2,2-Tetrachloroethane	µg/g	0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Tetrachloroethylene		4.5 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene		68 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	µg/g	6.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2-Trichloroethane		0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichloroethylene	µg/g	0.91 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichlorofluoromethane	µg/g	4 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Vinyl Chloride	µg/g	0.032 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
m/p-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	µg/g	26 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

Footnotes:

Tables should be read in conjunction with the accompanying document.

ND (value) = Indicates parameter not detected above laboratory method detection limit.

n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-07	19-08		19-09		19-101		19-102	
Sample Date			2-Dec-2019	3-Dec-2019	3-Dec-2019	20-Nov-2019	20-Nov-2019	21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-07 SA1	BH19-08 SA3	BH19-08 SA9	BH19-09 SA1	BH19-09 SA4	BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Fill	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0 - 0.61	1.52 - 2.13	6.10 - 6.71	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
Volatile Organic Compounds											
Acetone	µg/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	µg/g	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	µg/g	18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromoform	µg/g	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromomethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Carbon Tetrachloride	µg/g	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chlorobenzene	µg/g	2.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chloroform	µg/g	0.47	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibromochloromethane	µg/g	13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dichlorodifluoromethane	µg/g	16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichlorobenzene	µg/g	6.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichlorobenzene	µg/g	9.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,4-Dichlorobenzene	µg/g	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethane	µg/g	17	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloroethane	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethylene	µg/g	0.064	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,2-Dichloroethylene	µg/g	55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,2-Dichloroethylene	µg/g	1.3	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloropropane	µg/g	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,3-Dichloropropylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichloropropene, total	µg/g	0.18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	µg/g	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-)	µg/g	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hexane	µg/g	46	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	µg/g	70	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl Isobutyl Ketone	µg/g	31	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert-butyl ether	µg/g	11	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylene Chloride	µg/g	1.6 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Styrene	µg/g	34 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1,2-Tetrachloroethane	µg/g	0.087 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2,2-Tetrachloroethane	µg/g	0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Tetrachloroethylene		4.5 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene		68 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	µg/g	6.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2-Trichloroethane		0.05 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichloroethylene	µg/g	0.91 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichlorofluoromethane	µg/g	4 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Vinyl Chloride	µg/g	0.032 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
m/p-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	µg/g		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	µg/g	26 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

Footnotes:

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Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	BH15-1			BH15-2				BH15-3		
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample ID			BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3
Soil Type			Fill	Fill	Glacial Till	Fill	Fill	Glacial Till	Glacial Till	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	1.52 - 2.51	2.51 - 3.05	3.05 - 3.75
PAHs												
Acenaphthene	µg/g	96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	1.06	ND (0.2)	0.02	0.11	ND (0.02)	ND (0.02)
Acenaphthylene	µg/g	0.15 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.11	ND (0.02)	ND (0.02)
Anthracene	µg/g	0.67 ug/g dry	0.15	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.39	ND (0.02)	0.03
Benzo[a]anthracene	µg/g	0.96 ug/g dry	0.23	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.78	ND (0.02)	0.08
Benzo[a]pyrene	µg/g	0.3 ug/g dry	**0.96**	0.03	ND (0.02)	ND (0.02)	**0.53**	ND (0.2)	ND (0.02)	**1.19**	ND (0.02)	0.1
Benzo[b]fluoranthene	µg/g	0.96 ug/g dry	**1.4**	0.05	ND (0.02)	ND (0.02)	0.55	ND (0.2)	ND (0.02)	**1.11**	ND (0.02)	0.1
Benzo[g,h,i]perylene	µg/g	9.6 ug/g dry	1.2	0.04	ND (0.02)	ND (0.02)	0.46	ND (0.2)	ND (0.02)	0.57	ND (0.02)	0.07
Benzo[k]fluoranthene	µg/g	0.96 ug/g dry	0.61	0.02	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.65	ND (0.02)	0.07
Chrysene	µg/g	9.6 ug/g dry	0.45	0.03	ND (0.02)	ND (0.02)	0.6	ND (0.2)	ND (0.02)	1	ND (0.02)	0.12
Dibenzo[a,h]anthracene	µg/g	0.1 ug/g dry	**0.14**	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	**0.14**	ND (0.02)	ND (0.02)
Fluoranthene	µg/g	9.6 ug/g dry	0.29	ND (0.02)	ND (0.02)	ND (0.02)	1.27	ND (0.2)	0.04	2.31	ND (0.02)	0.23
Fluorene	µg/g	62 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	1.91	ND (0.2)	ND (0.02)	0.13	ND (0.02)	ND (0.02)
Indeno[1,2,3-cd]pyrene	µg/g	0.76 ug/g dry	**0.84**	0.03	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.54	ND (0.02)	0.05
1-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	6.56	ND (0.2)	0.09	0.04	ND (0.02)	ND (0.02)
2-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.40)	ND (0.2)	ND (0.02)	0.04	ND (0.02)	ND (0.02)
Methylnaphthalene (1&2)	µg/g	76 ug/g dry	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	6.56	ND (0.04)	0.09	0.08	ND (0.04)	ND (0.04)
Naphthalene	µg/g	9.6 ug/g dry	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.46	ND (0.01)	ND (0.01)	0.08	ND (0.01)	0.01
Phenanthrene	µg/g	12 ug/g dry	0.14	ND (0.02)	ND (0.02)	ND (0.02)	4.86	ND (0.2)	0.13	1.56	ND (0.02)	0.16
Pyrene	µg/g	96 ug/g dry	0.34	0.02	ND (0.02)	ND (0.02)	1.27	ND (0.2)	0.04	2.31	ND (0.02)	0.2

Footnotes:
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n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

(2) The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-01		19-02				19-03		19-04	
Sample Date			28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	26-Nov-2019	26-Nov-2019	21-Nov-2019	21-Nov-2019
Sample ID			BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3	BH19-03 SA2	BH19-03 SA7	BH19-04 SA2	BH19-04 SA4
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			1.52 - 2.13	4.57 - 5.18	0 - 0.60	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02	0.76 - 1.37	3.66 - 4.11	0.76 - 1.37	2.28 - 2.89
PAHs												
Acenaphthene	µg/g	96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.07	0.29	ND (0.02)	0.05	ND (0.02)
Acenaphthylene	µg/g	0.15 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.07	**0.20**	ND (0.02)	**0.21**	ND (0.02)
Anthracene	µg/g	0.67 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.28	**0.89**	ND (0.02)	0.21	ND (0.02)
Benzo[a]anthracene	µg/g	0.96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.60	**1.27**	ND (0.02)	0.51	ND (0.02)
Benzo[a]pyrene	µg/g	0.3 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	**0.50**	**1.05**	ND (0.02)	**0.42**	ND (0.02)
Benzo[b]fluoranthene	µg/g	0.96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.70	**1.22**	ND (0.02)	0.76	ND (0.02)
Benzo[g,h,i]perylene	µg/g	9.6 ug/g dry	53	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.37	0.57	ND (0.02)	0.29	ND (0.02)
Benzo[k]fluoranthene	µg/g	0.96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.30	0.68	ND (0.02)	0.42	ND (0.02)
Chrysene	µg/g	9.6 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.87	1.30	ND (0.02)	0.55	ND (0.02)
Dibenzo[a,h]anthracene	µg/g	0.1 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.09	0.08	ND (0.02)	0.08	ND (0.02)
Fluoranthene	µg/g	9.6 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	1.43	2.85	ND (0.02)	1.21	ND (0.02)
Fluorene	µg/g	62 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.10	0.30	ND (0.02)	0.05	ND (0.02)
Indeno[1,2,3-cd]pyrene	µg/g	0.76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.32	0.54	ND (0.02)	0.28	ND (0.02)
1-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.03	0.12	ND (0.02)	0.23	ND (0.02)
2-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.05	0.16	ND (0.02)	0.33	ND (0.02)
Methylnaphthalene (1&2)	µg/g	76 ug/g dry	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	0.09	0.27	ND (0.04)	0.56	ND (0.04)
Naphthalene	µg/g	9.6 ug/g dry	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.10	0.32	ND (0.01)	0.28	ND (0.01)
Phenanthrene	µg/g	12 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.86	2.47	ND (0.02)	0.66	ND (0.02)
Pyrene	µg/g	96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	1.21	2.69	ND (0.02)	1.06	ND (0.02)

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

(2) The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]		19-05		19-06			19-07	19-08		1
Sample Date			21-Nov-2019	2-Dec-2019	2-Dec-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	3-Dec-2019	3-Dec-2019	20-Nov-2019
Sample ID			DUP-1	BH19-05 SA2	BH19-05 SA6	BH19-06 SA3	BH19-06 SA5	DUP-2	BH19-07 SA1	BH19-08 SA3	BH19-08 SA9	BH19-09 SA1
Soil Type			Fill	Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Fill	Fill	Glacial Till	Fill
Sample Depth (mbgs)			Field duplicate of BH19-04	0.76 - 1.37	3.81 - 4.42	1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06	0 - 0.61	1.52 - 2.13	6.10 - 6.71	0 - 0.60
PAHs												
Acenaphthene	µg/g	96 ug/g dry	0.03	ND (0.02)	ND (0.02)	0.02	ND (0.02)	ND (0.02)	ND (0.02)	0.28	ND (0.02)	ND (0.02)
Acenaphthylene	µg/g	0.15 ug/g dry	0.08	ND (0.02)	ND (0.02)	0.05	ND (0.02)	ND (0.02)	ND (0.02)	**0.40**	ND (0.02)	ND (0.02)
Anthracene	µg/g	0.67 ug/g dry	0.10	0.03	ND (0.02)	0.09	ND (0.02)	ND (0.02)	ND (0.02)	**0.93**	ND (0.02)	ND (0.02)
Benzo[a]anthracene	µg/g	0.96 ug/g dry	0.26	0.06	ND (0.02)	0.22	ND (0.02)	ND (0.02)	ND (0.02)	**2.48**	ND (0.02)	ND (0.02)
Benzo[a]pyrene	µg/g	0.3 ug/g dry	0.23	0.05	ND (0.02)	0.19	ND (0.02)	ND (0.02)	ND (0.02)	**2.24**	ND (0.02)	ND (0.02)
Benzo[b]fluoranthene	µg/g	0.96 ug/g dry	0.35	0.06	ND (0.02)	0.29	ND (0.02)	ND (0.02)	ND (0.02)	**2.82**	ND (0.02)	0.03
Benzo[g,h,i]perylene	µg/g	9.6 ug/g dry	0.17	0.03	ND (0.02)	0.15	ND (0.02)	ND (0.02)	ND (0.02)	1.33	ND (0.02)	ND (0.02)
Benzo[k]fluoranthene	µg/g	0.96 ug/g dry	0.18	0.04	ND (0.02)	0.15	ND (0.02)	ND (0.02)	ND (0.02)	**1.79**	ND (0.02)	ND (0.02)
Chrysene	µg/g	9.6 ug/g dry	0.30	0.09	ND (0.02)	0.25	ND (0.02)	ND (0.02)	ND (0.02)	2.74	ND (0.02)	0.03
Dibenzo[a,h]anthracene	µg/g	0.1 ug/g dry	0.04	ND (0.02)	ND (0.02)	0.04	ND (0.02)	ND (0.02)	ND (0.02)	**0.33**	ND (0.02)	ND (0.02)
Fluoranthene	µg/g	9.6 ug/g dry	0.57	0.14	ND (0.02)	0.55	ND (0.02)	ND (0.02)	ND (0.02)	5.24	ND (0.02)	0.05
Fluorene	µg/g	62 ug/g dry	0.03	ND (0.02)	ND (0.02)	0.02	ND (0.02)	0.08	ND (0.02)	0.31	ND (0.02)	ND (0.02)
Indeno[1,2,3-cd]pyrene	µg/g	0.76 ug/g dry	0.15	0.03	ND (0.02)	0.14	ND (0.02)	ND (0.02)	ND (0.02)	**1.25**	ND (0.02)	ND (0.02)
1-Methylnaphthalene	µg/g	76 ug/g dry	0.18	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.07	ND (0.02)	ND (0.02)
2-Methylnaphthalene	µg/g	76 ug/g dry	0.26	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	0.10	ND (0.02)	ND (0.02)
Methylnaphthalene (1&2)	µg/g	76 ug/g dry	0.43	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	0.17	ND (0.04)	ND (0.04)
Naphthalene	µg/g	9.6 ug/g dry	0.21	0.01	ND (0.01)	0.02	ND (0.01)	ND (0.01)	ND (0.01)	0.15	ND (0.01)	ND (0.01)
Phenanthrene	µg/g	12 ug/g dry	0.36	0.08	ND (0.02)	0.26	ND (0.02)	0.13	ND (0.02)	3.12	ND (0.02)	0.05
Pyrene	µg/g	96 ug/g dry	0.50	0.12	ND (0.02)	0.47	ND (0.02)	ND (0.02)	ND (0.02)	4.43	ND (0.02)	0.04

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

(2) The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	9-09	19-101		19-102	
Sample Date			20-Nov-2019	21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-09 SA4	BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			2.28 - 2.89	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
PAHs							
Acenaphthene	µg/g	96 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Acenaphthylene	µg/g	0.15 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Anthracene	µg/g	0.67 ug/g dry	ND (0.02)	0.03	ND (0.02)	ND (0.02)	ND (0.02)
Benzo[a]anthracene	µg/g	0.96 ug/g dry	ND (0.02)	0.08	ND (0.02)	0.04	ND (0.02)
Benzo[a]pyrene	µg/g	0.3 ug/g dry	ND (0.02)	0.07	ND (0.02)	0.04	ND (0.02)
Benzo[b]fluoranthene	µg/g	0.96 ug/g dry	ND (0.02)	0.11	ND (0.02)	0.05	ND (0.02)
Benzo[g,h,i]perylene	µg/g	9.6 ug/g dry	ND (0.02)	0.06	ND (0.02)	0.03	ND (0.02)
Benzo[k]fluoranthene	µg/g	0.96 ug/g dry	ND (0.02)	0.05	ND (0.02)	ND (0.02)	ND (0.02)
Chrysene	µg/g	9.6 ug/g dry	ND (0.02)	0.12	ND (0.02)	0.06	ND (0.02)
Dibenzo[a,h]anthracene	µg/g	0.1 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Fluoranthene	µg/g	9.6 ug/g dry	ND (0.02)	0.22	ND (0.02)	0.09	ND (0.02)
Fluorene	µg/g	62 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Indeno[1,2,3-cd]pyrene	µg/g	0.76 ug/g dry	ND (0.02)	0.05	ND (0.02)	0.02	ND (0.02)
1-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
2-Methylnaphthalene	µg/g	76 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Methylnaphthalene (1&2)	µg/g	76 ug/g dry	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)
Naphthalene	µg/g	9.6 ug/g dry	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Phenanthrene	µg/g	12 ug/g dry	ND (0.02)	0.14	ND (0.02)	0.05	ND (0.02)
Pyrene	µg/g	96 ug/g dry	ND (0.02)	0.18	ND (0.02)	0.07	ND (0.02)

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

(2) The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	BH15-1			BH15-2			
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample ID			BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Soil Type			Fill	Fill	Glacial Till	Fill	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Metals									
Boron, available	µg/g	2 ug/g dry	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chromium (VI)	µg/g	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Mercury	µg/g	3.9 ug/g dry	0.5	0.3	ND (0.1)	1.2	ND (0.1)	1.4	ND (0.1)
Antimony	µg/g	40 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Arsenic	µg/g	18 ug/g dry	9.3	ND (1.0)	ND (1.0)	ND (1.0)	2.5	ND (1.0)	ND (1.0)
Barium	µg/g	670 ug/g dry	456	126	67.7	27.5	58.5	43	43.3
Beryllium	µg/g	8 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Boron	µg/g	120 ug/g dry	15.4	8	2.6	2.3	2.8	1.7	2.5
Cadmium	µg/g	1.9 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium	µg/g	160 ug/g dry	16.9	18.2	13	6.7	12.2	10	12.4
Cobalt	µg/g	80 ug/g dry	5	6.1	4.7	4	3.7	3.3	3.4
Copper	µg/g	230 ug/g dry	134	23.6	9.5	11.2	15.6	7.5	7.5
Lead	µg/g	120 ug/g dry	**400**	38.4	4.5	3.3	20.5	2.9	4.1
Molybdenum	µg/g	40 ug/g dry	1.4	1.2	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	1.4
Nickel	µg/g	270 ug/g dry	10.4	11.4	9	5.7	7.3	6	6.8
Selenium	µg/g	5.5 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Silver	µg/g	40 ug/g dry	0.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Thallium	µg/g	3.3 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	µg/g	33 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	µg/g	86 ug/g dry	19	24.7	21.5	15.1	19.6	19.3	17.6
Zinc	µg/g	340 ug/g dry	239	64.3	18.7	13	32.2	13	11.3

0.06

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Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	BH15-3			19-01		19-02			
Sample Date			28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019
Sample ID			BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3
Soil Type			Fill	Glacial Till	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till
Sample Depth (mbgs)			1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02 SA7
Metals											
Boron, available	µg/g	2 ug/g dry	n/a	n/a	n/a	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	n/a	ND (0.5)
Chromium (VI)	µg/g	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	n/a	ND (0.2)
Mercury	µg/g	3.9 ug/g dry	0.1	0.8	ND (0.1)	ND (0.1)	ND (0.2)	ND (0.1)	ND (0.1)	n/a	ND (0.1)
Antimony	µg/g	40 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.2)	ND (1.0)	ND (1.0)	n/a	ND (1.0)
Arsenic	µg/g	18 ug/g dry	3	ND (1.0)	ND (1.0)	1.8	1.7	2.9	1.9	n/a	1.9
Barium	µg/g	670 ug/g dry	69.2	39.8	49.1	36.8	36.8	157	176	n/a	191
Beryllium	µg/g	8 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	53	ND (0.5)	ND (0.5)	ND (0.5)	n/a	ND (0.5)
Boron	µg/g	120 ug/g dry	5.4	3.6	4.3	ND (5.0)	5.7	5.7	5.5	n/a	ND (5.0)
Cadmium	µg/g	1.9 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	n/a	ND (0.5)
Chromium	µg/g	160 ug/g dry	11.7	10.8	12.3	14.4	12.8	42.2	31.1	n/a	31.0
Cobalt	µg/g	80 ug/g dry	4	4.4	4.1	4.5	4.2	9.3	8.9	n/a	9.1
Copper	µg/g	230 ug/g dry	11.3	7.4	7.3	9.2	8.8	23.9	19.1	n/a	24.6
Lead	µg/g	120 ug/g dry	55.9	4.8	9.8	2.7	2.9	34.4	3.8	n/a	3.4
Molybdenum	µg/g	40 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	n/a	ND (1.0)
Nickel	µg/g	270 ug/g dry	7.6	7.6	7.7	8.4	9.2	23.5	19.0	n/a	19.3
Selenium	µg/g	5.5 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	n/a	ND (1.0)
Silver	µg/g	40 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	n/a	ND (0.3)
Thallium	µg/g	3.3 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	n/a	ND (1.0)
Uranium	µg/g	33 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	n/a	ND (1.0)
Vanadium	µg/g	86 ug/g dry	17.4	20.6	17.4	24.4	21.6	45.7	43.6	n/a	44.2
Zinc	µg/g	340 ug/g dry	95.4	15.2	20.2	ND (20.0)	191	78.0	50.0	n/a	49.9

Footnotes:

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-03		19-04			19-05	
Sample Date			26-Nov-2019	26-Nov-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	2-Dec-2019
Sample ID			BH19-03 SA2	BH19-03 SA7	BH19-04 SA2	BH19-04 SA4	DUP-1	BH19-05 SA2	BH19-05 SA6
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Fill	Fill	Glacial Till
Sample Depth (mbgs)			0.76 - 1.37	3.66 - 4.11	0.76 - 1.37	2.28 - 2.89	Field duplicate of BH19-04 SA2	0.76 - 1.37	3.81 - 4.42
Metals									
Boron, available	µg/g	2 ug/g dry	0.7	ND (0.5)	1.2	ND (0.5)	1.3	ND (0.5)	ND (0.5)
Chromium (VI)	µg/g	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	N/A	ND (0.2)	ND (0.2)
Mercury	µg/g	3.9 ug/g dry	0.6	ND (0.1)	1.1	ND (0.1)	ND (0.1)	0.2	ND (0.1)
Antimony	µg/g	40 ug/g dry	1.8	ND (1.0)	24.2	ND (1.0)	3.5	3.1	ND (1.0)
Arsenic	µg/g	18 ug/g dry	6.7	2.3	11.9	1.9	13.2	15.2	8.6
Barium	µg/g	670 ug/g dry	161	44.8	**764**	51.9	379	560	227
Beryllium	µg/g	8 ug/g dry	0.6	ND (0.5)	0.7	ND (0.5)	0.6	1.4	1.2
Boron	µg/g	120 ug/g dry	10.9	12.6	10.8	8.6	14.0	30.3	11.2
Cadmium	µg/g	1.9 ug/g dry	0.8	ND (0.5)	1.4	ND (0.5)	1.1	0.5	ND (0.5)
Chromium	µg/g	160 ug/g dry	25.2	17.3	30.4	16.8	31.2	92.7	92.2
Cobalt	µg/g	80 ug/g dry	6.6	5.0	10.3	5.2	6.5	29.6	22.7
Copper	µg/g	230 ug/g dry	25.5	9.0	122	8.7	**364**	82.2	61.7
Lead	µg/g	120 ug/g dry	**187**	4.5	**498**	5.5	**443**	**325**	14.5
Molybdenum	µg/g	40 ug/g dry	1.6	ND (1.0)	2.6	ND (1.0)	4.4	4.7	1.5
Nickel	µg/g	270 ug/g dry	15.5	8.4	27.2	9.8	20.2	50.1	43.3
Selenium	µg/g	5.5 ug/g dry	ND (1.0)	ND (1.0)	1.9	ND (1.0)	1.9	1.3	1.5
Silver	µg/g	40 ug/g dry	0.8	ND (0.3)	0.6	ND (0.3)	0.4	0.5	ND (0.3)
Thallium	µg/g	3.3 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	µg/g	33 ug/g dry	1.1	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	2.6	2.6
Vanadium	µg/g	86 ug/g dry	29.3	25.9	27.1	21.5	23.4	**125**	**161**
Zinc	µg/g	340 ug/g dry	113	21.1	**391**	28.5	**366**	263	95.0

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-06			19-07	19-08		19-09	
Sample Date			21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	3-Dec-2019	3-Dec-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-06 SA3	BH19-06 SA5	DUP-2	BH19-07 SA1	BH19-08 SA3	BH19-08 SA9	BH19-09 SA1	BH19-09 SA4
Soil Type			Fill	Glacial Till	Glacial Till	Fill	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06 SA5	0 - 0.61	1.52 - 2.13	6.10 - 6.71	0 - 0.60	2.28 - 2.89
Metals										
Boron, available	µg/g	2 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.5
Chromium (VI)	µg/g	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.2	ND (0.2)	ND (0.2)	ND (0.2)
Mercury	µg/g	3.9 ug/g dry	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.2	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	µg/g	40 ug/g dry	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	8.8	ND (1.0)	ND (1.0)	ND (1.0)
Arsenic	µg/g	18 ug/g dry	5.1	1.6	1.9	7.8	**21.9**	7.5	4.1	1.6
Barium	µg/g	670 ug/g dry	421	185	210	**1560**	**1140**	209	113	42.8
Beryllium	µg/g	8 ug/g dry	ND (1.0)	0.5	0.6	1.1	1.6	1.0	ND (0.5)	ND (0.5)
Boron	µg/g	120 ug/g dry	24.7	ND (5.0)	ND (5.0)	28.8	36.8	8.3	11.7	7.2
Cadmium	µg/g	1.9 ug/g dry	ND (1.0)	ND (0.5)	ND (0.5)	ND (0.5)	**2.9**	ND (0.5)	ND (0.5)	ND (0.5)
Chromium	µg/g	160 ug/g dry	36.6	34.5	39.8	40.4	118	69.8	15.4	17.0
Cobalt	µg/g	80 ug/g dry	12.2	10.0	10.5	14.4	29.0	19.8	6.1	4.9
Copper	µg/g	230 ug/g dry	52.7	20.9	19.6	26.1	119	44.1	16.2	8.7
Lead	µg/g	120 ug/g dry	72.0	5.2	5.6	34.1	**844**	11.2	20.3	4.3
Molybdenum	µg/g	40 ug/g dry	ND (2.0)	ND (1.0)	ND (1.0)	3.5	4.2	1.9	2.2	ND (1.0)
Nickel	µg/g	270 ug/g dry	26.8	20.3	21.7	38.4	103	35.5	13.3	9.4
Selenium	µg/g	5.5 ug/g dry	ND (2.0)	ND (1.0)	ND (1.0)	1.1	2.3	1.0	ND (1.0)	ND (1.0)
Silver	µg/g	40 ug/g dry	ND (0.6)	ND (0.3)	ND (0.3)	ND (0.3)	0.9	ND (0.3)	ND (0.3)	ND (0.3)
Thallium	µg/g	3.3 ug/g dry	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	µg/g	33 ug/g dry	ND (2.0)	ND (1.0)	ND (1.0)	2.5	2.5	4.5	ND (1.0)	ND (1.0)
Vanadium	µg/g	86 ug/g dry	37.0	47.4	52.3	34.8	**136**	**129**	19.3	22.6
Zinc	µg/g	340 ug/g dry	142	55.2	60.5	90.1	**721**	82.3	31.5	21.6

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-101		19-102	
Sample Date			21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
Metals						
Boron, available	µg/g	2 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium (VI)	µg/g	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Mercury	µg/g	3.9 ug/g dry	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	µg/g	40 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Arsenic	µg/g	18 ug/g dry	1.6	1.5	3.2	1.8
Barium	µg/g	670 ug/g dry	55.0	83.8	74.6	60.8
Beryllium	µg/g	8 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	µg/g	120 ug/g dry	6.4	ND (5.0)	12.4	6.7
Cadmium	µg/g	1.9 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium	µg/g	160 ug/g dry	12.2	21.4	16.4	19.6
Cobalt	µg/g	80 ug/g dry	3.5	6.3	6.6	6.1
Copper	µg/g	230 ug/g dry	49.2	11.7	19.7	12.7
Lead	µg/g	120 ug/g dry	38.6	4.2	39.8	4.9
Molybdenum	µg/g	40 ug/g dry	ND (1.0)	ND (1.0)	1.3	ND (1.0)
Nickel	µg/g	270 ug/g dry	8.2	11.4	14.1	11.9
Selenium	µg/g	5.5 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Silver	µg/g	40 ug/g dry	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Thallium	µg/g	3.3 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	µg/g	33 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	µg/g	86 ug/g dry	15.4	31.4	24.2	27.6
Zinc	µg/g	340 ug/g dry	74.6	28.9	35.3	26.3

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-01		19-02				19-03	
Sample Date			28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	26-Nov-2019	26-Nov-2019
Sample ID			BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3	BH19-03 SA2	BH19-03 SA7
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02 SA7	0.76 - 1.37	3.66 - 4.11
Inorganics										
SAR	N/A	12 µg/g	0.64	0.64	2.58	1.88	n/a	2.27	6.22	2.86
EC	uS/cm	1400 uS/cm	165	0.64	815	416	n/a	420	938	439
pH	pH units	n/a	n/a	8.1	n/a	n/a	n/a	n/a	n/a	n/a
Physicial Parameters										
% Solids	%	n/a	89.4	89.4	91.6	90.1	91.2	90.5	89.6	90.6
>0.075 mm	%	n/a	53	n/a	n/a	n/a	50.4	n/a	n/a	n/a
<0.075 mm	%	n/a	n/a	n/a	n/a	n/a	49.6	n/a	n/a	n/a
Texture	n/a	n/a	n/a	n/a	n/a	n/a	Coarse	n/a	n/a	n/a

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-04			19-05		19-06		
Sample Date			21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	2-Dec-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample ID			BH19-04 SA2	BH19-04 SA4	DUP-1	BH19-05 SA2	BH19-05 SA6	BH19-06 SA3	BH19-06 SA5	DUP-2
Soil Type			Fill	Glacial Till	Fill	Fill	Glacial Till	Fill	Glacial Till	Glacial Till
Sample Depth (mbgs)			0.76 - 1.37	2.28 - 2.89	Field duplicate of BH19-04 SA2	0.76 - 1.37	3.81 - 4.42	1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06 SA5
Inorganics										
SAR	N/A	12 µg/g	3.16	1.43	3.11	1.19	1.51	0.28	0.39	0.38
EC	uS/cm	1400 uS/cm	460	512	470	346	291	495	369	414
pH	pH units	n/a	7.65	N/A	7.71	n/a	n/a	n/a	7.85	7.70
Physicial Parameters										
% Solids	%	n/a	76.8	92.9	87.1	86.4	90.5	94.4	89.1	86.1
>0.075 mm	%	n/a	n/a	n/a	n/a	58.4	38.5	n/a	n/a	n/a
<0.075 mm	%	n/a	n/a	n/a	n/a	41.6	61.5	n/a	n/a	n/a
Texture	n/a	n/a	n/a	n/a	n/a	Coarse	Med/Fine	n/a	n/a	n/a

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-07	19-08		19-09		19-101		19-102	
Sample Date			2-Dec-2019	3-Dec-2019	3-Dec-2019	20-Nov-2019	20-Nov-2019	21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-07 SA1	BH19-08 SA3	BH19-08 SA9	BH19-09 SA1	BH19-09 SA4	BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Fill	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			0 - 0.61	1.52 - 2.13	6.10 - 6.71	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
Inorganics											
SAR	N/A	12 µg/g	0.05	2.75	3.22	3.08	2.54	1.63	2.67	0.35	1.52
EC	uS/cm	1400 uS/cm	131	**3310**	552	613	479	330	407	242	313
pH	pH units	n/a	n/a	n/a	n/a	N/A	N/A	N/A	N/A	N/A	N/A
Physicial Parameters											
% Solids	%	n/a	95.5	86.9	89.7	95.9	92.4	94.0	91.5	95.6	91.9
>0.075 mm	%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<0.075 mm	%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Texture	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-01		19-02				19-03	
Sample Date			28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	26-Nov-2019	26-Nov-2019
Sample ID			BH19-01 SA3	BH19-01 SA7	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3	BH19-03 SA2	BH19-03 SA7
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			1.52 - 2.13	4.57 - 5.18	0 - 0.60	4.57 - 5.18	5.33 - 5.94	Field duplicate of BH19-02 SA7	0.76 - 1.37	3.66 - 4.11
PCBs										
PBCs (total)	µg/g	1.1	ND (0.05)	ND (0.05)	0.07	ND (0.05)	n/a	ND (0.05)	ND (0.05)	ND (0.05)

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Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-04			19-05		19-06			19-07
Sample Date			21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019	2-Dec-2019	21-Nov-2019	21-Nov-2019	21-Nov-2019	2-Dec-2019
Sample ID			BH19-04 SA2	BH19-04 SA4	DUP-1	BH19-05 SA2	BH19-05 SA6	BH19-06 SA3	BH19-06 SA5	DUP-2	BH19-07 SA1
Soil Type			Fill	Glacial Till	Fill	Fill	Glacial Till	Fill	Glacial Till	Glacial Till	Fill
Sample Depth (mbgs)			0.76 - 1.37	2.28 - 2.89	Field duplicate of BH19-04 SA2	0.76 - 1.37	3.81 - 4.42	1.52 - 2.13	3.04 - 3.60	Field duplicate of BH19-06 SA5	0 - 0.61
PCBs											
PBCs (total)	µg/g	1.1	0.08	ND (0.05)	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

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Borehole Location	Unit	MECP Table 3 Standard (I/C/C) [1]	19-08		19-09		19-101		19-102	
Sample Date			3-Dec-2019	3-Dec-2019	20-Nov-2019	20-Nov-2019	21-Nov-2019	21-Nov-2019	20-Nov-2019	20-Nov-2019
Sample ID			BH19-08 SA3	BH19-08 SA9	BH19-09 SA1	BH19-09 SA4	BH19-101 SA1	BH19-101 SA4	BH19-102 SA1	BH19-102 SA4
Soil Type			Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till	Fill	Glacial Till
Sample Depth (mbgs)			1.52 - 2.13	6.10 - 6.71	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89	0 - 0.60	2.28 - 2.89
PCBs										
PBCs (total)	µg/g	1.1	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

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n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Industrial/Commercial/Community Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Sample ID	Unit	O.Reg 558Schedule 4 (1)	TCLP-1	TCPL-2
Sample Date			3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)			n/a	n/a
Physical Characteristics				
Ignitability			Negative	Negative
% Solids			92.8	90.4
Flashpoint			>70	>70
EPA 1311 - TCLP Leachate Inorganics				
Fluoride		150 mg/L	0.42	0.21
Nitrate as N		1000 mg/L	ND (1)	ND (1)
Nitrite as N		1000 mg/L	ND (1)	ND (1)
Cyanide, free		20 mg/L	ND (0.02)	ND (0.02)
EPA 1311 - TCLP Leachate Metals				
Arsenic		2.5 mg/L	ND (0.05)	ND (0.05)
Barium		100 mg/L	0.80	0.84
Boron		500 mg/L	0.11	ND (0.05)
Cadmium		0.5 mg/L	ND (0.01)	ND (0.01)
Chromium		5 mg/L	ND (0.05)	ND (0.05)
Lead		5 mg/L	ND (0.05)	0.09
Mercury		0.1 mg/L	ND (0.005)	ND (0.005)
Selenium		1 mg/L	ND (0.05)	ND (0.05)
Silver		5 mg/L	ND (0.05)	ND (0.05)
Uranium		10 mg/L	ND (0.05)	ND (0.05)
EPA 1311 - TCLP Leachate Volatiles				
Benzene		0.5 mg/L	ND (0.005)	ND (0.005)
Carbon Tetrachloride		0.5 mg/L	ND (0.005)	ND (0.005)
Chlorobenzene		8 mg/L	ND (0.004)	ND (0.004)
Chloroform		10 mg/L	ND (0.006)	ND (0.006)
1,2-Dichlorobenzene		20 mg/L	ND (0.004)	ND (0.004)
1,4-Dichlorobenzene		0.5 mg/L	ND (0.004)	ND (0.004)
1,2-Dichloroethane		0.5 mg/L	ND (0.005)	ND (0.005)
1,1-Dichloroethylene		1.4 mg/L	ND (0.006)	ND (0.006)
Methyl Ethyl Ketone (2-Butanone)		200 mg/L	ND (0.30)	ND (0.30)
Methylene Chloride		5 mg/L	ND (0.04)	ND (0.04)
Tetrachloroethylene		3 mg/L	ND (0.005)	ND (0.005)
Trichloroethylene		5 mg/L	ND (0.004)	ND (0.004)
Vinyl Chloride		0.2 mg/L	ND (0.005)	ND (0.005)
EPA 1311 - TCLP Leachate Organics				
Benzo[a]pyrene		0.001 mg/L	ND (0.0001)	ND (0.0001)

Footnotes:
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n/a = Chemical not analyzed or criteria not defined.
Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) MECP O. Reg 558: Schedule 4- Leachate Quality Criteria, Ontario Regulation 558/00 (amendin Regulation 347 of RRO 1990) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	MW15-1	DUP15-1	MW15-2	MW15-3	19-1	19-2	19-3	19-5
Sample Date		9-Mar-2015	9-Mar-2015	9-Mar-2015	9-Mar-2015	11-Dec-2019	11-Dec-2019	11-Dec-2019	10-Dec-2019
Water Levels (mbgs)		4.54	Field Duplicate of MW15-1	5.53	4.88	2.59	3.25	5.57	5.08
Benzene	44 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, Total	4200 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Petroleum Hydrocarbons - F1 (C6-C10)	750 ug/L	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Petroleum Hydrocarbons - F2 (C10-C16)	150 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum Hydrocarbons - F3 (C16-C34)	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum Hydrocarbons - F4 (C34-C50)	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)

Footnotes:

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> value = Indicates parameter detected above equipment analytical range.

n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	19-6	19-8	19-9C	DUP-1	19-102	Trip Blank	Equipment DUP	Field DUP
Sample Date		11-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	9-Dec-2019	10-Dec-2019	10-Dec-2019
Water Levels (mbgs)		2.31	4.63	4.47	Field Duplicate of 19-9C	4.17	n/a	n/a	n/a
Benzene	44 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, Total	4200 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Petroleum Hydrocarbons - F1 (C6-C10)	750 ug/L	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Petroleum Hydrocarbons - F2 (C10-C16)	150 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum Hydrocarbons - F3 (C16-C34)	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum Hydrocarbons - F4 (C34-C50)	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)

Footnotes:

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(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards [1]	MW15-1	DUP15-1	MW15-2	MW15-3
Sample Date		9-Mar-2015	9-Mar-2015	9-Mar-2015	9-Mar-2015
Water Levels (mbgs)		4.54	Field Duplicate of MW15-1	5.53	4.88
Acetone	130000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	44 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	85000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	380 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	5.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	0.79 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	630 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	2.4 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dibromochloromethane	82000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	4400 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	4600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	9600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	8 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	16 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	5.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1,2-)	0.25 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	51 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	470000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	140000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	190 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	610 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	1300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	3.3 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	3.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	640 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	4.7 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	2500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	4200 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Tables should be read in conjunction with the accompanying document.

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n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	19-1	19-2	19-3	19-5	19-6
Sample Date		11-Dec-2019	11-Dec-2019	11-Dec-2019	10-Dec-2019	11-Dec-2019
Water Levels (mbgs)		2.59	3.25	5.57	5.08	2.31
Acetone	130000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	44 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	85000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	380 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	5.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	0.79 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	630 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	2.4 ug/L	ND (0.5)	1.6	**4.5**	**4.4**	ND (0.5)
Dibromochloromethane	82000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	4400 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	4600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	9600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	8 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	16 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	5.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1,2-)	0.25 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	51 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	470000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	140000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	190 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	610 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	1300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	3.3 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	3.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	640 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	4.7 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	2500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	4200 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Tables should be read in conjunction with the accompanying document.

ND (value) = Indicates parameter not detected above laboratory method detection limit.

> value = Indicates parameter detected above equipment analytical

n/a = Chemical not analyzed or criteria not defined.

Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	19-8	19-9C	DUP-1	19-102	Trip Blank
Sample Date		10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	9-Dec-2019
Water Levels (mbgs)		4.63	4.47	Field Duplicate of 19-9C	4.17	n/a
Acetone	130000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	44 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	85000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	380 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	5.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	0.79 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	630 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	2.4 ug/L	ND (0.5)	0.7	ND (0.5)	ND (0.5)	ND (0.5)
Dibromochloromethane	82000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	4400 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	4600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	9600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	8 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	16 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	5.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1,2-)	0.25 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	51 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	470000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	140000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	190 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	610 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	1300 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	3.3 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	3.2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	640 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	4.7 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	2500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	4200 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

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Grey background and **bold font** indicates exceedances above MECP Table 3 standards.

(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	Equipment DUP	Field DUP
Sample Date		10-Dec-2019	10-Dec-2019
Water Levels (mbgs)		n/a	n/a
Acetone	130000 ug/L	ND (5.0)	ND (5.0)
Benzene	44 ug/L	ND (0.5)	ND (0.5)
Bromodichloromethane	85000 ug/L	ND (0.5)	ND (0.5)
Bromoform	380 ug/L	ND (0.5)	ND (0.5)
Bromomethane	5.6 ug/L	ND (0.5)	ND (0.5)
Carbon Tetrachloride	0.79 ug/L	ND (0.2)	ND (0.2)
Chlorobenzene	630 ug/L	ND (0.5)	ND (0.5)
Chloroform	2.4 ug/L	ND (0.5)	ND (0.5)
Dibromochloromethane	82000 ug/L	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	4400 ug/L	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	4600 ug/L	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	9600 ug/L	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	8 ug/L	ND (0.5)	ND (0.5)
1,1-Dichloroethane	320 ug/L	ND (0.5)	ND (0.5)
1,2-Dichloroethane	1.6 ug/L	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)
1,2-Dichloropropane	16 ug/L	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene		ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene		ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	5.2 ug/L	ND (0.5)	ND (0.5)
Ethylbenzene	2300 ug/L	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1,2-)	0.25 ug/L	ND (0.2)	ND (0.2)
Hexane	51 ug/L	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	470000 ug/L	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	140000 ug/L	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	190 ug/L	ND (2.0)	ND (2.0)
Methylene Chloride	610 ug/L	ND (5.0)	ND (5.0)
Styrene	1300 ug/L	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	3.3 ug/L	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	3.2 ug/L	ND (0.5)	ND (0.5)
Tetrachloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)
Toluene	18000 ug/L	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	640 ug/L	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	4.7 ug/L	ND (0.5)	ND (0.5)
Trichloroethylene	1.6 ug/L	ND (0.5)	ND (0.5)
Trichlorofluoromethane	2500 ug/L	ND (1.0)	ND (1.0)
Vinyl Chloride	0.5 ug/L	ND (0.5)	ND (0.5)
m/p-Xylene		ND (0.5)	ND (0.5)
o-Xylene		ND (0.5)	ND (0.5)
Xylenes, total	4200 ug/L	ND (0.5)	ND (0.5)

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(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards [1]	MW15-1	DUP15-1	MW15-2	MW15-3	19-1	19-2	19-3
Sample Date		9-Mar-2015	9-Mar-2015	9-Mar-2015	9-Mar-2015	11-Dec-2019	11-Dec-2019	11-Dec-2019
Water Levels (mbgs)		4.54	Field Duplicate of MW15-1	5.53	4.88	2.59	3.25	5.57
Acenaphthene	600 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.40
Acenaphthylene	1.8 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.42
Anthracene	2.4 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.95
Benzo[a]anthracene	4.7 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	2.00
Benzo[a]pyrene	0.81 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	**1.65**
Benzo[b]fluoranthene	0.75 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	**2.41**
Benzo[g,h,i]perylene	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	**1.03**
Benzo[k]fluoranthene	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	**1.33**
Chrysene	1 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	**2.36**
Dibenzo[a,h]anthracene	0.52 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.29
Fluoranthene	130 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.08	3.69
Fluorene	400 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.45
Indeno[1,2,3-cd]pyrene	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	**0.92**
1-Methylnaphthalene	1800 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.15
2-Methylnaphthalene	1800 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.22
Methylnaphthalene (1&2)	1800 ug/L	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	0.36
Naphthalene	1400 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.65
Phenanthrene	580 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	3.08
Pyrene	68 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.09	3.74

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(1) MECP Table 3 Standards: Table 3- Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use, Coarse Grained Soils; as per Ontario Regulation 153/04 (2011) under the Environmental Protection Act of the Ministry of the Environment, Conservation and Parks (MECP)

Sample ID	MECP Table 3 Standards (1)	19-5	19-6	19-8	19-9C	DUP-1	19-102
Sample Date		10-Dec-2019	11-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019
Water Levels (mbgs)		5.08	2.31	4.63	4.47	Field Duplicate of 19-9C	4.17
Acenaphthene	600 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Acenaphthylene	1.8 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Anthracene	2.4 ug/L	ND (0.01)	ND (0.01)	0.06	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[a]anthracene	4.7 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[a]pyrene	0.81 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[b]fluoranthene	0.75 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[g,h,i]perylene	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[k]fluoranthene	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chrysene	1 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibenzo[a,h]anthracene	0.52 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Fluoranthene	130 ug/L	0.05	0.07	0.12	ND (0.01)	ND (0.01)	0.06
Fluorene	400 ug/L	ND (0.05)	ND (0.05)	0.08	ND (0.05)	ND (0.05)	ND (0.05)
Indeno[1,2,3-cd]pyrene	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1-Methylnaphthalene	1800 ug/L	ND (0.05)	ND (0.05)	0.08	ND (0.05)	ND (0.05)	ND (0.05)
2-Methylnaphthalene	1800 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylnaphthalene (1&2)	1800 ug/L	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
Naphthalene	1400 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Phenanthrene	580 ug/L	ND (0.05)	ND (0.05)	0.49	ND (0.05)	ND (0.05)	0.09
Pyrene	68 ug/L	0.09	0.09	0.15	ND (0.01)	ND (0.01)	0.06

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Sample ID	MECP Table 3 Standards (1)	MW15-1	DUP15-1	MW15-2	MW15-3	19-1	19-2	19-3	19-5	19-6	19-8	19-9C	DUP-1	19-102
Sample Date		9-Mar-2015	9-Mar-2015	9-Mar-2015	9-Mar-2015	11-Dec-2019	11-Dec-2019	11-Dec-2019	10-Dec-2019	11-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019
Water Levels (mbgs)		4.54	Field Duplicate of MW15-1	5.53	4.88	2.59	3.25	5.57	5.08	2.31	4.63	4.47	Field Duplicate of 19-9C	4.17
Mercury	0.29 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	20000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	0.6	0.7	0.6	1.5	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Arsenic	1900 ug/L	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	1	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Barium	29000 ug/L	314	327	103	64	111	113	35	125	29	61	61	64	64
Beryllium	67 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Boron	45000 ug/L	76	89	185	209	142	127	503	176	160	ND (100)	676	695	145
Cadmium	2.7 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Chromium	810 ug/L	66	65	35	30	ND (1)	ND (1)	ND (1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chromium (VI)	140 ug/L	11	20	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cobalt	66 ug/L	6.1	6.5	2.8	2.7	0.5	12.1	ND (0.5)	16.5	13.7	ND (5.0)	23.0	23.1	6.0
Copper	87 ug/L	6.4	7.1	3.5	3.1	2.7	6.1	2.2	ND (5.0)	ND (5.0)	ND (5.0)	6.7	6.8	ND (5.0)
Lead	25 ug/L	1	0.9	ND (0.1)	ND (0.1)	ND (0.1)	0.1	0.3	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Molybdenum	9200 ug/L	4.5	5	9.3	10.2	4.2	9.5	49.3	11.4	7.5	30.9	ND (5.0)	ND (5.0)	9.5
Nickel	490 ug/L	40	45	19	16	2	12	3	ND (10)	36	24	24	23	39
Selenium	63 ug/L	ND (1)	ND (1)	ND (1)	ND (1)	1	1	ND (1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Silver	1.5 ug/L	0.1	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Sodium	2300000 ug/L	**10800000**	**10300000**	850000	1120000	155000	530000	209000	316000	89800	396000	1190000	1190000	1700000
Thallium	510 ug/L	0.7	0.6	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	420 ug/L	5.2	5.6	3.7	3.7	1.6	6.1	0.9	8.4	8.6	2.1	13.5	13.7	14.1
Vanadium	250 ug/L	9.5	8.3	20	13.5	0.5	1.7	0.8	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Zinc	1100 ug/L	11	18	9	10	ND (5)	8	ND (5)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
pH	n/a	n/a	n/a	n/a	n/a	7.4	7.6	8.2	7.6	7.2	8.5	7.3	7.3	7.4
Chloride	2300000 ug/L	n/a	n/a	n/a	n/a	162000	685000	350000	275000	26000	399000	1830000	1800000	**3570000**

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Sample ID	MECP Table 3 Standards [1]	MW15-1	DUP15-1	MW15-2	MW15-3	19-1	19-2	19-3	19-5	19-6	19-8	19-9C	DUP-1	19-102
Sample Date		9-Mar-2015	9-Mar-2015	9-Mar-2015	9-Mar-2015	11-Dec-2019	11-Dec-2019	11-Dec-2019	10-Dec-2019	11-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019
Water Levels (mbgs)		4.54	Field Duplicate of MW15-1	5.53	4.88	2.59	3.25	5.57	5.08	2.31	4.63	4.47	Field Duplicate of 19-9C	4.17
PCBs	7.8 ug/L	n/a	n/a	n/a	n/a	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

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Figures

366550 366600 366650 366700 366750

5031000 5030950 5030900 5030850

BRONSON

COMMISSIONER

ALBERT

SLATER

WELLINGTON

BRICKHILL

CAMBRIDGE

LAURIER

19-07
19-02
19-01
15-02
19-06
15-01
19-101
19-05
19-04
19-102
19-03
19-08
19-09C
19-09
15-03
15-04

KEY MAP

SCALE 1:25,000

LEGEND

- APPROXIMATE BOREHOLE
- ROADWAY
- SITE BOUNDARY
- APEC 1/PCA 2
- APEC 2/PCA 6
- APEC 3/PCA 7
- APEC 5/PCA 28, APEC 9/PCA 20
- APEC 6/PCA 12, APEC 10/PCA 21, APEC 11/PCA 24, APEC 4/PCA 11
- APEC 7/PCA 13
- APEC 8/PCA 18
- APEC 12/PCA 31
- APEC 13/PCA 32

APEC 1 / PCA ID #2: FORMER PAINT SHOP.
APEC 2 / PCA ID #6: FORMER CITY IRON & BOTTLE CO.
APEC 3 / PCA ID #7: FORMER MACHINE AND BRASS WORKS.
APEC 4 / PCA ID #11: FORMER METAL CASTINGS AND MOULDING SHOP.
APEC 5 / PCA ID #28: REGISTERED FEDERAL CONTAMINATED SITE (PARCEL OF LEBRETON FLATS).
APEC 6 / PCA ID #12: FORMER AUTOMOTIVE GARAGE AND REPAIRS, WITH A UST.
APEC 7 / PCA ID #13: FORMER NATIONAL BRAKE & CLUTCH SERVICE, AUTOMOTIVE GARAGE WITH USTS.
APEC 8 / PCA ID #18: FORMER WELDING COMPANY AND AUTOMOTIVE SERVICE STATION.
APEC 9 / PCA ID #20: PRESENCE OF FILL CONTAINING WASTE WITH METALS, POLYCYCLIC AROMATIC HYDROCARBON ("PAH") AND PETROLEUM HYDROCARBON ("PHC") IMPACTS ACROSS THE SITE.
APEC 10 / PCA ID #21: DOCUMENTED SPILL OF 900L OF FURNACE OIL.
APEC 11 / PCA ID #24: FORMER GAS PUMP AND AUTO REPAIR GARAGE.
APEC 12 / PCA ID #31: MULTIPLE OIL ASTS LOCATED ON SITE.
APEC 13 / PCA ID #32: VARIOUS STORAGE DRUMS AND/OR ASTS FOR CHEMICALS STORED ON SITE.

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
SITE PLAN WITH AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

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LEGEND

- APPROXIMATE BOREHOLE
- ROADWAY
- CROSS-SECTION LOCATION
- SITE BOUNDARY
- 9999 GROUNDWATER ELEVATION, mASL
- GROUNDWATER ELEVATION CONTOUR, mASL
- INTERPRETED GROUNDWATER FLOW DIRECTION

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

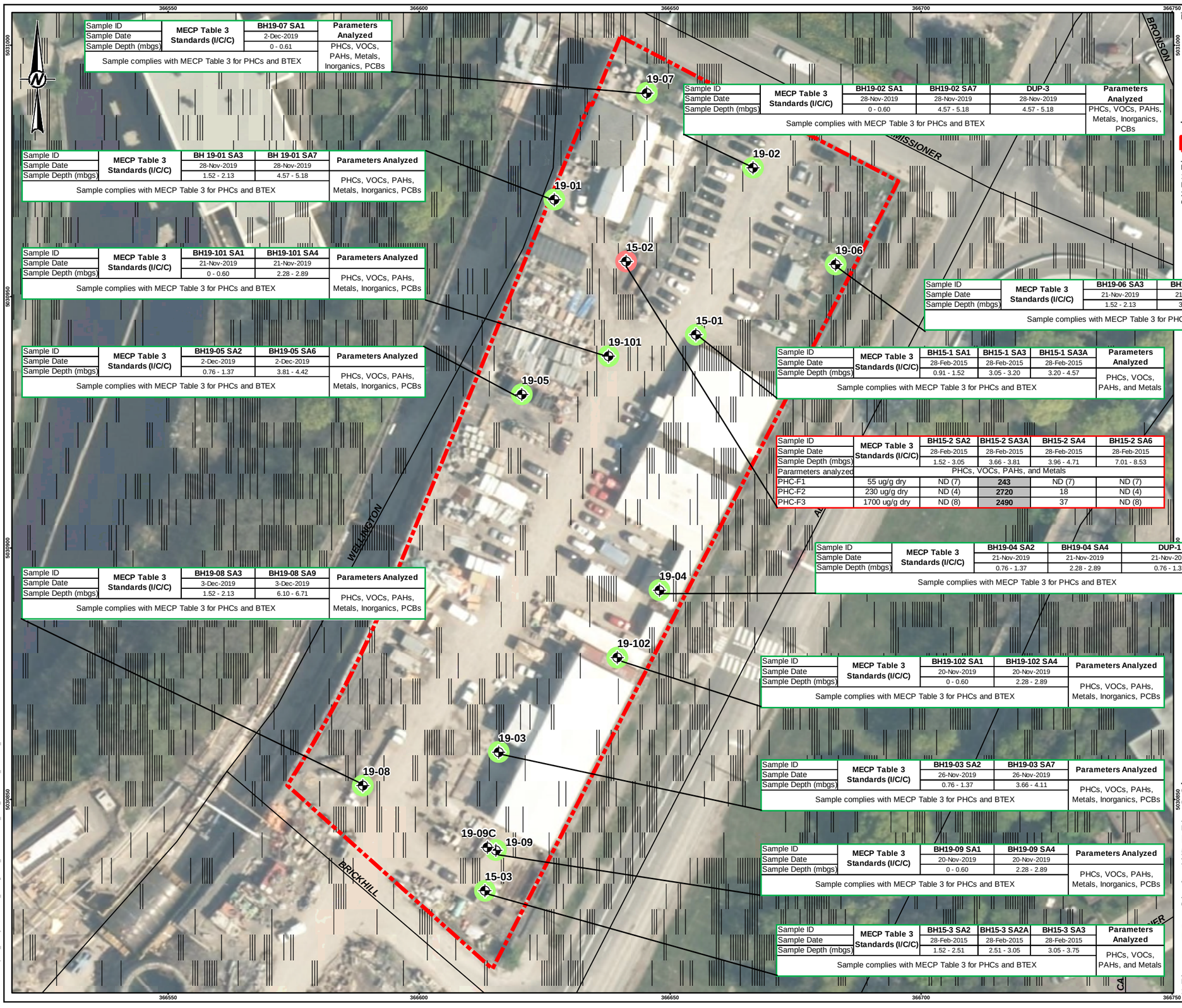
TITLE
GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTION

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	RCD
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for PHCs and BTEX			PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, and Metals

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Parameters analyzed		PHCs, VOCs, PAHs, and Metals			
PHC-F1	55 ug/g dry	ND (7)	**243**	ND (7)	ND (7)
PHC-F2	230 ug/g dry	ND (4)	**2720**	18	ND (4)
PHC-F3	1700 ug/g dry	ND (8)	**2490**	37	ND (8)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, and Metals

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN SOIL: PHCs AND BTEX

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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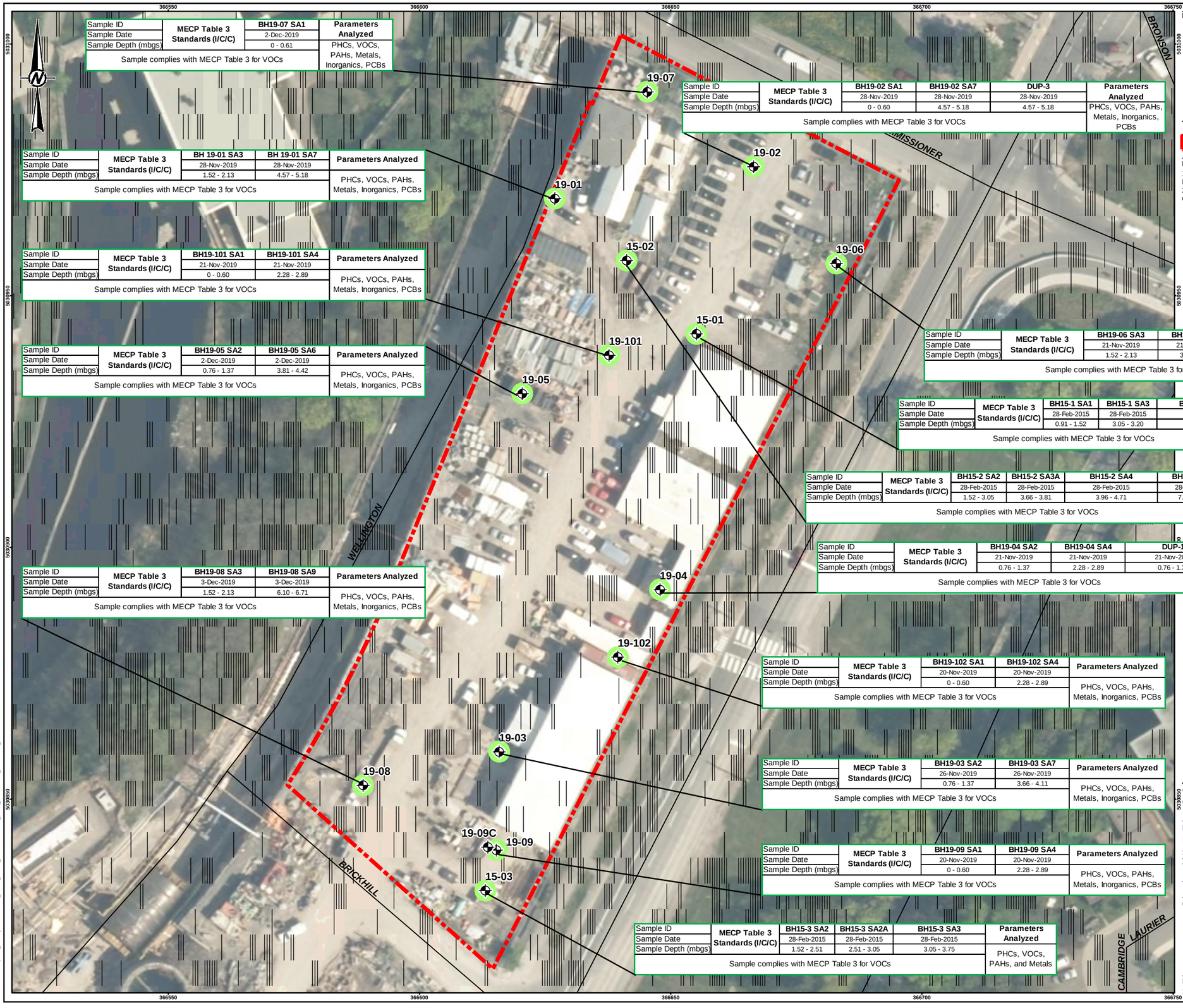

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for VOCs			PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, and Metals

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	
Sample complies with MECP Table 3 for VOCs						PHCs, VOCs, PAHs, and Metals

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, and Metals

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN SOIL: VOCs

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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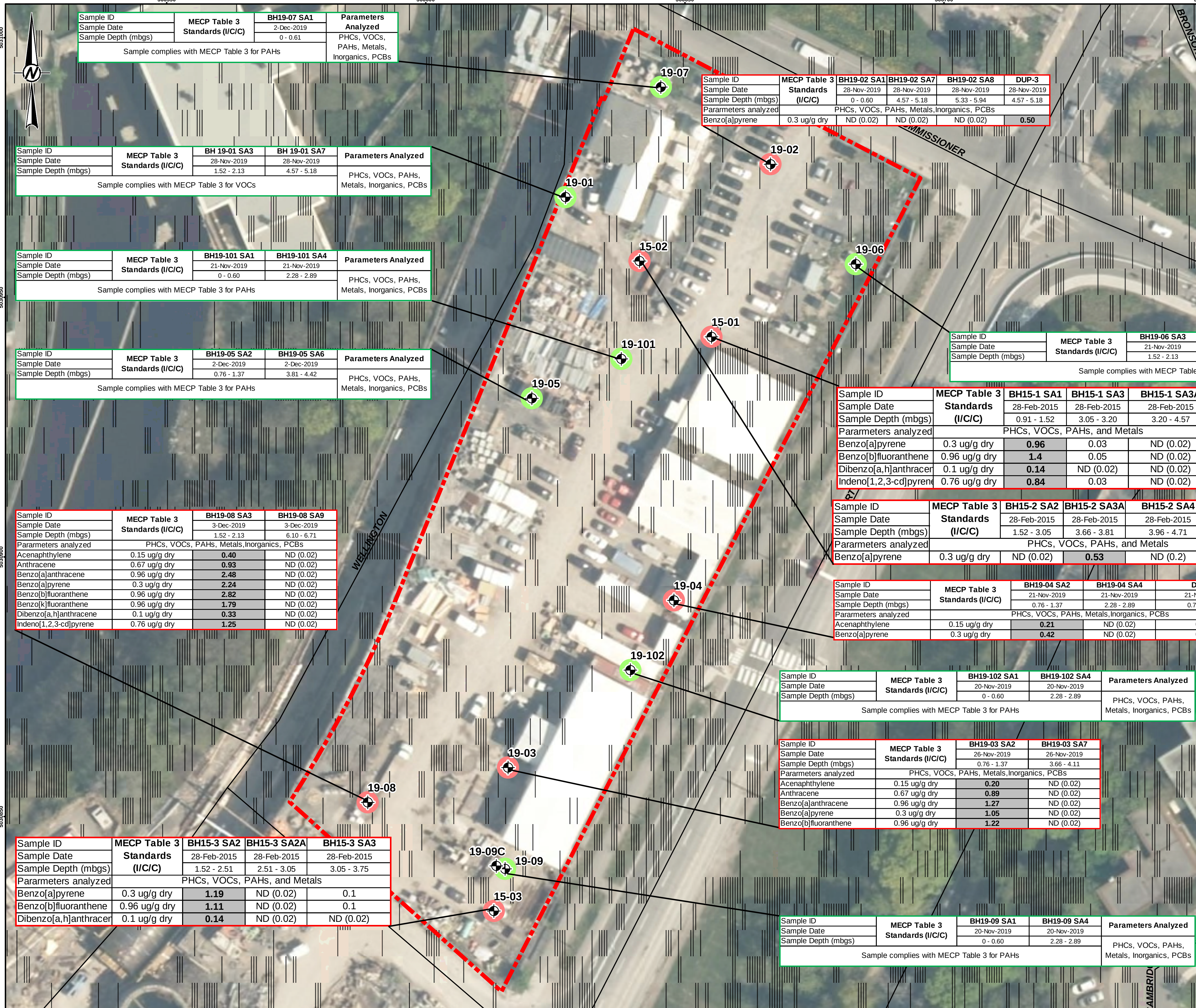


Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs			

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	5.33 - 5.94	4.57 - 5.18
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs				
Benzo[a]pyrene	0.3 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	**0.50**

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57
Pararmeters analyzed	PHCs, VOCs, PAHs, and Metals			
Benzo[a]pyrene	0.3 ug/g dry	**0.96**	0.03	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**1.4**	0.05	ND (0.02)
Dibenzo[a,h]anthracene	0.1 ug/g dry	**0.14**	ND (0.02)	ND (0.02)
Indeno[1,2,3-cd]pyrene	0.76 ug/g dry	**0.84**	0.03	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Pararmeters analyzed	PHCs, VOCs, PAHs, and Metals				
Benzo[a]pyrene	0.3 ug/g dry	ND (0.02)	**0.53**	ND (0.2)	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Acenaphthylene	0.15 ug/g dry	**0.40**	ND (0.02)
Anthracene	0.67 ug/g dry	**0.93**	ND (0.02)
Benzo[a]anthracene	0.96 ug/g dry	**2.48**	ND (0.02)
Benzo[a]pyrene	0.3 ug/g dry	**2.24**	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**2.82**	ND (0.02)
Benzo[k]fluoranthene	0.96 ug/g dry	**1.79**	ND (0.02)
Dibenzo[a,h]anthracene	0.1 ug/g dry	**0.33**	ND (0.02)
Indeno[1,2,3-cd]pyrene	0.76 ug/g dry	**1.25**	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Acenaphthylene	0.15 ug/g dry	**0.21**	ND (0.02)	0.08
Benzo[a]pyrene	0.3 ug/g dry	**0.42**	ND (0.02)	0.23

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Acenaphthylene	0.15 ug/g dry	**0.20**	ND (0.02)
Anthracene	0.67 ug/g dry	**0.89**	ND (0.02)
Benzo[a]anthracene	0.96 ug/g dry	**1.27**	ND (0.02)
Benzo[a]pyrene	0.3 ug/g dry	**1.05**	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**1.22**	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75
Parameters analyzed	PHCs, VOCs, PAHs, and Metals			
Benzo[a]pyrene	0.3 ug/g dry	**1.19**	ND (0.02)	0.1
Benzo[b]fluoranthene	0.96 ug/g dry	**1.11**	ND (0.02)	0.1
Dibenzo[a,h]anthracen	0.1 ug/g dry	**0.14**	ND (0.02)	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PAHs				

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT

CITY OF OTTAWA

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE

ANALYSIS AND EXCEEDANCES IN SOIL: PAHs

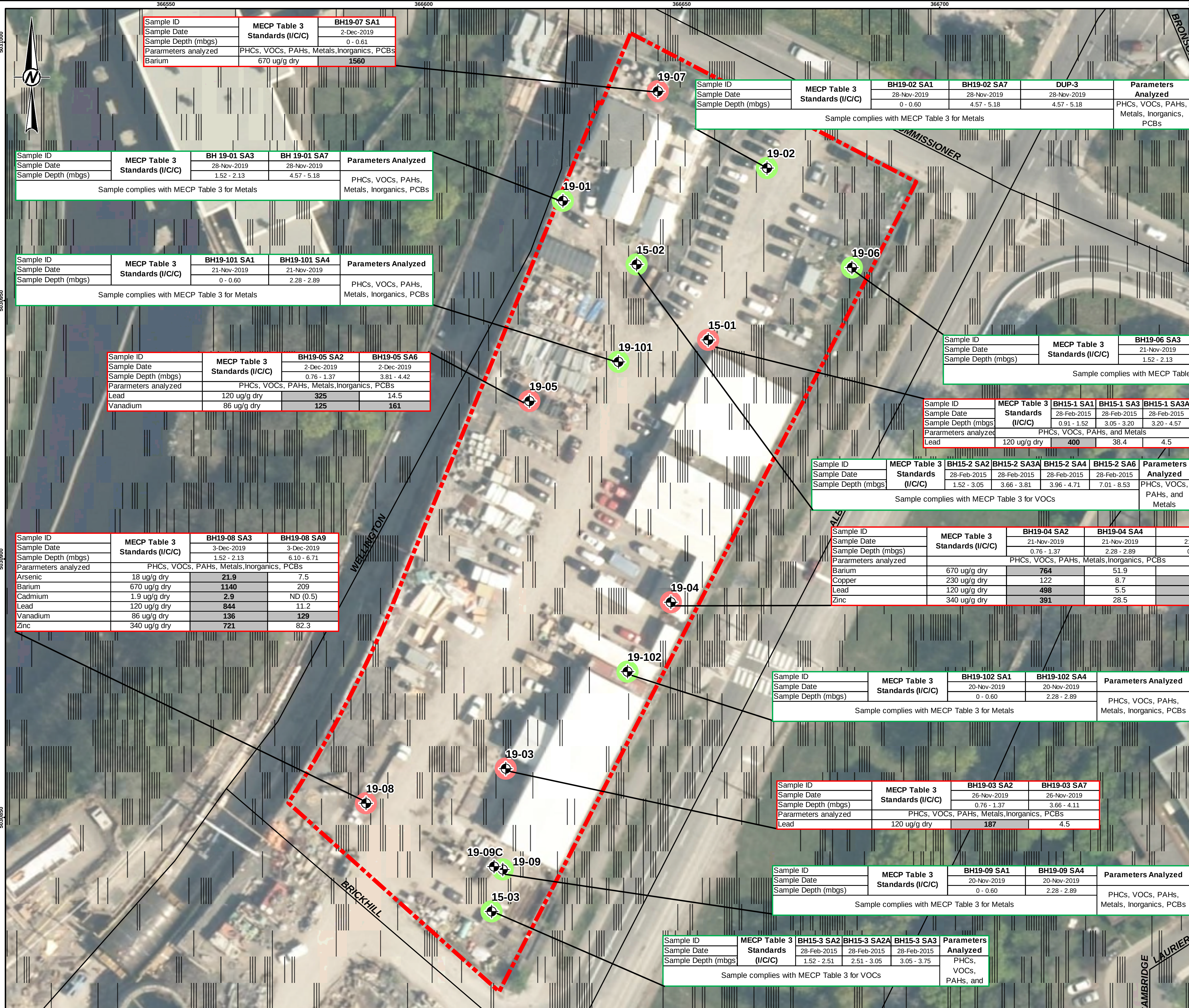
CONSULTANT

GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1
Sample Date		2-Dec-2019
Sample Depth (mbgs)		0 - 0.61
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Barium	670 ug/g dry	**1560**

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for Metals					

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for Metals					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6
Sample Date		2-Dec-2019	2-Dec-2019
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**325**	14.5
Vanadium	86 ug/g dry	**125**	**161**

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57
Pararmeters analyzed	PHCs, VOCs, PAHs, and Metals			
Lead	120 ug/g dry	**400**	38.4	4.5

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and Metals
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	
Sample complies with MECP Table 3 for VOCs						

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Arsenic	18 ug/g dry	**21.9**	7.5
Barium	670 ug/g dry	**1140**	209
Cadmium	1.9 ug/g dry	**2.9**	ND (0.5)
Lead	120 ug/g dry	**844**	11.2
Vanadium	86 ug/g dry	**136**	**129**
Zinc	340 ug/g dry	**721**	82.3

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Barium	670 ug/g dry	**764**	51.9	379
Copper	230 ug/g dry	122	8.7	**364**
Lead	120 ug/g dry	**498**	5.5	**443**
Zinc	340 ug/g dry	**391**	28.5	**366**

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Pararmeters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**187**	4.5

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	
Sample complies with MECP Table 3 for VOCs					

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN SOIL: METALS

CONSULTANT

GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	6

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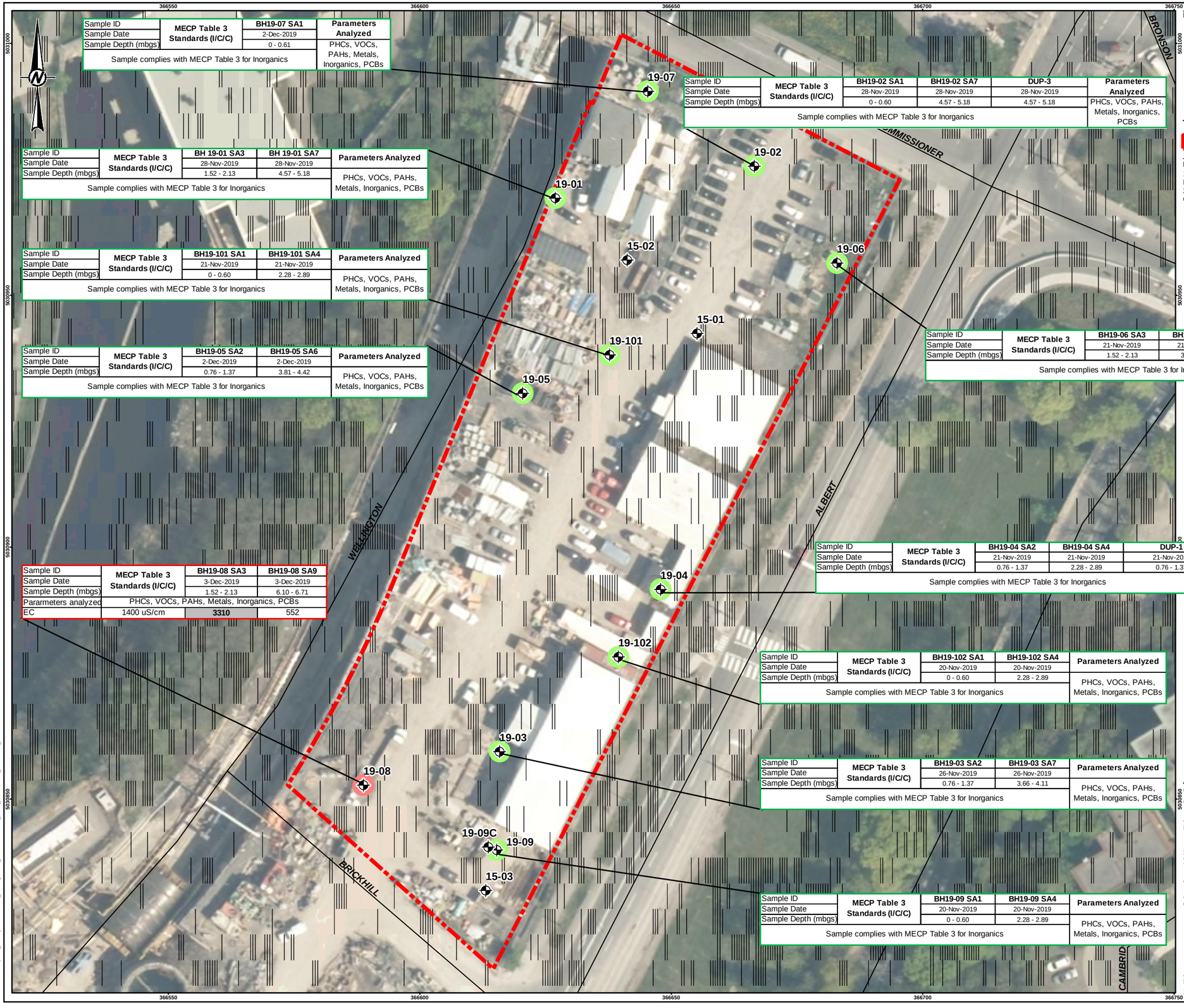

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for Inorganics			

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Parameters analyzed	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs		
EC	1400 uS/cm	**3310**	552

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN SOIL: INORGANICS

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**7**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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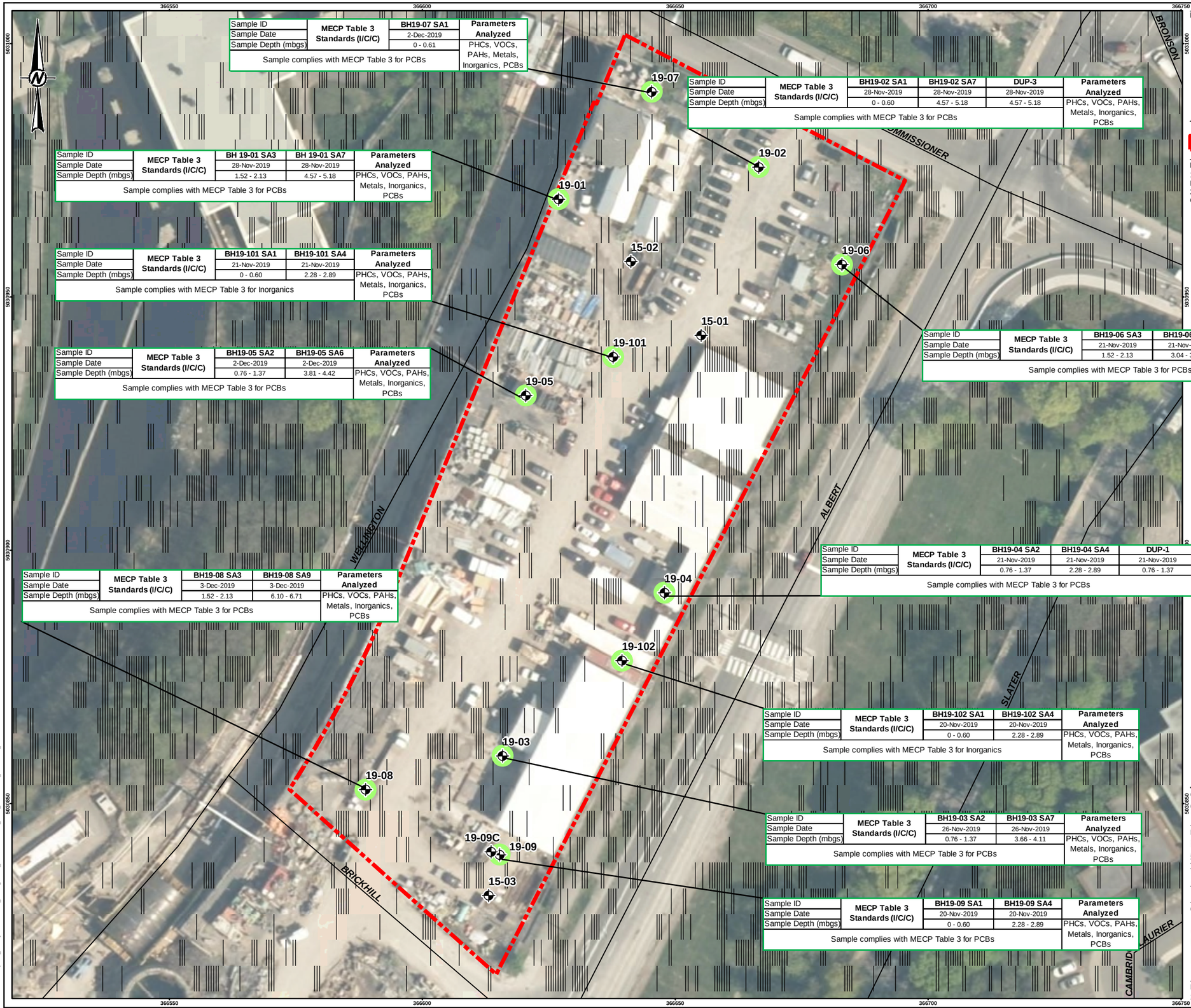

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for PCBs			PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for PCBs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for PCBs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for PCBs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN SOIL: PCBs

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 25mm

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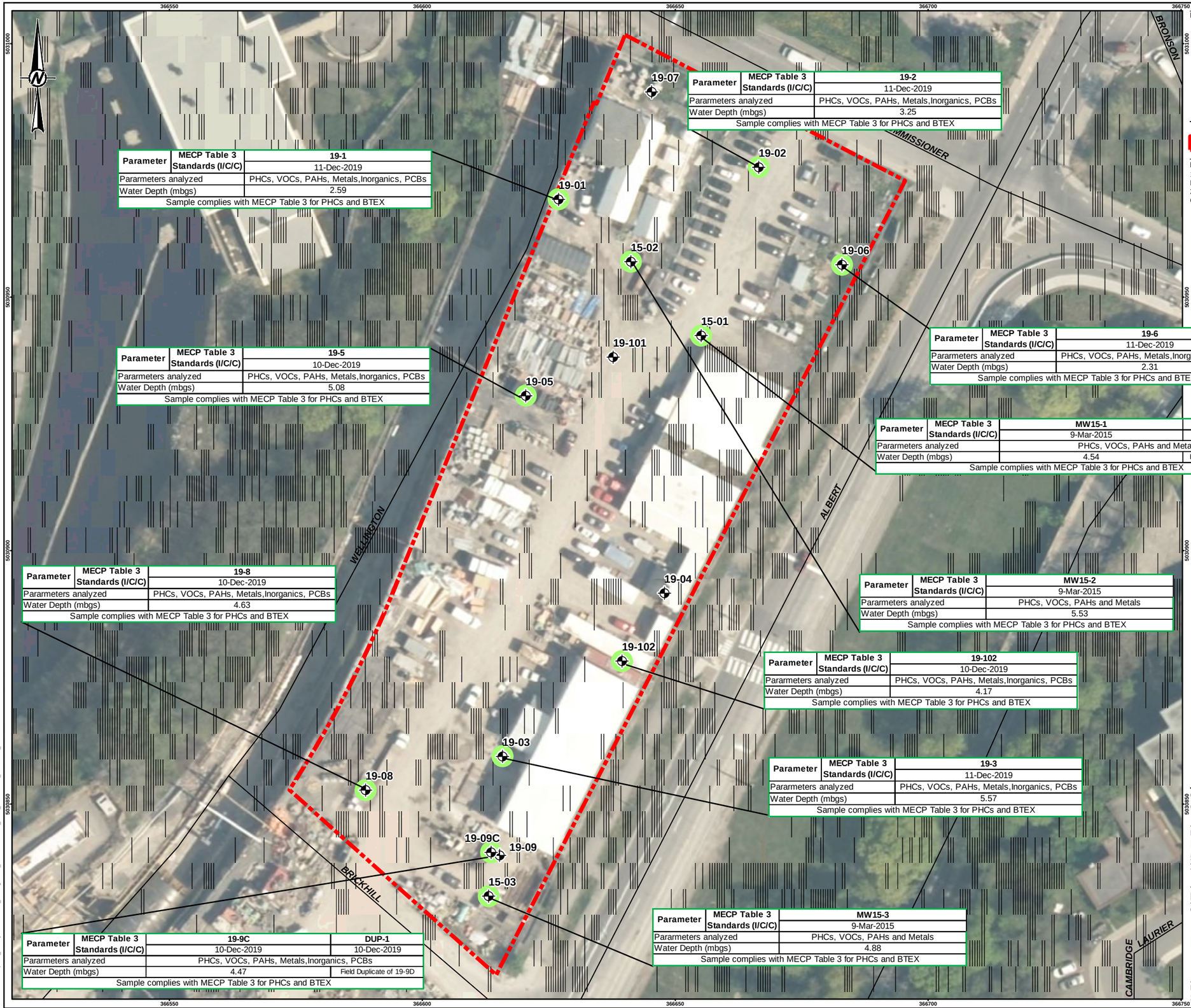


Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for PHCs and BTEX			

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PHCs and BTEX			

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for PHCs and BTEX		

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

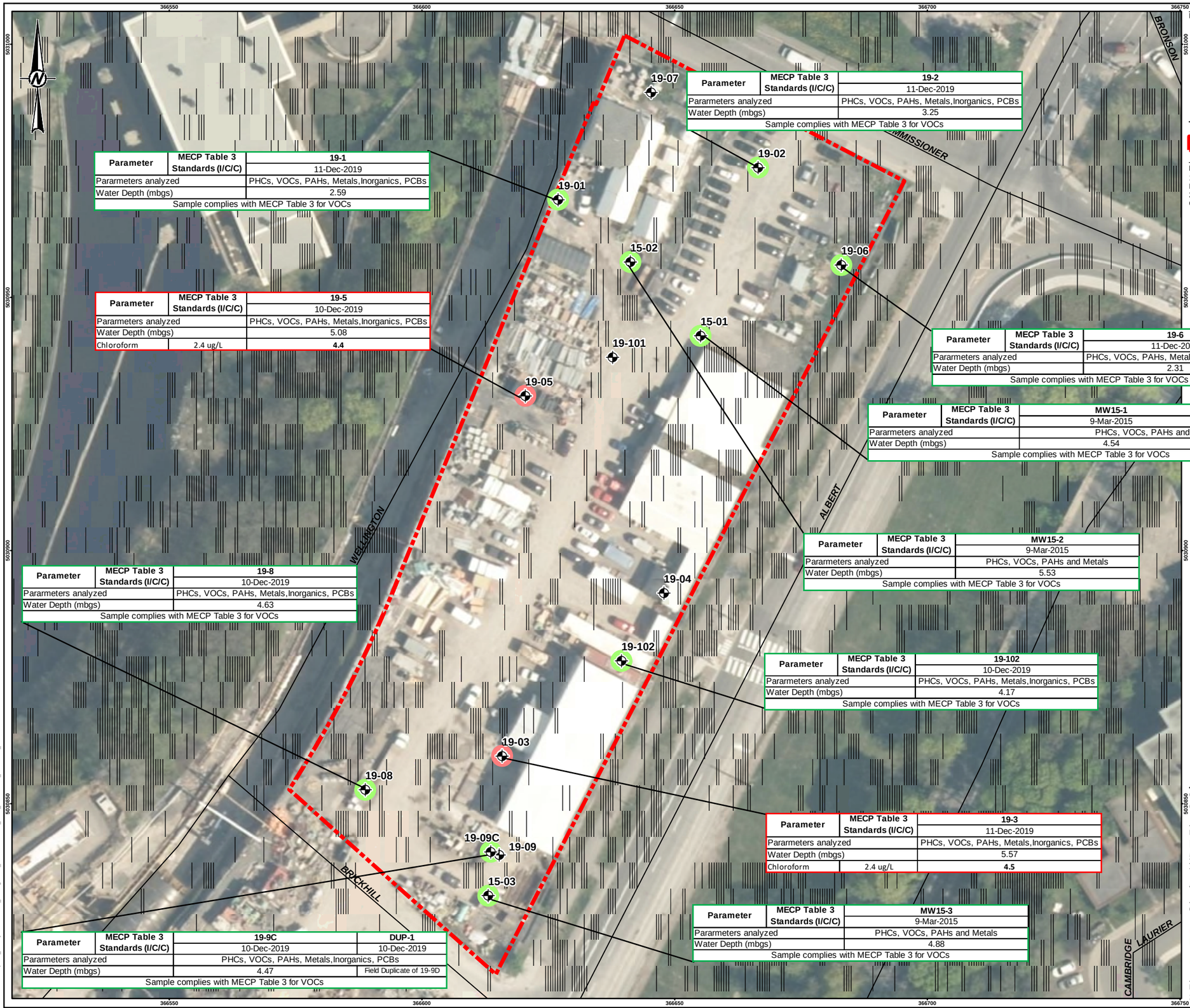
TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: PHCs AND BTEX

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	9

Path: N:\Active\Spatial_IM\City\Ottawa\557_Wellington\99_PRO\19120705_CofO_Enviro\0002_PhaseTwo_ESA\19120705-0002-HS-0009.mxd



Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Chloroform	2.4 ug/L	**4.4**

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for VOCs			

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Chloroform	2.4 ug/L	**4.5**

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for VOCs			

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: VOCs

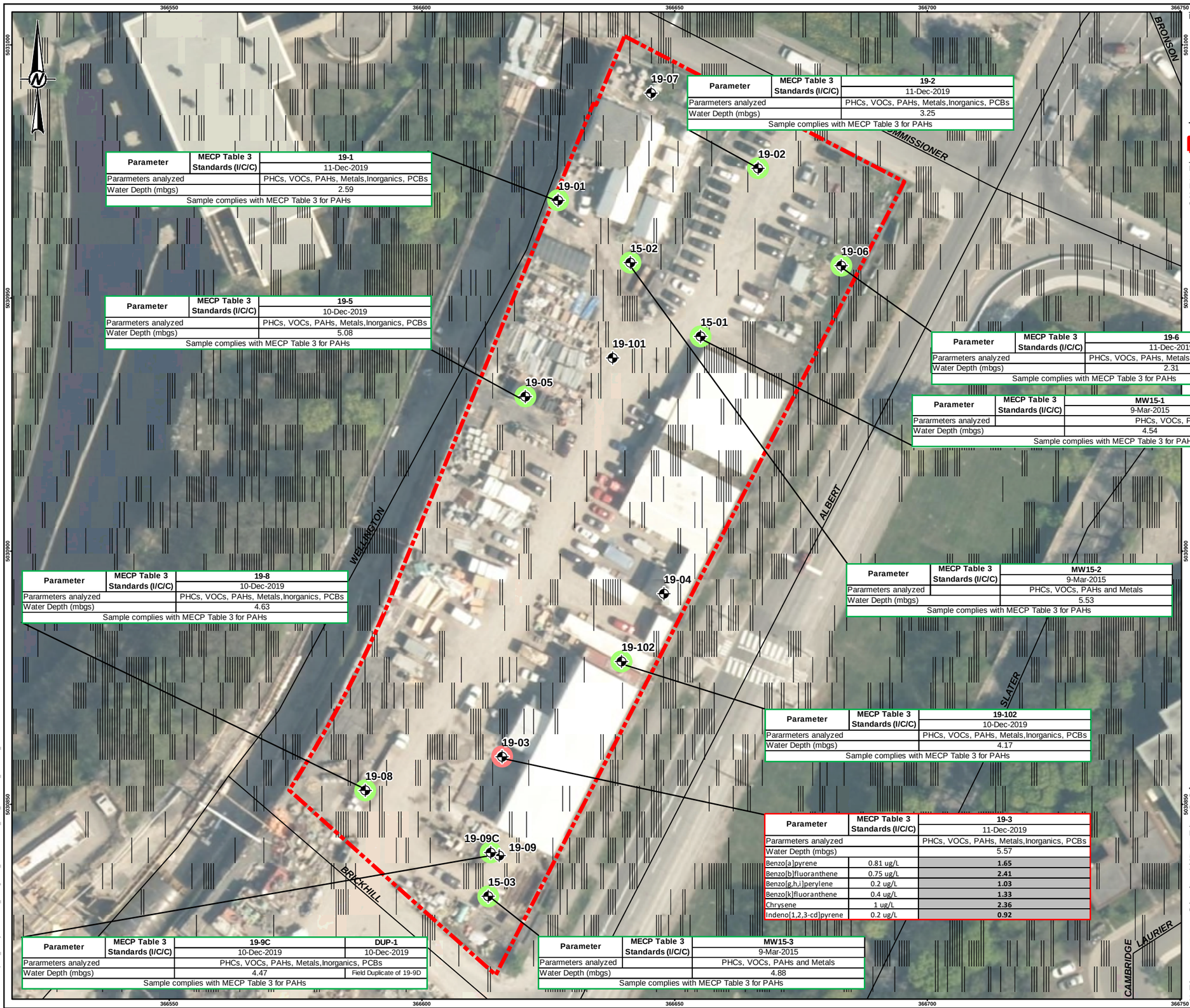
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**10**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_IM\City\Ottawa\557_Wellington\99_PRO\19120705_CofO_Enviro\0002_PhaseTwo_ESA\19120705-0002-HS-0010.mxd



Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for PAHs			

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Benzo[a]pyrene	0.81 ug/L	**1.65**
Benzo[b]fluoranthene	0.75 ug/L	**2.41**
Benzo[g,h,i]perylene	0.2 ug/L	**1.03**
Benzo[k]fluoranthene	0.4 ug/L	**1.33**
Chrysene	1 ug/L	**2.36**
Indeno[1,2,3-cd]pyrene	0.2 ug/L	**0.92**

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PAHs			

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for PAHs		

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: PAHs

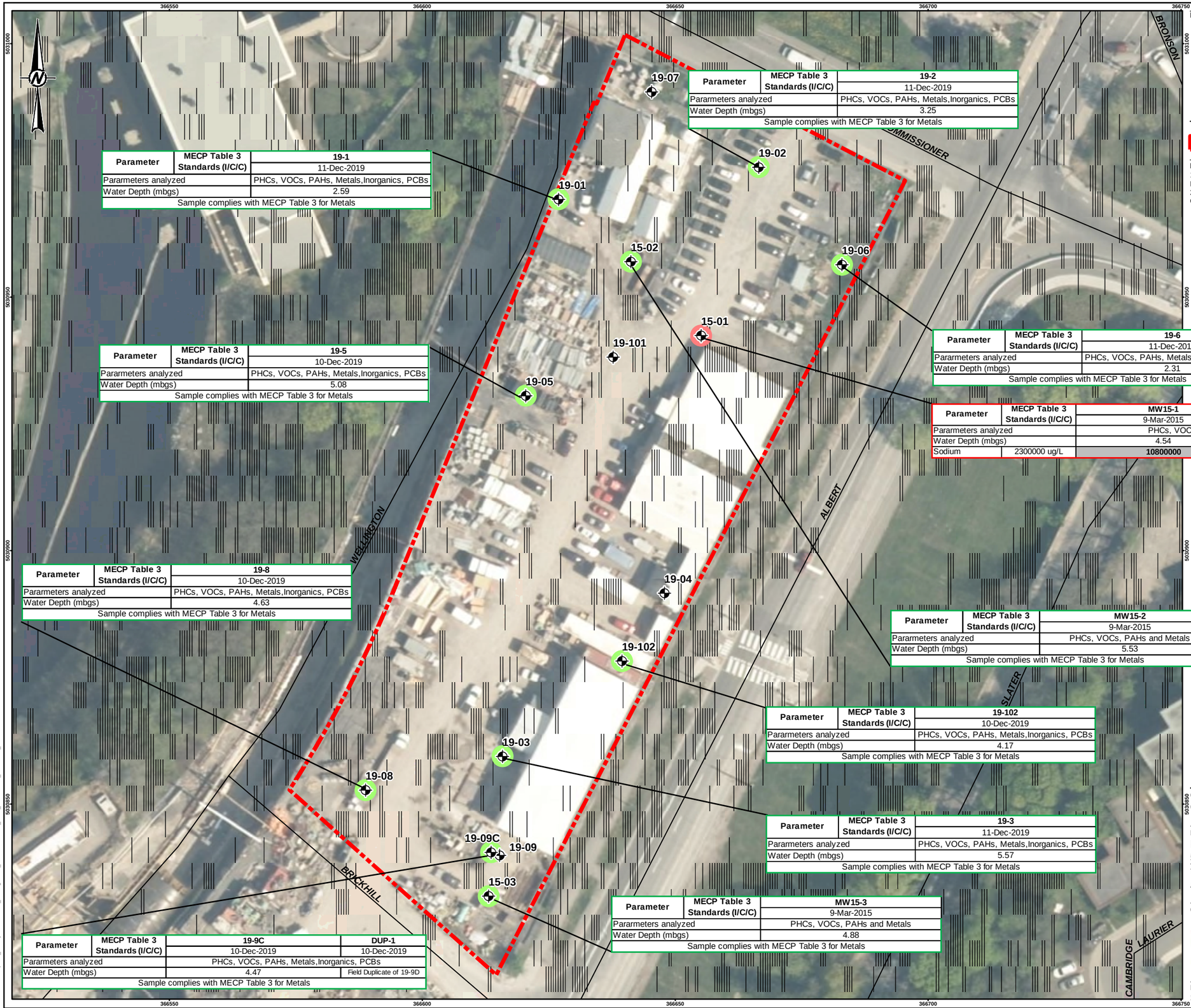
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**11**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 25mm

Path: N:\Active\Spatial_IM\Cityof\Ottawa\557_Wellington\99_PRO\19120705_CofO_Enviro\0002_PhaseTwo_ESA\19120705-0002-HS-0011.mxd



Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sodium	2300000 ug/L	**10800000**	**10300000**

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for Metals			

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: METALS

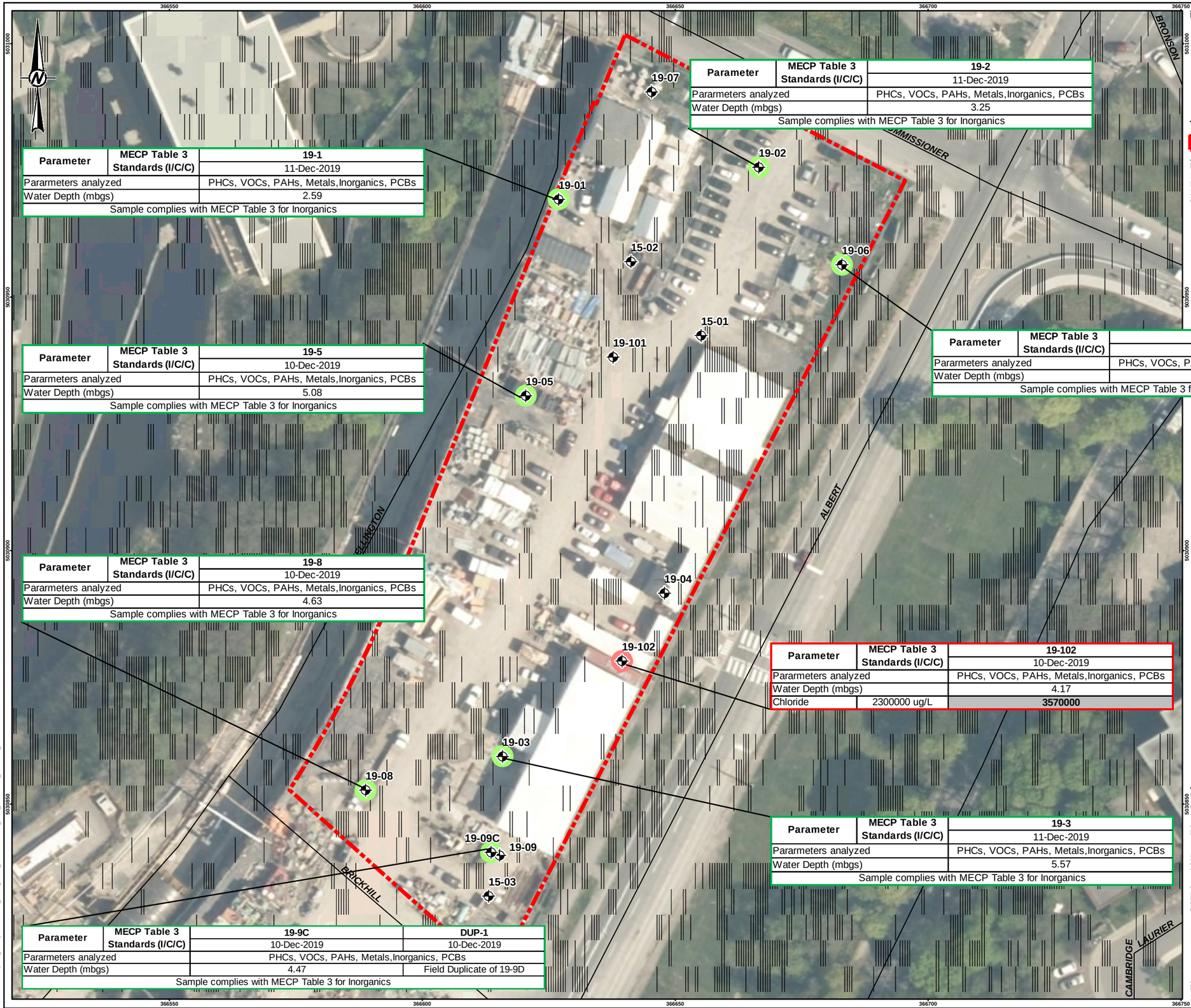
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**12**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 25mm

Path: N:\Active\Spatial_IM\Cyd\Ottawa\557_Wellington\99_PRO\19120705_CofO_Enviro\0002_Phase\Two_ESA\19120705-0002-HS-0012.mxd



Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Chloride	2300000 ug/L	**3570000**

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for Inorganics			

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: INORGANICS

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	**13**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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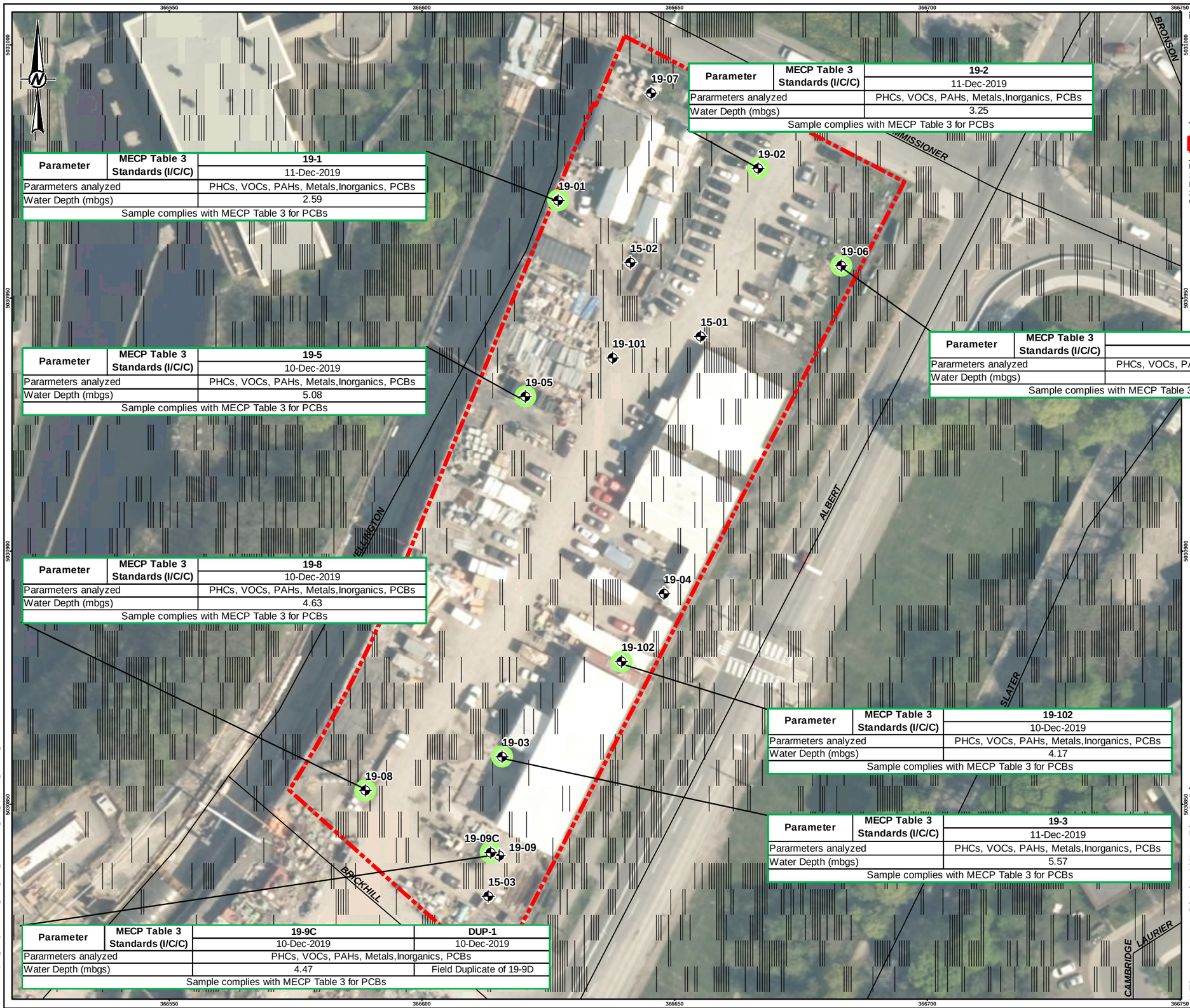


Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for PCBs		

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Pararmeters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PCBs			

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- LOCATION MEETING APPLICABLE MECP STANDARDS
- LOCATION WITH ONE OR MORE SAMPLES EXCEEDING APPLICABLE MECP STANDARDS
- ROADWAY
- SITE BOUNDARY

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40
1:750 METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
ANALYSIS AND EXCEEDANCES IN GROUNDWATER: PCBs

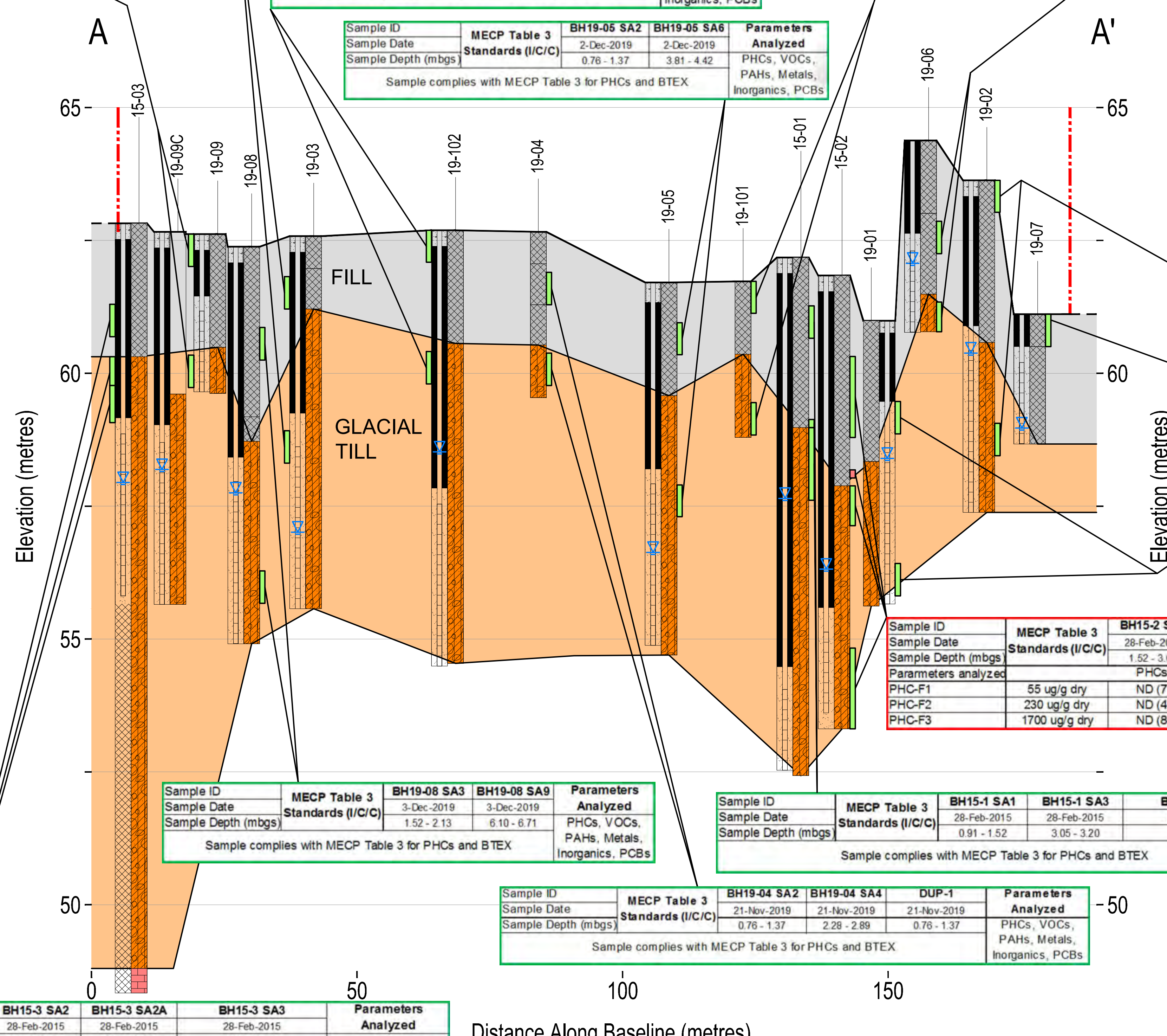
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-02
DESIGNED	----
PREPARED	JEM
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 25mm

Path: N:\Active\Spatial_IM\City\of Ottawa\557_Wellington\99_PRO\19120705_CofO_Enviro\0002_Phase\Two_ESA\19120705-0002-HS-0014.mxd



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	PHCs, VOCs, PAHs, Metals,
Sample complies with MECP Table 3 for PHCs and BTEX					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX			

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Pararmeters analyzed	PHCs, VOCs, PAHs, and Metals				
PHC-F1	55 ug/g dry	ND (7)	**243**	ND (7)	ND (7)
PHC-F2	230 ug/g dry	ND (4)	**2720**	18	ND (4)
PHC-F3	1700 ug/g dry	ND (8)	**2490**	37	ND (8)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX				

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	PHCs, VOCs, PAHs, and Metals
Sample complies with MECP Table 3 for PHCs and BTEX					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for PHCs and BTEX					

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	PHCs, VOCs, PAHs, and Metals
Sample complies with MECP Table 3 for PHCs and BTEX					

LEGEND

BOREHOLE/MONITORING IDENTIFIER (19-01)
GROUNDWATER LEVEL
STRATIGRAPHY
WELL SCREEN
SITE BOUNDARY
FILL
GLACIAL TILL
LIMESTONE BEDROCK
LOCATION MEETING APPLICABLE MECP STANDARD
LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH PHCs AND BTEX ANALYSIS AND EXCEEDANCE IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	15

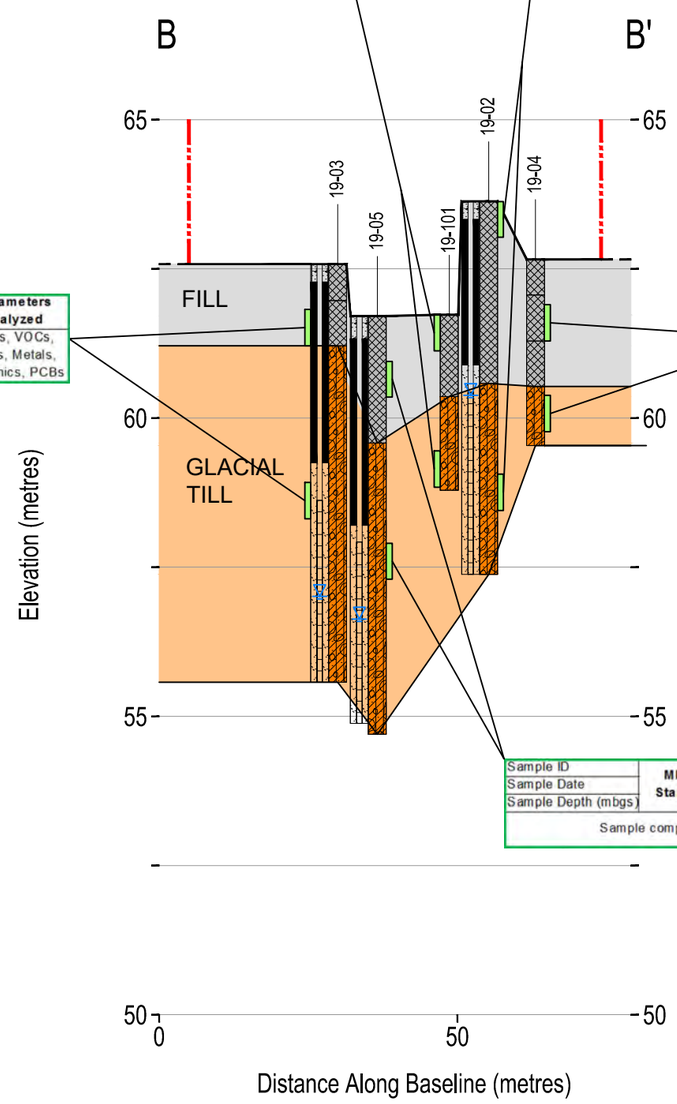
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for PHCs and BTEX					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PHCs and BTEX				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs



LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH PHCs AND BTEX ANALYSIS AND EXCEEDANCE IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	16

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				

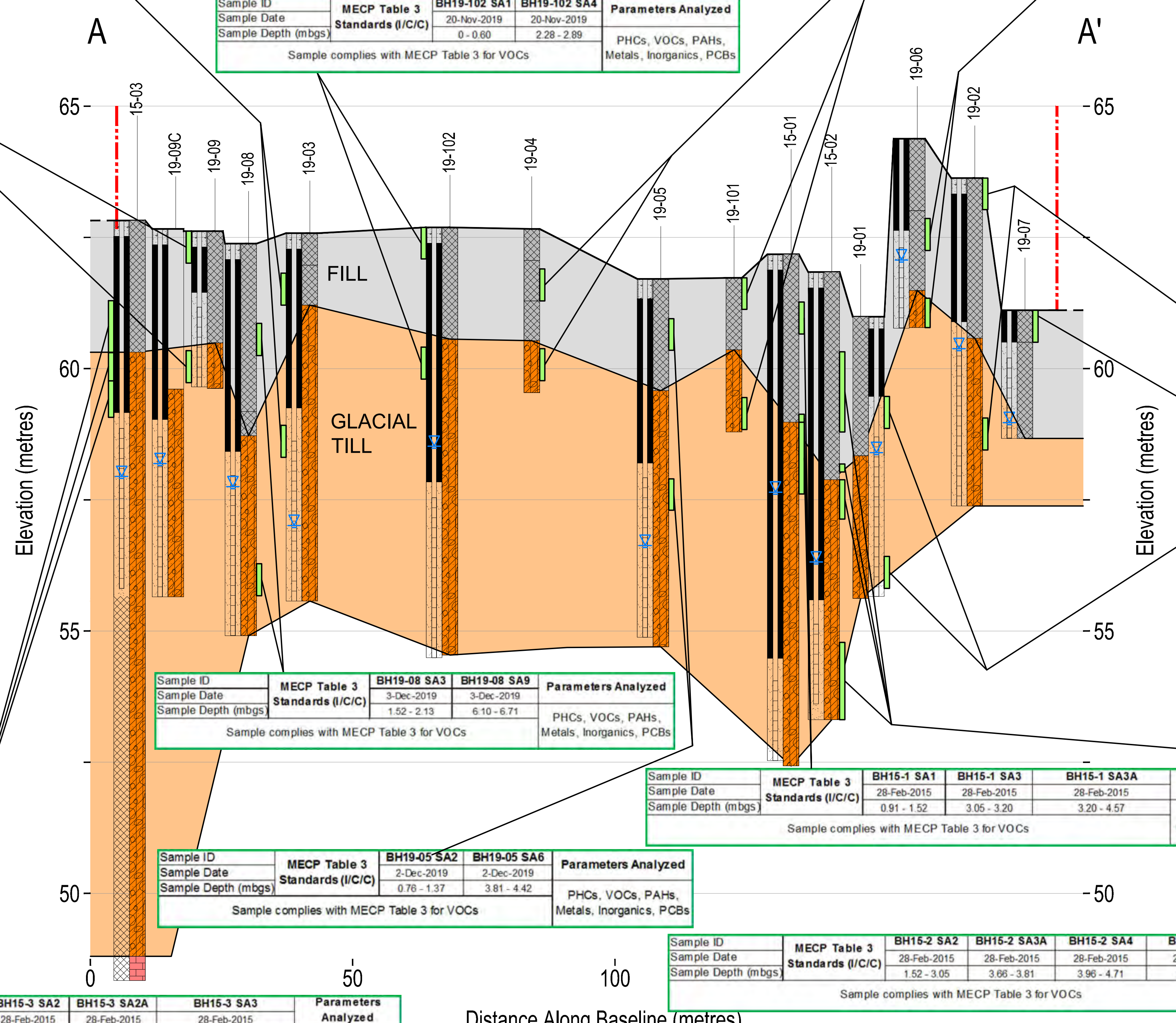
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for VOCs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for VOCs					



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for VOCs			

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	
Sample complies with MECP Table 3 for VOCs				

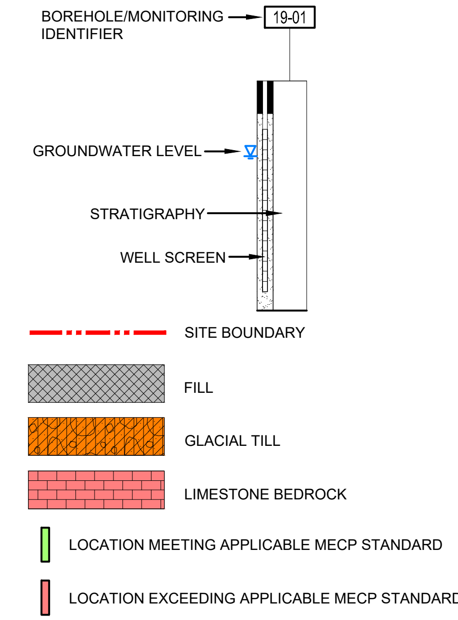
Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and Metals
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57	
Sample complies with MECP Table 3 for VOCs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for VOCs				

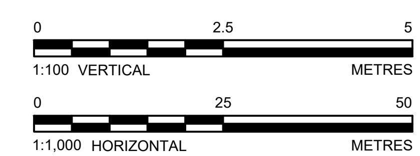
Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and Metals
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	
Sample complies with MECP Table 3 for VOCs						

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and Metals
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	
Sample complies with MECP Table 3 for VOCs					

LEGEND



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2



CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH VOCs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT

GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

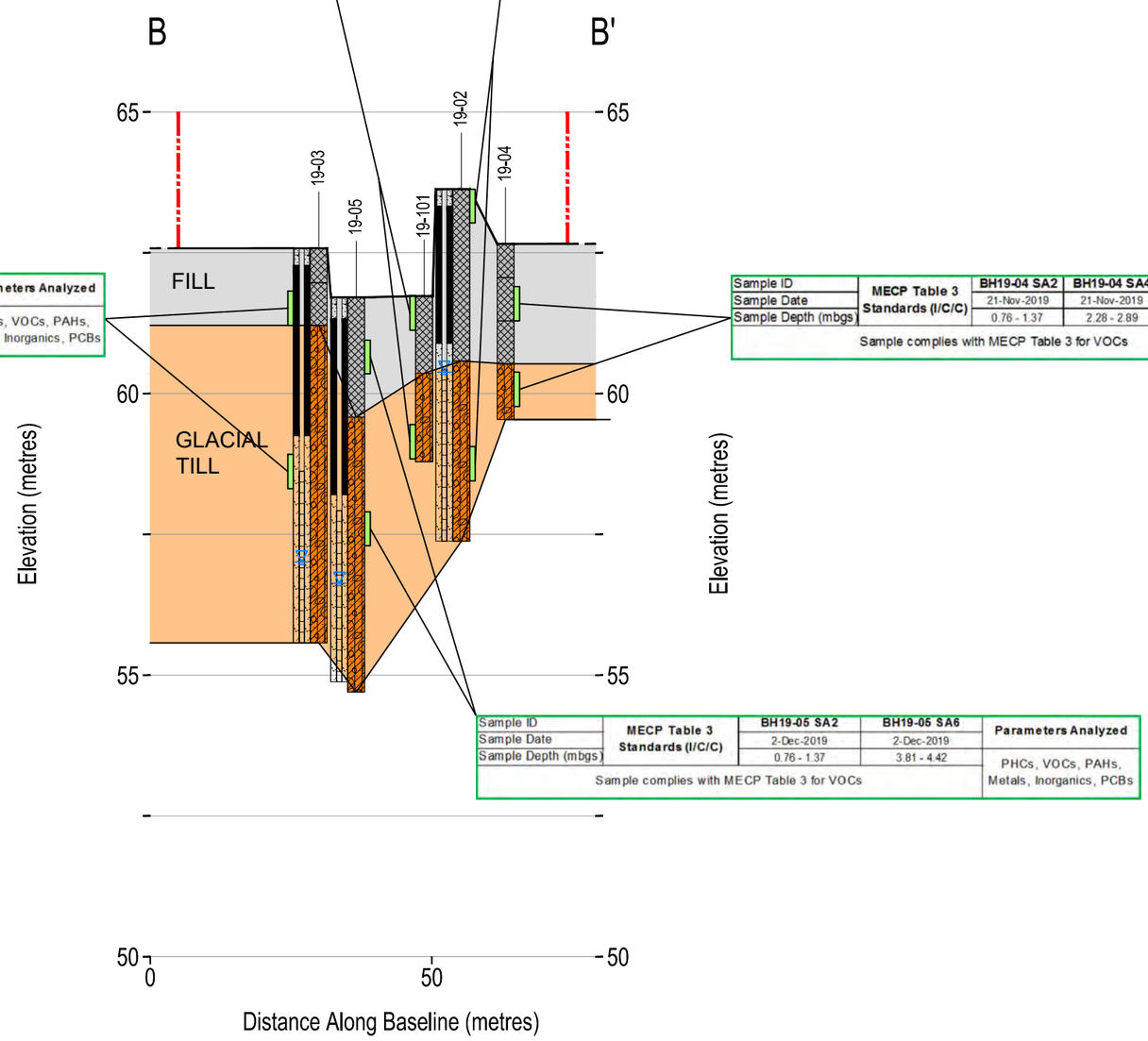
PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	17

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

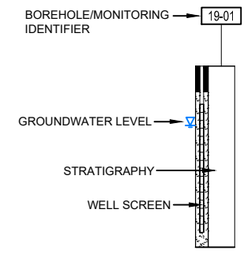
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for VOCs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for VOCs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

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3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH VOCs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PAHs				

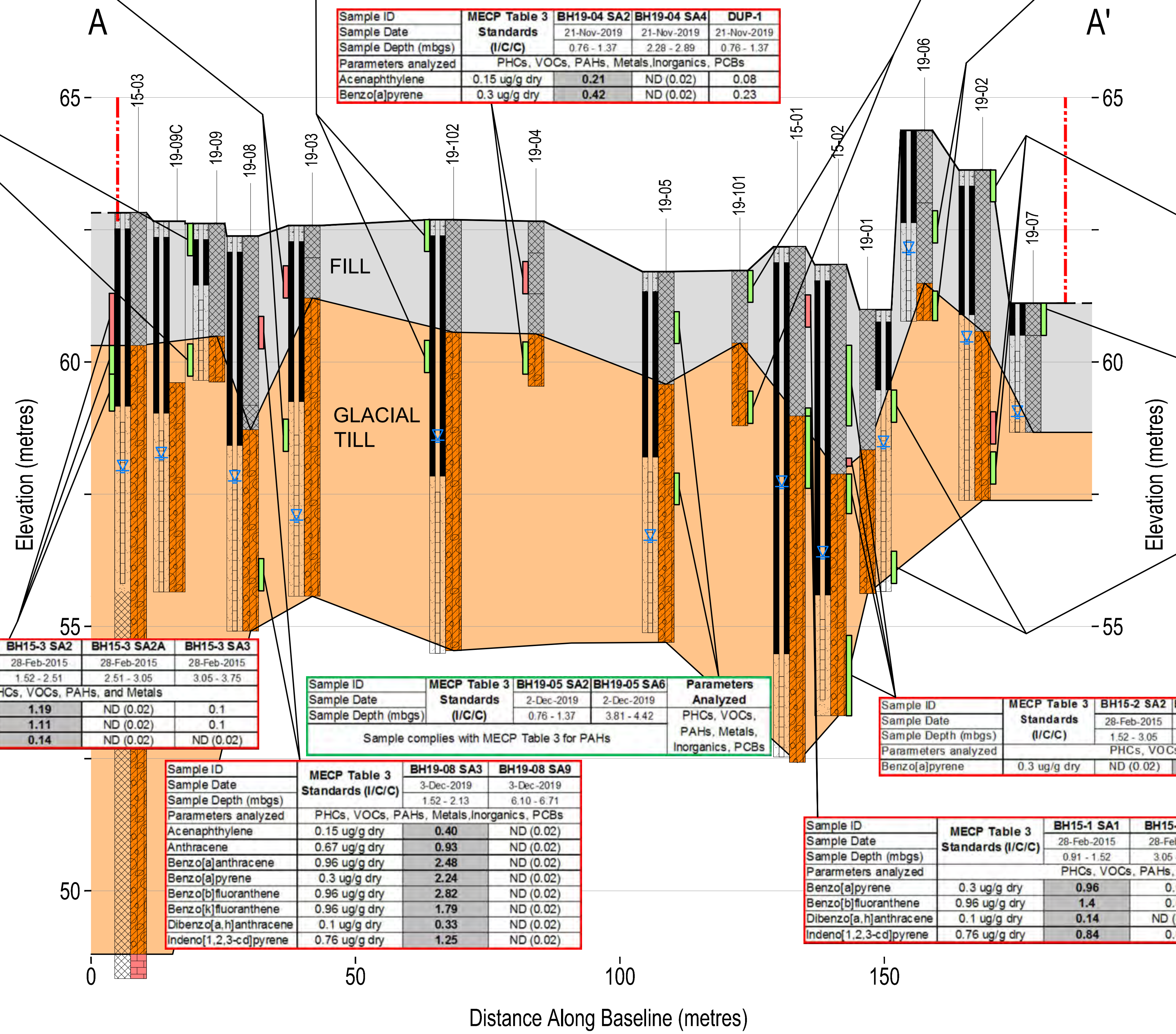
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Acenaphthylene	0.15 ug/g dry	**0.20**	ND (0.02)
Anthracene	0.67 ug/g dry	**0.89**	ND (0.02)
Benzo[a]anthracene	0.96 ug/g dry	**1.27**	ND (0.02)
Benzo[a]pyrene	0.3 ug/g dry	**1.05**	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**1.22**	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for PAHs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Acenaphthylene	0.15 ug/g dry	**0.21**	ND (0.02)	0.08
Benzo[a]pyrene	0.3 ug/g dry	**0.42**	ND (0.02)	0.23



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	5.33 - 5.94	4.57 - 5.18
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs				
Benzo[a]pyrene	0.3 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	**0.50**

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics,
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for PAHs			

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for VOCs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75
Parameters analyzed	PHCs, VOCs, PAHs, and Metals			
Benzo[a]pyrene	0.3 ug/g dry	**1.19**	ND (0.02)	0.1
Benzo[b]fluoranthene	0.96 ug/g dry	**1.11**	ND (0.02)	0.1
Dibenzo[a,h]anthracene	0.1 ug/g dry	**0.14**	ND (0.02)	ND (0.02)

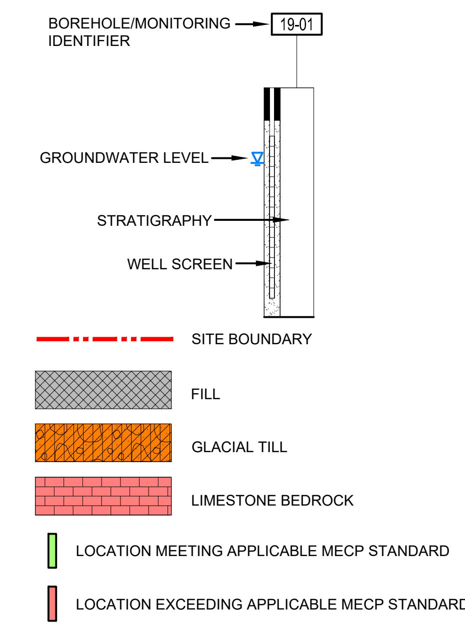
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PAHs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Acenaphthylene	0.15 ug/g dry	**0.40**	ND (0.02)
Anthracene	0.67 ug/g dry	**0.93**	ND (0.02)
Benzo[a]anthracene	0.96 ug/g dry	**2.48**	ND (0.02)
Benzo[a]pyrene	0.3 ug/g dry	**2.24**	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**2.82**	ND (0.02)
Benzo[k]fluoranthene	0.96 ug/g dry	**1.79**	ND (0.02)
Dibenzo[a,h]anthracene	0.1 ug/g dry	**0.33**	ND (0.02)
Indeno[1,2,3-cd]pyrene	0.76 ug/g dry	**1.25**	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53
Parameters analyzed	PHCs, VOCs, PAHs, and Metals				
Benzo[a]pyrene	0.3 ug/g dry	ND (0.02)	**0.53**	ND (0.2)	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57
Parameters analyzed	PHCs, VOCs, PAHs, and Metals			
Benzo[a]pyrene	0.3 ug/g dry	**0.96**	0.03	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**1.4**	0.05	ND (0.02)
Dibenzo[a,h]anthracene	0.1 ug/g dry	**0.14**	ND (0.02)	ND (0.02)
Indeno[1,2,3-cd]pyrene	0.76 ug/g dry	**0.84**	0.03	ND (0.02)

LEGEND



NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH PAHs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

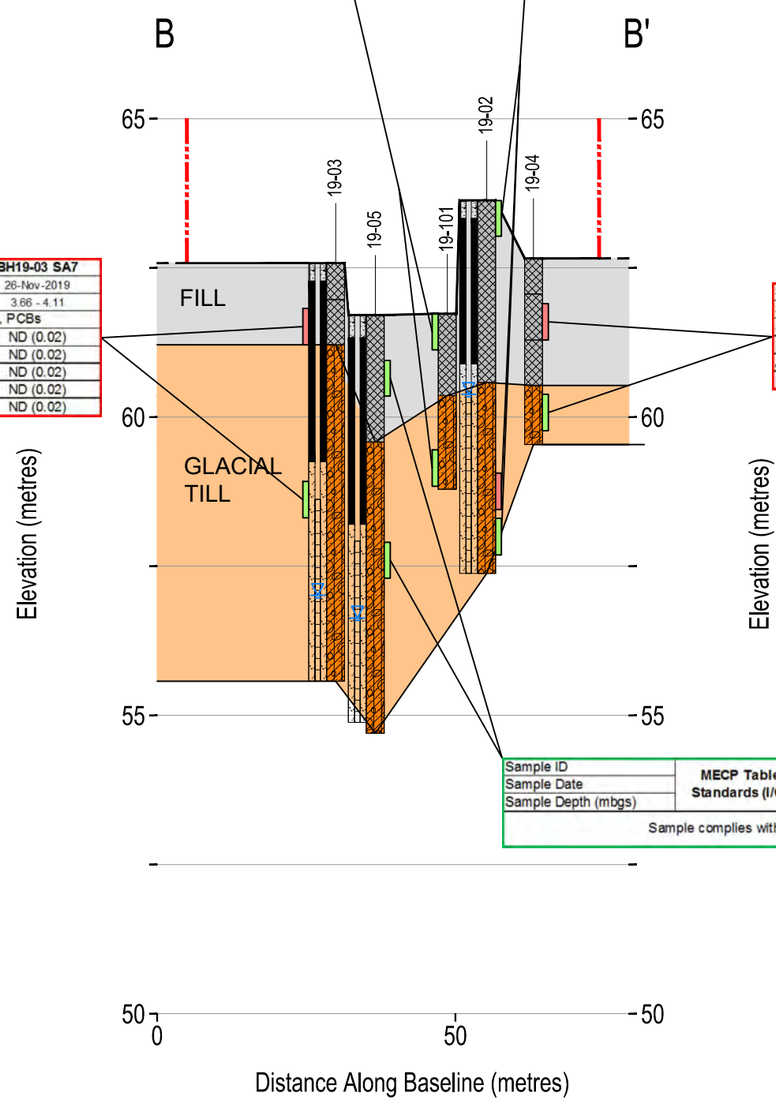
PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	19

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PAHs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	BH19-02 SA8	DUP-3
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	5.33 - 5.94	4.57 - 5.18
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Benzo[a]pyrene	0.3 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	**0.50**

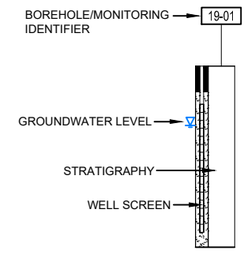
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Acenaphthylene	0.15 ug/g dry	**0.20**	ND (0.02)
Anthracene	0.67 ug/g dry	**0.89**	ND (0.02)
Benzo[a]anthracene	0.96 ug/g dry	**1.27**	ND (0.02)
Benzo[a]pyrene	0.3 ug/g dry	**1.05**	ND (0.02)
Benzo[b]fluoranthene	0.96 ug/g dry	**1.22**	ND (0.02)

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Acenaphthylene	0.15 ug/g dry	**0.21**	ND (0.02)	0.08
Benzo[a]pyrene	0.3 ug/g dry	**0.42**	ND (0.02)	0.23



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PAHs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

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3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH PAHs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	20

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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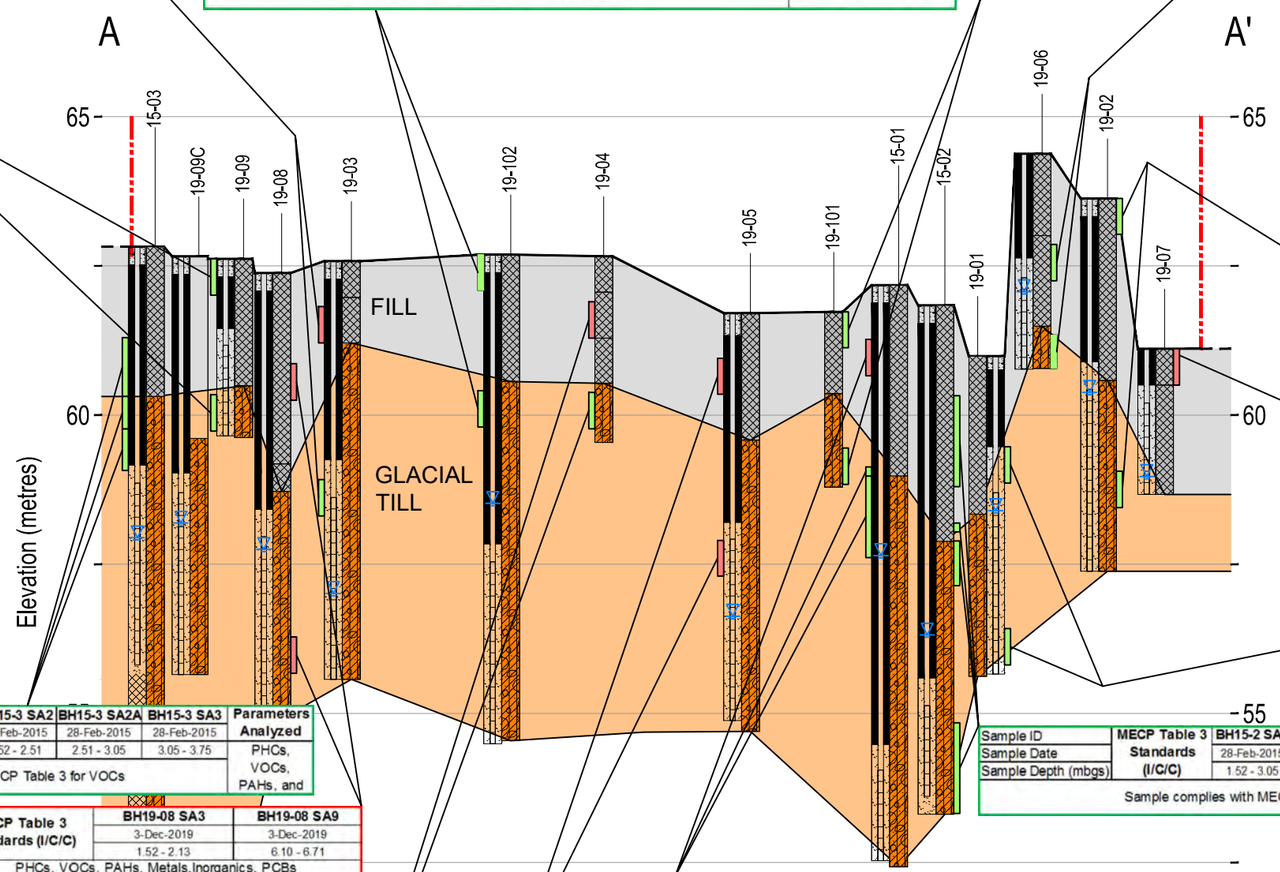
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for Metals					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**187**	4.5

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				



Sample ID	MECP Table 3 Standards (I/C/C)	BH15-3 SA2	BH15-3 SA2A	BH15-3 SA3	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and
Sample Depth (mbgs		1.52 - 2.51	2.51 - 3.05	3.05 - 3.75	
Sample complies with MECP Table 3 for VOCs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Arsenic	18 ug/g dry	**21.9**	7.5
Barium	670 ug/g dry	**1140**	209
Cadmium	1.9 ug/g dry	**2.9**	ND (0.5)
Lead	120 ug/g dry	**844**	11.2
Vanadium	86 ug/g dry	**136**	**129**
Zinc	340 ug/g dry	**721**	82.3

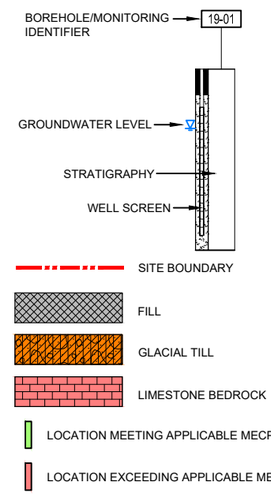
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Barium	670 ug/g dry	**764**	51.9	379
Copper	230 ug/g dry	122	8.7	**364**
Lead	120 ug/g dry	**498**	5.5	**443**
Zinc	340 ug/g dry	**391**	28.5	**366**

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-1 SA1	BH15-1 SA3	BH15-1 SA3A
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015
Sample Depth (mbgs)		0.91 - 1.52	3.05 - 3.20	3.20 - 4.57
Parameters analyzed	PHCs, VOCs, PAHs, and Metals			
Lead	120 ug/g dry	**400**	38.4	4.5

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6
Sample Date		2-Dec-2019	2-Dec-2019
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**325**	14.5
Vanadium	86 ug/g dry	**125**	**161**

Sample ID	MECP Table 3 Standards (I/C/C)	BH15-2 SA2	BH15-2 SA3A	BH15-2 SA4	BH15-2 SA6	Parameters Analyzed
Sample Date		28-Feb-2015	28-Feb-2015	28-Feb-2015	28-Feb-2015	PHCs, VOCs, PAHs, and Metals
Sample Depth (mbgs)		1.52 - 3.05	3.66 - 3.81	3.96 - 4.71	7.01 - 8.53	
Sample complies with MECP Table 3 for VOCs						

LEGEND



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for Metals					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1
Sample Date		2-Dec-2019
Sample Depth (mbgs)		0 - 0.61
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Barium	670 ug/g dry	**1560**

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics,
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for Metals				

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH METALS ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	21

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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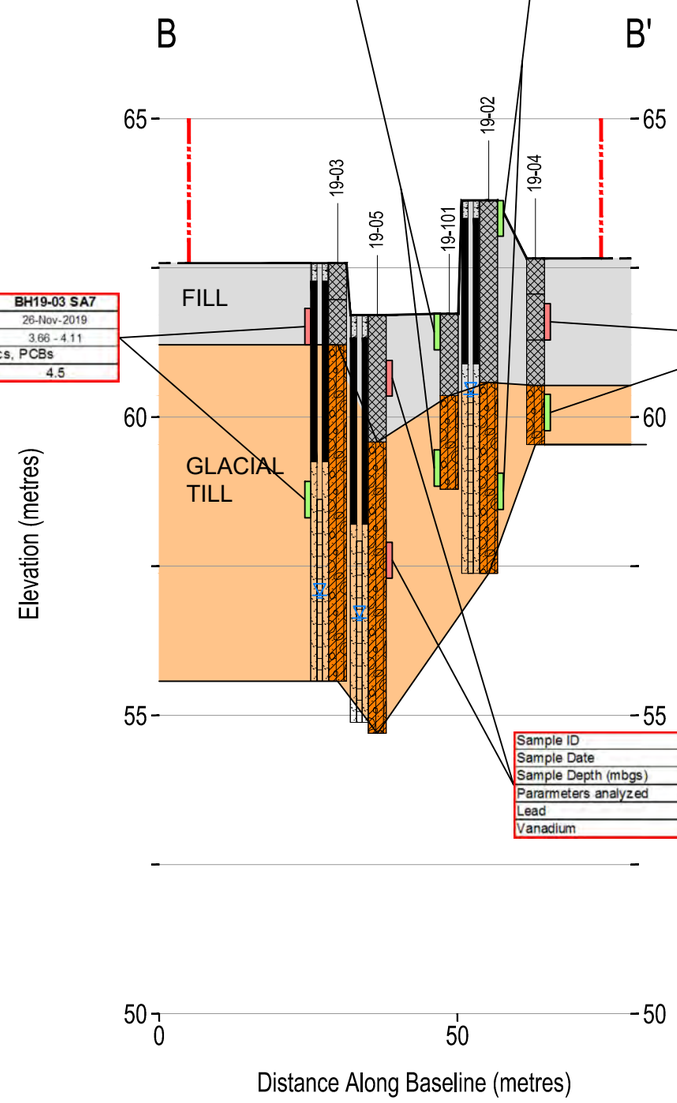
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for Metals					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Metals				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

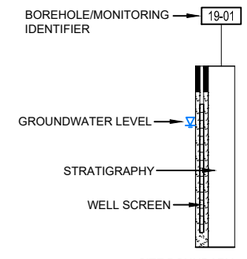


Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7
Sample Date		26-Nov-2019	26-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**187**	4.5

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs			
Barium	670 ug/g dry	**764**	51.9	379
Copper	230 ug/g dry	122	8.7	**364**
Lead	120 ug/g dry	**498**	5.5	**443**
Zinc	340 ug/g dry	**391**	28.5	**366**

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6
Sample Date		2-Dec-2019	2-Dec-2019
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42
Parameters analyzed	PHCs, VOCs, PAHs, Metals,Inorganics, PCBs		
Lead	120 ug/g dry	**325**	14.5
Vanadium	86 ug/g dry	**125**	**161**

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

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0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH METALS ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	22

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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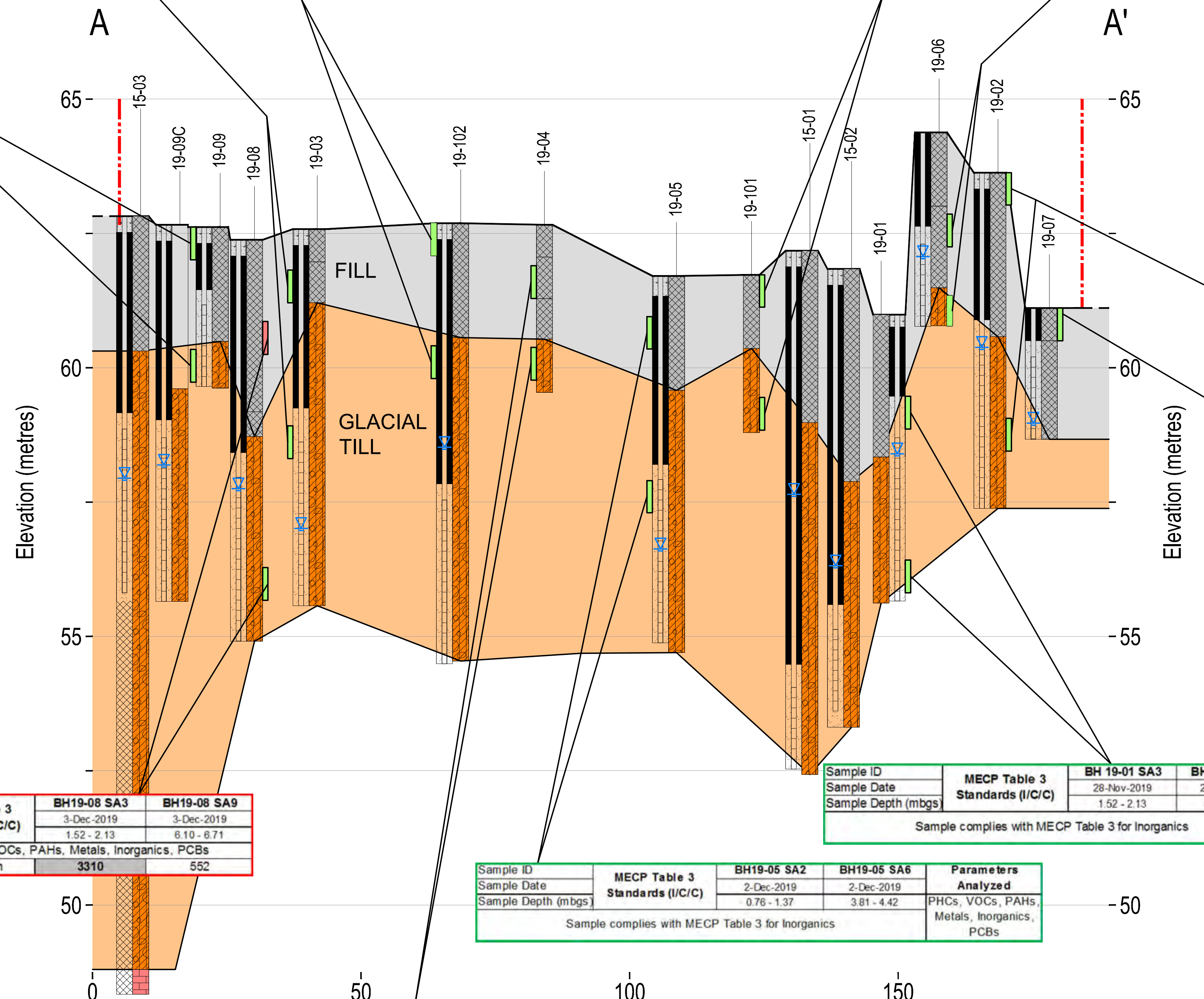
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	
Sample Depth (mbgs)		0 - 0.61	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics			

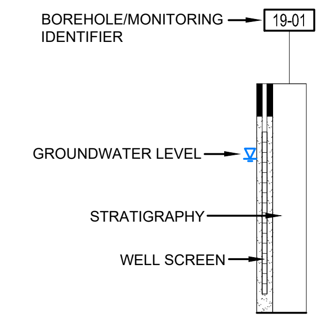
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9
Sample Date		3-Dec-2019	3-Dec-2019
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71
Parameters analyzed	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs		
EC	1400 uS/cm	3310	552

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics					

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LIMESTONE BEDROCK

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH INORGANICS ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

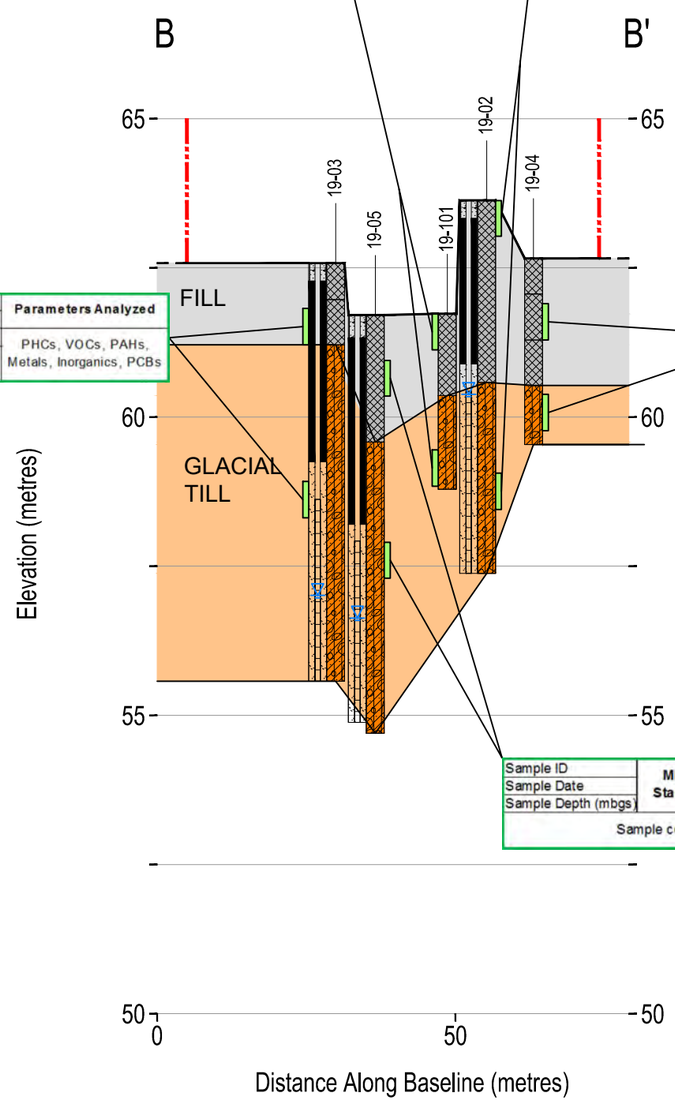
YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	23

25 mm
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

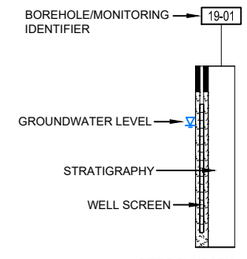


Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample complies with MECP Table 3 for Inorganics				

LEGEND



NOTE(S)

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3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH INORGANICS ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	24

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

Path: \\golder.gds\complexdata\office\ottawa\Active\Spatial_IM\CityofOttawa\557_Wellington\99_PROJ\19120705_CofO_Enviro\0002_PhaseTwo_ESA\ | File Name: 19120705-0002-HS-0015.dwg

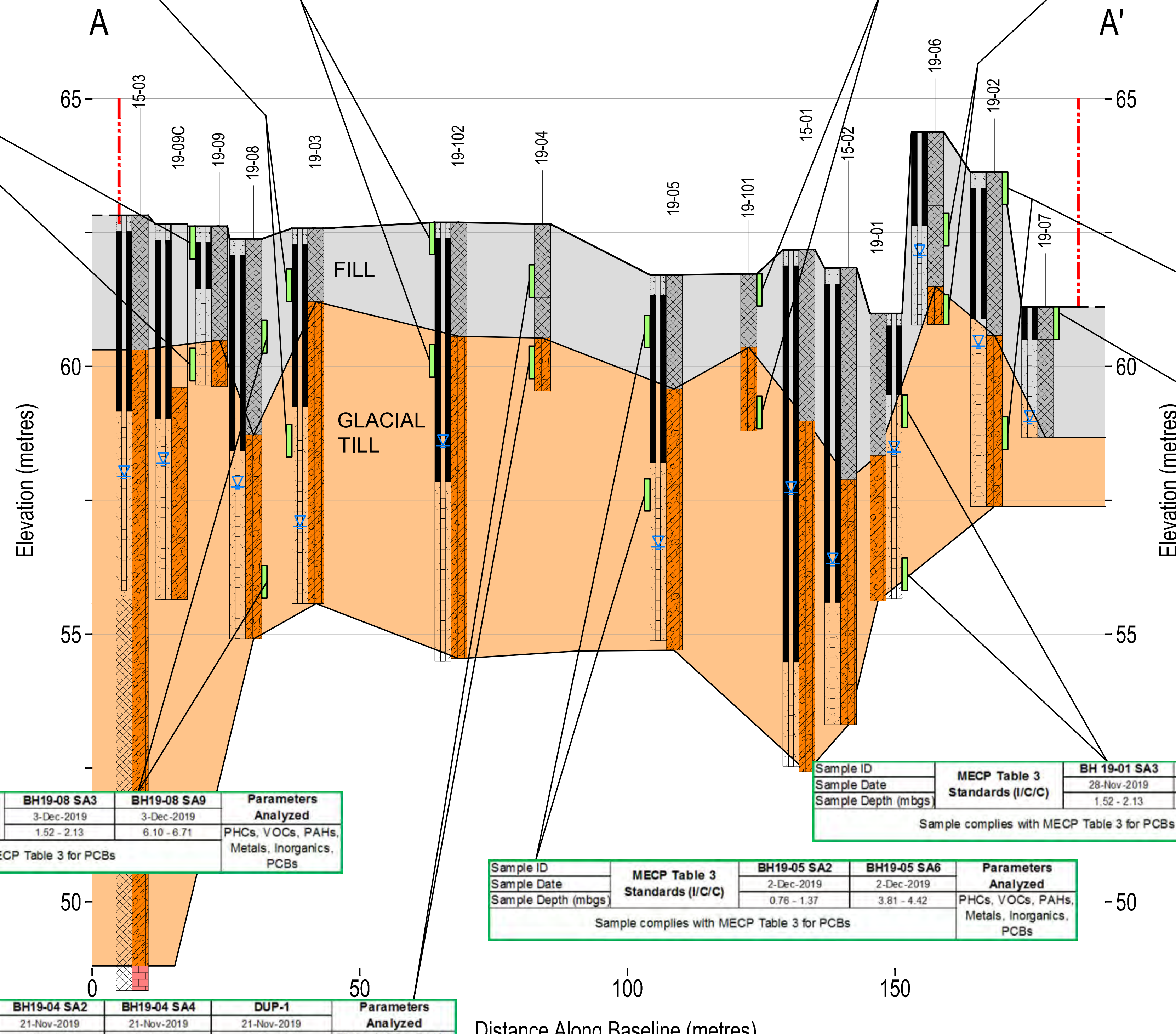
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-09 SA1	BH19-09 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for PCBs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for PCBs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-06 SA3	BH19-06 SA5	DUP-2	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	3.04 - 3.60	3.04 - 3.60	
Sample complies with MECP Table 3 for PCBs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-102 SA1	BH19-102 SA4	Parameters Analyzed
Sample Date		20-Nov-2019	20-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				



Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for PCBs					

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-07 SA1	Parameters Analyzed
Sample Date		2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0 - 0.61	
Sample complies with MECP Table 3 for PCBs			

Sample ID	MECP Table 3 Standards (I/C/C)	BH 19-01 SA3	BH 19-01 SA7	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	4.57 - 5.18	
Sample complies with MECP Table 3 for PCBs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-08 SA3	BH19-08 SA9	Parameters Analyzed
Sample Date		3-Dec-2019	3-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		1.52 - 2.13	6.10 - 6.71	
Sample complies with MECP Table 3 for PCBs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PCBs				

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	PHCs, VOCs, PAHs, Metals, Inorganics, PCBs
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for PCBs					

LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LIMESTONE BEDROCK

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH PCBs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	25

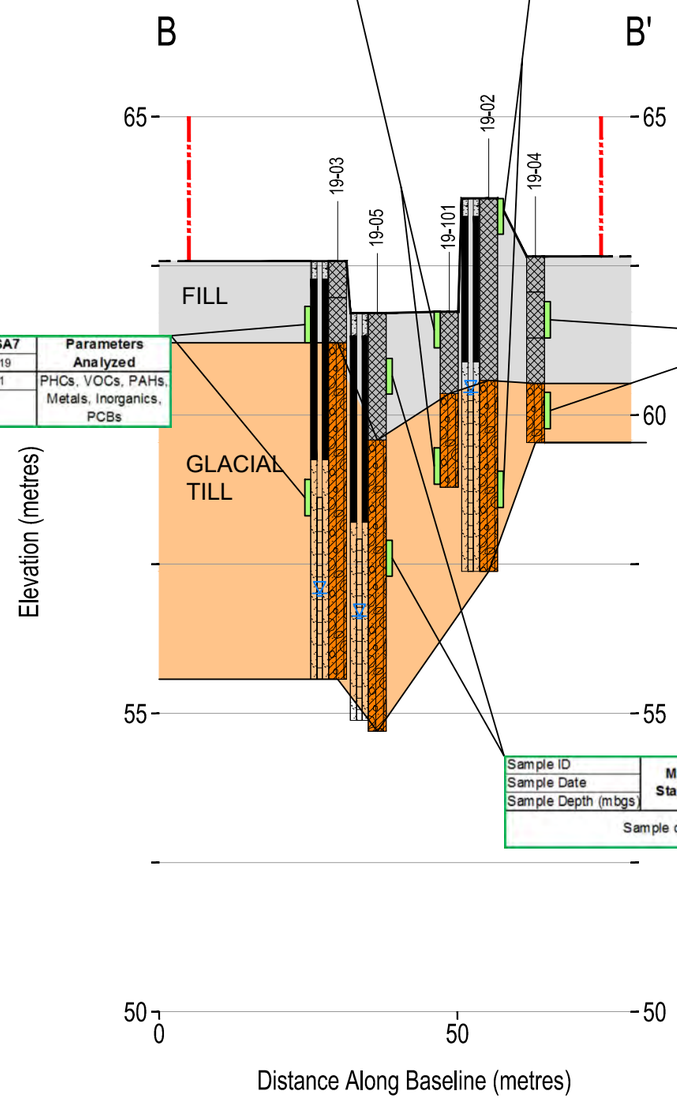
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-02 SA1	BH19-02 SA7	DUP-3	Parameters Analyzed
Sample Date		28-Nov-2019	28-Nov-2019	28-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	4.57 - 5.18	4.57 - 5.18	
Sample complies with MECP Table 3 for PCBs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-101 SA1	BH19-101 SA4	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0 - 0.60	2.28 - 2.89	
Sample complies with MECP Table 3 for Inorganics				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

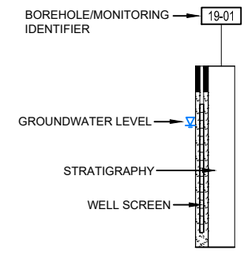
Sample ID	MECP Table 3 Standards (I/C/C)	BH19-03 SA2	BH19-03 SA7	Parameters Analyzed
Sample Date		26-Nov-2019	26-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.66 - 4.11	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-04 SA2	BH19-04 SA4	DUP-1	Parameters Analyzed
Sample Date		21-Nov-2019	21-Nov-2019	21-Nov-2019	
Sample Depth (mbgs)		0.76 - 1.37	2.28 - 2.89	0.76 - 1.37	
Sample complies with MECP Table 3 for PCBs					PHCs, VOCs, PAHs, Metals, Inorganics, PCBs

Sample ID	MECP Table 3 Standards (I/C/C)	BH19-05 SA2	BH19-05 SA6	Parameters Analyzed
Sample Date		2-Dec-2019	2-Dec-2019	
Sample Depth (mbgs)		0.76 - 1.37	3.81 - 4.42	
Sample complies with MECP Table 3 for PCBs				PHCs, VOCs, PAHs, Metals, Inorganics, PCBs



LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
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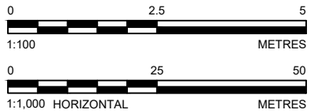
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2



CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH PCBs ANALYSIS AND EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	26

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

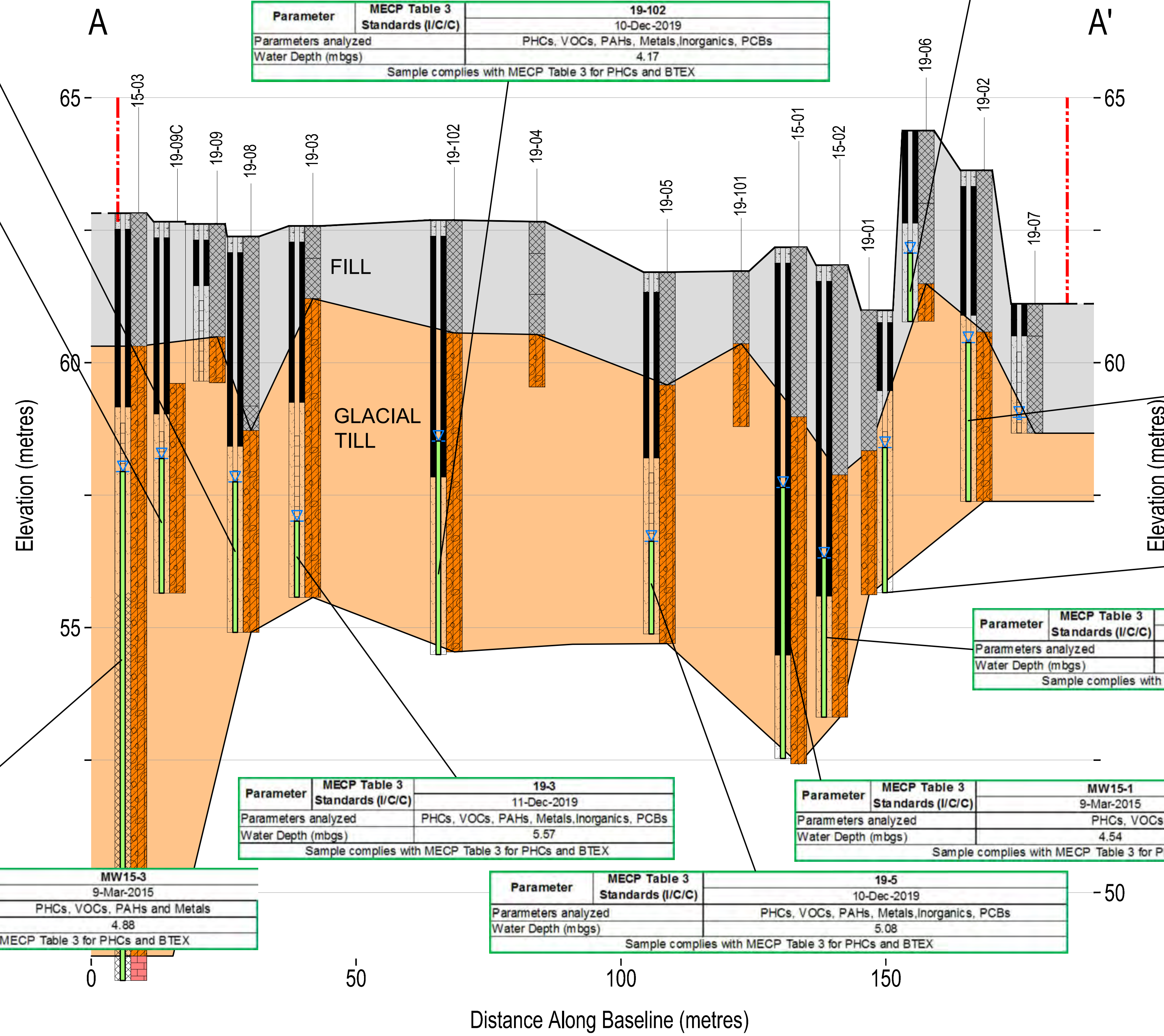
25 mm

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PHCs and BTEX			

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for PHCs and BTEX		



Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for PHCs and BTEX			

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PHCs and BTEX		

LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01
GROUNDWATER LEVEL
STRATIGRAPHY
WELL SCREEN
SITE BOUNDARY
FILL
GLACIAL TILL
LIMESTONE BEDROCK
LOCATION MEETING APPLICABLE MECP STANDARD
LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
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3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

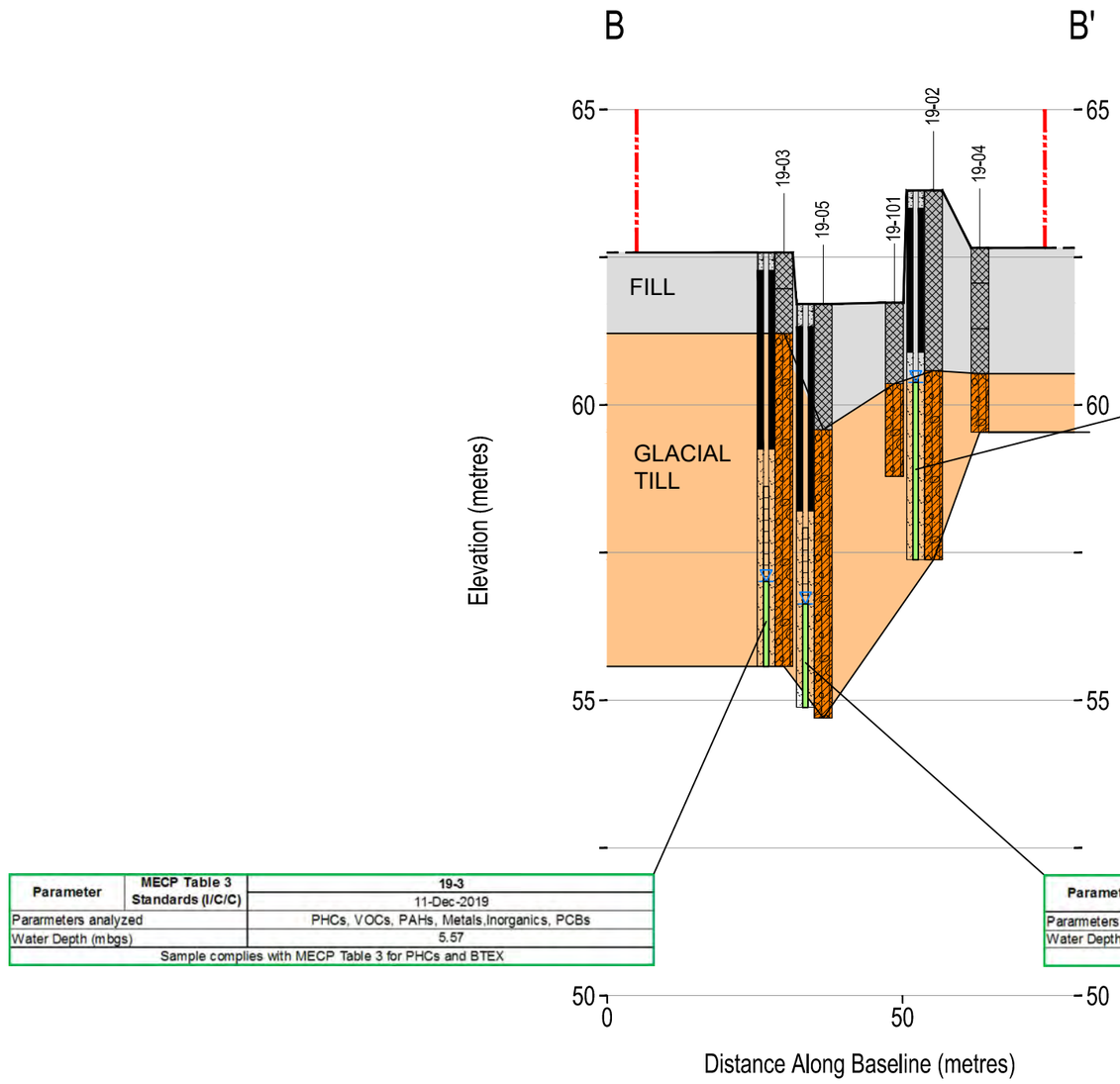
PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH PHCs AND BTEX ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	27

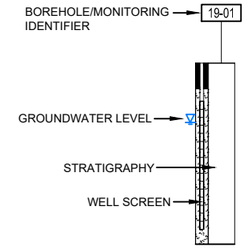


Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for PHCs and BTEX		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PHCs and BTEX		

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

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3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH PHCs AND BTEX ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	28

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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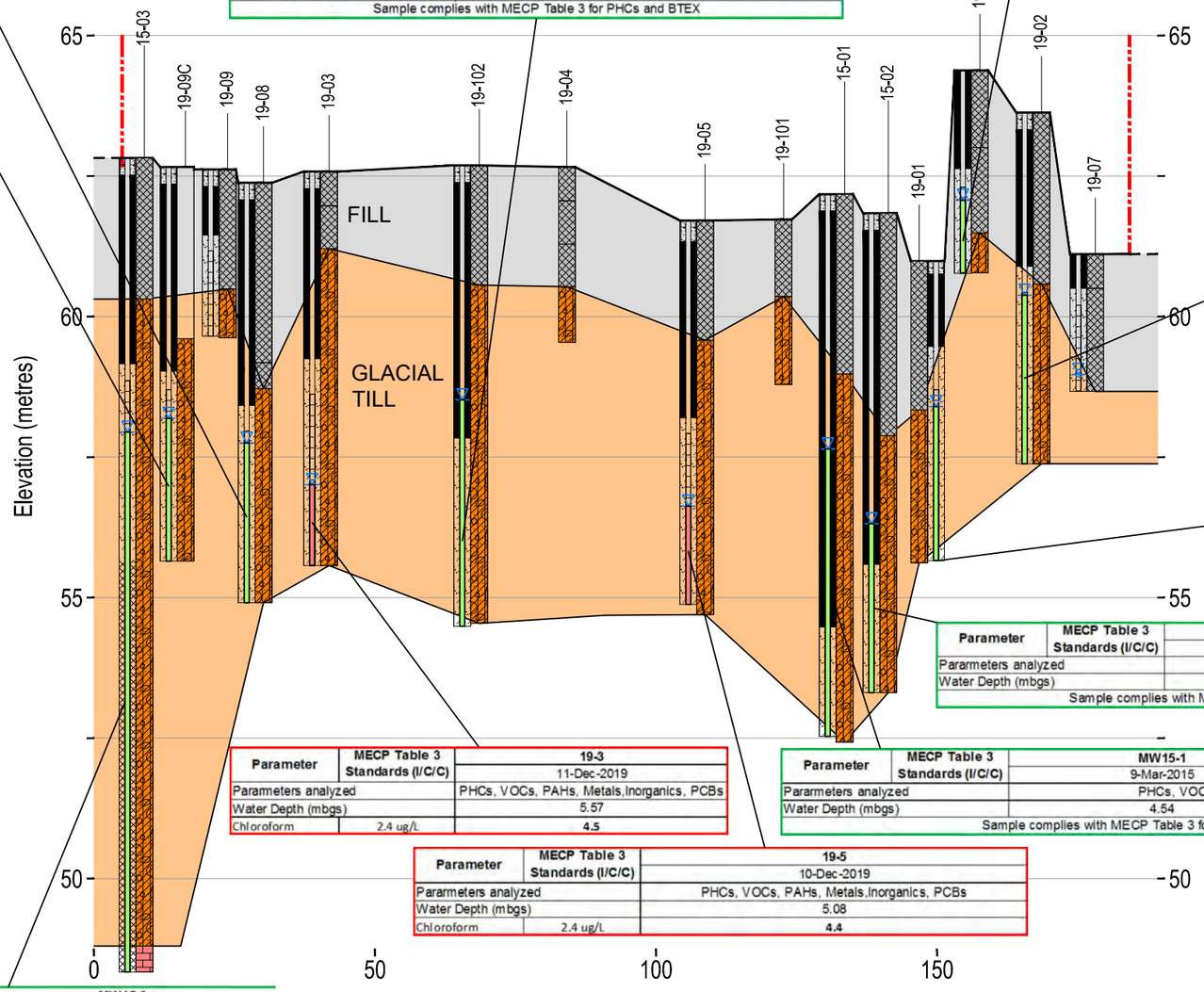
Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
Parameters analyzed		10-Dec-2019	10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for VOCs			

Parameter	MECP Table 3 Standards (I/C/C)	19-6
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		2.31
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		4.63
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		4.17
Sample complies with MECP Table 3 for PHCs and BTEX		



Parameter	MECP Table 3 Standards (I/C/C)	19-2
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		3.25
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-1
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		3.30
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
Parameters analyzed		9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals
		5.53
Sample complies with MECP Table 3 for VOCs		

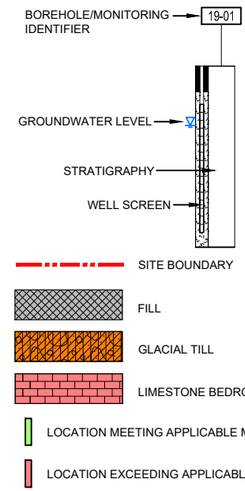
Parameter	MECP Table 3 Standards (I/C/C)	19-3
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		5.57
Chloroform	2.4 ug/L	4.5

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
Parameters analyzed		9-Mar-2015	9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals	
		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for VOCs			

Parameter	MECP Table 3 Standards (I/C/C)	19-5
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		5.08
Chloroform	2.4 ug/L	4.4

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
Parameters analyzed		9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals
		4.88
Sample complies with MECP Table 3 for VOCs		

LEGEND



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH VOCs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

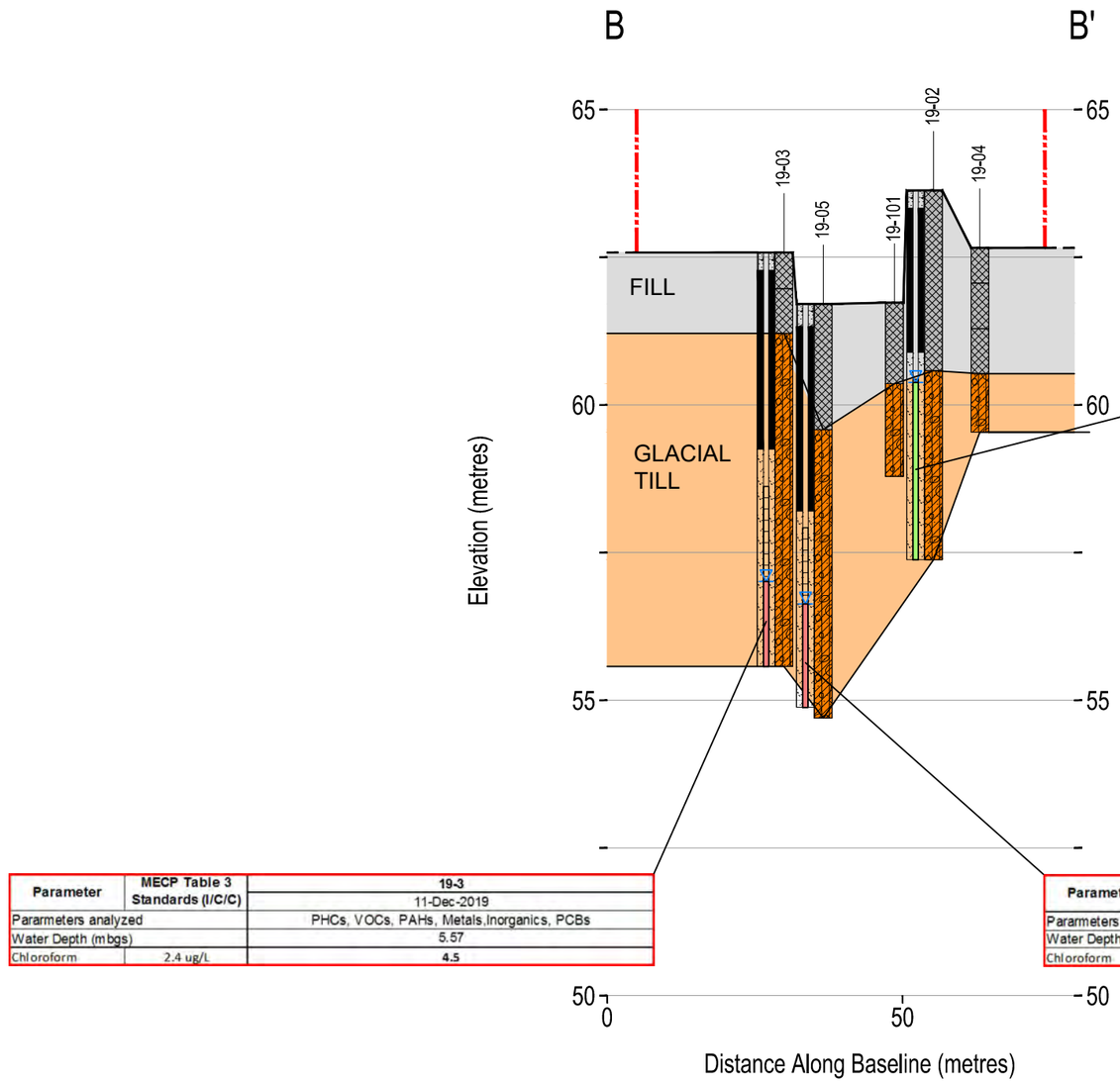
YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	29

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

Path: \\golder.gds\complexdata\offices\ottawa\Active\Spatial_IM\City\Ottawa\557_Wellington\99_PROJ\19120705_CofO_Enviro\0002_PhaseTwo_ESA\ | File Name: 19120705-0002-HS-0015.dwg

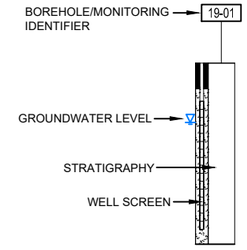


Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for VOCs		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Chloroform	2.4 ug/L	4.5

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Chloroform	2.4 ug/L	4.4

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH VOCs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	30

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

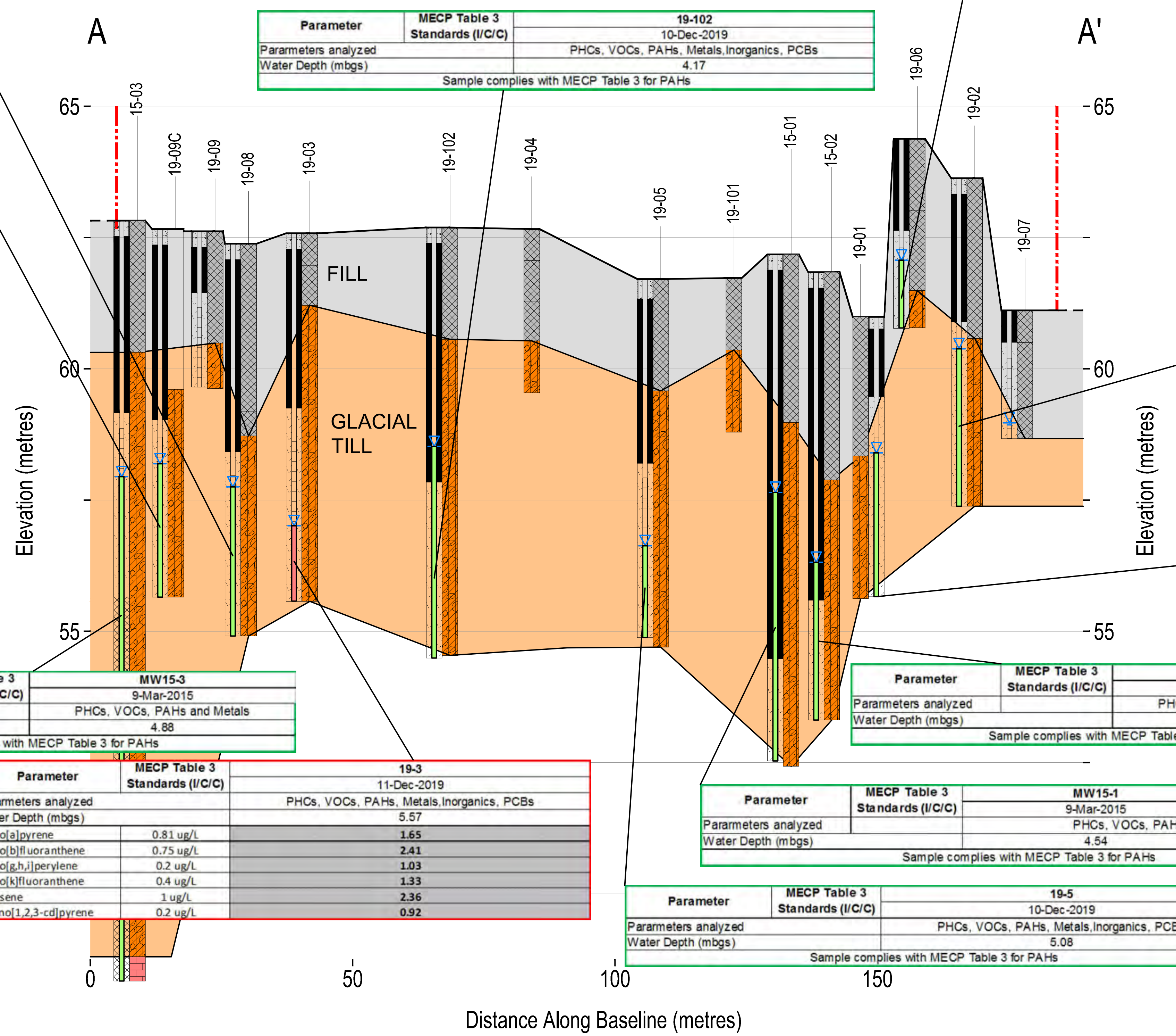
0 25 mm

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
		10-Dec-2019	10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
Water Depth (mbgs)		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PAHs			

Parameter	MECP Table 3 Standards (I/C/C)	19-6
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.31
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.63
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		4.17
Sample complies with MECP Table 3 for PAHs		



Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-1
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		2.59
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		4.88
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
		9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals
Water Depth (mbgs)		5.53
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Benzo[a]pyrene	0.81 ug/L	1.65
Benzo[b]fluoranthene	0.75 ug/L	2.41
Benzo[g,h,i]perylene	0.2 ug/L	1.03
Benzo[k]fluoranthene	0.4 ug/L	1.33
Chrysene	1 ug/L	2.36
Indeno[1,2,3-cd]pyrene	0.2 ug/L	0.92

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
		9-Mar-2015	9-Mar-2015
Parameters analyzed		PHCs, VOCs, PAHs and Metals	
Water Depth (mbgs)		4.54	Field Duplicate of MW15-1
Sample complies with MECP Table 3 for PAHs			

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PAHs		

LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LIMESTONE BEDROCK

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

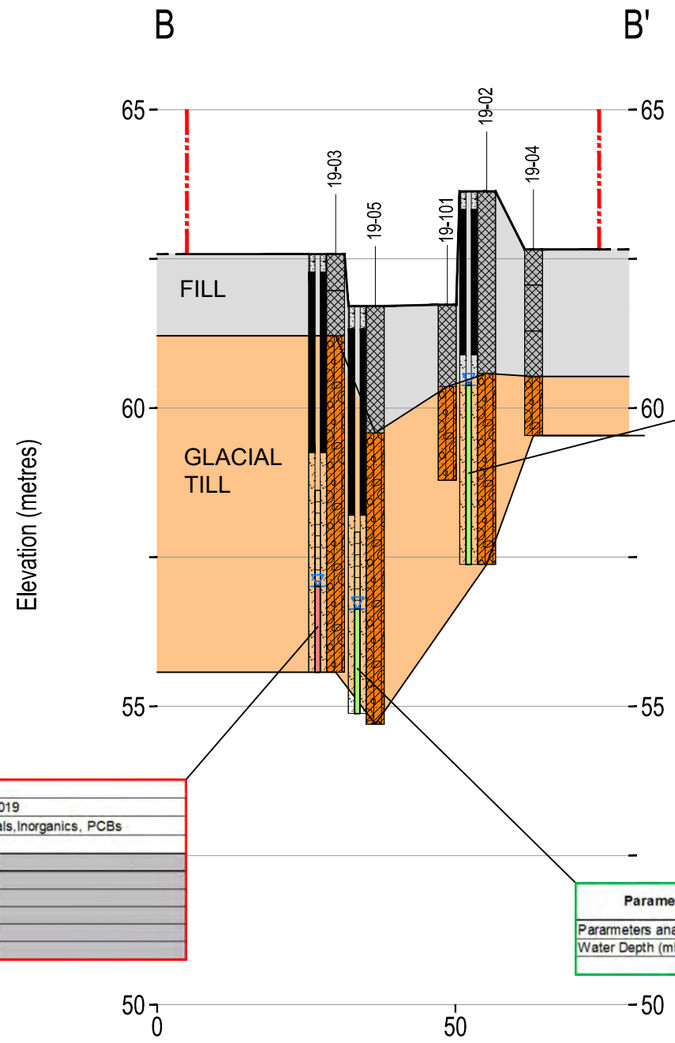
TITLE
CROSS-SECTION A-A' WITH PAHs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT

GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	31

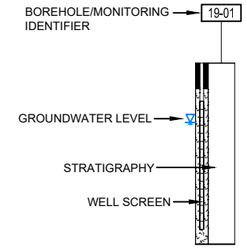


Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Benzo[a]pyrene	0.81 ug/L	**1.65**
Benzo[b]fluoranthene	0.75 ug/L	**2.41**
Benzo[g,h,i]perylene	0.2 ug/L	**1.03**
Benzo[k]fluoranthene	0.4 ug/L	**1.33**
Chrysene	1 ug/L	**2.36**
Indeno[1,2,3-cd]pyrene	0.2 ug/L	**0.92**

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PAHs		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PAHs		

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH PAHs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	32

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

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Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
Parameters analyzed		10-Dec-2019	10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for Metals			

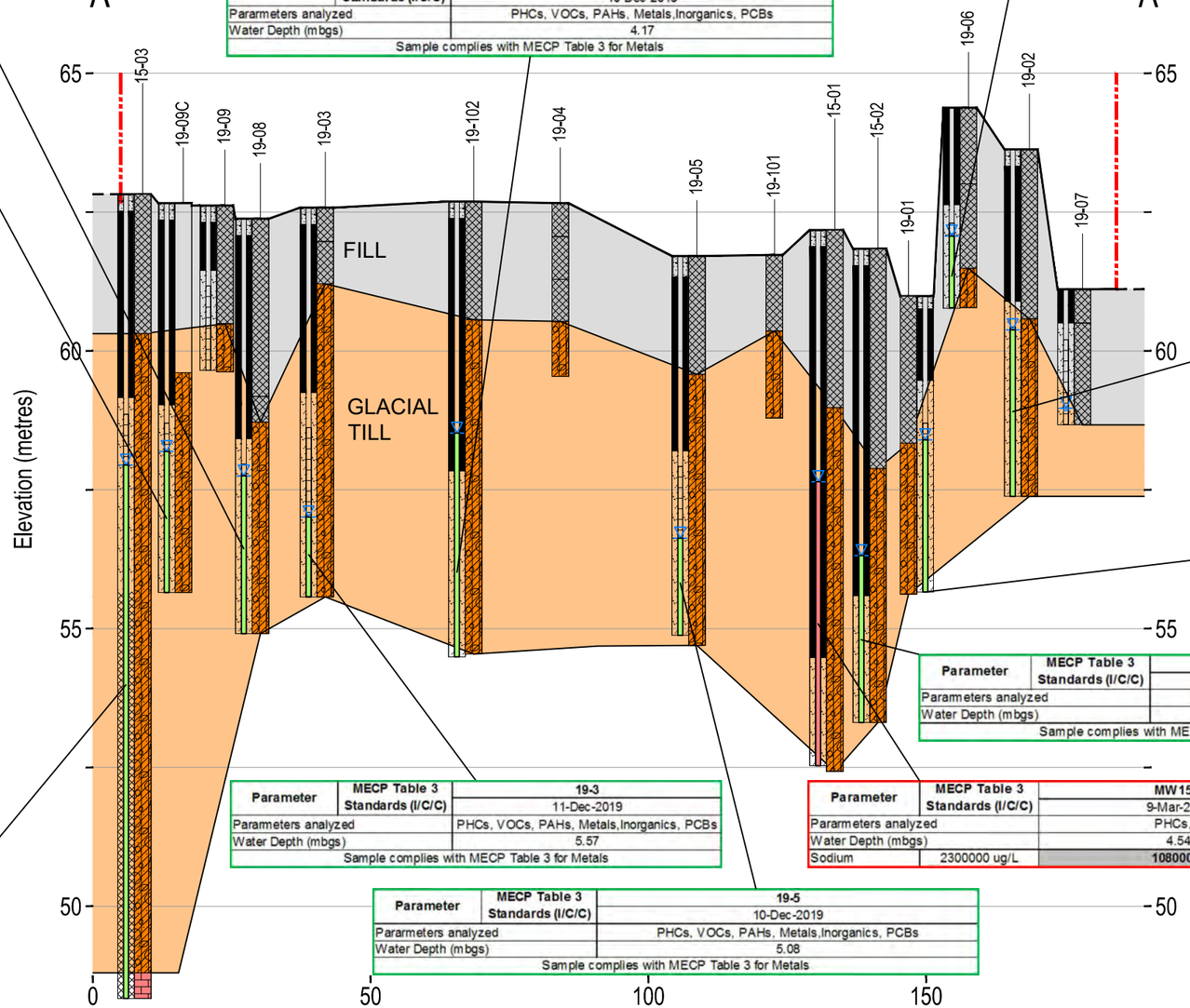
Parameter	MECP Table 3 Standards (I/C/C)	19-6
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		2.31

Parameter	MECP Table 3 Standards (I/C/C)	19-8
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		4.63

Parameter	MECP Table 3 Standards (I/C/C)	19-102
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		4.17

A

A'



Parameter	MECP Table 3 Standards (I/C/C)	19-2
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		3.25

Parameter	MECP Table 3 Standards (I/C/C)	19-1
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		2.59

Parameter	MECP Table 3 Standards (I/C/C)	MW15-2
Parameters analyzed		9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals
Sample complies with MECP Table 3 for PAHs		5.53

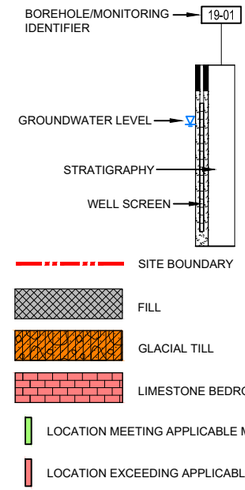
Parameter	MECP Table 3 Standards (I/C/C)	19-3
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		5.57

Parameter	MECP Table 3 Standards (I/C/C)	MW15-1	DUP15-1
Parameters analyzed		9-Mar-2015	9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals	
		4.54	Field Duplicate of MW15-1
Sodium	2300000 ug/L	**10800000**	**10300000**

Parameter	MECP Table 3 Standards (I/C/C)	19-5
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for Metals		5.08

Parameter	MECP Table 3 Standards (I/C/C)	MW15-3
Parameters analyzed		9-Mar-2015
Water Depth (mbgs)		PHCs, VOCs, PAHs and Metals
Sample complies with MECP Table 3 for PAHs		4.88

LEGEND



NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH METALS ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	33

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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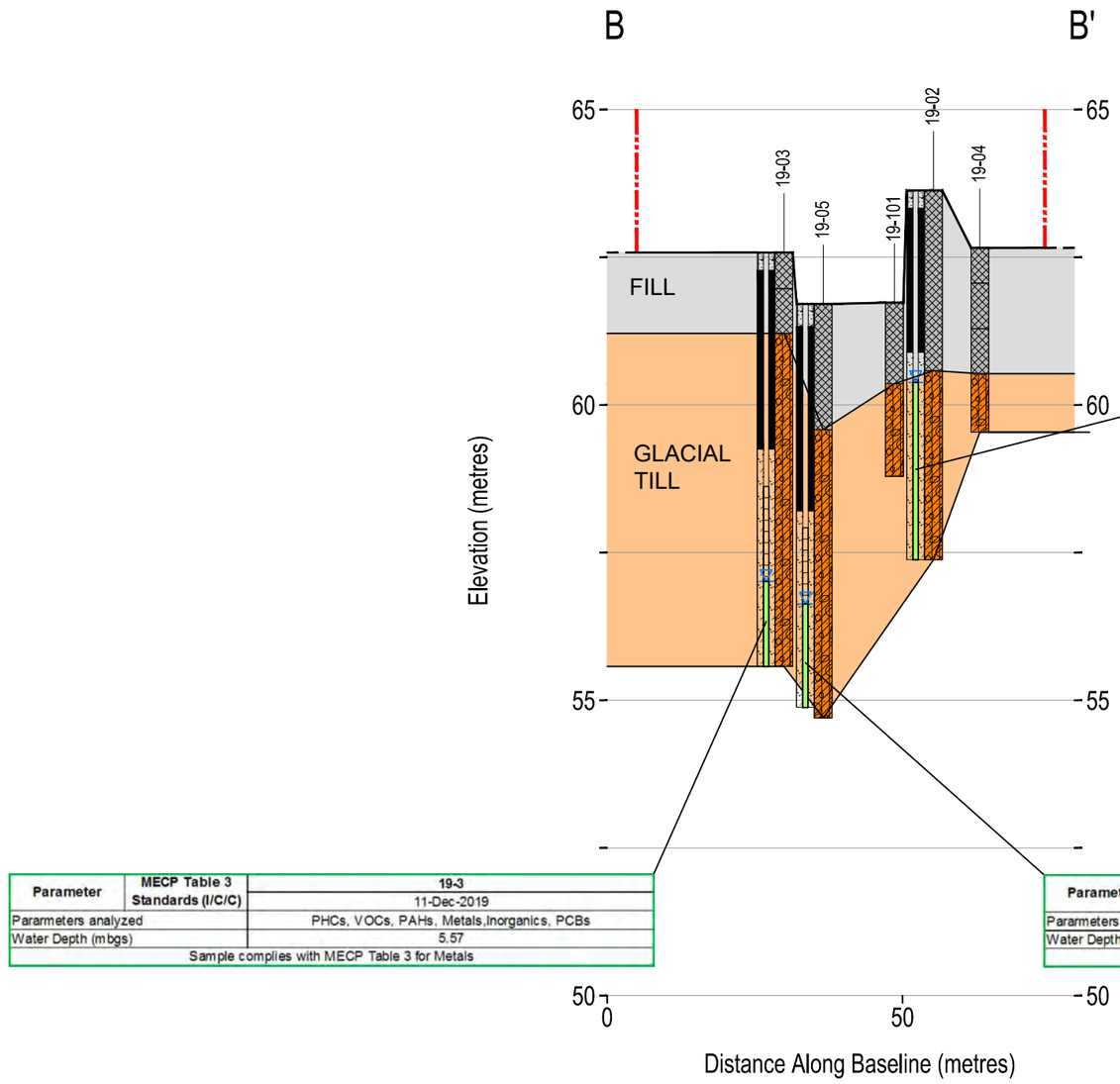
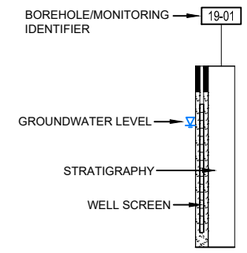


Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for Metals		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for Metals		

LEGEND



SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' WITH METALS ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	34

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
Parameters analyzed		10-Dec-2019	10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for Inorganics			

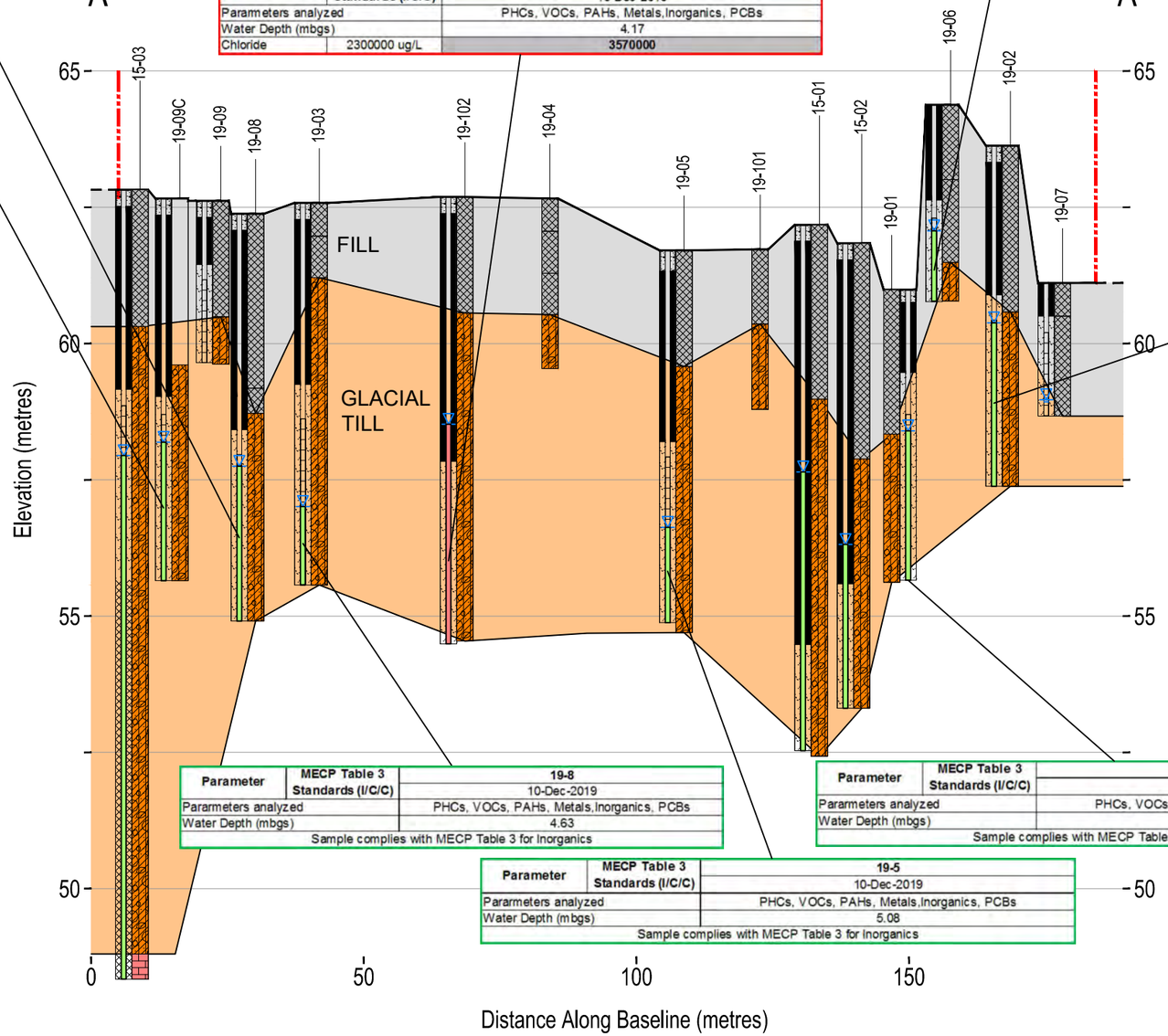
Parameter	MECP Table 3 Standards (I/C/C)	19-3
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		5.57
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		4.63
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-102
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Chloride	2300000 ug/L	4.17
		3570000

A

A'



Parameter	MECP Table 3 Standards (I/C/C)	19-2
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		3.25
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-8
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		4.63
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-1
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		2.59
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
		5.08
Sample complies with MECP Table 3 for Inorganics		

LEGEND

BOREHOLE/MONITORING IDENTIFIER → 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LIMESTONE BEDROCK

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 2

0 2.5 5
1:100 VERTICAL METRES

0 25 50
1:1,000 HORIZONTAL METRES

CLIENT
CITY OF OTTAWA

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH INORGANICS ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	35

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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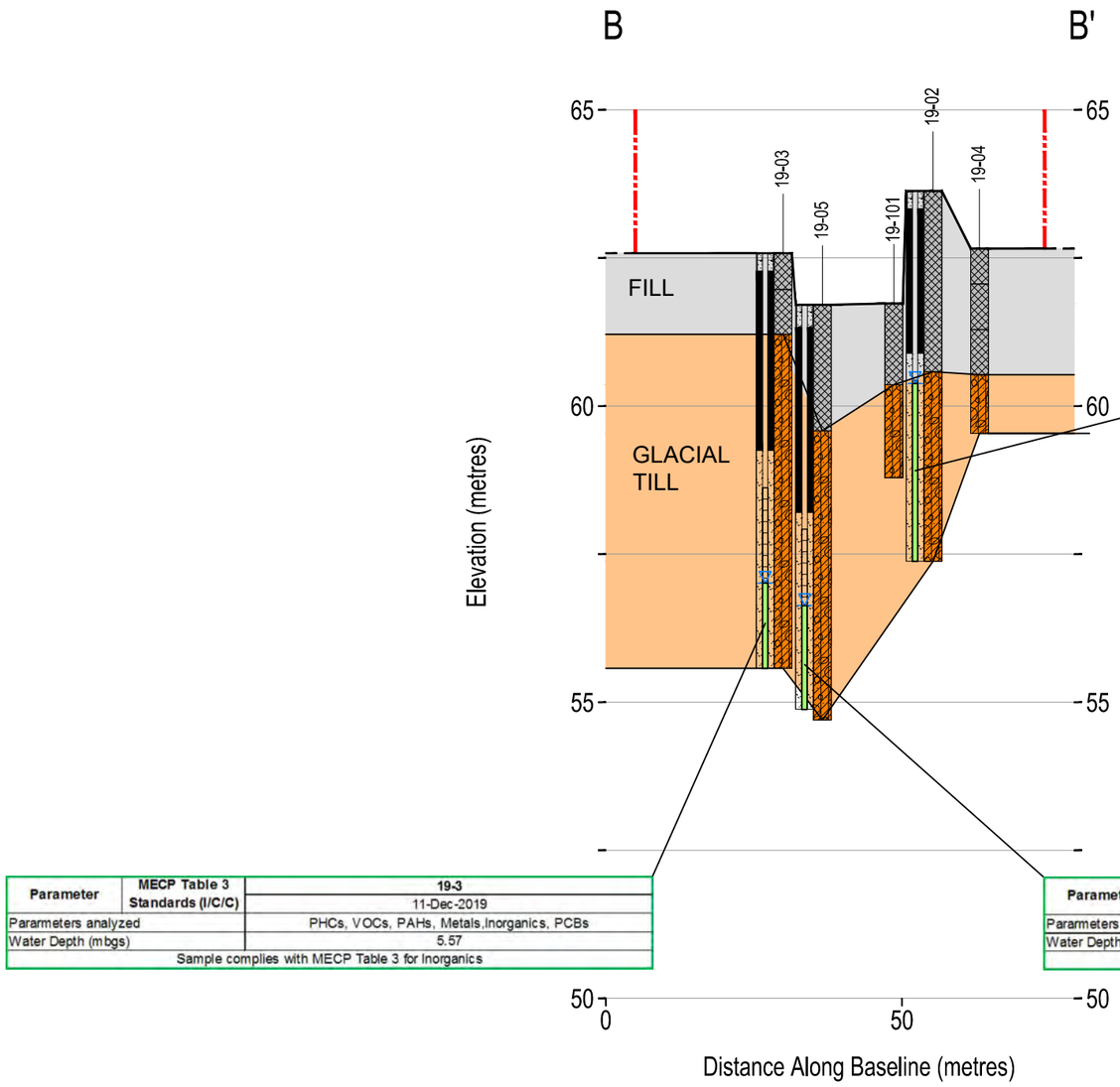

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-3
		11-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.57
Sample complies with MECP Table 3 for Inorganics		

Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for Inorganics		

LEGEND

BOREHOLE/MONITORING IDENTIFIER → 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
555 ALBERT STREET, OTTAWA, ONTARIO

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CROSS-SECTION B-B' WITH INORGANICS ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	36

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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Parameter	MECP Table 3 Standards (I/C/C)	19-9C	DUP-1
Parameters analyzed		10-Dec-2019	10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs	
		4.47	Field Duplicate of 19-9D
Sample complies with MECP Table 3 for PCBs			

Parameter	MECP Table 3 Standards (I/C/C)	19-6
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		2.31

Parameter	MECP Table 3 Standards (I/C/C)	19-8
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		4.63

Parameter	MECP Table 3 Standards (I/C/C)	19-102
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		4.17

A

A'

65

60

55

50

15-03 19-09C 19-09 19-08 19-03 19-102 19-04 19-05 19-101 15-01 15-02 19-01 19-06 19-02 19-07

FILL

GLACIAL TILL

Elevation (metres)

0 50 100

Distance Along Baseline (metres)

Parameter	MECP Table 3 Standards (I/C/C)	19-3
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		5.57

Parameter	MECP Table 3 Standards (I/C/C)	19-5
Parameters analyzed		10-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		5.08

Parameter	MECP Table 3 Standards (I/C/C)	19-1
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		2.59

Parameter	MECP Table 3 Standards (I/C/C)	19-2
Parameters analyzed		11-Dec-2019
Water Depth (mbgs)		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Sample complies with MECP Table 3 for PCBs		3.25

LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

SITE BOUNDARY

FILL

GLACIAL TILL

LIMESTONE BEDROCK

LOCATION MEETING APPLICABLE MECP STANDARD

LOCATION EXCEEDING APPLICABLE MECP STANDARD

NOTE(S)

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555 ALBERT STREET, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' WITH PCBs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
REVIEWED	SAC
APPROVED	EDW

PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	37

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

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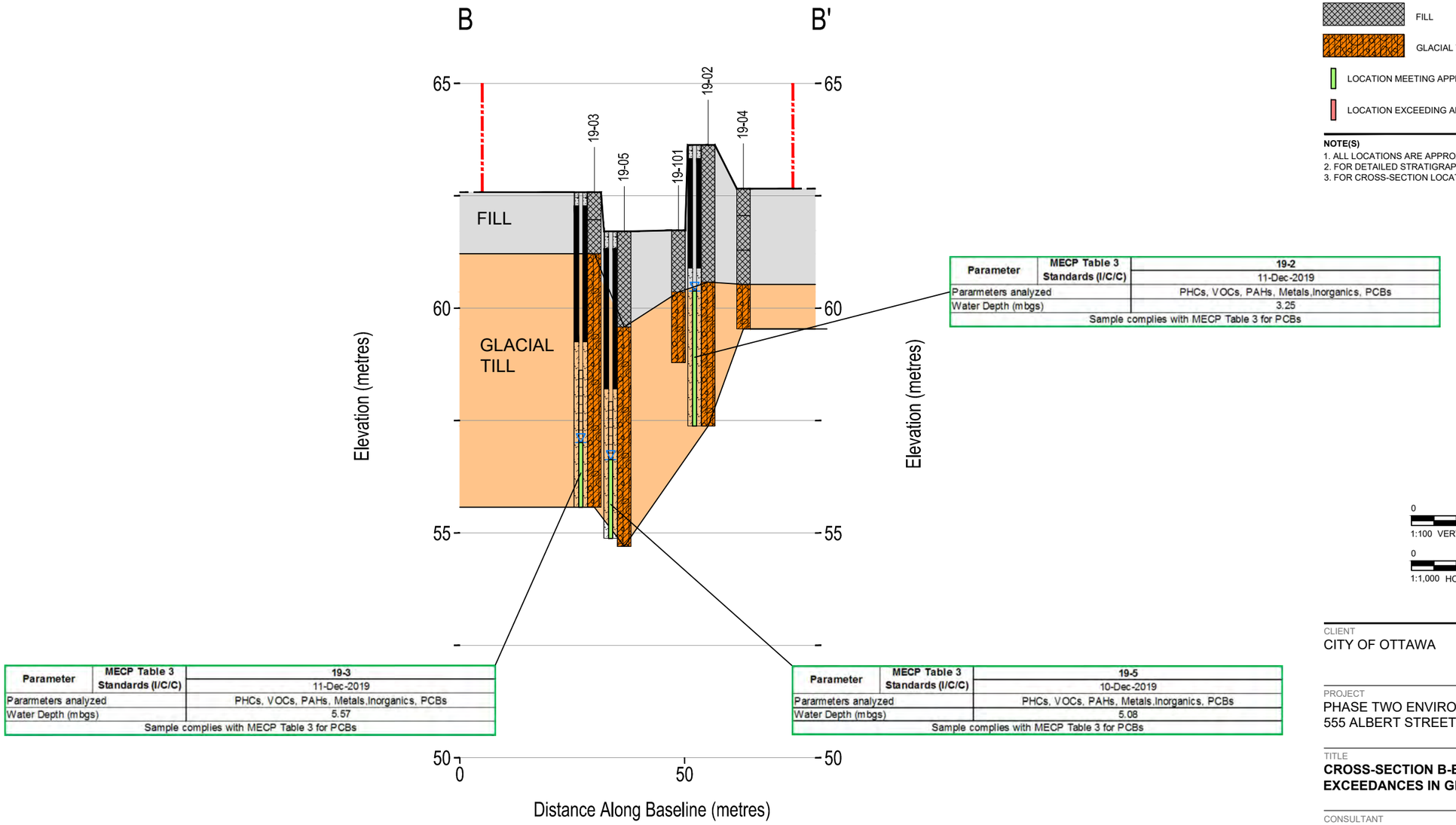

Parameter	MECP Table 3 Standards (I/C/C)	19-2
		11-Dec-2019
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Water Depth (mbgs)		3.25
Sample complies with MECP Table 3 for PCBs		

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Parameter	MECP Table 3 Standards (I/C/C)	19-5
		10-Dec-2019
Parameters analyzed		PHCs, VOCs, PAHs, Metals,Inorganics, PCBs
Water Depth (mbgs)		5.08
Sample complies with MECP Table 3 for PCBs		

LEGEND

BOREHOLE/MONITORING IDENTIFIER — 19-01

GROUNDWATER LEVEL

STRATIGRAPHY

WELL SCREEN

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FILL

GLACIAL TILL

LOCATION MEETING APPLICABLE MECP STANDARD

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555 ALBERT STREET, OTTAWA, ONTARIO

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CROSS-SECTION B-B' WITH PCBs ANALYSIS AND EXCEEDANCES IN GROUNDWATER

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-28
DESIGNED	----
PREPARED	ZS
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PROJECT NO.	CONTROL	REV.	FIGURE
19120705	0002	0	38

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

Path: \\golder.gds\complexdata\office\ottawa\Active\Spatial_IM\City\Ottawa\557_Wellington\99_PROJ\19120705_CofO_Enviro\0002_PhaseTwo_ESA\ | File Name: 19120705-0002-HS-0015.dwg

APPENDIX A

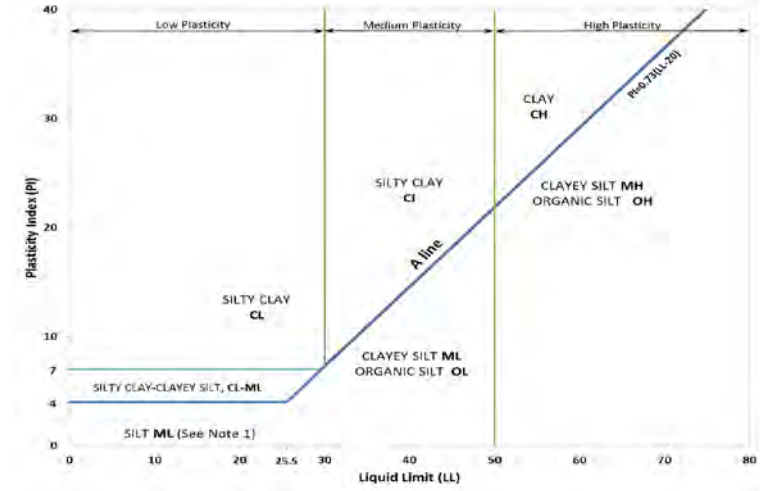
Record of Boreholes

METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil	Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
				Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)	Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
				Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
				Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
			Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
				None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% (see Note 2)	CL	SILTY CLAY
			Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
			Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures							30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat							75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to indicate a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
GS	Grab Sample
MC	Modified California Samples
MS	Modified Shelby (for frozen soil)
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
2. Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grainsize. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1,2] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
2. SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
NP	non-plastic
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

PROJECT: 19131600

RECORD OF BOREHOLE: 19-01

SHEET 1 OF 1

LOCATION: N 5030969.3 ;E 366627.0

BORING DATE: November 28, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		60.99							
0	Wash Boring / HW Casing	FILL - (SW/GW) SAND and GRAVEL, fine to coarse, some non-plastic fines; brown to grey brown; non-cohesive, wet, very loose to dense		0.00	1	SS	36			M	Bentonite Seal
1					2	SS	10				
2					3	SS	3				Silica Sand
				58.34	4	SS	3				
3		(SM/ML) SAND and SILT, some gravel; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, compact to very dense		2.65	5	SS	21				32 mm Diam. PVC #10 Slot Screen
4					6	SS	33				
5					7	SS	88				
				55.62							WL in screen measured at 2.59 mbgs (Elev. 58.40) on Dec. 11, 2019
		End of Borehole		5.37							
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-02

SHEET 1 OF 1

LOCATION: N 5030975.7 ;E 366666.5

BORING DATE: November 28, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		63.63							
0	Wash Boring / HW Casing	FILL - (SP) gravelly SAND, some non-plastic fines; dark brown to grey brown, contains brick, concrete fragments and ash; non-cohesive, moist, loose to compact		0.00	1	SS	18				Flush Mount Casing
1					2	SS	7				
					3	SS	11				Bentonite Seal
2					4	SS	14				
3				60.58							Silica Sand
		(SM/ML) SAND and SILT, some gravel and low plasticity fines; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist to wet, loose to very dense		3.05	5	SS	8				
4					6	SS	33			MH	
					7	SS	55				32 mm Diam. PVC #10 Slot Screen
5					8	SS	66				
6				57.38	9	SS	>50				
		End of borehole Sampler Refusal		6.25							WL in screen measured at 3.25 mbgs (Elev. 60.38) on Dec. 11, 2019
7											
8											
9											
10											

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

PROJECT: 19131600

RECORD OF BOREHOLE: 19-03

SHEET 1 OF 1

LOCATION: N 5030859.5 ;E 366615.9

BORING DATE: November 26, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.58							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SP) gravelly SAND, fine to coarse, some non-plastic fines; grey; non-cohesive, moist, dense		0.00	1	SS	35				Flush Mount Casing
				61.97							
1		FILL - (SP) gravelly SAND, angular gravel; grey to dark brown, contains brick and ash; non-cohesive, moist, compact		0.61	2	SS	20				
				61.21							
2	Wash Boring HW Casing	(SM/ML) SAND and SILT, some gravel; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist to wet, dense to very dense		1.37	3	SS	33				Bentonite Seal
					4	RC	DD				
					5	SS	73			MH	
3					6	SS	83				
					7	SS	87				Silica Sand
4											
					8	SS	82				
5											
					9	SS	>55				32 mm Diam. PVC #10 Slot Screen
					10	RC	DD				
6					11	SS	55				
					12	RC	DD				
					13	SS	50				
7				55.57							
		End of Borehole		7.01							WL in screen measured at 5.57 mbgs (Elev. 57.01) on Dec. 11, 2019
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-04

SHEET 1 OF 1

LOCATION: N 5030891.6 ;E 366647.9

BORING DATE: November 21, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.66							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SP) gravelly SAND, fine to medium, some non-plastic fines; grey brown; non-cohesive, moist, very dense		0.00	1	SS	100				
				62.06							
1		FILL - (SM) SILTY SAND, some gravel; grey, contains brick and ash; non-cohesive, moist, loose		0.60	2	SS	7				
				61.29							
2		(SM) gravelly SILTY SAND; brown, contains pockets of silty clay; non-cohesive, moist, compact		1.37	3	SS	11				
				60.53							
		(SM/ML) SAND and SILT, some gravel to gravelly; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, very dense		2.13	4	SS	54				
3				59.54	5	SS	60				
		End of Borehole Auger Refusal		3.12							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DG
CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-04A

SHEET 1 OF 1

LOCATION: N 5030891.6 ;E 366647.9

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.66							
0	Power Auger 200 mm Diam. (Hollow Stem)	No Sampling - Alternate to 19-04 advanced to obtain samples below previous refusal		0.00							
		End of Borehole Auger Refusal		61.97 0.69							
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-04B

SHEET 1 OF 1

LOCATION: N 5030891.6 ;E 366647.9

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.66							
0	Power Auger 200 mm Diam. (Hollow Stem)	No Sampling - Alternate to 19-04 advanced to obtain samples below previous refusal		0.00							
1											
2											
3				59.61							
		(SM/ML) SILTY SAND to sandy SILT, some gravel to gravelly; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, very dense		3.05	1	SS	66				
				59.00							
		End of Borehole Auger Refusal		3.66							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DG
CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-05

SHEET 1 OF 1

LOCATION: N 5030930.6 ;E 366620.5

BORING DATE: December 2, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.71							
0	Wash Boring / HW Casing	FILL - (SW) gravelly SAND, fine to coarse, some non-plastic fines; brown to grey, contains cobbles and boulders; non-cohesive, wet, very dense		0.00	1	SS	>50				Flush Mount Casing
1					2	SS	57				
					3	SS	>50				
2				59.58							Bentonite Seal
		(SM/ML) SAND and SILTY SAND, some gravel; grey, with brown mottling, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, dense to very dense		2.13	4	SS	50				
3					5	SS	>50				
											Silica Sand
4					6	SS	60				
					7	SS	42			MH	
5											32 mm Diam. PVC #10 Slot Screen
					8	SS	43				
6					9	SS	73				
					10	SS	>50				
7				54.70							
		End of Borehole		7.01							WL in screen measured at 5.08 mbgs (Elev. 56.63) on Dec. 10, 2019
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: JS

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-06

SHEET 1 OF 1

LOCATION: N 5030956.4 ;E 366683.0

BORING DATE: November 21, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		64.38							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SP) gravelly SAND, angular gravel, some non-plastic fines; grey brown; non-cohesive, moist, loose		0.00	1	SS	8				Bentonite Seal
1					2	SS	9				
				63.01							
		FILL - (SM/GM) SAND and GRAVEL, some non-plastic fines to silty; grey brown, contains brick fragments, pieces of wood and fly ash; non-cohesive, moist to wet, loose to compact		1.37	3	SS	7				Silica Sand
2					4	SS	21				
				61.49							32 mm Diam. PVC #10 Slot Screen
3		(SM) gravelly SILTY SAND; grey brown, contains cobbles and boulders(GLACIAL TILL); non-cohesive, wet, dense		2.89	5	SS	41				
				60.78							
		End of Borehole Auger Refusal		3.60							WL in screen measured at 2.31 mbgs (Elev. 62.07) on Dec. 10, 2019
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-07

SHEET 1 OF 1

LOCATION: N 5030990.5 ;E 366645.3

BORING DATE: December 2, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.11							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SP) gravelly SAND, some non-plastic fines; grey; non-cohesive, moist, compact		0.00	1	SS	21				Bentonite Seal
				60.50							
1		FILL - (SM) SILTY SAND, some gravel; brown to dark brown, contains brick and concrete fragments; moist to wet, very loose to loose		0.61	2	SS	7				Silica Sand
2					3	SS	2				32 mm Diam. PVC #10 Slot Screen
				58.67	4	SS	>50				
		End of Borehole Auger Refusal		2.44							WL in screen measured at 2.14 mbgs (Elev. 58.97) on Dec. 10, 2019
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: JS

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-08

SHEET 1 OF 1

LOCATION: N 5030852.8 ;E 366588.8

BORING DATE: December 3, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.38							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SP) gravelly SAND, fine to medium, some non-plastic fines; grey, contains brick, concrete fragments, cobbles and boulders; non-cohesive, moist, very dense to loose		0.00	1	SS	55				Flush Mount Casing
1					2	SS	37				
					3	SS	29				
2					4	SS	8				
3				59.18							
		FILL - (SP) SAND, fine to medium, some silt; brown; non-cohesive, moist, compact		3.20	5	SS	13				
				58.72							Bentontie Seal
		(SM/ML) SAND and SILT, some gravel; brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist to wet, very dense		3.66	6	SS	91				Silica Sand
4											
					7	SS	>50				
5											
					8	SS	>100				
6											32 mm Diam. PVC #10 Slot Screen
					9	SS	91				
7											
					10	SS	72				
				54.91							
		End of Borehole		7.47							WL in screen measured at 4.63 mbgs (Elev. 57.75) on Dec. 10, 2019
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: JS

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-09

SHEET 1 OF 1

LOCATION: N 5030839.9 ;E 366615.3

BORING DATE: November 20, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.62							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SM/GM) SAND and GRAVEL, fine to coarse, some non-plastic fines to silty; grey brown, contains brick, concrete fragments, wood pieces and ash; non-cohesive, moist to wet, loose to dense		0.00	1	SS	40				Flush Mount Casing
1					2	SS	5				Bentontie Seal
2					3	SS	12			M	Silica Sand
				60.49							
		(SM) SILTY SAND, some gravel; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very dense		2.13	4	SS	83				32 mm Diam. PVC #10 Slot Screen
3				59.62							
		End of Borehole Auger Refusal		3.00							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DG
CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-09A

SHEET 1 OF 1

LOCATION: N 5030839.9 ;E 366615.3

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.62							
0	Power Auger 200 mm Diam. (Hollow Stem)	No Sampling - Alternate to 19-09 advanced to obtain samples below previous refusal		0.00							
1				60.79							
2		End of Borehole Auger Refusal		1.83							
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-09B

SHEET 1 OF 1

LOCATION: N 5030839.9 ;E 366615.3

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.62							
0	Power Auger 200 mm Diam. (Hollow Stem)	No Sampling - Alternate to 19-09 advanced to obtain samples below previous refusal		0.00							
1				61.05							
		End of Borehole Auger Refusal		1.57							
2											
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-09C

SHEET 1 OF 1

LOCATION: N 5030840.5 ;E 366613.6

BORING DATE: November 27, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.66							
0	Wash Boring / HQ Casing	No Sampling - Alternate to 19-09 advanced to obtain samples below previous refusal		0.00							Flush Mount Casing
1											
2											Bentontie Seal
3				59.61							
		(SM) gravelly SILTY SAND; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist to wet, very dense		3.05	1	SS	>50				
					2	RC	DD				Silica Sand
4					3	SS	69				
					4	RC	DD				
5					5	SS	>50				
											32 mm Diam. PVC #10 Slot Screen
					6	SS	>50				
6					7	RC	DD				
					8	SS	>50				
					9	RC	DD				
7				55.65							
		End of Borehole		7.01							WL in screen measured at 4.47 mbgs (Elev. 58.19) on Dec. 10, 2019
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-101

SHEET 1 OF 1

LOCATION: N 5030938.2 ;E 366637.7

BORING DATE: November 21, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.73							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SW) gravelly SAND, fine to coarse, some non-plastic fines; grey brown, contains brick; non-cohesive, moist, very dense to compact		0.00	1	SS	53				
1					2	SS	14				
				60.36							
2		(SM) SILTY SAND, some gravel; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, very dense		1.37	3	SS	55				
					4	SS	74				
				58.79							
3		End of Borehole Auger Refusal		2.94							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DG
CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-101A

SHEET 1 OF 1

LOCATION: N 5030938.2 ;E 366637.7

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.73							
0	Power Auger 200 mm diam. (Hollow Stem)	No Sampling - Alternate to 19-101 advanced to obtain samples below previous refusal		0.00							
				60.97							
1		End of Borehole Auger Refusal		0.76							
2											
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-101B

SHEET 1 OF 1

LOCATION: N 5030938.2 ;E 366637.7

BORING DATE: November 25, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.73							
0	Power Auger 200 mm Diam. (Hollow Stem)	No Sampling - Alternate to 19-101 advanced to obtain samples below previous refusal		0.00							
1											
2											
3				58.33							
		End of Borehole Auger Refusal		3.40							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

GOLDER

LOGGED: DG
CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 19-102

SHEET 1 OF 1

LOCATION: N 5030878.2 ;E 366639.5

BORING DATE: November 20, 2019

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.69							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - (SW) gravelly SAND, fine to coarse, some non-plastic fines to silty; grey to dark brown, contains brick and ash; non-cohesive, moist, very dense to loose		0.00	1	SS	95				Flush Mount Casing
1					2	SS	10			M	
					3	SS	9				
2				60.56							
		(SM) SILTY SAND, fine to coarse, some gravel; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist to wet, dense to very dense		2.13	4	SS	37				Bentonite Seal
3					5	SS	68				
4					6	SS	53				▽
					7	SS	59				
5											Silica Sand
					8	SS	>100				
6					9	SS	60				32 mm Diam. PVC #10 Slot Screen
7					10	SS	65				
					11	SS	80				
8				54.54							
		End of Borehole Auger Refusal		8.15							WL in screen measured at 4.17 mbgs (Elev. 58.52) on Dec. 10, 2019
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: DG

CHECKED: CRG

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 15-01

SHEET 1 OF 1

LOCATION: N 5030942.4 ;E 366655.1

BORING DATE:

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] (ND = Not Detected) 100 200 300 400	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] (ND = Not Detected) 100 200 300 400	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}	WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.18									
0	Percussion Drill; 105 mm Diam. Casing			0.00									
1					1	SS							
2					2	SS							
3				58.98	3A				ND				
				3.20									
4					3	SS							Bentonite Seal
5					4	SS							
6					5	SS							
7					6	SS							
8													Silica Sand
9													51 mm Diam. PVC #10 Slot Screen
				52.43									W.L. in Screen at Elev. 57.645 m on March 9, 2015
10				9.75									

DEPTH SCALE

1 : 50

GOLDER

LOGGED:

CHECKED:

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 15-02

SHEET 1 OF 1

LOCATION: N 5030957.0 ;E 366641.2

BORING DATE:

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected; 100 200 300 400) / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected; 100 200 300 400)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; 20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.84						
0	Percussion Drill 105 mm Diam. Casing			0.00						
1					1	SS	⊕			
2					2	SS	⊕			
3					3	SS	⊕			Bentonite Seal
					3A		⊕			
				57.88						
4				3.96						
					4	SS	⊕			
5					4A	SS	⊕			
6					5	SS	⊕			Silica Sand
					5A	SS	⊕			
7										51 mm Diam. PVC #10 Slot Screen
8					6	SS	⊕			Silica Sand
				53.31						
				8.53						W.L. in Screen at Elev. 56.315 m on March 9, 2015
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED:

CHECKED:

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 15-03

SHEET 1 OF 2

LOCATION: N 5030831.8 ;E 366613.1

BORING DATE:

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] (ND = Not Detected) 100 200 300 400 ⊕	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] (ND = Not Detected) 100 200 300 400 □	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}	WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.82									
0	Percussion Drill 105 mm Diam. Casing			0.00									
1					1	SS		⊕					
2					2	SS		⊕					Bentonite Seal
				60.31									
				2.51									
3					2A			⊕					
					3	SS		⊕					
4					3A			⊕					Silica Sand
5													
6					4	SS		⊕					51 mm Diam. PVC #10 Slot Screen
					4A	SS		⊕					
7													
8					5	SS		⊕					Native Backfill
					5A			⊕					
9													
10					6	SS							
		CONTINUED NEXT PAGE											

DEPTH SCALE

1 : 50

GOLDER

LOGGED:

CHECKED:

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

PROJECT: 19131600

RECORD OF BOREHOLE: 15-03

SHEET 2 OF 2

LOCATION: N 5030831.8 ;E 366613.1

BORING DATE:

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected; 100 200 300 400) / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected; 100 200 300 400)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; 20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---								
10	Percussion Drill 105 mm Diam. Casing				6	SS				
11					7	SS				
12					8	SS				Native Backfill
13										
14				48.80 / 14.02						
				48.34 / 14.48						
15										W.L. in Screen at Elev. 57.945 m on March 9, 2015
16										
17										
18										
19										
20										

DEPTH SCALE

1 : 50

GOLDER

LOGGED:

CHECKED:

MIS-BHS 001 19131600.GPJ GAL-MIS.GDT 5/21/20 ZS

APPENDIX B

Laboratory Reports of Analysis

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert Street
Custody: 123734

Report Date: 29-Nov-2019
Order Date: 22-Nov-2019

Order #: 1948056

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

Paracel ID	Client ID
1948056-01	19-04 SA2
1948056-02	19-04 SA4
1948056-03	19-06 SA3
1948056-04	19-06 SA5
1948056-05	19-09 SA1
1948056-06	19-09 SA4
1948056-07	Dup-1
1948056-08	Dup-2
1948056-09	19-101 SA1
1948056-10	19-101 SA4
1948056-11	19-102 SA1
1948056-12	19-102 SA4

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 29-Nov-2019
Order Date: 22-Nov-2019
Project Description: 19120705/555 Albert Street

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	26-Nov-19	26-Nov-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	25-Nov-19	28-Nov-19
Conductivity	MOE E3138 - probe @25 °C, water ext	26-Nov-19	26-Nov-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	26-Nov-19	26-Nov-19
PCBs, total	SW846 8082A - GC-ECD	25-Nov-19	28-Nov-19
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	27-Nov-19	27-Nov-19
PHC F1	CWS Tier 1 - P&T GC-FID	26-Nov-19	27-Nov-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	25-Nov-19	26-Nov-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	26-Nov-19	26-Nov-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	25-Nov-19	27-Nov-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	26-Nov-19	27-Nov-19
SAR	Calculated	26-Nov-19	26-Nov-19
Solids, %	Gravimetric, calculation	25-Nov-19	25-Nov-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-04 SA2	19-04 SA4	19-06 SA3	19-06 SA5
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-01	1948056-02	1948056-03	1948056-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	76.8	92.9	94.4	89.1
General Inorganics					
SAR	0.01 N/A	3.16	1.43	0.28	0.39
Conductivity	5 uS/cm	460	512	495	369
pH	0.05 pH Units	7.65	-	-	7.85
Metals					
Antimony	1.0 ug/g dry	24.2	<1.0	<2.0	<1.0
Arsenic	1.0 ug/g dry	11.9	1.9	5.1	1.6
Barium	1.0 ug/g dry	764	51.9	421	185
Beryllium	0.5 ug/g dry	0.7	<0.5	<1.0	0.5
Boron	5.0 ug/g dry	10.8	8.6	24.7	<5.0
Boron, available	0.5 ug/g dry	1.2	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	1.4	<0.5	<1.0	<0.5
Chromium	5.0 ug/g dry	30.4	16.8	36.6	34.5
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	10.3	5.2	12.2	10.0
Copper	5.0 ug/g dry	122	8.7	52.7	20.9
Lead	1.0 ug/g dry	498	5.5	72.0	5.2
Mercury	0.1 ug/g dry	1.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	2.6	<1.0	<2.0	<1.0
Nickel	5.0 ug/g dry	27.2	9.8	26.8	20.3
Selenium	1.0 ug/g dry	1.9	<1.0	<2.0	<1.0
Silver	0.3 ug/g dry	0.6	<0.3	<0.6	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<2.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<2.0	<1.0
Vanadium	10.0 ug/g dry	27.1	21.5	37.0	47.4
Zinc	20.0 ug/g dry	391	28.5	142	55.2
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-04 SA2	19-04 SA4	19-06 SA3	19-06 SA5
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-01	1948056-02	1948056-03	1948056-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	103%	110%	111%	96.5%

Certificate of Analysis

Report Date: 29-Nov-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 19120705/555 Albert Street

	Client ID:	19-04 SA2	19-04 SA4	19-06 SA3	19-06 SA5
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-01	1948056-02	1948056-03	1948056-04
	MDL/Units	Soil	Soil	Soil	Soil
Dibromofluoromethane	Surrogate	74.4%	74.0%	76.5%	78.3%
Toluene-d8	Surrogate	104%	107%	104%	104%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	8
F2 PHCs (C10-C16)	4 ug/g dry	<40 [1]	<4	<4	23
F3 PHCs (C16-C34)	8 ug/g dry	169	<8	37	33
F4 PHCs (C34-C50)	6 ug/g dry	219	<6	18	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.05	<0.02	0.02	<0.02
Acenaphthylene	0.02 ug/g dry	0.21	<0.02	0.05	<0.02
Anthracene	0.02 ug/g dry	0.21	<0.02	0.09	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.51	<0.02	0.22	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.42	<0.02	0.19	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.76	<0.02	0.29	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.29	<0.02	0.15	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.42	<0.02	0.15	<0.02
Chrysene	0.02 ug/g dry	0.55	<0.02	0.25	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.08	<0.02	0.04	<0.02
Fluoranthene	0.02 ug/g dry	1.21	<0.02	0.55	<0.02
Fluorene	0.02 ug/g dry	0.05	<0.02	0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.28	<0.02	0.14	<0.02
1-Methylnaphthalene	0.02 ug/g dry	0.23	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	0.33	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	0.56	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	0.28	<0.01	0.02	<0.01
Phenanthrene	0.02 ug/g dry	0.66	<0.02	0.26	<0.02
Pyrene	0.02 ug/g dry	1.06	<0.02	0.47	<0.02
2-Fluorobiphenyl	Surrogate	79.5%	93.8%	91.5%	78.8%
Terphenyl-d14	Surrogate	78.3%	112%	98.3%	104%
PCBs					
PCBs, total	0.05 ug/g dry	0.08	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	133%	130%	128%	140%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-09 SA1	19-09 SA4	Dup-1	Dup-2
	Sample Date:	20-Nov-19 09:00	20-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-05	1948056-06	1948056-07	1948056-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	95.9	92.4	87.1	86.1
General Inorganics					
SAR	0.01 N/A	3.08	2.54	3.11	0.38
Conductivity	5 uS/cm	613	479	470	414
pH	0.05 pH Units	-	-	7.71	7.70
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	3.5	<1.0
Arsenic	1.0 ug/g dry	4.1	1.6	13.2	1.9
Barium	1.0 ug/g dry	113	42.8	379	210
Beryllium	0.5 ug/g dry	<0.5	<0.5	0.6	0.6
Boron	5.0 ug/g dry	11.7	7.2	14.0	<5.0
Boron, available	0.5 ug/g dry	<0.5	0.5	1.3	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	1.1	<0.5
Chromium	5.0 ug/g dry	15.4	17.0	31.2	39.8
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	<0.2
Cobalt	1.0 ug/g dry	6.1	4.9	6.5	10.5
Copper	5.0 ug/g dry	16.2	8.7	364	19.6
Lead	1.0 ug/g dry	20.3	4.3	443	5.6
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	2.2	<1.0	4.4	<1.0
Nickel	5.0 ug/g dry	13.3	9.4	20.2	21.7
Selenium	1.0 ug/g dry	<1.0	<1.0	1.9	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	0.4	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	19.3	22.6	23.4	52.3
Zinc	20.0 ug/g dry	31.5	21.6	366	60.5
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-09 SA1	19-09 SA4	Dup-1	Dup-2
	Sample Date:	20-Nov-19 09:00	20-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-05	1948056-06	1948056-07	1948056-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-09 SA1	19-09 SA4	Dup-1	Dup-2
	Sample Date:	20-Nov-19 09:00	20-Nov-19 09:00	21-Nov-19 09:00	21-Nov-19 09:00
	Sample ID:	1948056-05	1948056-06	1948056-07	1948056-08
	MDL/Units	Soil	Soil	Soil	Soil
4-Bromofluorobenzene	Surrogate	103%	107%	106%	96.4%
Dibromofluoromethane	Surrogate	72.1%	71.2%	72.1%	70.3%
Toluene-d8	Surrogate	107%	105%	106%	105%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	211
F3 PHCs (C16-C34)	8 ug/g dry	30	16	190	160
F4 PHCs (C34-C50)	6 ug/g dry	8	<6	89	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	0.03	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	0.08	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	0.10	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	0.26	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	0.23	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.03	<0.02	0.35	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	0.17	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	0.18	<0.02
Chrysene	0.02 ug/g dry	0.03	<0.02	0.30	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	0.04	<0.02
Fluoranthene	0.02 ug/g dry	0.05	<0.02	0.57	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	0.03	0.08
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	0.15	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.18	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.26	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	0.43	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	0.21	<0.01
Phenanthrene	0.02 ug/g dry	0.05	<0.02	0.36	0.13
Pyrene	0.02 ug/g dry	0.04	<0.02	0.50	<0.02
2-Fluorobiphenyl	Surrogate	99.7%	83.6%	87.5%	87.8%
Terphenyl-d14	Surrogate	115%	116%	91.4%	99.7%
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	0.61	<0.05
Decachlorobiphenyl	Surrogate	119%	136%	139%	122%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-101 SA1	19-101 SA4	19-102 SA1	19-102 SA4
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	20-Nov-19 09:00	20-Nov-19 09:00
	Sample ID:	1948056-09	1948056-10	1948056-11	1948056-12
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.0	91.5	95.6	91.9
General Inorganics					
SAR	0.01 N/A	1.63	2.67	0.35	1.52
Conductivity	5 uS/cm	330	407	242	313
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.6	1.5	3.2	1.8
Barium	1.0 ug/g dry	55.0	83.8	74.6	60.8
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	6.4	<5.0	12.4	6.7
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	12.2	21.4	16.4	19.6
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	3.5	6.3	6.6	6.1
Copper	5.0 ug/g dry	49.2	11.7	19.7	12.7
Lead	1.0 ug/g dry	38.6	4.2	39.8	4.9
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	1.3	<1.0
Nickel	5.0 ug/g dry	8.2	11.4	14.1	11.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	15.4	31.4	24.2	27.6
Zinc	20.0 ug/g dry	74.6	28.9	35.3	26.3
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-101 SA1	19-101 SA4	19-102 SA1	19-102 SA4
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	20-Nov-19 09:00	20-Nov-19 09:00
	Sample ID:	1948056-09	1948056-10	1948056-11	1948056-12
	MDL/Units	Soil	Soil	Soil	Soil
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	106%	105%	110%	110%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 29-Nov-2019

Order Date: 22-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-101 SA1	19-101 SA4	19-102 SA1	19-102 SA4
	Sample Date:	21-Nov-19 09:00	21-Nov-19 09:00	20-Nov-19 09:00	20-Nov-19 09:00
	Sample ID:	1948056-09	1948056-10	1948056-11	1948056-12
	MDL/Units	Soil	Soil	Soil	Soil
Dibromofluoromethane	Surrogate	73.3%	73.9%	72.9%	68.7%
Toluene-d8	Surrogate	104%	103%	106%	107%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	30	<8	27	<8
F4 PHCs (C34-C50)	6 ug/g dry	7	<6	<6	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.08	<0.02	0.04	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.07	<0.02	0.04	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.11	<0.02	0.05	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.06	<0.02	0.03	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.05	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.12	<0.02	0.06	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	0.22	<0.02	0.09	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.05	<0.02	0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	0.14	<0.02	0.05	<0.02
Pyrene	0.02 ug/g dry	0.18	<0.02	0.07	<0.02
2-Fluorobiphenyl	Surrogate	88.1%	61.8%	115%	97.2%
Terphenyl-d14	Surrogate	136%	92.6%	131%	128%
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	140%	136%	129%	128%

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						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	*0.116*		*ug/g*		*116*	*60-140*			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.33*		*ug/g*		*99.9*	*50-140*			
Surrogate: Terphenyl-d14	*1.59*		*ug/g*		*119*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*3.34*		*ug/g*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*2.34*		*ug/g*		*73.2*	*50-140*			
Surrogate: Toluene-d8	*3.27*		*ug/g*		*102*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	2.58	0.01	N/A	2.54			1.6	200	
Conductivity	257	5	uS/cm	253			1.6	5	
pH	7.79	0.05	pH Units	7.83			0.5	2.3	
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)	19	8	ug/g dry	10			60.0	30	QR-01
F4 PHCs (C34-C50)	36	6	ug/g dry	13			91.8	30	QR-01
Metals									
Antimony	1.9	1.0	ug/g dry	ND			0.0	30	
Arsenic	1.3	1.0	ug/g dry	1.3			5.8	30	
Barium	36.0	1.0	ug/g dry	42.7			17.0	30	
Beryllium	ND	0.5	ug/g dry	1.5			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	9.6	5.0	ug/g dry	12.7			28.3	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	15.2	5.0	ug/g dry	17.5			14.0	30	
Cobalt	2.6	1.0	ug/g dry	3.0			14.3	30	
Copper	5.9	5.0	ug/g dry	6.8			14.1	30	
Lead	4.7	1.0	ug/g dry	5.5			15.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.0	5.0	ug/g dry	8.1			14.8	30	
Selenium	ND	1.0	ug/g dry	1.4			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	14.1	10.0	ug/g dry	15.6			10.0	30	
Zinc	23.6	20.0	ug/g dry	27.0			13.2	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	0.083			0.0	40	
Surrogate: Decachlorobiphenyl	*0.182*		*ug/g dry*		*140*	*60-140*			
Physical Characteristics									
% Solids	80.1	0.1	% by Wt.	80.5			0.5	25	
Semi-Volatiles									
Acenaphthene	0.048	0.02	ug/g dry	0.049			2.9	40	
Acenaphthylene	0.222	0.02	ug/g dry	0.215			3.2	40	
Anthracene	0.240	0.02	ug/g dry	0.215			11.2	40	
Benzo [a] anthracene	0.642	0.02	ug/g dry	0.509			23.1	40	
Benzo [a] pyrene	0.572	0.02	ug/g dry	0.423			29.9	40	
Benzo [b] fluoranthene	0.884	0.02	ug/g dry	0.756			15.6	40	
Benzo [g,h,i] perylene	0.434	0.02	ug/g dry	0.295			38.2	40	
Benzo [k] fluoranthene	0.567	0.02	ug/g dry	0.422			29.4	40	
Chrysene	0.862	0.02	ug/g dry	0.552			43.9	40	QR-04
Dibenzo [a,h] anthracene	0.118	0.02	ug/g dry	0.081			37.4	40	
Fluoranthene	1.59	0.02	ug/g dry	1.21			27.5	40	
Fluorene	0.059	0.02	ug/g dry	0.054			8.8	40	
Indeno [1,2,3-cd] pyrene	0.402	0.02	ug/g dry	0.284			34.2	40	
1-Methylnaphthalene	0.363	0.02	ug/g dry	0.230			45.2	40	QR-04
2-Methylnaphthalene	0.518	0.02	ug/g dry	0.332			43.9	40	QR-04
Naphthalene	0.396	0.01	ug/g dry	0.281			33.8	40	
Phenanthrene	0.800	0.02	ug/g dry	0.655			19.9	40	
Pyrene	1.38	0.02	ug/g dry	1.06			26.7	40	
Surrogate: 2-Fluorobiphenyl	*1.31*		*ug/g dry*		*75.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*1.36*		*ug/g dry*		*78.6*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	*3.96*		*ug/g dry*		*105*	*50-140*			
Surrogate: Dibromofluoromethane	*2.95*		*ug/g dry*		*78.4*	*50-140*			
Surrogate: Toluene-d8	*3.98*		*ug/g dry*		*106*	*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)	204	7	ug/g		102	80-120			
F2 PHCs (C10-C16)	87	4	ug/g	ND	99.1	60-140			
F3 PHCs (C16-C34)	223	8	ug/g	10	99.4	60-140			
F4 PHCs (C34-C50)	153	6	ug/g	13	103	60-140			
Metals									
Antimony	49.1		ug/L	ND	97.7	70-130			
Arsenic	49.9		ug/L	ND	98.7	70-130			
Barium	66.7		ug/L	17.1	99.3	70-130			
Beryllium	55.0		ug/L	0.6	109	70-130			
Boron, available	4.93	0.5	ug/g	ND	98.5	70-122			
Boron	53.5		ug/L	5.1	96.8	70-130			
Cadmium	51.0		ug/L	ND	102	70-130			
Chromium (VI)	4.1	0.2	ug/g		82.0	70-130			
Chromium	62.5		ug/L	7.0	111	70-130			
Cobalt	53.9		ug/L	1.2	105	70-130			
Copper	55.8		ug/L	ND	106	70-130			
Lead	49.0		ug/L	2.2	93.6	70-130			
Mercury	1.35	0.1	ug/g	ND	90.3	70-130			
Molybdenum	53.9		ug/L	ND	107	70-130			
Nickel	56.3		ug/L	ND	106	70-130			
Selenium	45.3		ug/L	ND	89.5	70-130			
Silver	51.9		ug/L	ND	104	70-130			
Thallium	45.0		ug/L	ND	89.8	70-130			
Uranium	47.7		ug/L	ND	94.8	70-130			
Vanadium	56.1		ug/L	ND	99.7	70-130			
Zinc	61.3		ug/L	ND	101	70-130			
PCBs									
PCBs, total	0.638	0.05	ug/g	0.083	107	60-140			
Surrogate: Decachlorobiphenyl	*0.180*		*ug/g*		*138*	*60-140*			
Semi-Volatiles									
Acenaphthene	0.214	0.02	ug/g		129	50-140			
Acenaphthylene	0.182	0.02	ug/g		109	50-140			
Anthracene	0.184	0.02	ug/g		110	50-140			
Benzo [a] anthracene	0.166	0.02	ug/g		99.6	50-140			
Benzo [a] pyrene	0.143	0.02	ug/g		85.8	50-140			
Benzo [b] fluoranthene	0.187	0.02	ug/g		112	50-140			
Benzo [g,h,i] perylene	0.152	0.02	ug/g		91.3	50-140			
Benzo [k] fluoranthene	0.197	0.02	ug/g		118	50-140			
Chrysene	0.201	0.02	ug/g		120	50-140			
Dibenzo [a,h] anthracene	0.157	0.02	ug/g		94.2	50-140			
Fluoranthene	0.175	0.02	ug/g		105	50-140			
Fluorene	0.185	0.02	ug/g		111	50-140			
Indeno [1,2,3-cd] pyrene	0.133	0.02	ug/g		79.7	50-140			
1-Methylnaphthalene	0.172	0.02	ug/g		103	50-140			
2-Methylnaphthalene	0.189	0.02	ug/g		113	50-140			
Naphthalene	0.193	0.01	ug/g		116	50-140			
Phenanthrene	0.174	0.02	ug/g		105	50-140			
Pyrene	0.177	0.02	ug/g		106	50-140			
Volatiles									
Acetone	6.07	0.50	ug/g		60.7	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	2.72	0.02	ug/g		68.0	60-130			
Bromodichloromethane	2.92	0.05	ug/g		73.0	60-130			
Bromoform	3.72	0.05	ug/g		93.0	60-130			
Bromomethane	2.87	0.05	ug/g		71.8	50-140			
Carbon Tetrachloride	2.49	0.05	ug/g		62.2	60-130			
Chlorobenzene	3.96	0.05	ug/g		99.0	60-130			
Chloroform	2.91	0.05	ug/g		72.7	60-130			
Dibromochloromethane	3.98	0.05	ug/g		99.5	60-130			
Dichlorodifluoromethane	2.50	0.05	ug/g		62.5	50-140			
1,2-Dichlorobenzene	3.36	0.05	ug/g		84.1	60-130			
1,3-Dichlorobenzene	3.37	0.05	ug/g		84.3	60-130			
1,4-Dichlorobenzene	3.61	0.05	ug/g		90.2	60-130			
1,1-Dichloroethane	2.97	0.05	ug/g		74.2	60-130			
1,2-Dichloroethane	3.70	0.05	ug/g		92.4	60-130			
1,1-Dichloroethylene	2.68	0.05	ug/g		67.0	60-130			
cis-1,2-Dichloroethylene	2.43	0.05	ug/g		60.7	60-130			
trans-1,2-Dichloroethylene	3.16	0.05	ug/g		79.1	60-130			
1,2-Dichloropropane	3.38	0.05	ug/g		84.5	60-130			
cis-1,3-Dichloropropylene	2.76	0.05	ug/g		69.0	60-130			
trans-1,3-Dichloropropylene	2.65	0.05	ug/g		66.3	60-130			
Ethylbenzene	3.94	0.05	ug/g		98.5	60-130			
Ethylene dibromide (dibromoethane	3.18	0.05	ug/g		79.4	60-130			
Hexane	2.54	0.05	ug/g		63.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.14	0.50	ug/g		81.4	50-140			
Methyl Isobutyl Ketone	5.32	0.50	ug/g		53.2	50-140			
Methyl tert-butyl ether	8.20	0.05	ug/g		82.0	50-140			
Methylene Chloride	2.70	0.05	ug/g		67.5	60-130			
Styrene	3.80	0.05	ug/g		94.9	60-130			
1,1,1,2-Tetrachloroethane	4.34	0.05	ug/g		108	60-130			
1,1,2,2-Tetrachloroethane	4.04	0.05	ug/g		101	60-130			
Tetrachloroethylene	3.81	0.05	ug/g		95.2	60-130			
Toluene	4.09	0.05	ug/g		102	60-130			
1,1,1-Trichloroethane	3.55	0.05	ug/g		88.7	60-130			
1,1,2-Trichloroethane	2.58	0.05	ug/g		64.4	60-130			
Trichloroethylene	2.79	0.05	ug/g		69.6	60-130			
Trichlorofluoromethane	3.27	0.05	ug/g		81.7	50-140			
Vinyl chloride	3.21	0.02	ug/g		80.2	50-140			
m,p-Xylenes	7.85	0.05	ug/g		98.1	60-130			
o-Xylene	3.85	0.05	ug/g		96.3	60-130			

Qualifier Notes:

Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match -
Applies to samples: Dup-1, Dup-2, 19-101 SA1

Sample Qualifiers :

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

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous 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 LABORATORIES L

Paracel ID: 1948056

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300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
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Chain of Custody (Lab Use Only)
№ 123734

Page 1 of 2

Client Name: GOLDER ASSOCIATES	Project Reference: 19120705	**Turnaround Time:**	
Contact Name: SHIHAN CHOWDHURY	Quote # CITY OF OTTAWA - 555 ALBERT ST	☐ 1 Day	☐ 3 Day
Address: 1931 ROBERTSON ROAD, OTTAWA	PO #		
	Email Address: shihan_chowdhury@golder.com	☐ 2 Day	☒ Regular
Telephone: 613-406-6892		Date Required:	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 3 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ______ ☐ Other: ______

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

Paracel Order Number: 1948056

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs					O.REG METALS	O.REG SAR	O.REG CONDUCTIVITY	pH	PCBs		
1	BGM877 19-04 SA2	S		3	NOV 21/19		X	X	X					X	X	X	X	X	1x250ml+1vial	
2	878 19-04 SA4			3			X	X	X					X	X	X		X		
3	~~879~~ 19-04 SA6 895			3																
4	~~880~~ 19-06 SA3 879			3			X	X	X					X	X	X		X	1x250ml+1vial	
5	~~881~~ 19-06 SA5 880			3			X	X	X					X	X	X	X	X	1x250ml+1vial	
6	~~882~~ 19-09 SA1 881			3	NOV 20/19		X	X	X					X	X	X		X		
7	~~883~~ 19-09 SA4 882			3	-11-		X	X	X					X	X	X		X		
8	~~884893~~ DUP-1 : read = 19-04 DUP1		883	2	NOV 21/19		X	X	X					X	X	X	X	X	1x250ml+1vial	
9	~~885894~~ DUP-2 : read = 19-06 DUP2		890	2	-11-		X	X	X					X	X	X	X	X		
10	~~886892~~ 19-101 SA1		891	3	-11-		X	X	X					X	X	X		X	1x250ml+1vial	

Comments: IGNORE PROJECT # ON CONTAINERS. USE PROJECT # 19120705 FROM COCs.
SAMPLE ON HOLD: 19-04 SA6.

Method of Delivery: Walker

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: Juneepurn Dhamai	Verified By: [signature]
Relinquished By (Print): SHIHAN C	Date/Time: NOV 22/19 1547	Date/Time: NOV 25, 2019 11:55	Date/Time: 11-25-19 13:12
Date/Time: NOV 22/19 @ 15:05	Temperature: 12.2 °C	Temperature: 8.7 °C	pH Verified [ ] By:

PARACEL LABORATORIES LTD.

Paracel ID: 1948056

Head Office
300-2319 St. Laurent Blvd.
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Chain of Custody
(Lab Use Only)
№ 123735

Page 2 of 2

Client Name: GOUDER ASSOCIATES	Project Reference: 19120705	**Turnaround Time:**
Contact Name: SHIHAN CHOWDHURY	Quote #: CITY OF OTTAWA – 555 ALBERT ST	☐ 1 Day ☐ 3 Day
Address:	PO #:	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 3 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

	Paracel Order Number: 1948056 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	HWSB	O. Reg Metals	O. Reg SAR	O. Reg Conductivity	pH	RCS 1		
1	892 19-101 SA4	S		3	NOV 21/19		X	X	X					X	X	X		X		
2	893 19-102 SA1	S		2	NOV 20/19		X	X	X					X	X	X		X		
3	894 19-102 SA4	S		2	↓		X	X	X					X	X	X		X		
4	896 19-102 SA7	S		3																
5	897 19-102 SA10	S		3	↓															
6																				
7																				
8																				
9																				
10																				

Comments: IGNORE PROJECT # ON CONTAINERS. USE PROJECT # 19120705 FROM COC
SAMPLE ON HOLD: 19-102 SA7, 19-102 SA10

Method of Delivery: WALK-IN

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): SHIHAN. C	Date/Time: NOV 22/19 15:47	Date/Time: NOV 26, 2019 11:55	Date/Time: 11-25-19 13:12
Date/Time: NOV 22/19 @ 15:09	Temperature: 12.2°C	Temperature: 8.7 °C	pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert Street
Custody: 124127

Report Date: 5-Dec-2019
Order Date: 28-Nov-2019

Order #: 1948581

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

Paracel ID	Client ID
1948581-01	19-03 SA2
1948581-02	19-03 SA7

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 28-Nov-2019

Project Description: 19120705/555 Albert Street

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	3-Dec-19	3-Dec-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	28-Nov-19	3-Dec-19
Conductivity	MOE E3138 - probe @25 °C, water ext	4-Dec-19	4-Dec-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	4-Dec-19	4-Dec-19
PCBs, total	SW846 8082A - GC-ECD	27-Nov-19	30-Nov-19
PHC F1	CWS Tier 1 - P&T GC-FID	2-Dec-19	3-Dec-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	28-Nov-19	1-Dec-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	2-Dec-19	2-Dec-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	29-Nov-19	4-Dec-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	2-Dec-19	3-Dec-19
SAR	Calculated	3-Dec-19	3-Dec-19
Solids, %	Gravimetric, calculation	29-Nov-19	29-Nov-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 28-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-03 SA2	19-03 SA7	-	-
	Sample Date:	26-Nov-19 09:00	26-Nov-19 09:00	-	-
	Sample ID:	1948581-01	1948581-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	89.6	90.6	-	-
General Inorganics					
SAR	0.01 N/A	6.22	2.86	-	-
Conductivity	5 uS/cm	938	439	-	-
Metals					
Antimony	1.0 ug/g dry	1.8	<1.0	-	-
Arsenic	1.0 ug/g dry	6.7	2.3	-	-
Barium	1.0 ug/g dry	161	44.8	-	-
Beryllium	0.5 ug/g dry	0.6	<0.5	-	-
Boron	5.0 ug/g dry	10.9	12.6	-	-
Boron, available	0.5 ug/g dry	0.7	<0.5	-	-
Cadmium	0.5 ug/g dry	0.8	<0.5	-	-
Chromium	5.0 ug/g dry	25.2	17.3	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	6.6	5.0	-	-
Copper	5.0 ug/g dry	25.5	9.0	-	-
Lead	1.0 ug/g dry	187	4.5	-	-
Mercury	0.1 ug/g dry	0.6	<0.1	-	-
Molybdenum	1.0 ug/g dry	1.6	<1.0	-	-
Nickel	5.0 ug/g dry	15.5	8.4	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.3 ug/g dry	0.8	<0.3	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	1.1	<1.0	-	-
Vanadium	10.0 ug/g dry	29.3	25.9	-	-
Zinc	20.0 ug/g dry	113	21.1	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 28-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-03 SA2	19-03 SA7	-	-
	Sample Date:	26-Nov-19 09:00	26-Nov-19 09:00	-	-
	Sample ID:	1948581-01	1948581-02	-	-
	MDL/Units	Soil	Soil	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	106%	104%	-	-
Dibromofluoromethane	Surrogate	105%	109%	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 28-Nov-2019

Project Description: 19120705/555 Albert Street

	Client ID:	19-03 SA2	19-03 SA7	-	-
	Sample Date:	26-Nov-19 09:00	26-Nov-19 09:00	-	-
	Sample ID:	1948581-01	1948581-02	-	-
	MDL/Units	Soil	Soil	-	-
Toluene-d8	Surrogate	110%	109%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	97	<8	-	-
F4 PHCs (C34-C50)	6 ug/g dry	42	<6	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.29	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	0.20	<0.02	-	-
Anthracene	0.02 ug/g dry	0.89	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g dry	1.27	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g dry	1.05	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	1.22	<0.02	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.57	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.68	<0.02	-	-
Chrysene	0.02 ug/g dry	1.30	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.08	<0.02	-	-
Fluoranthene	0.02 ug/g dry	2.85	<0.02	-	-
Fluorene	0.02 ug/g dry	0.30	<0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.54	<0.02	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.12	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.16	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.27	<0.04	-	-
Naphthalene	0.01 ug/g dry	0.32	<0.01	-	-
Phenanthrene	0.02 ug/g dry	2.47	<0.02	-	-
Pyrene	0.02 ug/g dry	2.69	<0.02	-	-
2-Fluorobiphenyl	Surrogate	91.3%	97.0%	-	-
Terphenyl-d14	Surrogate	86.0%	95.4%	-	-
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	-	-
Decachlorobiphenyl	Surrogate	108%	109%	-	-

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						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	***0.104***		***ug/g***		***104***	***60-140***			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	***1.10***		***ug/g***		***82.8***	***50-140***			
Surrogate: Terphenyl-d14	***1.10***		***ug/g***		***82.4***	***50-140***			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	***8.55***		***ug/g***		***107***	***50-140***			
Surrogate: Dibromofluoromethane	***8.66***		***ug/g***		***108***	***50-140***			
Surrogate: Toluene-d8	***8.37***		***ug/g***		***105***	***50-140***			

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	476	5	uS/cm	474			0.5	5	
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	
Metals									
Antimony	2.0	1.0	ug/g dry	ND			0.0	30	
Arsenic	5.8	1.0	ug/g dry	5.6			2.3	30	
Barium	170	1.0	ug/g dry	176			3.8	30	
Beryllium	0.7	0.5	ug/g dry	0.7			4.3	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	10.9	5.0	ug/g dry	19.0			54.7	30	QR-01
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	52.0	5.0	ug/g dry	52.8			1.5	30	
Cobalt	12.0	1.0	ug/g dry	11.7			2.5	30	
Copper	30.4	5.0	ug/g dry	30.9			1.7	30	
Lead	33.1	1.0	ug/g dry	33.1			0.0	30	
Mercury	ND	0.1	ug/g dry	ND				30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	30.0	5.0	ug/g dry	30.7			2.3	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	0.3	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	67.1	10.0	ug/g dry	64.0			4.7	30	
Zinc	81.7	20.0	ug/g dry	82.4			0.9	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	ND			0.0	40	
Surrogate: Decachlorobiphenyl	***0.147***		***ug/g dry***		***110***	***60-140***			
Physical Characteristics									
% Solids	78.7	0.1	% by Wt.	79.5			1.0	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			0.0	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND			0.0	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND			0.0	40	
Pyrene	ND	0.02	ug/g dry	ND			0.0	40	
Surrogate: 2-Fluorobiphenyl	***1.18***		***ug/g dry***		***70.6***	***50-140***			
Surrogate: Terphenyl-d14	***1.12***		***ug/g dry***		***66.9***	***50-140***			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	***9.59***		***ug/g dry***		***107***	***50-140***			
Surrogate: Dibromofluoromethane	***9.44***		***ug/g dry***		***106***	***50-140***			
Surrogate: Toluene-d8	***9.80***		***ug/g dry***		***110***	***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)	165	7	ug/g		82.5	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	ND	113	60-140			
F3 PHCs (C16-C34)	254	8	ug/g	ND	121	60-140			
F4 PHCs (C34-C50)	156	6	ug/g	ND	117	60-140			
Metals									
Antimony	46.8		ug/L	ND	93.1	70-130			
Arsenic	52.2		ug/L	2.3	99.9	70-130			
Barium	120		ug/L	70.6	98.0	70-130			
Beryllium	48.4		ug/L	ND	96.2	70-130			
Boron, available	2.87	0.5	ug/g	ND	57.4	70-122			QM-07
Boron	49.5		ug/L	7.6	83.8	70-130			
Cadmium	48.6		ug/L	ND	97.0	70-130			
Chromium (VI)	0.2		mg/L	ND	90.5	70-130			
Chromium	67.6		ug/L	21.1	92.9	70-130			
Cobalt	50.8		ug/L	4.7	92.1	70-130			
Copper	55.5		ug/L	12.4	86.3	70-130			
Lead	60.2		ug/L	13.2	93.9	70-130			
Mercury	1.65	0.1	ug/g	ND	110	70-130			
Molybdenum	48.3		ug/L	ND	96.2	70-130			
Nickel	59.7		ug/L	12.3	94.8	70-130			
Selenium	47.7		ug/L	ND	95.0	70-130			
Silver	46.5		ug/L	ND	92.8	70-130			
Thallium	46.6		ug/L	ND	92.9	70-130			
Uranium	49.4		ug/L	ND	98.2	70-130			
Vanadium	74.4		ug/L	25.6	97.5	70-130			
Zinc	78.0		ug/L	33.0	90.2	70-130			
PCBs									
PCBs, total	0.532	0.05	ug/g		133	60-140			
Surrogate: Decachlorobiphenyl	***0.137***		***ug/g***		***137***	***60-140***			
Semi-Volatiles									
Acenaphthene	0.153	0.02	ug/g	ND	73.1	50-140			
Acenaphthylene	0.125	0.02	ug/g	ND	59.8	50-140			
Anthracene	0.173	0.02	ug/g	ND	82.5	50-140			
Benzo [a] anthracene	0.154	0.02	ug/g	ND	73.5	50-140			
Benzo [a] pyrene	0.134	0.02	ug/g	ND	64.0	50-140			
Benzo [b] fluoranthene	0.183	0.02	ug/g	ND	87.4	50-140			
Benzo [g,h,i] perylene	0.148	0.02	ug/g	ND	70.4	50-140			
Benzo [k] fluoranthene	0.152	0.02	ug/g	ND	72.3	50-140			
Chrysene	0.188	0.02	ug/g	ND	89.6	50-140			
Dibenzo [a,h] anthracene	0.139	0.02	ug/g	ND	66.1	50-140			
Fluoranthene	0.156	0.02	ug/g	ND	74.4	50-140			
Fluorene	0.139	0.02	ug/g	ND	66.5	50-140			
Indeno [1,2,3-cd] pyrene	0.123	0.02	ug/g	ND	58.8	50-140			
1-Methylnaphthalene	0.147	0.02	ug/g	ND	70.1	50-140			
2-Methylnaphthalene	0.155	0.02	ug/g	ND	73.8	50-140			
Naphthalene	0.154	0.01	ug/g	ND	73.6	50-140			
Phenanthrene	0.151	0.02	ug/g	ND	72.1	50-140			
Pyrene	0.169	0.02	ug/g	ND	80.6	50-140			
Volatiles									
Acetone	8.55	0.50	ug/g		85.5	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	4.01	0.02	ug/g		100	60-130			
Bromodichloromethane	4.25	0.05	ug/g		106	60-130			
Bromoform	4.14	0.05	ug/g		104	60-130			
Bromomethane	4.45	0.05	ug/g		111	50-140			
Carbon Tetrachloride	3.55	0.05	ug/g		88.8	60-130			
Chlorobenzene	4.65	0.05	ug/g		116	60-130			
Chloroform	4.24	0.05	ug/g		106	60-130			
Dibromochloromethane	4.75	0.05	ug/g		119	60-130			
Dichlorodifluoromethane	3.95	0.05	ug/g		98.6	50-140			
1,2-Dichlorobenzene	4.73	0.05	ug/g		118	60-130			
1,3-Dichlorobenzene	4.91	0.05	ug/g		123	60-130			
1,4-Dichlorobenzene	4.67	0.05	ug/g		117	60-130			
1,1-Dichloroethane	4.49	0.05	ug/g		112	60-130			
1,2-Dichloroethane	3.99	0.05	ug/g		99.8	60-130			
1,1-Dichloroethylene	3.97	0.05	ug/g		99.2	60-130			
cis-1,2-Dichloroethylene	4.26	0.05	ug/g		106	60-130			
trans-1,2-Dichloroethylene	4.00	0.05	ug/g		100	60-130			
1,2-Dichloropropane	4.43	0.05	ug/g		111	60-130			
cis-1,3-Dichloropropylene	3.51	0.05	ug/g		87.7	60-130			
trans-1,3-Dichloropropylene	3.40	0.05	ug/g		85.1	60-130			
Ethylbenzene	4.71	0.05	ug/g		118	60-130			
Ethylene dibromide (dibromoethane	4.24	0.05	ug/g		106	60-130			
Hexane	4.34	0.05	ug/g		108	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.76	0.50	ug/g		87.6	50-140			
Methyl Isobutyl Ketone	8.45	0.50	ug/g		84.5	50-140			
Methyl tert-butyl ether	6.07	0.05	ug/g		60.7	50-140			
Methylene Chloride	3.51	0.05	ug/g		87.8	60-130			
Styrene	4.54	0.05	ug/g		113	60-130			
1,1,1,2-Tetrachloroethane	4.64	0.05	ug/g		116	60-130			
1,1,2,2-Tetrachloroethane	4.12	0.05	ug/g		103	60-130			
Tetrachloroethylene	4.17	0.05	ug/g		104	60-130			
Toluene	4.72	0.05	ug/g		118	60-130			
1,1,1-Trichloroethane	3.65	0.05	ug/g		91.3	60-130			
1,1,2-Trichloroethane	3.81	0.05	ug/g		95.2	60-130			
Trichloroethylene	3.70	0.05	ug/g		92.5	60-130			
Trichlorofluoromethane	3.51	0.05	ug/g		87.8	50-140			
Vinyl chloride	4.41	0.02	ug/g		110	50-140			
m,p-Xylenes	8.93	0.05	ug/g		112	60-130			
o-Xylene	4.67	0.05	ug/g		117	60-130			

Qualifier Notes:

QC Qualifiers :

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

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

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 LABORATORIES LTD

Paracel ID: 1948581

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1948581	№ 124127

Page 1 of 1

Client Name: Golder Associates	Project Ref: 19120705
Contact Name: Shihan Chowdhury	Quote #: City of Ottawa - 555 Albert Street
Address: 1931 Robertson Rd, Ottawa	PO #:
	E-mail: shihan_chowdhury@golder.com
Telephone: 613-406-6892	

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

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☒ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☐ Table ___ For RSC: ☐ Yes ☐ No

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

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

Required Analysis

#	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCB	O.Reg Conductivity	O.Reg SAR			
1	19-03 SA2	BGM913	S		3	2019/11/26		X	X	X	X	X	X	X	X	X	X	9x250ml+1vial		
2	19-03 SA7	914	S		3	↓		X	X	X	X	X	X	X	X	X	X	↓		
3	~~19-203~~ 19-03 SA8	915	S		3	↓														
4	19-03 SA5	916	S		3	2019/11/27														
5	Thread-09 D.																			
6																				
7																				
8																				
9																				
10																				

Comments: 19-03 SA8 + 19-03 SA5 on HOLD
Samples received submerged in ice/water also in sample bags

Method of Delivery: Walk-in

Relinquished By (Sign): AWood	Received By Driver/Depot:	Received at Lab: Sineepoun Dohman	Verified By:
Relinquished By (Print): Alex Wood	Date/Time: Nov 28/19 16:11	Date/Time: Nov 29, 2019 12.55	Date/Time: 29Nov19 1335
Date/Time: 2019/11/28 16:00	Temperature: 8.4 °C	Temperature: 7.7 °C	pH Verified: ☐ By: NA

Chain of Custody (Env.) xlsx

Revision 3.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert St.
Custody: 124128

Report Date: 5-Dec-2019
Order Date: 29-Nov-2019

Order #: 1948614

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

Paracel ID	Client ID
1948614-01	19-01 SA3
1948614-02	19-01 SA7
1948614-03	19-02 SA1
1948614-04	19-02 SA7
1948614-05	Dup-3

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 05-Dec-2019
Order Date: 29-Nov-2019
Project Description: 19120705/555 Albert St.

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	3-Dec-19	3-Dec-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	2-Dec-19	4-Dec-19
Conductivity	MOE E3138 - probe @25 °C, water ext	4-Dec-19	4-Dec-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	3-Dec-19	3-Dec-19
PCBs, total	SW846 8082A - GC-ECD	2-Dec-19	3-Dec-19
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	2-Dec-19	3-Dec-19
PHC F1	CWS Tier 1 - P&T GC-FID	2-Dec-19	4-Dec-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	2-Dec-19	4-Dec-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	3-Dec-19	3-Dec-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	29-Nov-19	4-Dec-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	2-Dec-19	4-Dec-19
SAR	Calculated	3-Dec-19	3-Dec-19
Solids, %	Gravimetric, calculation	2-Dec-19	2-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 29-Nov-2019

Project Description: 19120705/555 Albert St.

	Client ID:	19-01 SA3	19-01 SA7	19-02 SA1	19-02 SA7
	Sample Date:	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00
	Sample ID:	1948614-01	1948614-02	1948614-03	1948614-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.4	90.9	91.6	90.1
General Inorganics					
SAR	0.01 N/A	0.64	0.67	2.58	1.88
Conductivity	5 uS/cm	165	145	815	416
pH	0.05 pH Units	-	8.10	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.8	1.7	2.9	1.9
Barium	1.0 ug/g dry	36.8	35.1	157	176
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	<5.0	<5.0	5.7	5.5
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	14.4	12.8	42.2	31.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.5	4.2	9.3	8.9
Copper	5.0 ug/g dry	9.2	8.8	23.9	19.1
Lead	1.0 ug/g dry	2.7	2.9	34.4	3.8
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	8.4	9.2	23.5	19.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	24.4	21.6	45.7	43.6
Zinc	20.0 ug/g dry	<20.0	191	78.0	50.0
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 29-Nov-2019

Project Description: 19120705/555 Albert St.

	Client ID:	19-01 SA3	19-01 SA7	19-02 SA1	19-02 SA7
	Sample Date:	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00
	Sample ID:	1948614-01	1948614-02	1948614-03	1948614-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	106%	105%	107%	104%

Certificate of Analysis

Report Date: 05-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 29-Nov-2019

Client PO:

Project Description: 19120705/555 Albert St.

	Client ID:	19-01 SA3	19-01 SA7	19-02 SA1	19-02 SA7
	Sample Date:	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00	28-Nov-19 09:00
	Sample ID:	1948614-01	1948614-02	1948614-03	1948614-04
	MDL/Units	Soil	Soil	Soil	Soil
Dibromofluoromethane	Surrogate	106%	104%	106%	106%
Toluene-d8	Surrogate	104%	103%	105%	104%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	32	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	24	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	79.4%	82.6%	112%	88.3%
Terphenyl-d14	Surrogate	87.7%	84.0%	110%	87.5%
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	0.07	<0.05
Decachlorobiphenyl	Surrogate	135%	118%	117%	132%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 29-Nov-2019

Project Description: 19120705/555 Albert St.

	Client ID:	Dup-3	-	-	-
	Sample Date:	28-Nov-19 09:00	-	-	-
	Sample ID:	1948614-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	90.5	-	-	-
General Inorganics					
SAR	0.01 N/A	2.27	-	-	-
Conductivity	5 uS/cm	420	-	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	1.9	-	-	-
Barium	1.0 ug/g dry	191	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	<5.0	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	31.0	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	9.1	-	-	-
Copper	5.0 ug/g dry	24.6	-	-	-
Lead	1.0 ug/g dry	3.4	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	5.0 ug/g dry	19.3	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	44.2	-	-	-
Zinc	20.0 ug/g dry	49.9	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 05-Dec-2019

Order Date: 29-Nov-2019

Project Description: 19120705/555 Albert St.

	Client ID:	Dup-3	-	-	-
	Sample Date:	28-Nov-19 09:00	-	-	-
	Sample ID:	1948614-05	-	-	-
	MDL/Units	Soil	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethar	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	107%	-	-	-

Certificate of Analysis

Report Date: 05-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 29-Nov-2019

Client PO:

Project Description: 19120705/555 Albert St.

	Client ID:	Dup-3	-	-	-
	Sample Date:	28-Nov-19 09:00	-	-	-
	Sample ID:	1948614-05	-	-	-
	MDL/Units	Soil	-	-	-
Dibromofluoromethane	Surrogate	107%	-	-	-
Toluene-d8	Surrogate	103%	-	-	-
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	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.07	-	-	-
Acenaphthylene	0.02 ug/g dry	0.07	-	-	-
Anthracene	0.02 ug/g dry	0.28	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.60	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.50	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.70	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.37	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.30	-	-	-
Chrysene	0.02 ug/g dry	0.87	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.09	-	-	-
Fluoranthene	0.02 ug/g dry	1.43	-	-	-
Fluorene	0.02 ug/g dry	0.10	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.32	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.03	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.05	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.09	-	-	-
Naphthalene	0.01 ug/g dry	0.10	-	-	-
Phenanthrene	0.02 ug/g dry	0.86	-	-	-
Pyrene	0.02 ug/g dry	1.21	-	-	-
2-Fluorobiphenyl	Surrogate	79.2%	-	-	-
Terphenyl-d14	Surrogate	62.5%	-	-	-
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	127%	-	-	-

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						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	***0.118***		***ug/g***		***118***	***60-140***			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	***1.10***		***ug/g***		***82.8***	***50-140***			
Surrogate: Terphenyl-d14	***1.10***		***ug/g***		***82.4***	***50-140***			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 05-Dec-2019
Order Date: 29-Nov-2019
Project Description: 19120705/555 Albert St.

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	***8.55***		***ug/g***		***107***	***50-140***			
Surrogate: Dibromofluoromethane	***8.66***		***ug/g***		***108***	***50-140***			
Surrogate: Toluene-d8	***8.37***		***ug/g***		***105***	***50-140***			

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	476	5	uS/cm	474			0.5	5	
pH	7.68	0.05	pH Units	7.80			1.6	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	1260	4	ug/g dry	1430			12.5	30	
F3 PHCs (C16-C34)	801	8	ug/g dry	842			5.0	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	1.5	1.0	ug/g dry	1.9			23.5	30	
Barium	13.2	1.0	ug/g dry	16.1			19.6	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	ND	5.0	ug/g dry	ND			0.0	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	7.6	5.0	ug/g dry	9.2			18.7	30	
Cobalt	2.4	1.0	ug/g dry	3.0			22.4	30	
Copper	5.2	5.0	ug/g dry	6.2			17.8	30	
Lead	2.2	1.0	ug/g dry	2.7			19.6	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	ND	5.0	ug/g dry	5.7			0.0	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	16.2	10.0	ug/g dry	20.5			23.6	30	
Zinc	ND	20.0	ug/g dry	ND			0.0	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	ND				40	
Surrogate: Decachlorobiphenyl	***0.152***		***ug/g dry***		***129***	***60-140***			
Physical Characteristics									
% Solids	84.8	0.1	% by Wt.	85.4			0.6	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			0.0	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND			0.0	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND			0.0	40	
Pyrene	ND	0.02	ug/g dry	ND			0.0	40	
Surrogate: 2-Fluorobiphenyl	***1.18***		***ug/g dry***		***70.6***	***50-140***			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	***1.12***		***ug/g dry***		***66.9***	***50-140***			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	***9.59***		***ug/g dry***		***107***	***50-140***			
Surrogate: Dibromofluoromethane	***9.44***		***ug/g dry***		***106***	***50-140***			
Surrogate: Toluene-d8	***9.80***		***ug/g dry***		***110***	***50-140***			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 05-Dec-2019
Order Date: 29-Nov-2019
Project Description: 19120705/555 Albert St.

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	165	7	ug/g		82.5	80-120			
F2 PHCs (C10-C16)	95	4	ug/g		119	80-120			
F3 PHCs (C16-C34)	232	8	ug/g		118	80-120			
F4 PHCs (C34-C50)	137	6	ug/g		110	80-120			
Metals									
Antimony	43.5		ug/L	ND	86.3	70-130			
Arsenic	53.1		ug/L	ND	105	70-130			
Barium	56.6		ug/L	6.4	100	70-130			
Beryllium	53.8		ug/L	ND	107	70-130			
Boron, available	2.87	0.5	ug/g	ND	57.4	70-122			QM-07
Boron	51.9		ug/L	ND	100	70-130			
Cadmium	49.5		ug/L	ND	98.9	70-130			
Chromium (VI)	4.1	0.2	ug/g	ND	74.0	70-130			
Chromium	58.0		ug/L	ND	109	70-130			
Cobalt	50.4		ug/L	1.2	98.5	70-130			
Copper	54.5		ug/L	ND	104	70-130			
Lead	49.1		ug/L	1.1	96.0	70-130			
Mercury	1.68	0.1	ug/g	ND	112	70-130			
Molybdenum	51.0		ug/L	ND	102	70-130			
Nickel	53.8		ug/L	ND	103	70-130			
Selenium	51.6		ug/L	ND	103	70-130			
Silver	49.0		ug/L	ND	97.9	70-130			
Thallium	50.5		ug/L	ND	101	70-130			
Uranium	52.4		ug/L	ND	104	70-130			
Vanadium	60.8		ug/L	ND	105	70-130			
Zinc	54.4		ug/L	ND	96.9	70-130			
PCBs									
PCBs, total	0.536	0.05	ug/g	ND	114	60-140			
Surrogate: Decachlorobiphenyl	***0.141***		***ug/g***		***121***	***60-140***			
Semi-Volatiles									
Acenaphthene	0.153	0.02	ug/g	ND	73.1	50-140			
Acenaphthylene	0.125	0.02	ug/g	ND	59.8	50-140			
Anthracene	0.173	0.02	ug/g	ND	82.5	50-140			
Benzo [a] anthracene	0.154	0.02	ug/g	ND	73.5	50-140			
Benzo [a] pyrene	0.134	0.02	ug/g	ND	64.0	50-140			
Benzo [b] fluoranthene	0.183	0.02	ug/g	ND	87.4	50-140			
Benzo [g,h,i] perylene	0.148	0.02	ug/g	ND	70.4	50-140			
Benzo [k] fluoranthene	0.152	0.02	ug/g	ND	72.3	50-140			
Chrysene	0.188	0.02	ug/g	ND	89.6	50-140			
Dibenzo [a,h] anthracene	0.139	0.02	ug/g	ND	66.1	50-140			
Fluoranthene	0.156	0.02	ug/g	ND	74.4	50-140			
Fluorene	0.139	0.02	ug/g	ND	66.5	50-140			
Indeno [1,2,3-cd] pyrene	0.123	0.02	ug/g	ND	58.8	50-140			
1-Methylnaphthalene	0.147	0.02	ug/g	ND	70.1	50-140			
2-Methylnaphthalene	0.155	0.02	ug/g	ND	73.8	50-140			
Naphthalene	0.154	0.01	ug/g	ND	73.6	50-140			
Phenanthrene	0.151	0.02	ug/g	ND	72.1	50-140			
Pyrene	0.169	0.02	ug/g	ND	80.6	50-140			
Volatiles									
Acetone	8.55	0.50	ug/g		85.5	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	4.01	0.02	ug/g		100	60-130			
Bromodichloromethane	4.25	0.05	ug/g		106	60-130			
Bromoform	4.14	0.05	ug/g		104	60-130			
Bromomethane	4.45	0.05	ug/g		111	50-140			
Carbon Tetrachloride	3.55	0.05	ug/g		88.8	60-130			
Chlorobenzene	4.65	0.05	ug/g		116	60-130			
Chloroform	4.24	0.05	ug/g		106	60-130			
Dibromochloromethane	4.75	0.05	ug/g		119	60-130			
Dichlorodifluoromethane	3.95	0.05	ug/g		98.6	50-140			
1,2-Dichlorobenzene	4.73	0.05	ug/g		118	60-130			
1,3-Dichlorobenzene	4.91	0.05	ug/g		123	60-130			
1,4-Dichlorobenzene	4.67	0.05	ug/g		117	60-130			
1,1-Dichloroethane	4.49	0.05	ug/g		112	60-130			
1,2-Dichloroethane	3.99	0.05	ug/g		99.8	60-130			
1,1-Dichloroethylene	3.97	0.05	ug/g		99.2	60-130			
cis-1,2-Dichloroethylene	4.26	0.05	ug/g		106	60-130			
trans-1,2-Dichloroethylene	4.00	0.05	ug/g		100	60-130			
1,2-Dichloropropane	4.43	0.05	ug/g		111	60-130			
cis-1,3-Dichloropropylene	3.51	0.05	ug/g		87.7	60-130			
trans-1,3-Dichloropropylene	3.40	0.05	ug/g		85.1	60-130			
Ethylbenzene	4.71	0.05	ug/g		118	60-130			
Ethylene dibromide (dibromoethane	4.24	0.05	ug/g		106	60-130			
Hexane	4.34	0.05	ug/g		108	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.76	0.50	ug/g		87.6	50-140			
Methyl Isobutyl Ketone	8.45	0.50	ug/g		84.5	50-140			
Methyl tert-butyl ether	6.07	0.05	ug/g		60.7	50-140			
Methylene Chloride	3.51	0.05	ug/g		87.8	60-130			
Styrene	4.54	0.05	ug/g		113	60-130			
1,1,1,2-Tetrachloroethane	4.64	0.05	ug/g		116	60-130			
1,1,2,2-Tetrachloroethane	4.12	0.05	ug/g		103	60-130			
Tetrachloroethylene	4.17	0.05	ug/g		104	60-130			
Toluene	4.72	0.05	ug/g		118	60-130			
1,1,1-Trichloroethane	3.65	0.05	ug/g		91.3	60-130			
1,1,2-Trichloroethane	3.81	0.05	ug/g		95.2	60-130			
Trichloroethylene	3.70	0.05	ug/g		92.5	60-130			
Trichlorofluoromethane	3.51	0.05	ug/g		87.8	50-140			
Vinyl chloride	4.41	0.02	ug/g		110	50-140			
m,p-Xylenes	8.93	0.05	ug/g		112	60-130			
o-Xylene	4.67	0.05	ug/g		117	60-130			

Qualifier Notes:

Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match -
Applies to samples: Dup-3

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

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 LABORATORIES LTD.

Paracel ID: 1948614

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1948614	Nº 124128

Page 1 of 1

Client Name: GOLDER ASSOCIATES LTD.	Project Ref: 19120705
Contact Name: SHIHAN CHOWDHURY	Quote #: CITY OF OTTAWA - 555 ALBERT ST.
Address: 1931 ROBERTSON ROAD, OTTAWA	PO #:
Telephone: 613-406-6892	E-mail: shihan_chowdhury@golder.com

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)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	HG	CrVI	B (HWS)	O. REG SAR	O. REG. CONDUCTIVITY	PCB	pH		
1	19-01 SA3 BGM917	S		3	NOV 28/2019		X	X	X	X	X	X	X	X	X	X		250mL 1 vial	
2	19-01 SA7 918	S		3	NOV 28/2019		X	X	X	X	X	X	X	X	X	X	X		
3	19-02 SA1 919	S		3	NOV 28/2019		X	X	X	X	X	X	X	X	X	X			
4	19-02 SA7 920	S		3	NOV 28/2019		X	X	X	X	X	X	X	X	X	X			
5	DUP-3 921	S		3	NOV 28/2019		X	X	X	X	X	X	X	X	X	X			
6																			
7																			
8																			
9																			
10																			

Comments: No. 5 - ID read - 19-02-DUP-3 (2 soils + 1 vial.)

Method of Delivery: Walk in

Relinquished By (Sign):	Received By Driver/Depot: Timeport Dolphin	Received at Lab:
Relinquished By (Print): SHIHAN CHOWDHURY	Date/Time: DEC 02, 2019 12:30	Date/Time: IV 2019 3:37
Date/Time: NOVEMBER 29/2019 @ 3:37pm	Temperature: 14.9 °C	Temperature: 3.4 °C

Verified By: D Gauthier
Date/Time: 2 Dec 19 7:45
pH Verified: ☐ By: NA

Chain of Custody (Env) xlsx

Revision 30

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert St.
Custody: 124129

Report Date: 11-Dec-2019
Order Date: 3-Dec-2019

Order #: 1949218

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

Paracel ID	Client ID
1949218-01	TCLP-1
1949218-02	TCLP-2

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 11-Dec-2019
Order Date: 3-Dec-2019
Project Description: 19120705/555 Albert St.

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Flashpoint	ASTM D93 - Pensky-Martens Closed Cup	10-Dec-19	10-Dec-19
Ignitability	Match Test	5-Dec-19	5-Dec-19
Metals, ICP-MS	TCLP EPA 6020 - Digestion - ICP-MS	9-Dec-19	9-Dec-19
REG 558 - Cyanide	MOE E3015- Auto Colour	6-Dec-19	6-Dec-19
REG 558 - Fluoride	EPA 340.2 - ISE	9-Dec-19	9-Dec-19
REG 558 - Mercury by CVAA	EPA 7470A - Cold Vapour AA	9-Dec-19	9-Dec-19
REG 558 - NO3/NO2	EPA 300.1 - IC	7-Dec-19	7-Dec-19
REG 558 - PAHs	EPA 625 - GC-MS	9-Dec-19	9-Dec-19
REG 558 - VOCs	EPA 624 - P&T GC-MS	5-Dec-19	6-Dec-19
Solids, %	Gravimetric, calculation	4-Dec-19	4-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 11-Dec-2019

Order Date: 3-Dec-2019

Project Description: 19120705/555 Albert St.

	Client ID:	TCLP-1	TCLP-2	-	-
	Sample Date:	03-Dec-19 09:00	03-Dec-19 09:00	-	-
	Sample ID:	1949218-01	1949218-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.8	90.4	-	-
Flashpoint	℃	>70	>70	-	-
Ignitability	N/A	Negative	Negative	-	-
EPA 1311 - TCLP Leachate Inorganics					
Fluoride	0.05 mg/L	0.42	0.21	-	-
Nitrate as N	1 mg/L	<1	<1	-	-
Nitrite as N	1 mg/L	<1	<1	-	-
Cyanide, free	0.02 mg/L	<0.02	<0.02	-	-
EPA 1311 - TCLP Leachate Metals					
Arsenic	0.05 mg/L	<0.05	<0.05	-	-
Barium	0.05 mg/L	0.80	0.84	-	-
Boron	0.05 mg/L	0.11	<0.05	-	-
Cadmium	0.01 mg/L	<0.01	<0.01	-	-
Chromium	0.05 mg/L	<0.05	<0.05	-	-
Lead	0.05 mg/L	<0.05	0.09	-	-
Mercury	0.005 mg/L	<0.005	<0.005	-	-
Selenium	0.05 mg/L	<0.05	<0.05	-	-
Silver	0.05 mg/L	<0.05	<0.05	-	-
Uranium	0.05 mg/L	<0.05	<0.05	-	-
EPA 1311 - TCLP Leachate Volatiles					
Benzene	0.005 mg/L	<0.005	<0.005	-	-
Carbon Tetrachloride	0.005 mg/L	<0.005	<0.005	-	-
Chlorobenzene	0.004 mg/L	<0.004	<0.004	-	-
Chloroform	0.006 mg/L	<0.006	<0.006	-	-
1,2-Dichlorobenzene	0.004 mg/L	<0.004	<0.004	-	-
1,4-Dichlorobenzene	0.004 mg/L	<0.004	<0.004	-	-
1,2-Dichloroethane	0.005 mg/L	<0.005	<0.005	-	-
1,1-Dichloroethylene	0.006 mg/L	<0.006	<0.006	-	-
Methyl Ethyl Ketone (2-Butanone)	0.30 mg/L	<0.30	<0.30	-	-
Methylene Chloride	0.04 mg/L	<0.04	<0.04	-	-
Tetrachloroethylene	0.005 mg/L	<0.005	<0.005	-	-
Trichloroethylene	0.004 mg/L	<0.004	<0.004	-	-
Vinyl chloride	0.005 mg/L	<0.005	<0.005	-	-
4-Bromofluorobenzene	Surrogate	108%	108%	-	-
Dibromofluoromethane	Surrogate	116%	116%	-	-
Toluene-d8	Surrogate	90.0%	90.0%	-	-

Certificate of Analysis

Report Date: 11-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 3-Dec-2019

Client PO:

Project Description: 19120705/555 Albert St.

	Client ID:	TCLP-1	TCLP-2	-	-
	Sample Date:	03-Dec-19 09:00	03-Dec-19 09:00	-	-
	Sample ID:	1949218-01	1949218-02	-	-
	MDL/Units	Soil	Soil	-	-
EPA 1311 - TCLP Leachate Organics					
Benzo [a] pyrene	0.0001 mg/L	<0.0001	<0.0001	-	-
Terphenyl-d14	Surrogate	111%	110%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	ND	0.05	mg/L						
Nitrate as N	ND	1	mg/L						
Nitrite as N	ND	1	mg/L						
Cyanide, free	ND	0.02	mg/L						
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	ND	0.0001	mg/L						
Surrogate: Terphenyl-d14	***0.21***		***mg/L***		***107***	***37.1-155.6***			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	ND	0.005	mg/L						
Carbon Tetrachloride	ND	0.005	mg/L						
Chlorobenzene	ND	0.004	mg/L						
Chloroform	ND	0.006	mg/L						
1,2-Dichlorobenzene	ND	0.004	mg/L						
1,4-Dichlorobenzene	ND	0.004	mg/L						
1,2-Dichloroethane	ND	0.005	mg/L						
1,1-Dichloroethylene	ND	0.006	mg/L						
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L						
Methylene Chloride	ND	0.04	mg/L						
Tetrachloroethylene	ND	0.005	mg/L						
Trichloroethylene	ND	0.004	mg/L						
Vinyl chloride	ND	0.005	mg/L						
Surrogate: 4-Bromofluorobenzene	***0.749***		***mg/L***		***109***	***83-134***			
Surrogate: Dibromofluoromethane	***0.716***		***mg/L***		***104***	***78-124***			
Surrogate: Toluene-d8	***0.666***		***mg/L***		***96.8***	***76-118***			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.25	0.05	mg/L	0.21			17.6	20	
Nitrate as N	ND	1	mg/L	ND				20	
Nitrite as N	ND	1	mg/L	ND				20	
Cyanide, free	ND	0.02	mg/L	ND				20	
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L	ND			0.0	29	
Barium	0.335	0.05	mg/L	0.328			2.3	34	
Boron	0.054	0.05	mg/L	ND			0.0	33	
Cadmium	ND	0.01	mg/L	ND			0.0	33	
Chromium	ND	0.05	mg/L	ND			0.0	32	
Lead	ND	0.05	mg/L	ND			0.0	32	
Mercury	ND	0.005	mg/L	ND			0.0	30	
Selenium	ND	0.05	mg/L	ND			0.0	28	
Silver	ND	0.05	mg/L	ND			0.0	28	
Uranium	ND	0.05	mg/L	ND			0.0	27	
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	ND	0.0001	mg/L	ND				50	
Surrogate: Terphenyl-d14	***0.23***		***mg/L***		***115***	***37.1-155.6***			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	ND	0.005	mg/L	ND				25	
Carbon Tetrachloride	ND	0.005	mg/L	ND				25	
Chlorobenzene	ND	0.004	mg/L	ND				25	
Chloroform	ND	0.006	mg/L	ND				25	
1,2-Dichlorobenzene	ND	0.004	mg/L	ND				25	
1,4-Dichlorobenzene	ND	0.004	mg/L	ND				25	
1,2-Dichloroethane	ND	0.005	mg/L	ND				25	
1,1-Dichloroethylene	ND	0.006	mg/L	ND				25	
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L	ND				25	
Methylene Chloride	ND	0.04	mg/L	ND				25	
Tetrachloroethylene	ND	0.005	mg/L	ND				25	
Trichloroethylene	ND	0.004	mg/L	ND				25	
Vinyl chloride	ND	0.005	mg/L	ND				25	
Surrogate: 4-Bromofluorobenzene	***0.756***		***mg/L***		***110***	***83-134***			
Surrogate: Dibromofluoromethane	***0.790***		***mg/L***		***115***	***78-124***			
Surrogate: Toluene-d8	***0.623***		***mg/L***		***90.5***	***76-118***			
Physical Characteristics									
% Solids	81.3	0.1	% by Wt.	81.6			0.4	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.73	0.05	mg/L	0.21	104	70-130			
Nitrate as N	11	1	mg/L	ND	111	81-112			
Nitrite as N	10	1	mg/L	ND	101	76-107			
Cyanide, free	0.047	0.02	mg/L	ND	94.8	60-136			
EPA 1311 - TCLP Leachate Metals									
Arsenic	58.5		ug/L	0.136	117	83-119			
Barium	91.4		ug/L	32.8	117	83-116			
Boron	59.5		ug/L	4.78	109	71-128			
Cadmium	52.7		ug/L	0.289	105	78-119			
Chromium	65.6		ug/L	0.162	131	80-124			
Lead	45.8		ug/L	1.26	89.0	77-126			
Mercury	0.0391	0.005	mg/L	ND	130	70-130			QM-07
Selenium	43.8		ug/L	0.213	87.3	81-125			
Silver	46.7		ug/L	ND	93.4	70-128			
Uranium	47.3		ug/L	0.147	94.2	70-131			
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	0.0361	0.0001	mg/L		72.3	39-123			
Surrogate: Terphenyl-d14	***0.21***		***mg/L***		***105***	***37.1-155.6***			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	0.034	0.005	mg/L		84.1	55-141			
Carbon Tetrachloride	0.051	0.005	mg/L		129	49-149			
Chlorobenzene	0.036	0.004	mg/L		90.1	64-137			
Chloroform	0.047	0.006	mg/L		118	58-138			
1,2-Dichlorobenzene	0.035	0.004	mg/L		88.3	60-150			
1,4-Dichlorobenzene	0.031	0.004	mg/L		78.4	63-132			
1,2-Dichloroethane	0.038	0.005	mg/L		95.6	50-140			
1,1-Dichloroethylene	0.049	0.006	mg/L		122	43-153			
Methyl Ethyl Ketone (2-Butanone)	0.113	0.30	mg/L		113	26-153			
Methylene Chloride	0.051	0.04	mg/L		128	58-149			
Tetrachloroethylene	0.038	0.005	mg/L		95.8	51-145			
Trichloroethylene	0.051	0.004	mg/L		128	52-135			
Vinyl chloride	0.049	0.005	mg/L		122	31-159			

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers :

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

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

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.

PARACEL LABORATORIES LTD.

Paracel ID: 1949218

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1949218	Nº 124129

Client Name: GOLDER ASSOCIATES	Project Ref: 19P0705	Page 1 of 1
Contact Name: SHIHAN CHOWDHURY	Quote #: CITY OF OTTAWA - 555 ALBERT ST.	Turnaround Time
Address: 1931 ROBERTSON ROAD, OTTAWA	PO #:	☐ 1 day ☐ 3 day
	E-mail: shihan_chowdhury@golder.com	☐ 2 day ☒ Regular
Telephone: 613-406-6892		Date Required:

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	O.Reg 558 PAHs (TCLP)	O. Reg 558 VOCs (TCLP)	O. Reg 558 Metals & Inorg.	Flash Point	Ignitability
1	TCLP-1 BGM 928	S		2	DEC 3/2019									X	X	X	X	X
2	TCLP-2 929	S		2	DEC 3/2019									X	X	X	X	X
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: No vials (MeOH)

Method of Delivery: Walk in

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): SHIHAN CHOWDHURY	Date/Time: 12/03/19 4:44 p	Date/Time: 12/04/19 14:27	Date/Time: 12-4-19 14:41
Date/Time: DEC 3/2019 @ 15:05	Temperature: 3.5 °C	Temperature: 7.3 °C	pH Verified: ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert St.
Custody: 124131

Report Date: 27-Dec-2019
Order Date: 3-Dec-2019

Revised Report **Order #: 1949221**

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

Paracel ID	Client ID
1949221-01	19-05 SA2
1949221-02	19-05 SA6
1949221-03	19-07 SA1
1949221-04	19-08 SA3
1949221-05	19-08 SA9

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Dec-2019
Order Date: 3-Dec-2019
Project Description: 19120705/555 Albert St.

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	5-Dec-19	5-Dec-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	4-Dec-19	5-Dec-19
Conductivity	MOE E3138 - probe @25 °C, water ext	5-Dec-19	5-Dec-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	5-Dec-19	5-Dec-19
PCBs, total	SW846 8082A - GC-ECD	3-Dec-19	5-Dec-19
PHC F1	CWS Tier 1 - P&T GC-FID	9-Dec-19	10-Dec-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Dec-19	6-Dec-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	5-Dec-19	5-Dec-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	4-Dec-19	6-Dec-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	9-Dec-19	10-Dec-19
SAR	Calculated	5-Dec-19	5-Dec-19
Solids, %	Gravimetric, calculation	4-Dec-19	4-Dec-19
Texture - Coarse Med/Fine	Based on ASTM D2487	23-Dec-19	24-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Dec-2019

Order Date: 3-Dec-2019

Project Description: 19120705/555 Albert St.

	Client ID:	19-05 SA2	19-05 SA6	19-07 SA1	19-08 SA3
	Sample Date:	02-Dec-19 09:00	02-Dec-19 09:00	02-Dec-19 09:00	03-Dec-19 09:00
	Sample ID:	1949221-01	1949221-02	1949221-03	1949221-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.4	90.5	95.5	86.9
>75 um	0.1 %	58.4	38.5	-	-
<75 um	0.1 %	41.6	61.5	-	-
Texture	0.1 %	Coarse	Med/Fine	-	-
General Inorganics					
SAR	0.01 N/A	1.19	1.51	0.05	2.75
Conductivity	5 uS/cm	346	291	131	3310
Metals					
Antimony	1.0 ug/g dry	3.1	<1.0	<1.0	8.8
Arsenic	1.0 ug/g dry	15.2	8.6	7.8	21.9
Barium	1.0 ug/g dry	560	227	1560	1140
Beryllium	0.5 ug/g dry	1.4	1.2	1.1	1.6
Boron	5.0 ug/g dry	30.3	11.2	28.8	36.8
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	0.5	<0.5	<0.5	2.9
Chromium	5.0 ug/g dry	92.7	92.2	40.4	118
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	0.2
Cobalt	1.0 ug/g dry	29.6	22.7	14.4	29.0
Copper	5.0 ug/g dry	82.2	61.7	26.1	119
Lead	1.0 ug/g dry	325	14.5	34.1	844
Mercury	0.1 ug/g dry	0.2	<0.1	<0.1	0.2
Molybdenum	1.0 ug/g dry	4.7	1.5	3.5	4.2
Nickel	5.0 ug/g dry	50.1	43.3	38.4	103
Selenium	1.0 ug/g dry	1.3	1.5	1.1	2.3
Silver	0.3 ug/g dry	0.5	<0.3	<0.3	0.9
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	2.6	2.6	2.5	2.5
Vanadium	10.0 ug/g dry	125	161	34.8	136
Zinc	20.0 ug/g dry	263	95.0	90.1	721
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Dec-2019

Order Date: 3-Dec-2019

Project Description: 19120705/555 Albert St.

	Client ID:	19-05 SA2	19-05 SA6	19-07 SA1	19-08 SA3
	Sample Date:	02-Dec-19 09:00	02-Dec-19 09:00	02-Dec-19 09:00	03-Dec-19 09:00
	Sample ID:	1949221-01	1949221-02	1949221-03	1949221-04
	MDL/Units	Soil	Soil	Soil	Soil
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 27-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 3-Dec-2019

Client PO:

Project Description: 19120705/555 Albert St.

	Client ID:	19-05 SA2	19-05 SA6	19-07 SA1	19-08 SA3
	Sample Date:	02-Dec-19 09:00	02-Dec-19 09:00	02-Dec-19 09:00	03-Dec-19 09:00
	Sample ID:	1949221-01	1949221-02	1949221-03	1949221-04
	MDL/Units	Soil	Soil	Soil	Soil
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	104%	109%	106%	107%
Dibromofluoromethane	Surrogate	105%	101%	101%	103%
Toluene-d8	Surrogate	108%	102%	103%	104%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	7	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	13	187
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	68
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.28
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.40
Anthracene	0.02 ug/g dry	0.03	<0.02	<0.02	0.93
Benzo [a] anthracene	0.02 ug/g dry	0.06	<0.02	<0.02	2.48
Benzo [a] pyrene	0.02 ug/g dry	0.05	<0.02	<0.02	2.24
Benzo [b] fluoranthene	0.02 ug/g dry	0.06	<0.02	<0.02	2.82
Benzo [g,h,i] perylene	0.02 ug/g dry	0.03	<0.02	<0.02	1.33
Benzo [k] fluoranthene	0.02 ug/g dry	0.04	<0.02	<0.02	1.79
Chrysene	0.02 ug/g dry	0.09	<0.02	<0.02	2.74
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.33
Fluoranthene	0.02 ug/g dry	0.14	<0.02	<0.02	5.24
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.31
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.03	<0.02	<0.02	1.25
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.07
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.10
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	0.17
Naphthalene	0.01 ug/g dry	0.01	<0.01	<0.01	0.15
Phenanthrene	0.02 ug/g dry	0.08	<0.02	<0.02	3.12
Pyrene	0.02 ug/g dry	0.12	<0.02	<0.02	4.43
2-Fluorobiphenyl	Surrogate	97.0%	80.3%	107%	89.5%
Terphenyl-d14	Surrogate	95.3%	94.3%	116%	77.2%
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	<0.05	0.05
Decachlorobiphenyl	Surrogate	128%	129%	104%	121%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Dec-2019
Order Date: 3-Dec-2019
Project Description: 19120705/555 Albert St.

	Client ID:	19-08 SA9	-	-	-
	Sample Date:	03-Dec-19 09:00	-	-	-
	Sample ID:	1949221-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	89.7	-	-	-
General Inorganics					
SAR	0.01 N/A	3.22	-	-	-
Conductivity	5 uS/cm	552	-	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	7.5	-	-	-
Barium	1.0 ug/g dry	209	-	-	-
Beryllium	0.5 ug/g dry	1.0	-	-	-
Boron	5.0 ug/g dry	8.3	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	69.8	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	19.8	-	-	-
Copper	5.0 ug/g dry	44.1	-	-	-
Lead	1.0 ug/g dry	11.2	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	1.9	-	-	-
Nickel	5.0 ug/g dry	35.5	-	-	-
Selenium	1.0 ug/g dry	1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	4.5	-	-	-
Vanadium	10.0 ug/g dry	129	-	-	-
Zinc	20.0 ug/g dry	82.3	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Dec-2019
Order Date: 3-Dec-2019
Project Description: 19120705/555 Albert St.

	Client ID:	19-08 SA9	-	-	-
	Sample Date:	03-Dec-19 09:00	-	-	-
	Sample ID:	1949221-05	-	-	-
	MDL/Units	Soil	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	108%	-	-	-

Certificate of Analysis

Report Date: 27-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 3-Dec-2019

Client PO:

Project Description: 19120705/555 Albert St.

	Client ID:	19-08 SA9	-	-	-
	Sample Date:	03-Dec-19 09:00	-	-	-
	Sample ID:	1949221-05	-	-	-
	MDL/Units	Soil	-	-	-
Dibromofluoromethane	Surrogate	103%	-	-	-
Toluene-d8	Surrogate	105%	-	-	-
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	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	64.5%	-	-	-
Terphenyl-d14	Surrogate	93.8%	-	-	-
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	139%	-	-	-

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						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	*0.118*		*ug/g*		*118*	*60-140*			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.04*		*ug/g*		*77.8*	*50-140*			
Surrogate: Terphenyl-d14	*0.984*		*ug/g*		*73.8*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*9.19*		*ug/g*		*115*	*50-140*			
Surrogate: Dibromofluoromethane	*8.35*		*ug/g*		*104*	*50-140*			
Surrogate: Toluene-d8	*8.30*		*ug/g*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	1.09	0.01	N/A	1.19			8.8	200	
Conductivity	336	5	uS/cm	346			3.0	5	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	29	4	ug/g dry	16			61.0	30	QR-04
F3 PHCs (C16-C34)	15	8	ug/g dry	ND			0.0	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	3.9	1.0	ug/g dry	3.1			23.4	30	
Arsenic	14.5	1.0	ug/g dry	15.2			5.2	30	
Barium	550	1.0	ug/g dry	560			1.8	30	
Beryllium	1.4	0.5	ug/g dry	1.4			0.5	30	
Boron, available	0.78	0.5	ug/g dry	ND			0.0	35	
Boron	31.0	5.0	ug/g dry	30.3			2.4	30	
Cadmium	ND	0.5	ug/g dry	0.5			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	89.3	5.0	ug/g dry	92.7			3.8	30	
Cobalt	27.0	1.0	ug/g dry	29.6			9.0	30	
Copper	71.2	5.0	ug/g dry	82.2			14.4	30	
Lead	287	1.0	ug/g dry	325			12.3	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	4.5	1.0	ug/g dry	4.7			4.9	30	
Nickel	48.7	5.0	ug/g dry	50.1			2.8	30	
Selenium	1.2	1.0	ug/g dry	1.3			7.0	30	
Silver	0.5	0.3	ug/g dry	0.5			1.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	2.3	1.0	ug/g dry	2.6			15.1	30	
Vanadium	119	10.0	ug/g dry	125			5.1	30	
Zinc	244	20.0	ug/g dry	263			7.3	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	ND				40	
Surrogate: Decachlorobiphenyl	*0.162*		*ug/g dry*		*125*	*60-140*			
Physical Characteristics									
% Solids	81.3	0.1	% by Wt.	81.6			0.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND			0.0	40	
Anthracene	ND	0.02	ug/g dry	0.030			0.0	40	
Benzo [a] anthracene	0.048	0.02	ug/g dry	0.056			14.9	40	
Benzo [a] pyrene	0.045	0.02	ug/g dry	0.048			6.4	40	
Benzo [b] fluoranthene	0.054	0.02	ug/g dry	0.056			3.5	40	
Benzo [g,h,i] perylene	0.028	0.02	ug/g dry	0.033			14.9	40	
Benzo [k] fluoranthene	0.035	0.02	ug/g dry	0.043			21.0	40	
Chrysene	0.076	0.02	ug/g dry	0.089			15.3	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			0.0	40	
Fluoranthene	0.119	0.02	ug/g dry	0.142			17.4	40	
Fluorene	ND	0.02	ug/g dry	ND			0.0	40	
Indeno [1,2,3-cd] pyrene	0.026	0.02	ug/g dry	0.032			19.3	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			0.0	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	0.012			0.0	40	
Phenanthrene	0.059	0.02	ug/g dry	0.081			31.3	40	
Pyrene	0.099	0.02	ug/g dry	0.118			16.8	40	
Surrogate: 2-Fluorobiphenyl	*1.26*		*ug/g dry*		*81.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.35*		*ug/g dry*		*87.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	*9.88*		*ug/g dry*		*107*	*50-140*			
Surrogate: Dibromofluoromethane	*9.67*		*ug/g dry*		*104*	*50-140*			
Surrogate: Toluene-d8	*9.57*		*ug/g dry*		*103*	*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)	177	7	ug/g		88.4	80-120			
F2 PHCs (C10-C16)	260	4	ug/g	16	262	60-140			QM-06
F3 PHCs (C16-C34)	284	8	ug/g	ND	124	60-140			
F4 PHCs (C34-C50)	165	6	ug/g	ND	114	60-140			
Metals									
Antimony	46.1		ug/L	1.2	89.7	70-130			
Arsenic	55.1		ug/L	6.1	98.0	70-130			
Barium	262		ug/L	224	75.9	70-130			
Beryllium	46.2		ug/L	0.6	91.2	70-130			
Boron, available	4.03	0.5	ug/g	ND	80.6	70-122			
Boron	52.2		ug/L	12.1	80.3	70-130			
Cadmium	45.4		ug/L	ND	90.5	70-130			
Chromium (VI)	0.1		mg/L	ND	71.5	70-130			
Chromium	89.4		ug/L	37.1	105	70-130			
Cobalt	57.4		ug/L	11.8	91.2	70-130			
Copper	74.1		ug/L	32.9	82.5	70-130			
Lead	154		ug/L	130	48.6	70-130			QM-07
Mercury	1.65	0.1	ug/g	ND	110	70-130			
Molybdenum	50.2		ug/L	1.9	96.6	70-130			
Nickel	67.6		ug/L	20.0	95.1	70-130			
Selenium	40.7		ug/L	ND	80.3	70-130			
Silver	40.7		ug/L	ND	81.1	70-130			
Thallium	43.9		ug/L	ND	87.3	70-130			
Uranium	47.4		ug/L	1.1	92.6	70-130			
Vanadium	103		ug/L	50.1	106	70-130			
Zinc	135		ug/L	105	60.1	70-130			QM-07
PCBs									
PCBs, total	0.604	0.05	ug/g	ND	116	60-140			
Surrogate: Decachlorobiphenyl	*0.161*		*ug/g*		*124*	*60-140*			
Semi-Volatiles									
Acenaphthene	0.177	0.02	ug/g	ND	91.6	50-140			
Acenaphthylene	0.160	0.02	ug/g	ND	83.0	50-140			
Anthracene	0.189	0.02	ug/g	0.030	82.6	50-140			
Benzo [a] anthracene	0.187	0.02	ug/g	0.056	68.2	50-140			
Benzo [a] pyrene	0.187	0.02	ug/g	0.048	71.9	50-140			
Benzo [b] fluoranthene	0.248	0.02	ug/g	0.056	99.4	50-140			
Benzo [g,h,i] perylene	0.176	0.02	ug/g	0.033	74.3	50-140			
Benzo [k] fluoranthene	0.201	0.02	ug/g	0.043	81.7	50-140			
Chrysene	0.287	0.02	ug/g	0.089	103	50-140			
Dibenzo [a,h] anthracene	0.150	0.02	ug/g	ND	77.9	50-140			
Fluoranthene	0.265	0.02	ug/g	0.142	63.8	50-140			
Fluorene	0.166	0.02	ug/g	ND	85.8	50-140			
Indeno [1,2,3-cd] pyrene	0.170	0.02	ug/g	0.032	71.8	50-140			
1-Methylnaphthalene	0.186	0.02	ug/g	ND	96.5	50-140			
2-Methylnaphthalene	0.206	0.02	ug/g	ND	106	50-140			
Naphthalene	0.179	0.01	ug/g	0.012	86.5	50-140			
Phenanthrene	0.217	0.02	ug/g	0.081	70.6	50-140			
Pyrene	0.262	0.02	ug/g	0.118	74.8	50-140			
Volatiles									
Acetone	7.17	0.50	ug/g		71.7	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	3.64	0.02	ug/g		90.9	60-130			
Bromodichloromethane	4.19	0.05	ug/g		105	60-130			
Bromoform	4.51	0.05	ug/g		113	60-130			
Bromomethane	4.28	0.05	ug/g		107	50-140			
Carbon Tetrachloride	4.09	0.05	ug/g		102	60-130			
Chlorobenzene	4.35	0.05	ug/g		109	60-130			
Chloroform	4.18	0.05	ug/g		104	60-130			
Dibromochloromethane	4.80	0.05	ug/g		120	60-130			
Dichlorodifluoromethane	4.32	0.05	ug/g		108	50-140			
1,2-Dichlorobenzene	4.46	0.05	ug/g		112	60-130			
1,3-Dichlorobenzene	4.17	0.05	ug/g		104	60-130			
1,4-Dichlorobenzene	4.44	0.05	ug/g		111	60-130			
1,1-Dichloroethane	4.20	0.05	ug/g		105	60-130			
1,2-Dichloroethane	3.86	0.05	ug/g		96.5	60-130			
1,1-Dichloroethylene	3.77	0.05	ug/g		94.3	60-130			
cis-1,2-Dichloroethylene	4.10	0.05	ug/g		102	60-130			
trans-1,2-Dichloroethylene	3.77	0.05	ug/g		94.2	60-130			
1,2-Dichloropropane	4.02	0.05	ug/g		101	60-130			
cis-1,3-Dichloropropylene	3.51	0.05	ug/g		87.7	60-130			
trans-1,3-Dichloropropylene	2.81	0.05	ug/g		70.2	60-130			
Ethylbenzene	4.50	0.05	ug/g		113	60-130			
Ethylene dibromide (dibromoethane	4.01	0.05	ug/g		100	60-130			
Hexane	3.60	0.05	ug/g		89.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.6	0.50	ug/g		106	50-140			
Methyl Isobutyl Ketone	7.43	0.50	ug/g		74.3	50-140			
Methyl tert-butyl ether	7.15	0.05	ug/g		71.5	50-140			
Methylene Chloride	3.39	0.05	ug/g		84.6	60-130			
Styrene	4.28	0.05	ug/g		107	60-130			
1,1,1,2-Tetrachloroethane	4.92	0.05	ug/g		123	60-130			
1,1,2,2-Tetrachloroethane	3.76	0.05	ug/g		93.9	60-130			
Tetrachloroethylene	4.16	0.05	ug/g		104	60-130			
Toluene	4.00	0.05	ug/g		100	60-130			
1,1,1-Trichloroethane	3.77	0.05	ug/g		94.4	60-130			
1,1,2-Trichloroethane	3.14	0.05	ug/g		78.5	60-130			
Trichloroethylene	3.13	0.05	ug/g		78.4	60-130			
Trichlorofluoromethane	3.61	0.05	ug/g		90.2	50-140			
Vinyl chloride	4.19	0.02	ug/g		105	50-140			
m,p-Xylenes	8.55	0.05	ug/g		107	60-130			
o-Xylene	4.42	0.05	ug/g		110	60-130			

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

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

QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report now includes data for texture

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 LABORATORIES LTD.

Paracel ID: 1949221

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
1949221	Nº 124131

Client Name: GOLDER ASSOCIATES LTD.	Project Ref: 19120705	Page 1 of 1
Contact Name: SHIHAN CHOWDHURY	Quote #: CITY OF OTTAWA - 395 ALBERT STREET	Turnaround Time
Address: 1931 ROBERTSON ROAD, OTTAWA	PO #:	☐ 1 day ☐ 3 day
	E-mail: shihan_chowdhury@golder.com	☐ 2 day ☒ Regular
Telephone: 613-406-6892		Date Required:

Regulation 153/04	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☒ ~~REG 558~~ SAC ☐ PWQO	
☐ Table 2 ☒ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA	
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm	
☐ Table ___	Mun: ___	
For RSC: ☐ Yes ☐ No	☐ Other:	

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCB	O.Reg Cond Electricity	O.Reg SAR			
1	19-05 SA2	BGM 930	S		2	~~DEC~~ 2/2019		X	X	X	X	X	X	X	X	X	X			
2	19-05 SA6	931	S		3	DEC 2/2019		X	X	X	X	X	X	X	X	X	X			
3	19-05 SA8	935	S		3	DEC 2/2019														
4	19-07 SA1	932	S		3	DEC 2/2019		X	X	X	X	X	X	X	X	X	X			
5	19-08 SA3	933	S		2	DEC 3/2019		X	X	X	X	X	X	X	X	X	X			
6	19-08 SA9	934	S		3	DEC 3/2019		X	X	X	X	X	X	X	X	X	X			
7	~~TCLP-1~~	SAC	~~S~~		~~2~~	~~DEC 3/2019~~	SAC													
8	~~TCLP-2~~	SAC	~~S~~		~~2~~	~~DEC 3/2019~~	SAC													
9																				
10																				

Comments: SAMPLE ON HOLD 19-05 SA8

Method of Delivery: Walk-in

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): SHIHAN CHOWDHURY	Date/Time: 12/04/19 14:33	Date/Time: 12/04/19 9:44	Date/Time: 12-4-19 14:42
Date/Time: DEC 3/2019 @ 15:00	Temperature: 7.3 °C	Temperature: 3.5 °C	pH Verified: ☐ By:

Chain of Custody (Env).xlsx

Revision 3.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705/555 Albert
Custody: 124799

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019

Order #: 1950275

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

Paracel ID	Client ID
1950275-01	19-9D
1950275-02	19-102
1950275-03	19-8
1950275-04	19-5
1950275-05	DUP-1
1950275-06	Field DUP
1950275-07	Equipment DUP
1950275-08	Trip Blank
1950275-09	Trip Spike

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019
Project Description: 19120705/555 Albert

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	11-Dec-19	11-Dec-19
Chromium, hexavalent - water	MOE E3056 - colourimetric	12-Dec-19	12-Dec-19
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	12-Dec-19	12-Dec-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Dec-19	18-Dec-19
PCBs, total	EPA 608 - GC-ECD	12-Dec-19	12-Dec-19
pH	EPA 150.1 - pH probe @25 ℃	11-Dec-19	11-Dec-19
PHC F1	CWS Tier 1 - P&T GC-FID	13-Dec-19	14-Dec-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	12-Dec-19	16-Dec-19
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	17-Dec-19	17-Dec-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	13-Dec-19	14-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	19-9D	19-102	19-8	19-5
	Sample Date:	10-Dec-19 08:00	10-Dec-19 09:00	10-Dec-19 10:00	10-Dec-19 11:00
	Sample ID:	1950275-01	1950275-02	1950275-03	1950275-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
pH	0.1 pH Units	7.3	7.4	8.5	7.6
Anions					
Chloride	1 mg/L	1830	3570	399	275
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]
Arsenic	1 ug/L	<10 [1]	<10 [1]	<10 [1]	<10 [1]
Barium	1 ug/L	61 [1]	64 [1]	61 [1]	125 [1]
Beryllium	0.5 ug/L	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]
Boron	10 ug/L	676 [1]	145 [1]	<100 [1]	176 [1]
Cadmium	0.1 ug/L	<1.0 [1]	<1.0 [1]	<1.0 [1]	<1.0 [1]
Chromium	1 ug/L	<10 [1]	<10 [1]	<10 [1]	<10 [1]
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	23.0 [1]	6.0 [1]	<5.0 [1]	16.5 [1]
Copper	0.5 ug/L	6.7 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]
Lead	0.1 ug/L	<1.0 [1]	<1.0 [1]	<1.0 [1]	<1.0 [1]
Molybdenum	0.5 ug/L	<5.0 [1]	9.5 [1]	30.9 [1]	11.4 [1]
Nickel	1 ug/L	24 [1]	39 [1]	24 [1]	<10 [1]
Selenium	1 ug/L	<10 [1]	<10 [1]	<10 [1]	<10 [1]
Silver	0.1 ug/L	<1.0 [1]	<1.0 [1]	<1.0 [1]	<1.0 [1]
Sodium	200 ug/L	1190000 [1]	1700000 [1]	396000 [1]	316000 [1]
Thallium	0.1 ug/L	<1.0 [1]	<1.0 [1]	<1.0 [1]	<1.0 [1]
Uranium	0.1 ug/L	13.5 [1]	14.1 [1]	2.1 [1]	8.4 [1]
Vanadium	0.5 ug/L	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]
Zinc	5 ug/L	<50 [1]	<50 [1]	<50 [1]	<50 [1]
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	0.7	<0.5	<0.5	4.4
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	19-9D	19-102	19-8	19-5
	Sample Date:	10-Dec-19 08:00	10-Dec-19 09:00	10-Dec-19 10:00	10-Dec-19 11:00
	Sample ID:	1950275-01	1950275-02	1950275-03	1950275-04
	MDL/Units	Water	Water	Water	Water
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	115%	120%	120%	117%
Dibromofluoromethane	Surrogate	102%	101%	102%	104%
Toluene-d8	Surrogate	99.8%	98.5%	101%	99.5%

Certificate of Analysis

Report Date: 18-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 10-Dec-2019

Client PO:

Project Description: 19120705/555 Albert

	Client ID:	19-9D	19-102	19-8	19-5
	Sample Date:	10-Dec-19 08:00	10-Dec-19 09:00	10-Dec-19 10:00	10-Dec-19 11:00
	Sample ID:	1950275-01	1950275-02	1950275-03	1950275-04
	MDL/Units	Water	Water	Water	Water
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	0.06	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	0.06	0.12	0.05
Fluorene	0.05 ug/L	<0.05	<0.05	0.08	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	0.08	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	0.09	0.49	<0.05
Pyrene	0.01 ug/L	<0.01	0.06	0.15	0.09
2-Fluorobiphenyl	Surrogate	94.0%	99.5%	93.7%	98.6%
Terphenyl-d14	Surrogate	101%	81.6%	92.5%	90.4%
PCBs					
PCBs, total	0.05 ug/L	<0.05	<0.05	<0.05 [5]	<0.05
Decachlorobiphenyl	Surrogate	73.5%	92.3%	78.2% [5]	88.0%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	DUP-1	Field DUP	Equipment DUP	Trip Blank
	Sample Date:	10-Dec-19 08:00	10-Dec-19 08:00	10-Dec-19 08:00	09-Dec-19 09:00
	Sample ID:	1950275-05	1950275-06	1950275-07	1950275-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
pH	0.1 pH Units	7.3	-	-	-
Anions					
Chloride	1 mg/L	1800	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<5.0 [1]	-	-	-
Arsenic	1 ug/L	<10 [1]	-	-	-
Barium	1 ug/L	64 [1]	-	-	-
Beryllium	0.5 ug/L	<5.0 [1]	-	-	-
Boron	10 ug/L	695 [1]	-	-	-
Cadmium	0.1 ug/L	<1.0 [1]	-	-	-
Chromium	1 ug/L	<10 [1]	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	23.1 [1]	-	-	-
Copper	0.5 ug/L	6.8 [1]	-	-	-
Lead	0.1 ug/L	<1.0 [1]	-	-	-
Molybdenum	0.5 ug/L	<5.0 [1]	-	-	-
Nickel	1 ug/L	23 [1]	-	-	-
Selenium	1 ug/L	<10 [1]	-	-	-
Silver	0.1 ug/L	<1.0 [1]	-	-	-
Sodium	200 ug/L	1190000 [1]	-	-	-
Thallium	0.1 ug/L	<1.0 [1]	-	-	-
Uranium	0.1 ug/L	13.7 [1]	-	-	-
Vanadium	0.5 ug/L	<5.0 [1]	-	-	-
Zinc	5 ug/L	<50 [1]	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	DUP-1	Field DUP	Equipment DUP	Trip Blank
	Sample Date:	10-Dec-19 08:00	10-Dec-19 08:00	10-Dec-19 08:00	09-Dec-19 09:00
	Sample ID:	1950275-05	1950275-06	1950275-07	1950275-08
	MDL/Units	Water	Water	Water	Water
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethar	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	121%	119%	117%	117%
Dibromofluoromethane	Surrogate	105%	102%	104%	104%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	DUP-1	Field DUP	Equipment DUP	Trip Blank
	Sample Date:	10-Dec-19 08:00	10-Dec-19 08:00	10-Dec-19 08:00	09-Dec-19 09:00
	Sample ID:	1950275-05	1950275-06	1950275-07	1950275-08
	MDL/Units	Water	Water	Water	Water
Toluene-d8	Surrogate	101%	99.8%	99.0%	98.8%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	<0.01	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	85.7%	-	-	-
Terphenyl-d14	Surrogate	118%	-	-	-
PCBs					
PCBs, total	0.05 ug/L	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	83.1%	-	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	Trip Spike	-	-	-
	Sample Date:	09-Dec-19 09:00	-	-	-
	Sample ID:	1950275-09	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	80.5 [6]	-	-	-
Benzene	0.5 ug/L	32.5 [6]	-	-	-
Bromodichloromethane	0.5 ug/L	32.9 [6]	-	-	-
Bromoform	0.5 ug/L	29.5 [6]	-	-	-
Bromomethane	0.5 ug/L	42.2 [6]	-	-	-
Carbon Tetrachloride	0.2 ug/L	33.7 [6]	-	-	-
Chlorobenzene	0.5 ug/L	31.6 [6]	-	-	-
Chloroform	0.5 ug/L	34.1 [6]	-	-	-
Dibromochloromethane	0.5 ug/L	28.1 [6]	-	-	-
Dichlorodifluoromethane	1.0 ug/L	33.9 [6]	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	28.6 [6]	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	28.1 [6]	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	28.6 [6]	-	-	-
1,1-Dichloroethane	0.5 ug/L	33.4 [6]	-	-	-
1,2-Dichloroethane	0.5 ug/L	31.6 [6]	-	-	-
1,1-Dichloroethylene	0.5 ug/L	30.6 [6]	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	31.4 [6]	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	29.2 [6]	-	-	-
1,2-Dichloropropane	0.5 ug/L	38.1 [6]	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	41.5 [6]	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	47.0 [6]	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	88.5 [6]	-	-	-
Ethylbenzene	0.5 ug/L	29.5 [6]	-	-	-
Ethylene dibromide (dibromoethar	0.2 ug/L	28.3 [6]	-	-	-
Hexane	1.0 ug/L	38.2 [6]	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	67.5 [6]	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	74.5 [6]	-	-	-
Methyl tert-butyl ether	2.0 ug/L	74.6 [6]	-	-	-
Methylene Chloride	5.0 ug/L	37.8 [6]	-	-	-
Styrene	0.5 ug/L	27.7 [6]	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	30.3 [6]	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	31.1 [6]	-	-	-
Tetrachloroethylene	0.5 ug/L	30.1 [6]	-	-	-
Toluene	0.5 ug/L	30.5 [6]	-	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 18-Dec-2019

Order Date: 10-Dec-2019

Project Description: 19120705/555 Albert

	Client ID:	Trip Spike	-	-	-
	Sample Date:	09-Dec-19 09:00	-	-	-
	Sample ID:	1950275-09	-	-	-
	MDL/Units	Water	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	32.9 [6]	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	33.6 [6]	-	-	-
Trichloroethylene	0.5 ug/L	31.1 [6]	-	-	-
Trichlorofluoromethane	1.0 ug/L	33.8 [6]	-	-	-
Vinyl chloride	0.5 ug/L	31.6 [6]	-	-	-
m,p-Xylenes	0.5 ug/L	62.7 [6]	-	-	-
o-Xylene	0.5 ug/L	32.8 [6]	-	-	-
Xylenes, total	0.5 ug/L	95.5 [6]	-	-	-
4-Bromofluorobenzene	Surrogate	100% [6]	-	-	-
Dibromofluoromethane	Surrogate	100% [6]	-	-	-
Toluene-d8	Surrogate	89.6% [6]	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	1780 [4]	-	-	-
F2 PHCs (C10-C16)	100 ug/L	1470 [3]	-	-	-
F3 PHCs (C16-C34)	100 ug/L	3930 [3]	-	-	-
F4 PHCs (C34-C50)	100 ug/L	2540 [3]	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
PCBs									
PCBs, total	ND	0.05	ug/L						
Surrogate: Decachlorobiphenyl	***0.466***		***ug/L***		***93.1***	***60-140***			
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	***19.0***		***ug/L***		***94.8***	***50-140***			
Surrogate: Terphenyl-d14	***18.9***		***ug/L***		***94.7***	***50-140***			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019
Project Description: 19120705/555 Albert

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	***92.9***		***ug/L***		***116***	***50-140***			
Surrogate: Dibromofluoromethane	***73.1***		***ug/L***		***91.3***	***50-140***			
Surrogate: Toluene-d8	***80.5***		***ug/L***		***101***	***50-140***			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019
Project Description: 19120705/555 Albert

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	357	5	mg/L	357			0.1	10	
General Inorganics									
pH	7.7	0.1	pH Units	7.7			0.1	3.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	ND	5.0	ug/L	ND			0.0	20	GEN02
Arsenic	ND	10	ug/L	ND			0.0	20	GEN02
Barium	60.2	10	ug/L	61.0			1.3	20	GEN02
Beryllium	ND	5.0	ug/L	ND			0.0	20	GEN02
Boron	675	100	ug/L	676			0.1	20	GEN02
Cadmium	ND	1.0	ug/L	ND			0.0	20	GEN02
Chromium (VI)	ND	10	ug/L	ND			0.0	20	
Chromium	ND	10	ug/L	ND			0.0	20	GEN02
Cobalt	22.5	5.0	ug/L	23.0			2.2	20	GEN02
Copper	6.66	5.0	ug/L	6.72			0.8	20	GEN02
Lead	ND	1.0	ug/L	ND			0.0	20	GEN02
Molybdenum	ND	5.0	ug/L	ND			0.0	20	GEN02
Nickel	23.8	10	ug/L	23.5			1.1	20	GEN02
Selenium	ND	10	ug/L	ND			0.0	20	GEN02
Silver	ND	1.0	ug/L	ND			0.0	20	GEN02
Sodium	1160000	2000	ug/L	1190000			2.4	20	GEN02
Thallium	ND	1.0	ug/L	ND			0.0	20	GEN02
Uranium	14.4	1.0	ug/L	13.5			6.0	20	GEN02
Vanadium	ND	5.0	ug/L	ND			0.0	20	GEN02
Zinc	ND	50	ug/L	ND			0.0	20	GEN02
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	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019
Project Description: 19120705/555 Albert

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Styrene	ND	0.5	ug/L	ND				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	***94.3***		***ug/L***		***118***	***50-140***			
Surrogate: Dibromofluoromethane	***80.0***		***ug/L***		***100***	***50-140***			
Surrogate: Toluene-d8	***79.2***		***ug/L***		***99.0***	***50-140***			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.5	1	mg/L		105	85-115			
Hydrocarbons									
F1 PHCs (C6-C10)	1720	25	ug/L		85.8	68-117			
F2 PHCs (C10-C16)	1760	100	ug/L		110	60-140			
F3 PHCs (C16-C34)	4290	100	ug/L		110	60-140			
F4 PHCs (C34-C50)	2400	100	ug/L		96.8	60-140			
Metals									
Mercury	3.42	0.1	ug/L	ND	114	70-130			
Antimony	47.6		ug/L	ND	93.2	80-120			
Arsenic	51.2		ug/L	ND	102	80-120			
Barium	106		ug/L	61.0	90.4	80-120			
Beryllium	51.4		ug/L	ND	103	80-120			
Boron	47		ug/L		93.2	80-120			
Cadmium	49.2		ug/L	ND	98.1	80-120			
Chromium (VI)	213	10	ug/L	ND	106	70-130			
Chromium	53.3		ug/L	ND	106	80-120			
Cobalt	70.2		ug/L	23.0	94.4	80-120			
Copper	56.3		ug/L	6.72	99.2	80-120			
Lead	40.9		ug/L	ND	81.5	80-120			
Molybdenum	48.8		ug/L	ND	88.6	80-120			
Nickel	71.1		ug/L	23.5	95.0	80-120			
Selenium	42.7		ug/L	ND	83.9	80-120			
Silver	49.6		ug/L	ND	99.1	80-120			
Sodium	9800		ug/L		98.0	80-120			
Thallium	43.0		ug/L	ND	85.8	80-120			
Uranium	60.0		ug/L	13.5	92.9	80-120			
Vanadium	53.7		ug/L	ND	106	80-120			
Zinc	57		ug/L	ND	88.9	80-120			
PCBs									
PCBs, total	0.912	0.05	ug/L		91.2	60-140			
Surrogate: Decachlorobiphenyl	***0.505***		***ug/L***		***101***	***60-140***			
Semi-Volatiles									
Acenaphthene	3.83	0.05	ug/L		76.7	50-140			
Acenaphthylene	3.90	0.05	ug/L		78.0	50-140			
Anthracene	3.17	0.01	ug/L		63.3	50-140			
Benzo [a] anthracene	4.30	0.01	ug/L		86.0	50-140			
Benzo [a] pyrene	3.24	0.01	ug/L		64.9	50-140			
Benzo [b] fluoranthene	4.44	0.05	ug/L		88.8	50-140			
Benzo [g,h,i] perylene	3.59	0.05	ug/L		71.9	50-140			
Benzo [k] fluoranthene	4.17	0.05	ug/L		83.3	50-140			
Chrysene	3.92	0.05	ug/L		78.4	50-140			
Dibenzo [a,h] anthracene	3.23	0.05	ug/L		64.6	50-140			
Fluoranthene	3.22	0.01	ug/L		64.4	50-140			
Fluorene	3.95	0.05	ug/L		79.1	50-140			
Indeno [1,2,3-cd] pyrene	3.68	0.05	ug/L		73.6	50-140			
1-Methylnaphthalene	6.11	0.05	ug/L		122	50-140			
2-Methylnaphthalene	5.35	0.05	ug/L		107	50-140			
Naphthalene	4.59	0.05	ug/L		91.9	50-140			
Phenanthrene	3.19	0.05	ug/L		63.8	50-140			
Pyrene	4.10	0.01	ug/L		81.9	50-140			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 18-Dec-2019
Order Date: 10-Dec-2019
Project Description: 19120705/555 Albert

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	119	5.0	ug/L		119	50-140			
Benzene	33.3	0.5	ug/L		83.3	60-130			
Bromodichloromethane	31.4	0.5	ug/L		78.4	60-130			
Bromoform	28.6	0.5	ug/L		71.6	60-130			
Bromomethane	50.3	0.5	ug/L		126	50-140			
Carbon Tetrachloride	33.8	0.2	ug/L		84.5	60-130			
Chlorobenzene	32.0	0.5	ug/L		80.0	60-130			
Chloroform	32.7	0.5	ug/L		81.8	60-130			
Dibromochloromethane	29.2	0.5	ug/L		72.9	60-130			
Dichlorodifluoromethane	33.0	1.0	ug/L		82.6	50-140			
1,2-Dichlorobenzene	29.0	0.5	ug/L		72.5	60-130			
1,3-Dichlorobenzene	28.8	0.5	ug/L		72.1	60-130			
1,4-Dichlorobenzene	29.8	0.5	ug/L		74.6	60-130			
1,1-Dichloroethane	32.6	0.5	ug/L		81.6	60-130			
1,2-Dichloroethane	30.1	0.5	ug/L		75.3	60-130			
1,1-Dichloroethylene	34.2	0.5	ug/L		85.5	60-130			
cis-1,2-Dichloroethylene	32.4	0.5	ug/L		80.9	60-130			
trans-1,2-Dichloroethylene	33.1	0.5	ug/L		82.7	60-130			
1,2-Dichloropropane	36.0	0.5	ug/L		90.0	60-130			
cis-1,3-Dichloropropylene	29.1	0.5	ug/L		72.6	60-130			
trans-1,3-Dichloropropylene	28.8	0.5	ug/L		71.9	60-130			
Ethylbenzene	31.4	0.5	ug/L		78.6	60-130			
Ethylene dibromide (dibromoethane	28.6	0.2	ug/L		71.6	60-130			
Hexane	38.7	1.0	ug/L		96.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	60.7	5.0	ug/L		60.7	50-140			
Methyl Isobutyl Ketone	66.4	5.0	ug/L		66.4	50-140			
Methyl tert-butyl ether	70.8	2.0	ug/L		70.8	50-140			
Methylene Chloride	37.2	5.0	ug/L		93.1	60-130			
Styrene	29.7	0.5	ug/L		74.3	60-130			
1,1,1,2-Tetrachloroethane	30.0	0.5	ug/L		75.1	60-130			
1,1,2,2-Tetrachloroethane	29.6	0.5	ug/L		73.9	60-130			
Tetrachloroethylene	34.6	0.5	ug/L		86.4	60-130			
Toluene	32.5	0.5	ug/L		81.2	60-130			
1,1,1-Trichloroethane	32.0	0.5	ug/L		80.1	60-130			
1,1,2-Trichloroethane	31.2	0.5	ug/L		78.0	60-130			
Trichloroethylene	32.6	0.5	ug/L		81.4	60-130			
Trichlorofluoromethane	36.5	1.0	ug/L		91.3	60-130			
Vinyl chloride	30.1	0.5	ug/L		75.3	50-140			
m,p-Xylenes	66.4	0.5	ug/L		83.0	60-130			
o-Xylene	33.1	0.5	ug/L		82.7	60-130			

Qualifier Notes:

Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match -
Applies to samples: Field DUP, Equipment DUP

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

3 : PHC Trip Spike prepared at concentrations of F2 = 1600 ug/L, F3 = 4000 ug/L, F4 = 2400 ug/L

4 : PHC F1 Trip Spike Prepared at a concentration of 2000 ug/L.

5 : Water sample included significant amount of sediment, which was included in extraction process. This is expected to result in reduced accuracy of the reported result.

6 : VOC Trip Spike prepared at 40 ug/L for all parameters, except for m/p-Xylene which is at 80 ug/L and ketones at 100 ug/L.

QC Qualifiers :

GEN02 : Elevated Reporting Limit due to matrix interference.

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 ID: 1950275

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Paracel Order Number (Lab Use Only): 1950275

Chain Of Custody (Lab Use Only) № 124799

Page 1 of 1

Client Name: Golder
Contact Name: Shihan Chowdhury
Address: 1931 Robertson Rd.
Telephone: 613-592-9600

Project Ref: 19120705
Quote #: City of Ottawa-555 Albert
PO #:
E-mail:

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)

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCBs	Sodium	Chloride	pH		
1	19-9D	BGM968	GW		9	19/12/10	800	X	X	X	X	X	X		X	X	X	X		
2	19-10D	969	↓		9	↓	900	X	X	X	X	X	X		X	X	X	X		
3	19-8	970	↓		9	↓	1000	X	X	X	X	X	X		X	X	X	X		
4	19-5	971	↓		9	↓	1100	X	X	X	X	X	X		X	X	X	X		
5	DUP-1	972	↓		9	↓	800	X	X	X	X	X	X		X	X	X	X		
6	Field DUP	973	/			19/12/10	800	X	X						reads field Blank					
7	Equipment DUP	974	/			19/12/10	800	X	X						reads equipment Blank					
8	Trip Blank	975	/			Dec 9	/	X	X											
9	Trip Spike	976	/			Dec 9	/	X	X											
10																				

Comments:

Method of Delivery: Walkin

Relinquished By (Sign): A. Bradshaw	Received By Driver/Depot: [signature]	Received at Lab: Jinneepam Dolemai	Verified By: [signature]
Relinquished By (Print): Aaron Bradshaw	Date/Time: Dec. 10/19 15:21	Date/Time: DEC 10, 2019 05:22	Date/Time: Dec 19 943
Date/Time: 19/12/10	Temperature: 7.7 °C	Temperature: 6.4 °C	pH Verified: ☑ By: [initials]

Revision 3.0

Chain of Custody (Env.) xlsx

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705 / 555 Albert St
Custody: 124047

Report Date: 27-Dec-2019
Order Date: 11-Dec-2019

Revised Report

Order #: 1950462

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

Paracel ID	Client ID
1950462-01	19-02 SA8

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Dec-2019
Order Date: 11-Dec-2019
Project Description: 19120705 / 555 Albert St

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	11-Dec-19	14-Dec-19
Solids, %	Gravimetric, calculation	13-Dec-19	13-Dec-19
Texture - Coarse Med/Fine	Based on ASTM D2487	23-Dec-19	24-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Dec-2019

Order Date: 11-Dec-2019

Project Description: 19120705 / 555 Albert St

	Client ID:	19-02 SA8	-	-	-
	Sample Date:	28-Nov-19 09:00	-	-	-
	Sample ID:	1950462-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	91.2	-	-	-
>75 um	0.1 %	50.4	-	-	-
<75 um	0.1 %	49.6	-	-	-
Texture	0.1 %	Coarse	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	96.4%	-	-	-
Terphenyl-d14	Surrogate	109%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.40*		*ug/g*		*105*	*50-140*			
Surrogate: Terphenyl-d14	*1.26*		*ug/g*		*94.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Physical Characteristics									
% Solids	73.1	0.1	% by Wt.	72.3			1.1	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	0.119			0.0	40	
Acenaphthylene	ND	0.02	ug/g dry	0.056			0.0	40	
Anthracene	ND	0.02	ug/g dry	0.119			0.0	40	
Benzo [a] anthracene	0.065	0.02	ug/g dry	0.560			158.0	40	QR-01
Benzo [a] pyrene	0.080	0.02	ug/g dry	0.828			165.0	40	QR-01
Benzo [b] fluoranthene	0.109	0.02	ug/g dry	0.991			160.0	40	QR-01
Benzo [g,h,i] perylene	0.080	0.02	ug/g dry	0.658			157.0	40	QR-01
Benzo [k] fluoranthene	0.059	0.02	ug/g dry	0.934			176.0	40	QR-01
Chrysene	0.083	0.02	ug/g dry	0.659			155.0	40	QR-01
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	0.080			0.0	40	
Fluoranthene	0.065	0.02	ug/g dry	0.681			165.0	40	QR-01
Fluorene	ND	0.02	ug/g dry	0.052			0.0	40	
Indeno [1,2,3-cd] pyrene	0.051	0.02	ug/g dry	0.556			166.0	40	QR-01
1-Methylnaphthalene	0.146	0.02	ug/g dry	0.965			147.0	40	QR-01
2-Methylnaphthalene	0.195	0.02	ug/g dry	1.33			149.0	40	QR-01
Naphthalene	0.136	0.01	ug/g dry	0.939			150.0	40	QR-01
Phenanthrene	0.086	0.02	ug/g dry	0.552			146.0	40	QR-01
Pyrene	0.077	0.02	ug/g dry	0.644			157.0	40	QR-01
Surrogate: 2-Fluorobiphenyl	*1.28*		*ug/g dry*		*85.3*	*50-140*			
Surrogate: Terphenyl-d14	*1.64*		*ug/g dry*		*109*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	0.151	0.02	ug/g		90.5	50-140			
Acenaphthylene	0.089	0.02	ug/g		53.5	50-140			
Anthracene	0.137	0.02	ug/g		82.3	50-140			
Benzo [a] anthracene	0.127	0.02	ug/g		76.3	50-140			
Benzo [a] pyrene	0.122	0.02	ug/g		73.1	50-140			
Benzo [b] fluoranthene	0.162	0.02	ug/g		97.2	50-140			
Benzo [g,h,i] perylene	0.119	0.02	ug/g		71.4	50-140			
Benzo [k] fluoranthene	0.157	0.02	ug/g		94.0	50-140			
Chrysene	0.153	0.02	ug/g		92.1	50-140			
Dibenzo [a,h] anthracene	0.108	0.02	ug/g		65.1	50-140			
Fluoranthene	0.130	0.02	ug/g		78.0	50-140			
Fluorene	0.156	0.02	ug/g		93.6	50-140			
Indeno [1,2,3-cd] pyrene	0.104	0.02	ug/g		62.6	50-140			
1-Methylnaphthalene	0.172	0.02	ug/g		103	50-140			
2-Methylnaphthalene	0.208	0.02	ug/g		125	50-140			
Naphthalene	0.176	0.01	ug/g		106	50-140			
Phenanthrene	0.151	0.02	ug/g		90.3	50-140			
Pyrene	0.136	0.02	ug/g		81.8	50-140			
Surrogate: 2-Fluorobiphenyl	*1.63*		*ug/g*		*122*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report now includes data for texture

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.

PARACEL LABORATORIES

Paracel ID: 1950462

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

Paracel Order Number (Lab Use Only): 1950462

Chain Of Custody
(Lab Use Only)
Nº 124047

Page 1 of 1

Client Name:	GOLDER ASSOCIATES
Contact Name:	SHIHAN CHOWDHURY
Address:	1931 ROBERTSON RD.
Telephone:	613-406-6892
Project Ref:	19120705
Quote #:	CITY OF OTTAWA - 555 ALBERT ST
PO #:	
E-mail:	shihan_chowdhury@golder.com

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	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	19-02 SA8 BGM 992	S		3	Nov 28/19				✓							2x250ml+1vial			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments: on ice. - AK

Method of Delivery: Walkin.

Relinquished By (Sign): [signature]	Received By Driver/Depot: [signature]	Received at Lab: Surabhi Dhami	Verified By: [signature]
Relinquished By (Print): JAMES SULLIVAN	Date/Time: Dec 11/19 16:34	Date/Time: DEC 13, 2019 11:56	Date/Time: 12-12-19 1222
Date/Time: DEC 11, 2019 16:34	Temperature: 8 °C	Temperature: 10.0 °C	pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd
Ottawa, ON K2H 5B7
Attn: Shihan Chowdhury

Client PO:
Project: 19120705 / 555 Albert St
Custody: 124796

Report Date: 19-Dec-2019
Order Date: 11-Dec-2019

Order #: 1950465

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

Paracel ID	Client ID
1950465-01	19-3
1950465-02	19-1
1950465-03	19-2
1950465-04	19-6

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 19-Dec-2019
Order Date: 11-Dec-2019
Project Description: 19120705 / 555 Albert St

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	13-Dec-19	13-Dec-19
Chromium, hexavalent - water	MOE E3056 - colourimetric	12-Dec-19	12-Dec-19
Conductivity	EPA 9050A- probe @25 ℃	13-Dec-19	13-Dec-19
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	16-Dec-19	18-Dec-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Dec-19	17-Dec-19
PCBs, total	EPA 608 - GC-ECD	12-Dec-19	13-Dec-19
pH	EPA 150.1 - pH probe @25 ℃	13-Dec-19	13-Dec-19
PHC F1	CWS Tier 1 - P&T GC-FID	13-Dec-19	15-Dec-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	16-Dec-19	18-Dec-19
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	18-Dec-19	18-Dec-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	13-Dec-19	15-Dec-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 19-Dec-2019

Order Date: 11-Dec-2019

Project Description: 19120705 / 555 Albert St

	Client ID:	19-3	19-1	19-2	19-6
	Sample Date:	11-Dec-19 09:00	11-Dec-19 10:00	11-Dec-19 11:00	11-Dec-19 12:00
	Sample ID:	1950465-01	1950465-02	1950465-03	1950465-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Conductivity	5 uS/cm	1530	1770	3800	3080
pH	0.1 pH Units	8.2	7.4	7.6	7.2
Anions					
Chloride	1 mg/L	350	162	685	26
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	1.5	0.7	0.6	<5.0 [1]
Arsenic	1 ug/L	1	<1	<1	<10 [1]
Barium	1 ug/L	35	111	113	29 [1]
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<5.0 [1]
Boron	10 ug/L	503	142	127	160 [1]
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<1.0 [1]
Chromium	1 ug/L	<1	<1	<1	<10 [1]
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	0.5	12.1	13.7 [1]
Copper	0.5 ug/L	2.2	2.7	6.1	<5.0 [1]
Lead	0.1 ug/L	0.3	<0.1	0.1	<1.0 [1]
Molybdenum	0.5 ug/L	49.3	4.2	9.5	7.5 [1]
Nickel	1 ug/L	3	2	12	36 [1]
Selenium	1 ug/L	<1	1	1	<10 [1]
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<1.0 [1]
Sodium	200 ug/L	209000	155000	530000	89800 [1]
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<1.0 [1]
Uranium	0.1 ug/L	0.9	1.6	6.1	8.6 [1]
Vanadium	0.5 ug/L	0.8	0.5	1.7	<5.0 [1]
Zinc	5 ug/L	<5	<5	8	<50 [1]
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	4.5	<0.5	1.6	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 19-Dec-2019

Order Date: 11-Dec-2019

Project Description: 19120705 / 555 Albert St

	Client ID:	19-3	19-1	19-2	19-6
	Sample Date:	11-Dec-19 09:00	11-Dec-19 10:00	11-Dec-19 11:00	11-Dec-19 12:00
	Sample ID:	1950465-01	1950465-02	1950465-03	1950465-04
	MDL/Units	Water	Water	Water	Water
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	115%	117%	115%	114%
Dibromofluoromethane	Surrogate	102%	105%	104%	104%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 19-Dec-2019

Order Date: 11-Dec-2019

Project Description: 19120705 / 555 Albert St

	Client ID:	19-3	19-1	19-2	19-6
	Sample Date:	11-Dec-19 09:00	11-Dec-19 10:00	11-Dec-19 11:00	11-Dec-19 12:00
	Sample ID:	1950465-01	1950465-02	1950465-03	1950465-04
	MDL/Units	Water	Water	Water	Water
Toluene-d8	Surrogate	100%	101%	99.0%	100%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	0.40	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	0.42	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	0.95	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	2.00	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	1.65	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	2.41	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	1.03	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	1.33	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	2.36	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	0.29	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	3.69	<0.01	0.08	0.07
Fluorene	0.05 ug/L	0.45	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	0.92	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	0.15	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	0.22	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	0.36	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	0.65	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	3.08	<0.05	<0.05	<0.05
Pyrene	0.01 ug/L	3.74	<0.01	0.09	0.09
2-Fluorobiphenyl	Surrogate	65.0%	102%	99.8%	97.9%
Terphenyl-d14	Surrogate	87.3%	123%	107%	117%
PCBs					
PCBs, total	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	80.7%	80.1%	84.7%	92.6%

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Conductivity	ND	5	uS/cm						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
PCBs									
PCBs, total	ND	0.05	ug/L						
Surrogate: Decachlorobiphenyl	***0.466***		***ug/L***		***93.1***	***60-140***			
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	***22.1***		***ug/L***		***111***	***50-140***			
Surrogate: Terphenyl-d14	***24.1***		***ug/L***		***120***	***50-140***			
Volatiles									

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 19-Dec-2019
Order Date: 11-Dec-2019
Project Description: 19120705 / 555 Albert St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	***92.9***		***ug/L***		***116***	***50-140***			
Surrogate: Dibromofluoromethane	***73.1***		***ug/L***		***91.3***	***50-140***			
Surrogate: Toluene-d8	***80.5***		***ug/L***		***101***	***50-140***			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	2430	20	mg/L	2460			0.9	10	
General Inorganics									
Conductivity	328	5	uS/cm	330			0.6	5	
pH	7.8	0.1	pH Units	7.8			0.5	3.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND				20	
Antimony	0.74	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	32.5	1	ug/L	34.4			5.8	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	74	10	ug/L	79			5.7	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND			0.0	20	
Chromium	1.1	1	ug/L	1.1			2.1	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	1.06	0.5	ug/L	1.09			2.6	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	1.5	1	ug/L	1.5			4.1	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	147000	200	ug/L	154000			5.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	0.5	0.1	ug/L	0.5			2.5	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
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	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 19-Dec-2019
Order Date: 11-Dec-2019
Project Description: 19120705 / 555 Albert St

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	***94.3***		***ug/L***		***118***	***50-140***			
Surrogate: Dibromofluoromethane	***80.0***		***ug/L***		***100***	***50-140***			
Surrogate: Toluene-d8	***79.2***		***ug/L***		***99.0***	***50-140***			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.8	1	mg/L		108	85-115			
Hydrocarbons									
F1 PHCs (C6-C10)	1720	25	ug/L		85.8	68-117			
F2 PHCs (C10-C16)	1760	100	ug/L		110	60-140			
F3 PHCs (C16-C34)	4290	100	ug/L		110	60-140			
F4 PHCs (C34-C50)	2400	100	ug/L		96.8	60-140			
Metals									
Mercury	3.10	0.1	ug/L	ND	103	70-130			
Antimony	43.9		ug/L	ND	87.4	80-120			
Arsenic	54.0		ug/L	ND	108	80-120			
Barium	79.1		ug/L	34.4	89.3	80-120			
Beryllium	47.4		ug/L	ND	94.8	80-120			
Boron	115		ug/L	79	73.4	80-120			QS-02
Cadmium	44.0		ug/L	ND	88.0	80-120			
Chromium (VI)	213	10	ug/L	ND	106	70-130			
Chromium	58.0		ug/L	1.1	114	80-120			
Cobalt	48.3		ug/L	ND	96.1	80-120			
Copper	49.8		ug/L	1.09	97.3	80-120			
Lead	41.8		ug/L	ND	83.6	80-120			
Molybdenum	47.0		ug/L	ND	93.6	80-120			
Nickel	51.3		ug/L	ND	101	80-120			
Selenium	43.4		ug/L	1.5	83.9	80-120			
Silver	43.1		ug/L	ND	86.2	80-120			
Sodium	8980		ug/L		89.8	80-120			
Thallium	42.7		ug/L	ND	85.4	80-120			
Uranium	46.2		ug/L	0.5	91.4	80-120			
Vanadium	58.5		ug/L	ND	116	80-120			
Zinc	43		ug/L	ND	83.2	80-120			
PCBs									
PCBs, total	0.912	0.05	ug/L		91.2	60-140			
Surrogate: Decachlorobiphenyl	***0.505***		***ug/L***		***101***	***60-140***			
Semi-Volatiles									
Acenaphthene	4.76	0.05	ug/L		95.3	50-140			
Acenaphthylene	4.54	0.05	ug/L		90.8	50-140			
Anthracene	4.34	0.01	ug/L		86.9	50-140			
Benzo [a] anthracene	4.77	0.01	ug/L		95.4	50-140			
Benzo [a] pyrene	4.08	0.01	ug/L		81.7	50-140			
Benzo [b] fluoranthene	5.87	0.05	ug/L		117	50-140			
Benzo [g,h,i] perylene	4.19	0.05	ug/L		83.7	50-140			
Benzo [k] fluoranthene	5.55	0.05	ug/L		111	50-140			
Chrysene	5.38	0.05	ug/L		108	50-140			
Dibenzo [a,h] anthracene	4.41	0.05	ug/L		88.1	50-140			
Fluoranthene	4.10	0.01	ug/L		82.1	50-140			
Fluorene	4.77	0.05	ug/L		95.4	50-140			
Indeno [1,2,3-cd] pyrene	4.59	0.05	ug/L		91.8	50-140			
1-Methylnaphthalene	5.26	0.05	ug/L		105	50-140			
2-Methylnaphthalene	5.74	0.05	ug/L		115	50-140			
Naphthalene	5.03	0.05	ug/L		101	50-140			
Phenanthrene	3.96	0.05	ug/L		79.2	50-140			
Pyrene	4.19	0.01	ug/L		83.7	50-140			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 19-Dec-2019
Order Date: 11-Dec-2019
Project Description: 19120705 / 555 Albert St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	119	5.0	ug/L		119	50-140			
Benzene	33.3	0.5	ug/L		83.3	60-130			
Bromodichloromethane	31.4	0.5	ug/L		78.4	60-130			
Bromoform	28.6	0.5	ug/L		71.6	60-130			
Bromomethane	50.3	0.5	ug/L		126	50-140			
Carbon Tetrachloride	33.8	0.2	ug/L		84.5	60-130			
Chlorobenzene	32.0	0.5	ug/L		80.0	60-130			
Chloroform	32.7	0.5	ug/L		81.8	60-130			
Dibromochloromethane	29.2	0.5	ug/L		72.9	60-130			
Dichlorodifluoromethane	33.0	1.0	ug/L		82.6	50-140			
1,2-Dichlorobenzene	29.0	0.5	ug/L		72.5	60-130			
1,3-Dichlorobenzene	28.8	0.5	ug/L		72.1	60-130			
1,4-Dichlorobenzene	29.8	0.5	ug/L		74.6	60-130			
1,1-Dichloroethane	32.6	0.5	ug/L		81.6	60-130			
1,2-Dichloroethane	30.1	0.5	ug/L		75.3	60-130			
1,1-Dichloroethylene	34.2	0.5	ug/L		85.5	60-130			
cis-1,2-Dichloroethylene	32.4	0.5	ug/L		80.9	60-130			
trans-1,2-Dichloroethylene	33.1	0.5	ug/L		82.7	60-130			
1,2-Dichloropropane	36.0	0.5	ug/L		90.0	60-130			
cis-1,3-Dichloropropylene	29.1	0.5	ug/L		72.6	60-130			
trans-1,3-Dichloropropylene	28.8	0.5	ug/L		71.9	60-130			
Ethylbenzene	31.4	0.5	ug/L		78.6	60-130			
Ethylene dibromide (dibromoethane	28.6	0.2	ug/L		71.6	60-130			
Hexane	38.7	1.0	ug/L		96.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	60.7	5.0	ug/L		60.7	50-140			
Methyl Isobutyl Ketone	66.4	5.0	ug/L		66.4	50-140			
Methyl tert-butyl ether	70.8	2.0	ug/L		70.8	50-140			
Methylene Chloride	37.2	5.0	ug/L		93.1	60-130			
Styrene	29.7	0.5	ug/L		74.3	60-130			
1,1,1,2-Tetrachloroethane	30.0	0.5	ug/L		75.1	60-130			
1,1,2,2-Tetrachloroethane	29.6	0.5	ug/L		73.9	60-130			
Tetrachloroethylene	34.6	0.5	ug/L		86.4	60-130			
Toluene	32.5	0.5	ug/L		81.2	60-130			
1,1,1-Trichloroethane	32.0	0.5	ug/L		80.1	60-130			
1,1,2-Trichloroethane	31.2	0.5	ug/L		78.0	60-130			
Trichloroethylene	32.6	0.5	ug/L		81.4	60-130			
Trichlorofluoromethane	36.5	1.0	ug/L		91.3	60-130			
Vinyl chloride	30.1	0.5	ug/L		75.3	50-140			
m,p-Xylenes	66.4	0.5	ug/L		83.0	60-130			
o-Xylene	33.1	0.5	ug/L		82.7	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

QC Qualifiers :

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

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.

PAI
LABORA

Paracel ID: 1950465

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00-2319 St. Laurent Blvd.
ttawa, Ontario K1G 4J8
: 1-800-749-1947
: paracel@paracellabs.com
/ww.paracellabs.com

Paracel Order Number (Lab Use Only): 195046

Chain Of Custody (Lab Use Only)
№ 124796

Page 1 of 1

Client Name: Golder
Contact Name: Shihan Chowdhury
Address: 1931 Robertson Rd.
Telephone: 613-~~592~~ 592-9600

Project Ref: 19140705
Quote #: City of Ottawa - 535 Albert St.
PO #:
E-mail:

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

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☐ Table — For RSC: ☐ Yes ☐ No

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

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

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCB's	Sodium	Chloride	pH		
1	19-3	BGM 993	GW		9	19/12/11	900	X	X	X	X	X	X		X	X	X	X		
2	19-1	994	↓		9	↓	1000	X	X	X	X	X	X		X	X	X	X		
3	19-2	995	↓		9	↓	1100	X	X	X	X	X	X		X	X	X	X		
4	19-6	996	↓		9	↓	1200	X	X	X	X	X	X		X	X	X	X		
5																				
6																				
7																				
8																				
9																				
10																				

Comments: Please Dispose of extra Bottle in Cooler - AK

Method of Delivery:

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Bram	Verified By:
Relinquished By (Print):	Date/Time: Dec 11/19 16:14	Date/Time: 12/12/19 12:00	Date/Time: 12-12-19 12:32
Date/Time:	Temperature: 2.3 °C	Temperature: 7.3 °C	pH Verified: X By:

golder.com