FINAL

Phase Two Environmental Site Assessment

1785 Bloor Street
Mississauga, Ontario

Prepared for:

1785 Bloor Holdings Inc.
181 Eglinton Avenue East, Suite 204
Toronto, ON M2P 1J4

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TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1.0 EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by 1785 Bloor Holdings Inc. (Client) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the property located at 1785 Bloor Street in Mississauga, Ontario (hereafter referred to as the Site or Phase Two Property). The Phase Two Property is presently developed with a ten-storey, multi-tenant residential building (Site Building).

This Phase Two ESA was conducted in accordance with the Province of Ontario's *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, which was last amended by Ontario Regulation 214/21 on March 19, 2021 (O. Reg. 153/04), at the request of the Client in relation to the future construction of a multi-tenant residential building in the northwestern portion of the Phase Two Property. Although the proposed development does not result in a change of land use to a more sensitive land use, it is Pinchin's understanding that the City of Mississauga requires the completion of Phase One and Two ESAs compliant with O. Reg. 153/04 to support the development approval. As such, this Phase Two ESA report has been prepared in accordance with O. Reg. 153/04.

The objectives of this Phase Two ESA were to assess the soil quality in relation to three areas of potential environmental concern (APECs) and related potentially contaminating activities (PCAs) and contaminants of potential concern (COPCs) identified in a Phase One ESA completed by Pinchin in accordance with O. Reg. 153/04. Pinchin notes that four APECs were identified as part of the Pinchin Phase One ESA. However, APEC-3 was related to the application salt for the purposes of de-icing to the surface of the Phase Two Property and as such did not require investigation as part of this Phase Two ESA. The identified APECs, PCAs and COPCs are summarized in Tables 1 and 2 (all Tables are provided within Section 9.0).

The Phase Two ESA was completed by Pinchin between January 20, 2022 and February 2, 2022, and included the advancement of five boreholes at the Phase Two Property. The boreholes were advanced to depths ranging from approximately 0.6 metres below floor surface to 3.7 metres below ground surface. Select soil samples collected from each of the borehole locations were submitted for laboratory analysis of petroleum hydrocarbons (PHCs) fractions 1 through 4 (F1-F4), benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX), polycyclic aromatic hydrocarbons (PAHs) and/or polychlorinated biphenyls (PCBs).

Based on Site-specific information, the applicable regulatory standards for the Phase Two Property were determined to be the *"Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition",* provided in the Ontario Ministry of the Environment, Conservation and Parks (MECP) document entitled, *"Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"* dated April 15, 2011 *(Table 3 Standards)* for medium and fine-textured soils and residential/parkland/institutional property use.

The laboratory results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 3 Standards*.

It is the opinion of the Qualified Person (QP) who supervised the Phase Two ESA that the applicable *Table 3 Standards* for soil at the Phase Two Property have been met as of the Certification Date of January 20, 2022 and that no further subsurface investigation is required in relation to assessing the environmental quality of soil at the Phase Two Property.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

2.0 INTRODUCTION

A Phase Two ESA is defined as an "assessment of property conducted in accordance with the regulations by or under the supervision of a QP to determine the location and concentration of one or more contaminants in the land or water on, in or under the property". Under O. Reg. 153/04, the purpose of a Phase Two ESA is as follows:

- To determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property;
- To obtain information about environmental conditions in the land or water on, in or under the Phase Two Property necessary to undertake a Risk Assessment, in accordance with O. Reg. 153/04, with respect to one or more contaminants of concern; and
- To determine if applicable Site Condition Standards and standards specified in a Risk Assessment for contaminants on, in or under the Phase Two Property were met as of the certification date by developing an understanding of the geological and hydrogeological conditions at the Phase Two Property and conducting one or more rounds of field sampling for all contaminants associated with any APEC identified in the Phase Two ESA sampling and analysis plan (SAP) and for any such contaminants identified during subsequent Phase Two ESA activities and analyses of environmental conditions at the Phase Two Property.

This Phase Two ESA was conducted at the request of the Client in relation to the construction of a multi-tenant residential building in the northwestern portion of the Phase Two Property. Although the proposed development does not result in a change of land use to a more sensitive land use, it is Pinchin's understanding that the City of Mississauga requires the completion of Phase One and Two ESAs compliant with O. Reg. 153/04 to support the development approval. As such, this Phase Two ESA report has been prepared in accordance with O. Reg. 153/04.

The overall objectives of this Phase Two ESA were to assess the soil quality in relation to APECs and related COPCs identified in a Phase One ESA completed by Pinchin, the findings of which were summarized in the report entitled "*Phase One Environmental Site Assessment*, *1785 Bloor Street, Mississauga, Ontario*", completed by Pinchin for the Client and dated January 14, 2022. The property assessed by the Pinchin Phase One ESA is referred to herein as the Phase One Property. The Phase Two ESA was conducted on the whole Phase One Property, at specific APECs identified during the Phase One ESA, and the Phase One Property and Phase Two Property have the same boundaries.

2.1 Site Description

This Phase Two ESA was completed for the property located at the municipal address of 1795 Bloor Street, Mississauga, Ontario. The Phase Two Property is 3.0 acres (1.2 hectares) in size and is bounded by a hydro corridor to the northeast, Bloor Street to the southeast and multi-tenant residential buildings to the southwest and northwest. A Key Map showing the Phase Two Property location is provided on Figure 1 and a detailed plan of the Phase Two Property and surrounding lands is provided on Figure 2 (all Figures are provided within Section 9.0).

The Phase Two Property is occupied by a multi-tenant residential building (Site Building), located in the southeastern portion.

A summary of the pertinent details of the Phase Two Property is provided in the following table:

Detail	Source/Reference	Information
Legal Description	Legal Survey Drawing provided by the Client	BLOCK P REGISTERED PLAN 719 CITY OF MISSISSAUGA REGIONAL MUNICIPALITY OF PEEL
Municipal Address	http://www6.mississauga.ca/missmaps/ City of Mississauga	1785 Bloor Street, Mississauga ON L4X 1S8
Parcel Identification Number (PIN)	Legal Survey Drawing provided by the Client	13330-0247 (LT)
Current Owner	Client, GeoWarehouse™	1785 Bloor Holdings Inc. 181 Eglinton Avenue East, Suite 204 Toronto, ON M4P 1J4
Owner Contact Information	Client	Daniel Greenberg c/o 1785 Bloor Holdings Inc. 181 Eglinton Avenue East, Suite 204 Toronto, ON M4P 1J4 jdgreenberg@compten.ca
Current Occupant	Client	Multi-tenant residential
Client Contact Information	Authorization to Proceed Form for Pinchin Proposal	Daniel Greenberg c/o 1785 Bloor Holdings Inc. 181 Eglinton Avenue East, Suite 204 Toronto, ON M4P 1J4 michi@sajeckiplanning.com
Site Area	GeoWarehouse™	12,048 m^2 (3.0 acres)
Current Zoning	Mississauga Zoning By-law 0225-2007	RA3-21 – Residential (Apartments)

Detail	Source/Reference	Information
Centroid UTM Co-ordinate	Google Earth™	614057 Easting
		4831254 Northing
		Zone 17T

A legal survey showing the Phase Two Property is provided in Appendix A (all Appendices are provided in Section 10.0).

2.2 Property Ownership

The entirety of the Phase Two Property is currently owned by the Client (1785 Bloor Holdings Inc.), located at 181 Eglinton Avenue East, Suite 204, Toronto, Ontario. Contact information for the Phase Two Property owner is provided in the preceding section.

Pinchin was retained by Mr. Daniel Greenberg of the Client to conduct the Phase Two ESA of the Phase Two Property. Contact information for Mr. Greenberg is provided in the preceding section.

2.3 Current and Proposed Future Uses

The Phase Two Property is presently utilized for residential purposes, and it is Pinchin's understanding that the Client intends to construct a multi-tenant residential building in the northwestern portion of the Phase Two Property. The proposed construction does not require that an RSC be filed as per O. Reg. 153/04.

2.4 Applicable Site Condition Standards

The Phase Two Property is currently a residential property located within the City of Mississauga and the proposed future land use will continue to be residential. It is Pinchin's understanding that drinking water for the Phase Two Property and surrounding properties within 250 metres of the Phase Two Property is supplied by the Regional Municipality of Peel (Region of Peel), and there are no known drinking water supply wells within 250 metres of the Phase Two Property. Source water is obtained by the Region of Peel from Lake Ontario.

Bedrock was not encountered at any of the boreholes completed at the Phase Two Property during the Phase Two ESA, which were advanced to a maximum depth of approximately 3.7 mbgs and, as such, the Phase Two Property is not a shallow soil property as defined in Section 43.1 of O. Reg. 153/04.

The Phase Two Property does not contain a water body nor is it located within 30 metres of a water body and the use of standards for properties situated within 30 metres of a water body is not required.

Section 41 of O. Reg. 153/04 states that a property is classified as an “environmentally sensitive area” if the pH of the surface soil (less than or equal to 1.5 mbgs) is less than 5 or greater than 9, if the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the property is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. A total of three representative soil samples collected from the boreholes advanced at the Phase Two Property were submitted for pH analysis. The pH analytical results are summarized in Table 3. The pH values measured in the submitted soil samples were within the limits for non-sensitive sites. The Phase Two Property is also not an area of natural significance and it is not adjacent to, nor does it contain land within 30 metres of, an area of natural significance. As such, the Phase Two Property is not an environmentally sensitive area.

As discussed further in Section 6.4, based on the results of grain size analysis completed on representative soil samples collected during the Phase Two ESA and the observed stratigraphy at the borehole locations at the Phase Two Property, it is the QP’s opinion that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04. Therefore, the soil at the Phase Two Property has been considered medium and fine-textured for the purpose of establishing the applicable MECP Site Condition Standards.

Based on the above, the appropriate Site Condition Standards for the Phase Two Property are the Table 3 Standards for:

- Medium and fine-textured soils; and
- Residential/parkland/institutional property use.

As such, all analytical results have been compared to these *Table 3 Standards*.

Pinchin submitted a notification letter to the Clerk for the Regional Municipality of Peel (Region of Peel) on February 11, 2022 regarding the intention to apply the *Table 3 Standards* in assessing soil quality at the Phase Two Property. At the time of writing this report, a response from the Region of Peel had not been received.

3.0 BACKGROUND INFORMATION

3.1 Physical Setting

The Phase Two Property is located in the south/central portion of the City of Mississauga at an elevation of approximately 130.8 metres above mean sea level (mamsl). The topography of the Phase Two Property is generally flat with little relief. The properties surrounding the Phase Two Property are at an equivalent grade with a gradual decrease in elevation towards the east-northeast. There are no drainage features (e.g., open ditches or swales) present on-Site. Surface water (e.g., storm runoff) is inferred to run overland and drain into the on-Site municipal storm sewer catch basins.

There are no open water bodies or areas of natural significance located on-Site or within the area assessed by the Pinchin Phase One ESA (the Phase One Study Area). A plan showing the Phase One Study Area is presented on Figure 3. The nearest surface water body is Etobicoke Creek located approximately 325 metres northeast of the Phase One Property at an elevation of approximately 120 mamsl.

A review of the MECP Source Protection Information Atlas indicated that the Phase One Study Area is not located in whole or in part within a well head protection area or other designation identified by the City of Mississauga for the protection of groundwater.

Based on information provided by the MECP, the Phase One Property and all other properties within the Phase One Study Area are serviced by a municipal drinking water system.

The records review did not identify the presence of wells within the Phase One Property or within the Phase One Study Area that supply water for human consumption or for agricultural purposes.

3.2 Past Investigations

3.2.1 Summary of Previous Environmental Investigations by Others

No previous environmental investigation reports by others were available for review.

3.2.2 Pinchin Phase One ESA Summary

From September 2021 through January 2022, Pinchin conducted a Phase One ESA to meet City of Mississauga requirements. The Phase One ESA consisted of a Site visit, interviews with Site personnel, records review, evaluation of information, and preparation of a written report which was completed under the supervision of a QP. A plan showing the Phase One Study Area is attached as Figure 3.

The Phase One ESA was completed recently and in accordance with the requirements of O. Reg. 153/04. Therefore, the information provided within the Phase One ESA Report is considered adequate such that it can be relied upon for the purpose of this Phase Two ESA.

Based on information obtained during the Phase One ESA, a total of four APECs and corresponding PCAs and COPCs were identified that could potentially affect the environmental condition of the subsurface media on, in or under the Phase Two Property. The COPCs associated with each APEC were determined based on a review of the PCAs and substances associated with the related activities, and on several sources of information, including but not limited to, Pinchin's experience with environmental contamination and hazardous substances, common industry practices for analysis of such contaminants and point sources, literature reviews of COPCs and associated hazardous substances, and evaluations of contaminant mobility and susceptibility for migration in the subsurface.

Table 1 presents the APECs and their associated PCAs and COPCs. Identified on-Site and off-Site PCAs are summarized in Table 2 and their locations are shown on Figure 4. APECs at the Phase Two Property are illustrated on Figure 5.

3.2.3 Use of Previous Analytical Data

No previous soil data were available for use in the Phase Two ESA.

4.0 SCOPE OF INVESTIGATION

4.1 Overview of Site Investigation

The scope of work for this Phase Two ESA was prepared to address the APECs identified at the Phase Two Property and consisted of the following:

- Prepared a health and safety plan and arranged for the completion of underground utility locates prior to the commencement of drilling activities.
- Developed a detailed SAP prior to the advancement of the boreholes and the installation of the monitoring wells. The SAP was outlined in the document entitled "*Sampling and Analysis Plan for Phase Two Environmental Site Assessment, 1785 Bloor Street, Mississauga, Ontario*", dated January 20, 2022, which is provided in Appendix B. Boreholes were advanced at the Phase Two Property to depths ranging between approximately 0.6 metres below floor surface (mbfs) and 3.7 metres below ground surface (mbgs).
- Retained Strata Drilling Group Inc. (Strata) to advance boreholes and complete monitoring well installations using a Geoprobe 7822DT™ drill rig or Hilti 2000-AVR™ electric jackhammer. Strata is licensed by the MECP in accordance with Ontario Regulation 903 (as amended) (O. Reg. 903) to undertake borehole drilling/well installation activities. Strata advanced five boreholes at the Phase Two Property to investigate the potential for soil contaminants associated with the APECs identified in the Phase One ESA.
- Collected soil samples at regular intervals within each borehole.
- Field screened soil samples for visual/olfactory evidence of impacts as well as for petroleum-derived vapours in soil headspace using a combustible gas indicator (CGI) calibrated to hexane and VOC-derived vapours in soil headspace using a photoionization detector (PID).

- Submitted a minimum of one “worst case” soil sample from each borehole for chemical analysis of:
  - Petroleum hydrocarbons (PHCs) fractions 1 through 4 (F1-F4);
  - Benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX);
  - Polycyclic aromatic hydrocarbons (PAHs); and/or
  - Polychlorinated biphenyls (PCBs).
- Submitted two duplicate soil samples for chemical analysis of the above-noted parameters for quality assurance/quality control (QA/QC) purposes.
- Submitted one trip blank for the soil sampling program for the chemical analysis of VOCs for QA/QC purposes.
- Submitted two representative soil samples for the laboratory analysis of grain size and two representative soil samples for the laboratory analysis of pH in order to confirm the appropriate MECP Site Condition Standards.
- Completed an elevation survey to establish the elevations of the boreholes.
- Compared the soil analytical results to the applicable criteria stipulated in the *Table 3 Standards*.
- Prepared a report (this report) documenting the findings of the Phase Two ESA which meets the reporting requirements listed in *Schedule E* and *Table 1 – Mandatory Requirements for Phase Two Environmental Site Assessment Reports* of O. Reg. 153/04.

4.2 Media Investigated

The scope of work for this Phase Two ESA was prepared to address the APECs and corresponding media at the Phase Two Property as identified through completion of the Phase One ESA.

The media of concern for the Phase Two ESA was soil. One of the APECs (APEC-3) identified as part of the Pinchin Phase One ESA included groundwater as a potentially impacted media. However, APEC-3 is related to salt application for de-icing purposes on the exterior of the Phase Two Property, and as such Pinchin has applied the exemption in Section 49.1 of O. Reg. 153/04 and this APEC did not need to be investigated as part of the Phase Two ESA. The remaining APECs were related to PCAs located at the ground surface (i.e., pad-mounted transformer (APEC-1), hydro vault (APEC-2) and potential historical heating oil aboveground storage tank (APEC-4)) and the results of soil samples collected and analyzed from these APECs showed no evidence of soil impacts, and as such groundwater impacts were considered unlikely. Pinchin did not conduct sediment sampling as part of this Phase Two ESA as there are no surface water bodies and, therefore no sources of sediment, present on-Site.

For assessing the soil at the Phase Two Property for the presence of COPCs, a total of five boreholes were advanced at the Phase Two Property for the purpose of collecting soil samples. Select “worst case” samples collected from each of the boreholes were submitted for laboratory analysis of the COPCs.

4.3 Phase One Conceptual Site Model

A conceptual site model (CSM) was created to provide a summary of the findings of the Phase One ESA. The Phase One CSM is summarized in Figures 1 through 5 which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures.
- Water bodies located in whole or in part within the Phase One Study Area.
- Areas of natural significance located in whole or in part within the Phase One Study Area.
- Drinking water wells located at the Phase One Property.
- Land use of adjacent properties.
- Roads within the Phase One Study Area.
- PCAs within the Phase One Study Area, including the locations of tanks.
- APECs at the Phase One Property.

The following provides a narrative summary of the Phase One CSM:

- The Phase One Property is a rectangular-shaped parcel of land approximately 3.0 acres (1.2 hectares) in size located along the northwest side of Bloor Street, approximately 90 metres southwest of the intersection of Bloor Street and Bridgewood Drive in Mississauga, Ontario. The Phase One Property is improved with a multi-tenant residential building (Site Building) that occupies the southeastern portion of the Phase One Property. The Site Building has been used for residential purposes since its construction in 1967. There is no record of industrial use or of a commercial use (e.g., garage, bulk liquid dispensing facility or dry cleaner) that would require classifying the Phase One Property as an Enhanced Investigation Property.
- No water bodies were identified within the Phase One Study Area. The nearest water body is Etobicoke Creek, which is located approximately 325 metres northeast of the Phase One Property.
- No areas of natural significance were identified within the Phase One Study Area.
- No drinking water wells were located on the Phase One Property.

- Adjacent to the southeast of the Phase One Property is Bloor Street, to the northeast is a hydro corridor and to the northwest and southwest are multi-tenant residential buildings. It is Pinchin's understanding that land uses at these properties have been similar since the mid-1960s to 1970s.
- A total of 14 PCAs were identified within the Phase One Study Area, consisting of four PCAs at the Phase One Property and 10 PCAs within the Phase One Study Area, outside of the Phase One Property. As shown on Figure 4, none of the off-Site PCAs are considered to result in APECs at the Phase One Property given the distance from the PCAs to the Phase One Property, their downgradient or transgradient locations relative to the inferred groundwater flow direction in the Phase One Study Area and/or the nature of operations and potential contaminants related to these operations. All on-Site PCAs are considered to represent APECs at the Phase One Property. Figure 5 provides a detailed summary of the APECs and associated PCAs and COPCs.
- Underground utilities at the Phase One Property provide potable water, natural gas, hydro, communication and sewer services to the Site Building. The natural gas, communication, hydro, and municipal water lines are understood to run northwest from Bloor Street to the Site Building. The natural gas and water services were observed to enter through the northeastern wall of the boiler room.

  The communication lines are understood to run to the southeastern elevation of the Site Building. Hydro lines are understood to run through the pad-mounted transformer located in the southeastern portion of the Phase One Property and continuing to the hydro vault in the northwestern portion of the Site Building. Sanitary and storm sewer utility lines are also understood to be present at the Phase One Property. Their location could not be determined, but it is understood that they discharge to the municipal sewer system. Plans were not available to confirm the depths of these utilities, but they are estimated to be located approximately 1 to 3 mbgs. The depth to groundwater at the Phase One Property is estimated to be approximately 3 mbgs, which coincides with the approximate depth of the utilities. As such, it is possible that the utility corridors may act as preferential pathways for contaminant distribution and transport in the event that shallow subsurface contaminants exist at the Phase One Property.
- The Phase One Property and the surrounding properties located within the Phase One Study Area are located within glacial deposits of till as the dominant landform with the primary native material consisting of diamicton (i.e., sandy to clayey silt till). Bedrock is expected to consist of shale, limestone, dolostone and siltstone of the Georgian Bay, Blue Mountain and Billings Formations at a depth below at least 9 mbgs.

The topography is considered to be mainly flat to rolling low local relief with poor surface water drainage conditions

- The Phase One Property is relatively flat with little relief. The area surrounding the Phase One Property slopes gradually downwards to the east-northeast. Local groundwater flow is inferred to be to the east-northeast, based on the topography of the area surrounding the Phase One Property.

The Phase One Property has parking areas and/or access routes located northwest, southwest and southeast of the Site Building. It is Pinchin's understanding that salt has historically been applied to the parking areas and access routes for safety reasons during winter conditions to remove snow and ice, which represents a PCA at the Phase One Property. However, it is the opinion of the QP supervising the Phase One ESA that, although salt-related parameters such as Sodium Adsorption Ratio and electrical conductivity in soil and sodium and chloride in groundwater may be present at concentrations exceeding the applicable Site Condition Standards, the exemption provided in Section 49.1 of O. Reg. 153/04 can been applied and the resulting APEC does not require investigation as part of a Phase Two ESA.

There were no deviations from the Phase One ESA requirements specified in O. Reg. 153/04 or absence of information that have resulted in uncertainty that would affect the validity of the Phase One CSM.

4.4 Deviations from Sampling and Analysis Plan

No notable constraints and limitations with respect to the SAP were documented during the field activities, and as such Pinchin has conducted the Phase Two ESA in a manner generally consistent with the SAP provided in Appendix B.

4.5 Impediments

Pinchin had full access to the Phase Two Property throughout the completion of the Phase Two ESA.

5.0 INVESTIGATION METHOD

5.1 General

The Phase Two ESA field work was conducted in accordance with Pinchin's standard operating procedures (SOPs) as provided in the SAP, which have been developed in accordance with the procedures and protocols provided in the MECP document entitled "*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*", dated December 1996, in the Professional Geoscientists of Ontario document entitled *"Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)"*, dated April 2011, and in O. Reg. 153/04.

No deviations from Pinchin's SOPs occurred during the Phase Two ESA.

5.2 Drilling

Pinchin retained Strata to advance a total of five boreholes (BH101 through BH105) at the Phase Two Property on January 20, 2022 to investigate the potential presence of COPCs associated with the APECs identified in the Phase One ESA. The boreholes were drilled to depths ranging between approximately 0.6 mbfs and 3.7 mbgs using a Geoprobe 7822DT™ drill rig or Hilti 2000-AVR™ electric jackhammer.

The locations of the boreholes are provided on Figure 6. Section 6.10.2 includes a table summarizing the boreholes completed to investigate each of the APECs. A description of the subsurface stratigraphy encountered during the drilling program is documented in the borehole logs included in Appendix C.

Measures taken to minimize the potential for cross-contamination during the borehole drilling program included:

- The use of dedicated, disposable PVC soil sample liners for soil sample collection during direct-push drilling.
- The extraction of soil samples from the interior of the sampling device (where possible), rather than from areas in contact with the sampler walls.
- The cleaning of all non-dedicated drilling and soil sampling equipment (i.e., split-spoon sampler and stainless steel knife used for sample collection) before initial use and between sample and borehole locations.
- The use of dedicated and disposable nitrile gloves for all soil sample handling.

Soil samples were collected at continuous intervals during split-spoon and direct-push drilling at a general frequency of one soil sample for every 0.61 or 0.75 metres drilled, respectively.

No excavating activities (e.g., test pitting) were completed as part of the Phase Two ESA.

5.3 Soil Sampling

Soil samples were collected in the boreholes at continuous intervals using 5.7 centimetre (cm) outer diameter (OD) direct push soil samplers with dedicated single-use sample liners or 5.7 cm OD diameter split-spoon samplers.

Discrete soil samples were collected from the dedicated sample liners or the split-spoon samplers using a stainless-steel knife. Dedicated and disposable nitrile gloves were worn during the collection of each soil sample. A portion of each sample was placed in a resealable plastic bag for field screening and a portion was containerized in laboratory-supplied glass sampling jars. Following sample collection, the sample jars were placed into dedicated coolers with ice for storage pending transport to Bureau Veritas Laboratories (BV Labs) in Mississauga, Ontario. Formal chain of custody records were maintained between Pinchin and the staff at BV Labs.

Subsurface soil conditions were logged on-Site by Pinchin personnel at the time of borehole drilling. Based on the soil samples recovered during the borehole drilling program, the soil stratigraphy at the drilling locations generally consists of sandy silt that extended to the maximum investigation depth of 3.7 mbgs.

No odours or staining were observed in the soil samples collected during the borehole drilling program.

A detailed description of the subsurface stratigraphy encountered during the borehole drilling program is documented in the borehole logs included in Appendix C.

5.4 Field Screening Measurements

Soil samples were collected at each of the sampling intervals during the drilling activities and analyzed in the field for VOC-derived and petroleum-derived vapour concentrations in soil headspace with an RKI Eagle 2™ equipped with a PID and a CGI operated in methane elimination mode. The soil samples collected for field-screening purposes were placed in resealable plastic bags. The plastic bags were stored in a warm environment for a minimum of five minutes and agitated in order to release organic vapours within the soil pore space prior to analysis with the PID and CGI.

Based on a review of the operator's manual, the RKI Eagle 2™ PID has an accuracy/precision of up to 1 part per million (ppm). The PID was calibrated prior to field use by the equipment supplier, Spectra Scientific Inc. (Spectra) according to Spectra's standard operating procedures. An in-field re-calibration of the PID was conducted (using the gas standard in accordance with the operator's manual instructions) if the calibration check indicated that the PID's calibration had drifted by more than +/- 10%.

Based on a review of the operator's manual, the RKI Eagle 2™ CGI has an accuracy/precision of up to +/- 25 ppm, or +/- 5% of the reading (whichever is greater). The CGI was calibrated prior to field use by Spectra according to Spectra's standard operating procedures. An in-field re-calibration of the CGI was conducted (using the gas standard in accordance with the operator's manual instructions) if the calibration check indicated that the CGI's calibration had drifted by more than +/- 10%.

In general, the soil samples with the highest measured vapour concentrations (i.e., "worst case") from a given borehole were submitted for laboratory analysis. Sample depth was also used in conjunction with the vapour concentrations in making the final selection of "worst case" soil samples for laboratory analysis.

5.5 Groundwater Monitoring Well Installation

Groundwater was not considered a potentially impacted media and as such no monitoring wells were installed as part of this Phase Two ESA.

5.6 Groundwater Field Measurements of Water Quality Parameters

Groundwater was not considered a potentially impacted media and as such no groundwater field measurements of water quality parameters were collected as part of this Phase Two ESA.

5.7 Groundwater Sampling

Groundwater was not considered a potentially impacted media and as such no groundwater samples were collected as part of this Phase Two ESA.

5.8 Sediment Sampling

Sediment sampling was not completed as part of this Phase Two ESA.

5.9 Analytical Testing

All collected soil samples were delivered to BV Labs for analysis. BV Labs is an independent laboratory accredited by the Canadian Association for Laboratory Accreditation and Standards Council of Canada. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at BV Labs. BV Labs conducted the laboratory analysis in accordance with the MECP document entitled *"Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act"* dated March 9, 2004 and revised on July 1, 2011 (*Analytical Protocol)*.

5.10 Residue Management Procedures

Soil cuttings generated by the borehole drilling program were containerized in four 205-litre drums that were stored in the central portion of the Phase Two Property. The drums also contained soil cuttings from concurrent geotechnical and hydrogeological investigations.

One composite soil sample (representative of the excess soil cuttings generated by the borehole drilling program) collected from the boreholes was submitted for the laboratory analysis of the leachate concentrations of inorganics, VOCs, PCBs and benzo(a)pyrene in accordance with the Toxicity Characteristic Leachate Procedure (TCLP) analysis as per Ontario Regulation 347/90 (O. Reg. 347/90) in order to characterize the soil cuttings for off-Site disposal purposes. The analytical results are provided in Appendix D which illustrate that the excess soil cuttings are classified as non-hazardous waste in accordance with O. Reg. 347/90.

Pinchin notes that at the time of writing, the drums of excess soil cuttings have not been removed from the Phase Two Property. Pinchin will assist the Client in arranging for disposal of these materials by an MECP-approved waste hauler at an MECP-approved waste management facility.

5.11 Elevation Surveying

On February 2, 2022, Pinchin completed a vertical elevation survey of all borehole locations using a Sokkia GCX2 GNSS receiver (Sokkia). The Sokkia collected geodetic elevations data for the borehole locations.

The elevation survey data is provided on the borehole logs in Appendix C.

5.12 Quality Assurance and Quality Control Measures

The QA/QC protocols that were followed during borehole drilling and soil sampling so that representative samples were obtained are described in the following subsections.

5.12.1 Sample Containers, Preservation, Labelling, Handling and Custody of Samples

Soil samples were containerized within laboratory-prepared sample containers in accordance with the *Analytical Protocol*.

The following soil sample containers and preservatives were used:

- BTEX and PHCs F1: 40 millilitre (mL) glass vials with septum-lids, pre-charged with methanol preservative.
- PHCs F2-F4, PAHs, PCBs, pH and grain size: 120 or 250 mL unpreserved clear glass wide-mouth jars with a Teflon™–lined lid.

The soil sampling trip blank for VOC analysis consisted of two 40 mL clear glass vials that were pre-charged with methanol preservative.

Each soil and QA/QC sample was labelled with a unique sample identifier along with the company name, sampling date, Pinchin project number and analysis required.

Each sample was placed in a cooler on ice immediately upon collection and prior to submission to BV Labs for analysis. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at BV Labs.

5.12.2 Equipment Cleaning Procedures

Dedicated, single-use PVC sample liners were used for each soil sample collected, which precluded the need for drilling equipment cleaning during soil sample collection. Equipment utilized in soil sample collection and handling (i.e., stainless steel knife used to remove soil from the sample liners) was cleaned with a solution of Alconox™ detergent and potable water followed by a distilled water rinse prior to initial use and between samples.

During the drilling of boreholes BH103 and BH104, the split-spoon samplers used to collect soil samples were cleaned before initial use and between samples using an Alconox™/potable water mixture followed by a distilled water rinse.

5.12.3 Field Quality Control Measures

A total of two field duplicate soil samples were collected by Pinchin during the Phase Two ESA for analysis of one or more of the COPCs. The frequency of field duplicate soil sample analysis complied with the requirement that one field duplicate soil sample is analyzed for every ten regular soil samples submitted for analysis of the COPCs. The soil sample field duplicate pairings and corresponding analytical schedules are summarized as follows:

- Soil sample “BH101-5” and its corresponding field duplicate “DUP01-012022” were submitted for laboratory analysis of BTEX, PHCs and PCBs.
- Soil sample “BH102-3” and its corresponding field duplicate “DUP02-012022” were submitted for laboratory analysis of PAHs.

In addition, one soil sampling trip blank was analyzed for VOCs.

The calibrations of the RKI Eagle 2™ PID/CGI used for field screening was checked by the equipment supplier (Spectra) prior to use in the field by Pinchin.

Spectra completed the calibration checks in accordance with the equipment manufacturers’ specifications and/or Spectra’s SOPs. As described in Section 5.4, calibration checks and recalibration (if required) were completed for the RKI Eagle 2™ PID/CGI during the drilling program.

5.12.4 QA/QC Sampling Program Deviations

There were no deviations from the QA/QC sampling program outlined in the SAP.

6.0 REVIEW AND EVALUATION

6.1 Geology

Based on the stratigraphic information obtained from the soil samples recovered during the drilling activities completed as part of the Phase Two ESA, the asphalt or grass-covered ground surface or concrete-covered floor surface at the Phase Two Property is underlain by native or reworked native soil, which is generally comprised of sandy silt that extends to the maximum investigation depth of 3.7 mbgs. Since groundwater was not identified as a potentially impacted media, monitoring wells were not installed within any of the boreholes. As such, the depth to water table was not determined during this Phase Two ESA.

The following table provides a summary of the primary geologic units observed during borehole drilling at the Phase Two Property:

Geologic Unit	Estimated Thickness (metres)	Top Elevation (mamsl)	Bottom Elevation (mamsl)	Properties
Native or reworked native soil	>3.7	131.01 – 132.23	127.67 – 128.88	Depth to water table not assessed as part of Phase Two ESA

The overburden/bedrock interface was not encountered during the drilling activities. Based on information provided in the Water Well Information System database, bedrock is located at depths below at least 9 mbgs within the Phase One Study Area.

Cross-sections summarizing the subsurface geological conditions have been provided as Figures 7B to 7C, with Figure 7A showing the cross-section lines.

6.2 Groundwater Elevations and Flow Direction

Groundwater was not considered a potentially impacted media and no monitoring wells were installed as part of this Phase Two ESA. As such, Pinchin did not assess groundwater elevations as part of this Phase Two ESA.

6.3 Groundwater Hydraulic Gradients

6.3.1 Groundwater Horizontal Hydraulic Gradients

Monitoring wells were not installed at the Phase Two Property as part of the Phase Two ESA. As such, horizontal hydraulic gradients were not determined.

6.3.2 Groundwater Vertical Hydraulic Gradients

Monitoring wells were not installed at the Phase Two Property as part of the Phase Two ESA. As such, vertical hydraulic gradients were not determined.

6.4 Fine-Medium Soil Texture

Two soil samples collected from the boreholes advanced at the Phase Two Property were submitted for 75 micron single-sieve grain size analysis. The soil samples selected for analysis were considered to be representative of the primary stratigraphic unit observed at the borehole locations, which was a sandy silt unit. As indicated in Table 3, both soil samples (BH101-2 and BH102-4) were classified as medium and fine-textured (15% and 35% coarse-grained soil, respectively).

Based on these grain size analysis results and the observed stratigraphy at the borehole locations at the Phase Two Property, it is the QP's opinion that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04. Therefore, the soil at the Phase Two Property was interpreted to be medium and fine-textured for the purpose of determining the MECP Site Condition Standards applicable to the Phase Two Property.

6.5 Soil Field Screening

Soil vapour headspace concentrations measured in the soil samples collected as part of this Phase Two ESA are presented in the borehole logs. Soil vapour headspace values measured with the CGI in methane elimination mode ranged from 0 ppm by volume (ppm_v) in several of the collected soil samples to a maximum of 60 ppm_v in soil samples BH101-S5 and BH105-S5 collected from boreholes BH101 and BH105 at depths of approximately 3.1 to 3.7 and 3.1 and 3.4 mbgs, respectively. Soil vapour headspace values measured with the PID were all measured at 0 ppm_v.

Up to two most apparent "worst case" soil samples, based on vapour concentrations as well as sample depths, recovered from each borehole was submitted for laboratory analysis of BTEX, PHCs (F1-F4), PAHs and/or PCBs.

6.6 Soil Quality

A total of five boreholes were advanced at the Phase Two Property at the locations shown on Figure 7 in order to assess for the presence of subsurface impacts resulting from the APECs identified in the Pinchin Phase One ESA. Select soil samples were collected from each of the advanced boreholes and submitted for laboratory analysis of the COPCs. The soil sample locations, depths and laboratory analyses are summarized in Table 3 and in the borehole logs.

The soil sample analytical results were compared to the *Table 3 Standards* and the following subsections provide a discussion of the findings.

6.6.1 BTEX

The soil sample analytical results for BTEX, along with the corresponding *Table 3 Standards*, are presented in Table 3. As indicated in Table 3, all reported concentrations of BTEX in the soil samples submitted for analysis were below the *Table 3 Standards*.

6.6.2 PHCs F1-F4

The soil sample analytical results for PHCs F1-F4, along with the corresponding *Table 3 Standards*, are presented in Table 3. As indicated in Table 3, all reported concentrations of PHCs F1- F4 in the soil samples submitted for analysis were below the *Table 3 Standards*.

6.6.3 PAHs

The soil sample analytical results for PAHs, along with the corresponding *Table 3 Standards*, are presented in Table 3. As indicated in Table 3, all reported concentrations of PAHs in the soil samples submitted for analysis were below the *Table 3 Standards*.

6.6.4 PCBs

The soil sample analytical results for PCBs, along with the corresponding *Table 3 Standards*, are presented in Table 3. As indicated in Table 3, all reported concentrations of PCBs in the soil samples submitted for analysis were below the *Table 3 Standards*.

6.6.5 General Comments on Soil Quality

The soil sample results show no evidence of chemical or biological transformations of chemical parameters in the subsurface.

As noted above, no soil impacts were identified at the Phase Two Property. As such, there is no evidence that the soil at the Phase Two Property is acting as a contaminant source for the groundwater.

The soil sample analytical results also show no evidence of NAPLs in the subsurface at the Phase Two Property. In addition, no evidence of NAPL was observed during borehole drilling.

6.7 Groundwater Quality

Groundwater was not considered a potentially impacted media and as such no groundwater samples were collected as part of this Phase Two ESA.

6.8 Sediment Quality

Sediment sampling was not completed as part of this Phase Two ESA.

6.9 Quality Assurance and Quality Control Results

QA/QC comprises technical activities that are used to measure or assess the effect of errors or variability in sampling and analysis. It may also include specification of acceptance criteria for the data and corrective actions to be taken when they are exceeded. QA/QC also includes checks performed to evaluate laboratory analytical quality, checks designed to assess the combined influence of field sampling and laboratory analysis and checks to specifically evaluate the potential for cross contamination during sampling and sample handling.

The QA/QC samples collected and submitted for analysis by Pinchin during the Phase Two ESA consisted of the following:

- Field duplicate soil samples to assess the suitability of field sampling methods and laboratory performance.
- A trip blank sample for VOC soil sampling to assess whether ambient conditions during transport of soil sample containers to the Phase Two Property and back to the analytical laboratory may have biased the soil sample results with respect to volatile constituents.

In addition to the above, laboratory quality control activities and sample checks employed by BV Labs included:

- Method blanks - where a clean sample is processed simultaneously with and under the same conditions (i.e., using the same reagents and solvents) as the samples being analyzed. These are used to confirm whether the instrument, reagents and solvents used are contaminant free.
- Laboratory duplicates - where two samples obtained from the sample container are analyzed. These are used to evaluate laboratory precision.
- Surrogate spike samples - where a known mass of compound not found in nature (e.g., deuterated compounds such as toluene-d8) but that has similar characteristics to the analyzed compounds is added to a sample at a known concentration. These are used to assess the recovery efficiency.
- Matrix spike samples - where a known mass of target analyte is added to a matrix sample with known concentrations. These are used to evaluate the influence of the matrix on a method's recovery efficiency.
- Use of standard or certified reference materials - a reference material where the content or concentration has been established to a very high level of certainty (usually by a national regulatory agency). These are used to assess accuracy.

The results of the field QA/QC samples are discussed in the following subsections.

6.9.1 Soil Duplicate Results

During borehole soil sampling activities, a total of two separate soil duplicate sample pairs were submitted for laboratory analysis. The field duplicate samples were collected by vertically splitting the soil cores into two halves, with one half collected as the regular sample and the other half collected as the field duplicate sample. The sample pairings and corresponding laboratory analyses are as follows:

- Soil sample "BH101-5" and its corresponding field duplicate "DUP01-012022" were submitted for laboratory analysis of BTEX, PHCs and PCBs.

- Soil sample “BH102-3” and its corresponding field duplicate “DUP02-012022” were submitted for laboratory analysis of PAHs.

The quality of the analytical results was evaluated by calculating relative percent differences (RPDs) for the parameters analyzed for the original and field duplicate samples. The RPD for each parameter was calculated using the following equation:

$$RPD = \frac{(\text{Original Concentration} - \text{Duplicate Concentration}) \text{ X } 100}{(\text{Original Concentration} + \text{Duplicate Concentration})/2}$$

An RPD was not calculated unless the parameter concentration in both the original and duplicate sample had detectable concentrations above the corresponding practical quantitation limit for the parameter, which is equal to five times the lowest laboratory reportable detection limit (RDL).

The calculated RPDs for the original and field duplicate soil samples have been compared to performance standards provided in the *Analytical Protocol.* Pinchin notes that although these performance standards only strictly apply to laboratory duplicate samples, they have been considered suitable for comparison to the field duplicate soil sample results as well.

Each of the calculated RPDs met the corresponding performance standards.

Based on Pinchin’s review of the calculated RPD values for the submitted soil sample duplicate pairings, the level of observed variance in the reported analytical results is considered acceptable for the purpose of meeting the data quality objectives of this Phase Two ESA.

6.9.2 Soil Trip Blank Results

One laboratory-prepared methanol vial accompanied the vials used for BTEX soil sampling during transportation of the sample containers from BV Labs to the Phase Two Property, during soil sampling on January 20, 2022 at the Phase Two Property, and during transportation of the soil samples from the Phase Two Property to BV Labs. The trip blank sample was submitted to BV Labs for analysis of VOCs.

As indicated in Table 3, the concentrations of the VOC parameters analyzed in the soil trip blank sample were below the laboratory RDLs. These findings indicate that ambient conditions during the transportation of the sample containers to and from the Phase Two Property and during soil sampling did not positively bias the BTEX analytical results for the soil samples collected on January 20, 2022.

6.9.3 Deviations from Analytical Protocol

There were no deviations from the holding times, preservation methods, storage requirements and container types specified in the *Analytical Protocol* during the completion of the Phase Two ESA.

6.9.4 Laboratory Certificates of Analysis

Pinchin has reviewed the laboratory Certificate of Analysis provided by BV Labs for the samples submitted during the Phase Two ESA and confirms the following:

- The laboratory Certificate of Analysis contained a complete record of the sample submission and analysis and meet the requirements of Section 47(3) of O. Reg. 153/04.
- A laboratory Certificate of Analysis has been received for each sample submitted for analysis during the Phase Two ESA.
- The laboratory Certificate of Analysis has been included in full in Appendix E.
- All of the analytical data reported in the Certificate of Analysis have been summarized, in full, in Table 3.

6.9.5 Laboratory Comments Regarding Sample Analysis

BV Labs routinely conducts internal QA/QC analyses in order to satisfy regulatory QA/QC requirements. The results of the BV Labs QA/QC analyses for the submitted soil samples are summarized in the laboratory Certificate of Analysis provided in Appendix E. Also included in Appendix E are all correspondences between the laboratory and staff at Pinchin.

No comments from BV Labs were provided on the laboratory Certificate of Analysis for the submitted soil samples.

The results of the QA/QC analyses were reviewed by the project staff at BV Labs and observed to be within the laboratory's internal requirements. Pinchin has also reviewed the laboratory Certificate of Analysis and has confirmed that the results of the analyses are acceptable for the purpose of meeting the data quality objectives of this Phase Two ESA.

The following general comments apply to the laboratory Certificate of Analysis received from BV Labs as part of this Phase Two ESA:

- The custody seal was present and intact on the submission.
- The temperature of the submitted soil samples upon receipt was measured at 0 ºC, which is below the sample preservation requirements of the *Analytical Protocol* of 5 ± 3ºC (i.e., between 2 and 8ºC). No issues were reported by the analytical laboratory related to the lowered sample temperatures (e.g., freezing). As such, it is the QP's opinion that the lowered sample temperature reported by BV Labs for these samples did not affect the analytical results.

6.9.6 QA/QC Sample Summary

The overall evaluation of the QA/QC sample results indicates no issues with respect to field collection methods and laboratory performance, and no apparent bias due to ambient conditions at the Phase Two Property and during transportation of the sample containers/samples to and from the analytical laboratory.

As such, it is the QP's opinion that the soil analytical data obtained during the Phase Two ESA are representative of actual Site conditions and are appropriate for meeting the objective of assessing whether the soil at the Phase Two Property meets the applicable MECP Site Condition Standards.

6.10 Phase Two Conceptual Site Model

The Phase Two Property is located at 1785 Bloor Street, Mississauga, Ontario. The Phase Two Property is bounded by a hydro corridor to the northeast, Bloor Street to the southeast and multi-tenant residential buildings to the southwest and northwest. A key map showing the Phase Two Property location is provided as Figure 1.

A Phase One CSM was created during the Pinchin Phase One ESA in order to provide a detailed visualization of the APECs which could occur on, in, under, or affecting the Phase Two Property. The Phase One CSM is summarized in Figures 1 through 5, which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures.
- Water bodies located in whole or in part within the Phase One Study Area.
- Areas of natural significance located in whole or in part within the Phase One Study Area.
- Drinking water wells located at the Phase One Property.
- Land use of adjacent properties.
- Roads within the Phase One Study Area.
- PCAs within the Phase One Study Area, including the locations of tanks.
- APECs at the Phase One Property.

The following subsections expand on the Phase One CSM with the information collected during the completion of the Phase Two ESA.

6.10.1 Potentially Contaminating Activities

The Phase One ESA identified a total of 14 PCAs within the Phase One Study Area. These PCAs consisted of four PCAs at the Phase Two Property and 10 PCAs within the Phase One Study Area, outside of the Phase Two Property. Each of the on-Site PCAs were interpreted as potentially affecting the environmental condition of the subsurface media on, in or under the Phase Two Property and were considered to result in APECs. Identified on-Site and off-Site PCAs are summarized in Table 2 and their locations are shown on Figure 4.

6.10.2 Areas of Potential Environmental Concern

Table 1 summarizes the APECs identified at the Phase Two Property, as well as their respective PCAs, COPCs and the media that could potentially be impacted. APECs at the Phase Two Property are illustrated on Figure 6. The Phase Two ESA included an assessment of soil quality within each of the APECs.

The following table summarizes the boreholes completed to investigate each of the APECs:

APEC	Investigation Location
APEC-1	BH101
APEC-2	BH105
APEC-4	BH102, BH103 and BH104

An additional APEC (APEC-3) was identified as part of the Pinchin Phase One ESA. However, APEC-3 is related to salt application for de-icing purposes on the exterior of the Phase Two Property, and as such Pinchin has applied the exemption in Section 49.1 of O. Reg. 153/04 and this APEC was not investigated as part of the Phase Two ESA.

A summary of the findings for each of the APECs is provided below.

APEC-1

The Pinchin Phase One ESA identified a pad-mounted oil-cooled electrical transformer in the southeastern portion of the Phase Two Property. The subsurface investigation of APEC-1 completed by Pinchin as part of the Phase Two ESA included borehole BH101. Soil samples were collected from the borehole and submitted for laboratory analysis of the COPCs. The soil samples submitted from borehole BH101 completed within APEC-1 met the *Table 3 Standards*.

APEC-2

The Pinchin Phase One ESA identified a hydro vault along the northwestern elevation of the Site Building. The subsurface investigation of APEC-2 completed by Pinchin as part of the Phase Two ESA included borehole BH105. A soil sample was collected from the borehole and submitted for laboratory analysis of the COPCs. The soil sample submitted from borehole BH105 completed within APEC-2 met the *Table 3 Standards*.

APEC-4

The Pinchin Phase One ESA identified the potential historical use of an AST to store fuel oil in, or nearby, the Site Building boiler room. The subsurface investigation of APEC-4 completed by Pinchin as part of the Phase Two ESA included boreholes BH102, BH103 and BH104. Soil samples collected from the boreholes and submitted for laboratory analysis of the COPCs. The soil samples submitted from boreholes BH102, BH103 and BH104 completed within APEC-4 met the *Table 3 Standards*.

6.10.3 Subsurface Structures and Utilities

A number of underground utilities are understood to be present at the Phase One Property, including natural gas, communication, electrical, municipal water and storm and sanitary sewer lines. The approximate known locations of these underground utilities are illustrated on Figure 2

Groundwater was not considered a potentially impacted media and as such no monitoring wells were installed as part of this Phase Two ESA. As such, Pinchin is unable to comment on the interaction of groundwater with buried utilities at the Phase Two Property.

6.10.4 Physical Setting

Based on the work completed as part of this Phase Two ESA, the following subsections provide a summary of the physical setting of the Phase Two Property.

Stratigraphy

The observed stratigraphy at the borehole locations completed for the Phase Two ESA generally consisted of native or reworked native soil comprised primarily of sandy silt to the maximum investigation depth of 3.7 mbgs. The borehole locations are shown on Figure 6. Cross-sections summarizing the subsurface geological conditions at the time of the Phase Two ESA have been provided as Figures 7B to 7C, with Figure 7A showing the cross-section lines.

Since groundwater was not identified as a potentially impacted media, monitoring wells were not installed within any of the boreholes. As such, the presence of aquifers at the Phase Two Property was not assessed as part of this Phase Two ESA.

Hydrogeological Characteristics

Groundwater was not considered a potentially impacted media and as such no monitoring wells were installed as part of this Phase Two ESA. As such, Pinchin is unable to comment on horizontal or vertical hydraulic gradients. In addition, given that groundwater was not identified as a potentially impacted media at the Phase Two Property, preferential migration of contaminants along utilities is not considered to be a concern.

Depth to Bedrock

Bedrock was not encountered at any of the borehole locations up to the maximum depth drilled of approximately 3.7 mbgs and based on the available water well records, bedrock depth at the Phase Two Property is located below at least 9.0 mbgs.

Depth to Water Table

Since groundwater was not identified as a potentially impacted media, monitoring wells were not installed within any of the boreholes. As such, the depth to water table was not determined during this Phase Two ESA.

Applicability of Section 35 of O. Reg 153/04 – Non-Potable Site Condition Standards

Site Condition Standards for non-potable groundwater use have been applied to the Phase Two Property given that the following conditions specified in Section 35 of O. Reg. 153/04 have been met:

- The Phase Two Property and all properties within 250 metres of the Phase Two Property are supplied by a municipal drinking water system.
- The Phase Two Property is not located within a well head protection area or other designation identified by the Region of Peel for the protection of groundwater.
- There are no wells located at the Phase Two Property or within the Phase One Study Area that are used or intended for use as a water source for human consumption or agriculture.
- Pinchin submitted a notification letter to the Clerk for the Region of Peel regarding the intention to apply the *Table 3 Standards* in assessing soil quality at the Phase Two Property. A response was received from the Region of Peel, dated February 28, 2022, confirming they had no objection to the application of the *Table 3 Standards* at the Site.

Applicability of Section 41 of O. Reg 153/04 – Environmentally Sensitive Area

Section 41 of O. Reg. 153/04 states that a property is classified as an “environmentally sensitive area” if the property is within an area of natural significance, the property includes or is adjacent to an area of natural significance or part of such an area, the property includes land that is within 30 metres of an area of natural significance or part of such an area, the soil at the property has a pH value for surface soil less than 5 or greater than 9 or the soil at the property has a pH value for subsurface soil less than 5 or greater than 11.

The Phase Two Property is not located in or adjacent to, nor does it contain land within 30 metres of, an area of natural significance. Furthermore, the pH values measured in the submitted soil samples were within the limits for non-sensitive sites. As such, the Phase Two Property is not an environmentally sensitive area as defined by Section 41 of O. Reg. 153/04.

Applicability of Section 43.1 of O. Reg 153/04 – Shallow Soil Property and Proximity to a Water Body

Section 43.1 of O. Reg. 153/04 states that a property is classified as a “shallow soil property” if one-third or more of the area consists of soil less than 2 metres in depth.

Bedrock was not encountered at any of the borehole locations, three of which (BH101, BH102 and BH105) were extended to depths below 2.0 mbgs. Shallow refusal above 2.0 mbfs was encountered at boreholes BH103 and BH104; however, this is understood to be the result of equipment limitations. As stated above, bedrock depth at the Phase Two Property is located below at least 9.0 mbgs. As such, the Phase Two Property is not a shallow soil property as defined by Section 43.1 of O. Reg. 153/04.

As per Section 43.1 of O. Reg. 153/04, the proximity of the Phase Two Property to a water body must be considered when selecting the appropriate Site Condition Standards.

The Phase Two Property does not include all or part of a water body, it is not adjacent to a water body and it does not include land within 30 metres of a water body. As such, Site Condition Standards for use within 30 metres of a water body were not applied.

Soil Imported to Phase Two Property

No soil was imported to the Phase Two Property during completion of the Phase Two ESA.

Proposed Buildings and Other Structures

It is Pinchin’s understanding that the construction of a fourteen-storey multi-tenant residential building, with three levels of underground parking, is proposed in the northwestern portion of the Phase Two Property.

6.10.5 Applicable Site Condition Standards

Based on the grain size analysis of representative soil samples collected during the Phase Two ESA and the observed stratigraphy at the borehole locations, Pinchin concluded that over two-thirds of the overburden at the Phase Two Property is medium and fine-textured as defined by O. Reg. 153/04 and Site Condition Standards for coarse-textured soil were not applied.

Based on the information obtained from the Phase One and Two ESAs, the appropriate Site Condition Standards for the Phase Two Property are:

- "*Table 3: Full Depth Generic Site Condition Standards for Use in a Non-Potable Ground Water Condition*", provided in the MECP document entitled "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"* dated April 15, 2011 (*Table 3 Standards*) for:
  - Medium/fine-textured soils; and
  - Residential/parkland/institutional property use.

6.10.6 Contaminants Exceeding Applicable Site Condition Standards in Soil

All soil samples collected during the Phase Two ESA met the applicable *Table 3 Standards* for the parameters analyzed.

6.10.7 Contaminants Exceeding Applicable Site Condition Standards in Groundwater

Groundwater was not considered a potentially impacted media at the Phase Two Property and as such assessment of contaminants in groundwater was not completed as part of this Phase Two ESA.

6.10.8 Meteorological and Climatic Conditions

As noted above, monitoring wells were not installed as part of this Phase Two ESA. As such, Pinchin cannot comment on the effect of meteorological or climatic conditions on contaminant distribution and migration in the subsurface at the Phase Two Property.

6.10.9 Soil Vapour Intrusion

No volatile parameters were identified at concentrations exceeding the *Table 3 Standards*. As such, soil vapour intrusion into buildings at the Phase Two Property is not considered a concern.

6.10.10 Contaminant Exposure Assessment

Given that all soil samples collected during the Phase Two ESA met the applicable *Table 3 Standards*, Pinchin considered that an evaluation of potential exposure pathways and receptors was unnecessary.

6.10.11 Applicability of Section 49.1 Exemptions

The Phase Two Property has paved parking areas and/or access routes located northwest, southwest and southeast of the Site Building. It is Pinchin's understanding that salt has historically been applied to the parking areas and access routes for safety reasons during winter conditions to remove snow and ice, which represents a PCA at the Phase Two Property. However, it is the opinion of the QP supervising the Phase Two ESA that, although salt-related parameters such as Sodium Adsorption Ratio and electrical conductivity in soil and sodium and chloride in groundwater may be present at concentrations exceeding the applicable Site Condition Standards, the exemption provided in Section 49.1 of O. Reg. 153/04 can been applied and the resulting APEC did not require investigation as part of the Phase Two ESA.

7.0 CONCLUSIONS

Pinchin completed a Phase Two ESA at the Phase Two Property in accordance with the requirements stipulated in O. Reg. 153/04. The Phase Two ESA report is required by the Client in relation to the future construction of a multi-tenant residential building at the Phase Two Property.

The Phase Two ESA completed by Pinchin included the advancement of five boreholes at the Phase Two Property.

Based on Site-specific information, the applicable regulatory standards for the Phase Two Property were determined to be the *Table 3 Standards* for residential land use and medium and fine-textured soils. Soil samples were collected from each of the borehole locations and submitted for laboratory analysis of BTEX, PHCs, PAHs and/or PCBs.

The laboratory results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 3 Standards*. The maximum reported soil concentrations for the parameters analyzed are summarized in Table 4.

It is the opinion of the QP who supervised the Phase Two ESA that the applicable *Table 3 Standards* for soil at the Phase Two Property have been met as of the Certification Date of January 20, 2022 and that no further subsurface investigation is required in relation to assessing the environmental quality of soil at the Phase Two Property.

7.1 Signatures

This Phase Two ESA was undertaken under the supervision of Robert MacKenzie, B.Sc., P.Geo., QP_{ESA} in accordance with the requirements of O. Reg. 153/04.

7.2 Terms and Limitations

This Phase Two ESA was performed for 1785 Bloor Holdings Inc. (Client) in order to investigate potential environmental impacts at 1785 Bloor Street, Mississauga, Ontario (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. This Phase Two ESA does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Phase Two ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

This Phase Two ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of the Client, subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

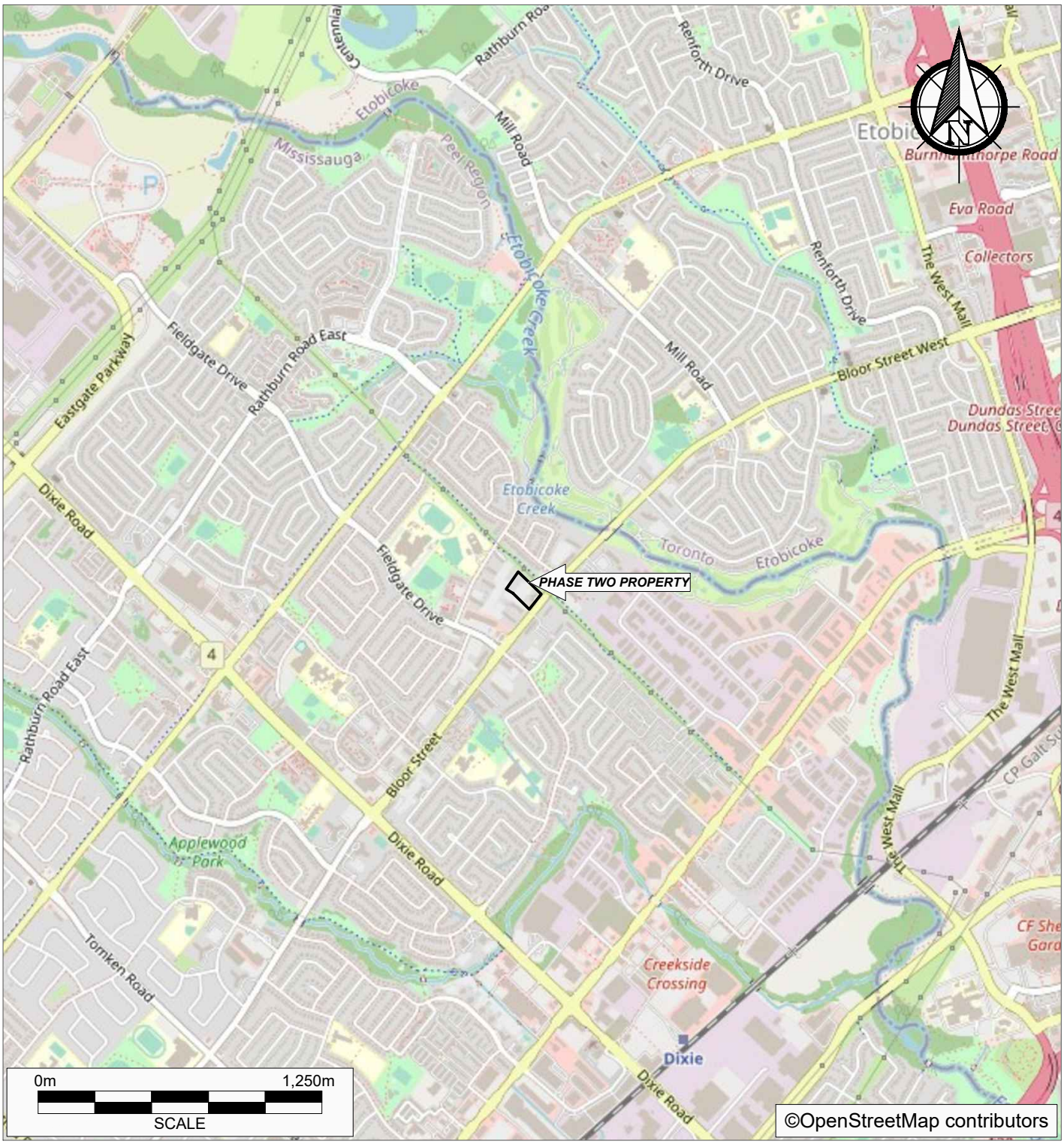
Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

8.0 REFERENCES

The following documents provided information used in this report:

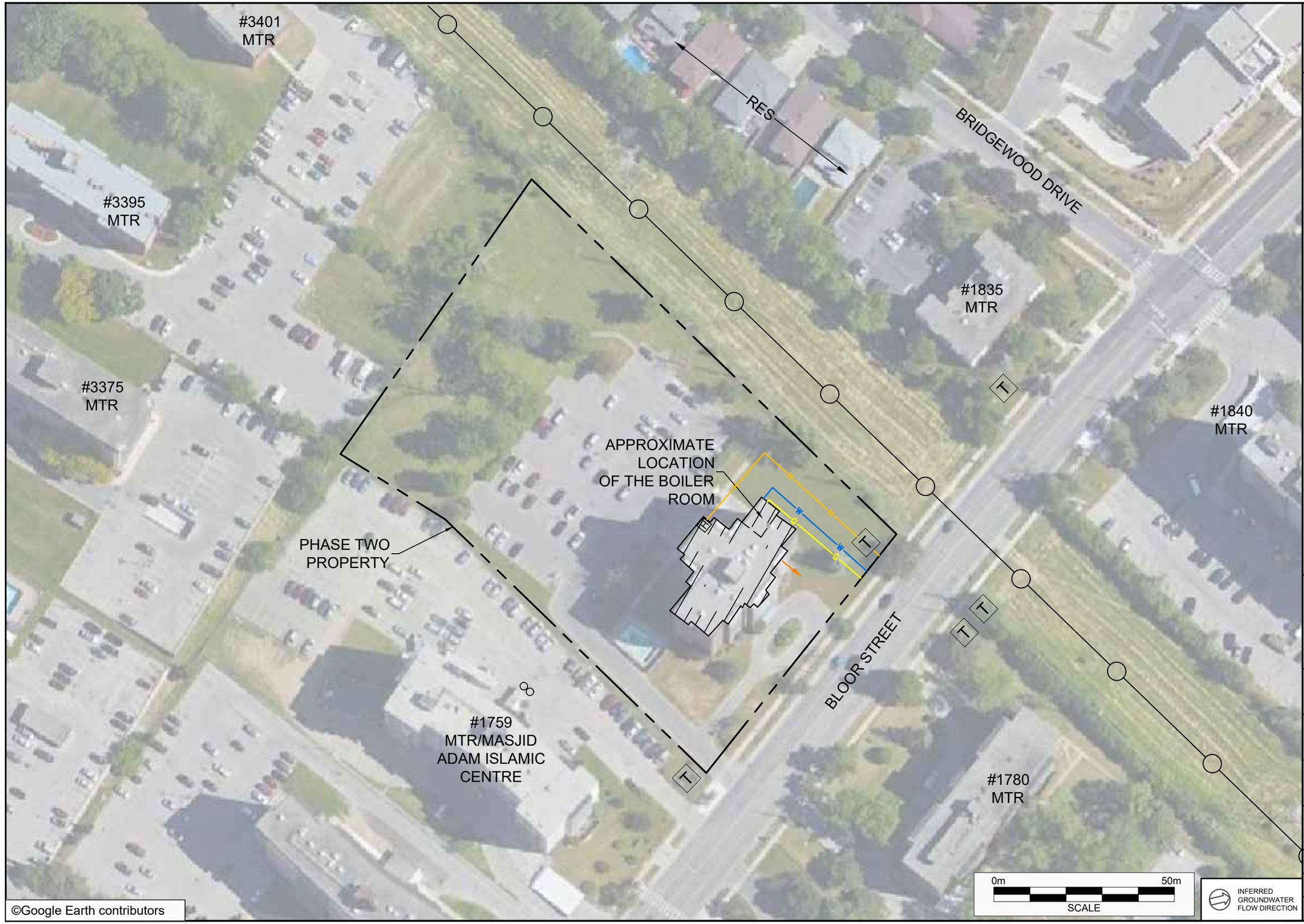
- Ontario Ministry of the Environment, Conservation and Parks. Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario. December 1996.
- Ontario Ministry of the Environment, Conservation and Parks. Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. March 9, 2004 amended July 1, 2011.
- Ontario Ministry of the Environment, Conservation and Parks. Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011.
- Pinchin Ltd. Phase One Environmental Site Assessment, 1785 Bloor Street, Mississauga, Ontario. January 14, 2022.
- Professional Geoscientists of Ontario. Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended). April 2011.
- Province of Ontario. Environmental Protection Act, R.S.O 1990, Chapter E.19.
- Province of Ontario. R.R.O. 1990, Regulation 347, General – Waste Management, as amended by Ontario Regulation 234/11.
- Province of Ontario. Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act. Last amended by Ontario Regulation 214/21 on March 19, 2021.

9.0 FIGURES AND TABLES



PINCHIN

PROJECT NAME: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME: 1785 BLOOR HOLDINGS INC.			
PROJECT LOCATION: 1785 BLOOR STREET, MISSISSAUGA, ONTARIO			
FIGURE NAME: KEY MAP			FIGURE NO.: 1
SCALE: AS SHOWN	PROJECT NO.: 291885.003	DATE: FEBRUARY 2022	



N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- MTR — MULTI-TENANT RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- C — UNDERGROUND COMMUNICATION LINE
- H — UNDERGROUND HYDRO LINE
- W — UNDERGROUND WATER LINE
- G — UNDERGROUND GAS LINE

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

PROJECT NAME:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
PHASE TWO PROPERTY

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	2

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0m 150m
SCALE

INFERRED GROUNDWATER FLOW DIRECTION

N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- PHASE ONE STUDY AREA BOUNDARY
- SITE BUILDING
- T PAD MOUNTED TRANSFORMER
- RES RESIDENTIAL
- MTR MULTI-TENANT RESIDENTIAL
- MTC MULTI-TENANT COMMERCIAL
- RFO RETAIL FUEL OUTLET
- HYDRO CORRIDOR
- INDUSTRIAL/COMMERCIAL/ COMMUNITY LAND USE
- RESIDENTIAL/PARKLAND/ INSTITUTIONAL LAND USE
- AGRICULTURAL OR OTHER LAND USE
- CURRENT UNDERGROUND STORAGE TANK

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

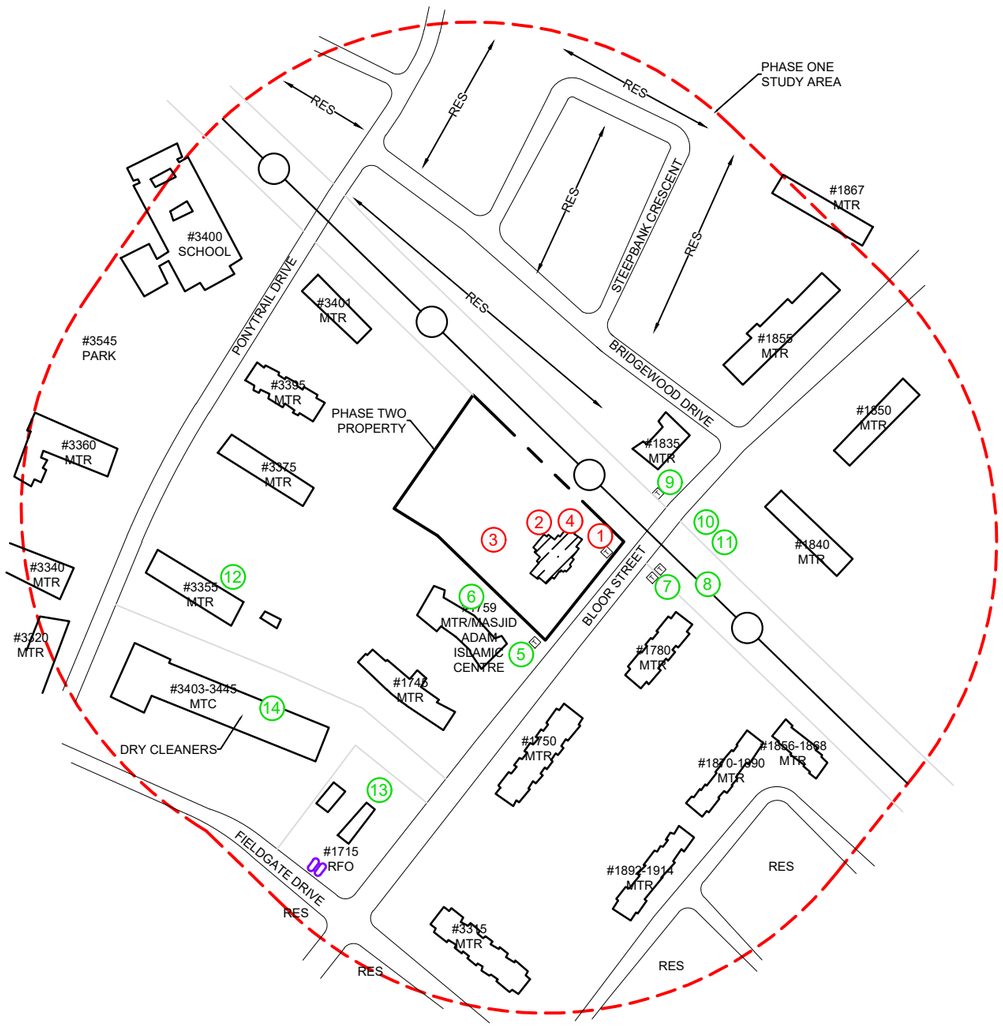
PROJECT NAME:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
PHASE ONE STUDY AREA

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	3



PCA Designation	Location of Potentially Contaminating Activity	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contributing to an APEC at the Site (Yes/No)	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
PCA-1	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	Yes	Soil
PCA-2	Northwestern portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	Yes	Soil
PCA-3	Paved areas of the Phase One Property.	Other – Salt Application for De-icing Purposes	On-Site	Yes	Soil and Groundwater
PCA-4	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	Yes	Soil
PCA-5	1759 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-6	1759 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	No	Not Applicable
PCA-7	1780 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-8	Hydro corridor (no address).	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-9	1835 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-10	1840 Bloor Street.	Other - Spill	Off-Site	No	Not Applicable
PCA-11	1840 Bloor Street.	Item 40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site	No	Not Applicable
PCA-12	3355 Ponytail Drive.	Other - Hazardous Waste Generation	Off-Site	No	Not Applicable
PCA-13	1715 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	No	Not Applicable
PCA-14	3403-3445 Fieldgate Drive.	Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used)	Off-Site	No	Not Applicable

N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- PHASE ONE STUDY AREA BOUNDARY
- SITE BUILDING
- T PAD MOUNTED TRANSFORMER
- RES RESIDENTIAL
- MTR MULTI-TENANT RESIDENTIAL
- MTC MULTI-TENANT COMMERCIAL
- RFO RETAIL FUEL OUTLET
- HYDRO CORRIDOR
- CURRENT UNDERGROUND STORAGE TANK
- APEC AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- PCA POTENTIALLY CONTAMINATING ACTIVITY
- # PCA CONTRIBUTES TO AN APEC
- # PCA DOES NOT CONTRIBUTE TO AN APEC

INFERRED GROUNDWATER FLOW DIRECTION

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

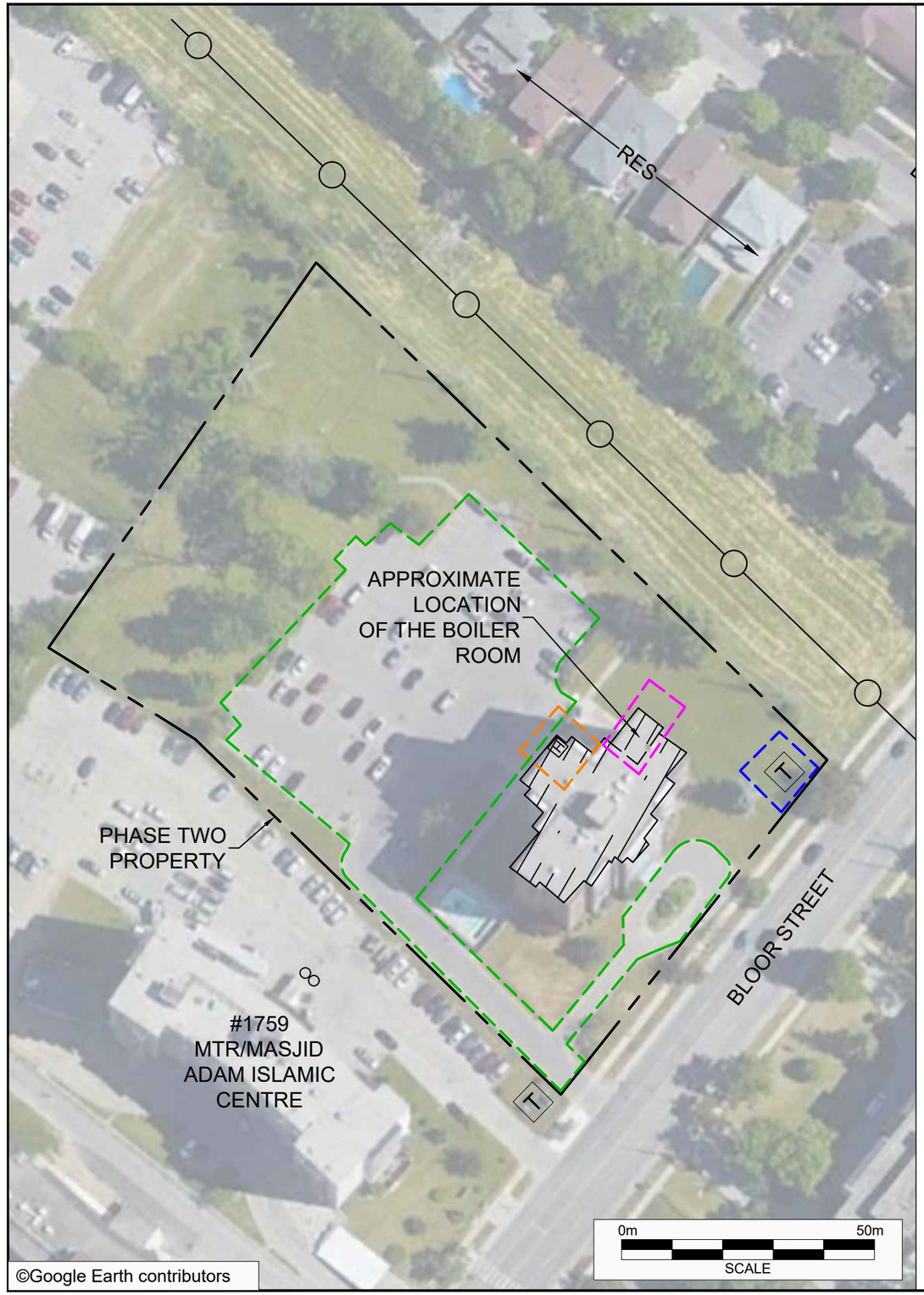
PROJECT NAME:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
POTENTIALLY CONTAMINATING ACTIVITIES

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	4



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
APEC-1 (Oil-cooled pad-mounted electrical transformer)	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-2 (Hydro vault)	Northwest portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-3 (Salt application for de-icing purposes)	Paved exterior areas.	Other – Salt Application for De-icing Purposes	On-Site	EC SAR Na Cl-	Soil and Groundwater
APEC-4 (Potential historical use of fuel oil as a heating source)	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil

N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- APEC — AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- APEC-1
- APEC-2
- APEC-3
- APEC-4

INFERRED GROUNDWATER FLOW DIRECTION

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

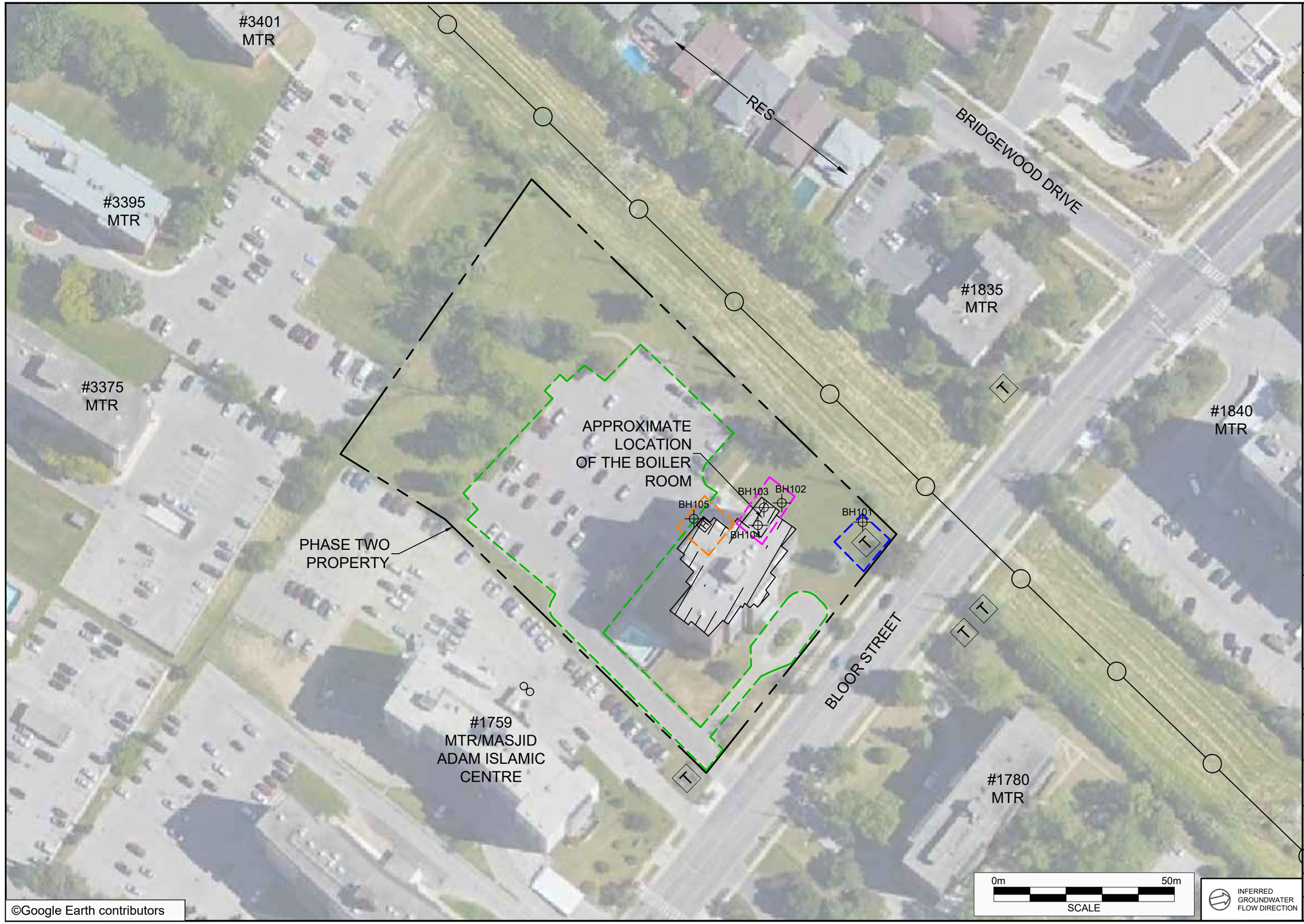
PROJECT NAME:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY: KP	REVIEWED BY: AN
DATE: FEBRUARY 2022	FIGURE NUMBER: 5



N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- MTR — MULTI-TENANT RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- APEC — AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- APEC-1
- APEC-2
- APEC-3
- APEC-4
- BOREHOLE LOCATION
- INFERRED GROUNDWATER FLOW DIRECTION

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

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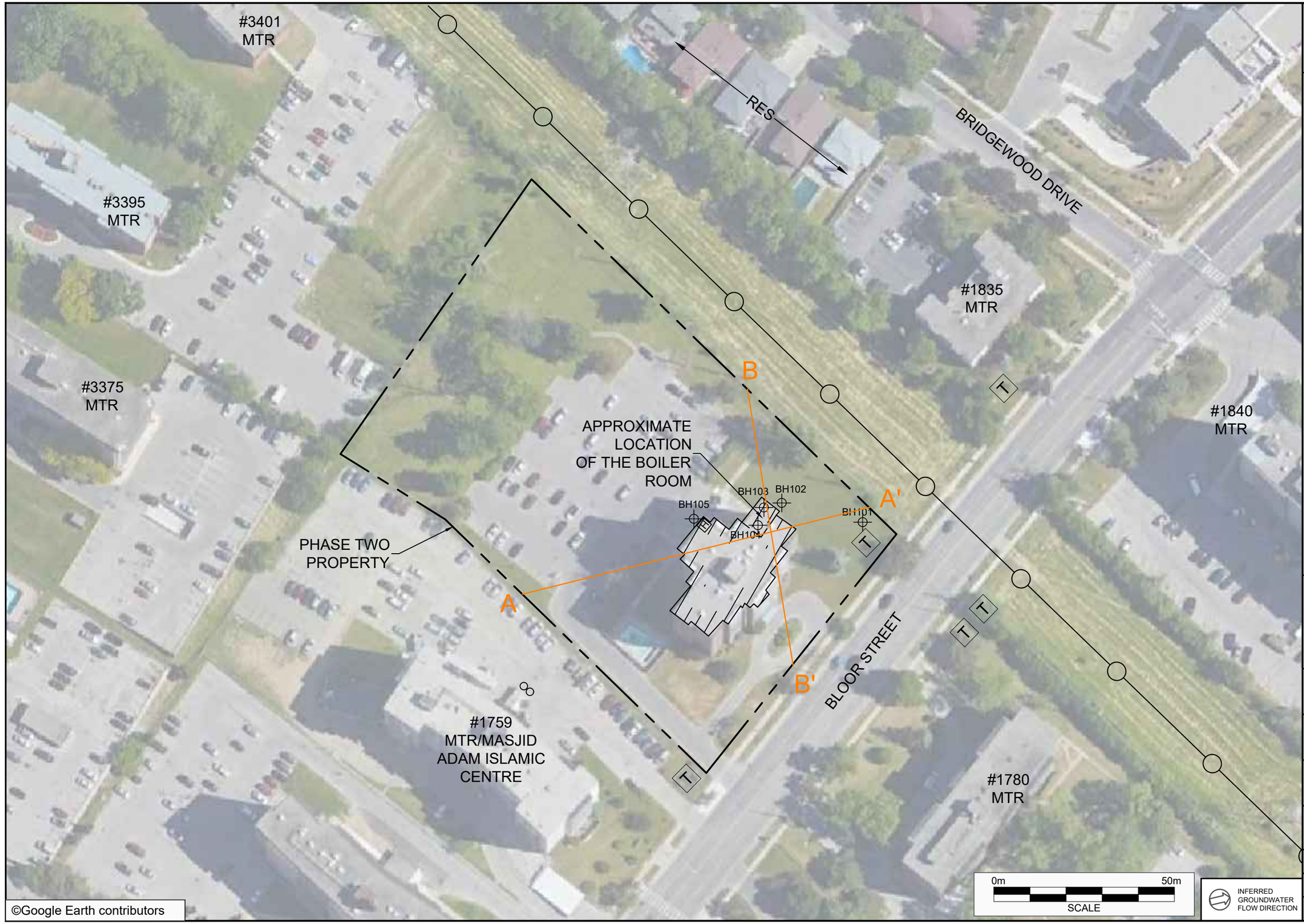
PROJECT NAME:
PHASE TWO ENIVORNMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
BOREHOLE LOCATION PLAN

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	6



N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- MTR — MULTI-TENANT RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- BOREHOLE LOCATION
- A A' — CROSS-SECTION LINE

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INTERPRETATION.

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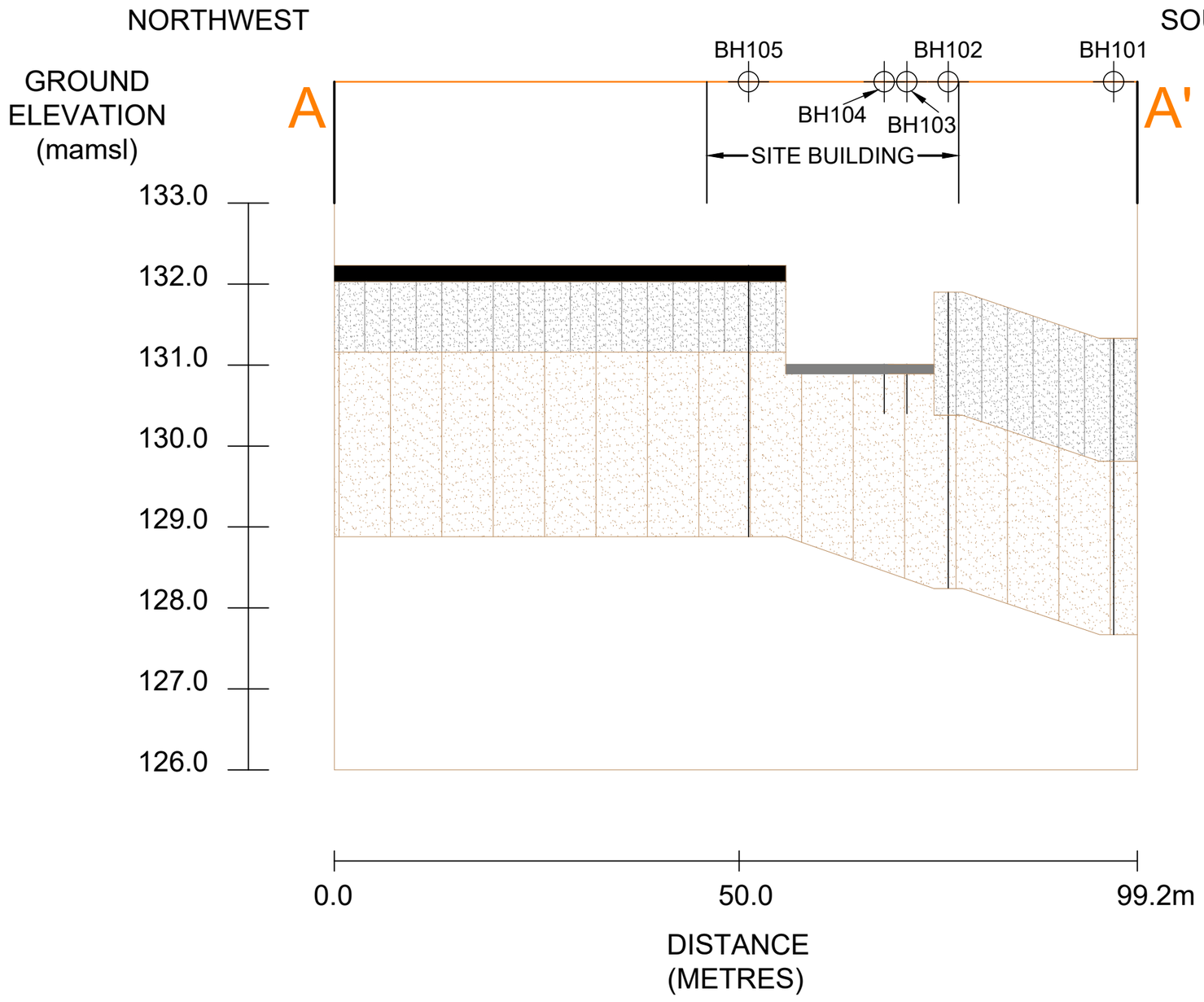
PROJECT NAME:
PHASE TWO ENIVORNMENTAL
SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS
INC.

PROJECT LOCATION:
1785 BLOOR STREET,
MISSISSAUGA, ONTARIO

FIGURE NAME:
CROSS-SECTION
LOCATION PLAN

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	7A



LEGEND

- PHASE TWO PROPERTY BOUNDARY
- CROSS-SECTION LINE (A A')
- BOREHOLE LOCATION
- ASPHALT
- CONCRETE
- SANDY SILT (REWORKED)
- SANDY SILT

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PINCHIN

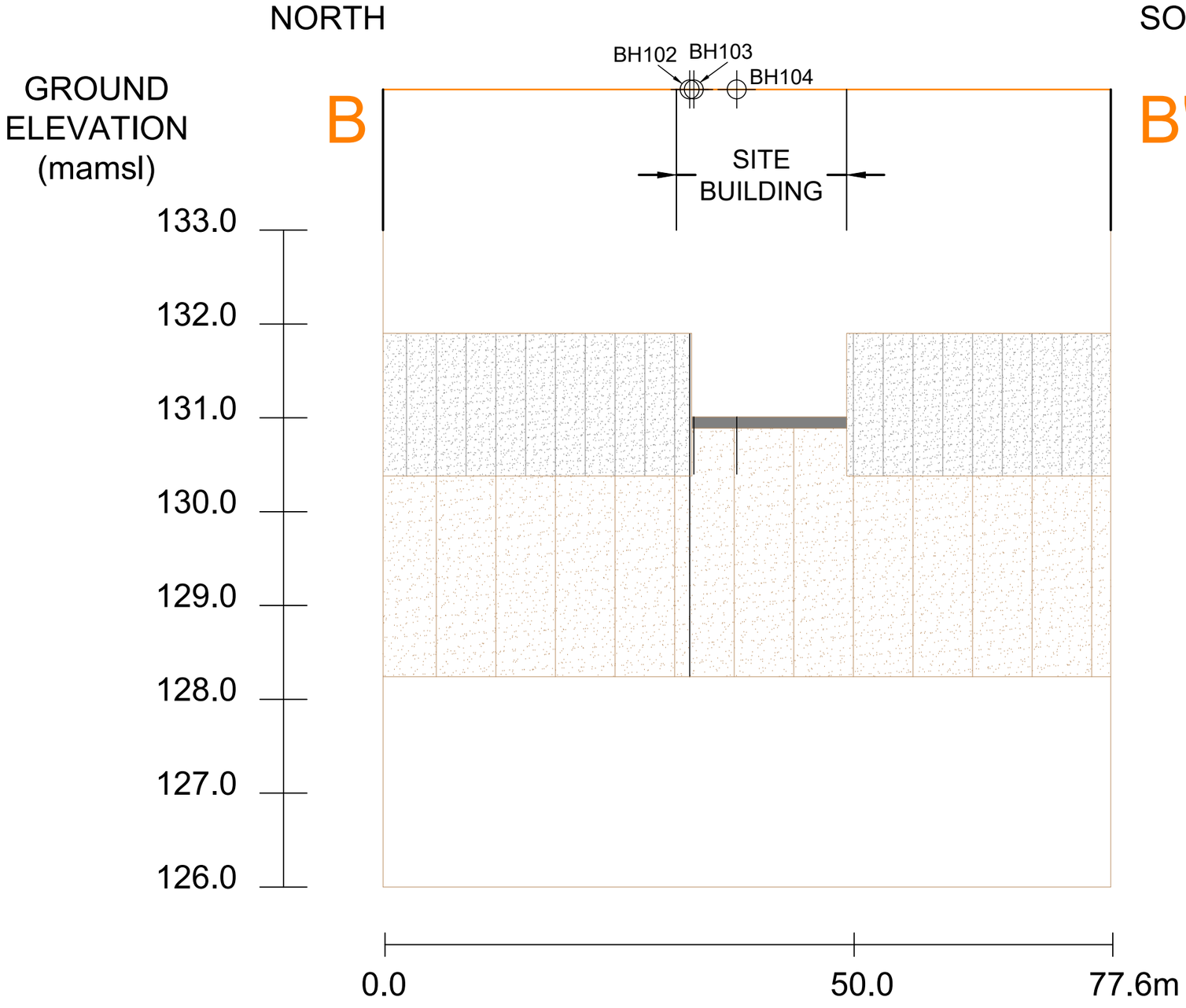
PROJECT NAME:
PHASE TWO ENIVORNMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
CROSS-SECTION DETAIL A-A'

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY: KP	REVIEWED BY: AN
DATE: FEBRUARY 2022	FIGURE NUMBER: 7B



LEGEND

- PHASE TWO PROPERTY BOUNDARY
- CROSS-SECTION LINE (A A')
- BOREHOLE LOCATION
- CONCRETE
- SANDY SILT (REWORKED)
- SANDY SILT

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

PROJECT NAME:
PHASE TWO ENIVORNMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
CROSS-SECTION DETAIL B-B'

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
FEBRUARY 2022	7C

Table 1 - Table of Areas of Potential Environmental Concern

Area of Potential Environmental Concern[1]	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
APEC-1 (Oil-cooled pad-mounted electrical transformer)	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-2 (Hydro vault)	Northwest portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-3 (Salt application for de-icing purposes)	Paved exterior areas.	Other – Salt Application for De-icing Purposes	On-Site	EC SAR Na Cl^-	Soil and Groundwater
APEC-4 (Potential historical use of fuel oil as a heating source stored in an aboveground storage tank)	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil

Notes:

1 - Areas of potential environmental concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one environmental site assessment, including through,
(a) identification of past or present uses on, in or under the phase one property, and
(b) identification of potentially contaminating activity.

2 - Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 - When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

List of Method Groups:

ABNs	PCBs	Metals	Electrical Conductivity
CPs	PAHs	As, Sb, Se	Cr (VI)
1,4-Dioxane	THMs	Na	Hg
Dioxins/Furans, PCDDs/PCDFs	VOCs	B-HWS	Methyl Mercury
OCs	BTEX	Cl-	Low or high pH,
PHCs	Ca, Mg	CN-	SAR

4 - When submitting a record of site condition for filing, a copy of this table must be attached

Table 2 - Table of Potentially Contaminating Activities

PCA Designation	Location of Potentially Contaminating Activity	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Distance from Phase One Property (metres)	Location Relative to Inferred Groundwater Flow Direction[1]	Contributing to an APEC at the Site (Yes/No)	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
PCA-1	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	NA – On-Site PCA	NA - On-Site PCA	Yes	Soil
PCA-2	Northwestern portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	NA – On-Site PCA	NA - On-Site PCA	Yes	Soil
PCA-3	Paved areas of the Phase One Property.	Other – Salt Application for De-icing Purposes	On-Site	NA – On-Site PCA	NA - On-Site PCA	Yes	Soil and Groundwater
PCA-4	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	NA – On-Site PCA	NA - On-Site PCA	Yes	Soil
PCA-5	1759 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	5	Upgradient/Transgradient	No	Not Applicable
PCA-6	1759 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	25	Upgradient	No	Not Applicable
PCA-7	1780 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	25	Transgradient	No	Not Applicable
PCA-8	Hydro corridor (no address).	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	30	Downgradient	No	Not Applicable
PCA-9	1835 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	40	Downgradient	No	Not Applicable
PCA-10	1840 Bloor Street.	Other - Spill	Off-Site	40	Downgradient	No	Not Applicable
PCA-11	1840 Bloor Street.	Item 40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site	40	Downgradient	No	Not Applicable
PCA-12	3355 Ponytail Drive.	Other - Hazardous Waste Generation	Off-Site	90	Upgradient	No	Not Applicable
PCA-13	1715 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	145	Upgradient/Transgradient	No	Not Applicable
PCA-14	3403-3445 Fieldgate Drive.	Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used)	Off-Site	130	Upgradient/Transgradient	No	Not Applicable

Notes:
APEC – Area of Potential Environmental Concern
PCA – Potentially Contaminating Activity
1 – Location of PCA relative to the Phase One Property in relation to the inferred groundwater flow direction in the Phase One Study Area

TABLE 3
SOIL ANALYTICAL RESULTS
1785 Bloor Holdings Inc.
1785 Bloor Street, Mississauga, Ontario

Sample Location	MECP Table 3 SCS (R/P/I-F)	BH101	BH101	BH101	BH101	BH102	BH102	BH102	BH102
Sample Designation		BH101-1	BH101-2	BH101-5	DUP01-012022	BH102-2	BH102-3	DUP02-012022	BH102-4
Sample Collection Date (dd/mm/yyyy)		20/01/2022	20/01/2022	20/01/2022	20/01/2022	20/01/2022	20/01/2022	20/01/2022	20/01/2022
Laboratory Certificate No.		C217455	C217455	C217455	C217455	C217455	C217455	C217455	C217455
Date of Laboratory Analysis (dd/mm/yyyy-dd/mm/yyyy)		24/01/2022 - 26/01/2022	25/01/2022	24/01/2022 - 26/01/2022	24/01/2022 - 26/01/2022	26/01/2022	24/01/2022 - 27/01/2022	24/01/2022 - 27/01/2022	25/01/2022 - 26/01/2022
Laboratory Sample No.		RRE242	RRE243	RRE245	RRE257	RRE246	RRE247	RRE258	RRE248
Sample Depth (mbgs)		0.0 - 0.8	0.8 - 1.5	3.1 - 3.7	3.1 - 3.7	0.8 - 1.5	1.5 - 2.3	1.5 - 2.3	2.3 - 3.1
Miscellaneous Parameters									
pH (pH Units)	NV	-	-	-	-	7.74	-	-	7.94
Sieve #200 <0.075 mm (%)	NV	-	85	-	-	-	-	-	65
Sieve #200 >0.075 mm (%)	NV	-	15	-	-	-	-	-	35
Soil Texture	NV	-	FINE	-	-	-	-	-	FINE
Petroleum Hydrocarbons (PHCs)									
PHCs F1 (C_6 - C_{10})	65	<10	-	<10	<10	-	<10	-	-
PHCs F2 (>C_{10} - C_{16})	150	<10	-	<10	<10	-	<10	-	-
PHCs F3 (>C_{16} - C_{34})	1300	<50	-	<50	<50	-	<50	-	-
PHCs F4 (>C_{34} - C_{50})	5600	<50	-	<50	<50	-	<50	-	-
PHCs F4G (>C_{50})	5600	-	-	-	-	-	-	-	-
Volatile Organic Compounds									
Acetone	28	-	-	-	-	-	-	-	-
Benzene	0.17	<0.020	-	<0.020	<0.020	-	<0.020	-	-
Bromodichloromethane	13	-	-	-	-	-	-	-	-
Bromoform	0.26	-	-	-	-	-	-	-	-
Bromomethane	0.05	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.12	-	-	-	-	-	-	-	-
Chlorobenzene	2.7	-	-	-	-	-	-	-	-
Chloroform	0.18	-	-	-	-	-	-	-	-
Dibromochloromethane	9.4	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	4.3	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	6	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.097	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	25	-	-	-	-	-	-	-	-
1,1-Dichloroethane	11	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.05	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	0.05	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	30	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	0.75	-	-	-	-	-	-	-	-
1,2-Dichloropropane	0.085	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Total)	0.083	-	-	-	-	-	-	-	-
Ethylbenzene	15	<0.020	-	<0.020	<0.020	-	<0.020	-	-
Ethylene Dibromide	0.05	-	-	-	-	-	-	-	-
Hexane	34	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	44	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	4.3	-	-	-	-	-	-	-	-
Methyl t-Butyl Ether (MTBE)	1.4	-	-	-	-	-	-	-	-
Methylene Chloride	0.96	-	-	-	-	-	-	-	-
Styrene	2.2	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	0.05	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	0.05	-	-	-	-	-	-	-	-
Tetrachloroethylene	2.3	-	-	-	-	-	-	-	-
Toluene	6	<0.020	-	<0.020	<0.020	-	<0.020	-	-
1,1,1-Trichloroethane	3.4	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	0.05	-	-	-	-	-	-	-	-
Trichloroethylene	0.52	-	-	-	-	-	-	-	-
Trichlorofluoromethane	5.8	-	-	-	-	-	-	-	-
Vinyl Chloride	0.022	-	-	-	-	-	-	-	-
Xylenes (Total)	25	<0.040	-	<0.040	<0.040	-	<0.040	-	-
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	58	-	-	-	-	-	<0.0050	<0.0050	-
Acenaphthylene	0.17	-	-	-	-	-	<0.0050	<0.0050	-
Anthracene	0.74	-	-	-	-	-	<0.0050	<0.0050	-
Benzo(a)anthracene	0.63	-	-	-	-	-	<0.0050	<0.0050	-
Benzo(a)pyrene	0.3	-	-	-	-	-	<0.0050	<0.0050	-
Benzo(b)fluoranthene	0.78	-	-	-	-	-	<0.0050	<0.0050	-
Benzo(ghi)perylene	7.8	-	-	-	-	-	<0.0050	<0.0050	-
Benzo(k)fluoranthene	0.78	-	-	-	-	-	<0.0050	<0.0050	-
Chrysene	7.8	-	-	-	-	-	<0.0050	<0.0050	-
Dibenzo(a,h)anthracene	0.1	-	-	-	-	-	<0.0050	<0.0050	-
Fluoranthene	0.69	-	-	-	-	-	<0.0050	<0.0050	-
Fluorene	69	-	-	-	-	-	<0.0050	<0.0050	-
Indeno(1,2,3-cd)pyrene	0.48	-	-	-	-	-	<0.0050	<0.0050	-
1- & 2-Methylnaphthalene	3.4	-	-	-	-	-	<0.0071	<0.0071	-
Naphthalene	0.75	-	-	-	-	-	<0.0050	<0.0050	-
Phenanthrene	7.8	-	-	-	-	-	<0.0050	<0.0050	-
Pyrene	78	-	-	-	-	-	<0.0050	<0.0050	-
Polychlorinated Biphenyls (PCBs)									
PCBs (Total)	0.35	<0.010	-	<0.010	<0.010	-	-	-	-

Notes:
MECP Table 3 SCS (R/P/I-F):
Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, for Residential/Parkland/Institutional Property Use and Medium/Fine-Textured Soils

BOLD	Exceeds SCS
BOLD	Reportable Detection Limit Exceeds SCS
Units	All units in micrograms per gram, unless otherwise noted
mbgs	Metres below ground surface
*	Sample depths are in metres below floor surface
NA	Not Applicable
NV	No Value

TABLE 3
SOIL ANALYTICAL RESULTS
1785 Bloor Holdings Inc.
1785 Bloor Street, Mississauga, Ontario

Sample Location	MECP Table 3 SCS (R/P/I-F)	BH103	BH104	BH105	BH105	-
Sample Designation		BH103-1	BH104-1	BH105-2	BH105-3	TRIP BLANK
Sample Collection Date (dd/mm/yyyy)		20/01/2022	20/01/2022	20/01/2022	20/01/2022	20/01/2022
Laboratory Certificate No.		C217455	C217455	C217455	C217455	C217455
Date of Laboratory Analysis (dd/mm/yyyy-dd/mm/yyyy)		24/01/2022 - 27/01/2022	24/01/2022 - 27/01/2022	26/01/2022	24/01/2022 - 26/01/2022	25/01/2022 - 26/01/2022
Laboratory Sample No.		RRE249	RRE250	RRE251	RRE256	RRE259
Sample Depth (mbgs)		0.1 - 0.6*	0.1 - 0.6*	1.1 - 1.5	1.5 - 2.4	-
Miscellaneous Parameters						
pH (pH Units)	NV	-	-	7.55	-	-
Sieve #200 <0.075 mm (%)	NV	-	-	-	-	-
Sieve #200 >0.075 mm (%)	NV	-	-	-	-	-
Soil Texture	NV	-	-	-	-	-
Petroleum Hydrocarbons (PHCs)						
PHCs F1 (C_6 - C_{10})	65	<10	<10	-	<10	-
PHCs F2 (>C_{10} - C_{16})	150	<10	<10	-	<10	-
PHCs F3 (>C_{16} - C_{34})	1300	<50	<50	-	<50	-
PHCs F4 (>C_{34} - C_{50})	5600	<50	<50	-	<50	-
PHCs F4G (>C_{50})	5600	-	-	-	-	-
Volatile Organic Compounds						
Acetone	28	-	-	-	-	<0.49
Benzene	0.17	<0.020	<0.020	-	<0.020	<0.0060
Bromodichloromethane	13	-	-	-	-	<0.040
Bromoform	0.26	-	-	-	-	<0.040
Bromomethane	0.05	-	-	-	-	<0.040
Carbon Tetrachloride	0.12	-	-	-	-	<0.040
Chlorobenzene	2.7	-	-	-	-	<0.040
Chloroform	0.18	-	-	-	-	<0.040
Dibromochloromethane	9.4	-	-	-	-	<0.040
1,2-Dichlorobenzene	4.3	-	-	-	-	<0.040
1,3-Dichlorobenzene	6	-	-	-	-	<0.040
1,4-Dichlorobenzene	0.097	-	-	-	-	<0.040
Dichlorodifluoromethane	25	-	-	-	-	<0.040
1,1-Dichloroethane	11	-	-	-	-	<0.040
1,2-Dichloroethane	0.05	-	-	-	-	<0.049
1,1-Dichloroethylene	0.05	-	-	-	-	<0.040
cis-1,2-Dichloroethylene	30	-	-	-	-	<0.040
trans-1,2-Dichloroethylene	0.75	-	-	-	-	<0.040
1,2-Dichloropropane	0.085	-	-	-	-	<0.040
1,3-Dichloropropene (Total)	0.083	-	-	-	-	<0.050
Ethylbenzene	15	<0.020	<0.020	-	<0.020	<0.010
Ethylene Dibromide	0.05	-	-	-	-	<0.040
Hexane	34	-	-	-	-	<0.040
Methyl Ethyl Ketone	44	-	-	-	-	<0.40
Methyl Isobutyl Ketone	4.3	-	-	-	-	<0.40
Methyl t-Butyl Ether (MTBE)	1.4	-	-	-	-	<0.040
Methylene Chloride	0.96	-	-	-	-	<0.049
Styrene	2.2	-	-	-	-	<0.040
1,1,1,2-Tetrachloroethane	0.05	-	-	-	-	<0.040
1,1,2,2-Tetrachloroethane	0.05	-	-	-	-	<0.040
Tetrachloroethylene	2.3	-	-	-	-	<0.040
Toluene	6	<0.020	<0.020	-	<0.020	<0.020
1,1,1-Trichloroethane	3.4	-	-	-	-	<0.040
1,1,2-Trichloroethane	0.05	-	-	-	-	<0.040
Trichloroethylene	0.52	-	-	-	-	<0.010
Trichlorofluoromethane	5.8	-	-	-	-	<0.040
Vinyl Chloride	0.022	-	-	-	-	<0.019
Xylenes (Total)	25	<0.040	<0.040	-	<0.040	<0.020
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	58	<0.0050	<0.0050	-	-	-
Acenaphthylene	0.17	<0.0050	<0.0050	-	-	-
Anthracene	0.74	<0.0050	<0.0050	-	-	-
Benzo(a)anthracene	0.63	<0.0050	<0.0050	-	-	-
Benzo(a)pyrene	0.3	<0.0050	<0.0050	-	-	-
Benzo(b)fluoranthene	0.78	<0.0050	<0.0050	-	-	-
Benzo(ghi)perylene	7.8	<0.0050	<0.0050	-	-	-
Benzo(k)fluoranthene	0.78	<0.0050	<0.0050	-	-	-
Chrysene	7.8	<0.0050	<0.0050	-	-	-
Dibenzo(a,h)anthracene	0.1	<0.0050	<0.0050	-	-	-
Fluoranthene	0.69	<0.0050	<0.0050	-	-	-
Fluorene	69	<0.0050	<0.0050	-	-	-
Indeno(1,2,3-cd)pyrene	0.48	<0.0050	<0.0050	-	-	-
1- & 2-Methylnaphthalene	3.4	<0.0071	<0.0071	-	-	-
Naphthalene	0.75	<0.0050	<0.0050	-	-	-
Phenanthrene	7.8	<0.0050	<0.0050	-	-	-
Pyrene	78	<0.0050	<0.0050	-	-	-
Polychlorinated Biphenyls (PCBs)						
PCBs (Total)	0.35	-	-	-	<0.010	-

Notes:
MECP Table 3 SCS (R/P/I-F):
Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, for Residential/Parkland/Institutional Property Use and Medium/Fine-Textured Soils

BOLD	Exceeds SCS
BOLD	Reportable Detection Limit Exceeds SCS
Units	All units in micrograms per gram, unless otherwise noted
mbgs	Metres below ground surface
*	Sample depths are in metres below floor surfac
NA	Not Applicable
NV	No Value

TABLE 4
MAXIMUM CONCENTRATIONS IN SOIL
1785 Bloor Holdings Inc.
1785 Bloor Street, Mississauga, Ontario

Parameter	Maximum Concentration	MECP Table 3 SCS (R/P/I-F)	Sample Designation	Sample Location	Sample Depth (mbgs)
Petroleum Hydrocarbons (PHCs)					
PHCs F1 (C_6 - C_{10})	<10	65	Multiple Samples	Multiple Samples	Multiple Samples
PHCs F2 (>C_{10} - C_{16})	<10	150	Multiple Samples	Multiple Samples	Multiple Samples
PHCs F3 (>C_{16} - C_{34})	<50	1300	Multiple Samples	Multiple Samples	Multiple Samples
PHCs F4 (>C_{34} - C_{50})	<50	5600	Multiple Samples	Multiple Samples	Multiple Samples
Volatile Organic Compounds					
Benzene	<0.02	0.17	Multiple Samples	Multiple Samples	Multiple Samples
Ethylbenzene	<0.02	15	Multiple Samples	Multiple Samples	Multiple Samples
Toluene	<0.02	6	Multiple Samples	Multiple Samples	Multiple Samples
Xylenes (Total)	<0.04	25	Multiple Samples	Multiple Samples	Multiple Samples
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	<0.005	58	Multiple Samples	Multiple Samples	Multiple Samples
Acenaphthylene	<0.005	0.17	Multiple Samples	Multiple Samples	Multiple Samples
Anthracene	<0.005	0.74	Multiple Samples	Multiple Samples	Multiple Samples
Benzo(a)anthracene	<0.005	0.63	Multiple Samples	Multiple Samples	Multiple Samples
Benzo(a)pyrene	<0.005	0.3	Multiple Samples	Multiple Samples	Multiple Samples
Benzo(b)fluoranthene	<0.005	0.78	Multiple Samples	Multiple Samples	Multiple Samples
Benzo(ghi)perylene	<0.005	7.8	Multiple Samples	Multiple Samples	Multiple Samples
Benzo(k)fluoranthene	<0.005	0.78	Multiple Samples	Multiple Samples	Multiple Samples
Chrysene	<0.005	7.8	Multiple Samples	Multiple Samples	Multiple Samples
Dibenzo(a,h)anthracene	<0.005	0.1	Multiple Samples	Multiple Samples	Multiple Samples
Fluoranthene	<0.005	0.69	Multiple Samples	Multiple Samples	Multiple Samples
Fluorene	<0.005	69	Multiple Samples	Multiple Samples	Multiple Samples
Indeno(1,2,3-cd)pyrene	<0.005	0.48	Multiple Samples	Multiple Samples	Multiple Samples
1- & 2-Methylnaphthalene	<0.0071	3.4	Multiple Samples	Multiple Samples	Multiple Samples
Naphthalene	<0.005	0.75	Multiple Samples	Multiple Samples	Multiple Samples
Phenanthrene	<0.005	7.8	Multiple Samples	Multiple Samples	Multiple Samples
Pyrene	<0.005	78	Multiple Samples	Multiple Samples	Multiple Samples
Polychlorinated Biphenyls (PCBs)					
PCBs (Total)	<0.01	0.35	Multiple Samples	Multiple Samples	Multiple Samples

Notes:

Units All units in micrograms per gram, unless otherwise noted
mbgs Metres below ground surface

10.0 APPENDICES

APPENDIX A

Legal Survey

PLAN OF SURVEY AND TOPOGRAPHY OF BLOCK P REGISTERED PLAN 719 CITY OF MISSISSAUGA REGIONAL MUNICIPALITY OF PEEL

SCALE 1:300

6m 3m 0m 6m 12m 18m 24metres

R-PE SURVEYING LTD., O.L.S.

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

□	DENOTES MONUMENT SET
■	DENOTES MONUMENT FOUND
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
CC	DENOTES CUT CROSS
SCP	DENOTES SPECIFIED CONTROL POINT
P.I.N.	DENOTES PROPERTY IDENTIFIER NUMBER
D1	DENOTES INSTRUMENT No. TT172757
D2	DENOTES INSTRUMENT No. TT171776
D3	DENOTES INSTRUMENT No. RO969037
D4	DENOTES INSTRUMENT No. VS59671
PL	DENOTES REGISTERED PLAN 719
PL1	DENOTES PLAN 43R-19078
PL2	DENOTES SURVEYOR'S REAL PROPERTY REPORT BY F. G. CUNNINGHAM INCORPORATED, O.L.S., DATED MARCH 1, 1997
(752)	DENOTES W. H. CARR, O.L.S.
(1302)	DENOTES A. SKRANDA SURVEYING LTD., O.L.S.
(WT)	DENOTES WITNESS
(NI)	DENOTES NOT IDENTIFIED
N/S	DENOTES NORTH/ SOUTH

LEGEND

CLF	DENOTES CHAIN LINK FENCE
CONC.	DENOTES CONCRETE
BXC	DENOTES CABLE BOX
CMF	DENOTES CORRUGATED METAL FENCE
MHSA	DENOTES MANHOLE SANITARY
CB	DENOTES CATCH BASIN
FF	DENOTES FINISHED FLOOR ELEVATION
HV	DENOTES HYDRO-VAULT
LS	DENOTES LAMP STANDARD
MH	DENOTES MANHOLE
UP	DENOTES UTILITY POLE
WV	DENOTES WATER VALVE
-W-	DENOTES OVERHEAD WIRE
Ø	DENOTES DIAMETER
	DENOTES DECIDUOUS TREE
	DENOTES CONIFEROUS TREE
-X-	DENOTES FENCE LINE
	DENOTES SIGN
	DENOTES GUY WIRE ANCHOR

INTEGRATION NOTE

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 075850129 AND 075850130, UTM ZONE 17, NAD-1983:CSRS:CBNV6-2010.0.

COORDINATES ARE UTM ZONE 17, NAD-1983:CSRS:CBNV6-2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

POINT ID	NORTHING	EASTING
SCP 075850129	4831464.48	613914.05
SCP 075850130	4831604.91	614006.30

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999745.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO CITY OF MISSISSAUGA VERTICAL BENCH MARK NUMBER 686 HAVING AN ORTHOMETRIC ELEVATION OF 135.35 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD:1928:PRE-78ADJ.).

TABLET SET ON THE SOUTH FACE AT THE EAST CORNER OF THE MOST SOUTH WALL OF FOREST GLEN PUBLIC SCHOOL ON THE NORTH SIDE OF PONYTRAIL DRIVE, 122 METRES WEST OF BRIDGEWOOD DRIVE.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 27th DAY OF APRIL ,2021.

DATE MAY 06th, 2021

S. GOONEWARDENA
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2153989
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3).

R-PE SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635-5000 Fax (416)635-5001
Tel.(905)264-0881 Fax (905)264-2099
Website: www.r-pe.ca
DRAWN: S.L. CHECKED: S.G.
JOB No. 21-092 CAD FILE No.21-092TP01

APPENDIX B

Sampling and Analysis Plan

FINAL

Sampling and Analysis Plan for Phase Two Environmental Site Assessment

1785 Bloor Street Mississauga, Ontario

Prepared for:

1785 Bloor Holdings Inc.
181 Eglinton Avenue East, Suite 204
Toronto, ON M2P 1J4

Attn: Daniel Greenberg

January 20, 2022

Pinchin File: 291885.003

Issued To:	**1785 Bloor Holdings Inc.**
Contact:	**Daniel Greenberg**
Issued On:	**January 20, 2022**
Pinchin File:	**291885.003**
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TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) has prepared this Sampling and Analysis Plan (SAP) for the Phase Two Environmental Site Assessment (ESA) to be performed at the property located at 1785 Bloor Street in Mississauga, Ontario (hereafter referred to as the Site or Phase Two Property). The Phase Two Property is presently developed with a ten-storey, multi-tenant residential building (Site Building). A Key Map showing the Phase Two Property location is provided on Figure 1 (all Figures are located in Appendix I).

The Phase Two ESA will be conducted at the request of 1785 Bloor Holdings Inc. (Client) in relation to the proposed construction of a multi-tenant residential building in the northwestern portion of the Phase Two Property. The Phase Two ESA will be conducted to support the filing of a Record of Site Condition (RSC) with the Ontario Ministry of the Environment, Conservation and Parks (MECP) and will be completed in accordance with the Province of Ontario's *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, which was last amended by Ontario Regulation 214/21 on March 19, 2021 (O. Reg. 153/04).

This SAP provides the scope of work and procedures for completing the field investigation for the Phase Two ESA. The Phase Two ESA will be performed in accordance with the scope of work, and terms and conditions described in the proposal and change order prepared for the Client entitled *"Proposal for Phase Two Environmental Site Assessment 1785 Bloor Street, Mississauga, Ontario"* dated December 17, 2021, and "*Change Order No. 1, Phase Two Environmental Site Assessment, 1785 Bloor Street, Mississauga, Ontario"*, dated January 18, 2022, respectively.

2.0 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The objectives of the Phase Two ESA will be to assess soil quality at the Phase Two Property in relation to three areas of potential environmental concern (APECs) and related potentially contaminating activities (PCAs) and contaminants of potential concern (COPCs) identified in a Phase One ESA completed by Pinchin in accordance with O. Reg. 153/04, the findings of which are provided in the report entitled "*Phase One Environmental Site Assessment Report, 1785 Bloor Street, Mississauga, Ontario",* prepared for the Client and dated January 14, 2022. The APECs and corresponding PCAs and COPCs are summarized in Table 1 (all Tables are located in Appendix II) and shown on Figures 2 to 4.

Note that although an additional APEC related to salt application for de-icing purposes (APEC-3) is listed in Table 1, Pinchin has applied the exemption in Section 49.1 of O. Reg. 153/04 and this APEC does not need to be investigated as part of the Phase Two ESA.

3.0 SCOPE OF WORK

The information obtained from the Phase One ESA, in particular the Phase One Conceptual Site Model, was used to determine the environmental media requiring investigation during the Phase Two ESA (i.e., soil), the locations and depths for sample collection, and the parameters to be analyzed for the samples submitted from each APEC. The Phase Two ESA scope of work will include the advancement of five boreholes. The proposed borehole locations are provided on Figure 4.

Table 2 in Appendix II provides a detailed summary of the proposed Phase Two ESA scope of work, including:

- Boreholes to be completed within each APEC and the COPCs to be analyzed for samples collected in each APEC.
- Media to be sampled at each sampling location, the sampling system (see Section 7.0), the soil sampling depth intervals and the sampling frequency.
- Number of samples per borehole to be collected and submitted for laboratory analysis.

Note that the soil sampling depth intervals (i.e., borehole depths) and sampling frequency are based on Pinchin's current knowledge of subsurface conditions and may be revised based on the actual subsurface conditions encountered.

Additional scope of work items include the following:

- Submission of up to two surface soil samples (0 to 1.5 metres below ground surface (mbgs)) and up to two subsurface soil samples (deeper than 1.5 mbgs) for pH analysis.
- Submission of up to two soil samples for grain size analysis.
- Elevation surveying of the ground/floor surface elevations at all borehole locations.

4.0 DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) for the Phase Two ESA will be to obtain unbiased analytical data that are representative of actual soil conditions at the Phase Two Property. This will be accomplished by implementing a quality assurance/quality control (QA/QC) program, as described in Section 5.0, and by completing the field work in accordance with Pinchin's standard operating procedures (SOPs), as described in Section 6.0. Pinchin's SOPs are based in part on the MECP's *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"*, dated December 1996 and the Professional Geoscientists of Ontario document entitled *"Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)"*, dated April 2011.

The DQOs are intended to minimize uncertainty in the analytical data set such that the data are considered reliable enough to not affect the conclusions and recommendations of the Phase Two ESA and to meet the overall objective of the Phase Two ESA, which is to assess the environmental quality of the Phase Two Property in relation to the identified APECs.

5.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

5.1 Non-Dedicated Sampling and Monitoring Equipment Cleaning

Based on the proposed scope of work, the following non-dedicated sampling and monitoring equipment will be used during completion of the Phase Two ESA:

- Spatula for soil sampling.
- Split-spoon samplers.

All of the above-listed equipment will be cleaned prior to initial use and between samples or sampling locations, as appropriate, following the equipment cleaning procedures described in SOP-EDR009. Any non-dedicated sampling or monitoring equipment not listed above that is used during the Phase Two ESA will also be cleaned in accordance with SOP-EDR009.

5.2 Trip Blanks

A trip blank is a set of VOC sample vials provided by the analytical laboratory and shipped with the sample containers. Trip blanks will be stored with the sample containers provided by the analytical laboratory during travel to the Phase Two Property, while on the Phase Two Property, and during travel from the Phase Two Property back to the analytical laboratory. The sample containers comprising a trip blank will not be opened in the field.

Groundwater sampling is not being undertaken during the Phase Two ESA and as such, submission and analysis of groundwater trip blanks is not required. A trip blank will accompany the soil sample containers.

One trip blank will accompany each submission to the laboratory. Each trip blank will be submitted for analysis of BTEX. Based on the scope of work and anticipated field work schedule for the Phase Two ESA, it is estimated that analysis of one trip blank will be required. Additional trip blanks will be submitted if there are additional laboratory submissions.

5.3 Field Duplicate Samples

Field duplicate soil samples will be collected for laboratory analysis in accordance with SOP-EDR025 at a frequency of one sample for every ten samples submitted for laboratory analysis, with a minimum of one sample per COPC.

5.4 Calibration Checks on Field Instruments

5.4.1 Field Screening Instruments

The photoionization detector (PID) and combustible gas indicator (CGI) used for the field screening of soil samples will be calibrated in accordance with the procedures described in SOP-EDR003. Calibration checks will also be made at the frequency specified in SOP-EDR003.

Records of the calibration and calibration checks of the PID and CGI, including any calibration sheets provided by the equipment supplier, will be retained in Pinchin's project file.

5.4.2 Water Quality Measurement Instruments

The Phase Two ESA scope of work will not include groundwater sampling and the calibration of water quality measurement instruments is not required.

6.0 STANDARD OPERATING PROCEDURES

The proposed field investigation for the Phase Two ESA will require the following SOPs to be followed:

- Borehole drilling (SOP-EDR006).
- Soil sampling (SOP-EDR013 and SOP-EDR019).
- Field screening (SOP-EDR003).
- QA/QC sampling (SOP-EDR025).
- Non-dedicated field equipment decontamination (SOP-EDR009).
- Vertical elevation surveying (SOP-EDR026).

The above-referenced SOPs are provided in Appendix III. Each SOP includes a section describing the specific requirements for Phase Two ESAs completed to support the filing of an RSC in accordance with O. Reg. 153/04.

Any deviations from the SOPs will be summarized in the Phase Two ESA report.

7.0 SAMPLING SYSTEM

The borehole locations in all APECs will be selected following a judgemental sampling system. Boreholes will be placed at locations where the potential for COPCs to be present is considered the highest (i.e., "worst case"), as per the following:

- A borehole will be completed near the electrical transformer located in the southeastern portion of the Phase Two Property (APEC-1).
- A borehole will be completed near the Site Building hydro vault (APEC-2).

- Boreholes will be completed interior and adjacent to the exterior of the Site Building boiler room (APEC-4).

In addition, the field screening results for soil samples collected from each borehole will be used to select "worst case" samples for laboratory analysis.

As noted in Section 2.0, APEC-3 is related to the application of salt for de-icing purposes on the exterior of the Phase Two Property and as such will not be investigated as part of the Phase Two ESA.

The sampling system that will be used for each APEC is summarized in Table 2.

8.0 PHYSICAL IMPEDIMENTS

Pinchin does not anticipate any physical impediments that will limit access to the Phase Two Property during completion of the Phase Two ESA.

9.0 TERMS AND LIMITATIONS

This Sampling and Analysis Plan (SAP) has been prepared to summarize the general scope of work and field procedures to be followed for the Phase Two ESA that will be performed for 1785 Bloor Holdings Inc. (Client) in order to investigate potential environmental impacts at 1785 Bloor Street in Mississauga, Ontario (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. The Phase Two ESA will not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived from the Phase Two ESA will be specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples will be analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of the Phase Two ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

The Phase Two ESA will be performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This SAP was prepared for the exclusive use of the Client, subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this SAP, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

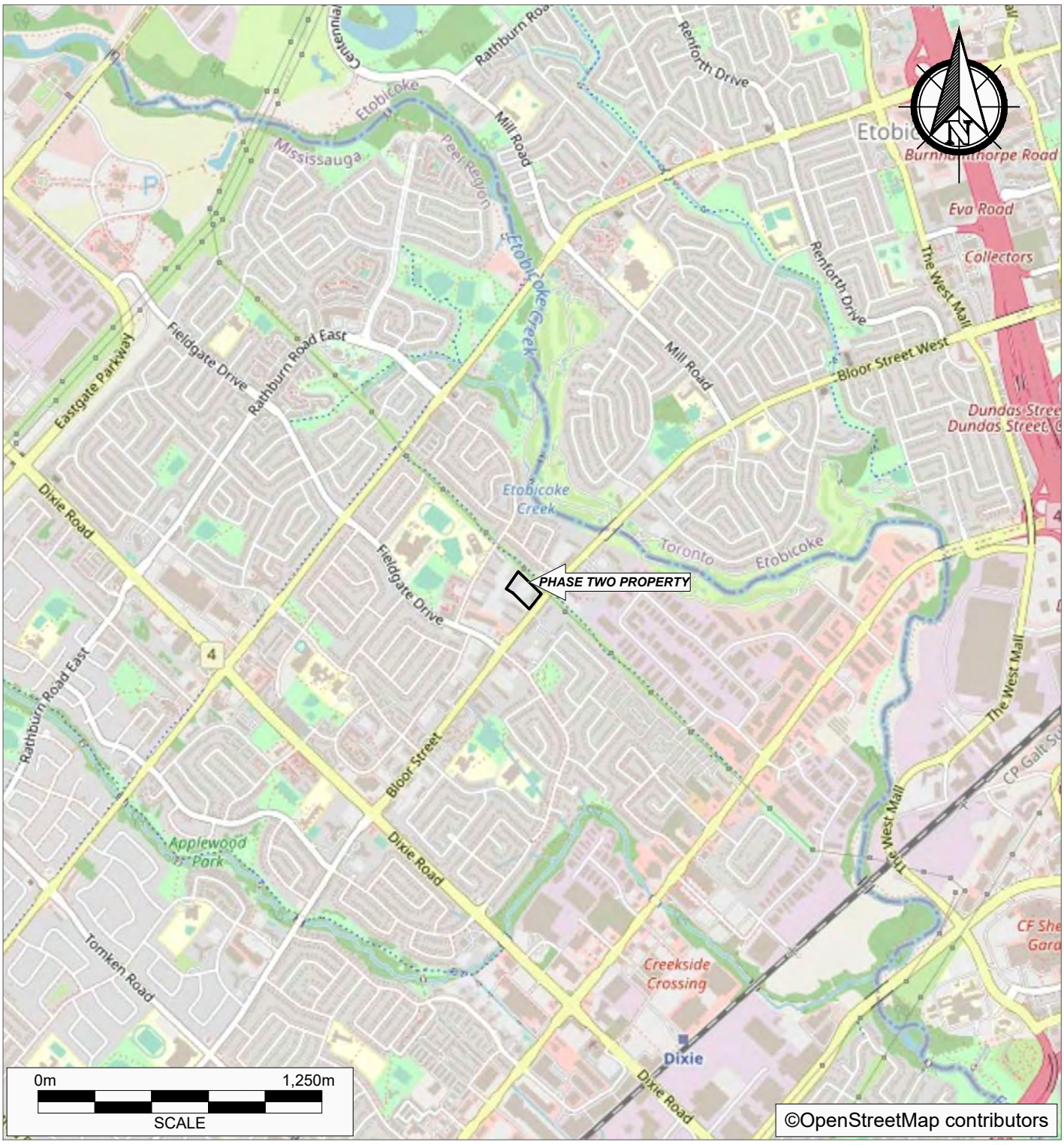
If additional parties require reliance on this SAP, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this SAP should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this SAP, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

291885.003 RSC Phase Two ESA SAP 1785 Bloor St Mississauga ON Jan 20 2022.docx

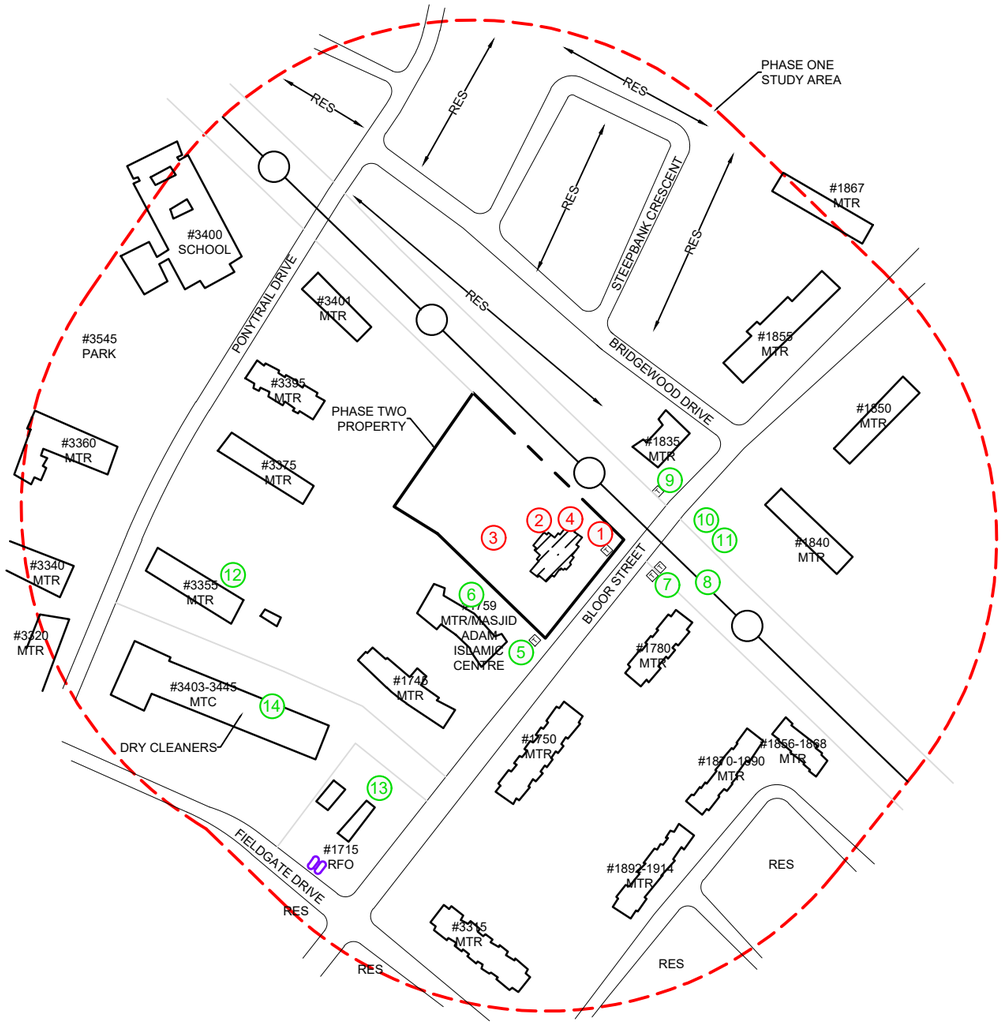
Template: RSC Sampling and Analysis Plan, EDR, January 17, 2020

APPENDIX I
Figures



PINCHIN

PROJECT NAME	SAMPLING AND ANALYSIS PLAN - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT		
CLIENT NAME	1785 BLOOR HOLDINGS INC.		
PROJECT LOCATION	1785 BLOOR STREET, MISSISSAUGA, ONTARIO		
FIGURE NAME	KEY MAP		FIGURE NO. 1
SCALE: AS SHOWN	PROJECT NO.: 291885.003	DATE: JANUARY 2022	



PCA Designation	Location of Potentially Contaminating Activity	Potentially Contaminating Activity	Location of PCA (On-Site or Off-Site)	Contributing to an APEC at the Site (Yes/No)	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
PCA-1	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	Yes	Soil
PCA-2	Northwestern portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	Yes	Soil
PCA-3	Paved areas of the Phase One Property.	Other – Salt Application for De-icing Purposes	On-Site	Yes	Soil and Groundwater
PCA-4	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	Yes	Soil
PCA-5	1759 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-6	1759 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	No	Not Applicable
PCA-7	1780 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-8	Hydro corridor (no address).	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-9	1835 Bloor Street.	Item 55 - Transformer Manufacturing, Processing and Use	Off-Site	No	Not Applicable
PCA-10	1840 Bloor Street.	Other - Spill	Off-Site	No	Not Applicable
PCA-11	1840 Bloor Street.	Item 40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site	No	Not Applicable
PCA-12	3355 Ponytail Drive.	Other - Hazardous Waste Generation	Off-Site	No	Not Applicable
PCA-13	1715 Bloor Street.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	Off-Site	No	Not Applicable
PCA-14	3403-3445 Fieldgate Drive.	Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used)	Off-Site	No	Not Applicable

N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- PHASE ONE STUDY AREA BOUNDARY
- SITE BUILDING
- T PAD MOUNTED TRANSFORMER
- RES RESIDENTIAL
- MTR MULTI-TENANT RESIDENTIAL
- MTC MULTI-TENANT COMMERCIAL
- RFO RETAIL FUEL OUTLET
- HYDRO CORRIDOR
- CURRENT UNDERGROUND STORAGE TANK
- APEC AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- PCA POTENTIALLY CONTAMINATING ACTIVITY
- # PCA CONTRIBUTES TO AN APEC
- # PCA DOES NOT CONTRIBUTE TO AN APEC

INFERRED GROUNDWATER FLOW DIRECTION

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

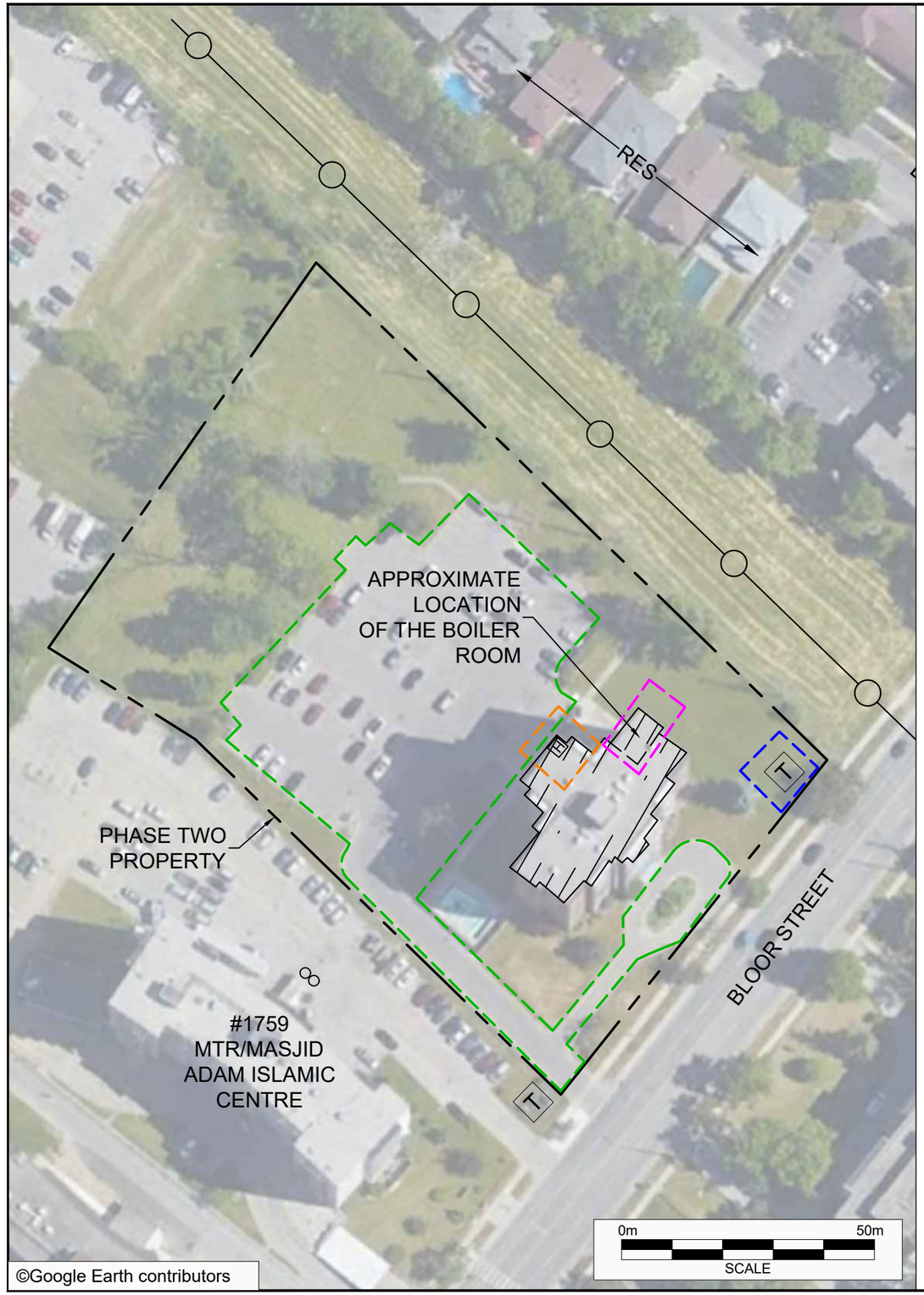
PROJECT NAME:
SAMPLING AND ANALYSIS PLAN - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
POTENTIALLY CONTAMINATING ACTIVITIES

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY: KP	REVIEWED BY: AN
DATE: JANUARY 2022	FIGURE NUMBER: 2



Area of Potential Environmental Concern[1]	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
APEC-1 (Oil-cooled pad-mounted electrical transformer)	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-2 (Hydro vault)	Northwest portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-3 (Salt application for de-icing purposes)	Paved exterior areas.	Other – Salt Application for De-icing Purposes	On-Site	EC SAR Na Cl-	Soil and Groundwater
APEC-4 (Potential historical use of fuel oil as a heating source stored in an aboveground storage tank)	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil

N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- APEC — AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- APEC-1
- APEC-2
- APEC-3
- APEC-4

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

INFERRED GROUNDWATER FLOW DIRECTION

PINCHIN

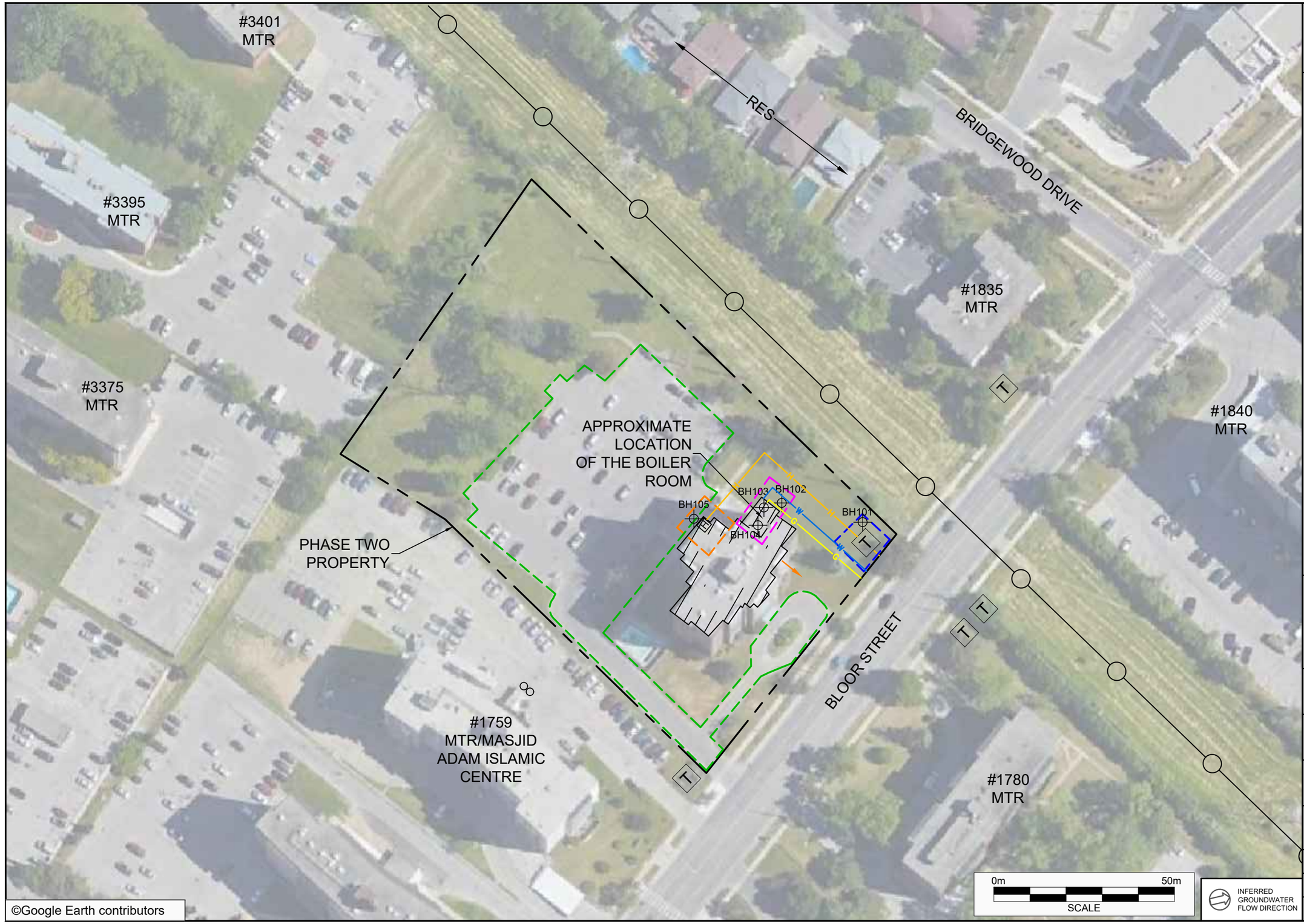
PROJECT NAME:
SAMPLING AND ANALYSIS PLAN - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY: KP	REVIEWED BY: AN
DATE: JANUARY 2022	FIGURE NUMBER: 3



N

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- SITE BUILDING
- T — PAD MOUNTED TRANSFORMER
- RES — RESIDENTIAL
- MTR — MULTI-TENANT RESIDENTIAL
- HYDRO CORRIDOR
- H — HYDRO VAULT
- VENT/FILL PIPE
- C — UNDERGROUND COMMUNICATION LINE
- H — UNDERGROUND HYDRO LINE
- W — UNDERGROUND WATER LINE
- G — UNDERGROUND GAS LINE
- APEC — AREA OF POTENTIAL ENVIRONMENTAL CONCERN
- APEC-1
- APEC-2
- APEC-3
- APEC-4
- PROPOSED BOREHOLE LOCATION

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

PINCHIN

PROJECT NAME:
SAMPLING AND ANALYSIS PLAN - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME:
1785 BLOOR HOLDINGS INC.

PROJECT LOCATION:
1785 BLOOR STREET, MISSISSAUGA, ONTARIO

FIGURE NAME:
PROPOSED BOREHOLE LOCATION PLAN

PROJECT NUMBER:	SCALE:
291885.003	AS SHOWN
DRAWN BY:	REVIEWED BY:
KP	AN
DATE:	FIGURE NUMBER:
JANUARY 2022	4

APPENDIX II

Tables

Table 1 - Table of Areas of Potential Environmental Concern

Area of Potential Environmental Concern[1]	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground Water, Soil and/or Sediment)
APEC-1 (Oil-cooled pad-mounted electrical transformer)	Southeastern corner of the Phase One Property.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-2 (Hydro vault)	Northwest portion of the Site Building.	Item 55 - Transformer Manufacturing, Processing and Use	On-Site	PHCs BTEX PCBs	Soil
APEC-3 (Salt application for de-icing purposes)	Paved exterior areas.	Other – Salt Application for De-icing Purposes	On-Site	EC SAR Na Cl^-	Soil and Groundwater
APEC-4 (Potential historical use of fuel oil as a heating source stored in an aboveground storage tank)	Interior and exterior to the Site Building boiler room.	Item 28 - Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs BTEX PAHs	Soil

Notes:

1 - Areas of potential environmental concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one environmental site assessment, including through,
(a) identification of past or present uses on, in or under the phase one property, and
(b) identification of potentially contaminating activity.

2 - Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 - When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

List of Method Groups:

ABNs	PCBs	Metals	Electrical Conductivity
CPs	PAHs	As, Sb, Se	Cr (VI)
1,4-Dioxane	THMs	Na	Hg
Dioxins/Furans, PCDDs/PCDFs	VOCs	B-HWS	Methyl Mercury
OCs	BTEX	Cl-	Low or high pH,
PHCs	Ca, Mg	CN-	SAR

4 - When submitting a record of site condition for filing, a copy of this table must be attached

Table 2 - Phase Two Scope of Work Summary

Sampling Location	APEC	Media Sampled	COPCs				Number of Samples Submitted for Analysis	Soil Sampling Depth Interval (mbgs)	Screen Interval (mbgs)	Sampling Frequency	Sampling System	Rationale/Notes
			PHCs	BTEX	PAHs	PCBs						
BH1	1	Soil	●	●		●	1	0 - 4.5	NA	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to an electrical transformer located in the southeastern portion of the Phase Two Property.
BH2	4	Soil	●	●	●		1	0 - 4.5	NA	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to the potential historical use of fuel oil stored in an aboveground storage tank near the Site Building boiler room.
BH3	4	Soil	●	●	●		1	0 - 3.1*	NA	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to the potential historical use of fuel oil stored in an aboveground storage tank near the Site Building boiler room.
BH4	4	Soil	●	●	●		1	0 - 3.1*	NA	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to the potential historical use of fuel oil stored in an aboveground storage tank near the Site Building boiler room.
BH5	2	Soil	●	●		●	1	0 - 4.5	NA	Continous/Soil cores every 1.5 m	Judgemental	Assess soil quality in relation to the Site Building hydro vault.

PHCs	Petroleum Hydrocarbons (Fracl	APEC	Area of Potential Environmental Concern
BTEX	Benzene, Toluene, Ethylbenzer	COPCs	Contaminants of Potential Concern
PAHs	Polycyclic Aromatic Hydrocarbo	m	Metres
PCBs	Polychlorinated Biphenyls	mbgs	Metres Below Ground Surface
*	Depths are in mbfs	mbfs	Meters Below Floor Surface
		NA	Not Applicable

APPENDIX III

Pinchin Standard Operating Procedures

SOP – EDR003 – REV005 – FIELD SCREENING OF SOIL SAMPLES

Title:	Field Screening of Soil Samples
Practice:	EDR
First Effective Date:	June 16, 2009
Version:	005
Version Date:	January 20, 2020
Author:	Robert MacKenzie
Authorized by:	Terry Duffy

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	June 16, 2009	N/A	MEM
001	November 26, 2010	Update approval signature	FG
002	September 25, 2013	Revised SOP to reflect current practices/Added section on O.Reg. 153/04 compliance	RLM
003	April 29, 2016	Updated Section 4.0/Modified time between readings to 1 hour	RLM
004	April 28, 2017	Removed reference to Pinchin West/In Section 5.2, clarified that soil vapour measurements do not need to be made within one hour of sampling during winter conditions	RLM
004	January 3, 2018	Reviewed and confirmed current	RLM
005	January 20, 2020	Remove PG Logo and Pinchin LeBlanc Reference	TD

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the quantitative and qualitative methods to be used by Pinchin field personnel for field screening soil samples for potential impacts during field investigations.

The quantitative part of field screening consists of the measurement of vapour concentrations in soil sample headspace in order to assess the potential for volatile constituents to be present in the soil. The soil vapour readings obtained from these measurements are then used to assist in selecting potential "worst case" soil samples for submission to the laboratory for analysis. There are no regulatory standards for comparison with soil headspace vapour readings and we are using the general principle that the sample with the highest soil headspace vapour concentration from a group of samples is often the most likely to be impacted by volatile constituents.

The qualitative part of field screening includes assessing the soil for visual or olfactory indicators of potential contamination and is used in conjunction with the soil headspace vapour readings to select "worst case" soil samples to be submitted for laboratory analysis.

Note that soil vapour measurements have limited value when selecting "worst case" soil samples for laboratory analysis of non-volatile parameters such as metals. Visual observations of the presence of staining and debris (e.g., brick fragments and other building materials, coal ash, etc.), along with sample depth and likely migration pathways are to be factored into selecting the samples. The sample with the highest soil headspace vapour reading is not automatically selected under these circumstances.

Soil samples collected for soil vapour measurement must not be submitted for laboratory analysis except for analysis of non-volatile parameters (i.e., metals and inorganics) or grain size analysis.

This SOP also applies to the field screening of sediment samples but for simplicity, only soil samples are referred to below.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

- Resealable plastic bags (e.g., Ziploc®);

  (Note that small capacity bags (e.g., 500 millilitre capacity) are preferred over larger sized bags. When conducting headspace screening of a set of soil samples, the size of bag used should be consistent throughout in order to maintain the same approximate headspace volume in each bag);
- Combustible gas indicator (CGI) capable of operating in methane-elimination and/or photo-ionization detector (PID);

  (The Project Manager will be responsible for selecting the appropriate instrument(s) for each project. CGIs (e.g., RKI Eagle or Gastechtor) are acceptable for screening of petroleum hydrocarbons (PHCs) and related compounds, whereas PIDs (e.g., MiniRAE) are acceptable for screening for volatile organic compounds (VOCs), including chlorinated solvents, but can also be used when screening for PHCs. For many projects, it will be appropriate to employ both a CGI and a PID); and
- Calibration equipment (e.g., calibration gas, regulators, tubing, calibration bags, etc. as provided by the equipment supplier).

5.2 Soil Headspace Vapour Measurement Procedure

The procedure for conducting soil headspace vapour measurements for soil sample headspace is as follows:

1. Unless pre-calibrated by the equipment supplier, calibrate the CGI/PID as per the instrument manufacturer's instructions before commencing soil vapour measurements. Record the date and time of calibration, and type and concentration of the calibration gas used in the field logbook or field forms;
2. Label the plastic bag with the sample number;
3. Create a split soil sample by splitting the sample core vertically (i.e., along the longitudinal axis) with one half used for soil headspace vapour measurement and the other half used to fill sample jars for laboratory analysis of volatile parameters (e.g., VOCs and PHCs (F1 fraction)). In other words, the depth interval of the soil subjected to soil headspace vapour measurements should be the same as the depth interval from which samples for volatile parameters are collected. This procedure doesn't apply to grab samples but is to be completed when soil cores are obtained, such as sampling with dual tube samplers, split-spoon samplers and hand augers. For grab samples, soil used for laboratory analysis and soil headspace vapour measurements should be collected from proximal locations;
4. Place the soil into the plastic bag until the bag is approximately one-quarter full as soon as possible after the sampling device is retrieved/opened;
5. Seal the bag and break apart the soil by manually kneading the soil in the sealed bag;
6. Allow the soil sample to equilibrate at ambient temperature for a minimum of 5 minutes but no longer than one hour before taking a soil headspace vapour measurement. The exception to this is that during winter conditions, the soil samples should be placed in a heated environment (e.g., building interior) to warm up for a minimum of 15 minutes before taking soil vapour measurements. In this case, the soil vapour measurements do not need to be completed within one hour of sample collection;
7. Do not store the bagged soil samples in direct sunlight prior to taking soil headspace vapour measurements;
8. When conducting soil headspace vapour measurements with a CGI, make sure it is switched to methane elimination mode;
9. When completing soil headspace vapour measurements of a soil sample using both a PID and CGI, the vapour measurement using the PID should be made first;

10. Immediately before taking a soil headspace vapour measurement, gently agitate the bag and then create a small opening in the top of the bag. Insert the tip of the CGI/PID into the headspace of the bag and quickly reseal the bag around the tip to minimize leakage. If there is any water inside the bag, ensure that the tip does not contact the water;
11. Record the maximum vapour concentration measured within the first 10 seconds after inserting the tip of the CGI/PID into the bag. Note any anomalies that occur during the taking of the measurement (e.g., if the readings displayed by the instrument progressively increase and do not reach an obvious peak);
12. Remove the tip of the CGI/PID from the bag and reseal the bag immediately in case additional soil headspace vapour measurements are needed. If the soil headspace vapour is measured for a sample using a PID and an additional measurement with a CGI is required, wait a minimum of five minutes after the bag is resealed before taking the measurement with the CGI;
13. Before completing the next soil headspace vapour measurement, allow the CGI/PID to reach “zero” or “baseline”. If the CGI/PID does not return to “zero” or “baseline” it should be recalibrated before further soil headspace vapour measurements are made;
14. At the discretion of the Project Manager, a calibration check of the CGI/PID should be completed at least once per day or at a frequency of once per 100 soil headspace vapour measurements (for projects where numerous soil headspace vapour measurements are made on a daily basis such as a large remediation project); and
15. A calibration check is made by measuring the concentration of a sample of the calibration gas with the CGI/PID without making any adjustments to the instrument beforehand and comparing the measured concentration with the known concentration. The comparison of the measured concentration versus the actual concentration of the calibration gas indicates how much the instrument’s calibration may have been altered during soil headspace vapour measurements, which is known as “instrument drift”. Should the calibration check show instrument drift of more than 10%, the CGI/PID needs to be recalibrated before completing further soil headspace vapour measurements. Record all pertinent information for the calibration check (e.g., date and time, initial measured concentration, calibration gas type and concentration) in the field logbook or field forms.

5.3 Visual Screening

Visual screening consists of examining the soil sample for potential indicators of contamination as per the following:

1. Visually examine the soil sample, including breaking apart a portion of the sample;

2. Note any indications of a mottled appearance, dark discolouration or staining, free-phase product or unusual colour;
3. Note any indications of non-soil constituents, such as brick, asphalt, wood or concrete fragments, coal fragments, coal ash, etc.; and
4. Record the findings of the visual screening in the field logbook or field forms. If there is no visual evidence of impacts this should be noted.

5.4 Olfactory Screening

Record in the field logbook or field forms the presence of any odours noted during sample collection and visual screening. Field staff are not expected to directly smell soil samples to assess the presence/absence of odours.

If it is possible to identify the likely type of odour (e.g., PHC-like, solvent-like, etc.) then this information should be recorded along with a comment on the severity of the odour (e.g., slight, strong, etc.). If the odour cannot be readily identified, it should be described in the field notes as “unidentified odour”.

If no odours are observed, this information should also be recorded in the field logbook or field forms.

5.5 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two Environmental Assessment (ESA) in accordance with Ontario Regulation 153/04, the following additional procedures must be undertaken:

- Calibration of the CGI/PID must be completed at the beginning of each field day and calibration checks must be made either at the end of each field day or after every 100 soil vapour readings (whichever occurs first); and
- Thorough records of the CGI/PID calibration and calibration checks must be kept, including any calibration sheets provided by the equipment supplier. The Quality Assurance/Quality Control section of the Phase Two ESA report requires a discussion of field screening instrument calibration, and equipment calibration records must be appended to the Phase Two ESA report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

Ontario Ministry of the Environment, *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*, December 1996.

9.0 APPENDICES

None.

I:\Orchard Sandbox\SOPS\EDR\SOP - EDR003 - REV005 - Field Screening of Soil Samples.docx

Template: Master SOP Template – February 2014

SOP – EDR006 – REV005 – BOREHOLE DRILLING

Title:	Borehole Drilling
Practice:	EDR
First Effective Date:	November 25, 2010
Version:	004
Version Date:	November 19, 2020
Author:	Francesco Gagliardi and Robert MacKenzie
Authorized by:	Terry Duffy

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	November 25, 2010	N/A	FG
001	November 22, 2013	Streamlined text to reflect most common current practices/Removed sections covered by other SOPs	RM
002	April 29, 2016	Updated Section 4.0	RM
003	April 28, 2017	Removed reference to Pinchin West	RM
004	January 30, 2020	Annual Review	TJD
005	November 19, 2020	Formatting updates	RM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents a description of the methods employed for the completion of boreholes and the collection of subsurface soil samples.

Boreholes are typically completed to determine geologic conditions for hydrogeological evaluation, to allow the installation of monitoring wells, and to allow for the collection of subsurface soil samples for laboratory analysis.

Several methods are available for the collection of shallow subsurface soil samples using hand-held equipment (e.g., hand augers, post-hole augers). However, the use of a drill rig, equipped with direct-push tooling, solid-stem augers and/or hollow-stem augers, is the most common method used by Pinchin to advance boreholes and will be the focus of this SOP.

A detailed discussion of all the various drilling rigs and drilling methods (e.g., direct push, augering, sonic drilling, air/water/mud rotary drilling, etc.) is beyond the scope of this SOP. The Project Manager will be responsible for determining the appropriate drill rig and drilling method for the site investigation.

The majority of the site investigations completed by Pinchin involve relatively straightforward drilling within the overburden within a one aquifer system. In some situations, such as when multiple aquifers are spanned by a borehole, when drilling into bedrock or when there are known impacts in the shallow subsurface, drilling using telescoped casing methods may be appropriate. Telescoped casing and bedrock drilling methods are beyond the scope of this SOP. In these situations, the Project Manager, in consultation with the drilling contractor, will be required to confirm the drilling requirements and procedures.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

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- Distributed to senior staff at Le Groupe Gesfor Poirier for distribution as appropriate.

5.0 PROCEDURE

5.1 General

The overall borehole drilling program is to be managed in accordance with SOP-EDR005. In particular, utility locates must be completed in accordance with SOP-EDR021 before any drilling activities commence.

All non-dedicated drilling and sample collection equipment must be decontaminated in accordance with SOP-EDR009.

5.2 Prior Planning and Preparation

The planning requirements for borehole drilling programs are covered in detail in SOP-EDR005.

As noted above, the type of drilling rig and drilling method will be determined by the Project Manager when scoping out the site investigation. In some cases, a switch in drilling rig and/or drilling method may be required depending on site conditions. For example, if competent bedrock is encountered in the subsurface at a depth above the water table, bedrock coring would be required to advance the borehole deep enough to install a monitoring well.

5.3 Borehole Drilling Procedures

Once the final location for a proposed boring has been selected and utility clearances are complete, one last visual check of the immediate area should be performed before drilling proceeds. This last visual check should confirm the locations of any adjacent utilities (subsurface or overhead) and verification of adequate clearance.

In some instances, in particular where there is uncertainty regarding the location of buried utilities or the borehole is being completed near a buried utility, the use of a hydro-excavating (hydro-vac) unit will be required to advance the borehole to a depth below the bottom of the utility. The hydro-vac uses a combination of high-pressure water and high-suction vacuum (in the form of a vacuum truck) to excavate

soil. This is also known as “daylighting”. The need to use a hydro-vac will be determined by the Project Manager.

If it is necessary to relocate any proposed borehole due to terrain, utilities, access, etc., the Project Manager must be notified, and an alternate location will be selected.

5.4 Borehole Nomenclature

If a borehole is advanced strictly for the purpose of soil sampling and no monitoring well is installed, the borehole should be identified as “BHxx”. If a monitoring well is installed in a borehole, the borehole should be identified as “MWxx”.

To avoid confusion, for site investigations involving both boreholes and monitoring wells, the numerical identifiers are to be sequential (e.g., there should not be a BH01 and MW01 for the same project).

When completing supplemental drilling programs, the borehole number should start at either the next sequential number after the last borehole number used in the first stage, or label them as ‘100 series’, ‘200 series’, etc. as appropriate (e.g., BH101, MW102, etc. for the first series of additional boreholes).

It is also acceptable to add the 2 digit year either before or after the borehole or monitoring well name (e.g., 17-MW101 or MW101-17).

5.5 Borehole Advancement

Each borehole will be advanced incrementally to permit intermittent or continuous sampling as specified by the Project Manager. Typically, the sampling frequency is one sample for every 2.5 or 5 feet (0.75 or 1.5 metres) the borehole is advanced. At the discretion of the Project Manager, soil samples may be collected at a lower frequency in homogeneous soil or at a higher frequency if changes in stratigraphy or other visual observations warrant it.

5.6 Direct-Push Drilling

This method is most commonly used at Pinchin to obtain representative samples of the subsurface soil material at a site. Direct-push drilling is achieved by driving a steel sampler into the subsurface at 1.5 metre intervals until the desired depth is achieved. The samplers are advanced by the drilling rig by means of a hydraulic hammer. For each soil sample run, a dedicated PVC sample liner is placed within the steel sampler which collects the soil as the sampler is advanced. After each sample run, a new sampler is assembled, and it is advanced deeper down the open borehole.

There are generally two methods of direct-push drilling which are used:

- Dual-tube sampling; and
- Macro-core sampling.

A dual-tube sampler consists of an 8.25 centimetre (cm) inner diameter steel tooling (outer tube), equipped with a steel cutting-shoe affixed to the advancing end. A smaller diameter steel tooling, consisting of a 5.75 cm inner diameter (inner tube), fits within the outer tube and contains a PVC sample liner within. These two tubes form the completed dual-tube sampler. The completed dual-tube sampler has a length of 1.5 metres.

A macro-core sampler consists of the smaller inner tube (mentioned above) used independently. The macro-core sampler measures approximately 1.5 metres in length.

The difference in drilling methods used is typically determined by soil conditions. Where soil conditions consist of tight or dense soil types (e.g., silts or clays), the macro-core sampling method may be used as this method provides less resistance to advancing the sampler. In soil types that are less resistive (e.g., loose sands), the dual-tube sampler may be used.

5.7 Auger Drilling (Split-Spoon)

The auger drilling method for borehole advancement and sampling involves using an auger drill rig to advance the borehole to the desired sampling depth and sampling with a split-spoon sampler. Borehole advancement with hollow stem augers is the preferred drilling method when sampling with split-spoon samplers as it minimizes the potential from sloughed material to reach the bottom of a borehole and possibly cross-contaminate samples when the split-spoon is driven beyond the bottom of the borehole. Solid stem augers can be used when drilling at sites with cohesive soils (e.g., silty clay), provided that the borehole remains open after the augers are removed from the ground prior to driving the split-spoon sampler.

The split-spoon sampler consists of an 18- or 24-inch (0.45 or 0.60 metres) long, 2-inch (5.1 cm) outside diameter tube, which comes apart lengthwise into two halves.

Once the borehole is advanced to the target depth, the sampler is driven continuously for either 18 or 24 inches (0.45 or 0.60 metres) by a 140-pound (63.5 kilogram) hammer. The hammer may be lifted and dropped by either the cathead and rope method, or by using an automatic or semi-automatic drop system.

The number of blows applied in each 6-inch (0.15 metre) increment is counted until one of the following occurs:

- A total of 50 blows have been applied during any one of the 6-inch (0.15 metre) increments described above;
- A total of 100 blows have been applied;

- There is no advancement of the sampler during the application of ten successive blows of the hammer (i.e., the spoon is "bouncing" on a cobble or bedrock); or
- The sampler has advanced the complete 18 or 24 inches (0.45 or 0.60 metre) without the limiting blow counts occurring as described above.

On the field form, record the number of blows required to drive each 6-inch (0.15 metre) increment of penetration. The first 6 inches is considered to be a seating drive.

The sum of the number of blows required for the second and third 6 inches (0.15 metres) of penetration is termed the "standard penetration resistance" or the "N-value". This information is typically provided on the borehole logs included in our site investigation reports.

The drill rods are then removed from the borehole and the split-spoon sampler unthreaded from the drill rods.

Caution must be used when drilling with augers below the groundwater table, particularly in sandy or silty soils. These soils tend to heave or "blow back" up the borehole due to the difference in hydraulic pressure between the inside of the borehole and the undisturbed formation soil. If blowback occurs, the drilling contractor will introduce water or drilling mud into the borehole or inside of the hollow-stem augers (if used) to equalize the hydraulic pressure and permit drilling deeper to proceed.

Heaving conditions and the use of water or drilling mud must be noted on the field logs, including the approximate volume of water or drilling mud used.

5.8 Auger Drilling (Direct Sampling)

In some jurisdictions (e.g., BC, Manitoba) it may be acceptable to collect soil samples directly from auger flights when using solid stem augers.

When sampling directly from auger flights, care must be exercised not to collect soils that were in direct contact with the auger or that were smeared along the edge of the borehole.

5.9 Borehole Advancement in Bedrock

It is sometimes possible to advance augers through weathered bedrock but borehole advancement through competent bedrock requires alternate drilling procedures. Bedrock drilling can be accomplished by advancing core barrels or tri-cone bits using air rotary or water rotary drilling methods. A description of the various bedrock drilling procedures is beyond the scope of this SOP.

The bedrock drilling method selected will depend in part on the type of bedrock, the borehole depth required, whether bedrock core logging is required, whether telescoped casing is required, etc. The Project Manager, in consultation with the drilling contractor, will determine the best method for advancing boreholes in competent bedrock.

5.10 Borehole Soil Sample Logging and Collection

The following describes the methods for logging and collection of samples from a split-spoon or direct-push sampler but can be adapted for sample collection from augers:

1. After the driller opens the split-spoon sampler or PVC liner, measure the length of the soil core retained in the sampler in inches or centimetres. Be sure to be consistent in the use of metric or imperial units, and that the units used are clearly noted in the field notes. The percentage of soil retained versus the length of the sampler is known as “sample recovery” and this information is presented on the borehole logs within our Phase II ESA reports;
2. Dedicated, disposable nitrile gloves are to be worn during soil logging and sampling;
3. When using a dual-tube or macro-core sampler with direct-push drilling, there is usually sufficient sample recovery to permit the collection of two soil samples from each sample run. In this case, if the sample recovery is greater than 2.5 feet (0.75 metres), divide the recovered soil into two depth intervals and log/collect a sample from each interval. Split-spoon samplers typically are not long enough nor provide enough sample to divide a sample run into two. However, if a recovered sample contains distinct stratigraphic units (e.g., fill material and native material, obviously impacted soil and non-impacted soil), the distinct units are to be sampled separately. It is especially important that potentially impacted soil (e.g., fill material, obviously impacted soil) is not mixed with potentially unimpacted soil (e.g., native soil, soil without obvious impacts) to form one sample;
4. Discard the top several centimetres in each core as this material is the most likely to have sloughed off the borehole wall and may not be representative of the soil from the intended depth interval;
5. To minimize the potential for cross-contamination, scrape the exterior of the soil core with a clean, stainless-steel putty knife, trowel or similar device to remove any smeared soil. Note that is not practical and can be skipped if the soil is non-cohesive (e.g., loose sand);
6. Split the soil core longitudinally along the length of the sampler and to the extent practical, collect the soil samples for laboratory analysis from the centre of the core (i.e., soil that has not contacted the sampler walls). When sampling directly from augers, soils in direct contact with the auger or soils retained on the augers that may have been in contact with the edge of the borehole should not be collected;

   Collect soil samples for potential volatile parameter analysis and field screening (in that order) as soon as possible after the core is opened. The length of time between opening the sampler and sample collection for these parameters should not exceed 2 minutes. It is important to follow this as it minimizes the potential for volatile constituents in the soil to

be lost. See SOP-EDR003 for additional details regarding the collection of soil samples for field screening;

7. Drillers are not to open the split-spoon sampler or PVC liner until instructed to do so. If drilling and sample retrieval is occurring at a rate faster than Pinchin staff are able to sample and log the soil cores, the drillers are to be instructed to slow down or stop until further notice. This will prevent a back log of soil cores from accumulating and minimize the exposure of the soil cores to ambient conditions. This is particularly important when sampling for VOCs;
8. Collect soil samples for the remaining parameters to be analyzed;
9. Soil samples are to be labelled and handled in accordance with SOP-EDR013;
10. Record the parameters sampled for, the type(s) and number of sample containers, and the time and date of sample collection in the field notes;
11. Determine the soil texture in accordance with SOP-EDR019 and record this information in the field notes;
12. Soil samples collected for soil headspace vapour measurement must not be submitted for laboratory analysis except for analysis of non-volatile parameters (i.e., metals and inorganics) or grain size analysis;
13. Immediately following collection, place each sample container in a cooler containing ice bags or ice packs; and
14. After the maximum borehole drilling depth is reached, measure the borehole depth with a weighted measuring tape and record the total depth in the field notes if the borehole diameter is large enough to permit measurement.

5.11 Borehole Backfilling.

Following completion of each borehole in which a well is not installed, it must be properly backfilled with bentonite and/or bentonite grout by the drilling contractor. The drilling contractor is to be consulted to confirm the proper borehole abandonment procedures required by the local regulations (e.g., Ontario Regulation 903 (as amended) for Ontario sites).

Drill cuttings are not be used to backfill boreholes.

Record the borehole backfilling method and materials used in the field notes.

5.12 Borehole Location Documentation

For each borehole, complete the following to document its location:

1. Photograph the completed borehole location. Close up photographs of the borehole are to be taken as well as more distant photographs that show the location of site landmarks relative to the borehole so that the photograph can be used to locate the borehole in the future; and
2. Using a measuring tape or measuring wheel, measure the distance between the borehole and a nearby landmark (e.g., corner of the nearest building) and provide a borehole location sketch in the field notes. Measurements are to be made at right angles relative to the orientation of the landmark or to a fixed axis (e.g., relative to true north). If required by the Project Manager, measure the UTM coordinates of the borehole with a hand-held GPS device.

5.13 Field Notes

The field notes must document all drilling equipment used, sample depths and measurements collected during the borehole drilling activities. The field notes must be legible and concise such that the entire borehole drilling and soil sampling event can be reconstructed later for future reference. The field notes are to be recorded on the field forms or in a field book.

5.14 Additional Considerations for O. Reg. 153/04 Phase Two ESA Compliance

None. Following this SOP will be sufficient to comply with the Ontario Regulation 153/04 requirements for Phase Two Environmental Site Assessments.

5.15 Health and Safety

All work activities under this SOP will be completed in a safe manner following the requirements of Pinchin's Occupational Health and Safety Program, client site requirements and current legislation.

Pinchin Employees conducting work under this SOP must meet the job competency requirements as outlined in Section 2.3 Job Competency of the Pinchin Health and Safety Program.

Where technical occupational health and safety assistance is required in evaluating hazards and determining controls, a Qualified Person should be engaged following Pinchin Health and Safety Program Section 3.2 Project Hazard Assessments.

If, while working on a site and following this SOP, there is an incident resulting in loss (personal injury, property damage) or a near miss (potential loss), fill in and submit the appropriate incident form (3.3.1.) or near miss form (3.3.2).

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of Health & Safety Training by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Canadian Standards Association, *Phase II Environmental Site Assessment, CSA Standard Z769-00 (R2018)*, dated 2000 and reaffirmed in 2018.

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*, April 2011.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

SOP – EDR009 – REV004 – FIELD DECONTAMINATION OF NON-DEDICATED MONITORING AND SAMPLING EQUIPMENT

Title:	Field Decontamination of Non-Dedicated Monitoring and Sampling Equipment
Practice:	EDR
First Effective Date:	August 03, 2009
Version:	004
Version Date:	January 3, 2018
Author:	Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	August 02, 2009	N/A	MEM
001	November 26, 2010	Updated Approval Signature/Added reference to Ontario Regulation 511/09	FG
002	September 20, 2013	Revised majority of text to reflect current practices/Focused on equipment cleaning and removed reference to personnel decontamination/Added section on O. Reg. 153/04 requirements/Revised reference list	RLM
003	April 29, 2016	Updated Section 4.0/Removed methanol as optional cleaning reagent	RLM
004	April 28, 2017	Removed reference to Pinchin West/In Section 5.2.2, modified requirements for cleaning water level tapes and interface probes/In Section 5.2.3, modified requirements for cleaning electrical or retrieval cables for pumps	RLM
004	January 3, 2018	Reviewed and confirmed current	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the general requirements for field decontamination of non-dedicated equipment used for monitoring of environmental media and the collection of environmental samples (i.e., equipment that is re-used between monitoring and sampling locations). Note that the procedures described in this SOP also apply to pumps used for well development.

3.0 OVERVIEW

The main purpose of non-dedicated monitoring and sampling equipment decontamination is to minimize the potential for cross-contamination during monitoring/sampling activities completed for site investigations. Cross-contamination can occur when equipment used to monitor/sample contaminated soil, groundwater or sediment is reused at another monitoring/sampling location without cleaning. This can result in the transfer of contaminants from a “dirty” monitoring/sampling location to a “clean” monitoring/sampling location, causing possible positive bias of subsequent samples. Positive sample bias can result in reported analytical results that are not representative of actual site conditions and, if significant cross-contamination occurs, can result in reported exceedances of the applicable regulatory standards for samples that would have met the standards had cross-contamination not occurred.

Site investigations completed by Pinchin typically use the following non-dedicated monitoring/sampling equipment:

- Manually operated equipment (e.g., water level tapes/interface probes using during groundwater monitoring and sampling, knifes/spatulas used for soil sampling, hand augers);
- Pumps for groundwater monitoring well development, purging and/or sampling (e.g., bladder pumps, submersible pumps); and
- Downhole drilling/sampling equipment (e.g., split-spoon samplers, augers).

The above list is not all inclusive and other non-dedicated monitoring/sampling equipment may be employed during a site investigation that requires decontamination. For example, it may be appropriate to decontaminate the bucket of a backhoe used for test pitting between test pit locations. The Project Manager will be responsible for identifying the additional monitoring/sampling equipment that requires decontamination and instructing field staff regarding the procedure to be followed for cleaning this equipment.

When conducting field monitoring and sampling work in the field, it is not always possible to judge whether a monitoring/sampling location is uncontaminated. Because of this, it is important that all non-dedicated monitoring/sampling equipment be properly cleaned before initial use and between uses to minimize the potential for cross-contamination to occur.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

The following is a list of equipment needed to perform the decontamination of non-dedicated monitoring and sampling equipment in accordance with this SOP:

- Personal Protective Equipment (PPE);
- Potable tap water;
- Distilled water (store bought);

- Volatile organic compound (VOC)-free deionized distilled water (supplied by the analytical laboratory);
- Laboratory grade, phosphate-free soap;
- Wash buckets (minimum of three);
- Scrub brushes;
- Paper towels; and
- Buckets or drums with resealable lids for containing liquids generated by equipment cleaning.

Other equipment required to clean drilling equipment (e.g., steam cleaner, power washer, tub for containing wash water, etc.) is typically provided by the drilling subcontractor. The Project Manager is responsible for ensuring that the drilling subcontractor brings the required cleaning equipment to the project site. Prior to mobilization, the Project Manager should also assess the availability of a potable water supply for drilling equipment cleaning at the project site. When no accessible potable water supply is available at a project site, the drilling subcontractor will need to bring a potable water supply to the site in the drill rig water supply tank or separate support vehicle, or arrange to have a third-party supplier deliver potable water to the site.

5.2 Procedure

5.2.1 General Procedures and Considerations

The following general procedures and considerations apply to all decontamination of non-dedicated monitoring/sampling equipment activities:

- Personnel will dress in suitable PPE to reduce personal exposure during equipment decontamination activities;
- In addition to cleaning between monitoring/sampling locations, all non-dedicated monitoring/sampling equipment must be cleaned before initial use. Field staff should not assume that the equipment was properly cleaned by the last person to use it;
- Prior to starting a drilling program, the downhole drilling equipment (e.g., augers) must be inspected and any “dirty” equipment must not be used in the drilling program or it must be cleaned prior to use; and
- All liquids and solids generated by the cleaning of non-dedicated monitoring/sampling equipment are to be containerized and managed in accordance with the procedures outlined in SOP-EDR020 – Investigation Derived Wastes.

5.2.2 Decontamination of Manually Operated Monitoring/Sampling Equipment

The procedure for decontaminating manually operated monitoring/sampling equipment is as follows:

- Wash the equipment in a bucket filled with a mixture of phosphate-free soap/potable water, while using a brush to remove any obvious contamination and/or adhered soil;
- Rinse the equipment thoroughly in a bucket filled with potable water;
- Rinse the equipment thoroughly using a spray bottle filled with distilled water, capturing the rinsate in a bucket; and
- Allow the equipment to air dry. If there is insufficient time to allow the equipment to air dry before reusing, or the equipment cleaning is occurring during winter conditions, the equipment should be dried after the final rinse with a clean paper towel.

At the discretion of the Project Manager, it may be acceptable to use spray bottles, rather than buckets, for lightly contaminated equipment or if no obvious contaminants are present.

Should soil or obvious contaminants remain on the equipment after cleaning, the above procedure must be repeated until the soil or contaminants have been removed. The equipment should not be reused if repeated cleanings do not remove the soil or contaminants.

The above equipment cleaning procedure applies to, but is not limited to, the following non-dedicated monitoring/sampling equipment:

- Knives/spatulas used for soil sampling;
- Hand augers;
- Water level tapes and interface probes (both the end probe and portion of the tape that entered the well);
- The exterior of submersible pumps and interior/exterior of bladder pumps (including the portion of the electrical or retrieval cables that contact groundwater in a well); and
- Various pieces of drilling equipment, including split-spoon samplers, hollow stem auger centre plugs, continuous sampling tubes, and the reusable portions of dual-tube samplers.

At the discretion of the Project Manager, the distilled water used for the final equipment rinse will be VOC-free deionized distilled water supplied by the analytical laboratory. For example, the use of VOC-free distilled water would be appropriate for a project where trace VOCs are being investigated and it is important to minimize the potential for cross-contamination and positive bias of VOC sample results.

For tapes associated with water level tapes and interface probes, if they were submerged in a monitoring well water free of non-aqueous phase liquids or obvious contamination, the tape can be cleaned at the discretion of the Project Manager by pulling the tape through a towel dampened with phosphate-free soap/potable water as the tape is retrieved. The end probe should then be cleaned as described above.

5.2.3 Decontamination of Groundwater Sampling Pumps

The exterior of each bladder or submersible pump that is used for well development, well purging and/or groundwater sampling, and the portion of any electrical or retrieval cables that entered the well, are to be cleaned following the procedure described above for decontaminating manually operated monitoring/sampling equipment.

Submersible pumps are not designed to be disassembled in the field and cleaning of the interior of this type of pump requires flushing of cleaning solutions through the pump. After cleaning the exterior of the pump, the minimum decontamination requirement for a submersible pump is the flushing of a phosphate-free soap/potable water mixture contained in a bucket through the pump (i.e., pumping the mixture through the pump and capturing the pump outflow in the same bucket or a separate bucket), followed by flushing distilled water contained in a separate bucket through the pump and capturing the pump outflow in the same bucket or separate bucket. Note that store bought distilled water is acceptable for this purpose.

At the discretion of the Project Manager and depending on the requirements of the project, the final step in the process is a final flush with laboratory-supplied VOC-free distilled water.

The following summarizes the flushing sequence for decontaminating the interior of a submersible pump:

- Soap/water mixture*;
- Distilled water (store bought)*; and
- Distilled water (laboratory supplied VOC-free distilled water - to be confirmed by the Project Manager).

* Minimum requirement.

Bladder pumps are designed for disassembly in the field to facilitate the replacement of the bladders. The internal parts of a bladder pump are to be cleaned in accordance with the procedure described above for decontaminating manually operated monitoring/sampling equipment. Whenever possible, bladders are to be disposed of between well locations. However, if it is necessary to reuse a bladder, it must be cleaned in accordance with the procedure for cleaning manually operated monitoring/sampling equipment. It should be noted that bladders are difficult to clean and the decontamination procedure needs to be thorough.

Flushing of a bladder pump with distilled water after cleaning and reassembly is not required unless specified by the Project Manager.

5.2.4 Decontamination of Downhole Drilling Equipment

Hollow stem and solid stem augers used for borehole advancement are to be decontaminated by the drilling contractor using the following procedure:

- Wherever possible, all augers used for borehole drilling should be cleaned before initial use and between borehole locations by steam cleaning or power washing with potable water. However, the minimum requirements for auger cleaning are as follows:
  - Use a brush or shovel to remove excess soil from all used augers; and
  - Any augers that may come into contact with groundwater are to be decontaminated by steam cleaning or power washing with potable water. An auger must not be used for the balance of the drilling program if obvious contaminants or residual soil remain on the auger following decontamination, unless subsequent cleaning efforts remove these materials.

As noted previously, downhole drilling equipment used for soil sample retrieval (e.g., split-spoon samplers, continuous sampling tubes and the reusable portions of dual-tube samplers used with direct push rigs) and the hollow stem auger centre plug are to be decontaminated following the procedure outlined above for cleaning manually operated monitoring/sampling equipment.

5.3 Decontamination Records

Field personnel will be responsible for documenting the decontamination of non-dedicated monitoring/sampling equipment and drilling equipment in their field log book or field forms. The documentation should include the type of equipment cleaned and the frequency of cleaning, the methods and reagents used for equipment cleaning, and how fluids generated by the equipment cleaning were stored.

5.4 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two Environmental Assessment (ESA) in accordance with Ontario Regulation 153/04, the following additional procedures must be undertaken:

- All augers must have excess soil removed by a brush or shovel and be steam cleaned or power washed before initial use and between borehole locations regardless of whether they contact the groundwater or not (i.e., the minimum requirements listed above for auger cleaning are not sufficient); and

- Thorough records of the frequency and cleaning materials used for the decontamination of non-dedicated monitoring/sampling equipment and downhole drilling equipment must be kept. The Quality Assurance/Quality Control section of the Phase Two ESA report requires a summary of what steps were taken to minimize the potential for cross-contamination during the Phase Two ESA. The handling and disposal of fluids generated by equipment decontamination must also be well documented in the field for inclusion in the Phase Two ESA report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

SOP – EDR013 – REV004 – SAMPLE HANDLING DOCUMENTATION

Title:	Sample Handling Documentation
Practice:	EDR
First Effective Date:	August 03, 2009
Version:	004
Version Date:	January 3, 2018
Author:	Mark McCormack and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	August 03, 2009	N/A	MEM
001	November 26, 2010	Updated Approval Signature/Added reference to Ontario Regulation 511/09	FG
002	September 12, 2013	Updated text/Added tables from MOE lab protocol/Streamlined reference section/Added O. Reg. 153/04 compliance section	RLM
003	April 29, 2016	Updated Section 4.0/Aligned document retention with PEP	RLM
004	April 28, 2017	Removed reference to Pinchin West	RLM
004	January 3, 2018	Reviewed and confirmed current	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the general requirements for sample handling and documentation practices.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

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- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment Required

- Laboratory-supplied sample containers;
- Field log book or field forms; and
- Laboratory-supplied Chain-of-Custody forms.

5.2 Procedures

5.2.1 Sample Labelling

Sample labels are to be filled out in the field at the time of sampling as completely as possible by field personnel. All sample labels shall be filled out using waterproof ink. At a minimum, each label shall contain the following information:

- Sample identifier, consisting of sample location (borehole number, monitoring well number, surface sample location, etc.) and sample number (if appropriate). For example, the second soil sample collected during borehole advancement at borehole BH3 would be labelled "BH3-2";
- Pinchin project number;
- Date and time of sample collection;
- Company name (i.e., Pinchin); and
- Type of analysis.

5.2.2 Sample Containers, Preservation and Holding Times

The sample containers, sample preservation and holding times for projects in Ontario are to be those specified in Table A (for soil and sediment) and Table B (groundwater) from the Ontario Ministry of the Environment Climate Change (MOECC, formerly the Ontario Ministry of the Environment) document entitled *"Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act",* dated March 9, 2004, amended as of July 1, 2011. These tables are attached and form part of this SOP.

With reference to the attached Tables A and B, field personnel must use the sample containers appropriate for the parameters being sampled for, undertake any required field preservation or filtration and observe the sample holding times.

Each province has its own preservation and holding time regulations or guidance, which are generally similar. It is the Project Manager's responsibility to ensure that field staff are aware of, and can meet, the requirements in the province they are working in.

5.2.3 Sample Documentation

The following sections describe documentation required in the field notes and on the Chain-of-Custody forms.

Field Notes

Documentation of observations and data from the field will provide information on sample collection and also provide a permanent record of field activities. The observations and data will be recorded using a pen with permanent ink in the field log book or on field forms.

The information in the field book or field forms will, at a minimum, include the following:

- Site name;
- Name of field personnel;
- Sample location (borehole number, monitoring well number, surface sample location, etc.);
- Sample number;
- Date and time of sample collection;
- Description of sample;
- Matrix sampled;
- Sample depth (if applicable);
- Method of field preservation (if applicable);
- Whether filtration was completed for water samples;
- Analysis requested;
- Field observations;
- Results of any field measurements (e.g., field screening measurements, depth to water, etc.); and
- Volumes purged (if applicable).

In addition to the above, other pertinent information is to be recorded in the field log book or field forms depending on the type of sampling being completed (e.g., field parameter measurements and pumping rates for low flow sampling) as required by the SOP for the particular sampling activity.

Sufficient information should be recorded to allow the sampling event to be reconstructed without relying on the sampler's memory.

All field notes are to be scanned and saved to the project folder on the server immediately upon returning from the field.

Sample Chain-of-Custody

Sample Chain-of-Custody maintains the traceability of the samples from the time they are collected until the analytical data are issued by the laboratory. Initial information concerning collection of the samples will be recorded in the field log book or field forms as described above. Information on the custody, transfer, handling and shipping of samples will be recorded on a Chain-of-Custody for each sample submission.

All signed Chain-of-Custody forms will be photocopied or duplicate copies retained prior to sample shipment. A Chain-of-Custody should be laboratory-specific and will typically be supplied by the laboratory with the sample containers requested for the project. The sampler will be responsible for fully filling out the Chain-of-Custody for each sample submission.

The Chain-of-Custody will be signed by the sampler when the sampler relinquishes the samples to anyone else (i.e., courier or laboratory). Until samples are picked up by the courier or delivered to the laboratory, they must be stored in a secure area. The following information needs to be provided on the Chain-of-Custody at a minimum:

- Company name;
- Name, address, phone number, fax number and e-mail address of the main contact for the submission (typically the Project Manager);
- Project information (project number, site address, quotation number, rush turnaround number, etc.);
- Regulatory standards or criteria applicable to the samples (including whether the samples are for regulated drinking water or whether the samples are for a Record of Site Condition);
- Sample identifiers;
- Date and time of sample collection;
- Matrix (e.g., soil, groundwater, sediment, etc.);
- Field preservation information (e.g., whether groundwater samples for metals analysis were field filtered);
- Analyses required;
- Number of sample containers per sample;
- Analytical turnaround required (i.e., standard or rush turnaround);
- Sampler's name and signature;
- Date and time that custody of the samples was transferred;

- Name and signature of person accepting custody of the samples from Pinchin, and date and time of custody transfer; and
- Method of shipment (if applicable).

The person responsible for delivery of the samples to the laboratory or transfer to a courier will sign the Chain-of-Custody, retain a duplicate copy or photocopy of the Chain-of-Custody so it can be scanned and saved to the project file, document the method of shipment, and send the original copy of the Chain-of Custody with the samples.

5.3 Additional Considerations for Ontario Regulation. 153/04 Phase Two ESA Compliance

Custody seals must be placed on all coolers containing samples prior to transfer to a courier or delivery to the laboratory. The laboratory will comment on the presence/absence of custody seals in the Certificate-of-Analysis for each submission and this information must be discussed in the Quality Assurance/Quality Control section of the Phase Two Environmental Site Assessment report.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Ontario Ministry of the Environment and Climate Change, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, March 9, 2004, as amended as of July 1, 2011.

9.0 APPENDICES

Appendix I Tables A and B From Ontario MOECC Laboratory Protocol

APPENDIX I

Tables A and B From Ontario MOECC Laboratory Protocol

TABLE A: SOIL AND SEDIMENT Sample Handling and Storage Requirements

SOIL Inorganic Parameters	**Container**[1]	**Field Preservation**	**Storage Temp.**[2]	**Preserved Holding Time**[3]	**Unpreserved Holding Time**[3]
Chloride, electrical conductivity	glass, HDPE or PET	none	5 ± 3 °C		30 days as received (without lab drying); indefinite when dried at the lab
Cyanide (CN^-)	glass wide-mouth jar, Teflon™ lined lid	protect from light	5 ± 3 °C		14 days
Fraction organic carbon (FOC)	glass jar, Teflon™ lined lid	none	5 ± 3 °C		28 days as received(without lab drying); indefinite storage time when dried
Hexavalent chromium	glass, HDPE	none	5 ± 3 °C		30 days as received
Metals (includes hydride-forming metals, SAR, HWS boron, calcium, magnesium, sodium)	glass, HDPE	none	5 ± 3 °C		180 days as received (without lab drying); indefinite when dried at the lab
Mercury, methyl mercury	glass, HDPE or PET	none	5 ± 3 °C		28 days
pH	glass, HDPE or PET	none	5 ± 3 °C		30 days as received
SOIL Organic Parameters	**Container** [1,5,6,7,20]	**Field Preservation**	**Storage Temp.**[2]	**Preserved Holding Time**[3]	**Unpreserved Holding Time**[3]
BTEX[8], PHCs (F1)[8], THMs, VOCs[7] **NB: SEE FOOTNOTE #20**	40–60 mL glass vial (charged with methanol preservative, pre-weighed)[6] AND glass jar (for moisture content) [hermetic samplers are an acceptable alternative[5, 18]]	methanol (aqueous $NaHSO_4$ is an acceptable alternative for bromomethane)[6, 7, 18,20]	5 ± 3 °C	14 days	hermetic samples: stabilize with methanol preservative within 48 hours of sampling[18]
1,4-Dioxane[9, 15]	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[9,15,18]		5 ± 3 °C	14 days	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[18]
PHCs (F2–F4)	glass wide-mouth jar, Teflon™ lined lid	none	5 ± 3 °C		14 days
ABNs, CPs, OCs, PAHs	glass wide-mouth jar, Teflon™ lined lid	none	5 ± 3 °C		60 days
Dioxins and furans, PCBs	glass wide-mouth jar Teflon™ lined lid	none	5 ± 3 °C		indefinite storage time

HDPE = high density polyethylene; PET = polyethylene terephthalate; HWS = hot water soluble boron; THM = trihalomethanes; VOC = volatile organic compounds; BTEX = benzene, toluene, ethylbenzene, xylenes; PHCs = petroleum hydrocarbons; CPs = chlorophenols; PCBs = polychlorinated biphenyls; OCs = organochlorine pesticides

[1–20]footnotes immediately follow Table B

TABLE B: GROUND WATER Sample Handling and Storage Requirement

GROUND WATER Inorganic Parameters	**Container[10]**	**Field Preservation**	**Storage Temperature[2]**	**Preserved Holding Time[3]**	**Unpreserved Holding Time[3]**
Chloride, electrical conductivity, pH	HDPE or glass	none	5 ± 3 °C		28 days
Cyanide (CN^-)	HDPE or glass	NaOH to a pH > 12	5 ± 3 °C	14 days	must be field preserved
Hexavalent chromium	HDPE or glass	field filter followed by buffer solution to a pH 9.3–9.7 [17]	5 ± 3 °C	28 days[17]	24 hours[17]
Metals (includes hydride-forming metals, calcium, magnesium, sodium)	HDPE or Teflon™ [10]	field filter followed by HNO_3 to pH < 2[11]	room temperature when preserved	60 days	must be field preserved
Mercury	glass or Teflon™ [10]	field filter followed by HCl to pH < 2[11]	room temperature when preserved	28 days	must be field preserved
Methyl mercury	glass or Teflon™	DO NOT FILTER HCl or H_2SO_4 to pH <2[12]	5 ± 3 °C	28 days	DO NOT FILTER must be field preserved[12]
GROUND WATER Organic Parameters[10, 13, 14]	**Container[10, 13, 14]**	**Field Preservation**	**Storage Temperature[2]**	**Preserved Holding Time[3]**	**Unpreserved Holding Time[3]**
BTEX, PHCs (F1),THMs, VOCs;	40–60 mL glass vials (minimum of 2)[14] (no headspace)	$NaHSO_4$ or HCl to a pH < 2[16]	5 ± 3 °C	14 days	7 days
1,4-Dioxane[9, 15]	when processed as a VOC sample: same as per VOCs above; when processed as an extractable: same as per ABNs below; (consult laboratory)[9, 15]		5 ± 3 °C	14 days	14 days
PHCs (F2–F4)	1L amber glass bottle, Teflon™ lined lid	$NaHSO_4$ or HCl to a pH < 2[16]	5 ± 3 °C	40 days	7 days
ABNs, CP, OCs, PAHs[19], PCBs	1L amber glass bottle, Teflon™ lined lid	none	5 ± 3 °C		14 days
Dioxins and furans	1L amber glass bottle, Teflon™ lined lid	None	5 ± 3 °C		indefinite storage time

HDPE = high density polyethylene;THM = trihalomethanes; VOC = volatile organic compounds; BTEX = benzene, toluene, ethylbenzene, xylenes; PHCs = petroleum hydrocarbons; CPs = chlorophenols; PCBs = polychlorinated biphenyls; OCs = organochlorine pesticides

1 One soil container is generally sufficient for inorganic analysis and another for extractable organics. A separate container is required for BTEX, THM, VOC and PHC (F1) moisture analysis.

2 Storage temperature refers to storage at the laboratory. Samples should be cooled and transported as soon as possible after collection.

3 Holding time refers to the time delay between time of sample collection and time stabilization/analysis is initiated. For samples stabilized with methanol, the hold time for the recovered methanol extract is up to 40 days.

[4] PET can not be used for samples requiring antimony analysis.

[5] As an alternative, the USEPA has investigated hermetic sample devices that take and seal a single core sample. The sample is submitted as is to the laboratory where it is extruded into an extracting solvent. Samples must be received at the laboratory within 48 hours of sampling. (Note that replicate samples are necessary for bisulphate and methanol extraction for all samples plus laboratory duplicates and spikes.) Consult the laboratory for the number of samples required.

[6] The USEPA has approved field preservation. Pre-weighed vials containing known weights of methanol preservative (or aqueous sodium bisulphate if used for bromomethane) are sent to the field. Sample cores (approximately 5 g) are extruded directly into the vial. The vials are sealed, and submitted directly to the laboratory. In practice, this technique requires great care to prevent losses of methanol due to leaking vials or through splashing. Consult the laboratory for the number of containers required.

[7] Methanol-preserved samples may elevate the detection limit for bromomethane (VOC); a separate bisulphate-preserved sample or hermetically sealed sample may be submitted at the time of sampling if bromomethane is a chemical of concern – contact the laboratory to determine if a separate sample should be collected.

[8] For BTEX and PHC (F1) pre-charging the soil sampling container with methanol preservative is an accepted deviation from the CCME method.

[9] 1,4-Dioxane may be analyzed with the ABNs or VOCs; sample container requirements used for ABNs or VOCs are both acceptable. If 1,4-dioxane is to be analyzed with ABNs, follow the ABN sample container requirements; similarly if it is to be analyzed with VOCs, follow VOC sample container requirements. Consult the laboratory for the container type and the total number required (see also footnote #15).

[10] Samples containing visual sediment at the time of analysis should be documented and noted on the Certificate of Analysis or written report as results may be biased high due to the inclusion of sediment in the extraction.

[11] Field filter with 0.45µm immediately prior to adding preservative or filling pre-charged container.

[12] Sample directly into a HCl or H_2SO_4 preserved container, or add acid to an unfiltered sample immediately after sample collection in the field.

[13] Aqueous organic samples should be protected from light. If amber bottles are not available, glass should be wrapped in foil.

[14] Separate containers are required for each organic water analysis. Consult the laboratory for required volumes. Chloride and electrical conductivity can be taken from the same container.

[15] For 1,4-dioxane in soil and sediment, no preservative is required if processed as an ABN, however. Methanol is an acceptable alternative if processed as a VOC. For 1,4-dioxane in groundwater, no preservative is required, however, $NaHSO_4$ or HCl are acceptable alternatives.

[16] Preserved to reduce biodegradation, however effervescence/degassing may occur in some ground water samples. In this case, rinse preservative out three times with sample and submit to the laboratory as unpreserved.

[17] To achieve the 28-day holding time, use the ammonium sulfate buffer solution [i.e., $(NH_4)_2SO_4/NH_4OH$] or $(NH_4)_2SO_4/NH_4OH/NaOH + NaOH$] as specified in EPA Method 218.6 (revision 3.3, 1994) or Standard Methods 3500-Cr Chromium (2009).Using only NaOH without the ammonium sulfate buffer to adjust the pH would require analysis within 24 hours of sampling.

[18] Alternatively, to achieve a longer hold time, hermetic samples may be frozen within 48 hours of sampling as per ASTM method D6418 – 09; however, storage stability must be validated by the laboratory with no more than 10% losses.

[19] For benzo(a)pyrene in ground water samples filtration prior to analysis on a duplicate sample is permitted.

[20] For VOC, BTEX, F1 PHCs, 1,4 dioxane soil samples collected before July 1, 2011, the following sampling and handling requirements are also permitted.

SOIL Organic Parameters	Container	Preservative	Storage Temperature	Preserved Holding Time	Unpreserved Holding Time
VOC, BTEX, F1 PHCs, 1,4-dioxane*	glass jar, Teflon lined lid, no headspace, separate container required Hermetic samplers are an acceptable alternative	none field preservation with aqueous sodium bisulphate and methanol is an acceptable alternative	5 ± 3C	See notations 1-3 below	Stabilize by extraction or freezing within 48 hrs of receipt at the laboratory (7days from sampling). Frozen or field preserved samples must be extracted within 14 days of sampling.

*Special care must be used when sampling for VOC, BTEX and F1 in soil and sediment. Studies have shown that substantial losses can occur through volatilization and bacterial degradation. There are several allowable options for field collection of samples. Each is discussed below. Consult SW846, Method 5035A for additional detail. The laboratory is required to stabilize the sample on the day of receipt, either by extraction or freezing.

1. Collection in soil containers: To minimize volatilization losses, minimize sample handling and mixing during the process of filling the sample container. The bottle should be filled with headspace and voids minimized. Care is required to ensure that no soil remains on the threads of the jar, preventing a tight seal and allowing volatilization losses. To minimize losses through bacterial degradation, commence cooling of the samples immediately and transport the samples to the lab as soon as possible, ideally on the day of sampling. Samples must be received at the laboratory within 48 hours of sampling. Freezing can be used to extend the hold time to 14 days, however the practice is difficult to implement in the field and can cause sample breakage.
2. As an alternative, the USEPA has investigated hermetic sample devices that take and seal a single core sample. The sampler is submitted as is to the laboratory where it is extruded into the extracting solvent. Samples must be received at the laboratory within 48 hours of sampling. This technique minimizes volatilization losses and is worth consideration for critical sites. (Note that replicate samplers are necessary for bisulphate and methanol extraction for all samples plus lab duplicates and spikes). Consult the laboratory for the number of samplers required.
3 The USEPA has also approved field preservation. Pre-weighed vials containing known weights of methanol and aqueous sodium bisulphate preservative are sent to the field. Sample cores (≈5 g) are extruded directly into the vial. The vials are sealed, and submitted directly to the laboratory. In practice, this technique requires great care to implement successfully. Losses due to leaking vials, through splashing and effervescence (aqueous bisulphate) can easily occur and make the sample unusable. Consult the laboratory for the number of containers required.

SOP – EDR019 – REV004 – SOIL SAMPLE LOGGING

Title:	Soil Sample Logging
Practice:	EDR
First Effective Date:	August 03, 2013
Version:	004
Version Date:	January 3, 2018
Author:	Francesco Gagliardi and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	November 26, 2010	N/A	FG
001	October 31, 2013	Streamlined SOP to focus only on soil sample logging/Added O. Reg. 153/04 compliance section	RLM
002	April 29, 2016	Updated Section 4.0	RLM
003	April 28, 2017	Removed reference to Pinchin West	RLM
004	January 3, 2018	Modified percentages of minor constituents in Section 5.1.3/Clarified when geotechnical terms can be used for soil logging in Section 5.2	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents the methods used to describe the physical characteristics of soil samples collected during site investigations.

The methods and equipment used for retrieving soil samples are provided in other SOPs (e.g., SOP-EDR007 – Borehole Drilling) and will not be repeated herein.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 General Procedures

For each soil sample collected during a site investigation, the following information is to be recorded in the field log book or field forms in the order presented below:

- Depth;
- Primary soil texture;
- Colour;
- Minor constituents*;
- Noticeable odours;
- Noticeable staining;
- Noticeable free-phase product/sheen*; and
- Moisture content.

*These constituents only need to be noted if they are actually present in the sample.

5.1.1 Primary Soil Texture

The primary soil texture should be determined using the attached flow chart as a guide to help classify the soil.

5.1.2 Colour

Describe the primary colour of the soil sample (e.g., brown, grey, black, green, white, yellow, red). The relative lightness or darkness of the primary colour can be described using the adjectives “light” or “dark” as appropriate. Soil that exhibits different shades or tints is to be described by using two colours (e.g., brown-grey). If the soil sample contains spots of a different colour, this is to be described as “mottling” (e.g., grey with green mottling).

5.1.3 Minor Constituents

Note the presence of minor constituents in the soil that are “natural” materials (e.g., gravel, cobbles, sand, oxidation, etc.) or “man-made” materials (e.g., asphalt, brick, concrete, coal or glass fragments, coal ash, etc.). Gravel comprises particles between 5 millimetres (mm) and 75 mm in diameter. Cobbles comprise particles greater than 75 mm in diameter (approximately the size of a man’s fist) and boulders are particles greater than 150 mm in diameter (approximately the size of man’s head).

When the percentage of the minor constituents in the soil is between approximately 1 and 10%, the adjective used to describe the relative amount of the minor constituent is “trace” (e.g., silty sand with trace brick fragments).

When the percentage of minor constituents of soil is between approximately 10 and 20%, the adjective used to describe the relative amount of the minor constituent is “some” (e.g., silty sand with some concrete fragments).

When the percentage of the “natural” minor soil constituents is between approximately 20 and 35%, the minor soil type is described by adding a ‘y’ or ‘ey’ to the soil type (e.g., silty, sandy, clayey).

When the percentage of the “natural” minor soil constituents is also greater than 35%, the minor soil type is described by using “and” the soil type (e.g., sand and gravel, sand and silt).

When the percentage of the “man-made” minor soil constituents is between approximately 30 and 50%, describe the soil as per the normal procedure and add “with” the minor constituent type(s) (e.g., silty sand with coal ash and brick fragments).

5.1.4 Noticeable Odours

Field staff are not expected to directly smell soil samples to assess the presence/absence of odours.

If it is possible to identify the likely type of odour then this information should be recorded along with a comment on the severity of the odour (e.g., slight, strong, etc.). Identification of specific chemical compounds, such as petroleum hydrocarbons (PHCs) or solvents is acceptable; however, this identification should be referenced as “xxxx-like” (e.g., PHC-like, solvent-like, etc.). This principle also applies when describing staining and free-phase product.

If the odour cannot be readily identified, it should be described in the field notes as “unidentified odour”. If no noticeable odours are observed, this needs to be recorded in the field notes as “no odour”.

5.1.5 Noticeable Staining

Describe the colour and possible source of the staining (e.g., black PHC-like staining).

If no noticeable staining is observed, this needs to be recorded in the field notes as “no staining”.

5.1.6 Noticeable Free-Phase Product/Sheen

Describe the colour, odour, possible composition and relative viscosity (if sufficient product is present to assess) of the product (e.g., dark brown, viscous, motor oil-like product). Identification of the composition of the product is acceptable but needs to be described as PHC-like, motor oil-like. Alternatively, the product can be described as “resembling” a substance (e.g., “resembling motor oil”).

The presence of any observed iridescent sheen is to be recorded in the field notes. Note that the presence of an iridescent sheen by itself in the soil does not constitute the presence of free-phase product but may be an indicator that free-phase product is present within the vicinity of the borehole.

5.1.7 Moisture Content

Describe the moisture content of the soil sample using one of the following three terms:

- Dry – no visible evidence of water and the soil is dry to the touch;
- Moist – visible evidence of water but the soil is relatively dry to the touch. Do not use the term “damp” to describe this type of soil; and
- Wet – visible evidence of water and the soil is wet to the touch. Free water is evident when sandy soil is squeezed. Do not use the term “saturated” to describe this type of soil.

5.1.8 Recording Soil Sample Descriptions in Field Notes

Recording the information in the field notes consistently in the above order will make it easier to prepare the borehole logs for the site investigation report.

Example soil sample descriptions are as follows:

- Sand, grey, trace gravel, PHC-like odours, free-phase PHC-like product, wet;
- Silty sand, brownish-grey, some gravel, trace asphalt and brick fragments, no odours or staining, moist; and
- Silty clay, brown, trace gravel, no odours or staining, moist to wet at 2.4 mbgs.

5.2 General Considerations

Where any physical properties change within a soil sample, the depth at which this transition takes place needs to be recorded. For example, for a soil sample collected from 1.8 to 2.4 metres below ground surface (mbgs), if the upper 0.3 metres has no odours but PHC-like odours are present below this depth then the field notes need to state “no odours from 1.8 to 2.1 mbgs, PHC-like odours from 2.1 to 2.4 mbgs”.

Some soil samples will contain a thin seam of a different soil type, such as a sand seam within a silty clay. The depth interval of any such seam is to be recorded in the field notes, and the material comprising the seam should be described separately using the logging procedure outlined above.

Unless soil sampling is being completed as part of a combined environmental/geotechnical investigation and EDR staff logging the soil samples have the appropriate geotechnical training, avoid the use of geotechnical terms (e.g., stiff, dense, high plasticity, etc.) when logging soil samples. If any geotechnical terms are inadvertently included in the field notes by staff who have not had geotechnical training, they must not be included in the borehole logs provided in our report.

5.3 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

None. Following this SOP will be sufficient to comply with the Ontario Regulation 153/04 requirements for Phase Two ESAs with respect to field logging. Risk assessments completed in accordance with Ontario Regulation 153/04 will typically require soil samples to be submitted to a laboratory for full soil texture analysis, but this is beyond the scope of field logging.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

American Society for Testing and Materials, *ASTM D2487-11 - Standard Practice for Classification of Soils for Engineering Purposes (United Soil Classification System)*, 2011.

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)*, April 2011.

9.0 APPENDICES

Appendix 1 Soil Texture by Feel Chart

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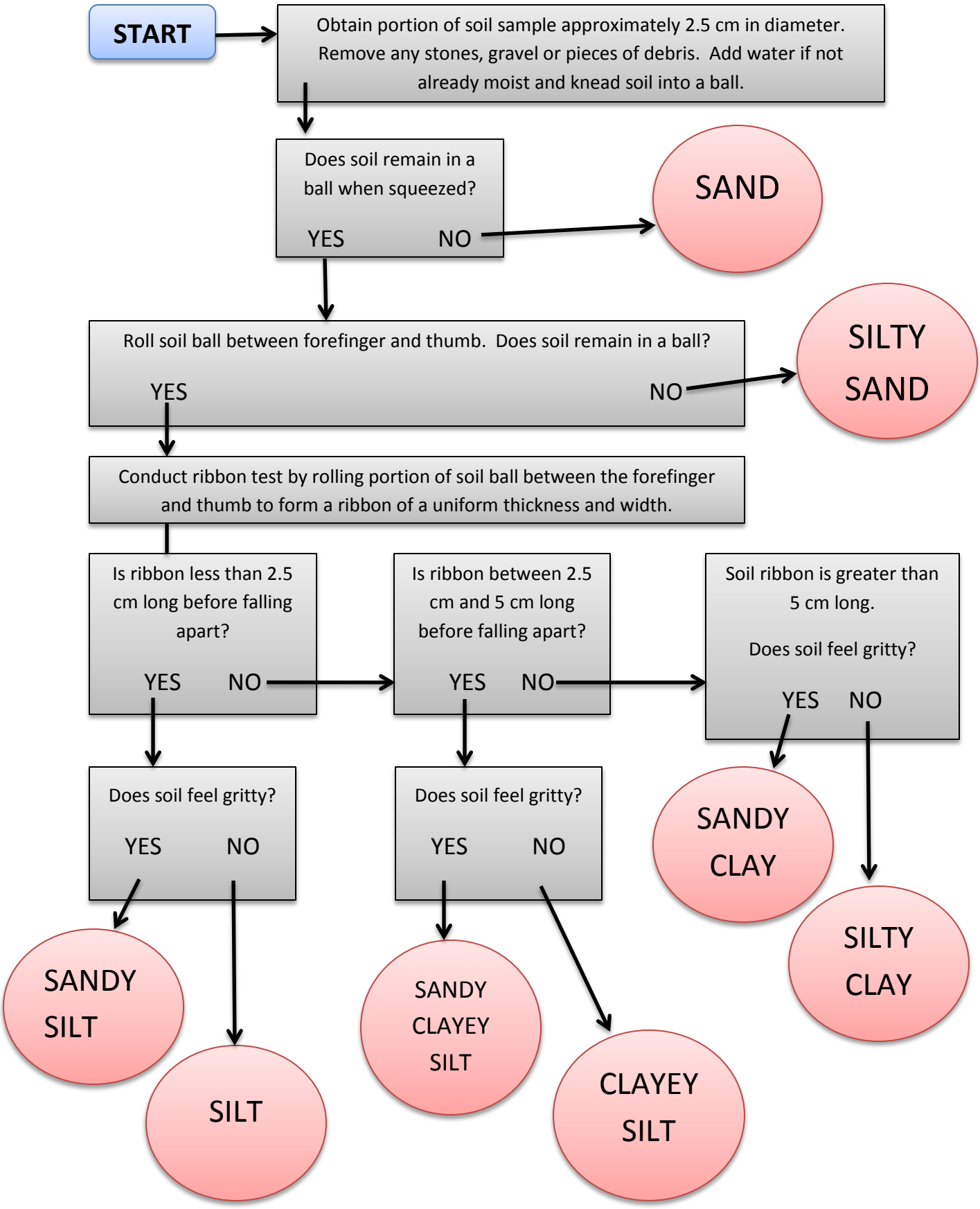
Template: Master SOP Template – February 2014

APPENDIX I

Soil Texture by Feel Chart

Key to Soil Texture by Feel



SOP – EDR025 – REV004 – QA/QC SAMPLING

Title:	QA/QC Sampling
Practice:	EDR
First Effective Date:	January 17, 2014
Version:	004
Version Date:	January 3, 2018
Author:	Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	January 17, 2014	N/A	RLM
001	June 26, 2014	Amended blind duplicate sampling requirements	RLM
002	April 29, 2016	Updated Section 4.0/Amended O.Reg. 153/04 trip blank requirements	RLM
003	April 28, 2017	Removed reference to Pinchin West	RLM
004	January 3, 2018	In Section 5.2.6, clarified order of regular investigative sample and duplicate sample collection	RLM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) describes the standard procedures for collecting soil, water and sediment samples for quality assurance/quality control (QA/QC) purposes.

A QA/QC program is essentially a management system that ensures that quality standards are met within a stated level of confidence. The QC component of the program comprises daily activities in the field and laboratory that are used to control the quality of both the samples collected and the sample analytical data. The QA component of the program is made up of measures used to determine whether the QC activities are effective.

When completing a site investigation, one of our primary goals is to obtain analytical data that are representative of actual soil, water and/or sediment conditions at the site. The completion of a QA/QC program, consisting of the collection and analysis of various QA/QC samples, provides information for use in evaluating the accuracy of the analytical data used to assess the environmental quality of the site.

The type and number of samples comprising the QA/QC program will be determined by the Project Manager on a site-by-site basis, but will typically include at a minimum a trip blank when collecting water samples for volatile parameter analysis and duplicate soil, water or sediment samples. Other types of QA/QC samples may be collected (e.g., equipment or field blanks) to meet project-specific requirements at the discretion of the Project Manager or to meet regulatory requirements.

The QA/QC sampling requirements and procedures for indoor air, soil vapour and sorbent tube samples are described in SOP-EDR012, SOP-EDR018 and SOP-EDR027, respectively.

3.0 OVERVIEW

The types of samples collected for the QA/QC program during site investigations may include the following:

- Trip blanks;
- Field blanks;
- Equipment blanks; and
- Field duplicates.

Trip blanks are used to assess whether ambient air conditions may have resulted in positive bias of water samples collected for volatile parameter analysis during transportation of the sample containers to and from a project site. Note that the term “positive bias” means that reported sample concentrations are greater than actual in situ sample concentrations due to some form of “cross-contamination”.

Field blanks are collected to assess whether ambient air conditions may have resulted in positive bias of samples collected at a project site for volatile parameter analysis at the time of sampling.

Equipment blanks are collected to assess the efficiency of non-dedicated monitoring/sampling equipment cleaning procedures.

Duplicate samples are collected to assess whether field sampling and laboratory analytical methods are suitable and reproducible.

The analytical results of the QA/QC samples are reviewed by the Project Manager to assess whether any data quality issues are evident which may affect the interpretation of the soil, water and/or sediment sample analytical data.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document.

This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and
- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

5.1 Equipment and Supplies

The equipment/supplies required for QA/QC sample collection are the same as that used for regular investigative sampling, except for the following:

- Volatile organic compound (VOC)-free distilled water supplied by the analytical laboratory for use in the collection of field blanks and/or equipment blanks;
- Additional sample jars supplied by the analytical laboratory for the collection of field blanks, equipment blanks and field duplicates; and
- Trip blanks supplied by the analytical laboratory.

5.2 QA/QC Sampling Procedures

5.2.1 General Procedures for QA/QC Blank Sampling

The analytical laboratory that will be completing the analysis of the regular investigative samples and QA/QC samples for a project must supply the water used to collect field blanks and equipment blanks. Water provided by another analytical laboratory or store-bought distilled water must not be used.

5.2.2 Trip Blanks

A trip blank is a set of VOC sample vials filled by the analytical laboratory with VOC-free distilled water and shipped with the sample containers. A trip blank is to be stored with the sample containers provided by the analytical laboratory during travel to the project site, while on the project site, and during travel from the project site back to the analytical laboratory. The sample containers comprising a trip blank are not to be opened in the field.

For some projects, submissions of volatile parameter samples to the analytical laboratory over several days will be required. In this case, a trip blank sample should accompany each submission to the laboratory. If this situation is anticipated, the Project Manager must request that the analytical laboratory provide sufficient trip blanks so that a trip blank can accompany the submission of each set of samples to the laboratory.

Trip blanks are to be analyzed for the same volatile parameters (i.e., VOCs and/or petroleum hydrocarbons (PHCs) (F1 fraction)) as the regular investigative samples. For example, if the groundwater sampling program includes analysis of VOCs and PHCs (F1-F4 fractions), then the trip blank(s) require analysis of VOCs and PHCs (F1 fraction). If the groundwater sampling program only includes VOC analysis, then the trip blank(s) require analysis of VOCs only.

Unless specified by the Project Manager, trip blanks are not required for soil and sediment sampling, or for water sampling involving only non-volatile parameters. At the discretion of the Project Manager and to meet project-specific requirements, trip blanks for non-volatile parameters can be prepared and analyzed using the same principles as for volatile parameter trip blanks.

5.2.3 Field Blanks

A field blank is a set of VOC sample vials filled during a sampling event at a project site with VOC-free distilled water supplied by the analytical laboratory and submitted for analysis of volatile parameters (i.e., VOCs and/or PHCs (F1 fraction)).

Field blanks are to be collected at a sample location considered “worst case” with respect to ambient air conditions (e.g., adjacent to and downwind of the pump island of an active retail fuel outlet, inside an active on-the-premises dry cleaner, etc.). At project sites where there is no obvious “worst case” ambient air location, the field blank can be collected at a sampling location picked randomly. The field blank collection location and rationale for selecting it must be documented in the field notes.

If a groundwater sampling event at a project site occurs over more than one day, a field blank is to be collected for each day of sampling.

Some project sites may have an isolated area where the ambient air conditions are significantly poorer than the remainder of the site and a field blank collected from this area may not be representative of conditions elsewhere on the site. In this case, at the discretion of the Project Manager, the collection of two field blanks may be appropriate, with one field blank collected from the poor ambient air area and one field blank collected from a location outside of this area.

Unless specified by the Project Manager, field blanks are not required for soil and sediment sampling, or for water sampling involving only non-volatile parameters. At the discretion of the Project Manager and to meet project-specific requirements, field blanks for non-volatile parameters can be collected and analyzed using the same principles as for volatile parameter field blanks.

5.2.4 Equipment Blanks

An equipment blank is collected by pouring VOC-free distilled water supplied by the analytical laboratory either over or through non-dedicated sampling/monitoring equipment that has been cleaned following sampling/monitoring using the procedures outlined in SOP-EDR009. The resulting rinsate is then captured in sample containers appropriate for the intended analysis. Note that the surface over which the distilled water is poured must be the surface from which samples are collected from or that is in contact with the medium being monitored. For example, if an equipment blank is being collected from a split-spoon sampler, the distilled water must be poured through the interior of the sampler, and not the exterior of the sampler.

The Project Manager will be responsible for determining the sampling/monitoring equipment from which equipment blanks will be obtained, the number of equipment blanks and the parameters to be analyzed. Regarding the latter, the parameters analyzed for equipment blanks are typically the parameters of concern for a given project site.

5.2.5 Evaluation of Blank Sample Results

The Project Manager will evaluate the results of the blank sample analysis to assess whether these results show that bias may have been introduced to investigative samples collected during the field sampling activities. Judgement by the Project Manager will be required to assess whether the blank sample results have any effect on the interpretation of the investigative sample results. This is assessed on a case-by-case basis, but the following general principles can be applied:

- If all soil, groundwater and/or sediment samples collected for a site investigation meet the applicable environmental standards/criteria, the presence of detectable or elevated parameter concentrations in the blanks has no effect on the interpretation of the investigative sample results;
- If parameters have detectable or elevated concentrations in the blank samples but none of these parameters are present in the regular investigative samples at concentrations exceeding the applicable environmental standards/criteria, the blank sample results have no effect on the interpretation of the investigative sample results;
- If parameters have detectable or elevated parameter concentrations in the blank samples and one or more of these parameters are present in the regular investigative samples at concentrations exceeding the applicable environmental standards/criteria, then positive bias of the regular investigative samples may have occurred. The Project Manager will need to assess a number of variables, including the relative parameter concentrations in the blank and regular investigative samples, to determine whether the regular investigative sample data are considered representative and usable for assessing the environmental quality of the site. If the regular investigative sample data are questionable, then resampling may be required; and
- If the regular investigative samples have exceedances of the applicable environmental standards/criteria and the blank samples have non-detectable parameter concentrations, the blank sample results have no effect on the interpretation of the investigative sample results.

5.2.6 General Procedures for QA/QC Duplicate Sampling

Whenever possible, duplicate samples are to be collected from "worst case" sample locations. The reason for this is that Relative Percent Differences (RPDs) are calculated using the analytical results of the duplicate and regular investigative samples to evaluate the suitability and reproducibility of field sampling and laboratory analytical methods. However, RPDs for a given parameter can only be calculated if there are detectable concentrations in both samples, and "worst case" sample locations are the most likely to have detectable levels of parameters of concern. The calculation and evaluation of RPDs is discussed at the end of this section.

When filling sample containers, the order of collection is to fill the sample container for a particular parameter or parameters for the regular investigative sample first and then fill the sample container for the same parameter or parameters for the duplicate sample second. For example, if groundwater was being sampled for PAHs and metals and a duplicate sample was required, the order of filling the sample containers would regular investigative sample for PAHs, duplicate sample for PAHs, regular investigative sample for metals and duplicate sample for metals.

5.2.7 Field Duplicate Samples – Soil/Sediment

Soils/sediments are frequently heterogeneous because they are typically deposited in horizontal layers over time, causing both small scale and large scale grain size variations that can often result in significant variations in contaminant concentrations between layers. Because of this, it is important that duplicate soil/sediment samples be collected from the same vertical depths as the regular investigative samples in sample cores or at discrete sampling locations (e.g., grab samples).

When collecting a duplicate soil/sediment sample from a sampling device that provides a soil core (e.g., dual-tube sampler, split-spoon sampler), the soil core is to be split in half vertically (i.e., longitudinally). A portion of one half of the core is used for the regular investigative sample and a portion of the other half of the core is used for the duplicate sample. The portion of each core placed in sample jars for analysis must be obtained from the same depth interval within the cores.

When collecting a duplicate soil/sediment sample from a grab sample (e.g., excavation floor or sidewall), the field duplicate sample must be collected as close as possible to the regular investigative sample location at the sample depth and within the same soil layer.

There are no special procedures for collecting field duplicates of composite soil/sediment samples given that the soil/sediment is homogenized during the composite sample collection procedure.

A field duplicate soil/sediment sample must be collected at the same time as the regular investigative sample. Retroactively splitting a soil/sediment sample to obtain a field duplicate sample is not permitted.

5.2.8 Field Duplicate Samples – Surface Water/Potable Water/Groundwater

There are no special procedures for collecting surface water/potable water/groundwater field duplicate samples with the following exceptions:

- When collecting a duplicate water sample for metals analysis and field filtering is required, a new filter is to be used to collect the duplicate sample unless the groundwater has a low sediment content; and
- When collecting a duplicate surface water sample, the sample containers for the same parameter(s) should be immersed in the surface water body at the same location and at the same time whenever possible.

5.2.9 Duplicate Sample Labelling

The duplicate sample should have the term “DUP” in the sample identifier to distinguish it as a duplicate sample.

5.2.10 Evaluation of Duplicate Sample Results

Duplicate sample results are evaluated by calculating RPDs using the following equation:

$$RPD = \frac{\text{Absolute Value (Original Concentration – Duplicate Concentration)}}{\text{(Original Concentration + Duplicate Concentration)/2}} \times 100\%$$

RPDs are not calculated unless the parameter concentrations in both the regular investigative sample and duplicate sample are detectable concentrations above the corresponding practical quantitation limit (PQL) for the parameter, which is equal to five times the lowest laboratory reportable detection limit (RDL).

For example, if the RDL for a parameter is 0.1 parts per million (ppm), and the concentration in the regular investigative sample is 0.4 ppm and the concentration in the duplicate sample is 0.6 ppm, the RPD cannot be calculated because the concentration in the regular investigative sample (0.4 ppm) is less than the PQL of 0.5 ppm (5 times the RDL of 0.1 ppm).

Also, if the regular investigative sample concentration is 2 ppm and the duplicate sample concentration is <1 ppm, then the RPD cannot be calculated regardless of the PQL since detectable concentrations were not reported for both samples.

Calculated RPDs for the regular investigative and field duplicate samples are compared to established performance standards to evaluate the suitability and reproducibility of field sampling and laboratory analytical methods. In Ontario, the Ontario Ministry of the Environment and Climate Change (formerly the Ontario Ministry of the Environment) provides duplicate sample performance standards in the document *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the*

Environmental Protection Act, dated March 9, 2004, amended as of July 1, 2011. Although these performance standards only strictly apply to laboratory duplicate samples, they are considered suitable for comparison to field duplicate samples. Other provinces provide their own similar guidance.

When calculated RPDs exceed the performance standards, the Project Manager will evaluate whether these results have any effect on the interpretation of the investigative sample results. This is judged on a case-by-case basis, but in many situations RPD values above the performance standards can be attributed to small scale heterogeneity inherent in soil samples or variations in the quantity of sediment in groundwater or surface water samples, and are not indicative of poor field sampling or laboratory procedures. The results of internal laboratory QA/QC sampling may provide additional information as to the precision of the data. Furthermore, if all soil, water and/or sediment samples collected for a site investigation meet the applicable environmental standards/criteria, the apparent lack of precision shown by elevated RPD values should not affect the interpretation of the investigative sample results.

Sometimes a regular investigative sample will meet the applicable environmental standards/criteria and its corresponding duplicate sample will fail the applicable environmental standards/criteria (or vice versa). In Ontario, it is permitted to average the parameter concentrations of two samples provided they are collected at the same time and from the same sample location and depth. The resulting average parameter concentrations are then compared with the applicable standards to determine whether the sample meets or fails the standards. This approach is not acceptable in all jurisdictions. In situations where averaging is not acceptable to the regulatory agency, the “worst case” sample result is to be used in assessing the environmental condition of the project site.

5.3 Fieldwork Records

The field notes must include the following information with respect to QA/QC samples:

- The date and time of sampling for all blank/duplicate samples;
- The sample location for field blanks and the rationale for selecting the field blank locations;
- The type of equipment from which a rinsate was collected for equipment blanks and the parameters to be analyzed; and
- The corresponding regular investigative sample location/sample interval for duplicate samples and the parameters to be analyzed.

5.4 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two ESA in accordance with Ontario Regulation 153/04, the QA/QC sampling program must consist of the following as a minimum:

- At least one field duplicate soil, sediment or groundwater sample must be collected for every ten samples submitted for analysis. The frequency is one duplicate sample for one to 10 regular investigative samples, two duplicate samples for 11 to 20 samples, etc. for all parameters analyzed. For example, even if only one groundwater sample is collected for PAHs analysis, a duplicate of this sample must be collected.

When sampling for VOCs, one trip blank sample must be submitted to the laboratory for VOCs analysis for each submission to the laboratory. In other words, if a groundwater sampling program lasts three days and samples are submitted to the laboratory at the end of each day, there must be a total of three trip blanks submitted with the samples (i.e., one per day of sampling). Note that analysis of trip blank samples for other volatile parameters (e.g., PHCs (F1 Fraction)) is not mandatory but can be completed at the discretion of the Qualified Person.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Association of Professional Geoscientists of Ontario, *Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended),* April 2011.

Ontario Ministry of the Environment and Climate Change, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, March 9, 2004, as amended as of July 1, 2011.

Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Province of British Columbia, *British Columbia Field Sampling Manual*, 2003.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

SOP – EDR026 – REV005 – VERTICAL ELEVATION SURVEYING

Title:	Vertical Elevation Survey
Practice:	EDR
First Effective Date:	April 3, 2014
Version:	005
Version Date:	January 3, 2018
Author:	Kathryn Matheson and Robert MacKenzie
Authorized by:	Robert MacKenzie
Signature:	

TABLE OF CONTENTS

1.0 VERSION HISTORY

Version	Date	Summary of Changes	Author
Original	April 2, 2014	N/A	KM
001	April 22, 2014	Text and figure edits	KM/RM
002	January 22, 2015	Added instruction regarding need to include a least one TP in a survey	RM
003	April 29, 2016	Updated Section 4.0	RM
004	April 28, 2017	Removed reference to Pinchin West	RM
005	January 3, 2018	Minor wording changes throughout	RM

2.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) presents a description of the methods employed for the completion of vertical elevation surveys of monitoring wells.

Relative vertical elevation surveys are typically completed on sites where three or more monitoring wells have been installed in order to allow for the triangulation of groundwater flow direction. The relative vertical elevation surveys completed by Pinchin are typically not used to determine elevations relative to sea level. However, if elevations relative to sea level are needed, a local benchmark with a known geodetic elevation is required.

Two methods are available for the completion of vertical elevation surveys: completion of the survey using a manual scope and survey rod (which requires a two-person team); or completion of the survey using a laser level. The use of a laser level and associated sensor is the most common surveying method used by Pinchin and will be the focus of this SOP. With minor modifications, this SOP can also be used for “conventional” surveying using a manual scope, survey rod and two-person team.

3.0 OVERVIEW

Not applicable.

4.0 DISTRIBUTION

This is an on-line document. Paper copies are valid only on the day they are printed. Refer to the author if you are in any doubt about the accuracy of this document. This SOP will be distributed to all Pinchin staff and others as follows:

- Posted to the SOP section of the Environmental Due Diligence and Remediation (EDR) Practice Line on the Pinchin Orchard; and

- Distributed to senior staff at Le Groupe Gesfor Poirier and Pinchin LeBlanc for distribution as appropriate.

5.0 PROCEDURE

The following terms are used in the completion of a vertical elevation survey:

Temporary Benchmark (TBM): A permanent landmark either on the site, or in a nearby location, which is used as an elevation reference and can be located again if required, including during winter. For our purposes, the benchmark is assigned an arbitrary elevation of 100.00 metres (m). If a geodetic benchmark is available and will be used instead, the elevation of this benchmark relative to sea level is used in lieu of 100.00 m.

Turning Point (TP): A temporary benchmark used to provide a reference point so that the tripod and laser level can be moved to a new location.

Backsight (BS): A reading taken on a point of known or assigned elevation (This will always be the first reading to determine the Height of the Instrument (HI)).

Foresight (FS): A reading taken on a point where the elevation is unknown.

Intermediate Sight (IS): A reading taken that is not a part of the main circuit of the survey. These points are not used as TPs or benchmark readings. Monitoring well elevations are usually recorded as IS.

5.1 Equipment and Supplies

5.1.1 Documents and Information Gathering

- A copy of the Site plan with monitoring well locations;
- A copy of Pinchin's Elevation Survey Sheet obtained from the Pinchin Orchard;
- A copy of this SOP;
- A site-specific Health and Safety Plan (as per the project requirements); and
- Client or site representative's contact details.

5.1.2 Vertical Survey Equipment

- Laser level and associated sensor;
- Tri-pod;
- Survey rod;
- Interface probe and equipment cleaning materials (Optional if water level measurements are required);
- Well keys;
- Tools to open monitoring wells (T-bar, socket set, Allen keys, etc.);

- Extra batteries; and
- Field forms or field log book.

5.2 Theory

Vertical elevation surveys use a benchmark to determine the relative or actual elevation of select points (i.e., monitoring wells). For relative elevation surveys, the benchmark is given an arbitrary elevation of 100.00 m and is used to calculate the relative elevations of the monitoring wells. If a geodetic benchmark is available, the elevation of this benchmark may be used to calculate the actual elevations of the monitoring wells relative to sea level.

BS, FS and IS are measured using a laser level mounted on a tripod. The laser level shoots a beam at a survey rod which is equipped with a sensor. With the rod standing vertically on top of the point to be measured, the field technician moves the laser receiver up the rod until the receiver indicates it is in the right position. The measurement is then read off the rod and recorded on the survey sheet. This process is repeated until measurements are obtained at all required locations.

Vertical elevation surveys are typically completed on a site in the following situations:

- At least three monitoring wells have been installed on-site and determining inferred groundwater flow direction is required;
- The casing or pipe elevation of a well has changed. This could be due to repairs, damage or frost heave;
- New monitoring well(s) have been installed on the site. Note that in this situation, the new monitoring well(s) may be “tied in” to the existing survey by using the original TBM or to at least three of the previously surveyed wells as reference points. If this is not possible, then an entirely new survey must be completed that includes all new and previously installed wells; and
- The survey error exceeds the allowable error.

5.3 Vertical Elevation Survey

The following general procedures and considerations apply to all vertical elevation surveys:

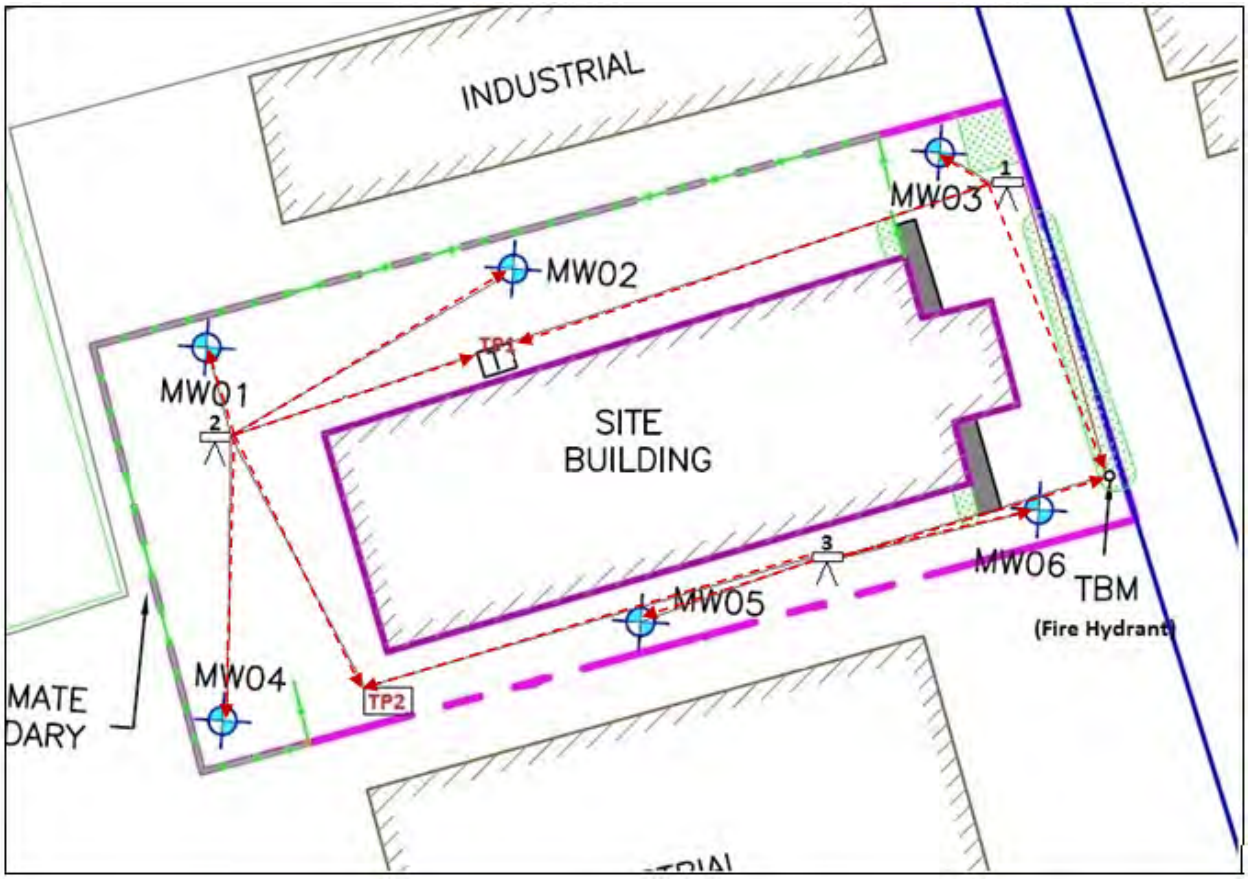
- Prior to use, turn on the laser level and receiver to ensure the batteries are fully charged; and
- Check equipment calibration (Equipment rentals should come with a calibration sheet for the survey equipment).

The following presents the general procedure for vertical elevation surveying:

1. Open all wells and, if required by the Project Manager, monitor the depth to groundwater from the top of the well casing with the interface probe. If the wells are flushmount installations located in an area with vehicle or pedestrian traffic, place a traffic cone or the original well cover over top of each well after it is opened so that the open well doesn't get run over or pedestrians do not trip over the open well.

   Select a permanent fixture to be the TBM whose elevation **should not change over time.** All elevations will be relative to this spot. Good choices for a TBM include concrete pads, gas shut offs, corners of catch basins or fire hydrants. The TBM will be assigned an arbitrary reference elevation of 100.00 m for ease of calculation. *Note: if using a fire hydrant as the TBM, do not use the bolts on the top or sides of the hydrant. If the hydrant is used in the future, the elevation of those bolts may change. Ideally, new personnel should be able to come to the site and reproduce or continue the survey using the same TBM at a later date;*

2. Using the Site Plan, plan the route for the survey. The ideal route requires as few TPs as possible as moving the tri-pod increases the chance of error in the measurements. However, at least one TP is required to create a survey loop and allow the error to be assessed unless a calibrated, self-levelling survey instrument is being used. The survey route must start by taking a BS to the TBM, followed by an IS to each of the well locations. The last shot of the survey will be a FS to the TBM location. Figure 1 below shows an example of a survey route;



3. Once the survey layout is complete, walk the survey route to ensure it is free of obstructions. Next, set up the tripod in a secure location where it is not likely to tip or be knocked over;
4. Hold the survey rod vertically on top of the TBM. Use the leveling bubble on the sensor to ensure the rod is level, and then move the sensor up the rod until it signals it is in the correct position. Record the BS of the TBM on the survey sheet;
5. Use the same method to record IS for the monitoring wells. Record an IS for both the top of casing and grade level for each monitoring well location. The top of casing elevation is to be measured with the survey rod placed at the reference point marked at the time of well installation. If no reference point is marked on the well, one should be added and used for all subsequent elevation survey and depth to groundwater measurements. All FS, BS and IS are to be recorded to the nearest 0.001 m;
6. If it is necessary to move the tri-pod, record the FS to the TP. Next, move the tripod to the new location and shoot a BS back to the TP (see Figure 2). **Make sure the location of the TP does not change between shooting the FS and the BS**;

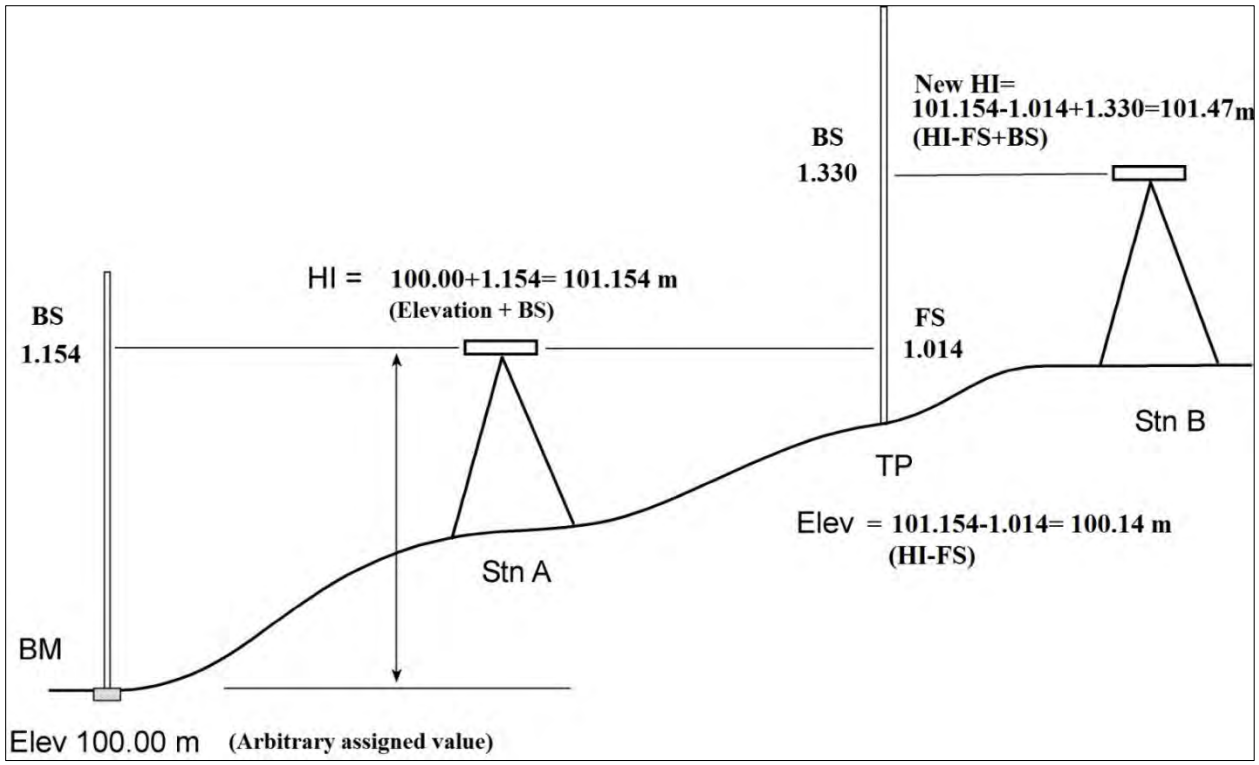


Figure 1: Survey set up from TBM with one TP.

7. Repeat steps 5 and 6 until a top of casing and grade IS have been recorded for all monitoring wells;
8. Record a final FS reading back to the TBM to close the survey; and
9. Perform a field calculation to ensure the survey error is within acceptable limits. The calculated difference between the sum of the FS and the sum of the BS values should be approximately equal. The difference between these values will be equal to the error. If the difference between these values is greater than the allowable error (see Section 5.4), the survey will have to be repeated. If the error is acceptable, the survey is complete and you may leave the site. The remaining calculations may be completed at the office.

5.4 Allowable Error

The acceptable error limit is 3 millimetres (mm) (0.003 m) per TP, with a maximum allowable error of 5 mm per survey. If the total error per survey exceeds 0.003 m per TP or 0.005 m per survey, the survey must be repeated. Common sources of error include:

- Tripod movement;
- Errors in reading the survey rod; and
- Not keeping the TP location consistent between FS and BS readings.

As noted in Section 5.3, an error check must be performed **before leaving the site** to ensure the survey error is within acceptable limits.

5.5 Calculations

Once the survey is complete, calculate the relative elevations of each surveyed point. This can be done in the field or at the office. Calculate each elevation by subtracting the IS values from the height of the instrument. A new HI will need to be calculated following each TP. The following is an example of the survey calculations for the survey layout shown in Figure 1.

PINCHIN ENVIRONMENTAL

ELEVATION SURVEY SHEET

PAGE 1 OF 1

PROJECT #:12345.006 | LOCATION: Survey Town

DATE: April 3, 2014 | TECH:KM | PM:

TEMPORARY BENCHMARK DESCRIPTION: Base of Fire Hydrant in the southeast corner of the Site.

Height of Instrument= Elevation + BS

TBM ELEV= 100.00

IS	BS	HI (ELEV+BS)	FS	ELEV (HI-FS)	DESCRIPTION
	1.154	101.154		100.00	TBM
1.332				99.822	MW03 Top of Casing
1.2105				99.944	MW03 Grade
			1.014		TP1
	1.330	101.47			
1.470				100.00	MW02 Top of Casing
1.354				100.116	MW02 Grade
1.465				100.005	MW01 Top of Casing
1.335				100.135	MW01 Grade
1.521				99.949	MW04 Top of Casing
1.401				100.069	MW04 Grade
			1.109		TP2
	1.156	101.517			
1.2985				100.219	MW05 Top of Casing
1.208				100.309	MW05 Grade
1.440				100.077	MW06 Top of Casing
1.345				100.172	MW06 Grade
			1.516		TP3
				100.001	Error=0.001
Sum=	3.640	Sum=	3.639		

Elevation= HI-IS

Recalculate the height of the instrument after each TP.
New HI = (Last HI)-(FS)+(BS)

Continue elevation calculations with new HI.

Difference between final elevation and original TBM elevation should be less than 0.003 m per turning point or 0.005 m total.

NOTES: Field error calculation= Sum(FS)-sum(BS) = 3.640-3.639 Error=0.001

5.6 Horizontal Survey

A horizontal survey should be completed on every site in conjunction with the vertical elevation survey if not already completed during the borehole drilling/well installation program. To complete a horizontal survey, measure the distance of each of the well locations relative to a nearby permanent or semi-permanent landmark (e.g., corner of the nearest building, fire hydrant, etc.) using a measuring wheel or tape. Measurements are to be made at 90 degree angles relative to the orientation of the landmark, and parallel or perpendicular to the long or short axis of the landmark or to a fixed axis (i.e., relative to true north) as appropriate. Record these measurements in a field book or on the site plan. If required by the Project Manager, measure the UTM coordinates of the well location with a hand-held GPS device.

5.7 General Considerations

When surveying a site where one or more well locations are located inside a building and inaccessible to survey, it is acceptable to survey the concrete foundation of the building in place of the well. If this method is used this must be noted on the survey sheet.

A higher error factor may be acceptable on very large sites and sites where a large number of TPs are used. These situations should be discussed with the Project Manager.

On sites with large elevation changes, the use of a scope and manual survey rod in place of the laser level may be more appropriate. This method requires a two-person team and allows the surveying of sites with large elevation changes without the use of unnecessary TPs. This method should be discussed with the Project Manager prior to use to ensure it meets project budget requirements.

5.8 Additional Considerations for Ontario Regulation 153/04 Phase Two ESA Compliance

When completing a Phase Two Environmental Assessment in accordance with Ontario Regulation 153/04, all surveying work must be undertaken by a licensed Ontario Land Surveyor and this SOP is not applicable.

6.0 TRAINING

The Practice Leader is responsible for identifying the training needs of EDR staff and ensuring that staff are trained and competent before undertaking work assignments.

All trained personnel are responsible for identifying coaching or re-training needs (if they are uncomfortable with work assignments that have been assigned).

The careful application of *Health & Safety Training* by each employee is an integral part of all activities and is assumed as part of this SOP.

7.0 MAINTENANCE OF SOP

1 Year.

8.0 REFERENCES

Canadian Standards Association, *Environmental Investigation Methodology for Contaminated Sites*, 2005.

9.0 APPENDICES

None.

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Template: Master SOP Template – February 2014

APPENDIX C

Borehole Logs

Log of Borehole: BH101

Project #: 291885.003 ***Logged By:*** JP

Project: Phase Two Environmental Site Assessment

Client: 1785 Bloor Holdings Inc.

Location: 1785 Bloor Street, Mississauga, Ontario

Drill Date: January 20, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface						
0 – 3 / 0 – 1		***Sandy Silt (Reworked)*** Brown, some gravel and clay, moist.	0.00	No Monitoring Well Installed	52	S1	15/0	PHCs, BTEX, PCBs
		Trace rootlets.				S2	10/0	Grain Size
5 – 10 / 1 – 3		***Sandy Silt*** Brown, trace gravel and clay, moist.	1.52		73	S3	20/0	
						S4	5/0	
		Wet.			100	S5	60/0	PHCs, BTEX, PCBs
12 / 4		End of Borehole	3.66					
		Sampler refusal at 3.66 mbgs						

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Note:
* Soil vapour concentrations measured using a RKI Eagle 2 equipped with a combustible gas indicator (CGI) and a photoionization detector (PID).

Grade Elevation: 131.33 mamsl

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH102

Project #: 291885.003 ***Logged By:*** JP

Project: Phase Two Environmental Site Assessment

Client: 1785 Bloor Holdings Inc.

Location: 1785 Bloor Street, Mississauga, Ontario

Drill Date: January 20, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface						
		Sandy Silt (Reworked) Brown, some gravel and clay, moist.	0.00	No Monitoring Well Installed		S1	5/0	
		Trace rootlets.			54	S2	5/0	pH
5 / 1		***Sandy Silt*** Brown, trace gravel and clay, moist.	1.52			S3	5/0	PHCs, BTEX, PAHs
					64	S4	0/0	pH, Grain Size
10 / 3		Wet.			100	S5	5/0	
12 / 4		End of Borehole	3.66					
		Sampler refusal at 3.66 mbgs						

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Note:
* Soil vapour concentrations measured using a RKI Eagle 2 equipped with a combustible gas indicator (CGI) and a photoionization detector (PID).

Grade Elevation: 131.90 mamsl

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH103

Project #: 291885.003 **Logged By:** JP

Project: Phase Two Environmental Site Assessment

Client: 1785 Bloor Holdings Inc.

Location: 1785 Bloor Street, Mississauga, Ontario

Drill Date: January 20, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Floor Surface	0.00	No Monitoring Well Installed				
		Concrete	0.12					
1		***Sandy Silt*** Brown, trace gravel and clay, moist to wet.	0.61		17	S1	0/0	PHCs, BTEX, PAHs
2		End of Borehole						
3 / 1								
4								
5								
6 / 2								
7								
8								
9								
10 / 3								
11								
12								
13 / 4								
14		Sampler refusal at 0.61 mbfs						
15								
16								

Contractor: Strata Drilling Group

Drilling Method: Split Spoon

Well Casing Size: NA

Note:
* Soil vapour concentrations measured using a RKI Eagle 2 equipped with a combustible gas indicator (CGI) and a photoionization detector (PID).

Grade Elevation: 131.01 mamsl

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH104

Project #: 291885.003 **Logged By:** JP

Project: Phase Two Environmental Site Assessment

Client: 1785 Bloor Holdings Inc.

Location: 1785 Bloor Street, Mississauga, Ontario

Drill Date: January 20, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Floor Surface	0.00	No Monitoring Well Installed				
		Concrete	0.12					
1		***Sandy Silt*** Brown, trace gravel and clay, moist to wet.	0.61		17	S1	0/0	PHCs, BTEX, PAHs
2		End of Borehole						
3 / 1								
4								
5								
6 / 2								
7								
8								
9								
10 / 3								
11								
12								
13 / 4								
14		Sampler refusal at 0.61 mbfs						
15								
16								

Contractor: Strata Drilling Group

Drilling Method: Split Spoon

Well Casing Size: NA

Note:
* Soil vapour concentrations measured using a RKI Eagle 2 equipped with a combustible gas indicator (CGI) and a photoionization detector (PID).

Grade Elevation: 131.01 mamsl

Top of Casing Elevation: NA

Sheet: 1 of 1

Log of Borehole: BH105

Project #: 291885.003 **Logged By:** JP

Project: Phase Two Environmental Site Assessment

Client: 1785 Bloor Holdings Inc.

Location: 1785 Bloor Street, Mississauga, Ontario

Drill Date: January 20, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface						
		Asphalt	0.00					
1		***Sandy Silt (Reworked)*** Dark brown, some gravel and clay, trace organics and asphalt fragments, moist.			68	S1	0/0	
3 / 1								
		Sandy Silt Brown, trace gravel and clay, wet. Occasional cobbles.	1.07			S2	0/0	pH
5						S3	5/0	PHCs, BTEX, PCBs
6 / 2					60			
8						S4	0/0	
10 / 3					100	S5	60/0	
11		End of Borehole	3.35					
12								
13 / 4		Sampler refusal at 3.35 mbgs						
14								
15								

No Monitoring Well Installed

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Note:
* Soil vapour concentrations measured using a RKI Eagle 2 equipped with a combustible gas indicator (CGI) and a photoionization detector (PID).

Grade Elevation: 132.23 mamsl

Top of Casing Elevation: NA

Sheet: 1 of 1

APPENDIX D

Residue Management

Your Project #: 291885.003
Your C.O.C. #: 859604-03-01

Attention: Amanda Brandt

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2022/01/31
Report #: R6984201
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C217450
Received: 2022/01/21, 18:40

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cyanide (WAD) in Leachates	1	N/A	2022/01/27	CAM SOP-00457	OMOE 3015 m
Fluoride by ISE in Leachates	1	2022/01/27	2022/01/28	CAM SOP-00449	SM 23 4500-F- C m
Total Metals in TCLP Leachate by ICPMS	1	2022/01/27	2022/01/27	CAM SOP-00447	EPA 6020B m
Nitrate& Nitrite as Nitrogen in Leachate	1	N/A	2022/01/28	CAM SOP-00440	SM 23 4500-NO3I/NO2B
PAH Compounds in Leachate by GC/MS (SIM)	1	2022/01/28	2022/01/30	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Leachate	1	2022/01/27	2022/01/28	CAM SOP-00309	EPA 8082A m
TCLP - % Solids	1	2022/01/26	2022/01/27	CAM SOP-00401	EPA 1311 Update I m
TCLP - Extraction Fluid	1	N/A	2022/01/26	CAM SOP-00401	EPA 1311 Update I m
TCLP - Initial and final pH	1	N/A	2022/01/27	CAM SOP-00401	EPA 1311 Update I m
TCLP Zero Headspace Extraction	1	2022/01/27	2022/01/28	CAM SOP-00430	EPA 1311 m
VOCs in ZHE Leachates	1	2022/01/28	2022/01/28	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Your Project #: 291885.003
Your C.O.C. #: 859604-03-01

Attention: Amanda Brandt

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2022/01/31
Report #: R6984201
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C217450
Received: 2022/01/21, 18:40

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: Antonella.Brasil@bureauveritas.com
Phone# (905)817-5817
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 558 TCLP BENZO(A)PYRENE

Bureau Veritas ID			RRE214			
Sampling Date			2022/01/21 12:00			
COC Number			859604-03-01			
	UNITS	347	TCLP	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons						
Leachable Benzo(a)pyrene	ug/L	1	<0.10	0.10	0.020	7806252
Surrogate Recovery (%)						
Leachable D10-Anthracene	%	-	91			7806252
Leachable D14-Terphenyl (FS)	%	-	90			7806252
Leachable D8-Acenaphthylene	%	-	85			7806252

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
347: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)

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O.REG 558 TCLP INORGANICS PACKAGE (SOIL)

Bureau Veritas ID			RRE214			
Sampling Date			2022/01/21 12:00			
COC Number			859604-03-01			
	UNITS	347	TCLP	RDL	MDL	QC Batch
Inorganics						
Leachable Fluoride (F-)	mg/L	150	0.15	0.10	0.020	7803325
Leachable WAD Cyanide (Free)	mg/L	20	<0.010	0.010	0.0050	7803337
Leachable Nitrite (N)	mg/L	-	<0.10	0.10	0.050	7803335
Leachable Nitrate (N)	mg/L	-	<1.0	1.0	0.20	7803335
Leachable Nitrate + Nitrite (N)	mg/L	1000	<1.0	1.0	0.20	7803335
Metals						
Leachable Arsenic (As)	mg/L	2.5	<0.2	0.2	0.01	7803177
Leachable Barium (Ba)	mg/L	100	0.6	0.2	0.01	7803177
Leachable Boron (B)	mg/L	500	0.2	0.1	0.02	7803177
Leachable Cadmium (Cd)	mg/L	0.5	<0.05	0.05	0.0007	7803177
Leachable Chromium (Cr)	mg/L	5	<0.1	0.1	0.01	7803177
Leachable Lead (Pb)	mg/L	5	<0.1	0.1	0.001	7803177
Leachable Mercury (Hg)	mg/L	0.1	<0.001	0.001	0.0005	7803177
Leachable Selenium (Se)	mg/L	1	<0.1	0.1	0.01	7803177
Leachable Silver (Ag)	mg/L	5	<0.01	0.01	0.001	7803177
Leachable Uranium (U)	mg/L	10	<0.01	0.01	0.001	7803177

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
347: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)

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TCLP LEACHATE PREPARATION (SOIL)

Bureau Veritas ID		RRE214			
Sampling Date		2022/01/21 12:00			
COC Number		859604-03-01			
	UNITS	**TCLP**	**RDL**	**MDL**	**QC Batch**
Inorganics					
Final pH	pH	5.60			7801402
Initial pH	pH	9.62			7801402
TCLP - % Solids	%	100	0.2	N/A	7801384
TCLP Extraction Fluid	N/A	FLUID 2			7801401

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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O.REG 558 TCLP PCBS (SOIL)

Bureau Veritas ID			RRE214			
Sampling Date			2022/01/21 12:00			
COC Number			859604-03-01			
	UNITS	347	TCLP	RDL	MDL	QC Batch
PCBs						
Leachable Aroclor 1016	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Aroclor 1221	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Aroclor 1242	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Aroclor 1248	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Aroclor 1254	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Aroclor 1260	ug/L	-	<3.0	3.0	0.20	7804607
Leachable Total PCB	ug/L	300	<3.0	3.0	0.20	7804607
Surrogate Recovery (%)						
Leachable Decachlorobiphenyl	%	-	99			7804607

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
347: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)

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O.REG 558 TCLP VOCS BY HS (SOIL)

Bureau Veritas ID			RRE214	RRE214			
Sampling Date			2022/01/21 12:00	2022/01/21 12:00			
COC Number			859604-03-01	859604-03-01			
	UNITS	347	TCLP	TCLP Lab-Dup	RDL	MDL	QC Batch
Charge/Prep Analysis							
Amount Extracted (Wet Weight) (g)	N/A	-	25	25	N/A	N/A	7803314
Volatile Organics							
Leachable Benzene	mg/L	0.5	<0.020	<0.020	0.020	0.0020	7805428
Leachable Carbon Tetrachloride	mg/L	0.5	<0.020	<0.020	0.020	0.0020	7805428
Leachable Chlorobenzene	mg/L	8	<0.020	<0.020	0.020	0.0020	7805428
Leachable Chloroform	mg/L	10	<0.020	<0.020	0.020	0.0020	7805428
Leachable 1,2-Dichlorobenzene	mg/L	20	<0.050	<0.050	0.050	0.0040	7805428
Leachable 1,4-Dichlorobenzene	mg/L	0.5	<0.050	<0.050	0.050	0.0040	7805428
Leachable 1,2-Dichloroethane	mg/L	0.5	<0.050	<0.050	0.050	0.0040	7805428
Leachable 1,1-Dichloroethylene	mg/L	1.4	<0.020	<0.020	0.020	0.0020	7805428
Leachable Methylene Chloride(Dichloromethane)	mg/L	5	<0.20	<0.20	0.20	0.010	7805428
Leachable Methyl Ethyl Ketone (2-Butanone)	mg/L	200	<1.0	<1.0	1.0	1.0	7805428
Leachable Tetrachloroethylene	mg/L	3	<0.020	<0.020	0.020	0.0020	7805428
Leachable Trichloroethylene	mg/L	5	<0.020	<0.020	0.020	0.0020	7805428
Leachable Vinyl Chloride	mg/L	0.2	<0.020	<0.020	0.020	0.0040	7805428
Surrogate Recovery (%)							
Leachable 4-Bromofluorobenzene	%	-	91	91			7805428
Leachable D4-1,2-Dichloroethane	%	-	109	108			7805428
Leachable D8-Toluene	%	-	98	98			7805428

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
347: Ontario Reg. 347/90 Schedule 4 Leachate Quality Criteria (as amended by Reg 558/00)
N/A = Not Applicable

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Bureau Veritas Job #: C217450
Report Date: 2022/01/31

Pinchin Ltd
Client Project #: 291885.003
Sampler Initials: JP

TEST SUMMARY

Bureau Veritas ID: RRE214
Sample ID: TCLP
Matrix: Soil

Collected: 2022/01/21
Shipped:
Received: 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide (WAD) in Leachates	SKAL/CN	7803337	N/A	2022/01/27	Louise Harding
Fluoride by ISE in Leachates	ISE	7803325	2022/01/27	2022/01/28	Surinder Rai
Total Metals in TCLP Leachate by ICPMS	ICP1/MS	7803177	2022/01/27	2022/01/27	Azita Fazaeli
Nitrate& Nitrite as Nitrogen in Leachate	LACH	7803335	N/A	2022/01/28	Nimarta Singh
PAH Compounds in Leachate by GC/MS (SIM)	GC/MS	7806252	2022/01/28	2022/01/30	Jonghan Yoon
Polychlorinated Biphenyl in Leachate	GC/ECD	7804607	2022/01/27	2022/01/28	Farag Mansour
TCLP - % Solids	BAL	7801384	2022/01/26	2022/01/27	Omer Imtiaz Uddin
TCLP - Extraction Fluid		7801401	N/A	2022/01/26	Omer Imtiaz Uddin
TCLP - Initial and final pH	PH	7801402	N/A	2022/01/27	Omer Imtiaz Uddin
TCLP Zero Headspace Extraction		7803314	2022/01/27	2022/01/28	Johan Mato
VOCs in ZHE Leachates	GC/MS	7805428	2022/01/28	2022/01/28	Karen Hughes

Bureau Veritas ID: RRE214 Dup
Sample ID: TCLP
Matrix: Soil

Collected: 2022/01/21
Shipped:
Received: 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TCLP Zero Headspace Extraction		7803314	2022/01/27	2022/01/28	Johan Mato
VOCs in ZHE Leachates	GC/MS	7805428	2022/01/28	2022/01/28	Karen Hughes

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.0°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
7804607	Leachable Decachlorobiphenyl	2022/01/28	103	30 - 130	101	30 - 130	101	%				
7805428	Leachable 4-Bromofluorobenzene	2022/01/28	96	70 - 130	97	70 - 130	90	%				
7805428	Leachable D4-1,2-Dichloroethane	2022/01/28	106	70 - 130	104	70 - 130	107	%				
7805428	Leachable D8-Toluene	2022/01/28	104	70 - 130	105	70 - 130	98	%				
7806252	Leachable D10-Anthracene	2022/01/30	96	50 - 130	92	50 - 130	97	%				
7806252	Leachable D14-Terphenyl (FS)	2022/01/30	98	50 - 130	92	50 - 130	97	%				
7806252	Leachable D8-Acenaphthylene	2022/01/30	93	50 - 130	88	50 - 130	90	%				
7803177	Leachable Arsenic (As)	2022/01/27	100	80 - 120	99	80 - 120	<0.2	mg/L	NC	35	<0.2	mg/L
7803177	Leachable Barium (Ba)	2022/01/27	106	80 - 120	100	80 - 120	<0.2	mg/L	NC	35	<0.2	mg/L
7803177	Leachable Boron (B)	2022/01/27	103	80 - 120	104	80 - 120	<0.1	mg/L	NC	35	<0.1	mg/L
7803177	Leachable Cadmium (Cd)	2022/01/27	98	80 - 120	96	80 - 120	<0.05	mg/L	NC	35	<0.05	mg/L
7803177	Leachable Chromium (Cr)	2022/01/27	98	80 - 120	97	80 - 120	<0.1	mg/L	NC	35	<0.1	mg/L
7803177	Leachable Lead (Pb)	2022/01/27	92	80 - 120	93	80 - 120	<0.1	mg/L	NC	35	<0.1	mg/L
7803177	Leachable Mercury (Hg)	2022/01/27	111	80 - 120	108	80 - 120	<0.001	mg/L	NC	35	<0.001	mg/L
7803177	Leachable Selenium (Se)	2022/01/27	98	80 - 120	99	80 - 120	<0.1	mg/L	NC	35	<0.1	mg/L
7803177	Leachable Silver (Ag)	2022/01/27	96	80 - 120	97	80 - 120	<0.01	mg/L	NC	35	<0.01	mg/L
7803177	Leachable Uranium (U)	2022/01/27	97	80 - 120	97	80 - 120	<0.01	mg/L	NC	35	<0.01	mg/L
7803325	Leachable Fluoride (F-)	2022/01/28	104	80 - 120	104	80 - 120	<0.10	mg/L	NC	25	<0.10	mg/L
7803335	Leachable Nitrate (N)	2022/01/28	88	80 - 120	96	80 - 120	<1.0	mg/L	NC	25	<1.0	mg/L
7803335	Leachable Nitrate + Nitrite (N)	2022/01/28	91	80 - 120	97	80 - 120	<1.0	mg/L	NC	25	<1.0	mg/L
7803335	Leachable Nitrite (N)	2022/01/28	101	80 - 120	104	80 - 120	<0.10	mg/L	NC	25	<0.10	mg/L
7803337	Leachable WAD Cyanide (Free)	2022/01/27	89	80 - 120	103	80 - 120	<0.0020	mg/L	NC	20	<0.010	mg/L
7804607	Leachable Aroclor 1016	2022/01/28					<3.0	ug/L				
7804607	Leachable Aroclor 1221	2022/01/28					<3.0	ug/L				
7804607	Leachable Aroclor 1242	2022/01/28					<3.0	ug/L				
7804607	Leachable Aroclor 1248	2022/01/28					<3.0	ug/L				
7804607	Leachable Aroclor 1254	2022/01/28					<3.0	ug/L				
7804607	Leachable Aroclor 1260	2022/01/28	101	30 - 130	100	30 - 130	<3.0	ug/L				
7804607	Leachable Total PCB	2022/01/28	101	30 - 130	100	30 - 130	<3.0	ug/L	NC	40		
7805428	Leachable 1,1-Dichloroethylene	2022/01/28	101	70 - 130	100	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable 1,2-Dichlorobenzene	2022/01/28	102	70 - 130	101	70 - 130	<0.050	mg/L	NC	30		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
7805428	Leachable 1,2-Dichloroethane	2022/01/28	105	70 - 130	100	70 - 130	<0.050	mg/L	NC	30		
7805428	Leachable 1,4-Dichlorobenzene	2022/01/28	115	70 - 130	114	70 - 130	<0.050	mg/L	NC	30		
7805428	Leachable Benzene	2022/01/28	98	70 - 130	95	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Carbon Tetrachloride	2022/01/28	99	70 - 130	98	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Chlorobenzene	2022/01/28	101	70 - 130	100	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Chloroform	2022/01/28	103	70 - 130	99	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Methyl Ethyl Ketone (2-Butanone)	2022/01/28	120	60 - 140	111	60 - 140	<1.0	mg/L	NC	30		
7805428	Leachable Methylene Chloride (Dichloromethane)	2022/01/28	108	70 - 130	104	70 - 130	<0.20	mg/L	NC	30		
7805428	Leachable Tetrachloroethylene	2022/01/28	94	70 - 130	93	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Trichloroethylene	2022/01/28	103	70 - 130	101	70 - 130	<0.020	mg/L	NC	30		
7805428	Leachable Vinyl Chloride	2022/01/28	107	70 - 130	107	70 - 130	<0.020	mg/L	NC	30		
7806252	Leachable Benzo(a)pyrene	2022/01/30	91	50 - 130	88	50 - 130	<0.10	ug/L	NC	40		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

FUNDAMENTAL LABORATORY ACCEPTANCE GUIDELINE

Invoice To:
Pinchin Ltd
ATTN: Accounts Payable
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2
Client Contact:
Amanda Brandt

Bureau Veritas Job #:	C217450
Date Received:	2022/01/21
Your C.O.C. #:	859604-03-01
Your Project #:	291885.003
Bureau Veritas Project Manager:	Antonella Brasil
Quote #:	C20345

No discrepancies noted.

Report Comments

Received Date:	**2022/01/21**	**Time:**	**18:40**	**By:**	
Inspected Date:		**Time:**		**By:**	
FLAG Created Date:		**Time:**		**By:**	

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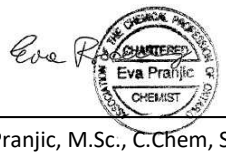
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #3103 Pinchin Ltd	Company Name:	Quotation #:	Bureau Veritas Job #: / Bottle Order #: 859604
Attention: ~~Jenny Park~~ Accounts Payable	Attention: Amanda Brandt, Jenny Park	P.O. #:	
Address: 2360 Meadowpine Blvd Unit # 2, Mississauga ON L5N 6S2	Address:	Project: 291885.003	COC #: C#859604-03-01
Tel: (905) 363-0678 Fax: (905) 363-0681	Tel: Fax:	Project Name:	Project Manager: Antonella Brasil
Email: ap@pinchin.com	Email: abrandt@pinchin.com; Jpark@pinchin.com	Site #:	
		Sampled By: JP	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): Table 1, Table 2, Table 3, Table; Res/Park, Ind/Comm, Agri/Other, Medium/Fine, Coarse, For RSC [x]

Other Regulations: CCME, Reg 558 [x], MISA, PWQO, Other [x] O.Reg 347/90; Sanitary Sewer Bylaw, Storm Sewer Bylaw, Municipality, Reg 406 Table

Special Instructions: For RSC

Include Criteria on Certificate of Analysis (Y/N)? Y

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Field Filtered (please circle): Metals / Hg / Cr VI; Dioxins/Furans in Soil (1613B); TCLP Metals / Inorganics; TCLP VOCs; TCLP Benzo(a)pyrene; TCLP PCBs

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: [x] (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required: Rush Confirmation Number: (call lab for #)

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered	TCLP Metals / Inorganics	TCLP VOCs	TCLP Benzo(a)pyrene	TCLP PCBs	# of Bottles	Comments
1		TCLP	2022/01/21	12:00pm	S	X	✓	✓	✓	✓	5	
2												
3												
4												
5												
6												
7												
8												
9												
10												

21-Jan-22 18:40
Antonella Brasil
C217450
URE ENV-1461

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present / Intact	Yes / No
Jenny Park	2022/01/21	1:00pm	[signature]	2022/01/21	18:40	0		1/0/1		✓

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Exceedance Summary Table – Regulation 558/00

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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APPENDIX E

Laboratory Certificates of Analysis

Your Project #: 291885.003
Your C.O.C. #: 859604-01-01, 859604-02-01

Attention: Amanda Brandt

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2022/01/28
Report #: R6980880
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C217455
Received: 2022/01/21, 18:40

Sample Matrix: Soil
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum	4	N/A	2022/01/27	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	1	N/A	2022/01/26		EPA 8260C m
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	7	N/A	2022/01/25	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (2)	3	2022/01/24	2022/01/24	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (2)	4	2022/01/24	2022/01/25	CAM SOP-00316	CCME CWS m
Moisture	8	N/A	2022/01/24	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	4	2022/01/26	2022/01/27	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Soil	4	2022/01/25	2022/01/26	CAM SOP-00309	EPA 8082A m
pH CaCl2 EXTRACT	3	2022/01/26	2022/01/26	CAM SOP-00413	EPA 9045 D m
Sieve, 75um	2	N/A	2022/01/25	CAM SOP-00467	ASTM D1140 -17 m
Volatile Organic Compounds in Soil	1	N/A	2022/01/25	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Your Project #: 291885.003
Your C.O.C. #: 859604-01-01, 859604-02-01

Attention: Amanda Brandt

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2022/01/28
Report #: R6980880
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C217455

Received: 2022/01/21, 18:40

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: Antonella.Brasil@bureauveritas.com
Phone# (905)817-5817

==========

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O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RRE247	RRE249	RRE250			
Sampling Date		2022/01/20	2022/01/20	2022/01/20			
COC Number		859604-01-01	859604-01-01	859604-01-01			
	UNITS	BH102-3	BH103-1	BH104-1	RDL	MDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	<0.0071	0.0071	N/A	7796244
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0020	7802359
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0020	7802359
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0020	7802359
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0040	7802359
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0020	7802359
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0020	7802359
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0040	7802359
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0040	7802359
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.0050	0.0010	7802359
Surrogate Recovery (%)							
D10-Anthracene	%	84	85	87			7802359
D14-Terphenyl (FS)	%	73	74	75			7802359
D8-Acenaphthylene	%	79	82	85			7802359

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RRE258			
Sampling Date		2022/01/20			
COC Number		859604-02-01			
	UNITS	DUP02-012022	RDL	MDL	QC Batch
Inorganics					
Moisture	%	12	1.0	0.50	7796467
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.0071	N/A	7796244
Polyaromatic Hydrocarbons					
Acenaphthene	ug/g	<0.0050	0.0050	0.0020	7802359
Acenaphthylene	ug/g	<0.0050	0.0050	0.0010	7802359
Anthracene	ug/g	<0.0050	0.0050	0.0010	7802359
Benzo(a)anthracene	ug/g	<0.0050	0.0050	0.0020	7802359
Benzo(a)pyrene	ug/g	<0.0050	0.0050	0.0010	7802359
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.0050	0.0020	7802359
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	0.0040	7802359
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	0.0020	7802359
Chrysene	ug/g	<0.0050	0.0050	0.0020	7802359
Dibenzo(a,h)anthracene	ug/g	<0.0050	0.0050	0.0040	7802359
Fluoranthene	ug/g	<0.0050	0.0050	0.0010	7802359
Fluorene	ug/g	<0.0050	0.0050	0.0010	7802359
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	0.0040	7802359
1-Methylnaphthalene	ug/g	<0.0050	0.0050	0.0010	7802359
2-Methylnaphthalene	ug/g	<0.0050	0.0050	0.0010	7802359
Naphthalene	ug/g	<0.0050	0.0050	0.0010	7802359
Phenanthrene	ug/g	<0.0050	0.0050	0.0010	7802359
Pyrene	ug/g	<0.0050	0.0050	0.0010	7802359
Surrogate Recovery (%)					
D10-Anthracene	%	87			7802359
D14-Terphenyl (FS)	%	75			7802359
D8-Acenaphthylene	%	83			7802359

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

O.REG 153 PCBS (SOIL)

Bureau Veritas ID		RRE242	RRE245	RRE256	RRE257			
Sampling Date		2022/01/20	2022/01/20	2022/01/20	2022/01/20			
COC Number		859604-01-01	859604-01-01	859604-02-01	859604-02-01			
	UNITS	BH101-1	BH101-5	BH105-3	DUP01-012022	RDL	MDL	QC Batch
PCBs								
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.0070	7799242
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.0070	7799242
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.0070	7799242
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.0070	7799242
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.0070	7799242
Surrogate Recovery (%)								
Decachlorobiphenyl	%	104	97	97	100			7799242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PHCS, BTEX/F1-F4 (SOIL)

Bureau Veritas ID		RRE242	RRE245	RRE247	RRE249	RRE250			
Sampling Date		2022/01/20	2022/01/20	2022/01/20	2022/01/20	2022/01/20			
COC Number		859604-01-01	859604-01-01	859604-01-01	859604-01-01	859604-01-01			
	UNITS	BH101-1	BH101-5	BH102-3	BH103-1	BH104-1	RDL	MDL	QC Batch
Inorganics									
Moisture	%	22	12	11	11	8.4	1.0	0.50	7796467
BTEX & F1 Hydrocarbons									
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	7798035
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	7798035
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	7798035
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	7798035
p+m-Xylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	0.040	7798035
Total Xylenes	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	0.040	7798035
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	5.0	7798035
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	5.0	7798035
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5.0	7796994
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	5.0	7796994
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	10	7796994
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes			7796994
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	98	99	101	100	101			7798035
4-Bromofluorobenzene	%	77	92	77	97	96			7798035
D10-o-Xylene	%	96	105	103	106	101			7798035
D4-1,2-Dichloroethane	%	103	106	106	102	105			7798035
o-Terphenyl	%	97	102	97	93	101			7796994

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

O.REG 153 PHCS, BTEX/F1-F4 (SOIL)

Bureau Veritas ID		RRE256	RRE257			
Sampling Date		2022/01/20	2022/01/20			
COC Number		859604-02-01	859604-02-01			
	UNITS	BH105-3	DUP01-012022	RDL	MDL	QC Batch
Inorganics						
Moisture	%	10	11	1.0	0.50	7796467
BTEX & F1 Hydrocarbons						
Benzene	ug/g	<0.020	<0.020	0.020	0.020	7798035
Toluene	ug/g	<0.020	<0.020	0.020	0.020	7798035
Ethylbenzene	ug/g	<0.020	<0.020	0.020	0.020	7798035
o-Xylene	ug/g	<0.020	<0.020	0.020	0.020	7798035
p+m-Xylene	ug/g	<0.040	<0.040	0.040	0.040	7798035
Total Xylenes	ug/g	<0.040	<0.040	0.040	0.040	7798035
F1 (C6-C10)	ug/g	<10	<10	10	5.0	7798035
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	5.0	7798035
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	10	5.0	7796994
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	50	5.0	7796994
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	10	7796994
Reached Baseline at C50	ug/g	Yes	Yes			7796994
Surrogate Recovery (%)						
1,4-Difluorobenzene	%	92	99			7798035
4-Bromofluorobenzene	%	104	95			7798035
D10-o-Xylene	%	94	99			7798035
D4-1,2-Dichloroethane	%	100	107			7798035
o-Terphenyl	%	101	96			7796994

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS (SOIL)

Bureau Veritas ID		RRE259			
Sampling Date		2022/01/20 08:00			
COC Number		859604-02-01			
	UNITS	TRIP BLANK	RDL	MDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	0.010	7796245
Volatile Organics					
Acetone (2-Propanone)	ug/g	<0.49	0.49	0.49	7798185
Benzene	ug/g	<0.0060	0.0060	0.0060	7798185
Bromodichloromethane	ug/g	<0.040	0.040	0.040	7798185
Bromoform	ug/g	<0.040	0.040	0.040	7798185
Bromomethane	ug/g	<0.040	0.040	0.040	7798185
Carbon Tetrachloride	ug/g	<0.040	0.040	0.040	7798185
Chlorobenzene	ug/g	<0.040	0.040	0.040	7798185
Chloroform	ug/g	<0.040	0.040	0.040	7798185
Dibromochloromethane	ug/g	<0.040	0.040	0.040	7798185
1,2-Dichlorobenzene	ug/g	<0.040	0.040	0.040	7798185
1,3-Dichlorobenzene	ug/g	<0.040	0.040	0.040	7798185
1,4-Dichlorobenzene	ug/g	<0.040	0.040	0.040	7798185
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	0.040	0.050	7798185
1,1-Dichloroethane	ug/g	<0.040	0.040	0.040	7798185
1,2-Dichloroethane	ug/g	<0.049	0.049	0.040	7798185
1,1-Dichloroethylene	ug/g	<0.040	0.040	0.040	7798185
cis-1,2-Dichloroethylene	ug/g	<0.040	0.040	0.040	7798185
trans-1,2-Dichloroethylene	ug/g	<0.040	0.040	0.040	7798185
1,2-Dichloropropane	ug/g	<0.040	0.040	0.040	7798185
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	0.030	7798185
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	0.040	7798185
Ethylbenzene	ug/g	<0.010	0.010	0.010	7798185
Ethylene Dibromide	ug/g	<0.040	0.040	0.040	7798185
Hexane	ug/g	<0.040	0.040	0.040	7798185
Methylene Chloride(Dichloromethane)	ug/g	<0.049	0.049	0.049	7798185
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	0.40	0.40	7798185
Methyl Isobutyl Ketone	ug/g	<0.40	0.40	0.40	7798185
Methyl t-butyl ether (MTBE)	ug/g	<0.040	0.040	0.040	7798185
Styrene	ug/g	<0.040	0.040	0.040	7798185

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS (SOIL)

Bureau Veritas ID		RRE259			
Sampling Date		2022/01/20 08:00			
COC Number		859604-02-01			
	UNITS	TRIP BLANK	RDL	MDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	<0.040	0.040	0.040	7798185
1,1,2,2-Tetrachloroethane	ug/g	<0.040	0.040	0.040	7798185
Tetrachloroethylene	ug/g	<0.040	0.040	0.040	7798185
Toluene	ug/g	<0.020	0.020	0.020	7798185
1,1,1-Trichloroethane	ug/g	<0.040	0.040	0.040	7798185
1,1,2-Trichloroethane	ug/g	<0.040	0.040	0.040	7798185
Trichloroethylene	ug/g	<0.010	0.010	0.010	7798185
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	0.040	0.040	7798185
Vinyl Chloride	ug/g	<0.019	0.019	0.019	7798185
p+m-Xylene	ug/g	<0.020	0.020	0.020	7798185
o-Xylene	ug/g	<0.020	0.020	0.020	7798185
Total Xylenes	ug/g	<0.020	0.020	0.020	7798185
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	98			7798185
D10-o-Xylene	%	108			7798185
D4-1,2-Dichloroethane	%	98			7798185
D8-Toluene	%	99			7798185

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		RRE243				RRE246			RRE248			
Sampling Date		2022/01/20				2022/01/20			2022/01/20			
COC Number		859604-01-01				859604-01-01			859604-01-01			
	UNITS	BH101-2	RDL	MDL	QC Batch	BH102-2	MDL	QC Batch	BH102-4	RDL	MDL	QC Batch
Inorganics												
Available (CaCl2) pH	pH					7.74		7800468	7.94			7800468
Miscellaneous Parameters												
Grain Size	%	FINE	N/A	N/A	7796207				FINE	N/A	N/A	7796207
Sieve - #200 (<0.075mm)	%	86	1	N/A	7796207				65	1	N/A	7796207
Sieve - #200 (>0.075mm)	%	15	1	N/A	7796207				35	1	N/A	7796207

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas ID		RRE251		
Sampling Date		2022/01/20		
COC Number		859604-01-01		
	UNITS	BH105-2	MDL	QC Batch
Inorganics				
Available (CaCl2) pH	pH	7.55		7800468

QC Batch = Quality Control Batch

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TEST SUMMARY

Bureau Veritas ID: RRE242 **Collected:** 2022/01/20
Sample ID: BH101-1 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/24	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	7799242	2022/01/25	2022/01/26	Farag Mansour

Bureau Veritas ID: RRE243 **Collected:** 2022/01/20
Sample ID: BH101-2 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sieve, 75um	SIEV	7796207	N/A	2022/01/25	Min Yang

Bureau Veritas ID: RRE245 **Collected:** 2022/01/20
Sample ID: BH101-5 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/24	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	7799242	2022/01/25	2022/01/26	Farag Mansour

Bureau Veritas ID: RRE246 **Collected:** 2022/01/20
Sample ID: BH102-2 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	7800468	2022/01/26	2022/01/26	Neil Dassanayake

Bureau Veritas ID: RRE247 **Collected:** 2022/01/20
Sample ID: BH102-3 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7796244	N/A	2022/01/27	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/24	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7802359	2022/01/26	2022/01/27	Mitesh Raj

Bureau Veritas ID: RRE248 **Collected:** 2022/01/20
Sample ID: BH102-4 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	7800468	2022/01/26	2022/01/26	Neil Dassanayake

TEST SUMMARY

Bureau Veritas ID: RRE248 **Collected:** 2022/01/20
Sample ID: BH102-4 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sieve, 75um	SIEV	7796207	N/A	2022/01/25	Min Yang

Bureau Veritas ID: RRE249 **Collected:** 2022/01/20
Sample ID: BH103-1 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7796244	N/A	2022/01/27	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/25	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7802359	2022/01/26	2022/01/27	Mitesh Raj

Bureau Veritas ID: RRE250 **Collected:** 2022/01/20
Sample ID: BH104-1 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7796244	N/A	2022/01/27	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/25	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7802359	2022/01/26	2022/01/27	Mitesh Raj

Bureau Veritas ID: RRE251 **Collected:** 2022/01/20
Sample ID: BH105-2 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	7800468	2022/01/26	2022/01/26	Neil Dassanayake

Bureau Veritas ID: RRE256 **Collected:** 2022/01/20
Sample ID: BH105-3 **Shipped:**
Matrix: Soil **Received:** 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/25	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	7799242	2022/01/25	2022/01/26	Farag Mansour

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TEST SUMMARY

Bureau Veritas ID: RRE257
Sample ID: DUP01-012022
Matrix: Soil

Collected: 2022/01/20
Shipped:
Received: 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7798035	N/A	2022/01/25	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7796994	2022/01/24	2022/01/25	(Kent) Maolin Li
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	7799242	2022/01/25	2022/01/26	Farag Mansour

Bureau Veritas ID: RRE258
Sample ID: DUP02-012022
Matrix: Soil

Collected: 2022/01/20
Shipped:
Received: 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7796244	N/A	2022/01/27	Automated Statchk
Moisture	BAL	7796467	N/A	2022/01/24	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7802359	2022/01/26	2022/01/27	Mitesh Raj

Bureau Veritas ID: RRE259
Sample ID: TRIP BLANK
Matrix: Soil

Collected: 2022/01/20
Shipped:
Received: 2022/01/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7796245	N/A	2022/01/26	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	7798185	N/A	2022/01/25	Ancheol Jeong

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.0°C

Cooler custody seal was present and intact .

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7796994	o-Terphenyl	2022/01/24	101	60 - 130	90	60 - 130	98	%				
7798035	1,4-Difluorobenzene	2022/01/25	96	60 - 140	94	60 - 140	100	%				
7798035	4-Bromofluorobenzene	2022/01/25	107	60 - 140	106	60 - 140	96	%				
7798035	D10-o-Xylene	2022/01/25	105	60 - 140	104	60 - 140	108	%				
7798035	D4-1,2-Dichloroethane	2022/01/25	98	60 - 140	100	60 - 140	103	%				
7798185	4-Bromofluorobenzene	2022/01/25	101	60 - 140	103	60 - 140	100	%				
7798185	D10-o-Xylene	2022/01/25	117	60 - 130	94	60 - 130	96	%				
7798185	D4-1,2-Dichloroethane	2022/01/25	98	60 - 140	104	60 - 140	108	%				
7798185	D8-Toluene	2022/01/25	104	60 - 140	102	60 - 140	97	%				
7799242	Decachlorobiphenyl	2022/01/26	94	60 - 130	92	60 - 130	98	%				
7802359	D10-Anthracene	2022/01/27	91	50 - 130	85	50 - 130	86	%				
7802359	D14-Terphenyl (FS)	2022/01/27	81	50 - 130	76	50 - 130	72	%				
7802359	D8-Acenaphthylene	2022/01/27	89	50 - 130	86	50 - 130	85	%				
7796207	Sieve - #200 (<0.075mm)	2022/01/24							0.48	20	56	53 - 58
7796207	Sieve - #200 (>0.075mm)	2022/01/24							0.81	20	44	42 - 47
7796467	Moisture	2022/01/24							0	20		
7796994	F2 (C10-C16 Hydrocarbons)	2022/01/25	108	60 - 130	97	80 - 120	<10	ug/g	NC	30		
7796994	F3 (C16-C34 Hydrocarbons)	2022/01/25	109	60 - 130	97	80 - 120	<50	ug/g	NC	30		
7796994	F4 (C34-C50 Hydrocarbons)	2022/01/25	111	60 - 130	97	80 - 120	<50	ug/g	NC	30		
7798035	Benzene	2022/01/25	96	50 - 140	95	50 - 140	<0.020	ug/g	NC	50		
7798035	Ethylbenzene	2022/01/25	109	50 - 140	108	50 - 140	<0.020	ug/g	NC	50		
7798035	F1 (C6-C10) - BTEX	2022/01/25					<10	ug/g	NC	30		
7798035	F1 (C6-C10)	2022/01/25	90	60 - 140	87	80 - 120	<10	ug/g	NC	30		
7798035	o-Xylene	2022/01/25	109	50 - 140	108	50 - 140	<0.020	ug/g	NC	50		
7798035	p+m-Xylene	2022/01/25	106	50 - 140	104	50 - 140	<0.040	ug/g	NC	50		
7798035	Toluene	2022/01/25	96	50 - 140	94	50 - 140	<0.020	ug/g	NC	50		
7798035	Total Xylenes	2022/01/25					<0.040	ug/g	NC	50		
7798185	1,1,1,2-Tetrachloroethane	2022/01/25	99	60 - 140	100	60 - 130	<0.040	ug/g	NC	50		
7798185	1,1,1-Trichloroethane	2022/01/25	103	60 - 140	100	60 - 130	<0.040	ug/g	NC	50		
7798185	1,1,2,2-Tetrachloroethane	2022/01/25	86	60 - 140	96	60 - 130	<0.040	ug/g	NC	50		
7798185	1,1,2-Trichloroethane	2022/01/25	97	60 - 140	104	60 - 130	<0.040	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7798185	1,1-Dichloroethane	2022/01/25	95	60 - 140	95	60 - 130	<0.040	ug/g	NC	50		
7798185	1,1-Dichloroethylene	2022/01/25	102	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	1,2-Dichlorobenzene	2022/01/25	96	60 - 140	95	60 - 130	<0.040	ug/g	NC	50		
7798185	1,2-Dichloroethane	2022/01/25	90	60 - 140	97	60 - 130	<0.049	ug/g	NC	50		
7798185	1,2-Dichloropropane	2022/01/25	96	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	1,3-Dichlorobenzene	2022/01/25	100	60 - 140	95	60 - 130	<0.040	ug/g	NC	50		
7798185	1,4-Dichlorobenzene	2022/01/25	117	60 - 140	111	60 - 130	<0.040	ug/g	NC	50		
7798185	Acetone (2-Propanone)	2022/01/25	89	60 - 140	100	60 - 140	<0.49	ug/g	NC	50		
7798185	Benzene	2022/01/25	91	60 - 140	92	60 - 130	<0.0060	ug/g	NC	50		
7798185	Bromodichloromethane	2022/01/25	97	60 - 140	100	60 - 130	<0.040	ug/g	NC	50		
7798185	Bromoform	2022/01/25	88	60 - 140	97	60 - 130	<0.040	ug/g	NC	50		
7798185	Bromomethane	2022/01/25	94	60 - 140	95	60 - 140	<0.040	ug/g	NC	50		
7798185	Carbon Tetrachloride	2022/01/25	102	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	Chlorobenzene	2022/01/25	100	60 - 140	99	60 - 130	<0.040	ug/g	NC	50		
7798185	Chloroform	2022/01/25	97	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	cis-1,2-Dichloroethylene	2022/01/25	97	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	cis-1,3-Dichloropropene	2022/01/25	94	60 - 140	98	60 - 130	<0.030	ug/g	NC	50		
7798185	Dibromochloromethane	2022/01/25	93	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	Dichlorodifluoromethane (FREON 12)	2022/01/25	85	60 - 140	85	60 - 140	<0.040	ug/g	NC	50		
7798185	Ethylbenzene	2022/01/25	96	60 - 140	92	60 - 130	<0.010	ug/g	NC	50		
7798185	Ethylene Dibromide	2022/01/25	90	60 - 140	97	60 - 130	<0.040	ug/g	NC	50		
7798185	Hexane	2022/01/25	104	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	Methyl Ethyl Ketone (2-Butanone)	2022/01/25	94	60 - 140	112	60 - 140	<0.40	ug/g	NC	50		
7798185	Methyl Isobutyl Ketone	2022/01/25	92	60 - 140	109	60 - 130	<0.40	ug/g	NC	50		
7798185	Methyl t-butyl ether (MTBE)	2022/01/25	89	60 - 140	92	60 - 130	<0.040	ug/g	NC	50		
7798185	Methylene Chloride(Dichloromethane)	2022/01/25	104	60 - 140	107	60 - 130	<0.049	ug/g	NC	50		
7798185	o-Xylene	2022/01/25	95	60 - 140	93	60 - 130	<0.020	ug/g	NC	50		
7798185	p+m-Xylene	2022/01/25	102	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
7798185	Styrene	2022/01/25	104	60 - 140	104	60 - 130	<0.040	ug/g	NC	50		
7798185	Tetrachloroethylene	2022/01/25	97	60 - 140	91	60 - 130	<0.040	ug/g	NC	50		
7798185	Toluene	2022/01/25	95	60 - 140	92	60 - 130	<0.020	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7798185	Total Xylenes	2022/01/25					<0.020	ug/g	NC	50		
7798185	trans-1,2-Dichloroethylene	2022/01/25	101	60 - 140	99	60 - 130	<0.040	ug/g	NC	50		
7798185	trans-1,3-Dichloropropene	2022/01/25	100	60 - 140	104	60 - 130	<0.040	ug/g	NC	50		
7798185	Trichloroethylene	2022/01/25	106	60 - 140	103	60 - 130	<0.010	ug/g	NC	50		
7798185	Trichlorofluoromethane (FREON 11)	2022/01/25	102	60 - 140	98	60 - 130	<0.040	ug/g	NC	50		
7798185	Vinyl Chloride	2022/01/25	97	60 - 140	95	60 - 130	<0.019	ug/g	NC	50		
7799242	Aroclor 1242	2022/01/26					<0.010	ug/g	NC	50		
7799242	Aroclor 1248	2022/01/26					<0.010	ug/g	NC	50		
7799242	Aroclor 1254	2022/01/26					<0.010	ug/g	NC	50		
7799242	Aroclor 1260	2022/01/26	101	30 - 130	105	30 - 130	<0.010	ug/g	NC	50		
7799242	Total PCB	2022/01/26	101	30 - 130	105	30 - 130	<0.010	ug/g	NC	50		
7800468	Available (CaCl2) pH	2022/01/26			101	97 - 103			1.4	N/A		
7802359	1-Methylnaphthalene	2022/01/27	92	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40		
7802359	2-Methylnaphthalene	2022/01/27	89	50 - 130	81	50 - 130	<0.0050	ug/g	NC	40		
7802359	Acenaphthene	2022/01/27	97	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40		
7802359	Acenaphthylene	2022/01/27	93	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40		
7802359	Anthracene	2022/01/27	93	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40		
7802359	Benzo(a)anthracene	2022/01/27	112	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40		
7802359	Benzo(a)pyrene	2022/01/27	106	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40		
7802359	Benzo(b/j)fluoranthene	2022/01/27	97	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40		
7802359	Benzo(g,h,i)perylene	2022/01/27	122	50 - 130	113	50 - 130	<0.0050	ug/g	NC	40		
7802359	Benzo(k)fluoranthene	2022/01/27	100	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40		
7802359	Chrysene	2022/01/27	111	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40		
7802359	Dibenzo(a,h)anthracene	2022/01/27	119	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40		
7802359	Fluoranthene	2022/01/27	100	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
7802359	Fluorene	2022/01/27	100	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
7802359	Indeno(1,2,3-cd)pyrene	2022/01/27	124	50 - 130	115	50 - 130	<0.0050	ug/g	NC	40		
7802359	Naphthalene	2022/01/27	82	50 - 130	78	50 - 130	<0.0050	ug/g	NC	40		
7802359	Phenanthrene	2022/01/27	103	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7802359	Pyrene	2022/01/27	94	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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FUNDAMENTAL LABORATORY ACCEPTANCE GUIDELINE

Invoice To:
Pinchin Ltd
ATTN: Accounts Payable
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2
Client Contact:
Amanda Brandt

Bureau Veritas Job #:	C217455
Date Received:	2022/01/21
Your C.O.C. #:	859604-01-01
Your Project #:	291885.003
Bureau Veritas Project Manager:	Antonella Brasil
Quote #:	C20345

- [X] Chain of Custody information incomplete
- [X] Chain of Custody not signed/dated
- [X] Labelling issue (missing/incorrect)

Report Comments

Received Date:	**2022/01/21**	**Time:**	**18:40**	**By:**	**URE**
Inspected Date:	**2022/01/21**	**Time:**	**19:00**	**By:**	**URE**
FLAG Created Date:	**2022/01/21**	**Time:**	**19:01**	**By:**	**KTN**

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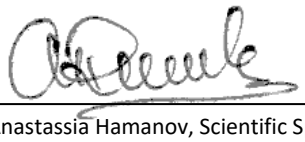
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

21-Jan-22 18:40
Antonella Brasil
C217455

Page 1 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#3103 Pinchin Ltd	Company Name:		Quotation #:	
Attention:	~~Jenny Park~~ Accounts Payable	Attention:	Amanda Brandt, Jenny Park	P.O. #:	
Address:	2360 Meadowpine Blvd Unit # 2	Address:		Project:	291875.003
	Mississauga ON L5N 6S2			Project Name:	
Tel:	(905) 363-0678 Fax: (905) 363-0681	Tel:	Fax:	Site #:	
Email:	ap jpark@pinchin.com	Email:	abrandt@pinchin.com, jpark@pinchin.com	Sampled By:	JP

URE ENV-1461 O

Bottle Order #: 859604

COC #: C#859604-01-01

Project Manager: Antonella Brasil

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☑ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	FOR RSC
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☑ Table 3 ☐ Agri/Other ☑ For RSC	☐ MISA Municipality	
☐ Table	☐ PWQO ☐ Reg 406 Table	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? Y

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Dioxins/Furans in Soil (1613B)	O. Reg 153 PHCs (F1-F4)	BTEX	O. Reg 153 PAHs	O. Reg 153 PCBs	pH	Single Sieve Grain Size (75µm)	# of Bottles	Comments
1		BH101-1	2021/01/20		S		✓	✓		✓			4	
2		BH101-2										✓	2	
3		BH101-3					✓	✓		✓			4	On-Hold until further notice
4		BH101-5					✓	✓		✓			4	
5		BH102-2									✓		2	
6		BH102-3					✓	✓	✓				4	
7		BH102-4									✓	✓	2	
8		BH103-1					✓	✓	✓				4	
9		BH104-1					✓	✓	✓				4	
10		BH105-2	2021/01/20		S						✓		1	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only
Jenny Park	21/01/21	12:00	Jenny Park	2021/01/21	18:40	0	Time Sensitive; Temperature (°C) on Recei 1.0/-1; Custody Seal Present ☐ Intact ☐ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #3103 Pinchin Ltd	Company Name:	Quotation #:	Bureau Veritas Job #: / Bottle Order #: 859604
Attention: ~~Jenny Park~~ Accounts Payable	Attention: Amanda Brandt, Jenny Park	P.O. #:	
Address: 2360 Meadowpine Blvd Unit # 2, Mississauga ON L5N 6S2	Address:	Project: 291885-003	COC #: C#859604-02-01 / Project Manager: Antonella Brasil
Tel: (905) 363-0678 Fax: (905) 363-0681	Tel: Fax:	Project Name:	
Email: AP ~~jpark~~@pinchin.com	Email: abrandt@pinchin.com ; jpark@pinchin.com	Site #: Sampled By:	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☑ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	For RSC
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☑ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality	
☐ Table	☐ PWQO ☐ Reg 406 Table	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Dioxins/Furans in Soil (1613B)	O. Reg 153 PHCs (F1-F4)	BTEX O. Reg 153 PAHs	O. Reg 153 PCBs	pH	Strata Sieve Grain Size (PSA)	VOCs	# of Bottles	Comments
1		BH 105-3	2022/01/22		S			✓	✓	✓				4	
2		DUP01-012022	↓	—	↓			✓	✓	✓				4	
3		DUP02-012022	↓	—	↓					✓				1	
4		Trip Blank	2022/01/22	8:00AM	S								✓	2	
5															
6															
7															
8															
9															
10															

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present / Intact	Yes	No
Jenny Park	22/01/21		See Page 1			0					

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

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Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:
Company Name: #3103 Pinchin Ltd
Attention: ~~Jenny Park~~ Accounts Payable
Address: 2360 Meadowpine Blvd Unit # 2, Mississauga ON L5N 6S2
Tel: (905) 363-0678 Fax: (905) 363-0681
Email: ap jpark@pinchin.com

REPORT TO:
Company Name:
Attention: Amanda Brandt, Jenny Park
Address:
Tel: Fax:
Email: abrandt@pinchin.com, jpark@pinchin.com

PROJECT INFORMATION:
Quotation #:
P.O. #:
Project: 291875-003
Project Name:
Site #:
Sampled By: JP

Laboratory Use Only:
Bureau Veritas Job #:
Bottle Order #: 859604
COC #: C#859604-01-01
Project Manager: Antonella Brasil

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☑ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☑ Table 3 ☐ Agri/Other ☑ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ☐ PWQO ☐ Reg 406 Table ☐ Other

Special Instructions: FOR RSC

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):
Field Filtered (please circle): Metals / Hg / Cr VI
Dissolved Furans on Soil (1613B)
O. Reg 153 PAHs (F1-F4)
BTEX
O. Reg 153 PAHs
O. Reg 153 PCBs
pH
Single Sieve Grain Size (75µm)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	# of Bottles	Comments
1		BH101-1	2021/01/20	9:20	S	4	
2		BH101-2		9:35		2	
3		BH101-3		9:45		4	On-Hold until further notice
4		BH101-5		10:00		4	
5		BH102-2		10:20		2	
6		BH102-3		10:40		4	
7		BH102-4		10:45		2	
8		BH103-1		3:20		4	
9		BH104-1		3:40		4	
10		BH105-2	2021/01/20	11:35	S	4	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
[signature] Jenny Park	21/01/21	12:00	[signature]	2021/01/21	18:40	0

Laboratory Use Only
Time Sensitive
Temperature (°C) on Recei: 1.0 / -1
Custody Seal Present Intact: Yes ✓ / No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.
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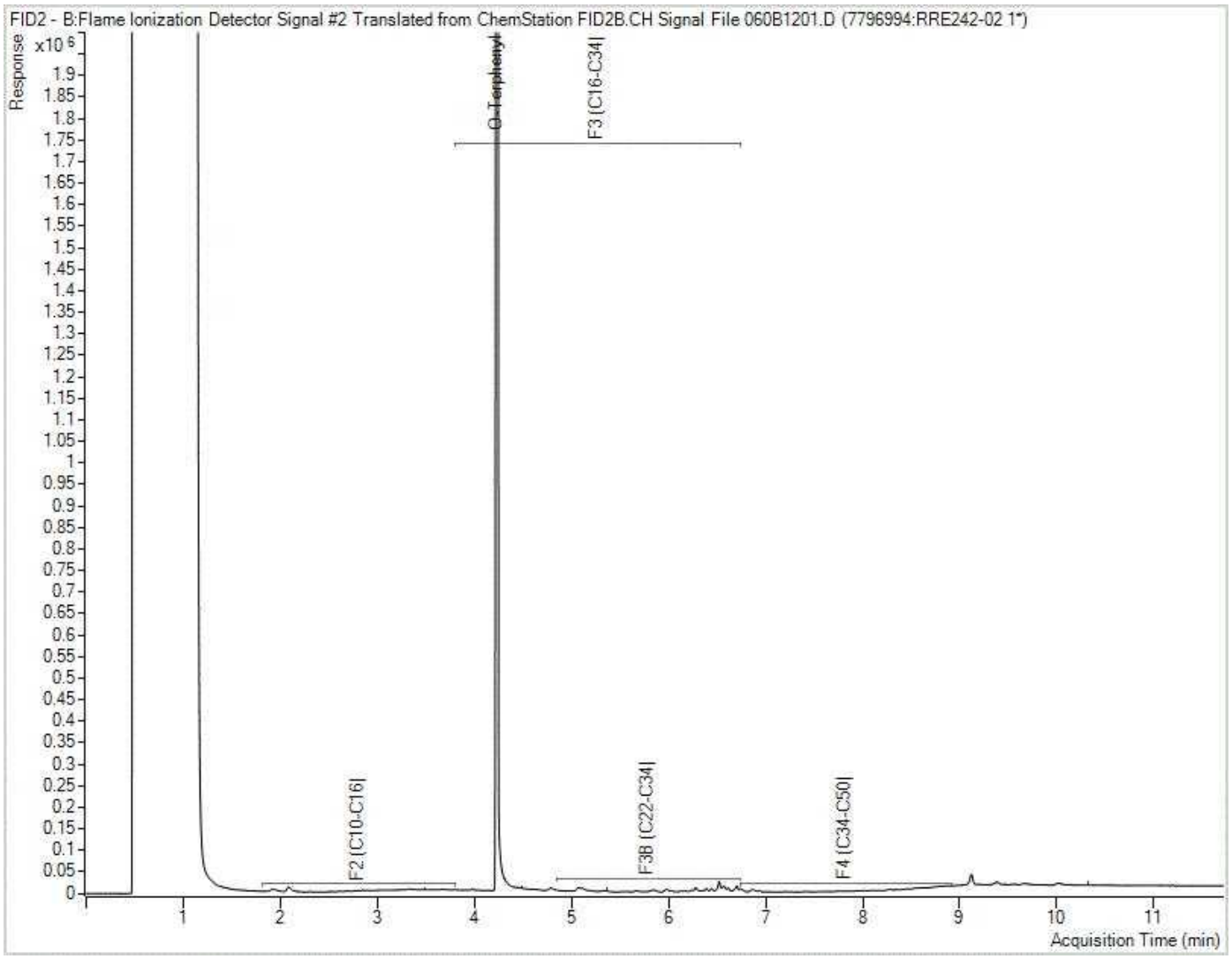
SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

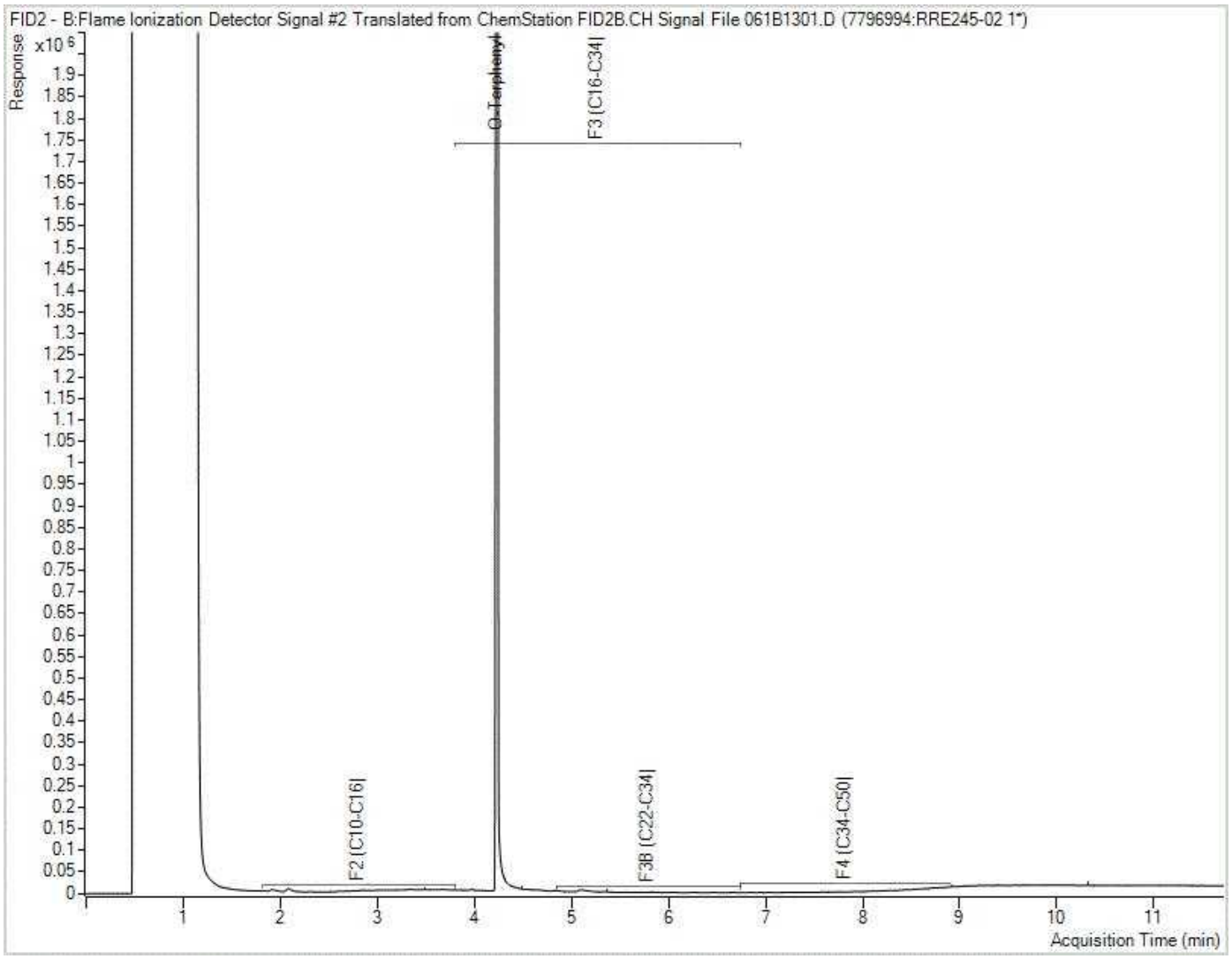
10 BH105-3 — 11:40

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



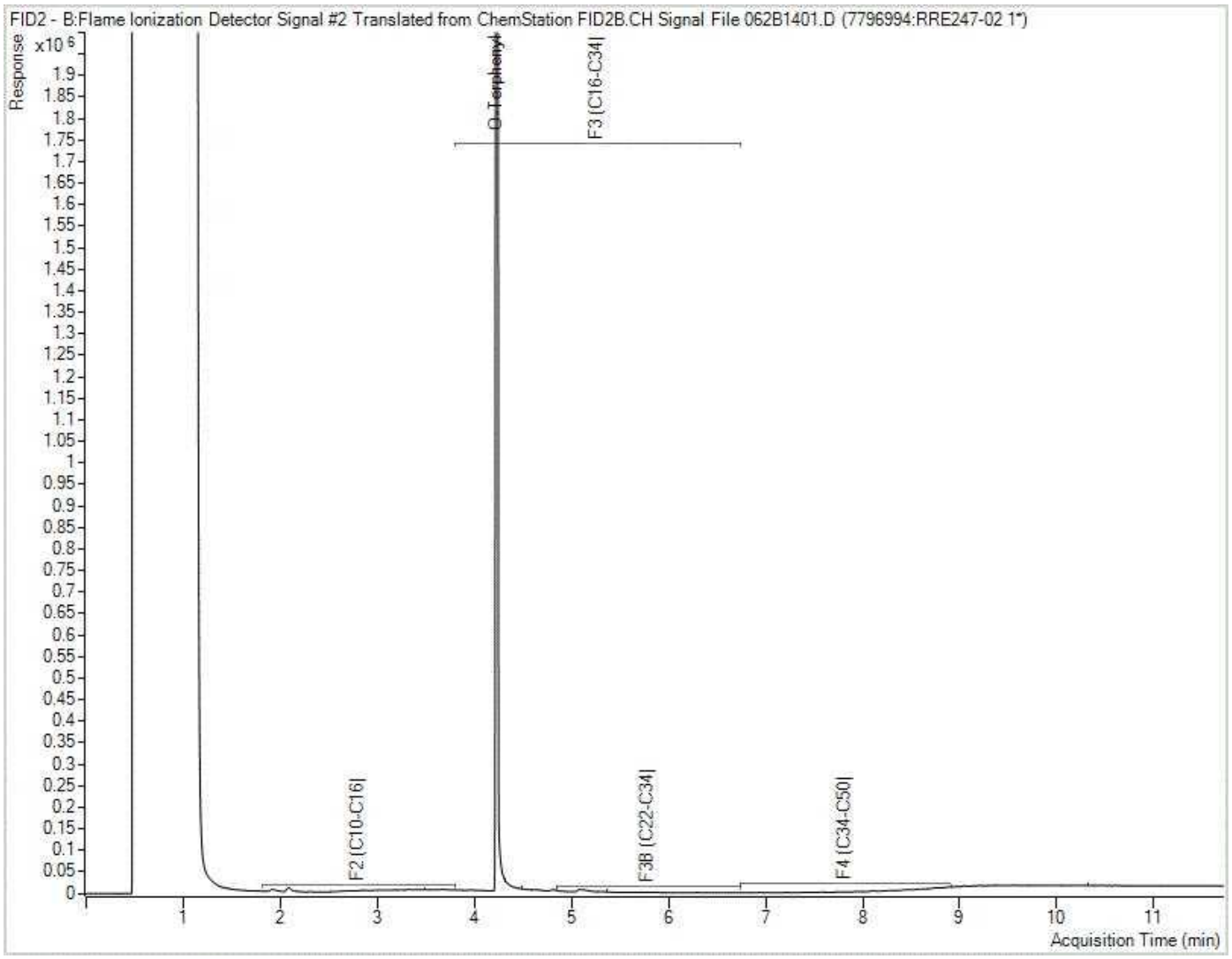
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



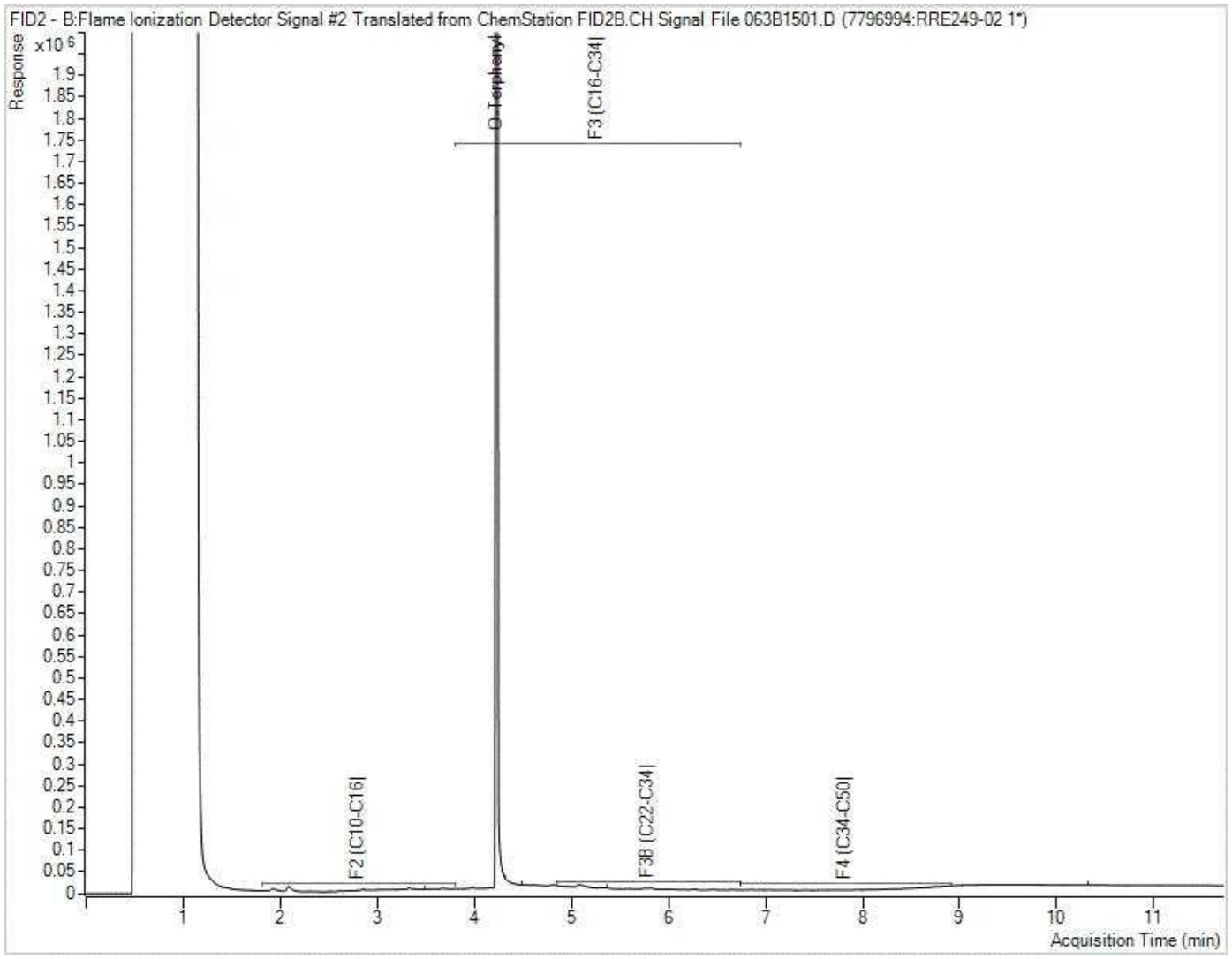
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



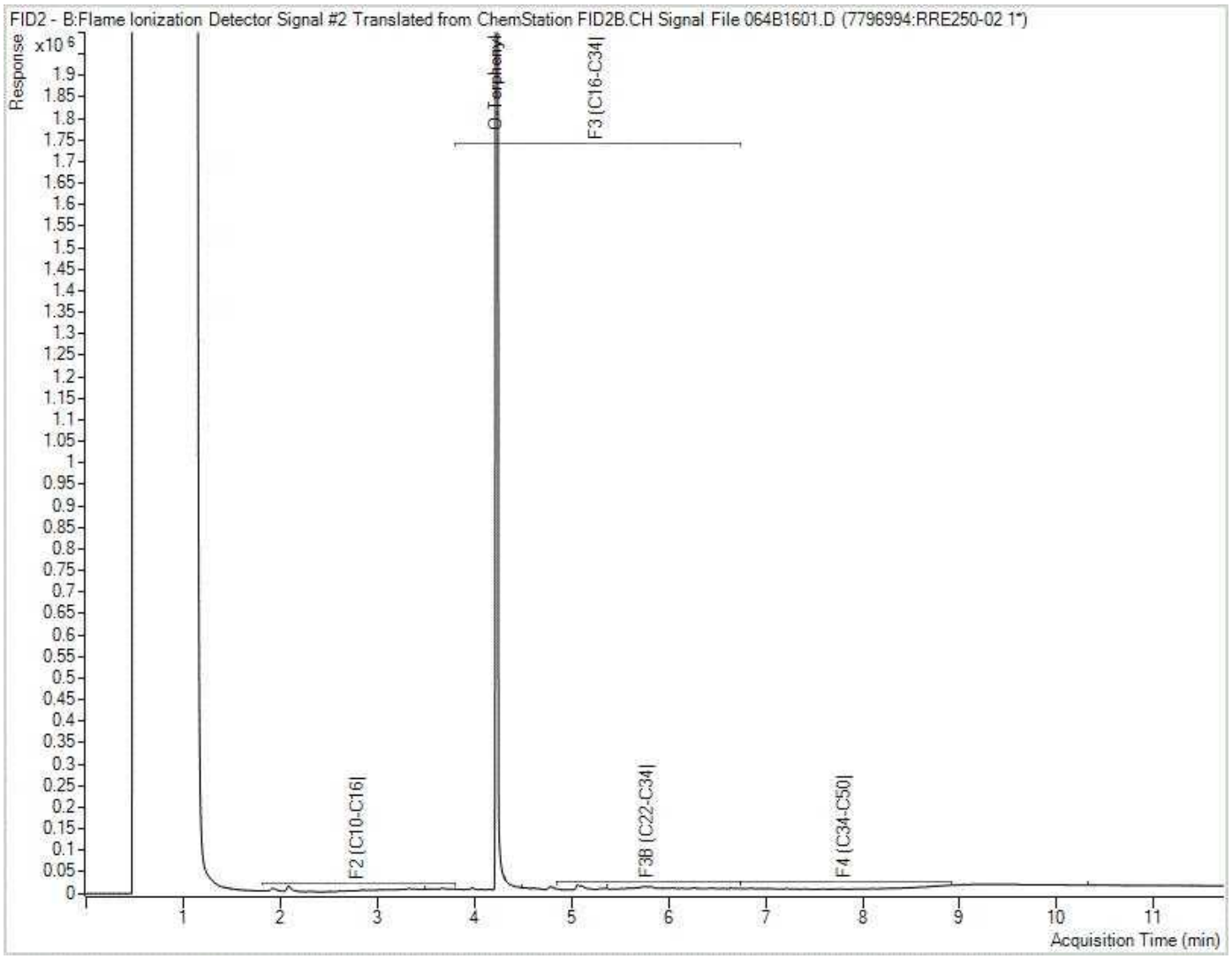
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



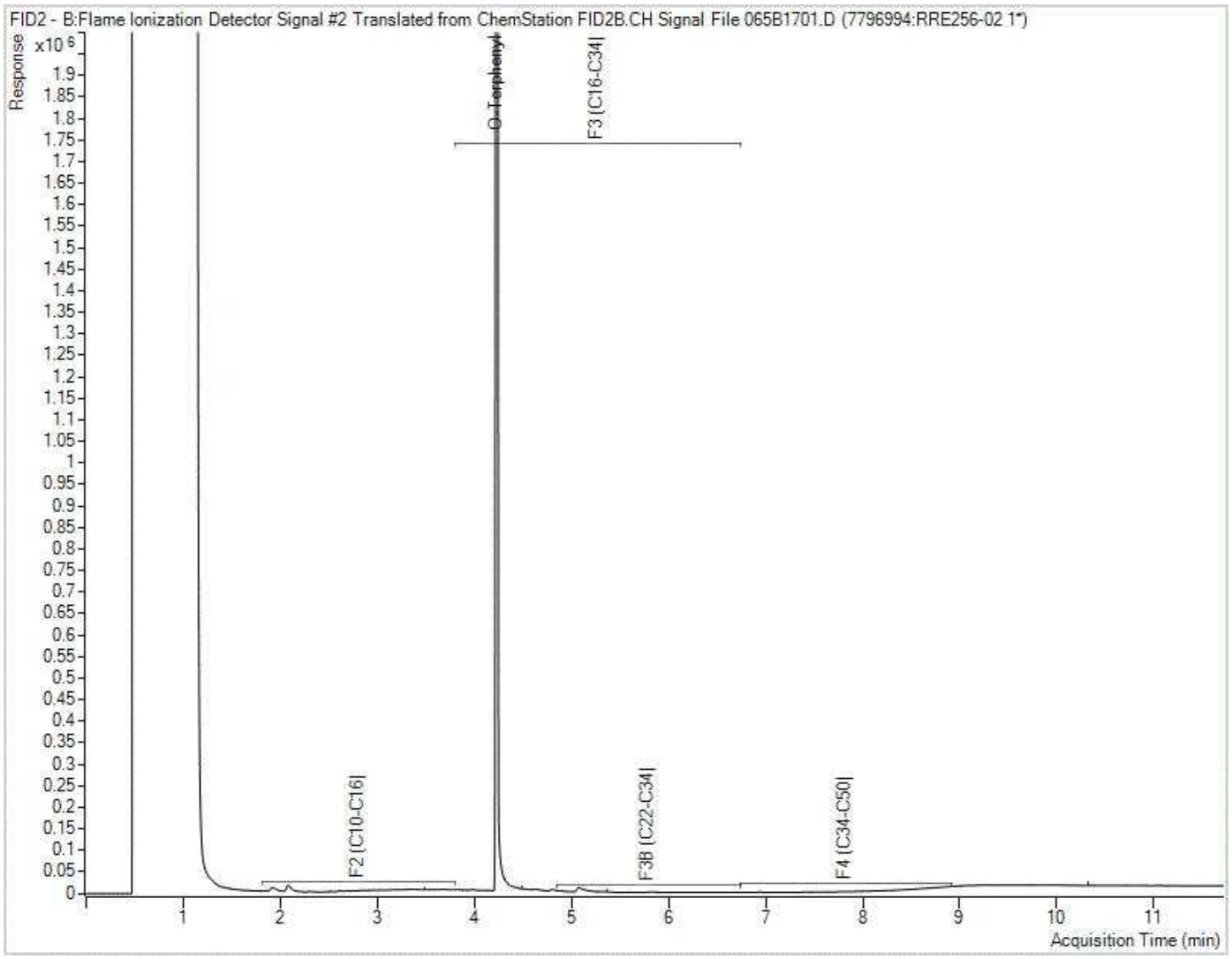
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



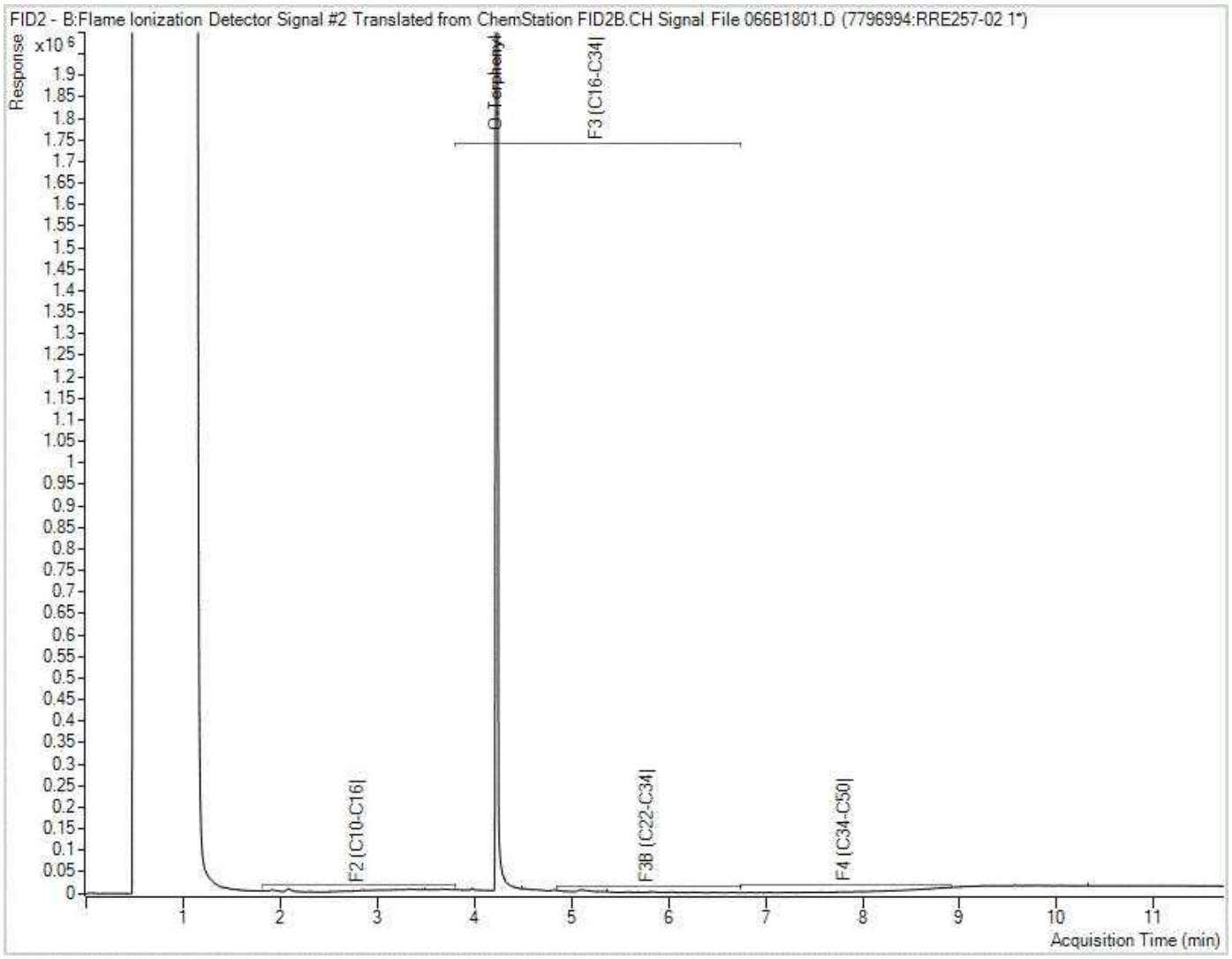
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.